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**Workshop Directors:
Katar Singh and Vishwa Baliabh**

**Institute of Rural Management Anand 388 001 India
Phone : (02692) 23120 Telex : 0172/262
Fax: 02692-22220**

PROF. E LINOR JATROUJ

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CONTRIBUTORS OF PAPERS

Dr. BC Barik is Reader in Sociology, Water and Land Management Institute, Anand, Gujarat.

Shri Chetan Agarwal is a graduate of IRMA. He is currently working with the Society for Promotion of Wastelands Development (SPWD), New Delhi.

Dr. SK Chauhan is Assistant Professor (Agricultural Economics) at the Himachal Pradesh Agricultural University, Palampur, H.P. He has authored a book on "Economics of Sheep Farming". His current research interests are socio-economic aspects of tribals, economics of dairy and fish farming and management of natural resources such as land and water.

Dr. KK Datta is Scientist (Agricultural Economics) at the Central Soil Salinity Research Institute, Karnal. His major area of specialisation is related to the economic aspects of agricultural land drainage. He did advance research on farm level impacts of agricultural land drainage at the International Land Reclamation and Development Institute, The Netherlands.

Shri Dilip Kumar Mohanty is a graduate of IRMA. He is currently working with the Gujarat Co-operative Milk Marketing Federation (GCMMF), Anand, Gujarat.

Dr. Dinesh K Marotfcia is Professor and Head of the Department of Agricultural and Natural Resource Economics at Indira Gandhi Agricultural University, Raipur. He holds M.Sc. (Agril. Economics) from G.B. Pant University of Agriculture and Technology and Ph.D. from the University of Alberta with specialisation in natural resource economics. He has published widely in the area of management of renewable natural resources.

Prof; OT Gulati is Joint Director, Water and Land Management Institute (WALMI), Anand, Gujarat. He has done research work on alternative approaches to Main Canal Management and on Farmers' Organisations.

Dr. V. Haridasan is Deputy Director (Economic Research) in the Rubber Research Institute of India under the Rubber Board. He has around 30 years of experience and has published 60 papers, 3 booklets and 2 books.

Dr. PK Joshi is Senior Scientist (Agricultural Economics) at the Central Soil Salinity Research Institute, Karnal. His major area of research is related to the economic aspects of irrigation induced salinity, agricultural land drainage and environmental impact assessment. He is a member of several national committees related to water management,

environment, etc. He received D.K. Desai Research award for best research paper published in Indian Journal of Agricultural Economics in the year 1991.

Dr. Katar Singh is Reserve Bank of India Chair Professor at the Institute of Rural Management, Anand. His current teaching and research interests are in the areas of agricultural and rural development and natural resources management. He has over 25 years of teaching, training, and research experience. His publications include two text books, Rural Development: Principles, Policies and Management (Sage, 1986) and Managing Common Pool Resources: Principles and Case Studies (Oxford University Press, forthcoming).

Dr. Kartikeya V Sarabfcai is Director, Vikram Sarabhai Centre for Development Interaction (VIKSAT), Ahmedabad, Gujarat.

Dr. Kazi MB Rahim is Reader in the Department of Agricultural Economics, Institute of Agriculture, Visva-Bharati, Sriniketan, West Bengal.

Dr. Marcus Moench is Research Associate Pacific Institute, currently located at Vikram Sarabhai Centre for Development Interaction (VIKSAT), Ahmedabad.

Dr. KN Nair is on the faculty of the Centre for Development Studies, Trivandrum, Kerala.

Shri SN Lele is a retired Chief Engineer from the Ministry of Water Resources, Government of India. Currently he is the Secretary of the Society for Peoples' Participation in Ecosystem Management, Pune. He has co-authored a report on Working for Farmers Participation in Irrigation Management in Major Irrigation Projects (1992).

Shri VK Mishra is Managing Director, National Tree Growers' Co-operative Federation (NTGCF), Anand, Gujarat.

Dr. TV Moorti is Professor and Head (Agricultural Economics) at the Himachal Pradesh Agricultural University, Palampur, H.P. His current research interests are socio-economic aspects of wastelands, agricultural credit system, economics of livestock farming, irrigation systems, farming systems and land reforms pertaining to hills. He has guided about 50 students at M.Sc. and Ph.D level.

Dr. V Mukuiida Das is Professor in the Centre for Management Development (CMD), Trivandrum. Formerly he was on the faculty of the Institute of Rural Management, Anand.

Prof. RK Patil is Consultant in the Society for Peoples' Participation in Ecosystem Management, Pune. Among his many publications are: Farmer Managed Irrigation Systems (1987) and Working for Farmers Participation in Irrigation

Management in Major Irrigation Projects (1992). Both the studies are co-authored.

Shri S. Raju is an IRMA graduate. He is currently working with Vikram Sarabhai Centre for Development Interaction (VIKSAT), Ahmedabad, Gujarat.

Dr. Rakesh Saxena is Assistant Professor in the Institute of Rural Management, Gujarat. He is an agricultural economist and has many years of experience in teaching and research.

Prof. Ramchandra Bhatta is Assistant Professor, Fishery Economics at the University of Agricultural Sciences, College of Fisheries, Mangalore, Karnataka. He holds a Master's Degree in Economics from Bangalore University and a Master's Degree in Fisheries (Economics) with a distinction from the University of Hull, United Kingdom. He has many years of teaching experience.

Shri Ram Mohan Hair is a graduate of IRMA. Currently he is working the South Indian Federation of Fishermen Societies (SIFFS), Trivandrum, Kerala.

Dr. Randall A Kramer is Associate Professor at the School of Forestry and Environmental Studies, Duke University, Durham, North Carolina. He has published many papers on sustainable agriculture development in internationally reputed journals.

Dr. VCV Retnam is Organiser, Society for Social Development, Ramavaramapuram, Nagercoil.

Ms. Sangeeta Dhar Choudhary is a graduate of IRMA. She is currently working with a non-governmental organisation—Seva Mandir, Udaipur.

Shri Saumindra Bhattacharya is a graduate of IRMA. He is currently working with the Gujarat Co-operative Milk Marketing Federation (GCMMF), Patna, Bihar.

Dr. Sunil Ray is Fellow, Institute of Development Studies, Jaipur.

Dr. Suresh Balakrishnan is on the faculty of the Centre for Management Development (CMD), Trivandrum.

Shri Suresh Subramanian is a graduate of IRMA. He is currently working with the Aga Khan Rural Support Programme (India) (AKRSP(I), in Veraval, Gujarat.

Dr. Thomas Palakudiyil is Assistant Professor in the Institute of Rural Management, Anand (IRMA), Gujarat. He is an economist and has many years of teaching and research experience. He was closely associated with many NGOs engaged in organising rural people for development and change. Areas of his current interest include process of

rural change, political economy of development, rural poverty and development economics.

Prof. Tushaar Shah is Director, Institute of Rural Management, Anand (IRMA), Gujarat. He has many years of teaching and research experience and has many publications to his credit including two books. His current research interests are in the areas of economics, management of co-operative organisations and natural resource systems.

Dr. Vishwa Ballabh is Assistant Professor in the Institute of Rural Management, Anand. He is an agricultural economist and has over eight years of experience including two years at ICRISAT, Hyderabad. He has many publications to his credit. His current academic interest is in the area of natural resource economics.

CO-OPERATIVES III NATURAL RESOURCES MANagements
EXPERIENCES , ISSUES, AND AGENDA FOR FUTURE RESEARCH
(THEME PAPER)

Katar Singh and Vishwa Ballabh

Introduction

In common parlance, co-operation connotes a form of group behaviour aimed at achieving a goal or set of goals of common interest to the group. In this sense, co-operation is as old as the human civilisation itself. As an ethical norm, co-operation has been stressed in all the major religions and moral systems of the world. As a social structure, co-operation is manifest in innumerable organisations created by man for the purpose of joint action to achieve a common goal. According to the International Encyclopedia of the Social Sciences (Sills 1968 : 384) "Co-operation is joint or collaborative behaviour that is directed toward some goal and in which there is common interest or hope of reward". In this paper, we use the word "co-operation" to mean a formal socio-economic structure and the word 'co-op' to imply a registered co-op society.

The main objectives of this paper are; a) to examine the rationale for co-op management of natural resources; b) to present an overview of the evolution and growth of co-ops in the development and management of natural resources; c) to critically review the experience with co-op management of natural resources; d) to identify and analyse major issues and options in creating and nurturing such co-ops; and e) to outline an agenda for future research.

Extent and significance of Common Pool Natural Resources

The natural resources of land, water, forests, fisheries, etc. constitute the basic support system for life on earth. directly support the livelihood of hundreds of millions of people, particularly the rural poor, and contribute to agricultural and economic growth. India has nearly 329 m ha of land of which nearly 66 m ha are classified as forest land (NIRD 1990 : 34). Of the total forest land, 36.54 m ha is classified as reserved (closed) forests and 27.66 m ha as open forests (WRI 1990 : Table 19.1, 293). The surface water resources (in terms of average annual flow) of India are estimated at 178 m ha metres (CMIE, 1990) and replenishable groundwater resources at 45.23 m ha metres per annum (NIRD, 1990 : 44). As regards marine fish resources, India has a marine coastline of nearly 12,700 km and her fishing rights extend over 4.52 lakh sq. kms of maritime area (shelf to 200 m depth) and 20.15 lakh sq. kms of

Exclusive Economic Zone (WRI, 1990: 337). The inland fish resources consist of 2.90 m ha of inland reservoirs and lakes, and 1.60 m ha of fresh water ponds and tanks most of which could be used for fish culture (Srivastava, et al., 1985a : 1).

There are no reliable estimates of the extent of natural common pool resources (CPRs) in India available at present. Using some rough criteria, Singh (forthcoming) has made some 'guesstimates which are reproduced in Table 1. The figures in Table 1 have been taken from different sources and several subjective judgements have been employed in making the estimates [1]. But, in the absence of any other better estimates, we shall use Singh's guesstimates as a basis for establishing the saliency of CPRs in India's rural economy.

While the extent of natural resources used as common pool is substantial, most of the CPRs in India, as also in other developing countries of the world, are highly degraded and their productivity is much below their potential. The phenomenon of degradation of CPRs was termed as the "tragedy of the commons" by Hardin (1968). The underlying reason for the tragedy is best summed up in the conservative dictum that "everybody's property is nobody's property" (Gordon 1954s 135). Since they are nobody's property, CPRs are likely to be abused, misused and over-exploited. A point of confusion has been that the term suggests resources unmanaged by any individual or group (Kramer and Ballabh 1991). Common property subsumes a set of social norms, conventions, rules for regulating its use. In this sense, it is different from an open access resource whose use is not regulated by any conventions and rules. The problem of common property stems from the inappropriate structure of joint use rights whereas problems of open access arise from the absence of ownership of the resources (Singh, forthcoming). Several alternative solutions are suggested to overcome these problems. While open access arrangements are widely deplored, some analysts suggest privatisation (Smith 1988), while others recommend public management (Myers 1989). A third camp argues for common property management of these resources citing the examples of successful community institutional arrangements (Ostrom 1990; Berkes et al. 1989; Ballabh and Singh 1988). However, these institutional arrangements cannot be free from the context in which they are located and the purpose which these resources serve.

The Role of Common Pool Resources in India's Village Economy

The role of CPRs varies across different ecological agroclimatic zones and farming systems. CPRs contribute to the rural economy in a variety of ways such as: a) supply of fodder and grazing space; b) water for various purposes; c) raw materials for different rural industries; d) silt and mud for house construction; and so on (Jodha 1987).

Besides, CPRs such as dry beds of rivers/tanks used for off-season cropping and tanks used to collect irrigation water play an important resource-augmenting role in the private property resource (PPR) based farming system.

CPRs also contribute greatly to the poor man's nutrition by facilitating his food gathering from forests, ponds, and other sources, and strengthening his self-provisioning system. According to one study, 84% to 100% of the rural poor households depends on CPRs for their livelihood (Jodha 1986). While the small farmers and the rural poor use CPRs to fulfil their subsistence requirements, the large and rich people use them to meet their commercial needs like collection of silt for enriching their fields. The CPRs also contribute substantially to the income of the rural poor households. According to an estimate, the contribution of CPRs to the income of the rural poor is more than the contribution made by poverty alleviation programmes like the IRDP (Jodha, 1986).

The forest and other CPRs were used and are still being used as buffer, particularly in a fragile environment, to support life. They help in regaining productive capacity and thus provide stability to the production systems in such environments. Massive investment in government sponsored relief work could not protect the large scale cattle deaths in Rajasthan and Gujarat in 1987 when it was reported that over 75% cattle died in some parts of Rajasthan. Similar droughts in the past had less severe impact on people and their livestock. This was in spite of the fact that we now have better communication and transport facilities. This was mainly attributed to the loss of forest cover in the region.

Rationale for **Co-operative** Management of Natural Resources

Until recently the role of natural CPRs in the village economy was not understood properly. Therefore, privatisation or public ownership was suggested as a solution to arrest their degradation and preserve the environment. It was further argued that assigning property rights to the landless poor in such resources would improve equity. However, overwhelming evidence is now available which suggests that these policies have neither helped preserve the natural resources and the environment nor have they enabled the poor gain access to these resources. In fact, the poor have been worst sufferers in the sense that they have lost control of whatever CPRs were accessible to them. The complete process of privatisation of CPRs as it affected the rural people involved three stages: a) they were deprived of their right to the collective use of the CPRs; b) they were given individual titles to small parts of privatised CPRs; and c) the circumstances disintitiled them from the newly acquired land (Jodha 1986). Similarly, the policies which helped the rich to capture and privatise the

CPRs like **groundwater** resources also led to inequitable distribution of these resources (Ballabh and Shah 1989).

On the other hand, public line agencies are normally centrally funded organisations which operate according to top-down standard administrative procedures. They tend to seek to maximise budgets and staff. Budgets, staff **advancements**, salaries and benefits are not normally related to management performance. Line agencies are generally accountable only to other government institutions and do not have an economic market for their "outputs". The result is a proliferation to the extent that their evaluation tends to be based not on producing outputs, but on conformity to the higher authorities regarding the use of inputs (Rainey 1983). The public management of our natural resources has been equally disappointing. The forest resources are declining, surface irrigation systems achieve less than 40% of their potential. Besides, the long-term productivity of irrigated lands is threatened by increased salinity, alkalinity, **silting**, water logging and flooding. Alternative institutional arrangements, therefore, are required to restore the productivity of CPRs.

As biological-systems, the CPRs are dynamic and subject to **management** interventions that can provide sustainable benefit flows in the form of food, fodder, fuelwood, fibre, timber, manure, etc., clean surface and groundwater, air filtration and **humidification**, and eco-tourism. Management of CPRs on a sustained yield basis depends upon a careful orchestration of the policies and management practices. Lack of equitable access to CPRs and, hence, inequitable distribution of their benefits often lead to clandestine encroachment or misappropriation of these resources forcing an opportunistic and highly exploitative mode of resource use. There is, therefore, a need for exploring viable CPR management, strategies for their restoration and utilisation within a development context. For the success of any strategy of natural resources management, the involvement of local people is essential. This is so because the use of natural resources by any user has many unintended side effects, or in technical terms, externalities, on other co-users. For **example**, pumping of ground water in a watershed affects the aquifer that is a CPR to which all those who live in the watershed have a legitimate claim. If one of the co-users pumps more water, to that extent, less water is left for use by the others in the watershed. Optimum use of ground water in a watershed therefore, requires the co-operation or participation of all the people living and using ground water in the watershed. Similarly, soil and water conservation in a watershed requires the participation of all the land owners having land in the watershed in the form or adoption of the recommended soil and water conservation measures. In a nutshell, all uses of the natural resources, irrespective of whether they are owned privately or publicly, are interdependent and require the co-operation of all the resource users for internalising/

minimising the externalities involved. This is best achieved when the planning and management of natural resources, especially CPR are done on watershed basis and the resources are managed by their users who are organised into a formal association preferably a co-op society. Co-op management of natural CPRs is therefore the most appropriate of all forms of management in most situations.

Evolution and Growth of Co-ops

The origin of the formal co-op organisation in 1844 in the United Kingdom was rooted in the people's urge to get together voluntarily to help themselves derive higher benefit from the prevailing environment than they could by acting individually. Subsequently, in other European countries, the co-ops emerged primarily as people's response to exploitation of some kind or other. In most of the developing countries, however, the co-ops have been promoted by the governments as instruments of agricultural and rural development.

In India, the modern co-op movement was formally introduced in 1904 with the promulgation of the Indian Co-operative Credit Societies Act. To a large extent, the Act was the outcome of the interest taken by social reformers, leaders of public opinion, and government officials in protecting peasant cultivators from the exploitative practices of money lenders-cum-traders. In the beginning, the co-ops confined their activities to providing cheap credit to farmers. The Co-operative Societies Act of 1912 enlarged the scope of co-ops to include non-credit institutions and federal organisations. Gradually, and particularly after Independence, co-op activity was extended to other spheres such as marketing and processing of agricultural produce and provision of consumer goods. Co-operation soon became one of the major instruments of planned rural development (GOI 1951). India's successive Five Year Plans have emphasised the role of co-ops in implementing various agricultural and rural development programmes. Unlike in developed countries, co-ops in India have been mostly sponsored and supported by the government. The central and state governments have spent enormous amounts of money to promote and sustain co-ops. As of 1988-89, in India there were 3.38 lakh co-ops of all types with a total membership of 15.6 lakh, paid-up capital of Rs.5,242.4 crore and working capital of Rs.62,144.5 crore (Sankaran 1991). Besides, there were 20 national level co-op organisations and 260 state level co-op organisations in the country.

Formal natural resources management co-op societies (NRMCS), except perhaps the tank water management co-ops of South India, are of a relatively recent origin in India. NRMCS include those of marine fisheries, inland fisheries, lift irrigation, canal irrigation, tubewell irrigation, tank management, tree growers', forest labour contract, salt

producers', etc. Statistics about the number and membership of various types of NRMCS in India are not available except for fisheries co-ops. These co-ops **have** been initiated for a variety of reasons by voluntary associations, NGOs, and the governments.

Theories of Co-operation

Two different sets of theories of co-operation are relevant in the context of management of natural resources - one that seeks to explain the behaviour of a co-op as a firm and the other as to why resource users co-operate and/or do not co-operate. In this paper, we shall deal with the former on which we have two well-known theories propounded by Olson (1971) and Buchanan and Tullock (1965). Their salient features are presented below [2].

Olson's Theory

Mancur Olson has challenged a generally held view that groups of individuals having common interests usually work together to achieve them. He argues that "Unless the number of Individuals in a group is quite small, or unless there is coercion or some other special device to make individuals act in their common interest, rational, self-interested individuals will not act to achieve their common or group interests" (Olson 1971: 2).

In general, the larger the group, the less noticeable the actions of its individual members, the higher the transaction costs of bringing them together, and hence, the higher the tendency to free-ride. This is why large groups frequently fail to provide collective goods for their members. Using two simple tools of economic analysis, Olson has shown that "certain small groups can provide themselves with collective goods without relying on coercion or any positive inducements apart from the collective good itself. This is because in some small groups each of the members, or at least some of them, will find that his personal gain from having the collective good exceeds the total cost of providing the collective good" (ibid; 33-34).

Olson does not specify the number of individuals that would make the very small group, but he asserts that the group should be small enough so that "the individual actions of any one or more members are noticeable to any other individuals in the group." An important implication of Olson's theory for managing CPRs is that if a group using a CPR is very large and heterogeneous, it should be divided into a number of small and homogeneous sub-groups and each one randomly assigned a portion of the CPR that should be as far as possible proportionate to the size of the group. If there are marked variations in the quality of the CPR, the assignments may be rotated every year. This is, however, possible only if the CPR is divisible and if some

arrangement exists for dividing and apportioning the CPR among the sub-groups.

According to Olson, despite the free-rider problem, voluntary groups can provide collective goods in a wide range of areas including education, labour unions, and natural resources. Group action can also emerge in such less desirable forms as collusion and oligopolies in which firms or agents collaborate to restrict quantity and maintain high prices.

In the 1971 appendix to his book, Olson also discusses the possible role of the political entrepreneur in promoting collective action. A political entrepreneur is an individual with a combination of such traits as leadership, trust of the community or its fear, ability to discern the motivations of others, and desire to organise the group for collective action. Olson suggests that the success of the political entrepreneur will be related to his ability to utilise selective incentives to motivate participation in collective action.

Buchanan and Tullock's Theory

James M. Buchanan and Gordon Tullock (1965) have propounded a theory of collective choice that is very similar to Olson's theory. In their words, their theory "can perhaps be best classified as being methodologically individualistic." In their theory, they emphasise the central rôle of individual behaviour arguing that a collective action must be composed of individual actions. They assert that in view of separate individuals participating in collective actions with different and often conflicting interests and purposes, "any theory of collective choice must attempt to explain or to describe the means through which (the) conflicting interests (of individuals) are reconciled." Their theory is analogous to the theory of private choice embodied in the theory of markets and has much in common with the views of political scientists typified by Arthur Bentley who tried to explain collective choice in terms of interplay of group interests.

In the context of management of natural CPRs, a key question is: What are the conditions under which a group comprising free and rational utility-maximising individuals choose to formulate and abide by a rule or a set of rules of restrained use of CPRs? Buchanan's and Tullock's answer to this question can be summed up like this: A group would choose a collective mode of action when each of its individual members finds it profitable to act collectively rather than individually, i.e., when his perceived costs are less than his perceived benefits from the collective action. The perceived costs include both external costs and decision-making costs.

Buchanan and Tullock adopt what they call a "cost" approach in their analysis of collective choices and actions. In other words, they consider collective action as a means of reducing the external costs that are imposed on an individual by purely private or voluntary actions of other individuals.. The authors argue that "it is the existence of external costs that rationally explains the origin of either voluntarily organised, co-op, contractual arrangements or collective activity" (Buchanan and Tullock 1965 : 71) . They use two cost functions --an external cost function and a decision-making cost function--to determine the "optimal" or most "efficient" decision-making rule for an individual. The external costs are envisioned to be a decreasing function and the decision-making costs as an increasing function, both of the number of individuals required to reach an agreement. In simple words, this means that the external costs are envisioned to decrease- and the decision-making costs to increase as the number of members in a group increases. The optimum decision rule for an individual is derived by minimising the sum of expected external costs and expected costs of decision making.

To sum up, according to the theoretical frameworks of Olson and Buchanan and Tullock, people will participate in collective action when they are organised in small groups; when the expected private benefits from the collective action exceed the expected private costs of participation; and when rules for preventing free-riding and shirking and ensuring equitable sharing of benefits and costs of the collective action exist and are enforced and monitored by the people themselves.

Review of Experiences with Co-op Management of **Natural Resources**

Fisheries Co-ops

As of 1988-89, the number of primary fisheries co-ops in India was 8,372 and their total membership stood at 11.30 lakh (Sankaran 1991). The annual business turnover was estimated at Rs.43.94 crore. In 1988-89, there was one National Federation of Fishermen's Co-operatives, 15 State Federations of Fishermen's Co-operatives, and at the district level, there, were 78 Central Fishermen's Co-operative Societies.

There is not much published work available on inland fisheries co-ops in India. We could locate only a few studies on the subject, A critical review of these studies is presented in the following paragraphs:

Chatterjee and Bandyopadhyay (1990:234) highlight the inordinate increase in fish prices in West Bengal in recent years and attribute this to various imperfections in the fish market. In their opinion, fisheries co-ops could play

an important role in increasing fish production, and the incomes of fishermen, and in ensuring a fair price to the fish consumers in the state. They found the relative share of fisheries co-ops in the total fish market had declined over time, that their financial performance had been discouraging, and that they had failed to serve the interests of both the fisherman and the consumer. The authors do not specify any reasons for the dismal performance of the fisheries co-ops in the state.

Singh and Bhattacharjee (1991) conducted an in-depth case study of a common pool fish pond in a tribal village, Bergram-Majhipara, of Birbhum district of West Bengal. The fish pond was managed by a co-op society. All the (tribal) households residing in the village were members of the co-op. The study revealed that fish culture in the pond was economically viable, and that the benefits in the form of both fish as well as money from the sale of fish were distributed equally among all the members of the co-op.

Being a socially homogeneous group, the tribals were able to manage the co-op very well. An NGO played a catalytic role and helped the tribals with money, legal and technical information, and moral support. The authors conclude that co-op management of India's hundreds of thousands of common pool fish ponds that are almost unproductive now could transform them into a very valuable and dependable source of income, employment, and nutritious food for the poor villagers and avert their tragedy. The most critical inputs needed for this transformation are identified to be a catalytic agent, financial help and technical guidance.

Srivastava et al. (1985b : 151-167) in a comprehensive all-India study of fish co-ops found that over a period of time a large number of primary co-ops had become defunct mainly due to lack of marketing knowledge, low bargaining power, poor financial management, inadequate financial resources, absence of vertical and horizontal co-ordination, lack of planning, individualistic and non-co-op behaviour and fatalistic attitude of the fishermen, and excessive dependence on the government. For improving the performance of fish co-ops, the authors recommend that : a) separate fish farmers' primary co-ops be organised in each district having good potential for fish culture; b) retailers of fish also be organised into co-ops; c) only professionally trained managers be employed to manage the co-ops; and d) fishing consultancy cells be set up at the state level to provide techno-economic advice and guidance to fish co-ops.

There have been numerous studies of marine fisheries co-ops in both the developing and developed countries. On the whole, most of the fishermen's co-ops studied were successful and were able to retain the loyalty of their members. For example, Berkes (1986 : 218-229) studied the local level management of the Tasucu Bay fishery located on the Mediterranean coast of Turkey. He found that all the

fishermen living in the region constituted a homogeneous group and were members of a **co-op**. It serves several **purposes**, namely, fighting off competing users, provision of financial assistance to its members, control-of the type of fishing technology used in the bay, and marketing of the fishermen's catch. The author judges the co-op to be a successful one having no problems of overuse or pollution, **Similarly, in** another study of a fishermen's co-op in Ebibara community in Japan, Brameld (1968) found that the co-op had proprietary rights on nearby fishing grounds granted by the Japanese government that also regulated the types of gear to be used. The co-op established most of the other regulations, provided services such as credit and cold storage, encouraged **techniques, and** lobbied for its members' interests with other **fishermen's co-ops** and the government. It was also found that the enforcement of regulations was weak and that the fishermen regularly used illegal fishing methods, especially during the "off season" when catches are small.

A few cases of failures of fishing co-ops have also been reported in the literature. **For** example, Sabella (1980) **documents** a case of failure of a fishing co-op in Peru. The author argues that the traditions of independent ownership, the familial organisation of fishing and the intra-village solidarity obtaining in the region conflicted with **co-operative's** organisation and ideology: concepts such as collective ownership of boats and equipment, and sharing of wealth by all members ran counter to their understanding of personal initiative and raised fears of free-riders.

To conclude this section, we may say that there are many issues in the co-op management of fisheries that are not yet adequately researched. They include a) conditions under which fishermen come together on their own initiative and organise themselves into co-ops; b) conditions under which fishing co-ops can attain economic viability and become **self-sustaining without** any external support; c) how co-ops can acquire and **maintain exclusive** rights, to fisheries falling in their jurisdiction; d) how, to reconcile the **conflicting interests** and claims of members using traditional craft and gear, and those using mechanised craft and gear; e) **how to** ensure equitable access to fish stocks and equitable distribution **of benefits** from the catch; and f) how to ensure fair and remunerative price to members, and retain their loyalty to the co-ops.

Wasteland Afforestation/Tree Growers' Co-operatives

Tree Growers' Co-operatives (TGCS) are of a relatively recent origin in India. . . **Fadvel** Tree Growers' Co-operative Society **organised in** the mid 1970s in Surat district of Gujarat is probably the first such society established in India. Now, many NGOs are organising wasteland afforestation/tree growers' **co-ops** in the areas where they work. A bold initiative was taken by the National Dairy Development

Board in 1986 to organise tree growers' co-ops as a pilot project in selected states of India. For this purpose, a national level autonomous organisation, the National Tree Growers' Co-operative Federation (NIGCF) has been established with its headquarters at Anand. The NIGCF initially selected five states of Gujarat, Andhra Pradesh, Orissa, Karnataka and Rajasthan for organising TGCS under a pilot project. Later on one more state, Uttar Pradesh, was included in the project. As of March 1992, it had organised 129 TGCS of which 117 had been registered. The total membership of all TGCS stood at 12,144 and the area covered, at nearly 1,449 ha [3].

The long-term goal of the NIGCF is to adapt the basic principles of the Anand pattern dairy co-ops for creating economically viable and self-sustaining co-ops of tree growers*. There is not much published literature available about the performance of TGCS. However, recently, a few case studies have been conducted by scholars and practitioners which were presented at a workshop held in RMA in December 1991.

From a review of available literature on and afforestation projects, the following lessons can be drawn (Singh and Ballabh 1989; Shankar Narayan 1991; Saxena 1987; Gupta 1989; Shah and Ballabh 1986).

1. Integration of savings, savings-linked loans, and afforestation/plantation activities: AKRSP(I)'s experience shows that unless this is done, no programme of afforestation of common wastelands with people's participation can succeed in the long run.
2. Choice of tree species : Wrong selection of tree species by the Forest Department officials has led to alienation of the local people from afforestation activities. It is therefore necessary that a system needs to be evolved and institutionalised for choosing of suitable tree species through joint consultation with the local people and Forest Department officials.
3. Alternative sources of fodder and fuelwood: When the village commons are closed for grazing, collection of fuelwood, for allowing newly planted saplings to grow, the local people's requirements of fodder and fuelwood must be met from some other alternative sources. Neglect of this basic principle of forest/plantation protection has led to the failure of tree plantation schemes.
4. Equitable distribution of benefits from woodlots/plantations; Definite rules should be specified and made public right at the outset for ensuring equitable distribution of all short-term, intermediate, and long-term benefits from the community plantations. Such rules should be incorporated in the bye-laws of the co-

op and must be enforced and monitored by the members of the society. Unauthorised usurpation of benefits by any member or other vested interests must be prevented and the culprits penalised heavily.

5. Economic viability; Conditions under which economic viability can be achieved and maintained should be specified right at the time of project formulation and thereafter, a close monitoring should be done to make sure that they are all fulfilled. This is essential to sustain the project.
6. Procurement, storage, processing, and marketing: A co-op organisation should perform all these functions most cost-effectively if it is to successfully compete with private, traders engaged in these activities.

In view of the significant economics of the scale involved in these activities, only a vertically and horizontally integrated three-tier structure can successfully perform these functions.

7. Quality-based pricing? Judging the quality of the wood is the most difficult task for the personnel of co-ops and it is in this respect that the private traders are superior to the co-op personnel. It requires a lot of hands-on experience and skill to be good at judging the quality of wood and determining its price accordingly. Co-op personnel will need to beg, borrow, and steal expertise in this area from the private trade.

Irrigation Co-operatives

India has a very long history of government intervention in the development and management of irrigation facilities. In developing irrigation facilities, the major emphasis so far has been on major, and medium sized' projects. It is estimated that by the end of the Seventh Plan, a total public investment of the order of Rs. 27,000 crore had been made in the major and medium sized irrigation projects in India. Both are deeply in the red. Annual losses from the projects are currently estimated at Rs.800 and Rs.900 crore. It is therefore important that such projects are managed well and colossal losses avoided.

One of the main reasons for the losses is the nature of the final output of the projects, water. Water from a public canal system becomes a CPR as soon as it flows out of the canal outlet. Like any other CPR, it is also misappropriated and wasted. Besides, improper use of the canal water also leads to many other problems such as waterlogging, salinity, alkalinity, suboptimal crop pattern, inequitable distribution within the command areas, particularly between the head-reaches and tail-enders, etc. Maintenance of the water channels which are also a part of the CPR is not done regularly and properly. Consequently, a

lot of water is wasted through seepage, leakage, and evaporation and the tail-enders get very little or no water at all; Thus, the use of canal water is neither efficient nor equitable. Similarly, groundwater which is also a CPR is also over-exploited and misused.

A number of policy instruments have been suggested to achieve efficiency and equity in the use of both surface and groundwater in India. They include raising the water tariff, changing the system of water pricing from area basis to volume basis, organising water users into some form of association, conjunctive use of surface water and groundwater, etc.

Participation of the water users in the management decisions particularly those relating to distribution of water, cost recovery, and maintenance and repairs is essential for efficient water management at the field level. There are many success stories of farmers managing irrigation water in India, the Philippines, Sri Lanka and many other South East Asian countries. In particular, the experience of the National Irrigation Administration in the Philippines in organising water users is well-documented and analysed. In India, there are many successful canal irrigators¹ co-op societies working in the Ukai-Kakrapar project command area in Gujarat and co-op lift irrigation societies working in many states. There are many NGOs that are engaged in promoting such co-ops. However, the water users associations and co-ops are still in a rudimentary formative stage and their impact is still not felt at the macro level. A brief review of the experience of some of those co-ops is presented below.

Bautista (1987) describes his and his colleagues' experiences in organising Irrigators' Associations (IAs) in the command area of the Magat River Irrigation System which is one of the two largest irrigation systems in the Philippines. He makes use of graduates in agriculture called Irrigators' Associations Advisors (IAA) to promote farmers' associations. He identifies the following as the key factors affecting the success in organising IAs (ibid : 3-4)

1. Strong determination and commitment of the personnel of the Project authority to demonstrate exceptionally good performance and to solve farmers' problems regarding adequacy and timely delivery of water supplies;
2. Strong support for the programme by the Project Manager and other top officials of the agency, particularly, the National Irrigation Administration (NIA) Administrators;
3. Active members and their continuing education in the development and maintenance of IAs;

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4. Delegation of authority and provision of incentives commensurate with the additional responsibilities and duties assigned to farmers;
5. Promotion of group activities aimed at organisational development and giving Immediate and tangible benefits to the participating members of the IAs; and
6. Proper management of funds, regardless of the amount, effective inter-agency co-ordination, and selection of honest and unbiased members as IA Presidents.

Katar Singh (1991) documents the experience with a canal water users' co-op, the Mohini Water Co-operative Society (MWCS), in Surat district of Gujarat. This is perhaps the first water users' co-op established in India. It was registered in September 1978 and started functioning in April 1979*. The author concludes that the MWCS helped its members secure adequate, assured, equitable and timely supply of water from a public canal system which under the management of Irrigation Department was not dependable. The members of the society were generally satisfied with its performance; they got higher crop yields due to the timely and adequate supplies of water. Of late, the society has been facing a number of problems such as defaults in payment of water charges, non-co-operation of its members in the maintenance and repair of water channels and non-adherence to the recommended cropping pattern by its members. Although the society pays for water measured volumetrically, it charges the member-irrigators at the flat per ha basis as done by the Irrigation Department*. This system of charging for water provides no incentives for farmers to use the water judiciously and hence they grow more of water-intensive crops like sugar-cane, banana, paddy, etc.

Ballafoh et al. (1992) review the experience of three interventions relating to the farmers' organisation and water users' co-ops in the Mahi Right Bank Canal Command area, Gujarat*. They conclude that the performance of all the three interventions was far from satisfactory. These were the important lessons of that experience: First, it took considerable time for the intervening agency to make an impact and seek farmers' participation. Second, the supply of sufficient quantity of water was assured in all the three cases. However, such assurance cannot be provided in all the areas where the model is to be replicated. The authors, therefore, conclude that it is difficult to scale up and replicate these models elsewhere. Besides, none of these interventions addressed the issue of the dichotomy between the promotion of farmers' participation in the system or minor/distributory levels, and the continuance of full government control at the system level. The line functionaries remained accountable to the principal chief irrigation engineers, and the farmers felt that they were in a subordinate position. In such circumstances, it will always be difficult to persuade

farmers to contribute towards the cost of an organisation whose behaviour they cannot influence.

According to another review (Ballabh and Shah 1989), critical to the success of community tubewells were such factors as small size of the groups and a high degree of homogeneity in group membership in terms of both caste and landholding*. Indo-Norwegian Agricultural Development Project (INADP) community tubewells in Deoria have worked well only when their members came from one or two families. Success is also associated with certain group processes, quality of leadership and external support in both leadership and management. These observations fit in well with the conventional understanding of organisations because the transaction costs associated with collective action would tend to be smaller if the members of the group belonged to a homogeneous and cohesive community than if they did not.

However, there are several constraints which, in reality, make such homogeneity difficult to achieve. Often, small farmers' fields are interspersed by large farmers' plots. In such situations, it becomes necessary to include large farmers as members of the group lift irrigation scheme. External support, managerial and institutional, becomes particularly important in community lift irrigation; and so does the availability of good local leadership. The role of the leader essentially amounts to : a) motivating people to form a group and establish community tubewells; and b) providing initial support in drawing the rules and regulations for water distribution. This has, for example, been observed in the case of some *Pani Panchayats* in Maharashtra which could not overcome internal conflicts and tension due to inadequate support from the *Gram Gaurav Pratishthan*.

Assigning individual and joint responsibilities has a positive influence in group functioning. In Mulkanoor villages of Karimnagar district in Andhra Pradesh, a government programme to provide credit and subsidy support for minor irrigation wells for the weaker sections operationalised the concept of 'joint responsibility' by stipulating that even if a single individual fails to repay the loan, the entire group forfeits its right to use the pumpset. This procedure has proved effective and most of the groups in Mulkanoor have paid off their bank loans. In contradistinction to this, internal conflicts in INADP community tubewells in Deoria and Vaishali Small Farmers' Association (VASFA) community tubewells in Vaishali over electricity dues collection arose primarily from the failure to assign individual and/or joint responsibilities.

Many small group tubewells in various regions have been promoted by external agencies, most often, by voluntary organisations. But, spontaneous groups have also emerged to take advantages of economic gain from water sales. It was

argued that in Gujarat, water-companies, an indigenous form of community lift irrigation organisation, have grown from strength to strength and have become the backbone of water markets. Water companies of Gujarat are better and more professionally managed than most community lift irrigation schemes and public tubewell programmes; they keep meticulous accounts, mostly issue printed receipts and distribute profit annually.

The economic gain (which individual members were not able to capture) at the initial stage was the main motivating factor for small farmers to participate in collective action in the INADP community tubewells in Deoria; this has also been a strong reason for the emergence and proliferation of landless group tubewells in Bangladesh. In recent years, as their average command area has started decreasing, economic gain declined and, therefore, the landless irrigation groups in some parts of Bangladesh seem to have begun to disintegrate. In many parts of India too, small farmers' lift irrigation groups, especially the large ones, display a strong tendency to either break up or shrink before the competition from water markets. This raises two important issues: a) what kind of professional and managerial assistance would help them withstand market pressure and internal tensions; and b) at what stage should public policy intervene and how.

The failure of community tubewells in many cases is also related with wrong siting of wells, faulty technology, inadequate technical and managerial support from the promoting agency, and insufficient water yield in wells. The last may mean two things first, that the yield is not sufficient to justify the cost; and second, it is not sufficient to provide members with as much water as they want. If the scarcity is of the first kind, then it amounts to wrong techno-economic choice. However, the second should be a matter of concern and would indicate the more difficult group processes needed to establish rules for equitable rationing of scarce water.

Winding up of lift irrigation groups due to insufficient water yield in wells has been recorded by Nagabrahmam (1989) and others in the Association of Sarva Seva Farms (ASSEFA) promoted small group tubewells in Madurai, in some community tubewells in Mulkanoor and Nellore etc., and even in some of the community tubewells promoted by the *Gram Gaurav Pratishthan* based on the principle of *Pani Panchayat*. This certainly suggests a strong need to improve the technical and managerial capability of the agencies engaged in promoting community action; but it also suggests the need for better understanding of the ways of equitable rationing and use of limited water.

Public policies can have a powerful influence on the survival and growth of community lift irrigation. In Uttar Pradesh, for instance, the locational policy followed for

the establishment of new World Bank tubewells resulted in the duplication of pumping capacities in certain areas. In Deoria district, for instance, this created much confusion, and eventually, many groups collapsed and private tubewell owners disinvested in tubewells in the face of competition from the new tubewells with better technology, more reliable electricity- and advantage of subsidies.

Barik (1991) describes the experience of a successful lift irrigation co-op in a tribal village of Panchmahals in Gujarat. At the request of local people, the co-op was organised with the technical and financial support of an NGO and the District Rural Development Agency, Panchmahals. The irrigation project has a command area of nearly 120 ha and some 150 tribal farm households are its beneficiaries. The total investment in the project was of the order of Rs.9.50 lakh* The project is now managed by the co-op. The NGO provides technical services and advice as and when needed. As a result of the project, the standard of living of the beneficiaries has improved and seasonal migration from the area reduced. The author does not point out any issues/problems in the operation and management of the coop., The attributes the success of the co-op to the active involvement of its members in its functioning and management.

Sarada and Narender (1990) document the experience of a lift irrigation co-op society of Gaddipalli of Nalgonda district of Andhra Pradesh. The society was registered in March 1969 and is perhaps the first of its kind ever set up in India. It has a membership of 1,035 farmers drawn from seven villages. It provides technical know-how, farm inputs, and services to its members with a view to promote their all-round development. The authors argue that the establishment of the society has substantially raised the fixed as well as working capital investment per ha and has led to greater cropping intensity mainly due to the increased area under paddy and ground-nut. According to the authors, the society provided irrigation to only 66% of the planned command area and has failed to achieve some of its other objectives as well. This was, in their opinion, due to improper management, faulty implementation, financial problems, etc.

Rajagopalan (1992) presents a case study of a lift irrigation co-op society in a tribal village in Gujarat. The scheme was promoted and executed by an NGO at a cost of Rs.14.89 lakh which was borne by the Gujarat State Irrigation Department. It became operational in 1986-87. Its planned command area was about 400 ha. The society faces a number of problems such as non-recovery of water charges from its members, conflicts among them about the basis/method of fixing water charges, failure to enforce the planned cropping pattern and irrigation schedule, electricity tariff charged at a fixed flat rate per horse power, indifference on the part of the members of the Management Committee of the society towards its functioning,

irresponsible behaviour of pump operators, and a rift between the Chairman and the Secretary of the society. As a result, the society was in a very bad shape;

To sum up, the main issues involved in co-op management of irrigation water include the following [4]:

1. Pricing of irrigation water;
2. Recovery of water charges from member-irrigators;
3. Enforcing socially optimum cropping patterns;
4. Equitable distribution of water particularly between those farmers whose fields are located in the head-reaches and tail-ends of the canals/distributories;
5. Repair and maintenance of common property structures such as field channels, founs, etc.;
6. Timely and adequate supply of water when the main system is owned and controlled by the Irrigation Departments;
7. Indifference or even opposition to co-op management by rich farmers who have their own sources of irrigation, and who sell water, often at exorbitant rates, to other farmers usually marginal and small as well as by those whose fields are located in the head-reaches of canals/distributories;
8. Lack of honest and benevolent leadership;
9. Factionalism and infighting among members;
10. Time consuming and complicated procedure of registration;
11. Excessive dependence on the government for funds and the consequent government interference in the functioning and management of the co-ops; and
12. Lack of requisite technical and managerial expertise with co-ops.

Agenda for Future Research

There are many issues in the co-op management of natural resources management that have not yet been adequately researched or have not been researched at all. Some of these issues have been alluded to in the previous section where we have presented a brief critical review of past experience with NM co-ops. Outlined below are some of the major issues that we would like scholars and managers to probe into and contribute papers on.

1. *Macro Environment Affecting NRM Co-ops.* The contributors may examine the constitutional, legal, institutional, economic, **socio-cultural**, and political dimensions of the present macro environment and their effect on NRM co-ops; how the NRM co-ops have coped with those conditions/constraints/threats; and how they have responded to the opportunities offered by the macro environment. The roles of the government and **politicians**, and options available to the co-ops to cope with the environment may also be discussed.
2. *Governance and Control Structures and Mechanisms.* The contributors may critically examine the governance, control structures and systems, of various types of NRM co-ops and assess their impact on the performance of co-ops. Using an eclectic approach, the contributors may try and specify salient characteristics/features of the governance and control structures that might be appropriate for NRM coops. Suggestions as to how these desirable features could be built into the existing structures should also be specified. Questions relating to vertical and horizontal integration and backward and forward linkages may also be addressed.
3. *Operating Rules and Procedures.* The contributors may critically examine the current operating rules and procedures of NRM coops and assess how they help or hinder the coops in performing their functions more efficiently/cost-effectively. Suggestions should be made as to how the bottlenecks created by the existing rules and procedures could be removed.
4. *Personnel Policies and Organisational Behaviour.* The contributors may critically examine the existing personnel policies of recruitment, induction/training, promotion, job security, remuneration, rewards and punishment, and assess their impact on the behaviour of employees and performance of NRM coops. Suggestions may be made to improve the personnel policies in NRM co-ops.
5. *Decentralisation of Decision Making.* The contributors may critically look into the existing system of decision-making - who decides, what, and how - and whether some decisions could be better made at a lower/higher level. If so, what administrative and financial powers commensurate with those decisions should also be reshuffled.
6. *Member Participation:* The contributors may critically review the existing provisions that facilitate or hinder members'-participation in decision making, implementation, and monitoring. The extent of member participation at different levels and in various functions/activities may be quantified and its impact

on the performance of co-ops assessed. Specific suggestions should be made as to how and where member-participation should be encouraged, and where and why it should be discouraged.

7. *Resource-specific Issues*, -The contributors should identify those characteristics of resources such as size, divisibility, ownership, location (fixed or fugitive), **accessibility**, productivity, **etc.**, that help or hinder their co-op management and suggest appropriate measures to tackle them.
8. *Resource Users/members-specific Issues*. The contributors may specify those traits and characteristics of resource users/members such as gender, age, education, income, awareness, beliefs, values, etc., that help or hinder co-op management of natural resources and suggest measures to promote/inculcate those traits that are desirable for co-op management and discourage those that are not.
9. *Technology-specific Issues*. The contributors may assess the economic, financial, social, commercial, and environmental viability and soundness of the technologies that are available and used for development, conservation, harvesting/appropriating, processing, transporting, and storage of natural resources and suggest how the technologies could be made more appropriate/relevant for co-op management.
10. *Issues Relating to Size and Distribution of Benefits*. The contributors may determine the extent of benefits realised by the members of NRM coops and how the benefits are distributed among the members of coops and between the co-ops and *de jure* owners of resource(s) being co-operatively managed. Specific suggestions may be made as to how the present system of distribution could be made more equitable and fair and acceptable to all the members of co-ops.
11. *Issues Relating to Markets and Marketing*. The contributors may assess the adequacy and appropriateness of the existing markets and marketing facilities, determine to what extent they help or hinder co-op management of natural resources, and suggest measures to improve the existing system. Problems and prospects of international trade in natural resources/resource commodities through co-ops may also be explored.
12. *Pricing and Cost Recovery Issues*. The contributors may study the existing methods of pricing of resource(s) resource products/commodities supplied by the co-ops to their members and the problems in cost recovery and suggest measures to improve the existing methods of pricing and cost recovery.

Table 1
Estimates of the Common Pool Land, Water, Forests, and
Fish Resources in India

Resource	Unit	Year	Total endowment	Used as CPR	CPR as % of total endowment
1.0	Nan-forest land	Million ha	1984-85 262	100.44(2)	38
2.0	Forest				
2.1	Reserved forests	do	1990 36.54(3)	0	0
2.2	Open forests	do	1990 27.66(3)	27.66	100
3.0	Water				
3.1	Surface water (Avg. annual flow)	Million ha m	1974 178.00(4)	178.00	100
3.2	Total replenish- able groundwater	Million ha m/year	1984 45.23(5)	20.00	44
4.0	Fish				
4.2	Marine fish				
(i)	Length of marine coastline	Km	- 12,700(6)	12,700	100
(ii)	Maritime area	'000 sq km	- 452.10(6)	452.10	100
(iii)	Exclusive Economic Zone	do	- 2015(6)	2015	100
(iv)	Annual catch	Million tonnes	1988-89 1,82(7)	1.82	100
4.3	Inland fish				
(i)	Major rivers and their tributaries	Km	- 27,359(8)	27,359	100
(ii)	Canals and irrigat- ion channels	do	- 1,12,654(8)	1,12,654	100
(iii)	Reservoirs and lakes	Million ha	- 2.90(8)	2.90	100
(iv)	Fresh water ponds and tanks	do	- 1.60(8)	1.28	80
(v)	Annual catch	Million tonnes	1988-89 1.34(7)	1.07	80

Sources Reproduced from Singh (forthcoming)

Notes

- [1] There is nothing like absolutely correct and incontrovertible estimates of the common pool natural resources available anywhere. There are many problems in measurement, recording, and reporting of such estimates and in monitoring changes in their quantity and quality over time. The extent of common pool natural resources, both in absolute and relative terms, is, however, significant enough to warrant the attention of policy makers and resource managers.
- [2] The exposition and discussion of these theories here is reproduced from Singh (forthcoming).
- [3] Personal communication with Shri V.K. Mishra, Managing Director, National Tree Growers' Co-operative Federation.
- [4] Some of these issues are very well illustrated by Datye and Patil (1987).

References

- Ballabh, Vishwa (1992). "Management of Common Pool Natural Resources in India and the Role of Non-government Organisations"¹. Mimeo. Anand: Institute of Rural Management.
- Ballabh, Vishwa and Katar, Singh (1988). "Van (Forest Panchayats in Uttar Pradesh Hills : A Critical Ana Analysis". Research Paper 2. Anand : Institute of Rural Management.
- Ballabh, Vishwa and Tushaar, Shah (1989). "Efficiency and Equity in Groundwater Use and Management". Workshop Report No,3. Anand: Institute of Rural Management.
- Ballabh, Vishwa, V. Muralidharan, O.T. Gulati, and Tushaar, Shah (1992). "The Operating System of the MRBC---An Analytical Study". Paper presented in the Workshop on India - IIMI Collaborative Research in Irrigation Management 13-14 February 1992, organised by WOPCOS and IIMI at New Delhi during February 13-14, 1992.
- Barik, B.C. (1991). "Tribal Farmers, Lift Irrigation, and Rural Development", Social Change, 21(2), 39-47.
- Bautista, Honorio B. (1987). "Experiences with Organising Irrigators' Associations : A Case Study from the Magat River Irrigation Project in the Philippines". IIMI Case Study No. 1. Sri Lanka : International Irrigation Management Institute.
- Berkes, Fikret (1986). "Local Level Management and the Commons Problem : A Comparative Study of Turkish Coastal Fisheries", Marine Policy, Vol. 10.
- Berkes, Fikret, et.al. (1989). "The Benefits of the Commons", Nature. Vol. 340, July, pp. 91-93.
- Buchanan, James M. and Gordon Tullock (1965). The Calculus of Consents. Ann Arbor : University of Michigan Press,
- Chatterjee, PK and S. Bandyopadhyay (1990). "Performance and Progress of Primary Cooperative Fisheries in West Bengal", Indian Journal of Agricultural Economics, XLV (3), July-September.
- CMIE (1990), Basic Statistics Relating to Indian Economy. Vol. I. Bombay: All India, Centre for Monitoring Indian Economy.
- Datye, K.R. and R.K. Patil (1987). Farmer Managed Irrigation Systems, Pune : Centre for Applied Systems Analysis in Development (CASAD).

- GOI (1951). **First Five Year Plan**. New Delhi: Planning Commission, Government of India.
- Gordon, H. Scott (1954). "The Economic Theory of a Common-Property Resource : The Fishery". *Journal of Political Economy*. April
- Gupta, **Tirath (1989)**. "Protection of Social Forestry Plantation in Madhya Pradesh and **Uttar** Pradesh—Some Issues for Wasteland Management". *Management and Labour Studies*. 4(2); 10-32 and **77-86**.
- Hardin, Garrett (1968). "The Tragedy of the Commons", *Science*, 162 : 1243-1248.
- Iyengar, S (1988). Common Property Land Resources in Gujarat: Some Findings About Their Size Status and Use. Use. Ahmedabad: Gujarat Institute of Area Planning.
- Jodha, NS (1986). "Common Property Resources and Rural Poor in Dry Regions in India". *Economic and Political Weekly*, 21(27), 1169-1181.
- Jodha, NS (1987). "A Note on Contribution of CPRs to PPR—Based Farming Systems in Dry Tropical Regions of India, Paper presented at the Common Property Resources Workshop in Sariska, Rajasthan,
- Kramer, RA and Ballabh, Vishwa (1991). Management of Common Pool Forest Resources". Paper presented for the Triennial Conference of the International Association of Agricultural Economists, 22-29 August at Tokyo, Japan.
- Myers, Norman (1989). *The Primary Source : Tropical Forests and Our Future*. New York : W.W., Norton.
- Nagabrahmam, D (1989). "Small Groups and Groundwater Management". A paper presented at the workshop on Efficiency and Equity in Groundwater Use and Management held at Institute of Rural Management, Anand, Gujarat, January 30-February 1.
- NIRD (1990). *Rural Development Statistics, 1989*. Hyderabad: National Institute of Rural Development.
- Ostrom, Elinor (1990). *Governing the Commons: The Evolution of Institutions for Collective Action*. New York : Cambridge University Press.
- Olson, Mancur (1971). *The Logic of Collective Action : Public Goods and the Theory of Groups*, rev. ed. New York : Schocken Books.

Rainey, Hal G (1983); "Public Agencies and Private Firm : Incentive Structure, Goals and Individual Roles". Administration and Society, 15(2) : 207-242.

1
Rajagopalan, R. (1992). "Gonda Village Lift Irrigation Cooperative Society". In Management of Cooperatives Cases, in Rural Management 5. Anand : Institute of Rural Management.

Sabella, James C. (1980). "Jose Olaya : Analysis of a Peruvian Fishing Cooperative that Failed", Anthropological Quarterly, 53 (1), 56-63.

Sankaran, S.R. (1991). Report of the Committee on Organisation of Co-operatives for Rural Poor. New Delhi : Department of Agriculture and Co-operation, Government of India.

Sarada, R.V. and I. Narender (1990). "Rural Development Through Cooperatives : A Case Study of Mahatma Gandhi Lift Irrigation Cooperative Society in Gaddipalli of Nalgonda District", Indian Journal of Agricultural Economics, XLV (3) : 236-237.

Saxena, NC (1987). "Commons, Trees, and the Poor in Uttar Pradesh Hills" ODI, Social Forestry Network Publication, pp. 43.

Shah, Tushaar and Ballabh V (1986). "Ownership/Use Rights and Community Involvement in Wastelands Development: Experience from Gujarat⁸". Paper presented on the workshop on Fodder Production - An Alternative for Marginal and Wastelands Development, May 15-16 at NDDB, Anand.

Shankar Narayanan (1991). "Participatory Regeneration of Forests on Common Lands Through Village Level People's Institutions : The Experience of Aga Khan Rural Support Programme (India) in the Tribal Areas of Bharuch". Paper presented at the Training Workshop on People's Participation in Natural Resources Management, 25-30 November at the Institute of Rural Management, Anand.

Sills, David S. (Ed,) (1968). International Encyclopedia of the Social Sciences, New York : The Macmillan Company and The Free Press.

Singh, Katar and Ballabh Vishwa (1989). "Afforestation of Village Common Lands : A Case Study of Aslali Village. Woodlot in Gujarat, Case Study No. 4, Anand : Institute of Rural Management.

Singh, Katar and S. Bhattacharjee (1991). "The Bergram Majhipara Common Pool Fish Pond : A Case Study". Case Study NO. 8. Anand : Institute of Rural management.

Singh, Katar (forthcoming). Managing Common Pool Resources : Principles and Case Studies. New Delhi : Oxford University Press.

Smith, Robert J (1988). "Private Solutions to Conservation Problems". In T. Cowen, Editor, The Theory of Market Failure: A Critical Review. Failure : George Mason University Press.

Srivastava, U.K. et al. (1985 a). Inland Fish Marketing in India Fresh Water. Culture Fisheries, Vol.3. New Delhi : Concept Publishing Company.

Srivastava, U.K. et al. (1985 b). Inland Fish Marketing in India. : Markets. Cooperatives and Corporations. **Vol.7.** New **Delhi**: Concept Publishing Company.

WRI (1990). World Resources, 1990 A Report of the World Resources Institute in collaboration with the United Nations Environment Programme and the United Nations Development Programme. New York/Oxford : Oxford: University Press.

INSTITUTION BUILDING FOR AFFORESTATION OF WASTELANDS :
LESSONS OF VIKSAT EXPERIENCE IN GUJARAT

G. Raju and Kartikeya v. Saratohai

Abstract. The paper deals with the importance of institutions in afforestation of wastelands and describes the process of institution building and the difficulties encountered. The important issues raised are (i) difficulties in obtaining official permission for leasing of wastelands for afforestation; (ii) lack of coordination and communication among the various line functionaries of the government departments involved; and (iii) problems in securing needed technical guidance and funds. Because of the inordinate delays in obtaining the official permission, transaction cost of implementation of such projects to the voluntary organisations engaged in the task are very high. The authors highlight the need for simplification of the rules and procedures and argue that this would go a long way in promoting afforestation of common pool wastelands in India.

Keywords, afforestation, institution building, Gujarat, gauchar, National Wastelands Development Board, Viksat, woodlot.

Introduction

The 1980s saw a people's movement wave sweep across India's Wasteland Development Programme. The agenda was set forth by the late Prime Minister Shri Rajiv Gandhi who set up the National Wastelands Development Board (NWDB) and gave a target of 100 million ha. of wastelands to be developed by the turn of the 20th Century through a people's programme. VIKSAT a non-Governmental organisation (NGO) based in Ahmedabad has played its part in this programme and in the paper we share VIKSAT's experience in developing this people's movement.

The Wastelands Development Programme becomes a people's programme only if people can take part in the programme with relative ease, with minimal support from government departments and non-governmental organisations. For this to happen people should have easy access to wastelands, to funds, to technical know-how, to markets for which they have to depend on outside resources. As far as the community itself is concerned co-operation among people, the willingness to protect and develop wastelands, good leadership in the community are seen to be necessary. These contribute to viable grassroots institutions. When the

outside resources complement internal efforts of the community viable grassroots institutions get started and the wastelands development programme becomes a reality. In this paper we analyze the experience of VIKSAT vis-a-vis each of these issues.

Externality Factors

Access to Land-

The two categories of land, the control of which lies external to the community are degraded forest land and revenue wastelands. Although there is a third category of *Panchayat Gauchar* we are not considering it here because firstly the extent of this *gauchar* compared to other two categories is insignificant and secondly *gauchars* are clearly meant for use as pastures for the village cattle. It is another matter that *gauchars* have been usurped from communities by the mere fiat of a *panchayat* order for village woodlot programme.

Access to Degraded Forest Land. The Gujarat Forest Department had passed a policy resolution (some salient features are provided in Annexure - I) in 1984 allowing lease of degraded forest land to Tree Growers' Co-operative Societies (TGCS) for afforestation. In the following section we trace our experience of operationalising this policy.

1985 - 1988

The Beginning

The experience of operationalising a policy into a workable procedure was an eye-opener. The first step involved getting a list of degraded forest land from the Forest Department meant for lease to TGCS. This itself took about six months as the Forest Department had to compile a list of such degraded forest land. VIKSAT took the help of a retired Chief Conservator of Forests in getting this list prepared expeditiously by the Forest Department. The next step involved identification of land on the site. VIKSAT undertook this exercise in two districts viz. Panchmahal and Mehsana. Several problems cropped up. Estimating the extent of encroachment, demarcation of land was difficult as maps were outdated. Physical boundaries were non-existent, the social forestry wing of the Forest Department in some instances had undertaken plantation, though on site it was difficult to believe that any plantation had been undertaken as survival was so poor and in some instances the land under consideration was under dispute between the Forest Department and private individuals. VIKSAT went back to the Forest Department with these experiences and suggested a need for a more updated list. It was also suggested that the Forest Department consider releasing those forest lands that

will not be taken up for afforestation as per the working plan in the next ten years instead of the usual 15 year period. This suggestion was acceptable to the department. A second list was prepared and this time we could identify such land in Bhiloda taluka in Sabarkantha district. When we met the Deputy Conservator of Forests (Dy CF) , Sabarkantha the first time he was not even aware of this Government Resolution (GR). We then produced our copy which convinced him that there must be a copy of this GR in his files too which was finally located. He could not guide us in the matter of procedures as to how to apply for lease of the degraded forest land as there was no precedence. But he was open to the idea of jointly evolving a procedure.

Accordingly, it was decided that the promoters of the tree growers' co-op society make a simple application to the Dy CF. It was also agreed that the Dy CF would then send the area of degraded forest land under consideration. Having worked this out, VIKSAT organised a first of a series of meeting, with the village communities explaining the scheme and providing guidance for setting up TGCS. The next big hurdle we came across was formulating a bye-laws of TGCS and getting it approved by the Registrar of Co-operative Societies, This task took a considerable amount of time, ingenuity and co-ordination with both the Forest Department and the Co-operation Department. Some experts on constitution of co-op were also consulted. Finally a model bye-law was prepared and submitted to the Registrar of Co-operative Societies for his approval.

Chicken or Egg? What came First?

A piquant situation of whether the chicken or the egg first, confronted us at the time of registration of the first of the TGCS. For registration of TGCS, an important consideration is the economic viability of the co-op society. For this, the registrar wanted proof that the land has been leased to the co-op and a proposal to show the viability of TGCS. The latter was easier done in consultation with the Forest Department. While for the former, a certificate for land lease had to be issued by the Dy CF. The Dy CF felt that the TGCS must be a registered body before he can issue such a certificate for land lease. After mediation with both the departments, a via-media mechanism of a provisional certificate was worked out to be issued by the Dy CF stating that the land under consideration was available and would be leased to the TGCS once registered. Thus after one long year of evolving the two procedures above, the first of the TGCS was registered in 1986. Out of this experience VIKSAT produced and published two important publications viz. (i) A manual to form TGCS and (ii) the bye-law of TGCS and made it available to other Voluntary Agencies (VAs) and individuals who were interested to take up similar work.

The Indian-Forest' Conservation Act (1980) Confronts

The next step involved applying to the state Forest Department for lease of degraded forest land. It was at this stage, we were informed about the Indian Forest Conservation Act, 1980, and the proviso by which the clearance for dereserving reserved forest land even for afforestation purpose had to be obtained from the Ministry of Environment and Forests, Government of India (GOI). It came as a shock as we had rightly presumed that the Government of Gujarat (GOG) would have taken care of all such provisions before declaring the official resolution to lease degraded forest land, to TGCS.

As this was not the case, VIKSAT had to process a fresh application to be sent to the GOI through the State Forest Department. Here again as there was no precedence, a procedure, format for application had to be worked out after several sittings with the Conservator of Forests. Finally the first of the applications, after going through a tortuous channel i.e. the Deputy Conservator of Forests - Conservator of Forests - Principal Chief Conservator of Forests - Secretary of State Forest Department reached the Ministry of Environment and Forests in January 1987. Our application got stuck for three long years as it was at the centre of a crucial but unresolved policy issue of by whom and how would degraded forest land be regenerated. Finally in 1988 the Ministry rejected the application for lease of degraded forest land to TGCS.

Only in June 1990, the Ministry of Environment and Forests, GOI issued a circular directive to all states for seeking community participation for development of degraded forest land in what is known as participatory forest management.

The above experience amplifies the process one has to go through in gaining access to land for afforestation purposes. This was the experience of many other voluntary agencies also. In a survey of voluntary agencies we had conducted in 1990 almost 70% of agencies wanted extra liaison and lobbying support in getting access to land.

Access to Funds. In one of the earlier experiences, we had to visit the District Rural Development Agencies at least fifteen times to get the *Kisan* Nursery Project sanctioned and to get the first instalment paid to the *kisans*.

Afforestation being a seasonal activity timely payment for labour works is essential. In practice this is never so. In another experience, payment of subsidies to the members of our co-op for survival of seedlings planted came two years after the sanction was received. In the same survey mentioned about 80% of voluntary agencies mentioned access to funds as a constraint. One cannot imagine the case for the grassroots institution. Even the NWDB which was specifically set up to encourage wastelands development

programme did not become an exception to the law of delayed release of grant.

Access to Technical Know-how/Training, In 1985, we had carried out a survey of training Institution In Gujarat providing training in forestry related matters. There was none to provide training to NGOs personnel, leave alone for the grassroots institutions. A great deal of training support is needed for the grassroots institutions. Training on technical aspects like nursery raising, tree plantations, soil and moisture conservation measures, institutional aspects like formation of co-ops, accounting, record keeping, audit will need to be provided to grassroots institutions.

No wonder that VIKSAT's training programme soon became a flagship activity. In the same survey about 70% of voluntary agencies were interested in getting their staff trained. In other words even after five years of existence of wasteland development programmes access to training/technical know-how was still difficult.

Marketing. In a survey of farmers conducted in two talukas in Bhavnagar and Mehsana considered to be eucalyptus districts none of the farmers went for a repeat cultivation of eucalyptus, the main reason being that they did not get the price that the Forest Department had promised. According to this study farmers suffered losses ranging from Rs.5,000 to Rs.1,50,000 averaging some Rs. 20,000 per ha. In Sihor (Bhavnagar) 20% of the sample sold some or all their produce, under half of these making a profit. The rest could not sell at all. In Vijapur (Mehsana) though 80% of the eucalyptus growers made a positive margin over costs only 20% made a profit relative to profit foregone on standard cropping cycles. Then there are these tricky rules and regulations governing harvest of trees even on their own land and their subsequent transportation too add to the woes of the farmers. For example, there are five trees specified in the Saurashtra tree felling Act, that require permission from the collector for harvesting even from privately owned lands. Then for many other species transit pass is to be procured from Dy CF. These laws are hardly known and a poor farmer often get into trouble.

Marketing of forest products is another aspect which needs greater support. The situation which the eucalyptus marketing case mentioned earlier points out is also true for various non-timber forest products as the collectors of these products do not get remunerative price. At a workshop conducted in South Gujarat in April, 1992 it was reported that the price paid by State Forest Development Corporation (SFDC) is only half of the market price for products such as mahua, gums etc.

The success of producers marketing federation in dairy and oilseeds sector based on Anand Model is worth looking into.

The producers have formed a co-op at the village level and are federated into a large organisation for processing of produce and marketing. Professionals are employed for managing both the processing and marketing operations while producers retain their control over the organisation to give it an overall direction and policy lobbying.

Social Factors

Social factors come into play in building grassroots institutions. Leadership rivalry inter-clan rivalry, lack of adequate co-operation among people, family disputes spilling over to affairs of the co-op are events that constantly affect smooth functioning of the co-op. But we do not find these problems insurmountable. In one of the villages, our concerted effort has helped in smoothening social tensions and brought about unity. The effort involved almost a door-to-door campaign, discussing the points of contention between the warring factions sifting between actual facts and rumours and bring the factions for a discussion and reconstituting the management committee to everybody's satisfaction. The notable point is that even at the height of social tension the forest protection effort was never given up. Grazing and illicit cutting has been completely stopped the last three years.

From our experience of working with TGCS, the social factors that influence institution building can be positively shaped to reinforce institution building process. In most of our TGCS there is a representative of the sub-clan in the management committee. The clan unity is very strong socially. The committee members plays the role of disseminator of information to his clan.

Except for marketing which comes into play only when the trees are ready for harvest, other externalities come into play right from the beginning. It is clear that over land finance there is a stranglehold of the bureaucracy which is almost inaccessible to the grassroots institutions. No grassroots institutions can ever grow under such circumstances. The success stories we hear of has happened at enormous investments both of money and manpower and their spread is quite suspect. This is not the kind of people's movement we all dream about.

What must be done?

Our experience suggests that for people to participate in afforestation related development programmes the following are essential.

1. A clear cut policy and clarity for the same at various

levels The GOI needs to spell out an unambiguous policy and clearly communicate it to the state government both the objectives of the policy and the urgency behind it. The mere issue of a circular does not serve the purpose. The state government for its own part must communicate the same to the key officers incharge of policy implementation. In case of the forest department the Deputy Conservator of Forests holds the key. He must be sufficiently motivated to implement the policy or be given the stick in case of non-compliance.

2. Evolving clear cut procedures

The government departments work by procedures. Our experience highlights the delays that can happen for want of even an application form. NGOs can play an important role in evolving procedures along with the department concerned. A good example of this is already happening with joint forest management programme in Gujarat. A state level Working Group of senior forest officer and representatives of NGOs have been set up. The Working Group meets periodically and discusses various issues and NGOs and foresters work out the procedures together. In fact, in the case of Gujarat even the GR had been prepared jointly.

3. Information Dissemination

For large scale of involvement of people at grassroots level information about new initiatives/policies of government must reach them. Initiatives from people by itself can bring about pressure on the bureaucracy and policy makers and bring about better response from the implementing agency. The government department/corporation sponsored news magazines, information department, mass media must be roped in to spread the message of new policy initiatives to the grassroot. The general consensus among both government officials and NGOs is that such an information centre be set up with a NGO which is more responsive. However, the government department will have to feed this NGO with information regarding schemes, policies etc. It is grassroots initiative that can sustain this programme.

4. Location of Training and Market facilities

For the training support the social forestry division should reorient strategies to provide training services rather than implementing tree growing programme themselves. The district co-op unions should be revitalized to provide institutional training support to the co-ops. NGOs have developed various training skills which must be made use of.

3
Mudra

Initiatives are needed from both government and NGOs to set up a Tree Grower's Federation for setting up processing of trees and tree-based products and finally marketing to consumers along the AMUL model. Such processing and marketing operations should be run by professionals employed by the producers federation.

The example of Anand model of marketing federation for dairy products makes out a strong case for a similar venture in the forestry sector too..lm 0.5"

Conclusion

The GOI's new economic policy emphasise debureaucratisation and deregulation to give fillip to the process of private sector industrialization. As per the new policy a private entrepreneur is given full scope to exploit his entrepreneurship. He does not have to go from department to department for issue of permits or licenses. Why cannot the rural committees be provided a similar climate for taking up afforestation initiatives. The arguments put forward in favour of the new economic policy very much holds good for the forestry sector too as this paper points out. The people's initiative can come about if the bureaucracy and policy makers play a supportive role as recommended in this paper.

The supportive role has to be in terms of making the access of communities to wastelands easier, information dissemination providing back up technical know-how and training, ensuring favourable policy support for setting up producers federation for processing and marketing and removal of controls that retard people's initiatives.

Annexure - I

Salient features of Government of Gujarat Resolution for lease of degraded forest land.

1. The lessee has to be a registered Tree Growers" Co-operative of poor farmers.
2. The lease is for a period of 30 years at a token fee of Rs.1/ha./year.
3. The entire produce of reforestation will be owned by the **TGCS**.
4. The government funds **will** be made available for reforestation purposes.
5. The lessee must grow at least 400 trees per hectares.

Workshop-9

V.K. Mislira

Abstract. Hardin's theory of the tragedy of the commons is negated where local community **develops** a democratic and sustainable institution for **the** management of the **common** property resource. The same community which was involved in the process of degradation, actively co-operates in its development and proper utilisation. The Tree Growers' Co-operatives being organised under a project being implemented by the National Tree Growers' Co-operative Federation Limited (NTGCF) have set examples of sustainable development of the village commons in five states. Administrative, political, bureaucratic, social and technical constraints have been faced during past five years of the project implementation. Of these, problems in securing land tenure has been a major constraint. Existing tree felling and transit rules could be the potential problems of the future. So far as the local people are concerned, indications are very positive. In all the project areas they have supported the co-operative idea, and have created a strong social fencing to protect the plantation on the **common** land. Sustainability of these co-operatives, quality of management of **common** property resource and strength of the Tree Growers' Co-operative Society (TGCS) in resisting socio-economic and political pressures is yet to be seen. Several possibilities are emerging which convince us of the feasibility of replicating Tree Growers' Co-operatives where large areas of uncultivable wastelands are available, pressure of human population is comparatively less, shortage of fuelwood and fodder persists and people wish to try out a programme which is implemented and managed by them. During the past five years of implementation of the Tree Growers' Co-operatives Project, our perception of long gestation period has changed. There are various income generating activities which can be initiated using 'plantation' on the wastelands leased to the Tree Growers' **-Co-operatives**. The present paper discusses administrative, social and economic aspects of the management of village commons by the Tree Growers' Co-operatives.

Key words. Wasteland, Tree Growers' Co-operative Society, National Tree Growers' Co-operative Federation of India, Gujarat.

Introduction

Hardin's theory of ^{s2}the Tragedy of the Commons¹¹ is a case of sweeping pessimism. Such a tragedy occurs where there is an open access to common resource without any rules and regulations. However, if there is an institutional structure, be it formal or informal and if it is fairly democratic and managed by the people in true sense, the tragedy can be averted.

There are well documented examples of successful and efficient management of common resources through collective action of local people. Similarly, there are numerous examples of failures of the government managed programmes, ineffectiveness of the laws and rules pertaining to conservation and protection of common resources because they did not conform to the local needs and aspirations. Neither were they planned, implemented, monitored and evaluated by the local people. Such examples also prove that the alternatives suggested by Hardin for putting common resources under the government control to avert "the Tragedy of the Commons" are not always feasible. Similarly privatisation of common resources as suggested by Hardin has its own limitations. It neither checks exploitation, nor serves the common purpose. Besides, privatisation of a highly degraded resource by resource poor or financially weaker sections of the society either remains un-utilised for want of financial support or it eventually gets transferred to the resource rich. Therefore, a new system was needed to be evolved which would facilitate transfer of the management of the common resources from the government to the local community, creates an institutional structure to manage the common resource in a democratic and economically as well as ecologically sound manner and has replicability under varying environmental conditions.

The new system also needed to be such that it would provide incentives to the local people initially for reversing the trend of irresponsible over-exploitation and later for maintaining regenerated resource and using it in a sustainable manner.

The task was difficult, especially in view of limited resources and innumerable users. But human beings have tremendous capacity to evolve systems and co-operate in distress. Taking advantage of this capacity, an experiment was started in India in 1986 to organise the Tree Growers' Co-operatives which would develop village commons into a green resource for meeting rural needs of fuelwood, fodder and timber. This paper presents an account of the experiences gained so far and future prospects of extending the co-op movement for the management of common resources at levels higher than the village.

The Genesis

Deforestation, land degradation, energy crisis and resultant deterioration in the quality of human life are a matter of serious concern to the policy makers, administrators, researchers, development workers and common public all over the world. India is one of the foremost countries to have initiated social forestry programme to reverse the trend of de-forestation and to re-vegetate its vast stretches of wastelands in the early seventies. By mid-eighties it was realised that the problem is of greater magnitude and needs special attention, and efforts should be made to involve people in afforestation programme. Creation of a separate Ministry to deal with Environment & Forests and establishment of the National Wastelands Development Board (NWDB) in the mid-eighties were some of the actions taken by the government of India which demonstrated political will to deal with the problems of degradation of natural resources. To what extent the political will has been able to move things into action and to what extent we have been able to achieve success in our endeavour is another story, but it was realised that the social forestry programmes implemented by the Forest Department needed a drastic re-orientation. People's participation, sustainability and economic as well as ecological viability of the social forestry programmes was given serious consideration. During the late 1980s the government of India started looking for various institutional options for these programmes. One such options was the 'Tree Growers' Co-operatives' similar to the milk co-op created under the "Operation Flood" and the Oil Seed Growers' Co-operatives organised under the 'Operation Golden Flow' funded by the National Dairy Development Board (NDDB) in different parts of the country. As such, the NDDB was requested to consider implementing a pilot project in Gujarat, Andhra Pradesh, Karnataka, Orissa and Rajasthan to ascertain whether the co-op approach would succeed in managing village commons for meeting rural needs of fuelwood, fodder and timber and whether the so called social forestry programme could be made sustainable and economically viable through co-ops with people's participation. The pilot project named Tree Growers' Co-operatives Project (TGCP) initiated in 1986 and funded by the NDDB has completed its five years term. In 1992 it was re-named as National Tree Growers' Cooperative Federation (NTGCF). The lessons learnt during this period are discussed in this paper.

The Village Commons - Present Status

Broadly there are three categories of common land available in the vicinity of the villages. They are : (1) degraded forest land, (2) revenue land (cultivable and un-cultivable) and (3) common grazing land or Panchayat land. The terminology used for these lands may differ from state to

state but what is common is their utilisation by the community as a common resource irrespective of the category of the land and its title.

So far as the exact area and boundaries of these categories of the common land are concerned, there is a lot of confusion between the concerned departments. The records are outdated and un-reliable. Besides most of the land fit for cultivation has either been encroached on, or re-appropriated by the government or distributed to the landless under various schemes. Within these categories of land, it has been found that the classification referring to land productivity is outdated and incorrect eg., the degraded forest lands in many cases are recorded as good forest or reserve forest whereas there may not be even a single tree on them. Similarly, the revenue lands categorised as cultivable may not be fit for cultivation at all as they may have degraded due to continuous soil erosion ever since their classification or reclamation several years back. Among the un-cultivable revenue lands also, a sizeable area is encroached on. Encroachments are legalised from time to time out of political interests.

A large area of land distributed to the landless and weaker sections has remained un-utilised due to several constraints. These could be lack of financial support, location and quality of land, resistance from the powerful persons in the area and migration of beneficiaries to some other area. The status of revenue wastelands in different states is detailed here.

1. In Orissa, the revenue wastelands are broadly classified as
 - a) Abad Ajogya Anabadi - Land which is unfit for cultivation
 - b) Abad Jogya Anabadi - Land fit for cultivation

While the Abad Ajogya Anabadi lands are undulating, rocky, barren and highly degraded, a large area of the Abad Jogya Anabadi land, though degraded and unfit for cultivation has been named as Patra Jungle, Choto Jungle, Jungle Mela-II etc. By virtue of its name as jungle, such revenue wastelands attract the Forest Conservation Act and as such the central government's permission is required before it is leased to the Tree Growers¹ Co-op Societies (TGCS) or any other institution even for plantation of trees.

2. In Rajasthan, the revenue wastelands are categorised as Barani II and III referring to the cultivable and un-cultivable status respectively. However, a large portion of the Barani II land is unfit for cultivation and needs re-classification before it could be leased to the TGCS or any other institution for the purposes other than agriculture.

Besides, large tracts of common grazing land and degraded forest land which is in a state of zero productivity are inaccessible for any productive use by the village institutions due to present policies of the state and central government.

3. In Gujarat, the revenue wasteland is categorised as un-cultivable and cultivable but most cultivable revenue wastelands are in a state of degradation and need re-classification. Further, the revenue wastelands in a good number of districts* are not being leased for any purpose as they have been reserved for Narmada oustees. The matter pertaining to land lease to the TGCS needs to be referred to the Narmada Project authorities for approval before a lease is accorded. Common grazing land to the extent of 10 hectares can be leased to the milk co-op for fodder production on the recommendations of the village Panchayats. Though Gujarat is one of the foremost states to have finalised joint forest management programme, very little progress has been made to allow village level institutions to participate in this programme due to the go-slow attitude of the Forest Department and complicated procedures and staff terms and conditions which are not conducive to people's participation.

4. In Andhra Pradesh, similar situation exists as that of Gujarat. Due to the Telugu Ganga Project, land lease in certain areas has been banned and reserved for compensatory plantation. Besides, a large area allotted to the rural poor under the Joint Farming Co-operatives Scheme or Patta Scheme has remained un-utilised due to management problems and financial constraints. Encroachment is rampant throughout the state and is being legalised from time to time under land distribution programme to the rural poor.

5. In Karnataka, C & D class and Gomal lands are the revenue wastelands falling under the category of un-cultivable and Panchayat lands which are leased to the TGCS or any other organisation for plantation. Such lands have also been distributed to the landless under various programmes from time to time. Sometime ago these lands were transferred from the Revenue Department to the Forest Department for the purpose of afforestation work. However, partly due to the failure of the Forest Department to bring these lands under green cover and partly due to political considerations, C & D class lands have again been taken over by the Revenue Department. Encroachment on the revenue wastelands is highest in Karnataka among all project states.

Some common problems related to the classification and leasing of the revenue wastelands to the TGCS are :

- (a) obsolete and outdated land records;
- (b) rampant and politically motivated encroachment;

- (c) reclaimed land or land categorised as cultivable have degraded over several years of neglect and need re-classification;
- (d) a significant area of the revenue wastelands allotted to the landless and the scheduled castes/scheduled tribes (SC/ST) has remained un-utilised due to financial and social constraints;
- (e) transfer of land from one department to an other for various schemes has created a lot of confusion and delay in lease and afforestation; and
- (f) boundaries of various categories of land ie., revenue, forest and Panchayat are not properly defined, as a result there are disputes even after lease to the TGCS.

Procedural Constraints in Land Tenure

It is a well established fact that irrespective of the tenurial rights vested with either the Revenue, Forest or any other department of the state or central government, the local people use all kinds of wastelands as a common resource for various purposes. It is also known through experience that unless land/tree tenure is secured it is very difficult to ensure people's participation in wasteland development. Unfortunately, the land lease rules and procedures are extremely complicated and time consuming. Besides, procedures vary from state to state and are interpreted as per the convenience of the bureaucracy.

In most states, the power to lease land is vested either with the Cabinet or with the Revenue Minister/Revenue Secretary. Therefore, an application for land lease by a TGCS has to pass through several desks starting from the lowest rank of the Revenue Development ie., the Patwari/Talati to the Minister/Cabinet level. After five years of rigorous follow-up and persuasion the power for leasing land to the TGCS have been decentralised to the District Collectors at least in Rajasthan. In other states, the matter is still under consideration. A cursory look at the schematic diagram showing movement of file pertaining to land lease in two states (Annexure-1) would clarify the complexity of land lease.

The terms and conditions of land lease also vary from state to state. In some states a standard rent of 6.5% of the present value of land to be leased is charged as lease fee per acre per year. Thus for a highly degraded land a co-op is asked to pay a lease fee of Rs.90 or Rs. 100 per acre per year. Such a proposition looks quite absurd when one considers the quality of land in the context of the national policy on people's participation in wasteland development and afforestation. Sometimes, due to political considera-

tions same or even better quality land is transferred to individuals on ownership basis but when it comes to lease to a co-operative of the village community there is reluctance to waive even the lease **fee**.

Often it is insisted by the state bureaucracy/polity that the benefits from the lease land should be available only to the landless or to the SC/ST. It is strange **that** the state administration ignores the misuse of degraded common lands by all, be it rich or poor and even condones encroachments but when it comes to leasing land to a village co-operative, it is insisted that the benefits should be restricted only to a particular section of the rural society. There are numerous examples of failure of institutions or programmes when common property resource has been reserved for a section of the rural society or when the principles of co-operation have been ignored for political/foureaucratic considerations.

One of the terms and conditions for land lease in Orissa is that the TGCS should not plant any vegetation on the leased land which would convert the character of that land into a forest. Such a condition is not only unrealistic but also contravenes the national policy and programmes on wasteland development and afforestation. Yet there is a justification. The state government is very critical of conversion of revenue lands into forest lands and practically losing control over it as it then attracts the Forest Conservation Act and its lease to any individual/institution needs the central government permission. This perception is based on the past experience when a large area of revenue wastelands planted with trees was categorised as forest land and now attracts the Forest Conservation Act. In a state like Orissa, most revenue wastelands still have sufficient root-stock which would grow into trees with protection and care and transform the area into a lush green forest even without planting. Therefore, the terms and conditions for land lease would get violated even if nothing is planted on the leased land.

Another un-realistic condition for land lease which is prevalent in most states is that the extent of the area to be leased to an institution for plantation has no relationship with land productivity status. Our argument has been that the extent of the area of wastelands to be leased to the TGCS should be based on the land capability and local needs. For example, large tracts of saline mud flats in Cambay have a fertility status which is far lower compared to the ravines along the Mahi river in Gujarat. Yet, the upper limit for land lease is the same for both types of land.

Period of land lease is another important point which needs to be discussed here. Generally, the revenue wastelands are being leased to the TGCS for a period ranging from 15 to 30 years. For transforming highly degraded land to a state of

reasonable productivity at least 10-12 years are needed. The period could be longer if the land is salt affected, desert and highly infertile. If the lease is only for a period of 15 years, it keeps the TGCS membership quite uncertain about further extension of the lease period and thereby affects their participation, long-term planning and investments. It is, therefore, necessary that the period of lease should be extended to at least 30 years in tropical and 50 years in temperate climatic conditions to encourage people to participate confidently.

The existing restrictions on tree felling and transit is another problem which would suddenly get aggravated when trees on common lands are to be felled by the TGCS. Seeking permission for felling trees even on private lands is a cumbersome procedure. Though existing restrictions are thoroughly flouted by one and all, when it comes to the TGCS operations, procedures would have to be followed and it would affect the overall working of the co-op and participation of the rural community. The state-wise terms and conditions of land lease are appended as Annexure-2.

Non-Revenue Waste Lands (NRWL)

Degraded forest lands are still not available to the local institution for regeneration except in a few states like West Bengal. A cursory look at the GO No.6-12/89-FP dated 1 June 1990 issued by the Secretary, Environment and Forests, Government of India reveals that despite some positive changes, the fundamental issues remain untouched. Critical preconditions for the success of any community effort in their regenerating or protecting forests would be:

- (a) security of tenure; and
- (b) the right of the community to determine the planning, the execution, and the sharing of benefits within the community, from the lands worked on, or protected by them.

Regarding the security of the tenure, the order has strictly forbidden any form of lease of patta. The need for security of their tenure on the land could have been overcome by at least providing the community with some sense of ownership over the produce. Under this order they continue not to have ownership over either the land or the produce. If it is not seen as theirs, it will not be protected as their own land would be.

Regarding the right of determination by the community, it is clear that they have none. The planning is done by the Forest Department as per their working schemes. These working schemes are known to be designed primarily to raise revenue for the government; in practical terms, this means

that mostly long gestation timber trees will be grown and not what the village communities require to meet their everyday needs.

Point (xii) of page 3 of the GO says that 'cutting of trees should not be permitted before they are ripe for harvesting'. This is a very relative concept and liable to misuse by the Forest Department. In practical terms, a tree is 'ripe' for harvest when we need it most. If we have the opinion of meeting our needs from elsewhere and allow the tree to grow, it will increase in density and volume, and therefore in value, until the time it dies. As we know, most trees live for over a hundred years, if allowed to. The word 'ripe' will be interpreted differently by the people and the Forest Department. If like in West Bengal, the village community is given 25% of the value after harvest, then 75% will increase the longer the tree is left to grow, and there will again be a conflict of interests between the Forest Department and the people which means that we are still at square one.

Finally, under this GO, the beneficiaries are only allowed to take away "grasses, lops and tops of branches and minor forest produce". All of these are minor forest produce and even prior to this order, communities living in proximity to the forests were permitted to take these away without an obligation to protect the forest.

The terms and conditions designed by different states for Joint Forest Management (JFM) are as shown in Table 1.

So far as common grazing lands are concerned, they are being managed by the village panchayats who also have authority to sign a contract for renting a portion of such lands for fodder production or tree plantation. However, in general it is not the policy of the state government to allow common grazing lands to be leased to any one even for fodder production or tree plantation. In semi-arid/arid regions of Gujarat & Rajasthan large tracts of common grazing land in each village is reserved for grazing*. The extent of the reserved grazing land area is based on the livestock population of the village with no consideration to land productivity and availability of grazable bio-mass in different seasons.

Due to decades of neglect, over-grazing and soil erosion, common grazing lands have been reduced to a bowl of dust. Rural people and perhaps animals as well derive a psychological satisfaction from grazing but in the real sense the grazing lands do not support animal feeding during most parts of the year. On one hand the country is facing acute shortage of fodder and fuelwood and on the other large tracts of grazing lands are left to degrade. The TGCS under an agreement with the village Panchayats and the state government could develop a portion of common grazing lands into a pasture by planting appropriate species of grasses,

bushes and trees. The produce could be sold to the members as well as non-members for a reasonable price. This would set examples of proper land use and improve fodder availability as well. However, efforts in this direction have not yielded any positive results so far.

Rural Social Fabric and Common Lands

The availability and the extent of exploitation of common land is directly related to the economic condition of the rural community. Large tracts of wastelands are available in the interiors of rainfed, semi arid/arid regions where the cropping intensity as well as the pressure of population is comparatively low. The extent of encroachment is an indication of population pressure, land productivity and political influence favouring privatisation of common resource. Generally, the best quality land has been encroached on by the influential and powerful people and the worst by the poor. Encroachment of land is in progress in all the areas with varying degrees of intensity.

During the initial meetings organised by the Spearhead Teams of the National TGCF in prospective villages for organising the TGCS, those who oppose and are reluctant are the vested interests. They could be owners of a large number of livestock and/or persons who have either already encroached on or are in the process of encroaching on the land proposed to be leased to the TGCS. Generally, large villages with a heterogeneous caste structure and moderate to good financial status have proved to be unfit for the TGCS organisation. Villages located in interiors having not more than 150 to 200 households are most conducive to the TGCS organisation. If the requirement of firewood and fodder is well perceived, it generally helps to convince people for organising co-operatives and putting revenue wastelands under productive use. There are several instances of voluntary surrender of claims on the revenue wasteland encroached on by the members of the TGCS. Such withdrawals are not possible by legal or punitive measures. However, under a co-op system social pressures and individual's responsibility towards an organisation of their own make; these are possible. In one particular case more than hundred acres of land which was purchased by the entire village community from their contributions some fifty years ago and reserved for grazing has now been placed at the disposal of the TGCS for a period of 90 years. This is in contrast to the Revenue Department's reluctance to lease the revenue wastelands for more than 15 to 25 years.

In such villages where the entire population is divided in several hamlets on the basis of caste or economic status, it is very difficult to organise a co-op and convince people with conflicting needs and ideas to put common resource under co-op management. In a conducive environment where the size of village is small to medium, caste structure is

balanced, economic status In general is poor and shortage of fuelwood and fodder is well perceived, a TGCS makes good success and gets maximum co-operation from all sections of the village community. Some very positive trends of people's co-operation observed in a good number of TGCS villages are quoted below:

- (a) Consciousness about the protection of common land plantation and development of social norms for its protection.
- (b) Active participation in the selection of species to be planted and planning soil and water conservation work.
- (c) Voluntary surrender of encroached land in favour of the TGCS.
- (d) Voluntary contributions in cash and labour for the construction of soil and water conservation structure and watch and ward of the plantation area.
- (e) Giving up grazing and illicit felling of trees from the area leased to the TGCS.
- (f) Willingness to pay for fodder/fuelwood harvested from the TGCS plantation thus setting a new trend against free riding.

There are some negative indications as well which need to be mentioned. Initially when a TGCS is in a formative stage and a new resource is in the making, poorer people co-operate as they get employed in the process of land development plantation and after care. Later some benefits start trickling in, in the form of fodder, small fruits and fuel wood from prunings/loppings. Politically influential and strong people in the village keep a low profile for they practically get nothing from this new institution except of course an opportunity to leadership. However, when a resource is created and acquires a significant value vested interests may try to grab it. Besides, the pressure of population would also increase and by the time the resource is able to provide benefits to the community it may be insufficient to meet the local needs and may collapse under the pressure of population. Another possibility which is evident even at this stage is that in some cases the resource is so impressive as to become "owners pride and neighbours envy" and create social problems.

In order to avoid such a situation it would need

- (a) educating and training of the TGCS members as well as people in neighbouring villages in the concepts and principles of co-operation;

- (b) structuring common land plantation with the importance of bio-diversity in focus so that benefits are well spread, multifarious and discourage clear felling;
- (c) modifying the TGCS bye-laws to prevent distribution/ clear felling of common resource; and
- (d) promoting participation of women in the decision making process as they would resist clear felling.

There have been some stray cases of mis-appropriation of funds by the society staff when Spearhead Team supervision at the time of distribution of the wages to the members was relaxed. Excessive dependence of the societies on the Spearhead Team in technical and administrative matters is a matter of concern. In fact the Spearhead Teams support to the co-ops should be phased out so that a TGCS can handle most of its activities individually.

Technical Aspects

Selection of species and soil and water conservation are two important technical aspects of common resource development which are needed to be discussed here. In general, the project has adopted a strategy of promoting local species and allow natural regeneration on the lands leased to the TGCS. Our earlier efforts to establish alien species proved to be a miserable failure in some TGCS plantations. Detailed discussions with the rural community on the selection of species based on their needs and experience and cross - checking it with the technical experts have proved to be highly successful for the selection of appropriate species and their establishment on the waste lands. A list of species of trees, grasses and medicinal plants planted by the TGCS on common land is appended as Annexure-3.

Soil and water conservation is another important activity with which both the local community and the staff of the Spearhead Teams (SHT) of NTGCF need to be fully conversant. Depending on the topography, quality of land, soil type and extent of vegetation, soil and water conservation work has to be designed using locally available material and knowledge. Wherever there are some confusions, technical advice could be taken. It has been observed that the plantations without proper soil and water conservation work have very poor establishment of vegetation. Providing location specific practical training in soil and water conservation and low cost techniques for the farmers and SHT the staff have been the constraints in effective implementation of soil and water conservation work on the TGCS plantation areas. The forestry courses conducted at the agricultural universities need to be reviewed. The present syllabus covers only the production forestry and meets the industrial needs. There is a need to include courses and practical training on institutional development, people's

participation and common resource management. In the curriculum of the forestry courses conducted, by the universities, inclusion of courses on procurement, processing and marketing of wood and non-wood produce and ecological and environmental monitoring through local organisations is also necessary.. To strengthen research work, the Indian Council of Agricultural Research (ICAR) and the Indian Council of Forestry Research & Education (ICFR&E) need to work with greater co-ordination and co-operation as it would help implement a need-based research, education and extension programme for wastelands development and tree plantation.

Bench-mark documentation and protection of vegetation existing before initiating the TGCS plantation-, identification of economically important species, and their propagation, studies on the association of various species of trees and lesser vegetation and dependence of local community on them are now being done by the NTGCF on a regular basis.

Observations on the improvement in soil fertility, wild life and water table due to natural regeneration and man-made plantation are also in progress but need to be systematised by proper data collection, computerisation and correlation studies.

Economic Aspects

There is a wide variation in soil fertility, topography, vegetational cover and hydrological status of the village commons which determines the extent of investments on land development, soil and water conservation status, plantation and after care, survival and growth of trees planted, natural regeneration, and yield.

In general, the output of grass for fodder and fibre starts in the second year followed by wood from pruning and thinning in the third or fourth year. Small fruits and roots as food or medicines are also being obtained in the initial years of the plantation on common land in extremely hostile, edaphic and environmental conditions. Natural regeneration continues to be protected. Effect of soil and water conservation has been spectacular in almost all the areas. With significant improvement in bio-mass production from erstwhile degraded lands, the sustainability of the

TGCS and the economics of wasteland development are also improving.

In a typical TGCS, investments made on land development, plantation and after care and managerial subsidy are depicted in Figure-1, Annexure-4. The investments on land development, soil and water conservation work as shown in the above mentioned figure are highest in the first two

years of common resource development. The expenditure on tree plantation shown is highest in the third and fifth years as the maximum area was planted at that point of time and also because of phasing of plantation work. Thereafter, the expenditure on after care i.e. watering, watch and ward and soil working was met under the common land investments. The expenditure on the staff salaries and maintenance of the TGCS office have remained constant and considerably low because of the conscious effort on the part of the TGCS to spend less on such items. In Figure-2, Annexure-4, the returns from the common land plantation from the sale of fodder and value of existing trees are depicted. The returns from the fodder sale were highest in the second year after which the production declined with the improvement in the canopy area. During 1992, the output from pruning and thinning was carried out which resulted into an output of fuelwood worth Rs.33,000. During this period a similar experiment was made by the society on charcoal which gave an output worth Rs.3,000 approximately. The value of the existing stock of trees has been constantly increasing, the base area of such plantations is now being monitored and over a period of another 10-15 years, it would be possible for the NTGCF to develop valuable information on the biomass production in various species under different environmental conditions. Such information would also help promote tree plantation on marginal and degraded lands.

As indicated in the above figures, the return and investment in a typical TGCS under the pilot project and grants to the TGCS are available up to a period of five years. The total investment made during this period on a TGCS was Rs.3.45 lakhs whereas the total income/value of the biomass in the common land plantation went up to Rs.2.22 lakhs by 1992.

In the common land, trees are planted at a spacing of 3' x 2' or 3' x 3¹ (1,650 to 1,100/hectare) and with an average survival percentage of 60% around 900-1,100 trees/hectare would be well established. Besides, the regeneration rate is estimated to be 100-150 trees/hectare, thus compensating the mortality of the planted trees to a great extent. Smaller plants and grass also regenerate, fill up the gaps and provide small fruits and fodder. It is expected that the income would increase steadily with the increase in the production of wood and non-wood biomass - regenerated as well as planted and protected from the common land plantations. Based on the estimations and present growth rate, it could be expected that the financial condition of the TGCS would be reaching its climax between 10-15 years regarding which the future data generated on the plantations would provide adequate insights.

Apart from common land plantation, the TGCS are also now getting increasingly involved in the procurement of pods and seeds of trees and medicinal plants from its members and its marketing after minor processing. Procurement of wood for sale as poles and sized wood and packaging material is also

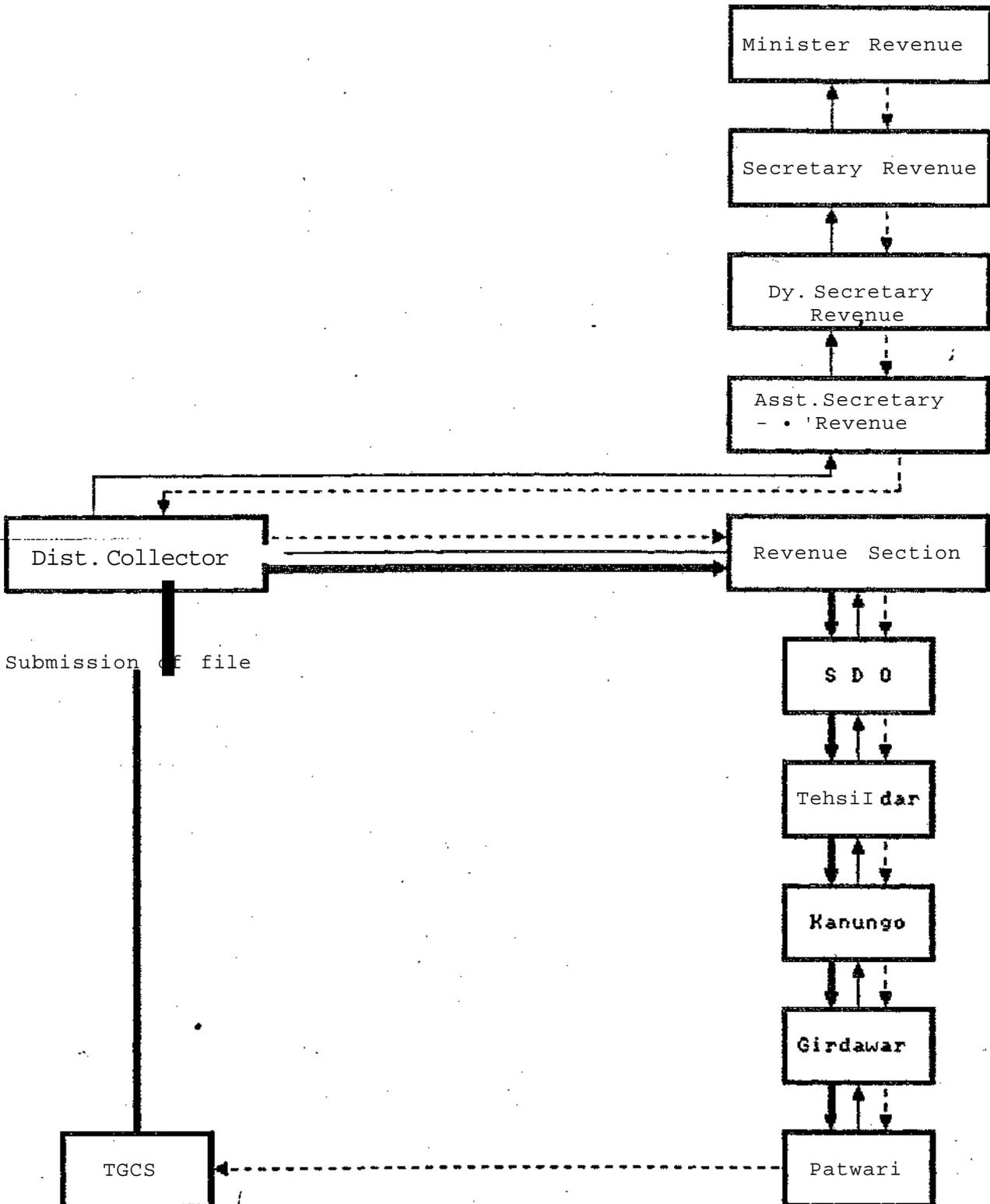
picking up, Apiculture, rope making, manufacture of leaf cups & plates are some of the income generating activities that are being promoted by the TGCS. It is too early to present a complete picture of the techno-economics of common land management and economic viability *of* a TGCS over a short period of five years. Yet, the indications are positive and it is hoped that most of the TGCS would be sustainable in the long run.

Table 1
State-level Joint Forest Management Policies

State	Sharing	Organisation	FPC Respon- sibility "	Tenure period
Rajasthan	All MFPS (except bamboo) 60% of net timber, 50% re-invest	Registered society Revenue village based	Control grazing, illegal felling, fires. encroach- ment	Not specified Maximum of 50 ha. per group
Orissa	Subsistence timber/fuel. Free, not for sale	FPC-Panchayat based. 8 members + sarpanch	-same as above- Distribu- tion to villages.	Not specified
Gujarat	All MFPS' 25% of GFD timber. 80% of timber from other sources	Village communities, panchayat, society, or informal groups. All families.	To regene- rate & develop degraded forest land. No agriculture	No lease or ownership rights. Joint manage- ment agree- ment

MFP : Minor Forest Produce
FPC : Forest Protection Committee

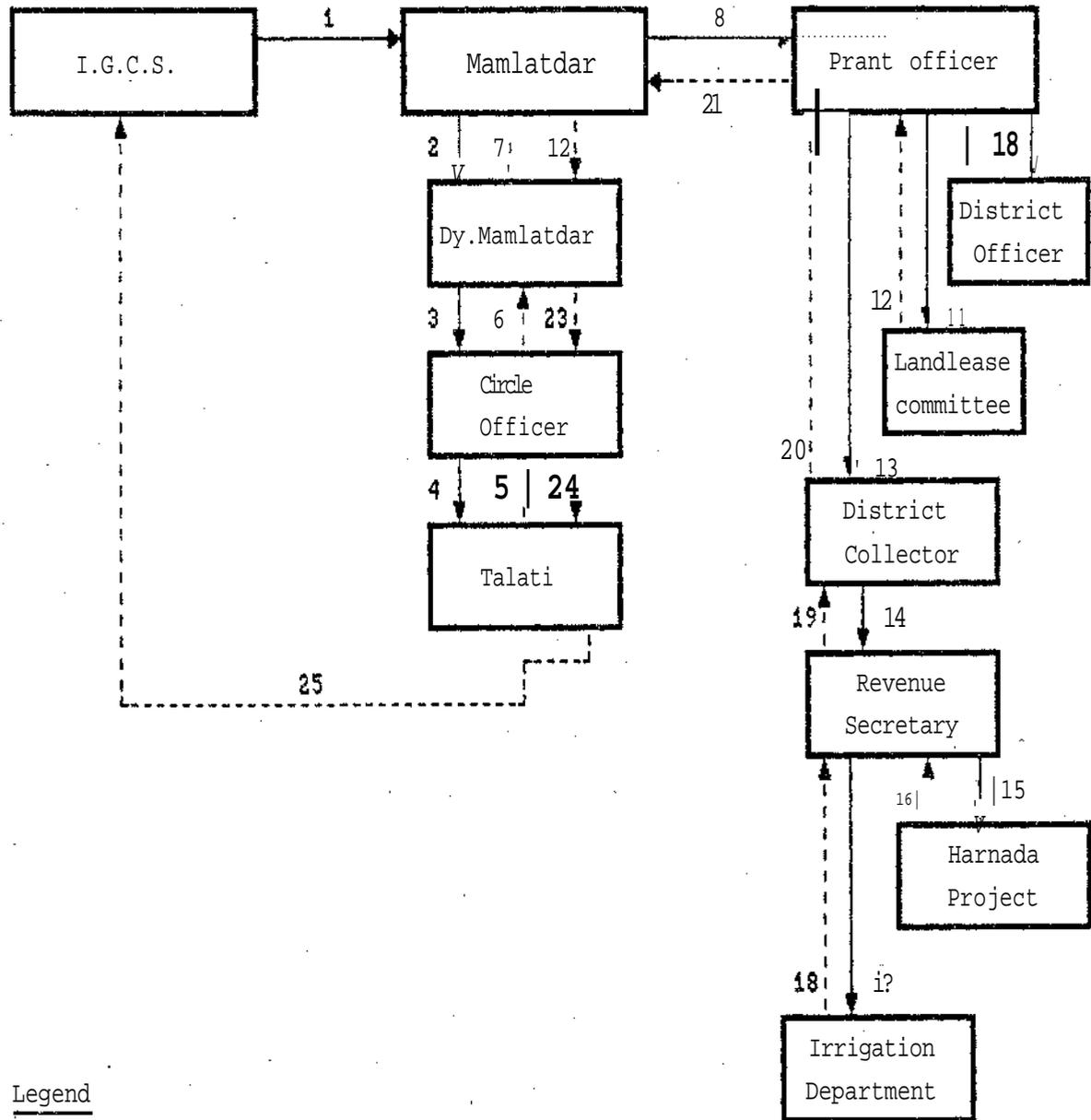
Movement of file in channel for land lease to Tree Growers' Cooperative Societies in Rajasthan.



Legend

- Movement of file from TGCS to Patwari via District Collector & Tehsildar.
- Movement of file from Patwari to Minister (Rev.) via office of the District Collector for approval
- - - -** Movement of file from the Minister (Rev.) to TGCS via office of the District Collector for issuing land lease order.

Movement of the file in channel for land lease of Revenue Wasteland to a T.G.C.S. in Gujarat



Legend

— Movement of file for necessary action.

- - - - - Movement of the file for further approval after taking necessary action.

Annexure -2

Comparative Statement on the Land Leasing
Terms and Conditions of Different States

Sharing of benefit	Land Tenure	Power of Land Lease	Membership	Land rent	Tree Species Exempted
<u>Rajasthan</u>					
Usufructory rights include distribution of tree and tree produce to all members as per the TGCS bye-laws	25 yrs, Dist. Collr. Renewal up to 40 ha. for 10 more years		Open to all the families in the TGCS villages	First 10 yrs, there is no land rent. After 10 yrs. payable at the lowest Barani class rate.	- Shisam - Babul - Subabool - Israili - Babool - Eucalyptus - Jangal Jalebi - Vilayati - Babool
<u>U.P</u>					
Usufructory rights for use of tree and tree produce to all members	Initially 30 yrs. Renewal on the basis of successful implementation of the proj.	Dist. Magistrate Can lease 15 ha. of land	Open to all	No rent	15 Tree Species exempted from Tree Felling Act,,

Annexure-2 (contd.)

Sharing of benefit	Land Tenure	Power of Land Lease	Membership	Land rent	Tree Species Exempted
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Karnataka

Usufructory rights of benefits would go to weaker sections of the society SC/ST landless labourers & small and marginal farmers	30 yrs.	Dist. Collector can lease only five ha. of land	Open to all	Re.1/acre/year (Formal order would be issued later)	Eucalyptus
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Remarks; All information given as per the Govt. Administrative order. Final terms and conditions have to be finalised.

A.P

Usufructory rights of benefits would go to weaker sections of the society ie., SC/ST landless labourers & small and marginal farmers	30 yrs.	Dist. Collector can lease only five hectares of I and	Open to all	Re.1/acre/year (Formal order would be	Eucalyptus
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Remarks; Land is leased to NTGCF and not to TGCS

Annexure 2 (contd.)

Sharing of benefit	Land Tenure	Power of Land Lease	Membership	Land rent	Tree Species Exempted
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Gujarat

Usufructory rights of benefits will go to landless and marginal farmers	15 yrs. Renewal may be for 15 years	State Govt. can lease 80 ha. land lease would depend on number of TGCS members ie., landless & marginal farmers	SC,ST marginal farmers & members <u>Bakshi Panch</u> (Backward class)	No rent for first 8 years. After that rate of the rent of half assessment prevailing in the plantation area. For the renewal full rent would be paid by the TGCS	Eucalyptus Subabool Saru
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Orissa

Usufructory rights of harvesting of trees and tree produce is to only landless labourers and not to the big farmers	10 yrs. Renewal subject to the performance of the TGCS	Dist. Collector can only lease 5 ha.	Open to all	No rent for first 6 yrs. The arrear will be realised in 3 instalments from the 7th year onwards	NIL
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Remarks: All these are abstracts from the administrative letters. Land lease terms and conditions have to be finalise.

List of Species Planted in 1953

Species Name	Local Name	Uses	SHT's Name						
			AJM	JPR	KHD	GDR	CHI	CUD	KOL
Acacia nilotica			*	*	*	*	*	*	*
Ailanthus excelsa			*	*	*	*	*	*	*
Albizzia lebbek			*	*	*	*	*	*	*
Azadirachta indica			*	*	*	*	*	*	*
Acacia catechu			*	-	-	*	*	-	-
Acacia auriculiformis			-	-	*	-	*	-	-
Acacia cuoriformis			-	-	-	*	-	-	-
Acacia senegal			*	-	*	-	*	-	-
Artocarpus integrifolia			-	-	-	-	*	*	-
Albizzia amara			-	-	-	-	-	-	*
Acacia stenophylo			-	-	*	-	-	-	-
Acacia asplicepe			-	-	*	-	-	-	-
Anacardium occidentals			-	-	-	-	-	<	-
Anona squamosa			-	-	-	*	-	*	-
Bombax ceiba			-	*	*	-	-	-	*
Bamboosa arundencea			*	-	-	-	-	*	-
Casurina equistifolia			-	-	*	-	-	*	*
Casia auriculata			-	-	*	-	-	-	-
Casia fistula			-	*	-	-	-	-	-

AJM: Aimer ; JPR: Jaipur ; KHD: Kheda; GDR: Godhra;
 ANG : Anpul; CHT: Chit+oor: CUD: Cudcianab: KOL: Kolar

Species	Name	Local	Name	Uses	SHT's Name
					AJM JPR GOR ANG CHT CUD KOL
Casia siamea					* * * * *
Dalbergia sisoo					* * * * *
Dendrocalamus strictus					
Dichrostachys cineraria					- - - - -
Pongamia pinnata					* * * * *
Pterocarpus santlaies					- - - - -
Prosopis juliflora					* * * * *
Psidium guajava					- - - - -
Pithacellobium duke					* * * * *
Prosopis cinnerera					- - - - -
Sasania saman					- - - - -
Syzygium cumini					- - - - -
Salvadora persica					* * * * *
Sesbania grandiflora					- - * - - * * -
Shorea robusta					- - - * - - -
Syzygium jumbolanus					- - - * - - -
Sapindus emarginatus					- - - * - - -
Santalam albuni					- - - * - - -
Terminalia tomentosa					- - - * - - -
Thaspea populea					- - - * - - -

Species Name	Local Name	Uses	SHT's Name						
			AM	JPR	KHD	SDR	ANG	CHT	CUD	KOL
SasDania egyptica			-	-	-	-	-	-	-
Sesbania sesban			-	-	*	*	-	-	-
Terminalia arjuna			-	-	-	*	-	-	-
Phoenix dactylizera			-	-	-	-	-	-	-
Zizipnus mauritiana			*	*	*	-	-	*	-
Parkinsonia aculeata			*	-	-	-	-	-	-
Ziiba petinora			*	-	*	-	-	-	-
Tamarindus indica			-	-	-	-	-	*	-
Enteretobium samak			-	-	-	*	-	-	-
Horinga Pterigosperma			-	-	-	*	-	-	-
Morus alba			-	-	*	-	-	-	-
Melia azadirachta			-	-	-	*	-	-	-
Moringa oleifera			-	-	-	*	-	-	-
Leucanea leucocphala			-	*	*	-	*	*	*
Delonix regia			*	-	*	-	*	-	-
Emblica officinalis			-	-	*	-	-	-	-
Eucalyptus			*	*	-	-	*	*	*
Ficus religiosa			-	-	*	-	-	-	-
Ficus bengalansis			-	-	*	-	-	-	-
Ficus sila			-	-	-	*	-	-	-
Gmelina arboria			-	-	-	*	*	-	-

* District where species are planted

Investment in common land plantation

of a typical TGCS

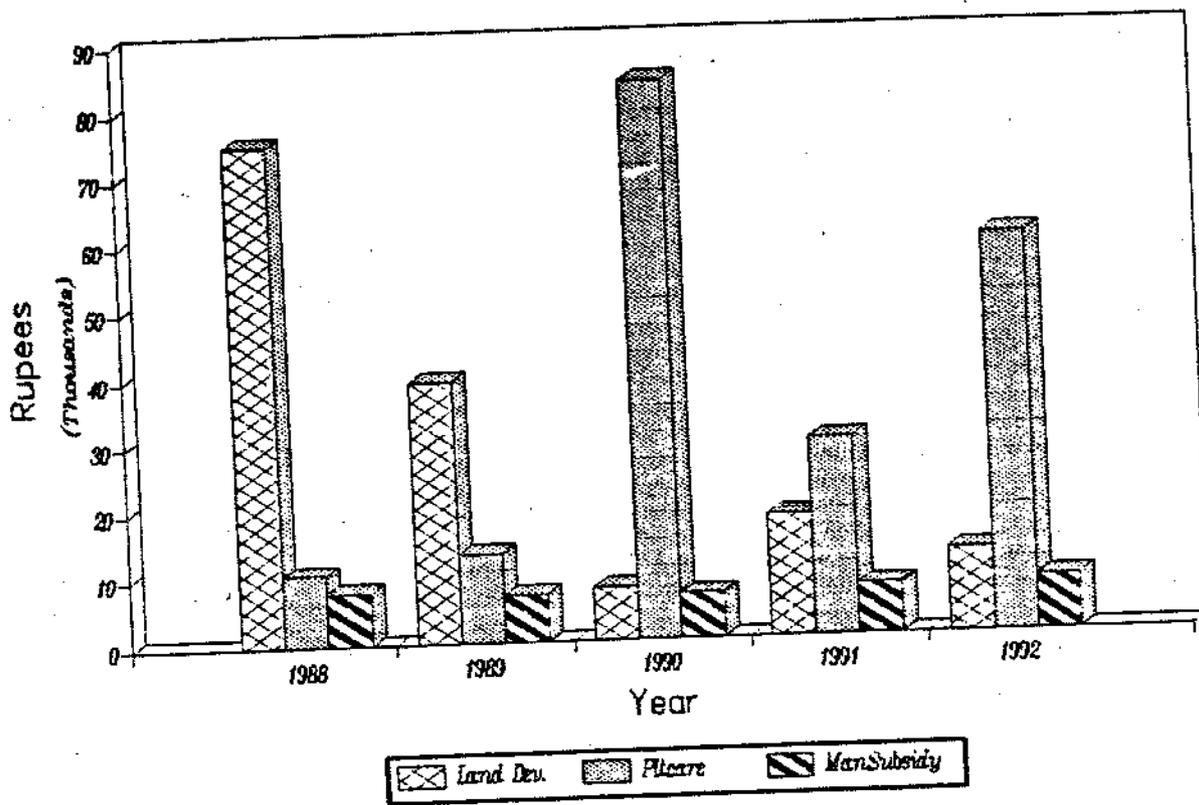
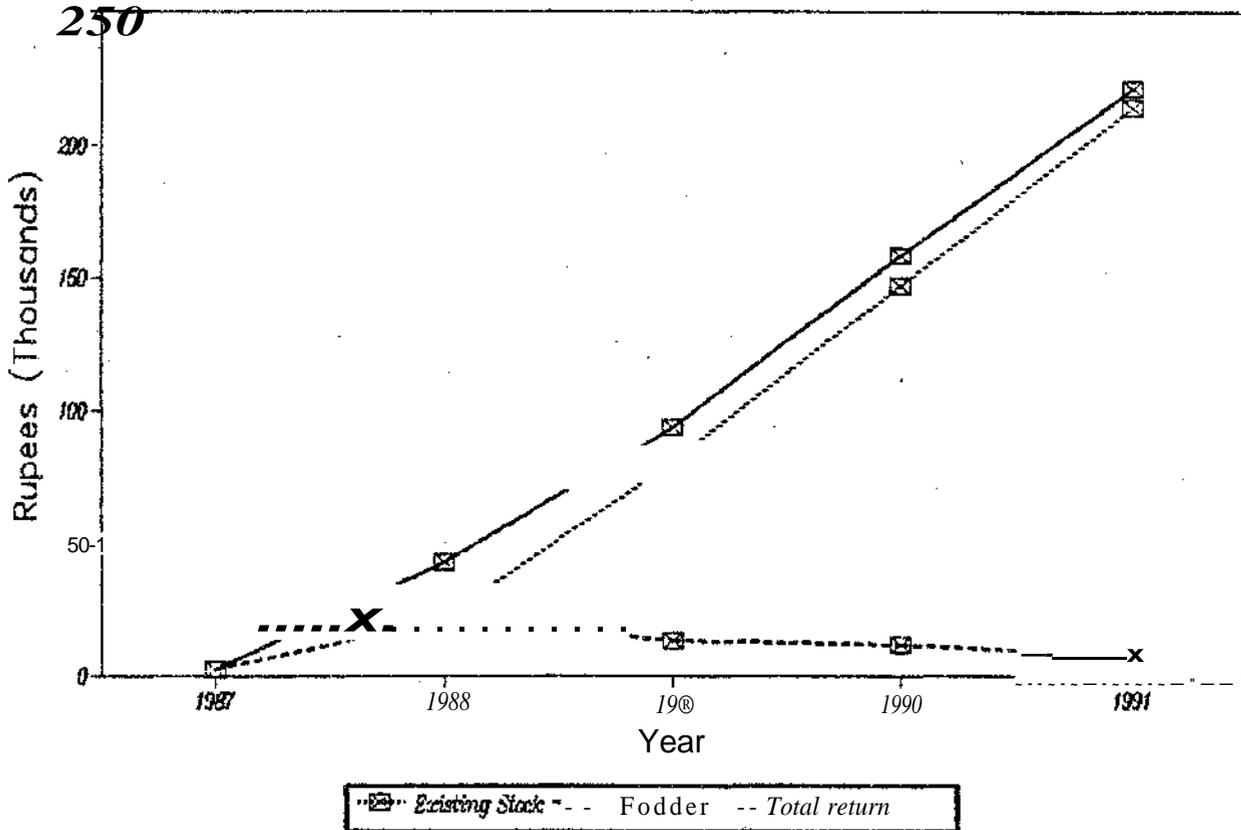


Figure-2

Returns from common land palntation of a typical TGCS

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References

- Berkes F. (1989), "The Benefits of the Commons". *Nature*, 340, 91-93.
- Berkes, F. , Feeny, D., (1990). "Paradigms Lost : Changing Views on the Use of Common Property Resources. *Alternatives* 17, 48-55 .
- Bunch, R. (1982). *Two Ears of Corn. A Guidja to People Centred Agricultural Improvement, Oklahoma : World Neighbours.*
- Chambers, R., N.C. Saxena and Shah, T, Shah (1991). To the Hands of the Poor - Water and Trees. New Delhi : Oxford & IBH Publishing Co.
- Fenny, D., et al. (1990). "Tragedy of Commons : Twenty Two Tears Later". *Human Ecology* 18, 1-19.
- Hardin, G. (1968). "The Tragedy of the Commons". *Science* 162, 1243-1248.
- National Dairy Development Board & National Tree Growers⁸ Co- operative Federation Limited (1992) Tree Growers! Co- operatives Project : Tamil Nadu. Orissa & Ralasthan. Reappraised document I & II., Anand, India.
- Saxena. R. (1992). "Economics of Sarnal TGCS". A working paper. IRMA, Anand.
- Wade, R. (1987). Village Republics : Economic Conditions for Collective Action in South India. Cambridge : Cambridge University Press.

PEOPLE'S PARTICIPATION IN ORGANISING AND MANAGING TREE
GROWERS¹ CO-OPERATIVE SOCIETIES : A CASE STUDY IN ORISSA

Katar Singh and Suresh Subramanian

Abstract 'Tree Growers' Co-operative Societies (TGCS) represent an organisational innovation in the field of restoration and afforestation of common pool wastelands and privately-owned marginal lands not fit for production of agricultural crops. As of March 1992, some 129 TGCS had already been established in six states under the aegis of the National Tree Growers' Co-operative Federation. For the success of any co-operative venture in general and TGCS in particular, people's participation is a pre-requisite. This paper is aimed at determining the extent of people's participation in organising and managing TGCS in Dhenkanal district of Orissa and identifying the factors that affect it. For fulfilling the objectives of the study, a sample of four TGCS was drawn and studied in detail.

People's participation was found to be relatively high in both the old TGCS and relatively low in the young ones. The major factors that were associated with high people's participation included awareness and education about TGCS, cohesive village communities, good leadership, high stakes in the common pool wastelands, availability of revenue wastelands in sufficient quantity, professional skills and pro-people stance of the project officials, and project design-specific factors such as decentralised and democratic decision making, provision for equitable distribution of benefits and sharing of costs. Measures for enhancing the members' participation in the operations and management of TGCS are suggested.

Keywords. Anand pattern, common pool, Orissa, people's participation index, tree growers' co-operative societies.

Introduction

Like the village *Van Panchayats* of Uttar Pradesh hills and the village Co-operative Forest Societies of Kangra district in Himachal Pradesh, Tree Growers' Co-operative Societies (TGCS) represent an organisational innovation that holds high promise as an instrument of afforestation of common pool and privately-owned wastelands in India. A bold initiative was taken by the National Dairy Development Board (NDDB) in 1986 to organise TGCS on the Anand pattern under a Pilot Project, the Tree Growers' Co-operative Project (TGCP), in selected states of India. For this purpose, a national level autonomous organisation, the National Tree

Growers' Co-operative Federation (NTGCF) has been established with its headquarters in Anand. The NTGCF initially selected five states of Gujarat, Andhra Pradesh, Orissa, Karnataka and Rajasthan for organising TGCS under the Project. Later on, one more state, Uttar Pradesh, was included in the Project. As of March 1992, the NTGCF had organised 129 TGCS of which 117 had been registered. The total membership of all TGCS stood at 12,144 and the area covered at nearly 1,449 ha [1].

The long term goal of the NTGCF is to adapt the basic principles of the Anand pattern dairy co-ops for creating economically viable and self-sustaining co-ops of tree growers. Since they are still in their infancy, there is not much published literature available about the operations, management, performance and impact of TGCS.

The TGCS aim at improving the availability of fire wood, fodder and small timber in the villages, undertaking the processing of wood to produce high-value products, and promoting the revegetation of wastelands and thereby enhancing their productivity and restoring the environment.

For the success of any co-operative venture in general and TGCS in particular, people's participation is a pre-requisite. This study was undertaken to determine the extent of people's participation in organising and managing the TGCS in Dhenkanal district of Orissa and identifying the factors that affect it.

Research Procedure

The study was conducted in a purposively selected district in Orissa, Dhenkanal, where the Anand pattern TGCS had been established under the NDDB's Pilot Project. For an in-depth study, a sample of two pairs of TGCS - one pair comprising one good old and one good new TGCS and the other pair comprising one average old and one average new TGCS. The selection of the TGCS was done purposively in consultation with the members of the Spearhead Team deployed in the district under the Pilot Project. The criterion used for defining "good" was continued good physical performance in terms of the number of trees planted and survival rate of the trees planted [2]. The age of co-op was used as the criterion for determining 'old' and 'young' TGCS; the old ones were established in April 1988 and the new ones in April 1991. The two-way classification of the sample TGCS is as follows:

	Old (1988)	New (1991)
Good	Durgapur	Muktapasi
Average	Jhamunda Jungle	Sondapal

Table 1 presents some salient features of the sample TGCS. The Durgapur TGCS is the largest and the sondapal the smallest of all the sample TGCS in terms of number of members and the area of wastelands leased in. The Durgapur and Jhamunda Jungle TGCS were both registered on April 20, 1988 and Muktapasi and Sondapal on April 23, 1991; so the former two were relatively old and the latter two relatively young.

Finally, a stratified random sample of 91 members was selected from amongst the members of the selected TGCS - roughly at the rate of 20% of the total number of members in each co-op. The stratification was done on the basis of both caste and size of land holding. The number of members selected from each stratum was in proportion to the total number of members in the stratum.

Both primary and secondary data were collected to fulfill the objectives of the study. The primary data were collected from the sample members through the personal interview method using a pre-structured questionnaire comprising both close-ended and open-ended questions. The secondary data were collected from the office records of the TGCS, the TGCP, and Resource Inspectors.

There is no universally acceptable measure or index of people's participation that could be used to evaluate development programmes in terms of people's participation. One could use as crude measures of participation such parameters as proportions of the target group of people who participated in various stages of a programme; who adopted various recommended measures and practices; and who expended their time and money on participation in collective action required for resource conservation, development and management on a sustained basis. Such measures could be presented in the form of a simple frequency table.

To measure people's participation, we used the People's Participation Index (PPI) as developed by Singh (1992). For computing the PPI, the sample members were asked a set of ten questions that were framed to elicit the necessary information for computing the PPI [3]. Each of the questions was so framed as to have either a yes (1) or no (0) answer, or an "always (1), sometimes (0.5), or never (0)" answer. Out of the ten questions, eight followed the first pattern and the remaining two the second pattern. Each of the questions was assigned a weight showing its relative importance as a measure of participation. The sum of the weights added up to 100. Following this method, we computed a participation score for each of the sample respondents and all the scores thus computed were added and then divided by the number of sample respondents in each of the four sample villages to compute a PPI for each village.

Findings and Discussion

In this section, we present the main findings of our study and briefly discuss them.

Extent of People's Participation

The term people's participation has become a rhetoric these days, It is used to connote different things by different people and in different contexts, According to Banki (1981 : 533), people's participation is a dynamic group process in which all members of a group contribute to the attainment of group objectives, share the benefits from group activities, exchange information and experience of common interest, and follow the rules, regulations, and other decisions made by the group. For the purpose of this study, **we** use the term to mean participation in the meetings convened by the TGCP **staff**; contribution of money, labour, or both towards the common purpose set by the TGCS; following the rules and regulations prescribed by the TGCS; abstaining from doing any damage to the common property of the TGCS; and participation in the management of the TGCS.

Table 2 presents a summary of the responses of the sample members to the questions asked of them about their participation in the activities of the TGCS concerned and the PPI for each of the sample TGCS. As is evident from the table, the PPI was, in general, moderate for all the four TGCS; the highest being in the case of Jhamunda Jungle co-op and the lowest for Sondapal co-op [4].

The co-op having the highest PPI was representative of the average old co-ops and the co-op having the lowest PPI represented the average new co-ops. The PPI for the co-op which represented the good old co-ops was the second highest at 73 with the highest score being only one percentage point higher than it. Both the old good and average co-ops fell only marginally short of being classified in the next (higher) class of people's participation. This means that both the old good and average co-ops had higher people's participation than the young good and average ones, On this basis, we could hypothesise that although both age and success are positively correlated with members' participation, success is more important than age; the PPI for Muktapasi TGCS which was new and successful (good) was higher than for Sondapal TGCS that was also new but not successful (average). However, it is very difficult to identify the direction of causation, i.e., whether success determines participation, or vice versa. In the following section, we shall identify the major factors that affect people's participation and briefly explain how they operate.

Factors Affecting People's Participation

There are many factors that affect people's participation in natural resources management programmes. In the context of rural development programmes, Korten (1983; 183-200) identifies three categories of obstacles to people's participation, namely, obstacles within the (programme) agency; obstacles within the community; and obstacles within the society. A CRDAP (1984 : 4.1-44) report identifies the following seven barriers to people's participation; a) easy availability of grants and subsidies; b) prejudices and discrimination against women; c) illiteracy and lack of awareness; d) factionalism and heterogeneity of population; e) disparities in wealth and social status; f) interference by politicians; and g) misunderstanding about the motivation and objectives of people's organisations. Mishra et al. (1984 : 45-46) classify the factors affecting people's participation into six categories, namely, physical and biological; economic; political; social; cultural; and historical.

The determinants of people's participation that we have identified on the basis of our study can be grouped into the following five categories:

1. Resource-specific;
2. Community-specific;
3. Project-specific; and
4. Environment-specific factors.

A brief discussion about each of these sets of factors and practicable alternatives to remove the obstacles to people's participation engendered by them follows:

Resource-specific Factors

There are many characteristics of the resource that affect people's participation in its use and management. They include resource centrality, i.e., the importance of the resource as a means of survival; resource scarcity; ownership of the resource; uncertainty about availability of the resource/benefits; location of the resource; divisibility of the resource/resource products; and feasibility of exclusion of free riders from-sharing the benefits from the resource (Singh 1992 : 15). Most of the members, especially the poor, of the sample TGCS depend to a large extent for their livelihood on the village common lands that include revenue wastelands, degraded forest lands, and village panchayat pasture lands. Since most of the village common lands in the study area have been degraded and yield very little benefits, if any, growing trees of locally useful species on those lands under the aegis of the TGCS was perceived highly beneficial by the members. Given the high credibility of the TGCP and its staff, the members were quite certain that the promised benefits from the trees planted on the village common land

by the TGCS will in fact accrue to them. Besides, those members who wanted to work for the TGCS in tree planting operations got "wage-paid employment also (Table 1). Every member of the TGCS had an equal chance to avail of the wage-paid employment opportunity. However, most of the rich and upper caste members of the TGCS did not opt to work.

The wastelands leased out to the sample TGCS were meant for collective use (tree plantation); they were not to be partitioned and allotted to individual members for their private use* In this sense, the common pool wastelands were indivisible and were amenable to only collective use by the members of the TGCS concerned.

Community-specific Factors

A number of socio-cultural characteristics including beliefs and values of the community/members affect their participation in the activities of the TGCS.

All the four villages where the sample TGCS were based had a heterogeneous social structure characterised by multiple castes. However, in terms of economic status, members of all the four TGCS were more or less homogeneous; most of them were marginal and small farmers. In terms of representation of women, all the sample TGCS were more or less comparable.

Each of the four sample TGCS had a similar settlement pattern characterised by the upper caste people residing in the centre and the lower caste people on the periphery. Discussions about the issues of common interest and other interactions and meetings also took place in groups of same caste people in their own *exclusive chaupadhis* (common meeting places); the lower caste people normally sat outside the *chaupadhis* of the upper caste people and did not participate in the meetings.

The same pattern of behaviour and interaction was also evident among the activities of the TGCS. For example, the TGCS provide an equal chance to every member to participate in their programmes such as the Farmers' Induction Programme (FIP) and the Women Orientation Programme (WOP), but usually only the members of the upper caste attend those programmes. But the lack of participation by the members of lower caste or poor members of the upper castes in the TGCS programmes is due more to economic reasons than social-cultural factors. For example, to participate in the FIP, members have to be away from their homes-for at least 8-10 days. The poor can hardly afford this; they must **'work'** every day to feed themselves and their families.

In Sondapal village, the members had planted saplings in the wasteland leased in by the TGCS for the purpose. But a few other villagers (non-members) who had encroached this land, and were growing crops on it, uprooted some 5,000 saplings at one night. That was the reason for the low survival rate

of trees in the TGCS. But in the other TGCS, no such incidents were reported and the sample members there had no quarrels among themselves. They all co-operated with one another in the matters regarding use of the common pool resource (wasteland).

In Jhamunda Jungle TGCS, we observed that the discussions about TGCS and other matters of common interest took place in small caste-based groups. As this TGCS had entered its fourth year of functioning and the Project was sanctioned for only five years, there was a discussion among the dominant upper caste members about what would be the fate of the TGCS after the funds from the Project stop flowing in. The lower caste members did not participate in those discussions about an important issue of common interest, or rather their participation was not sought by the upper caste members.

Most of the members participate in the employment-oriented activities taken up by the TGCS. The wages are paid on the piecemeal basis, except in the case of bush cleaning. The other programmes offered by the TGCP were also taken up in all the TGCS but the extent of their coverage varied with the age of the TGCS.

Although all the sample TGCS provided an equal chance to every member to work on wages, due to some social and other constraints, not all the members participated in wage-paid employment. For instance, the upper caste and well-off members did not work in the fields. This can be well understood by the following example. In Muktampasa TGCS, it was decided that on one particular day all the members would work without any wages to clear the bushes in the wasteland leased in by it. But the upper caste members sent their hired workers to work on their behalf; they perhaps considered it below their dignity to work along with the lower caste poor people. But this was accepted as something normal by the other members. They viewed it as indirect participation by contributing hired labour instead of their own labour.

The members' participation was generally higher in the old TGCS than in the new ones. The main reason for this is that in a new TGCS, people who are innovators and early adopters join the society first and participate in its activities. The proportion of such people in total population is low and hence participation in the activities of TGCS is also low initially. Gradually, as time passes by and TGCS make good progress, other people join their membership. This was observed to happen in all the four cases. Here we cite the case of Durgapur TGCS to illustrate the process. In Durgapur, initially only a few villagers joined the TGCS but afterwards many people joined and got involved in such activities as nursery raising, wage-paid employment, etc. and started interacting with the Project personnel as well as among themselves.

Leadership is another important factor affecting people's participation. Good political entrepreneurship and leadership is required to motivate people to come together and act collectively in their common interest (Olson 1971).

The impact of good leadership was observed in the case of Durgapur TGCS where, subsequent to its Secretary preparing to leave it to join another organisation, its activities had come to a virtual halt. The Chairman of the TGCS stepped in at that critical juncture, motivated the members to hold on, asked the Secretary to quit, and got another Secretary for the co-op. Thus, he averted a major crisis. Given the important role of leadership in enlisting and sustaining members' participation, it is imperative for the Project personnel to develop skills in identifying, attracting and nurturing good leadership in the interest of their programme,

The economic status of members and their stakes in the resource/organisation also count in their participation in the affairs of TGCS. The poor tribals depend on the forest for their livelihood and hence it is difficult to convince them to conserve it unless alternative means of income are made available to them. So, the Project needs to provide the poor local people with alternative employment and allow them to use minor forest produce from the forests as was done under an experiment in the Arabari Forest Range in West Bengal [5]. Similarly, other programmes that help conserve the resource (trees) such as improved *chulahas* should also be taken up as part of the Project.

For enlisting women's participation, formation of the women's forums was taken up under the Project. It has proved to be a useful instrument to encourage them to participate in the Project, particularly in the activities of nursery raising. / ' ' ' ' ..

It was also observed that values and beliefs affect participation only upto a threshold level. Once that level is reached, only economic factors operate. For instance, the upper caste people refused to participate in labour activities but were interested in nursery raising where the returns are higher and where they can use their *mulliahs* (servants) to work. In the short run, it is difficult to change the values and beliefs and they should be accepted as given and the resource management programmes should be designed accordingly. But in the long run, values and beliefs can be changed as we saw in the case of women joining the TGCS as members and participating in nursery raising as well as other labour activities.

Project-specific Factors

Many parameters of a project such as its strategy, approach, objectives, instruments or measures to be used to achieve the objectives, characteristics of its personnel, systems

for distribution of benefits and sharing of costs of participatory management among all participants, etc. are important determinants of people's participation.

We observed that the decision-making process in the sample TGCS was influenced by the social and economic factors. To provide proportional representation to all the caste groups, the TGCP decided that in the Managing Committee (MC), there should be a member from each *sahi* (caste group). But the members of the lower castes could not sit along with those of the higher caste in the meetings of the MC. Thus, the lower caste people were restrained from participating in the decision-making process despite the existence of a statutory provision for this. After having observed this incident, TGCP personnel decided that the Managing Committee meetings will be held at a place where all the caste groups can sit together and discuss matters of their common interest [6].

Another obstacle to members' participation arose out the fact that quite a few members of the TGCS migrate for 3-4 months every year and therefore they cannot attend the General Body meetings which are held once a year. This led to those people being alienated from the decision-making process. So once again, to solve this problem, the TGCP management decided that there will be four meetings of the General Body every year - once every three months. The date, time and place of every meeting were to be communicated to all concerned by the Secretary, TGCP.

It has also been observed that women do not readily come forward to join the TGCS due perhaps to the orthodox attitude of the community towards them. The TGCP management thought that fixing of a certain quota for membership of women would lead to their token representation only and hence would not achieve the intended objective of their active involvement in the decision-making process. So the Project management employed a two-pronged strategy. Firstly, a woman was recruited as an employee of the Project and subsequently, women awareness camps and women Orientation Programme were held regularly and activities like nursery raising were assigned to women and men jointly, as it was basically a family activity. With the awareness of women on the increase, several precedents have been set where women have become members of the Management Committees also.

Another characteristic feature which was observed among the members of the sample TGCS was formation of groups based on political affiliations. This tendency has been there traditionally and is manifested in the form of bitter disputes over land holdings, livestock, etc. and family feuds. The groups form their cliques and try to manipulate situations to their advantage. The strategy adopted by the Project management to cope with this problem was to remain apolitical and neutral and try to get the best out the situation.

We observed that, in all the sample TGCS, most of the members were involved to a great extent, in taking important decisions like allocation of labour activities, selection of participants for the FIP programme, etc. In Jhamunda Jungle, for instance, the members were asked to plan as to how many saplings should be raised for plantations. Although the members made quite a few mistakes, they had a good experience that developed confidence in themselves about their ability to plan. This kind of experience and confidence building are necessary for making the members self-reliant so that they can take over the management of the TGCS after the Project personnel; withdraw from the

The attitudes, values and skills of the Project personnel also influence members' participation to a great extent. We observed that in all the TGCS, decisions regarding soil work, tree species, raising of trees, etc., were taken by professionals. The Project staff were also trained in rural development, sociology, communication and interpersonal skills required to deal with rural people.

On the whole, we can say that the Project management has been quite sensitive, responsive, and flexible in its approach to establishing TGCS, resolving their teething problems, and nurturing them.

Environment-specific Factors

There are many physical, institutional, legal, political, and policy-related factors that affect members' participation in the activities of the TGCS.

Agro-climatically all the four villages were comparable and therefore none of them had any comparative advantage over the others in this respect. Durgapur and Muktapasi villages were both located very near to the metaled roads and were electrified whereas the other two sample villages were both situated some four km away from the metaled roads and were not electrified.

Durgapur had adequate institutional infrastructure that included one Oilseeds Growers' Co-operative Society (OGCS), one Grameen bank, one High School, one rice mill. It was also very rich in natural resources of land and water. These factors were all congenial to higher people's participation.

We observed that the TGCP was facing a number of problems all arising from changing policies of the Government of Orissa (GOO) and inconsistent and uncertain behaviour of the government officers concerned with the Project. The Project was launched in Orissa after the GOO had agreed to lease out village revenue wastelands to the TGCS to be established under the Project. But now the Government is hesitating in keeping its promise and thus has made the things difficult for the TGCP. The Project authorities are now in a dilemma

- whether to continue the Project or close it. The latter would amount to betraying the trust that the participating villagers have reposed in the Project and the former is fraught with high chances of failure.

Apparently, a few revenue officials in the state have vested interest in the status quo, i.e., keeping the revenue **wastelands as** they are. The process by which they gain from the status quo works like this. When some rich and influential people encroach the wastelands, they are allowed to keep the land if they bribe the Revenue Inspector. This type of illegal privatisation of revenue lands has been going on for decades. Now, with the leasing of the wastelands to the TGCS, the officials are afraid that they would no longer have any control over the wastelands and that would dry up an important, albeit illegal, source of their income. Hence, they are against the leasing of wastelands to the TGCS. This matter has been discussed in a couple of meetings of the State Level Coordination Committee but no concrete steps have been taken by the GOO to remove this unnecessary hurdle.

Besides, the Orissa Co-operative Societies Act has recently been amended. Of the various changes that have been effected, the following changes directly affect the TGCS.

- a) A minimum of 50 members are needed to start a society.
- b) A reservation should be made for women members.
- c) Chairman should be directly elected from amongst the members in the GBM.

The TGCP is going to be adversely affected by the first two amendments. Fixing the minimum number of members required to form a society at 50 is an arbitrary decision. If a village has, say, 70 households, it will be difficult to enroll 50 members out of them initially as it has been observed that initially very few people come forward to become members.

The second amendment is against what the TGCP has been trying to prevent from happening. A statutory reservation for women can ensure their token representation but cannot necessarily motivate them to actively participate in the affairs of the TGCS. The third amendment is a positive step in the right direction and therefore it is welcome.

It was observed that the people do not participate simply because they are not aware about the seriousness of the problem of degradation of common pool lands. Lack of relevant literature in vernacular, social problems and lack of involvement of women were major obstacles to their active participation. To improve members' participation and to ensure the success of the programme, these obstacles have to be removed. The decisions recently taken by the Project management such as increasing the number of General Body Meetings from one to four, conducting WOPs, establishing a

women's forum in every society, publicising the role of forest in village economy through *palas* (folk songs and dramas) are appropriate and timely.

Conclusions and Implications

On the basis of our research findings and their analysis presented in this paper, we can draw many conclusions. Some the major conclusions and their implications are briefly stated in the following paragraphs.

1. People's participation was found to be relatively high in both the old TGCS and relatively low in the young ones. The major factors that were associated with high people's participation included awareness and education about TGCS, cohesive village communities, good leadership, high stakes in the common pool wastelands, availability of revenue wastelands in sufficient quantity, professional skills and pro-people stance of the project officials, and project design-specific factors such as decentralised and democratic decision making, provision for equitable distribution of benefits and sharing of costs.
2. To organise a TGCS on common pool village lands involving only a group or a section of the village community, even if it constitutes a majority, has its own limitations. The perception of common land differs from people to people. The powerful in the village would encroach it and deprive other people from its benefits. The common man might let loose his cattle for grazing on it. The common pool land has always been a sensitive issue in the villages. In this context, willingness of the "majority" might not always be a good indicator to organise a TGCS. Lack of complete consensus among all villagers might lead to tendencies to sabotage the effort by those who are not taken into confidence by the organisers even if they are in a minority. This happened in Sondapal where a small minority of the villagers was not ready to form a TGCS and the majority who wanted it was not able to go ahead. The challenge before the Project functionaries is to empower the pro-TGCS group to stand up to the situation. It is the poor landless and the marginal and small farmers who are dependent to a great extent on common pool lands and who need to be mobilised, organised and involved more meaningfully and actively in the affairs of the TGCS if it has to become a people's movement.
3. As the Spearhead Team of the Project organises more and more TGCS, they would learn more about how to involve villagers in this task and what factors facilitate participation and what factors hinder it. At this stage, one thing that can be stated with

confidence is that the people are responding to the change and will do so more actively if they are educated and convinced about the private benefits to them from TGCS and enlightened about their social desirability.

The decisions recently taken by the Project management such as increasing the number of General Body Meetings from one to four, conducting WOPs, establishing a women's forum in every society, publicising the role of forest in village economy through *palas* (folk songs and dramas) are very appropriate and timely and hence need to be pursued vigorously.

Table 1

A Profile of the Selected TreeGrowers' Co-operative Societies

Particular	TGCS			
	Muktapasi	Jhamunda Jungle	Durgapur	Sondapal
Month and year of registration	April 23, 1991	April 20, 1988	April 20, 1988	April 23, 1991
Sample classification	New & Good	Old & Average	Old & Good	New & Average
Total population of the village	1,374	761	1,921	572
No. of households	200	121	353	91
Literacy rate (%)	31	21	30	19
No. of members	82	109	190	75
No. of male members	68	92	169	64
No. of female members	14	17	21	11
Members as % of total households	41	90	54	82
Wastelands covered (acre)	110	82	112	74
Mo. of trees planted as of March 1992 ('000)	34	112	131	22
Survival rate (%)	81	84	86	69
Employment generated (mandays)	1,300	1,000	1,175	1,100
No. of farmers included under the Farmers' Induction Programme	5	17	21	4
No. of Women Orientation Programmes organised	1	4	3	1

Table 2
 People's Participation Index for Selected TGCS

Question number*	Weight assigned to the question	Score of responses for TGCS			
		Muktapasi	Jhanmnda Jungle	Durgapur	Sondopal
1.	5	16	22	38	15
2.	10	16	18	29	11
3.	10	12	18	36	12
4.	10	16	22	38	15
5.	5	2	6	4	2
6.	15	12	22	30	12
7.	15	6	16	28	6
8.	10	6	12	22	5
9.	10	8	10	26	6
10.	10	10	16	28	8
All	100	104	162	279	92
Number of respondents		16	22	38	15
Total score of responses		1,040	1,620	2,790	920
Total weight of questions		1,600	2,200	3,800	1,500
People's Participation Index		65	74	73	61

* The questions are listed in Annexure 1.

Annexure 1

Questionnaire used for Collection of Information about Members' Participation in the Affairs of TGCS

1. Are you a member of the TGCS? (Y/N)
2. Did you participate in any meetings called by the TGCS? (Always/Sometimes/Never)
3. Do you participate in the meetings (other than attendance)? (Always/Sometimes/Never)
4. Do you abide by the norms and regulations of the TGCS? (Always/Sometimes/Never)
5. Are you a member of the Management Committee ? (Y/N)
6. Did you contribute any money or labour towards activities of common interest? (Y/N)
7. Did you participate in the Farmers Induction Programme organised by the TGCS? (Y/N)
8. Did you ever share any information or experience that you had about the resource with the Project personnel ? (Y/N)
9. Did you ever consult the Project personnel about your problems ? (Y/N)
10. Did you ever consult your fellow members about your problems? (Y/N)

Motes

- [1] Personal communication with Shri V. K. Mishra, Managing Director, National Tree Growers' Co-operative Federation Ltd.
- [2] Since the sample TGCS were all nascent, their financial performance was not considered as a selection criterion.
- [3] The questions are listed in Annexure 1.
- [4] Following Singh (1992), we ranked the PPI having values up to 25 as low, 26 to 50 as average, 51 to 75 as moderate, and 76 and above as high.
- [5] Provision of alternative sources of income to the poor people who were dependent on the forest was instrumental in enlisting people's co-operation in regeneration and protection of *sal* forest in the Arabari Forest Range in West Bengal. For details see Singh (forthcoming)
- [6] ¹ We do not know whether the lower caste people are now participating in the meetings.

References

- Bamherger, Michael and Shams, Khalid. (1989). Community Participation in Project Management : The Asian Experience. Kuala Lumpur, Malaysia: Asian and Pacific Development Centre, and Washington, DC: Economic Development Institute of the World Bank.
- Banki, Evan S. (1981). Dictionary, of Administration and Management. Los Angeles, California : Systems Research Institute.
- CIRDAP (1984). People's Participation in Rural Development : An Overview of South and South-East Asian Experiences. Camilla, Bangladesh : Centre on Integrated Rural Development for Asia and Pacific.
- Korten, Frances F. (1983). "Community Participation : A Management Perspective on Obstacles and Options". In Korten, David C. and Alfonso, Felipe B, Eds. Bureaucracy and the Poor: Closing the Gap. West Hartford, Connecticut : Kumarian Press.
- Mishra, S. N., Kushal Sharma and Neena Sharma (1984) . Participation and Development. Delhi : NBO Publishers' Distributors.
- Olson, Mancur. (1971) . The Logic of Collective Action : Public Goods and the Theory of Groups. Rev.Ed. New York: Schocken Books.
- Singh, Katar (1992). People's Participation in Natural Resources Management. Workshop Report 8. Anand : Institute of Rural Management.
- Singh, Katar (forthcoming). Managing Common Pool Resources : Principles and Case Studies. New Delhi : Oxford University Press.

CO-OPERATIVE MANAGEMENT OF MINOR FOREST PRODUCTS IN
MADHYA PRADESH : A CASE STUDY

Dinesh K. Marothia

Abstract. This paper presents an overview of co-operative (co-op) management of Minor Forest Products (MFPs) in Madhya Pradesh (MP) and the results of an indepth case study of Magri, Rajpur and Dugli MFP Primary Co-op Societies (PCS) "functioning in Raipur district of MP. The paper critically traces out the roots of different management systems of MFPs and discusses the administrative and financial structure of the three-tier co-op management system currently operating in the state. On the basis of the overview and results of the indepth study, we could conclude that the current status of co-op management seems to be "government oriented co-op network¹ and hence co-ops have not been able to provide substantial benefits to the members except to ensure proper wages. The quantity of MFPs collection has also been fluctuating over the years due to government policies and natural calamities. The PCS are poorly equipped with infrastructural facilities and members do not have much participation except to collect MFPs and dispose it off. The paper suggests some policy interventions for effective management of MFPs through co-op.

** advisory committees, attitude analysis, district union, federation, harra, Minor Forest Products (MFPs), salseeds, tendu leaves, primary societies,

Introduction

Minor forest products (MFPs) or non-wood forest product resources play a vital role in the process of economic development, providing food, shelter, energy needs are livelihood to millions of forest dwellers, maintain equilibrium of the total life support system of the earth and enriching the Indian heritage. The trade of MFPs *have* been dominated by traders during the colonial rule and ever after Independence and the state departments of forest (SDF) did not even record them as an important sources *i* revenue until mid-sixties. Traders have been purchasing MFPs from the forest dwellers for nominal cash price or one sided barter. This pattern of trade is still operating *in* many tribal pockets of the country. Commercial uses of MFPs in pharmaceutical, oil, *bidi*, handicrafts and many other industries have attracted the attention of the state governments as a source for increasing the state revenue and gradually, MFPs became important raw materials in the commercial transformation of many industries. Recognising

the commercial value of MFPs some states nationalised MFPs in mid-sixties and seventies to ensure remunerative rates to forest dwellers for their produce and to make adequate supply of MFPs to village, cottage and forest based industries. The trade and process of collection of the nationalised MFPs have basically been governed through three different management interventions viz; contractors and industrialists, forest departmental agencies and primary agricultural credit societies (PACS) (Tewari 1986) . Notwithstanding the three management interventions in the collection of MFPs, the economic situation of forest dwellers improved marginally in some states but in others were rocked by violent, tribal uprising and the forest dwellers demanded denationalisation of MFPs. Furthermore, the collection of MFPs has always been much lower than the estimated potential (Gupta, Banerjee and Guleria 1981; Agrawal and Narain 1985).

Recognising the drawbacks of the above management systems, the Government of Madhya Pradesh (GOMP) has launched the biggest co-op venture of its kind in the country to introduce the co-op system of MFPs management in May 1989. A three-tier co-op system with the Madhya Pradesh State Minor "Forest Produce Trade and Development Co-op Federation Ltd (FED).the District Minor Forest Produce Unions DUs and the Primary Minor Forest Produce Cooperative Societies (PCS) at the apex, secondary, and primary levels was designed respectively for co-op management of MFPs in Madhya Pradesh (MP) to completely eliminate the intermediaries and to manage the trade of MFPs through co-op societies of actual forest dwellers, so that tribals and other backward classes who bear the brunt of the trade secure commensurate socio-economic benefits from the co-op management (Lal and Dave 1991). However, the trade of MFPs has been highly sensitive, socio-economically and politically, in the state of MP. The nationalised MFPs have been the most widely covered subject in the local, state and national newspapers during the collection session. The issues of. MFPs co-op management have also been frequently raised on different political platforms in various parts of the state and in the state legislative assembly too. No comprehensive study has yet been conducted to trace the process of co-op management of MFPs and distil lessons that might be useful in improving the management of MFPs in the state of MP. An attempt has therefore been made in this paper to present an overview of co-op management of MFPs in MP and analysis of an indepth study of Nagri, Rajpur and Dugli PCS functioning in South Raipur District Union (SRDU) of Raipur District of MP.

Study Area, and Data Base.

The head quarters of the three selected PCS namely Nagri, Rajpur and Dugli are located at 66 km., 86 km., and 41 km. respectively from Dhamtari town in the south east of Nagri-

Sihawa Road. The villages of the selected PCS fairly represent the tribal, agro-forestry and Socio-economic conditions of SRDU, Raipur forest circle and the state as well. Information on planning, management, co-op organisation¹ and financial set up, dimensions of trade, rules and regulations of FED, DUs and PCS has been collected from the office records of the FED, Bhopal, SRDU, Nagri, Rajpur and Dugli PCS. Most of the required information was gathered. However, some information could not be obtained as office records were not updated or financial data were not finalised. Due to the lack of information details of benefits of distribution of total value of MFPS sale could not be presented for the selected PCS.

To analyse the perceptions of forest dwellers (members) of the PCS, field level workers and members of the management committees of the PCS, an attitude survey has been conducted using interview and/cum questionnaire. From each collection centre of Nagri, Rajpur and Dugli 8, 5 and 4 members were randomly selected. Nagri, Rajpur and Dugli have .7, .10 and 5 collection centres respectively. This makes a sample of 56, 50 and 20 members from Nagri, Rajpur and Dugli. Thus, 126 total randomly drawn members from the three societies were interviewed. We have also intensively interviewed 30 field workers (Nodel officer, Phad manshies, checkers, peon), 42 members (30 executive and 12 nominated) of the management committees of Nagri, Rajpur and Dugli PCS. All the interviews were conducted at the collection centres and the PCS head quarters in the period beginning from the first week of May till the last week of June 19.92.

Management of MFPS in HP : An Overview

Alternative systems of management of MFPS have been implemented in MP. Specified MFPS for monopoly state trading through suitable legislation have been nationalised by GOMP in four stages: Tendu leaves (*Diospyros spp.*) in 1964, Harra (*Terminalia chehula*) and Gums of five types and Mahua (*Bassia latifolia*) in 1969, Sal seeds (*Shorea robusta*) in 1974 and other MFPS, namely bamboo (*Bamhoosa spp*) and Khair (*Bauhinia purpurea*) in 1973. The state monopoly of the nationalised items continued till 1984. To inculcate a sense of belonging in the MFPS trade and to ensure benefits of trade to forest dwellers, the state has formed the FED in 1984 to co-operatise the management of MFPS. An account of how the management of specified MFPS was done and controlled before and after nationalisation (or state trading) and co-operatisation may be given to indicate the changes that followed the co-op intervention for the management of MFPS in MP.

Prior to nationalisation of tendu leaves in 1964, the SDF had nominal control over the trade of tendu leaves. Tendu leaves growing on the GOMP lands were sold unplucked to the contractors or private parties while the petty traders handled tendu leaves grown by tribals on their own lands. The amount earned by the GOMP was much less in proportion to the profit earned by the contractors. The contractors had the tendency to cover maximum growing area of the tendu leaves so as to collect maximum leaves. For years together the contractors had usufruct rights of the forest resources and used poor forest dwellers as a captive resource by maintaining informal relations with them through money-lending, and giving occasional benefits. These observations have also been made elsewhere with particular reference to the pre-nationalised management of MFPS (Gupta, Banerji and Guleria 1981).

The GOMP enacted the Madhya Pradesh Tendu Patta Vyapar Vinियaman Adhiniyam (Act) in 1964 and took over the trade in tendu leaves to control the violent theft of tendu leaves from the forest and other government lands, to enhance the state revenue, to ensure payment of proper wages to the tendu pluckers and to free the downtrodden tribals from the clutches of the middlemen and traders. The tendu leaves growing areas were divided into units (one unit produced 2,500-3,000 standard bag of leaves and one standard bag (S.B.) is equivalent to 50,000 leaves) after the state nationalised the trade. The agents were appointed by the government for each unit under the provisions section 4 of the Act. The agent collected or purchased and delivered or transported the leaves to the purchaser, who was appointed for a particular unit and collection centre. Under provisions section 5 of the act, no person other than the state government or an agent appointed by it can either purchase or transport the tendu leaves. The price paid by the purchaser was worked out on the basis of number of standard bags of tendu leaves delivered to him. A private grower if he was growing more than one standard bag, was required to be registered in a manner prescribed in the rules made under the provisions section 4 of the Act (Lai and Dave 1991). The rate of purchase of tendu leaves grower on private lands was fixed by the GOMP every year in consultation with the divisional level committee comprised of representatives of growers, traders, bid! manufactures and concerned GOMP officers. The rates of the tendu leaves grown on private lands were generally higher than that of the government forest lands (Lai and Dave 1991). The purchaser-agent system continued till 1980. The purchaser used to manipulate the extent of trade and recorded less than the actual number of standard bags delivered to him. To overcome this weakness in the system, lump sum payment method was introduced in 1980. In the same year the GOMP appointed MP State Marketing Federation (MARFED) as the agent in some units to deal with tendu leaves trade. This

corrective measure has benefited the tendu pluckers and the GOMP as well, in terms of wages and revenue (Lai and Dave 1991). Considering the success of the tendu leaves trade the GOMP enacted the Madhya Pradesh Laghu Van Upaj Vyapar Viniyamam Adhiniyam in 1969 and took over the trade of harra, salseeds, gums and mahua. Due to some political reasons, state control of mahua flowers was lifted. The pattern of state trading in case of salseeds and harra was also governed by purchaser agent system till 1980 and changed to the lump sum payment as in case of tendu leaves. Gums, khirwood, salai and bamboo were collected and traded through the SDF (Lai and Dave 1991) .. The other denationalised MFPs have been and are collected by the forest dwellers and sold in a' weekly local market to tribal agent/retailers/wholesalers at the prices generally dictated by the middlemen (Marothia and Gauraha 1992).

Co-op Management of MFPs :

Although the process of co-op management of MFPs was initiated in 1984, with the formation of FED, complete co-op venture as an organised sector was introduced from the tendu leaves collection season (April-June) of 1989. Under the auspices of MARFED and FED the work of tendu leaves, harra and salseeds collection was entrusted to LAMPS and PACS in the selected tribal pockets of the state in 1984. The MARFED has been appointed as purchaser and the LAMPS & the PACS as agents. This pattern of trade was adopted with the administrative objective that within three to four years the FED should be able to develop the co-op network to deal with MFPs trade management (Reports of General Body of FED, 1989-91). On the directives of the GOMP, the FED had to enrol all the LAMPS and the PACS of the state over the years as its members. The FED however, dealt with the trading of MFPs through inviting tenders from potential buyers. The LAMPS and PACS were responsible for collecting the tendu leaves, harra and salseeds from the collection centers through their authorised agents or representatives and these representatives were responsible for the payments to the forest dwellers. During 1984-85 to 1988-89 it was observed that the LAMPS and the PACS could not appoint their representatives at the collection centres due to their own burden of work. Even if they have appointed the representative, they could not perform the work to the expectations. During 1984 to 1988, the activities of FED also confined to few districts and the LAMPS and PACS played only a negligible role (Agarwal 1990; Lai and Dave 1991 and the forest dwellers could not be brought into the stream of co-op management.

In June 1988, the GOMP ultimately took a historical and revolutionary decision to co-operativise the management of MFPs (tendu leaves, harra, salseeds, gums and mahua) to totally eliminate the middlemen in collection, storing, processing, grading and trading of MFPs and to provide

proper wages to MFPs collectors. The basic theme of the co-op management of MFPs was that the collection of MFPs should be done by the co-op societies of actual collectors so that the forest dwellers share the benefits of trade and become the partner of the management system. The PCS were to be constituted by the people who actually laboured in the trade (Sood 1991, Lai and Dave 1991). In May 1989, the biggest co-op venture of its kind was launched in the state with the following specific objectives? (i) to ensure fair prices to the forest dwellers of MFPs and payment made well in time at the collection centres itself; (ii) to totally eliminate middlemen in the collection, storing, processing, grading and trading of MFPs and save forest dwellers from exploitation by the contractors, traders and middlemen; (iii) to teach forest dwellers proper techniques of the operations used in collection, grading and processing of MFPs; (iv) to involve forest dwellers in the total process of co-operatisation; (v) to strengthen the rural economy base in the tribal areas by creating employment opportunities through MFPs co-operatisation; and (vi) to integrate other welfare programmes with the MFPs collection.

Co-op Structure of FED

For effective implementation of the co-op management of MFPs at FED, DUs and PCS levels (Fig.1) bye-laws have been prepared for each level and made effective from January 1989. The bylaws clearly spelt out the working zones, objectives, functions, responsibilities, organisation, administrative and financial set-up, duties and rights structure of the members of the governing bodies operating at apex, secondary and primary levels.

At the apex level of the three-tier system, the board of directors of FED is the highest policy making body. The board constitutes the Principal Secretaries of forest and co-op as chairman and secretaries; commissioners, directors, regional director, additional registrar of the co-op and marketing and one non-government nominated person as directors of the board. The FED as apex body has the prime responsibility to provide administrative, financial, legal and technical support to the DUs and PCS. The Board of Directors of FED meet normally once in a year and this yearly general body meeting is attended by the directors of the board, representatives of the DUs and PCS. The meeting is generally held at the FED head office located in Bhopal, MP. The normal issues discussed in the annual meetings are: progress report, of the work, audited account of the FED, approval of the proceedings of the last meetings, approval of the proposed budget, and work plan or any other important issue. The FED has also been arranging training of the chairman and other government and non-government members of the DUs and PCS.

At the secondary level, the DUs were formed under the chairmanship of district collectors with all the district level officers, five chairmen of the PCS and five non-government members belonging to SC/ST or weaker sections as directors. The nominations of the chairman of the PCS and non-government members are done in consultation with the district advisory committee (DAC). The FED nominates one District Forest Officer (DFO) as managing director of a DU, There are 78 DUs working in the state. Each forest division of the state has a DU (except behind district which does not produce tendu leaves and other MFPs), The DUs are responsible for effective implementation of the policies of the FED at their own level and supervision of the operational network at the PCS level. The managing director is responsible to supervise all the PCS and to provide them financial, administrative and legal support and to co-ordinate between chairman and other, district level officers. The DUs are also required to appoint a nodel officer, a clerk (locally known as *phad munshi* who procures MFPs and pays the wages to members every day), head checkers, checkers, forest guard and a peon for the PCS to supervise the quality of MFPs. Managers and assistant managers are also appointed by the DUs in consultation with the DAC for the PCS. Following the bye-laws, the DUs have to arrange general body meetings once in three months, however, these can also be arranged as and when needed. The records of the DUs indicate that general body meetings have been regularly arranged to review the progress of the trade and problems, The DUs also arrange training of the chairmen and members of the PCS.

At the primary level, 1,947 PCS were constituted with only actual forest dwellers as members and the chairman was elected from the members only. The management committee of the PCS has 13 members with nine elected and four nominated members. The elected members mostly belong to the ST/SC categories. Since women constitute a large majority of the forest dwellers, two women serve as representatives in the management committee. The DUs appoint nodel officers to supervise the work of *phad munshi*, head checker and checkers, A nodel officer regulates and controls the flow of cash to the *phad munshi*. Normally, for every collection centre, the PCS appoint one *phad munshi* and a checker. A head checker supervises the work of two to three centres. A *phad munshi* procures tendu leaves, *harra* and *salseeds* at the collection centres. He maintains full records of the bundles of tendu leaves and quantity of *harra* and *salseeds* procure for each member, checks the quality, ensures the quantity and makes payment in exact denomination of notes. He is assisted by a forest guard, a tribal inspector and an assistant co-op inspector nominated by the forest, tribal and co-op departments in the management committee. These nominated members are on deputation from their respective departments. In order to identify actual forest dwellers, the FED issues an identity card to each member of the PCS and the *phad munshi* is required to make all the entries of

collection of MFPs, wages paid in the card every day. Based on the collection quantity, bonus money is paid to the members (discontinued after 1988-89). At every collection centre, the PCS are supposed to arrange fair price commodities and drinking water for the members.

The DUs watchmen, peon and messengers and other lower staff are deputed by the FED. Every PCS also has a part-time manager belonging to ST/SC from a local area. The selection of the manager is done by the DAC and he is appointed by PCS. Manager and checkers get an honorarium every month depending upon the categories of the PCS, and the Phad *munshi* gets a commission on the basis of total transactions made from his centre. Manager, *phad munshi*, checker have to execute a bond of Rs.5,000 with a guarantee of two persons of the local village. The committee is also responsible to distribute net value benefits received from the DUs following the guidelines of bye-laws. The normal functioning period of the committee is three years.

In addition to the three-tier co-op structure, advisory committees are also formed at state and district levels. Such committees can also be formed at *tehsil*, block, forest range and collection centre level. Presently, the advisory committees are working at the state and district levels (Figure-I). The chairman, vice-chairman and members of the state advisory committees - (SAC) and (DAC) - are public representatives. The Secretary SDF, is the coordinator of the SAC whereas the district collector is the member secretary of the DAC, The SAC has 2-3 members including the chairman - a member of parliament serves as a chairman of the SAC and DAC. At the district level, all the members of parliament and Legislative Assembly, Chairmen co-op Banks, Panchayat and 5 to 10 nominated public representatives by the GOMP serve as members. The DAC could form Primary Advisory Committees (PAC) under its supervision, if needed. The SAC and DAC serve as "watch dogs" and monitor the activities of the FED, the DUs and the PCS, and ensure that the co-op management of MFPs is effectively working at the three-tier co-op levels.

Financial Structure of FED

To perform the massive operation of co-op management of MFPs, the FED could pool Rs. 11.39 crore as share capital, margin money, loan and cash credit from the GOMP, NCDC, private and public institutions in 1984-85. On the similar pattern, working capital for the DUs and PCS have been arranged by the FED. In case of the DUs, the authorised share capital has generally been Rs. 1 crore. and equally divided in 1 lakh shares of Rs. 100.00. The DUs were paid Rs.20,000. The DUs purchased one share of Rs.1000 from the FED. After deducting Rs.1,000, the FED allotted Rs.19,000 to the DUs. This money used to meet working expenditure. Similarly, in case of the PCS the share capital

has been Rs. 1 lakh and equally divided 10,000 shares of Rs.10 each. Taking into account the poor conditions of the members of the PCS, the FED paid the share money amounting to Rs.10 for every member in every society Rs.1 as entry fee for every member was also paid by the FED. The amount was later recovered from the members when they were paid the wages for collecting MFPs. All the PCS are members of the DUs and they have to purchase a share of Rs.100. This share is purchased from the allotment of working capital of Rs.2,000 by the DUs to the PCS, This money was also paid by the FED and, recovered later on. The PCS have to be constituted under the supervision of the DUs and in consultation with the DAC. At least one member of a forest dweller family should be a member of the PCS. Every PCS must have at least 20 forest dwellers as registered members. The list of the registered members should be approved from the DUs. 50% women representation is desirable but it should not be less than 20% in any case. The PCS should have their account preferably in the branches of district co-op banks and arrangements are made by the FED to get different denominations of notes from the R.B.I to the district co-op banks so that members get exact amount for their wages. The PCS retain 3% amount of the total quantity sold as service charges, the DLJs charge 1%. The FED charges only Rs.1 for the total quantity sold; but all the administrative expenditure of the FED are met by the GOMP. The DUs charge 2% of the forest development tax from the purchasers on the total sale.

Co-op Management of MFPs in Nagri, Rajpur and Dugli PCS This section examines the existing management structure of the selected PCS and their performance in terms of collection expenditure and income of MFPs. The existing management structure of the selected PCS in terms of field workers and working capital seems to be inadequate (Table-1) to deal with the quantum of MFPs collection. The *Phad munshi* is required to make entries every day in the collection card of each member. He is also solely responsible for, supervising the basic operation of watering, drying, bagging; and temporary storage of MFPs. It is almost impossible to perform effectively such a large scale job within a stipulated period of time with the existing numbers of *Phad munshis*. Similar observation holds true in case of the checker because he has to supervise quality of MFPs, payments of wages and entries made by the *Phad munshi* of four to five collection centres simultaneously. The checkers are also not provided with any transportation facilities and it has been observed during our field visits that the existing strength of the *Phad munshis* and checkers is not in tune with the amount of the work (Table-1). The PCS management committees (MC) have been dominated by the government officers and often they are not accountable to the members. The government and elected members of the MC of the PCS have generally friendly relationship. However, the chairmen and non-government members are not comfortable

with too much control of government officers in the MC and they feel that their positions are reduced to the level of a clerk to maintain records and arrange meetings. It is this feeling of the **non-government** members of the MC which is creating hidden problems for the PCS to pursue the goals of **co-op** management for the benefits of the members. and the non executive members of the PCS very rarely attend the meetings and their role is almost negligible in the process of **co-operatisation**. They are essentially concerned with the collection of MFPS and collect their wages from the *Phad munshi*. However, they are happy to receive at least proper wages for their produce.

The effective collection season of tendu leaves is only of 45 days duration (May-June) and the plucking of tendu leaves has to be discontinued after the onset of monsoon. The total collection of tendu leaves has been fluctuating between 1989-91. This fluctuation has also generated variability in the net value of quantity sold. The total collection of tendu leaves was reduced during 1991 due to the upper limits of collection fixed by sell FED to out the old stock of 1990 (Table-2). Also, due to the transition period and the uncertainty in the process of shift in the management system of MFPS from state trading pattern to co-op, the traders could not purchase from other states in 1989-90. As a result the FED could even sell out the MFPS at much higher rates than the quoted ones in the tenders. The FED was able to reap attractive income and it was unfortunately projected as a grand success of co-operatisation of MFPS in the state (Neeraj 1992). In the year 1990, the FED invited the tenders fixing Rs.800 minimum rates for one S.B. of tendu leaves and the FED could fetch some tenders even of higher rates but somehow the FED rejected the tenders **with** the assumption based on 1989 rates, that the FED may further fetch the higher prices and in this process of poor judgment, tendu leaves were sold out even at the rate of Rs.30 per S.B. in some areas of MP. The PCS including Nagri, Rajpur and Dugli have also felt the brunt of this policy (Table-2). Somehow, this year, this event was projected as a flop show of co-operatisation (Neeraj 1991). The success and failure of co-operatisation **was** measured on a politically sensitive scale. The expenditure and income breakup of tendu leaves collected by the PCS is given in Table-2. More than 73 to 87% of the total expenditure on the collection of tendu leaves has been accounted for wages paid to the members of the PCS. Pay and commissions was the next important contributory item of total expenditure. Expenditure on godown rent, transportation, watering of leaves was almost equal to the pay and commission share. The unit cost has thus varied according to the magnitude of expenditure on these items. The ultimate purchaser (traders) paid 2% forest development tax. Significant variation in the net value of per S.B. in a particular year was evident among the PCS due to variations in sale price and unit cost (Table-2).

Salseeds' are collected during June-July. The collection of salseeds has been fluctuating and shows every alternate year as a bad year (Table-3). The fluctuation in three PCS may be attributed to grazing of young plants and frequent fire hazards. Both, these factors affected the soil moisture and in turn the productivity level of salseeds. These observations were also made for the state as a whole (Bhatnagar and Kawdia 1989). It is evident from **Table-3.that** the collection of salseeds was quite low in 1990 as compared to 1991. The lower collection was also due to the fact that the amount to be paid to forest dwellers for collected salseeds was not received in time by the PCS and hence, even the collected quantity could not be purchased. Whatever small quantity was collected could also not be sold out due to the conflict between the SROU and the Raipur Salseed Industry. Before co-operatisation, the owner of sal seed industry had a contract with the SDF to purchase salseed for 10 years. Under the contract arrangement the owners of the salseed industry used to collect salseeds directly from the collection centres through their own manpower and after formation the **FED**, from LAMPS and **MARFED**. The case filed by the salseed industry against the SDF is **still** in court. It is important to note here that in **1991**, the same firm purchased the total quantity collected through the highest bidding of the tenders.

The wages paid to the members contributed more than 90% in the total expenditure of the salseed collection. Pay, commission, stitching, loading, weighing and transportation accounted for the remaining expenditure. The variation in the unit cost and net values was almost negligible in the PCS in 1991 (Table 3).

Harra **collection-is** generally done in January-March and the collection has continuously been decreasing (Table-4).

Harra trees in the study area have been damaged due to fruit insects and this has resulted in poor quality. Harra collection has substantially been reduced in 1991 as the FED could not fix the collection target for harra off-hand and money could also not be released to the PCS in time. In case of harra also, more than 72 to 92% amount of the total expenditure has been paid to members as wages. Expenditure on transportation was the next important contributory cost item. The net value was lowest in case of Rajpur PCS in 1991 due to higher unit cost and lower sale price of harra. The poor quality of harra resulted in lower sale price (**Table-4**).

To popularise the co-op management of MFPs, the GOMP introduced bonus payment to the individual members of the PCS on the basis of quantum of leaves collection. The bonus was paid only for 1989-90 and then discontinued and even the total amount was not properly distributed to the members. In the same year, a group insurance scheme for the members of the PCS was introduced. In all the three PCS the amount

for insurance has been claimed but till today no amount has been paid to the nominee of the members (Table-5).

Attitudes and Opinions Survey

To analyse the perceptions of the members of the PCS we have interviewed 126 members. We have asked the sample respondents about their opinions pertaining to various aspects of the co-op management of MFPs. The responses obtained are summarised in Table-6. All the members thought that the co-op management has benefited them in terms of proper wages and generally, *Phad munshis* make correct entries of their produce in their collection cards. However, delay in wage payment was identified as the major problem by a sizable number of members. Furthermore, majority of members were unhappy with inadequate involvement of members in total operation of MFPs and management, the upper limit fixed for MFPs collection, discontinued bonus scheme, and functioning of insurance scheme. Respondents were equally divided on the issue of basic facilities and attitude of the *Phad munshi* in rejecting good quality produce. All the members would like to have co-op management of other MFPs and they have also expressed that they have learnt the skill of MFPs collection and processing due to co-op management.

The assessment of the effectiveness of the PCS has also been analysed with the help of the fair perceptions of field level workers and members of the management committee. Inadequate storage and transportation facilities affecting the normal facilities of collection of MFPs were considered to be the major aspects by all the field level workers.

However, timely supply of the essential items and required money was satisfactorily maintained in view of the field workers. A majority of the members of the MC were satisfied with the overall performance of their PCS. A majority of the members considered that political interference creates problems. The perceptions of the majority of respondents about bonus and insurance schemes and inclusion of more MFPs are in tune with the members of the PCS. In view of the members of the MC the number of collection centres are inadequate to deal with the current quantum of MFPs collection.

Conclusions and their Implications

1. The collection of MFPs has been fluctuating due to delay in fixing targets of collection and calamities. A large proportion of the collected quantity of MFPs, particularly tendu leaves could not be sold out, and whatever little quantity was sold out was sold at a lower price, due to misjudgment of the FED in assessing the tenders.

Inadequate godowns and other infrastructural facilities resulted in heavy damage of tendu leaves and other MFPs. It is suggested that the FED should work towards coordinating effective procurement, storage, transportation, processing and marketing linkages at the DU and PCS levels. All these factors demand a serious thinking to review the existing policy of co-op management.

2. The PCS have inadequate field staff and are poorly equipped with storage and transportation facilities and this has been causing damage to the quality of MFPs, particularly in case of early monsoon. Forest resources are managed and controlled under the state property regime in MP and members of the PCS have only usufruct rights for collection of MFPs. The SDF charges 2% forest development tax from the ultimate buyers and this amount must be used only for the development of the forest dominated with MFPs tracts.
3. Currently, the co-op management system at the PCS level is playing a negligible role and it is basically restricted to holding the MC meetings and maintaining records of total quantity collection and capital received from the DUs. The PCS also do not have much control over the field staff (*Phad munshi* and checkers) as they are technically and financially administrated by the nodal officer (appointed by the SRDU). The members of the PCS do not have much interaction with the MC except to collect wages from collection centres for their produce. Furthermore, the collected quantity of MFPs is directly transported to the DUs head quarter and sold by them through tender procedure. Once the whole quantity is sold **out**, the expenditure and benefits details are worked out and the PCS then receive their share. Benefits could not be distributed due to a large quantity of unsold MFPs. Bonus scheme has been discontinued and most of the members of the PCS are unhappy with this decision. Insurance scheme is operating poorly.
4. The FED did a reasonably good job in reducing the exploitation of the members of the PCS in terms of proper wages for their MFPs. In some cases however, harassment of members by the *Phad munshi* is evident (although he is a local person and invariably belonging to a tribal community). This problem gets more serious if the *Phad munshi* and checkers (also local and belonging to a tribal community) work in collusion. In order to arrest this tendency it is suggested here that MC should start monitoring randomly some collection centres.
5. The existing structure of the co-op management of MFPs in MP is essentially dominated by government officers and it is almost working as 'government oriented co-op.' In order to perceive the core theme of the co-op

or collective management in real sense it is essential to establish a close linkage between the members and the MC at all levels particularly at the PCS levels. The participation of the members right from the collection stage to marketing is essential to inculcate the feeling of belongingness to the co-op system.

6. The forest dwellers of the study area, like other parts of MP, have indepth knowledge of the thousands of MFPs species and ecological interrelations of various components of their resource base. Currently, the collection of MFPs is much lower than the existing potentiality in the forest dominated pockets of MP. To further improve the socio-economic standards of the tribals other denationalised MFPs may also be brought under the co-op management system.
7. A comprehensive research and field oriented programme of identifying the various MFPs, assessing their potential and feasibility of marketing and their effective use should be undertaken by the FED or entrusted to some forest management organisation. Research on improved MFPs species, location specific and production oriented technologies of collection, drying, semi-processing and storage should get priority in the forest management institutions. It is important to keep in mind that without indigenous knowledge, identification and categorising of MFPs will be an almost impossible task for any research and management organisation. Above all, the forest dwellers have to be an inseparable component of any production, research and management system.

*A "Coop"
but more membership
of government.*

Fig.1: CO-OP STRUCTURE OF FED

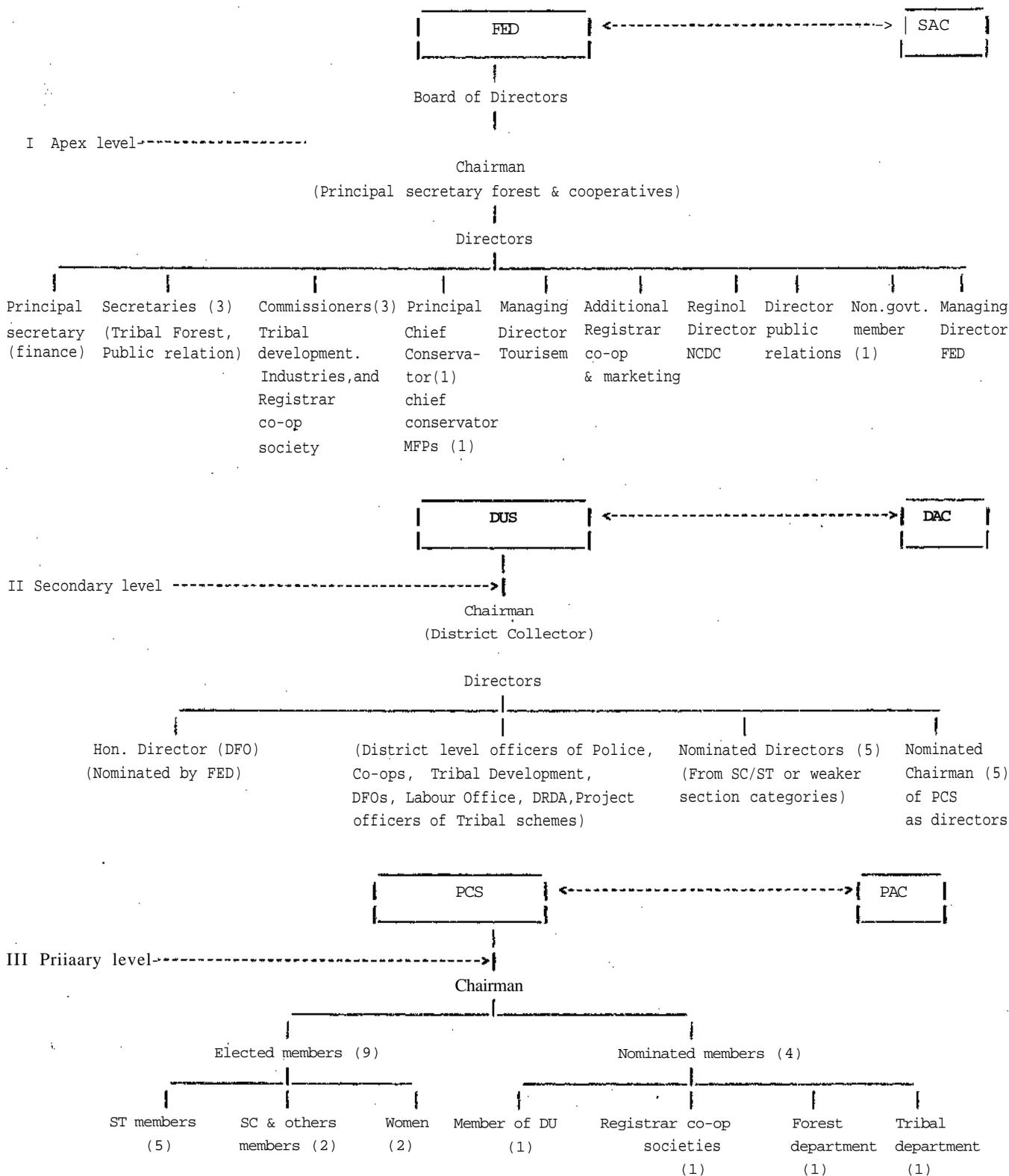


Table 1
Management Structure of PCS

Particulars	Nagri	Rajpur	Dugli
1. Establishment year	198.8--89	1988--89	1988-89
2. No. of members	1081	945	331
(a) ST(%)	64.76	78.63	91.84
(b) SC (%)	5.64	2.75	1.21
(c) Others (%)	29.60	18.62	6.95
3. No. of villages covered	8	10	5
4. No. of Collection centres	7	10	5
5. No. of members per collection centres	154	94	66
6. Working capital (Rs.)			
(a) Share capital	7,200.00	7,880.00	3,270.00
(b) Grant & Subsidy	2,000.00	2,000.00	2,000.00
(c) Entry fees	720.00	788.00	327.00
(d) Total	9,920.00	10,668.00	5,597.00
7. Management committee setup			
(a) Chairman	1	1	1
(b) Elected members	9	9	9
i. Men	7	7	7
ii. Women	2	2	2
(c) Nominated members			
i. SRDU (DFO)	1	1	1
ii. Forest (forest guard)	1	1	1
iii. Cooperative (Depty coop. inspector)	1	1	1
iv. Tribal (Distt. organizer)	1	1	1
8. Field Workers			
i. Nodel officer	1	1	1
ii. Phad Munshi (Clerk)	7	10	5
iii. Checker	2	2	1
iv. Peon	1	1	1

Source : Records of the PCS Nagri, Rajpur, Dugli, 1991-92.

Table 2

Total Collection, Expenditure and Income of Tendu leave in PCS

S.No.	Particulars	Nagri			Rajpur			Dugli		
		1989	1990	1991	1989	1990	1991	1989	1990	1991
1-	Total collection (S.B.)	2876.575	3281.515	1532.450	2270.960	2327.620	1093.455	1074.725	1263.935	360.355
2.	Total amount paid to members as wages (Rs.)	431486.25 (79.75)*	820378.75 (87.23)	383112.50 (82.37)	340644.00 (80.96)	581905.00 (87.46)	273363.75 (83.50)	161208.75 (77.89)	315983.75 (84.46)	90088.75 (73.43)
3.	Details of Expenditure:									
a.	Pruning	11700.00 (2.16)	15000.00 (1.59)	12400.00 (2.67)	9000.00 (2.14)	12564.00 (1.89)	6920.00 (2.11)	7800.00 (3.77)	7896.00 (2.11)	3900.00 (3.18)
b.	Watering of leaves, stiching, loading and unloading of bags (Rs)	11847.25 (2.119)	22583.40 (2.40)	12228.60 (2.63)	11313.20 (2.69)	16272.75 (2.44)	8724.30 (2.66)	5368.20 (2.59)	8844.65 (2.37)	2878.70 (2.35)
c.	Temporary godown Rent & transportation (Rs)	28735.20 (5.31)	23409.50 (2.49)	27730.55 (5.96)	9970.25 (2.37)	12659.20 (1.90)	10135.45 (3.09)	8192.00 (3.96)	15460.00 (4.13)	6501.25 (5.30)
d.	Permanent godown Rent & transportation (Rs)	20650.52 (3.82)	—	—	15399.60 (3.66)	7023.00 (1.05)	3271.60 (0.10)	3365.75 (7.63)	2636.00 (0.70)	1079.50 (0.88)
e.	Pay & Commission (Rs)	31991.30 (5.91)	44077.65 (4.69)	25362.00 (5.45)	28585.10 (6.79)	31172.35 (4.69)	20254.60 (6=19)	15682.00 (7.58)	18757.45 (5.01)	12848.10 (10.47)
f.	Contingencies & office expenses (Rs)	4567.00 (0.84)	11645.90 (1.24)	4275.00 (0.92)	4221.25 (1.00)	3443.50 (0.52)	4314.00 (1.32)	4211.25 (2.03)	3363.00 (0.90)	4849.00 (3.95)

Table 2 (contd..)

S.No.	Particulars	Nagri			Rajpur			Dugli		
		1989	1990	1991	1989	1990	1991	1989	1990	1991
g.	Misc. expenses (Rs)	40.00 (0.02)	3352.00 (0.36)	--	1620.50 (0.39)	314.50 (0.05)	417.50 (0.13)	1141.75 (0.55)	1190.00 <0.32>	539.00 (0.44)
h.	Total Expenditure (Rs)	541017.52 (100.00)	940447.20 (100.00)	465108.65 (100.00)	420753.90 (100.00)	665354.30 (100.00)	327401.20 (100.00)	206969.70 (100.00)	374130.85 (100.00)	122684.30 (100.00)
4.	Unit cost per S.B.(Rs)	188.08	286.59	303.51	185.28	285.85	299.42	1.92.58	296.00	340.45
5.	Total Qty. sold (SB)	2876.575	3249.785	1530.430	2258.685	unsold	1090.535	1073.535	1263.755	359.855
6.	Sale price per S.B.(Rs)	1075.00	30.00	875.00	1118.00	--	1385.00	1075.00	650.00	1014.00
7.	Total value of Qty sold (Rs)		97493.55	1339126.30	2525209.83	--	1510390.98	1154050.41	821440.75	364903.77
a.	Excluding forest deve- lopment tax	3092318.13	99443.42	1365908.80	2575714.00	--	1540598.80	1177131.40	837869.37	372201.85
b.	Including forest deve- lopment tax	3154164.50								
8.	Net value of Qty.sold (Rs)		-842953.65	874017.65	2104455.90	--	1182989.78	947080.71	447309.9	242219.47
a.	Excluding forest deve- lopment tax	2551300.61	-841003.78	-900800.18	2154960.10	--	1213197.60	970161.71	463738.72	249517.55
b.	including forest deve- lopment tax	2613146.90								
9.	Net value per S.B.(Rs)		-259.39	571.09	931=72	--	084.78	882.21	353.95	673.10
a.	Excluding forest deve- lopment tax	886.92	-258.79	588.59	954.08	--	1112.48	903.71	366.95	693.38
b.	Including forest deve- lopment tax	908.42								

* Figures in brackets indicate percentages to total expenditure.

Table 3

Total Collection, Expenditure and Income of Sat seeds in PCS

S.No.	Particulars	Nagri		Rajpur		Dugli	
		1990	1991	1990	1991	1990	1991
1.	Total collection (Qt)	687.02	1666.44	198.47	1559.71	7.80	446.77
2.	Total amount paid to members as wages (Rs.)	79007.30 (95.05)*	199972.80 (91.82)	22824.05 (95.22)	187165.20 (91.41)	897.00 (95.61)	53612.40 (90.33)
3.	Details of Expenditure						
a.	Stiching, loading, unloading, weighing, Bags	1016.76 (1.22)	2816.20 (1.29)	300.00 (1.25)	2539.55 (1.24)	15.00 (1.60)	2637.00 (4.44)
b.	Transportation	700.00 (0.84)	7496.80 (3.44)	150.00 (0.63)	8026.00 (3.92)	5.00 (0.33)	670.15 (1.13)
c.	Godown rent (Rs)	--	1668.00 (0.77)	--	1559.70 (0.76)	--	--
d.	Pay & commission	2404.55 (2.89)	5831.55 (2.68)	694.60 (2.90)	5459.00 (2.67)	21.20 (2.26)	1563.65 (2.63)
e.	Misc, expenses (Rs)	--	--	--	--	--	870.00
f.	Total expenditure (Rs)	83128.61 (100.00)	217785.35 (100.00)	23968.65 (100.00)	204749.45 (100.00)	938.20 (100.00)	59353.20 (100.00)
4.	Unit cost per Qt. (Rs)	121.00	130.69	120.77	131.27	120.28	132.85
5.	Total Qty. sold (Qt)	unsold	1666.44	unsold	1559.71	unsold	446.77
6.	Sale price per Qt.(Rs)	--	271.10	--	271.10	--	271.10
7.	Total value of Qt.sold (Rs)						
a.	Excluding forest development tax	--	451771.88	--	422837.38	--	121119.35
b.	Including forest development tax	--	460807.32	--	431294.13	--	123541.74
8.	Net value of Qt. sold (Rs)						
a.	Excluding forest development tax	--	233986.53	--	218087.93	--	61766.15
b.	Including forest development tax	--	243021.97	--	226544.68	--	64188.54
9.	Net value per Qt. (Rs)						
a.	Excluding forest development tax	--	140.41	--	139.83	--	138.25
b.	Including forest development tax	--	145.83	--	145.25	--	143.67

* Figures in brackets indicate percentages to total expenditure

Table 4

Total Collection, Expenditure and Income of Harra in PCS

S.No.	Particulars	Nagri		Rajpur		Dugli	
		1990	1991	1990	1991	1990	1991
1.	Total collection (Qt)	81.19	6.22	258.42	110.54	194.27	169.35
2.	Total amount paid to members as wages (Rs.)	9460.40 (88.78)*	665.50 (88.59)	29150.35 (88.72)	11447.00 (72.42)	24669.00 (90.48)	18435.00 (92.47)
3.	Details of Expenditure						
a.	Stiching, loading, unloading, weighing bags	266.20 (2.50)	6.00 (0.80)	332.40 (1.01)	1333.40 (8.44)	1245.70 (4.57)	254.00 (1.28)
b.	Transportation	736.95 (6.91)	65.08 (8.65)	2524.60 (7.68)	2524.60 (15.97)	777.00 (2.85)	762.00 (3.82)
c.	Godown rent (Rs)	91.20 (0.86)	7.00 (0.93)	252.40 (0.77)	252.50 (1.60)	232.00 (0.85)	220.00 (1.10)
d.	Pay & commission	101.50 (0.95)	7.75 (1.03)	323.00 (0.98)	138.15 (0.87)	242.80 (0.89)	174.19 (0.88)
e.	Misc. expenses (Rs)	..	..	275.00 (0.84)	110.50 (0.70)	97.10 (0.36)	90.10 (0.45)
f.	Total expenditure (Rs)	10656.25 (100.00)	751.25 (100.00)	32857.75 (100.00)	15806.15 (100.00)	27263.60 (100.00)	19935.29 (100.00)
4.	Unit cost per Qt.	131.25	120.78	127.15	143.00	140.34	117.72
5.	Total Qty. sold (Qt)	81.19	6.22	258.42	110.54	194.27	169.35
6.	Sale price per Qt.(Rs)	238.48	223.39	234.45	219.27	249.89	225.63
7.	Total value of Qty. sold (Rs)						
a.	Excluding forest development tax	19362.05	1389.50	60587.70	24238.30	48546.25	38210.25
b.	Including forest development tax	19749.29	1417.29	61799.45	24723.07	49517.18	38974.45
8.	Met value of Qty. sold (Rs)						
a.	Excluding forest development tax	8705.80	638.25	27729.95	8432.15	21282.65	18274.96
b.	Including forest development tax	9093.04	666.04	28941.70	8916.92	22253.57	19039.16
9.	Net value per Qt. (Rs)						
a.	Excluding forest development tax	107.23	102.61	107.30	76.28	109.55	107.91
b.	Including forest development tax	112.00	107.08	112.00	80.67	114.55	112.42

* Figures in brackets indicate percentages to total expenditure

Table 5
Insurance and Bonus Payment to Members of PCS

(1989-90)

Particulars	Nagri	Rajpur	Dugli
A. Insurance			
i. No, of cases (death)	3	2	4
ii. Amount claimed (Rs.)	9,000.00	12,000.00	21,000.00
iii. Causes of death	Illness	Illness	Illness
B. Bonus			
i. Total Bonus amount received (in Rupees)	2,82,560.27	1,92,401.90	1,06,451.76
ii. Total No. of members	720	788	325
iii. Actual amount distributed (in Rupees)	1,29,200.00	59,490.00	69,477.00
iv. Members received bonus	375	208	210
v. Bonus amount per member (in Rupees)	344.53	286.00	330.84

Table 6
Responses of the Sample Members of PCS

S.No.	Question	Percentage of sample members answering (126)	
		Yes	No
1.	Do you believe that co-op management of MFPS collection has benefited you in terms of proper wages?	100.00	—
2.	Are you receiving your wages regularly ?	40.00	60.00
3.	Does phadmunsi make correct entries of the quantity collected of MFPS every day in your collection card ?	80.00	20.00
4.	Do you think that <i>phad munsi</i> rejects your good quality MFPS ?	50.00	50.00
5.	Do you think that training of collection and processing has improved your skill?	100.00	—
6.	Do you think that your collection centre has basic facilities ?	50.00	50.00
7.	Are you satisfied with upper limit fixed for MFPS collection ?	10.00	90.00
8.	Are you unhappy with bonus withdrawal scheme?	100.00	—
9.	Do you think that the insurance scheme is operating effectively?	30.00	70.00
10.	Do you have adequate participation in various operations of MFPS management besides collection work?	10.00	90.00
11.	Do you want other MFPS collection through coop ?	100.00	—
12.	Have you participate in general body meeting of management committee?	10.00	90.00

Table 7

Assessment of Effectiveness of PCS by Field Level Worker's and Members of Management Committee

SI.No.	Question	Yes	No
A. Response of field level workers (30)*			
1.	Do you get the essential items required at collection centres timely?	80.00	20.00
2.	Do you receive required money at collection centre timely ?	80.00	20.00
3.	Do you have any permanent godown at collection centres to store the MFPs ?	--	100.00
4.	Do you have transport facilities to superwise the quality of MPPs collection ?	--	100.00
B. Response of members of management committees (42)*			
1«	Do you have any political interference in your management committee ?	67.00	33.00
2.	Do you think your PCS have effective co-ordination with SRDU ?	67.00	33.00
3.	Have your society organised any training programme for your field workers and members ?	100.00	--
4.	Do you have adequate nos. of collection centres ?	--	100.00
5.	Are you aware with the rules and regulation of the bye-laws ?	100.00	-
6.	Is your PCS regularly organising management committees meetings ?	100.00	--
7.	Is your PCS maintaining proper records ?	80.00	20.00
8.	Are you satisfied with the existing co-op management system of MFPs ?	67.00	33.00
9.	Are you willing to include more MFPs under co-op management ?	100.00	—
10.	Are you unhappy with bonus withdrawal scheme?	100,00	-
11.	Do you think that the insurance scheme is operating effectively?	--	100.00

* Figures in brakets indicate no. of respondents.

Reference

- Agrawal, A. and S. Narain (1985).** The State of **India's Environment** The Second Citizen's Report. New Delhi: Centre for Science and Environment.
- Agrawai, M. (1990). "Marketing of Forest Products in Tribal Economy - A Case Study of Surguja District." Ph.D. Thesis, submitted to Guru Ghasidas University, Bilaspur MP.
- Bhatnagar, P. and G.Kawdia (1989). "Trends and Issues in Salseed Production in Madhya Pradesh." Journal of Tropical Forestry 5(1), 36-42.
- Gupta, R. et al. (1981). Tribal Unrest and Forestry Management in Bihar. 1st ed. Place of **Publication** Meerut Prabhat Press.
- Lal, J.B. and R.K. Dave (1991). "Tendu Leaves Trade in Madhya Pradesh: A Big Cooperative Venture." The Indian Forester 117 (9), 728-732.
- Madhya Pradesh State minor forest produce Trade and development co-operative federation (Ltd.) **Bhopal Reports, of General Body Meetings, 1989-91.**
- Marothia, D.K. and A.K. Gauraha (1992). "Marketing of Denationalized Minor Forest Products in Tribal Economy." Indian Journal of Agricultural Marketing. Forthcoming.
- Neeraj (1992). "Tendu Patta Sahkarikaran - **Aukade** aur Thathya." (in Hindi) Nav Bharat Daily News Paper Raipur. Monday, June 29, P.4.
- Sood, A (1991). "Cooperative Venture Ensures a Big Benefit to Tribals." NDC Bulletin 25 (3), .21-24.
- Tewari, D.N. (1986). Forestry in National Development. 1st ed. Dehradun: Jugat Kishore and Company (**Pub.Div.**)•

THE VATRA TREE GROWERS' CO-OPERATIVE SOCIETY LTD
A CASE STUDY

Rakesh Saxena

Abstract. The Vatra Tree Growers' Co-operative Society Ltd, (Gujarat) a four year old, is one of those village level primary co-operatives that are being organised to replicate Anand Pattern structure for cultivation of trees and fodder. At present, it is directly federated into the National Tree Growers' Co-operative Federation Ltd (NTGCFL) formerly known as the Rashtriya Vriksha Mitra Sahyog Ltd (RVMSL) at the national level for processing, marketing and other necessary support at a collective level as the middle level union or federation is yet to be established. This case study has taken a close look into the background, organisation and activities of the Society.

The Society has been organised with the basic objective of improving the socio-economic condition of its members by motivating them to grow suitable trees and grasses on individual and common marginal and waste lands. It has leased in 40 ha of the revenue wasteland of the village for a period of 15 years. At present, it has 1.1 lakh trees on 38 ha of the leased-in land while the remaining 2 ha of this land are being used for fodder cultivation. Other activities of the Society are training and education of members, installation of smokeless *chulhas*, nursery raising, and marketing of tree produce.

The Society has made an important beginning in improving the productivity of the revenue wasteland and restoring its benefits to almost the whole village on one hand and in enabling the villagers through education and training to manage their own resources on the other. It is expected that the common plantation of the Society on 38 ha will provide an internal rate of return of at least 20 per cent. Some important issues being faced by the Society are as follows: (1) frequent encroachment by the animals of *rahari* community into the planted area, (2) seasonal nature of the employment made available by the Society, (3) very limited plantation on private land of members, (4) large mortality rate of smokeless *chulhas*, (5) inadequate processing and marketing facilities available with the NTGCFL, (6) low participation in the general body meetings, (7) cases of multi-membership per household, and (8) inadequacy of the current provision for making equitable distribution of profits from the common land.

Keywords : India, Gujarat, Co-operatives, Trees, Grasses, Wastelands.

Introduction

*all private
own - COOP*

Various models of tree growers' co-operatives exist in India today. Based on the extent of replication of these models, three of them, namely, the Anand Pattern or RVMSL model promoted by the Rashtriya Vriksha Mitra Sahyog Ltd, the IFFCO model promoted by the Indian Farmers' Fertilisers Cooperative Ltd, and the Masik model promoted by Shri Viriayak Rao Patil, seem to be relatively more important. All of them originated during the eighties. Approximately 135 primary co-operatives of tree growers have been organised on these models in eight states of India, namely, Gujarat, Rajasthan, Madhya Pradesh, Maharashtra, Uttar Pradesh, Orissa, Andhra Pradesh and Karnataka. There are many other models of tree growers co-operatives that have been adopted but are still operating at a limited scale, e.g., the Viksat model promoted by Viksat - a voluntary organisation and the Medak model promoted by Shri Padmanabha Reddy - a forest officer.

The purpose of this case study is (1) to highlight the prominent features of the RVMSL model, (2) to study the progress made by the Vatra Tree Growers' Co-operative Society (TGCS), and (3) to raise the issues being faced by the Vatra TGCS. The Vatra TGCS has been chosen for the study as it is one of the oldest primary co-operative societies of tree growers organised on the Anand Pattern.

Location

Vatra is a village in the Khambhat taluka of Kheda district in Gujarat. It is located about 10 km east of the Khambhat town (Map 1). The Vatra TGCS has been organised by the residents of the village at the motivation of the erstwhile Kheda Spearhead Team of the National Dairy Development Board (NDDB) ROW a part of the Rashtriya Vriksha Mitra Sahyog Ltd (RVMSL),

Objectives and Activities

The Society has been organised with the objective of motivating members and village communities to grow trees and grasses of suitable species on marginal agricultural land, wasteland, common grazing land, revenue land, degraded forest lands etc., to meet the local fuelwood, fodder and small timber need to improve the socio-economic condition of the members in particular, and to improve the ecological environmental status in general (RVMSL, Model bye-laws). The Society, registered on July 20, 1987 has, at present, 620 members and has leased in 40 hectares of the revenue wasteland of the village.

In order to achieve its objectives, the main activities of the Society over the last four years have been (i) training

and education of members, (2) plantation of trees and production of fodder on the leased-in land, (3) sale of fodder and firewood, (4) marketing of the tree produce of the members, (5) promotion of nurseries and plantation on private lands, and (6) installation of smokeless *chulhas* in village households.

Background and Role of RVMSL

The Advisory Board on Energy (ABE) had recommended in 1984, after examining the problems of domestic fuel supply, that the NDDDB should prepare a pilot project for all the four regions of the country to replicate the Anand Pattern co-operative structure for large scale plantation in rural areas. The NDDDB on its part realised that shortage of green fodder was a major constraint in increasing milk production under its Operation Flood project. The NDDDB, therefore, submitted a pilot project proposal to the ABE in January, 1985 to meet both rural fuelwood and forage needs through co-operatives of tree growers (NDDDB, 1985).

In the meantime, the Government of India created the National Wastelands Development Board (NWDB) vide a resolution dated 7th May, 1985 to bring the wastelands of the country under productive use through afforestation and tree plantation. The ABE, NWDB and Ministry of Environment and Forests appreciated the approach suggested by the NDDDB proposal and it was decided that the NDDDB would launch the pilot project on behalf of the NWDB.

The pilot project visualised establishment of a two tier structure for tree growers' co-operatives — the primary tree growers' co-operatives as the first tier at the village cluster level and state level federations as the second tier — in four states, namely, Rajasthan in the northern region, Gujarat in the west, Andhra Pradesh in the south and Orissa in the east, over a period of five years.

The NDDDB launched the pilot project in 1986. It created the RVMSL in 1988 as the apex level organisation to carry out activities conducive to the socio-economic development of tree growers by organising effective production, procurement, processing, and marketing of related commodities (RVMSL, 1988).

The RVMSL is a multi-state co-operative society registered under the Multi-State Co-operative Societies Act, 1984. Its head office is at Anand (District Kheda, Gujarat) and its jurisdiction is confined to five states, namely, Gujarat, Andhra Pradesh, Orissa, Rajasthan, and Karnataka. In line with its objective, the RVMSL has been facilitating the organisation of tree growers' co-operatives and providing them all necessary support. In all, 91 primary co-operative societies of tree growers, including the ones organised in the initial stages of the NDDDB project, have been formally

organised as a part of the Anand pattern structure in eight districts of these states by 31st March, 1991. All these societies are members of the RVMSL. The chairmen of these societies elect one person from every state from among them as their representative on the Board of Directors of the RVMSL. The RVMSL at present has seven persons on its Board - the Managing Director of the RVMSL, the one nominated representative of the NDDDB and five representative chairmen.

The RVMSL has organised the co-operatives of tree growers through its Spearhead Teams. Each of the eight districts mentioned above has one separate Spearhead Team. The Team goes to the concerned area, identifies potential villages and motivates people to form a TGCS. Each Society is provided necessary grants by the RVMSL through the respective Spearhead Team to meet its various expenses till it becomes financially viable.

Profile of Vatra Village

Population: According to the village level revenue official, locally called *talati*, the total population of Vatra in 1990 was 3,704 with 533 households. Of this, 335 (63%) were farming households, 118 landless labour households (22%), and 80 other households (15%). The farming households consisted of 88 large farm households (26%), 129 medium farm households (39%), 70 small farm households (21%), and 48 marginal farm households (14%).

Land: The land use pattern of the village for the year 1987 is given in Table 1. The village has about 175 ha. of land classified as uncultivable and *gauchar*. The Vatra TGCS has been given 40 ha. revenue wasteland from this land for plantation of trees on a lease for 15 years.

Crops and Livestock: According to the information given by *talati* about the cropping pattern for 1990-91, the net cultivated area of the village is about 521.83 ha. out of which about 420 ha. is cultivated in kharif, 349 ha. in rabi, and 110 ha. in the summer season. The main crops grown in the village are *bajra* (74%), paddy (17%) and *jowar* (9%) in the kharif season; tobacco (80%), mustard (10%), *rajagra* (5%), and *arhar* (5%) in the rabi season; and *bajra* (100%) in summer. *Bajra* is an important source of fodder for the animals in the village while dried tobacco stems are used as fuel. Almost all the farmers keep a part of the land under some fodder crop.

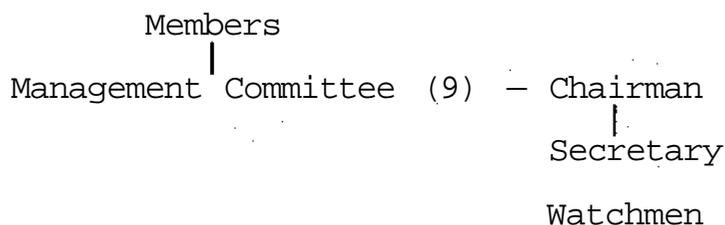
A household survey conducted by the Kheda Spearhead Team of the NDDDB in May 1987 indicates the number of trees on private land as 1,473 (NDDDB, 1987). Excluding landless labour households, the average number of private trees per household thus works out to around 3.5. The *talati* estimates that another 38 trees are on Panchayat land.

The village has a milk co-operative of 711 milk producers. It procured 6,47,056 litres of milk in 1990-91. The average procurement per day works out to about 1,773 litres. The co-operative estimated the population of cattle and buffaloes for the year 1990 as 407 and 900 respectively. In 1981 it was 540 and 375 respectively. That is, while the total population of cattle and buffaloes in the village increased during the decade from 915 to **1,307,-** the cattle population has decreased while the buffalo population has increased significantly. It indicates towards increasing fodder requirements of the village.

While milk production is an important source of income in the village, it is relatively more important for *rabari* households who have a large number of milch animals.

Organisational structure

The society has the following organisational structure.



The General Body of the Society consisting of all the members has the supreme powers in the Society. A meeting of the General Body is held each year. The members elect nine representatives from the General Body to the Management Committee who, in turn, elect a Chairman from among themselves. The tenure of each member of the Management Committee is three years. Each year, three members of the Management Committee who have completed their term are replaced by three new elected members. Since in the first and second years of the Society, no member of the Management Committee was able to complete three years of his tenure, the members to be replaced were chosen by draw of lots. The tenure of the Chairman is one year.

The Management Committee takes practically all the decisions related to the work of the Society in its monthly meetings and presents the progress of work each year before the General Body. The Chairman sees to the execution of the resolutions made by the Management Committee. Over the last four years, i.e., from 1987-88 to 1990-91, four General Body meetings and 50 Management Committee meetings have taken place. While the average attendance in a Management Committee meeting has been six members (67%), it has been 45 members (8%-10%) in a General Body meeting.

The Secretary and watchmen are paid employees of the Society. The Secretary works under the supervision of the

Chairman and looks after accounts, correspondence, labour work, etc. The Society has **employed** three watchmen for the protection of the plantation.

Membership

According to the bye-laws of the Society, any person is entitled to become a member, if he fulfills the following conditions.

- (i) he is residing in Vatra, has completed 18 years of age and is competent to contract,
- (ii) he is growing and raising trees or grass or has been assigned tree pattas,
- (iii) he has agreed in writing, to sell the trees grown and its produce, grasses, etc. only to the Society,
- (iv) his written application on the prescribed form for membership has been approved by the majority of the Management Committee,
- (v) he has paid the value of minimum one share, i.e., RS.10, and an entrance fee of **Re.1,**
- (vi) he is not dealing in any business related to trees or its produce, grasses and allied activities, detrimental to the objectives of the Society,
- (vii) he is not bankrupt or declared insolvent, and
- (viii)** he is not **criminally** convicted for moral turpitude.

If a person does not fulfill the second condition above but satisfies all other conditions, then he can become a **nominal** member by paying Re.1. He will have to satisfy the second condition within one year to become member of the Society.

A member of the Society may be expelled by a resolution passed by 3/4th majority of the members entitled to vote from among those who are present at a General Body Meeting for the following reasons:

- (i) If he is a persistent defaulter.
- (ii) If he willfully deceives the Society by false **statements.**
- (iii) If he intentionally does any act likely to injure the reputation of the Society.
- (iv) If he does not sell trees, its products and/or grasses **through** the Society and if he or his family

deals in the marketing of trees, grasses and its products.

- (v) If he persistently dishonours the suggestions and resolutions of the Managing Committee.
- (vi) If he does not reside in the area of operation of the Society regularly or ceases to possess any of the qualifications for becoming member.
- (vii) If he is involved in destroying, cutting, felling of trees illegally or in any other such activity that hampers the growth of trees/grasses causing harmful effect on the ecology and environment of the village in general and on the members and the Society in particular.

The member to be expelled shall be given an opportunity to present his case before the resolution of the General Body Meeting.

As mentioned earlier, the membership of the Society by the end of September, 1991 was 620. The membership over the last four years has increased in the following manner.

Year	Membership in the year	Cumulative membership
1987-88	458	458
1988-89	16	474
1989-90	12	486
1990-91	94	580
1991 -	40	620 (upto 30.9.91)

Out of 620 members, 360 are landless (58%), 201 are marginal farmers (33%), 33 are small farmers (5%), and 26 are large farmers (4%). According to sex, 558 are male members and 62 are female members. The landless persons as such do not fulfill the second condition of membership mentioned above but they are treated to have fulfilled this condition once they start working on the common land of the Society. The total membership of the Society can be approximately divided into various caste groups as follows:

Caste group	No. of members
1. Solankis	208 (34%)
2. Thakurs	168 (27%)
3. Patels	103 (17%)
4. Rabaris	40 (6%)
5. Bhois	29 (5%)
6. Harijans	26 (4%)
7. Others	46 (7%)

Though it is not mentioned in the bye-laws of the Society, it is a norm to be maintained that there can be only one

member from each household. However, some households appear to have violated this norm. If the number of such households is significant, it may have important implications for decision making within the Society and for distribution of benefits.

It can be seen from the figures on membership in different years that after 458 persons became members in the first year, there are very few persons who became members in the second and third year. The number of new members in the fourth year has suddenly gone up. In the current year that started in July 1991, 40 persons have already become members over the last three months while many applications are pending for membership. It seems that those who kept away at first have become eager to become members after they were convinced about the expected benefits from the Society.

Acquisition of Land

The Society had applied to the Revenue Department of the Government of Gujarat that it may be given 65 ha. of revenue wasteland of Vatra village on a lease of 15 years for plantation of trees under GR 1.1.87 of the Government which allows for such use of wasteland. The request was accepted and the land allotted in 1987. However, the *rabaris* of the village who had a large number of animals and had been making full use of the revenue wasteland for grazing their animals pleaded in the Court of Justice that the land should not be leased to the Society as the remaining common land will not be sufficient for grazing their animals. Most of the other villagers stall-fed their animals. While the court proceedings prolonged, the Society voluntarily agreed to leave 25 ha. of land out of the 65 ha. leased to it, for common grazing. Therefore, only 40 ha. of revenue wasteland remained leased to the Society.

Plantation on Common Land

Out of the soil. of revenue wasteland, 38 ha. have been put under plantation. There are about 1.1 lakh of trees of 21 species currently standing: on this; land out of which about 0.86 lakh trees vary in age from one to four years (see Tables 2 & 3). Majority of the trees are *ganda babul* (63%)', *desi babul* (19%) and *neem* (10%) trees.

The Society has done the fencing and appointed three watchmen to protect grass and trees on the common land. Incidences of villagers cutting trees in the protected area have been rare. Even the one or two incidences of this type were of very small magnitude and only in the beginning of the Society. No fine was imposed in such cases. The concerned persons were called by the Management Committee and were convinced about the benefits of protecting the trees on the common land.

However, there have been many **incidences** of open grazing animals entering the plantation area. These animals belong to the *rabaris* of the village who continue the practice of open grazing and do not confine to the grazing land as there is very little grass available on it due to un-managed grazing. Such incidences have been put before the members of the Society and the villagers who have approved imposition of suitable penalties. As shown in Table 7, a total fine of Rs 5,070 was collected for the damages caused by such incidences in the year 1990-91.

Only recently, in October, 1991, there was a significant incidence of tree cutting. About 72 trees were felled one night and left in the plantation area with an anonymous note from the residents of the next village warning the Society of more such damages if the wandering animals of the *rabaris* of Vatra entered the crop fields of their village again.

Plantation on Private Land

The Society has been motivating its members to grow trees and fodder grasses on their marginal and wasteland, and on the boundaries of their farms. Free saplings of trees and root slips of grasses are provided to the members for this purpose and an annual grant of Re. 1 is given for each surviving tree for the first three years towards maintenance expenditure. However, there has not been much success in this direction.

Only three members on a total land of 4.75 acres have attempted so far to establish *Kisan Vans*, i.e., growing trees and fodder on their own land. All of them had planted trees in 1987-88. By February 1990, only one acre of land of a member remained under plantation with 110 trees. The other two had withdrawn with their 3.75 acres of land. The last count in October 1991, showed that of the 110, only 38 trees remained. The rest of the trees had been cut and the land had been put back to crop cultivation.

Bund plantation, i.e., plantation on the boundaries of the field, was done for the first time in 1989. Three members planted 250 saplings of *neem* and *babul*, and 150 root slips of grasses. They, with one other member, planted another 378 tree saplings and 75 root slips in 1990. Out of the first lot of 250 trees, about 75% had survived as per counting in October 1991. Counting of the surviving trees from the 1990 plantation is yet to be done.

Considering both the size of the plantation and the number of members involved, it is clear that it has not been possible for the Society to make much headway as far as plantation on private land is concerned. It seems that there is already a sufficient number of trees on private land reducing the need for any additional plantation. It

appeared, from the conversations held with the villagers that those members who have large plots of land, almost everyone has some trees to meet his timber and fuelwood needs. Those with smaller plots are more pressed for growing fodder for their milch animals and other crops instead of trees. They meet their requirements of fuelwood from by-products of crops like tobacco stems collected from their own field or obtained as part of their wages and by sharing the wood they help to cut on other people's land. Hardly anyone in the village seems to buy fuelwood from the market.

Fodder and fuelwood

Fodder: Out of the 40 hectares of land leased in by the Society, two hectares are allocated exclusively for fodder cultivation. Various fodder crops and grasses like lucern, maize, jowar, napier, cenchrus ciliaris, gini, etc., are grown on this land and the fodder is sold to members. In addition to this, wild and planted grasses also grow quite well on the plantation land due to the protection provided. Both these sources provide a good quantity of fodder each year.

Sale of grass had started in October 1987 itself. The grass was cut from the common plantation area and tied into bundles weighing approximately 20 kgs. They were brought to the building of the milk co-operative in the village where it was sold at Rs.4.50 per bundle. Each bundle involved a labour cost of Re.0.50 for cutting and carrying. The lucern grass from the fodder plot became available for sale in December 1987. It was sold at Rs.7 per 20 kgs. The prices of the grass were decided by the Management Committee approximately on the basis of costs involved.

The procedure of cutting the grass and selling it as the 20 kg bundles at the milk co-operative continued for about a year. It was then realised that the method was very time consuming and costly to the Society. Often, the people did not turn up for taking the bundles as promised. By December 1988, the procedure of selling the grass was changed to the auction system. Dates for the auction were declared to the members in advance. On those dates, the members reached the plantation site and participated in the auction which was done on area basis. The available area of grass on both common plantation and fodder plot was divided into strips and the auction was started by the Secretary of the Society with a minimum price based on a rough idea of the costs incurred and quantity of grass in the strip. Everyone who bought the grass was given a period of about one month to take one cutting of the grass. The same strips were auctioned again after the grass had grown back to its normal size.

There was no restriction on the number of strips a person could buy. While the grass on common plantation was auctioned only during the rainy season, those on fodder plot were available almost throughout the year. Looking at the list of buyers on some auction dates, it appears that (i) in each auction about 10 to 11 persons bought fodder from the fodder plot and about 20 to 30 persons from the common plantation, (2) majority of the buyers had 1 to 2 *bigha* of land (1.5 *bigha* = 1 acre), members with large or nil land holdings were rare, and (3) most of the buyers were Solankis and Thakurs.

The revenues obtained by the Society from fodder sale and approximate quantities of fodder produced each year are as follows:

Year (Jan.-Dec.)	Quantity of fodder (MT)	Sale of fodder (Rs)	Average revenue per 20 kgs (Rs)
1987	4.45	1,632.60	7.34
1988	104.15	20,624.50	3.96
1989	60.25	13,074.00	4.34
1990	74.62	11,551.00	3.09
1991	30.98	7,313.00	4.72

The fodder plot is economically viable on its own and no RVMSL grant is given for operations on it. Net profits of Rs.2,833 and Rs.5,124 were made on the fodder plot during 1989-90 and 1990-91, respectively. Incomes and expenditures related to the fodder plot for 1989-90 and 1990-91 are given in Table 4.

Fuelwojod: The Society has not yet made any significant contribution to the availability of fuelwood in the village. Only once, in April 1990, some tree branches available due to pruning of trees were auctioned to the villagers. Four persons had bought the branches at a total payment of Rs.120.

Nursery Raising

Over the last four years, members of the Society have raised about 1.58 lakh tree saplings in their own nurseries and sold them to the Society for plantation on the common land. Necessary training of the members for this purpose and specialised inputs were arranged by the Society. Preference has been given to women members for raising nurseries to meet the requirements of the Society. The Society paid Re.0.43 per sapling bought from the members and received a commission of Re.0.02 per sapling out of the grants received for this purpose from the RVMSL.

The number of saplings raised by the members in different years is given below:

Year	No. of saplings
1988	84,443
1989	38,000
1990	18,075
1991	17,525
Total	1,58,043

Smokeless Chulhas

As a part of its energy conservation programme and to improve kitchen sanitation and health of women, the Society has started facilitating installation of smokeless *chulhas* in the village households. Some village women have been trained to construct these *chulhas*. The cost of material used in making one *chulha* is about Rs.50. The household installing the *chulha* pays only Rs.15 to the Society out of which Rs.5 goes to the *chulha* maker immediately after the construction of a *chulha* and the rest is retained by the Society. Another Rs.10 is paid to the *chulha* maker in installments for her follow up visits. This and the material cost of Rs.50 are met from the grants received by the Society from the RVMSL. The Society has been installing a 'two pots type' model named 'Sukhad'.

The Society started installing *chulhas* in March 1989. The annual progress of *chulha* installation is as follows:

Year	Number of <i>chulhas</i> installed
1989	53
1990	11
1991	38
Total	102

It is surprising that out of the 64 *chulhas* installed in 1989 and 1990, only about seven are currently in working condition. Out of the 38 *chulhas* installed in the current year, five have already stopped working. The reasons given by the beneficiaries for the non-functioning of *chulhas* are varied and at times contradictory. Some of the reasons given are as follows:

- (i) The *chulha* is not suitable for making *rotlas*— the traditional thick *roti* of coarse grains.
- (ii) Water enters into the *chulha* and kitchen through the vertical exhaust pipe during the monsoon.
- (iii) The *chulha* is in need of repair.

Profile of the beneficiaries shows that all of them are either landless or marginal farmers, and about 2/3rds of them are *Solankis* (based on the profile of beneficiaries in 1989 and 1990 only).

Marketing of Members' Produce

The Society has recently started purchasing *neem* seed and *babul* pods from both members and non-members on an experimental basis. The purchase of *neem* seed was made for the first time in July 1990. No market for *neem* seeds had operated earlier in the village. Twenty-six persons sold 473.5 kgs of *neem* seed at an average price of Rs.1.50 per kg. These persons were mostly landless labourers who had collected the seed from all over the village. The total quantity of seed was bought by the RVMSL at the same price from the Society. The RVMSL extracted oil from the seed sold by different societies and sold both the oil and cake in the market. The RVMSL could earn a gross revenue of only about Re.0.91 per kg of seed. The purchase of *neem* seed by the Society has been suspended for the time being.

Babul pods were purchased by the Society for the first time in June, 1991. Both members and non-members sold the pods. However, the pods were purchased through three shop keepers in the village by giving them a commission of Re.0.50 per 20 kgs. Individual sellers received a price of Rs.9.50 per 20 kgs of pods from the shop keepers and the Society paid the shop keepers Rs.10 per 20 kgs. The Society sold the seed to the RVMSL at a rate of Rs.11 per 20 kgs. A total quantity of 8,716 kgs was purchased by the Society and it made a net profit of **Rs.435.80** in this transaction. The open market price of *babul* pods in the village was only Rs.6 per 20 kgs earlier. Informed persons in the village estimate that every year about 16,000 kgs of *babul* pods are collected and sold in the village, mostly by landless labourers. The society has decided to continue the purchase of *babul* pods next year.

Details were not available about the disposal of these pods by the RVMSL. However, the RVMSL had realised a gross revenue of Rs.2 0.4 0 per 20 kgs of pods last year when it had purchased the pods from other societies in the district. The pods were powdered and sold to a cattle feed factory.

Training and Education

The Society has been arranging for necessary training and education of members so that they develop useful skills and ability to manage their own affairs. Some of the activities undertaken by the Society in this direction are mentioned below:

- (i) Members' visit to other co-operative organisations to understand their working.
- (ii) Awareness camps in the village for women.
- (iii) Training of members for raising a nursery and making smokeless *chulhas*.
- (iv) Training of the Secretary in accounts, etc.

Employment

The Society has generated a significant amount of gainful employment in the village. Month-wise generation of employment by the Society has been shown in Table 5, The figures refer mainly to the activities related to the plantation such as land preparation, digging of pits, planting of saplings, watering, etc., and do not include employment to the Secretary, watchmen, workers on fodder farm, and nursery raisers.

The Table shows that the Society has created about 12,000 mandays of employment in the above mentioned activities from June 1987 to September 1991 - a period of about four years. Considering per hectare per annum employment, it comes to about 80 mandays.

While on an annual basis, the employment has varied from 1,662 mandays to 3,218 mandays, much of the employment each year has been generated during just four months, namely, from May to August as the activities related to plantation of saplings are concentrated during this period. About 70 per cent of the total employment has been generated during these four months. Figure 1 shows the peaks of employment in each year during this period. Since these months are the peak periods of employment for agricultural labour, sometimes the Society faced difficulties in obtaining labour at the right time.

The Society pays the minimum legal wage rate as determined by the Government. Its wage rate thus remained fixed at Rs.14.50 per manday from June 1987 to December 1990 and increased to Rs. 15 per manday in January 1991. However, one day of work is usually determined by the pre-specified amount of work to avoid shirking. At these wage rates, the Society has paid about Rs.1.62 lakh in the form of wages to the villagers upto the end of 1990-91. This payment works out to about 43 per cent of the total expenditure made by the Society during this period.

While employment opportunities are open to both members and non-members, preference for work is given to members. The mandays of employment are equally divided among the members who show interest for work.

As the plantation of the total 38 hectares is almost complete by now, the employment opportunities available in

the Society are expected to drop significantly during the coming years.

Income and Expenditure

The annual expenditure of the Society during the first four years, i.e., from 1987-88 to 1990-91, has varied from about Rs.0.76 lakh to Rs.1.14 lakh. In all, the Society has spent a sum of about Rs.3.75 lakh on its various activities. Considering the per hectare expenditure during this period, it works out to about Rs.9,363.

Against its expenditure, the Society has received, under various heads, a total grant of about Rs.3.05 lakh from the RVMSL till March 1991. Table 6 shows the amount of annual grants provided by the RVMSL to the Society. About 78 per cent of the total grant from the RVMSL has been under the heads of land development and plantation aftercare.

All the grants received by the Society from the RVMSL are shown as income in the Profit and Loss account of the Society. Including such grants, the Society has generated a total income of about Rs.3.87 lakh during the first four years (given below). That is, the Society has generated a revenue of about Rs.0.82 lakh from its own activities like sale of fodder, interest on bank deposits, etc., during the same period. Considering all items of income and expenditure, the Society has made a total profit of about Rs.13,000 in this period.

Year	Income(Rs.)	Expenditure(Rs.)	Profit/Loss(Rs.)
1987-88	1,11,458.69	1,04,726.39	6,732.30
1988-89	77,615.15	79,311.10	- 1,695.95
1989-90	1,17,227.06	1,14,162.09	3,064.97
1990-91	81,252.05	76,304.55	4,947.50
Total	3,87,552.95	3,74,504.13	13,048.82

Table 7 shows the Profit and Loss account of the Society for the year 1990-91. Some minor adjustments have been made in this Table for consistency of figures and for grouping of items.

The major items of expenditure in 1990-91 have been soil and water conservation, activities related to plantation of trees and cultivation of fodder, salaries, and purchase of *babul* seed from the villagers. Though most of the items of income for 1990-91 are in the form of various grants from the RVMSL, it is important to note that about 2.5% of the total income has come from the Society itself in the form of sale of grass (18%), fine for damage (6%) and interest on bank deposits (1%). The Profit and Loss accounts of the Society for different years indicate that, in general, the

share of such income., in its total income has been, increasing over the years. Such share for different **years** has **been** calculated as follows:

Year	Share (%)
1987-88	10.93
1988-89	14.48
1989-90	11.35
1990-91	25.64

Table 8 shows the Balance Sheet of the Society as on 30th June 1991. The accumulated profits of the Society are shown in the Balance Sheet as Rs.13,003.37. The total value of assets of the Society has been shown as about Rs.24,000. The value of trees and grants from the **RVMSL** do not appear in the Balance Sheet,

As shown earlier, the fodder plot of **two** hectares has already become economically viable. What is the economic viability of tree plantation on the common land? A quick and rough calculation in this regard based on some simplistic assumptions has been made in Table 9. It shows that at 1990-91 prices the activity of tree plantation on common land will break even if the Society earns a revenue of about Rs.7 per tree at a one time harvest of its trees in 2001-02 when the 15 years¹ lease of the land **will** be over. The Society needs to earn an average revenue of about Rs.19, Rs. 33 and Rs. 55 per tree to obtain an internal rate of return as 10%, 15% and 20%, respectively.

An internal rate of return close to 20% on tree plantation on common land seems quite within the reach of the Society*. As Shah (1990) shows in his study, the expected revenue from even a six year old tree in the case of *desi babul*, *ganda babul* and *neem* which constitute about 92 % of the tree population of the Society is as follows:

Tree	Approx. girth (metre)	Approx. height (metre)	Volume (cubic metre)	Density (Kgs./ cub. in.)	Weight of tree (Kgs.)	Market value at 1990 price (Rs.)
<i>Desi babul</i>	0.6	4	0,090	800	72	43.20
<i>Gand babul</i>	0.6	4	0.090	700	63	37.80
<i>Neem</i>	0.7	4	0.122	750	92	55.10

The calculations in Table 9 have been made as follows;

- (i) The annual expenditures made before 1990-91 have been inflated annually by 10 per cent to adjust them to 1990-91 prices.

- (ii) The annual expenditures on tree cultivation made before 1990-91 have been calculated by deducting the 1990-91 expenditure on fodder plot, i.e., Rs.9,581, from the total annual expenditure of the Society at 1990-91 prices.
- (iii) The expenditure on tree cultivation during 1990-91 has been calculated by deducting expenditures on fodder plot, smokeless *chulhas*, and purchase of *babul* and *neem* seeds from the total expenditure.
- (iv) The expenditure on tree cultivation during 1991-92 has been derived from such expenditure calculated for 1990-91 in proportion to the number of trees.
- (v) Only the recurring types of expenditure like salaries, house rent, watering, etc., have been taken into account from the Profit and Loss account of 1990-91 for calculating annual expenditure on tree cultivation after 1991-92 as the total plantation has been completed in 1991-92. In case of watering and chemicals only 25 per cent of the expenditure has been considered as recurring expenditure.
- (vi) The expected number of trees in 2001-02 has been calculated as 66 per cent of the total trees planted from 1987-88 to 1991-92.

Distribution of Net Profit

According to the bye-laws of the Society, the net profit is to be distributed as follows:

- (i) A sum not less than 25% shall be taken to the Reserve Fund.
- (ii) Sums to be set aside in accordance with the co-operative Societies Act and Rules of the State.
- (iii) Dividend to share holders not exceeding 12% of the paid up share capital.

The balance after the above deductions is to be distributed as:

- (a) 65% as bonus to the members in accordance with the value of tree/grass and its produce etc., sold by the member to or through the Society.
- (b) 5% to be set aside for Community Development work
- (c) 10% as bonus to staff
- (d) 15% to be set aside as soil, water, energy conservation and wasteland development fund.
- (e) 5% to be set aside as co-operative propaganda fund.

In addition to the sums prescribed for the Reserve Fund as given above, all entrance-fees, fines, share transfer fees, forfeited amount of share capital and donations shall be carried over to the Reserve Fund.

The Balance Sheet in Table 8, however, shows the Reserve Fund as only Rs.573 which is the entrance fee paid by the 579 members. It does not seem to have included the fines collected by the Society and 25% of the profit as mentioned above.

The Society, for the time being, has not allocated the profits but has maintained them as such in its account. It has been reconsidering the method for distribution of bonus to members as the one suggested above individuals is not equitable in nature particularly for the distribution of huge profits expected at the time of harvesting of trees.

Conclusion

There is some evidence to show that (i) the common property resources (CPRs) make significant contribution to the income of the rural poor, (ii) the area and productivity of CPRs have been declining over the years, (iii) much of the privatisation of CPRs done to help the rural poor has ultimately landed the privatised CPRs in the hands of the non-poor, and thus (iv) the rural poor have been losing a significant, source of their sustenance through the decline of CPRs (Jodha, 1986 & Iyengar, 1989} . In this context, one can see that the Vera TGCS is making a significant contribution by maintaining the size and increasing the productivity of the common land. Further, the Society has not only exposed the villagers to a socially and economically useful new community enterprise but has also been working in the direction of enabling the people through participation, education and training to manage their resource for their development themselves.

Some of the issues that seem to be pertinent to the Society are as follows:

- (i) Resistance by *rabaris*: By the organisation of the Vatra TGCS the vested interests-of the *rabaris* are hurt. The *rabaris* who may not constitute more than 6 to 7 percent of the village population we're making almost sole use of the total grazing land of the village for their animals. Even after the formation of the Vera TGCS, they have at least about 100 hectares of *guacharo* land for this purpose. Still, they are resisting the change since their private interests in the form of free grass to their animals are reduced whatever be the benefits to the village as such. It may take some time for them to learn the new discipline brought in by the Society. Once they do so, they may benefit more by actively participating in the

functioning of the Society, It is a welcome sign that about 40 *rabari* families have already become members of the Society.

- (ii) Scarcity of Fodder : Though the Society has added to the availability of fodder in the village, it appears that the **problem of** fodder availability in the village is more **acute** than that of fuelwood. The leaves of the majority of trees on the common land, ie. *babul* and *neem*, may not be useful as regular fodder. Only in acute scarcity of fodder, have the villagers used *neem* leaves as fodder for their animals. It may be useful to increase fodder production on the common land in conjunction with trees.
- (iii) Involvement of the **People**, : Participation of members in meetings, particularly the General Body meetings, has been low. The availability of employment has been very **period** specific and now that the plantation is over there seems to be a gap as far as employment or contact of the people with the Society is concerned. The Society is considering taking up some related activities, such as honey bee keeping, enhancing the involvement of the people in a more regular manner.
- (iv) Marketing of Tree Produce) The Society has not been able to promote plantation on private land in a significant manner. It also has to strengthen its capability to market tree produce. It may be possible to achieve the first by improving its processing and marketing rather than by trying directly to plant more trees on private land. Better processing and marketing abilities may also enhance involvement of the people in doing business with the Society as initiated by purchasing of *neem* seeds and *babul* pods.

Distribution of Profit: Since the members have hardly sold anything to the Society, it is not clear on what basis the Society is going to distribute bonus from the net profit to the members or how it is going to market the members' produce. Even if there are sales by the members through the Society, the profit earned in the activities on common land cannot be distributed on this basis. The Society has been actively thinking of evolving an equitable method for such distribution.

- (vi) Multi-membership Per **Household**: Since most of the benefits like availability of employment, sale of fodder, etc. , are based on **membership**, the Society may check the extent of multi-membership per household. It is all the more important to do this if the distribution of net profits, in the absence of any other criterion, is going to be based on just membership to the Society.

Table 1
Land Use. Pattern of Vatra Village in 1987

Particulars	Area, :in hectares
Total land	-722.1973
Cultivable land	523.4941
a) Cultivable land	52.1.8349
i) Irrigated land ;	322.4530
ii) Unirrigated land	199.3819
b) Fallow land	κ 1.6592
B	33.1146
Uncultivable land	
C. Land for public use.	
a) Houses	164.5741
b) Gauchar	1.1899
c) Ponds	141.9687
d) Other uses (roads, etc.)	.5.2711
D. Other land	16.1444
	.1.0145
Source: Village Talati	

Table 2
Plantation and Survival of Trees from 1987-88 to 1989-90

Sl. No.	Common name	Botanical name	Saplings planted (number)			Total saplings planted (no.)	Surviving plants in June 1990 (no.)	% of surviving plants
			1987-88	1988-89	1989-90			
1.	Desi Babul	Acacia nilotica	4,625	3,700	8,500	16,825	10,725	63.7
2.	Ganda Babul	Prosopis juliflora	-	18,710	20,364	39,074	29,500	75.5
3.	Bengali Babul	Acacia auriculiformis	-		80	80	0	0.0
4.	Ram Babul	Acacia cypriciformis	-		240	240	170	70.8
5.	Subabul	Leucaena leucocephala	1,200	1,000	-	2,200	900	40.9
6.	Heem	Azadirachta indica	1,400	1,050	10,129	12,579	6,250	49.7
7.	Bamboo	Dendrocalamus strictus	100	-	-	100	22	22.0
8.	Sisum	Dalbergia sissoo	100	400	200	700	440	62.9
9.	Saragwa	Moringa oleifera	-	50	80	130	25	19.2
10.	Adoosa	Ailanthus excelsa	-	90	30	120	5	4.2
11.	Jamun	Syzygium cumini	-	10	-	10	0	0.0
12.	Saru	Casuarina equisetifolia	-	170	-	170	3	1.8
13.	Simda	Bombax ceiba	-	-	1,300	1,300	950	73.1
14.	fCassod	Cassia Siamea	-	-	2,067	2,067	565	27.3
15.	Gugur	Comifora whaited	-	-				
16.	Ber	Zizyphus mauritiana	-	-				
17.	Avar	Cassia auriculata	-	-				
18.	PHoodi	Salvadora persica	-	-				
19.	Karanj	Pongau'a pinnata	-	.	.	.	.	.
20.	Gundi	Cordia rothii	-		-			
21.	Siras	Albizia lebbeck	-	-	-	-;		
Total			7,425	25,180	42,990	75,595	49,555	65.6

Source ; Records of Vatra TGCS

Table 3
Plantation And Survival Of Trees From 91 To 1991-92

SI	Common name	Botanical name of	Saplings planted in 1990-	Standing treesCplan- ted+natural) in June*91	Saplings planted in 1991-92	Standing treesCptan- ted+natural) in Sept ¹ 91	% of each plant in total standing
	Desi Babul			20,111	950	21,061	19.2
	Ganda Sabul			48,040	21,615	69,655	63.4
	Bengali Babul			5			0.0
	Ram Babul			178			0.2
	Subabul			925			0.8
	Neem			11,455			10.4
	Bamboo			45			0.1
	Si sum			513			0.5
	Saragwa			29			0.0
	Adoosa			5			0.0
	Jamun			8			0.0
	Saru			3			0.0
	Simda			1,688			1.5
	Kassod			565			0.5
	Gugur			686			0.6
	Ber			565			0.5
	Avar			153			0.1
	Piloodi			1,210			1.1
	Karanj			32			0.9
	Gundi			129			0.1
	Siras			10			0.0
No	of tree	tree	91 (no.)	(no.)	(no.)	<no>	plants

6,435

Acacia
nilotica
Prosopis

18,510

ucocephala				
Azadirachta				
indica				
Dendrocalamiis	50		50	
strictus				
DaIbergia				
sissoo				
Moringa				
oleifera				
Ailanthus				
excelsa Syzygium				
eumini Casuarina	10			
equisetifolia				
Bombax	25			
ceiba				
Cassia				
Siamea Comifora				
whaited	1,500	Zizyphus		
mauritiana Cassia				565
auriculeta Salvadora				
persica Pongamia				153
pinnata Cordia		960		
rothii Albizia				1,210
lebbeck				
				992
Total	28,305	s, 355	23,575	
		109,930	100.0	129

Source: Records of Vatra TGCS

10

Table 4
Annual Income and Expenditure on Fodder
Plot at Current Prices (July to June)

Particulars	Year	
	1989-90	1990-91
A) Expenditure (Rs.):		
1. Land preparation	368.00	1,053.75
2* Chemicals & fertilisers	4,320.75	737.40
3. Irrigation	3,447.08	5,722.75
4. Labour	769.20	1,154.50
5. Transport	94.00	198.50
6. Miscellaneous	302.00	713.65
Total	9,301.03	9,580.55
B) Income (Rs.):		
1. Sale of fodder	11,767.00	14,705.00
2. Sale of seed	367.50	
Total	12,134.50	14,705.00
C) Net Profit (Rs.)	2,833.47	5,124.45

Source: Records of Vatra TGCS

Table 5
 Monthwise **Generation, of** Employment - **(Mandays)**

Month	Year 1986-87 19.87-88 1988-					
	89	1989-90	1990-91	1991-92		
July		517.0	505.5	1075.5	284.0	709.0
August		215.0	377.0	544.0	485.5	24.0
September	-	242.5	59.0	52.5	3.2.0	7.0
October		344.5	0.0	19.0	161.0	-
November		372.0	0.0	0.0	0.0	-
December		180.5	0.0	0.0	0.0	-
January		211.0	0.0	253.0	246.0	-
February	-	302.0	5.0	126.5	104.5	-
March		342.0	80.5	70.0	0.0	-»
April		100.0	89.0	124.5	3.0	-
May		158.5	474.0	509.0	180.5	-
June	1,006.5	233.0	72.0	266.0	723.0	-
Total	1,006.5	,218.0	1,662*0	3,040.0	2,219.5	740.0

Grand Total : 11,886 mandays
 Source : Records of Vatra TGCS

Table 6
Annual Grants by RVHSL (July to June)

No	Yearwise grant <Rs.>					Total grant	% of total
	1986-87*	1987-88	1988-89	1989-90	1990-91**	over	grant for
.						(Rs.)	purpose
1. Salaries	600.00	5,625.00	5,500.00	6,280.00	4,760.00	22,765.00	7.46
2. Records	16.00	448.50	476.00	221.00	407.00	1,568.50	0.51
3. Rent	0.00	0.00	0.00	300.00	450.00	750.00	0.25
. Equipment	1,020.50	1,264.75	1,011.90	255.00	140.00	3,692.15	1.21
5. Fencing	960.00	1,607.50	2,550.00	2,736.50	677.00	8,531.00	2.80
6. Saplings	0.00	1,392.00	1,595.00	6,975.50	2,743.50	12,706.00	4.16
7. Land development	10,374.75	83,786.54	27,044.00	11,142.50	7,179.00	139,526.79	45.73
8. Plantation aftercare	0.00	0.00	22,884.00	61,304.15	13,885.75	98,073.90	32.14
9. Chemicals	1,425.00	10,074.25	5,577.80	0.00	0.00	17,077.05	5.60
10 Energy conservation	0.00	0.00	0.00	0.00	173.00	173.00	0.06
11 Bund plantation	0.00	0.00	0.00	140.00	0.00	140.00	0.05
12 Seeds	0.00	0.00	0.00	130.00	0.00	130.00	0.04
Total	14,396.25	104,198.54	66,638.70	89,484.65	30,415.25	305,133.39	100.00

Note: RVMS account for such grants is maintained from April to March each year. Above figures have been calculated from monthly grant figures.

* Only from April to June 1987,

** Only from July 1990 to March 1991.

Source : Records of RVMSL

Table 7
Profit and Loss Account (1.7.1990 to 30.6.1991)

Income	Rs.	Expenditure	Rs.
Fine for damage	5,070.00	Commission	28.00
Bank interest	1,060.20	Salaries	8,240.00
Salary grant	6,440.00	Stationery	595.50
Stationery grant	477.00	Saplings	2,743.50
Sapling grant	2,743.50	Fencing	857.00
Fencing grant	857.00	Soil & Water Cons.grant	14,956.50
Soil & Water Cons.grant	14,956.50	Plant care	590.50
Nursery grant	11,812.30	Pit digging	4,275.00
House rent grant	600.00	Chemicals	1,366.80
Smokeless <i>chulha</i> grant	904.50	Plantation	8,511.50
RVMSL	800.00	Soil work	3,342.25
Refreshment grant	50.00	Watering	2,540.00
<i>Kisan Van</i> grant	150.00	Fodder	9,382.05
Plantation grant	20,626.05	Transportat ion	198.50
Sale of grass	14,705.00	Nursery	11,169.00
		House rent	600.00
		Nursery grant	247.00
		Smokeless <i>chulhas</i>	904.50
		<i>Neem</i> seed purchase	799.95
		Audit fee	50.00
		Refreshment	50.00
		<i>Kisan Van</i>	150.00
		Dead stock	349.00
			<hr/>
			76,304.55
			<hr/>
		Profit	4,947.50
			<hr/>
Total	81,252.05		81,252.05

Source: Records of Vatra TGCS

Table 8
Balance Sheet as on 30.6.1991

Liabilities	Rs.	Assets	Rs,
Share capital	5,790.00	Bank	18,114.25
Reserve fund	579,00	Equipment	5,377.90
Equipment grant	3,708.15	Fee	200,00
Profit	3,003.37		
RVMSL	500.00	Cash in hand	137,37
Dead stock	349.00	RVMSL share	100e00
<hr/> Total	<hr/> 23,929.52		<hr/> 23,929.52

Source: Records of Vatra TGCS

Table 9
 Required Revenue from Trees on Common Land in
 2001-02 at 1990-91 Prices

Particulars	Value (Rs.) at Discount Rate of			
	0%	10%	15%	20^
A. Expenditure :				
1987-88	126,638	168,555	192,601	218,830
1988-89	84,373	102,092	111,584	121,498
1989-90	115,039	126,543	132,295	138,047
1990-91	60,662	60,662	60,662	60,662
1991-92	50,525	45,927	43,957	42,087
1992-93	11,452	9,459	8,658	7,948
1992-93 to 2001-02	114,520	54,500	41,319	32,054
Total Present Value	563,209	567,738	591,074	621,126
B. Total Revenue Required in 2001-02 :	563,209	1622,110	2749,183	4600,933
C. Revenue Required per Tree in 2001-02 : *	6.69	19.28	32.68	54.69

Expected number of trees - 84,134 (**approx. 66%** of the
 total no. of trees planted from 1987-88 to 1991-92)

Monthwise Employment

(From June 1987 to September 1991)

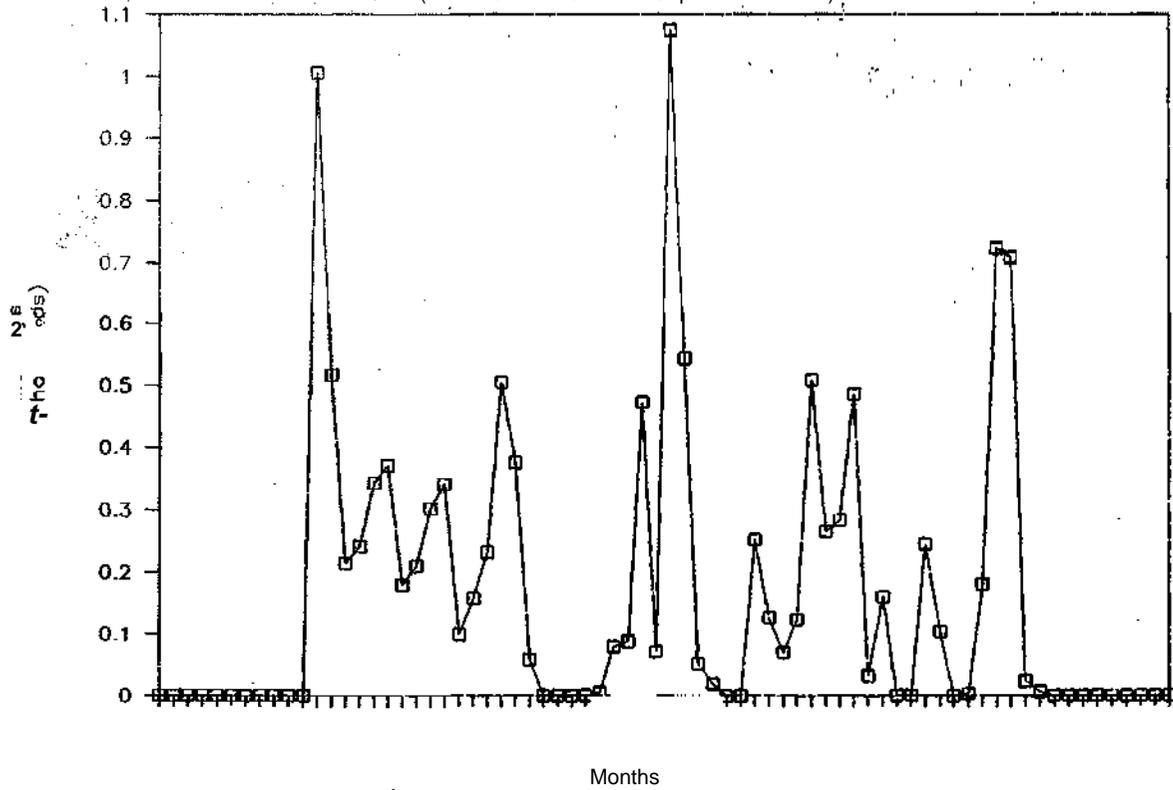
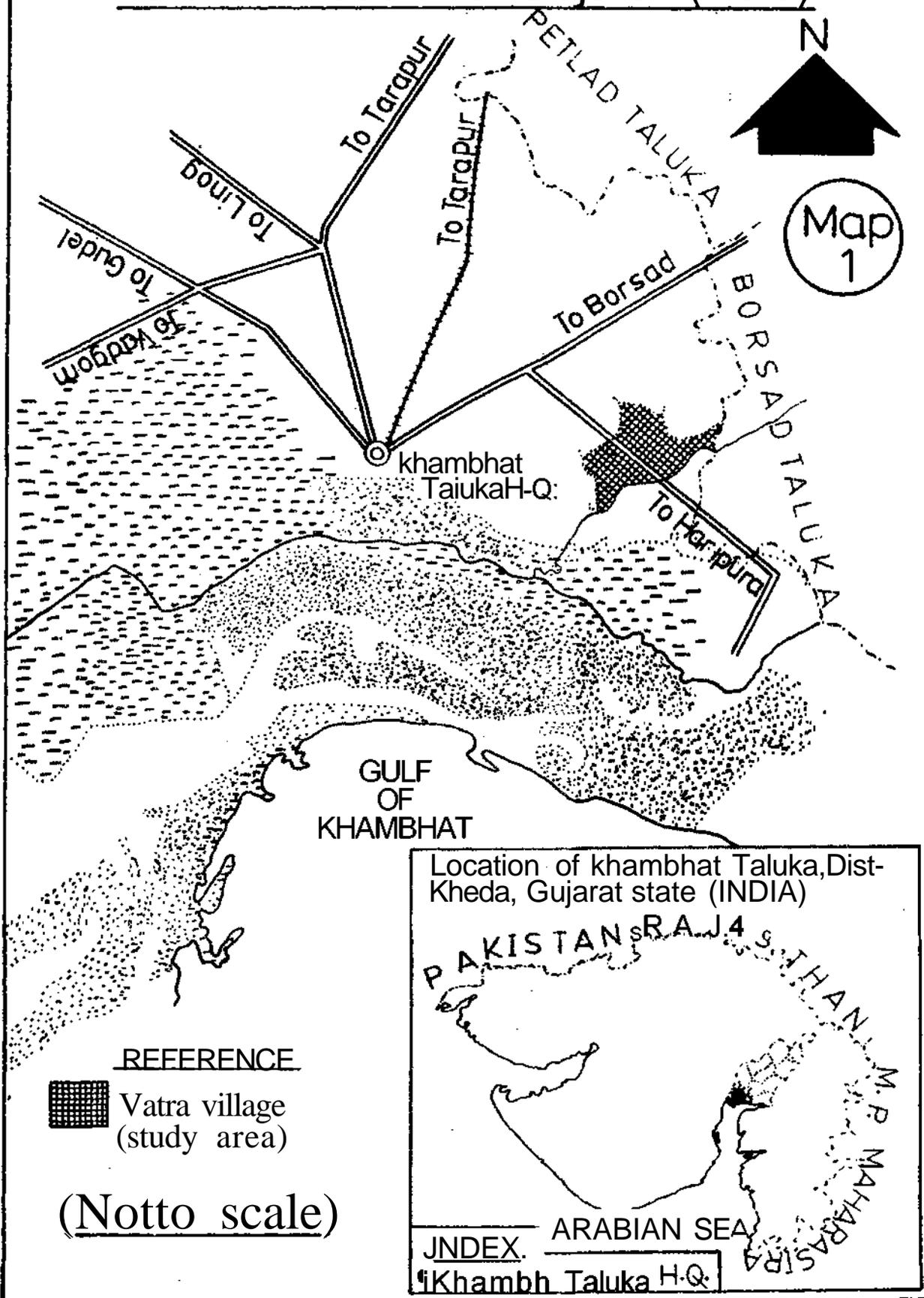


Figure-1

Location of Vatra village, Khambhat Taluka Kheda Dist. Gujarat (India)



References

Government of Gujarat (1987) .-National Plan for Development of Wasteland - Grant for Growing Fruit Trees and Other Trees etc Revenue Dept., Resolution No. LND-3986-1226-A, 1st January, Sachivalaya, Gandhinagar.

Iyengar, S, (1989). Common Property Land Resources in Gujarat: Some Findings about their Size Status and Use. Paper presented at the Workshop on Status of Common Property Land Resources in Gujarat and Problems of their Development held on March 17, 1989 in Ahmedabad.

Jodha, N.S. (1986). "Common Property Resources and Rural Poor in Dry Regions of India", Economic and Political Weekly. **XXI** (27) . 5th July.

National Dairy Development Board, (1985). Meeting Rural and Forage Needs Through Tree Growers' Rural Fuelwood and Forage Needs Through Tree Growers' Cooperative Societies—A Pilot Project Proposal. August, Anand.

_____(1987). Household Survey of Vatra for Tree Grown Project, Spearhead Team, Kheda, May, 1987, Anand,

Rashtriya Vriksha Mitra Sahyog Ltd (1988), Bye-Laws of Vriksha Mitra Sahyog Ltd., Anand.

_____Model Bye-Laws of Tree Growers' Co-operatives, Anand.

Shah, Tushaar, (1990) . Charangam Tree Growers' Cooperative Society, Anand : Institute of Rural Management.

A CASE STUDY OF A SABAIGRA PROCESSING AND **MARKETING**
CO-OPERATIVE SOCIETY IN ORISSA

Katar Singh and Dilip Kumar Mohanty

Abstract. Sabaigrass (*Eucaliopsis binota*) is a commercially important species of a perennial grass that grows wildy and is cultivated on marginal and degraded lands in many parts of eastern India including Orissa. It has multi-farious commercial uses* Many rural poor families depend on it for their livelihood. This paper presents an overview of the importance of sabaigrass in the economy of the Mayurbhanj district of Orissa and the main findings of an in-depth study of the Mayurbhanj Sabai Processing and Marketing Co-operative Society based in Betnoti in Mayurbhanj district of the state. The main objective of the co-operative was to improve the living standard of its members. Its main activities included purchase and sale of sabaigrass and borrowing and lending money. It functions more like a private commercial enterprise and not as a member-controlled co-operative.

The co-operative has not been performing well due to various problems--both internal to its governance and management and external to it. The major problems included infight among its Directors, rigid purchase and sale procedures, lack of forward linkages and consequent inefficient marketing of its produce, poor quality of the produce, low morale of its employees and so on. The authors highlight the need for effective vertical integration of the co-operative with an apex marketing organisation for ensuring remunerative price for its produce, control of quality of its products and unnecessary expenditures, and boosting of the morale of its employees through both monetary and non-monetary incentives linked to their productivity.

Keywords. Forward linkage, marketing, organisation, Orissa, processing, sabaigrass.

• Introduction

Sabaigrass (*eucaliopsis binota*) is a commercially important natural resource. It is a species of a perennial grass that grows wildy as well as is cultivated on marginal and degraded lands by farmers in many parts of eastern India including Orissa [1]. Many rural poor households depend on it to a great extent for their livelihood. - Besides, providing a sources of employment and income to the landless poor and marginal and small farmers, sabaigrass yields raw materials for several small scale cottage industries and

Sample + Mohanty

mini paper plants and affords protection against soil and water erosion.

In Orissa, Mayurbhanj district is known for sabaigrass production. Mayurbhanj is a land-locked district of Orissa state. It has a total geographical area of 10,413 sq.km or 10.41 lakh ha and is situated on the northern boundary of the state with its district headquarters located at Baripada. The total cultivable area of the district is 4.47 lakh ha of which 43.70 % is highland with very poor water retention capacity (GOO 1991 a) . The highlands are generally not suitable for cultivation of crops or orchards. But they are suitable for cultivation of sabaigrass. The agro-climatic conditions obtaining in the district are also suitable for sabaigrass production [2] . According to a rough estimate made by the Orissa State Forest Department, the total production of sabaigrass in Mayurbhanj district of the state is about 2,00,000 rot per annum of which some 120,000 mt is converted into ropes and the remainder is used for other purposes. At the average price of Rs.5 per kg of ropes and Rs.3.50 per kg of grass the total value of the produce works to Rs. 8.80 crores per annum which is quite a significant contribution to the economy of the district [3] .

The Mayurbhanj Sabai Processing and Marketing Co-operative Society Limited, hereafter referred to as Sabai Co-op, was established at the behest of the Government of Orissa (GOO) with the main objective of improving the economic well being of sabaigrass growers in the district. The Sabai Co-op is registered under the Orissa Co-operative Societies Act 1962. It is the only co-op of its kind operating in the district and it has its jurisdiction throughout the district.

This research was undertaken to study the organisation, operations, and management of the Sabai Co-op, evaluate its performance, and identify the factors affecting its performance.

The Research¹ Procedure

The case study method of research was followed for fulfilling the objectives of the study. The Mayurbhanj Sabai Processing and Marketing Co-operative Society was purposely selected for the study as it, was one of oldest societies of its kind established in the state. A sample of 64 sabaigrass growers comprising 43 members and 21 non-members was randomly selected for an in-depth study. Both primary and secondary data were collected for fulfilling the objectives of the study. The data were collected using a mix of various techniques including Rapid Rural Appraisal, individual interviews, group discussions, and document review. The data collection work was done in April 1992.

*paper wall layer
soil generation*

Economics of Sabaigrass Production

Sabaigrass is cultivated mostly by poor marginal and small farmers on their degraded lands. It is also collected by them as well as by the landless poor from the common pool village lands where it grows naturally.

Table 1 presents year-wise data on total cost, yield, gross returns, and net returns for sabaigrass for a 12-year rotation period. The cost and return estimates are based on the 1992 prices. The per acre cost of production of sabaigrass in the initial year works out to around Rs.1,800. The cost for the second year is roughly Rs. 450 and from the 3rd year to the 10th year Rs. 525 per year. The produce is harvested in the 11th and 12th years. In the 11th year, the cost of harvesting is estimated at Rs. 150 and in the 12th year at Rs.100. In the last two years no maintenance is required and hence no maintenance costs. Thus the total cost of production over a period of 12 years works to Rs. 6,700 per acre.

The returns are realised from sale of dry sabaigrass which has a good market in the district. The average yield of sabaigrass by year is presented in Table 1. The total yield per acre over a period of 12 years was about 96 quintals (qt). The gross returns from the sale of sabaigrass were worked out at the present (1992) market price of Rs. 350 per qt and are presented by year in Table 1. As shown in the table, the gross returns over a period of 12 years are estimated at Rs. 33,600 per acre, and net returns at Rs. 26,900. The average net returns per acre per annum over the 12-year period was Rs. 2,241. This represents a significant income from a (land) resource that is degraded and whose opportunity cost is almost zero. Besides, the cultivation of sabaigrass generates about 120 man days of employment per acre over the 12-year period of which 53 man days of employment is generated in the first two years (GOO nd)'.

An important feature of employment generation from sabaigrass is that it is available whenever it is needed; one can make ropes of sabaigrass at one's convenience and at any place inside or outside one's dwelling. This work does not hamper one's main activity and is therefore a good source of supplementary income.

The most important advantage of sabaigrass is its low cost of cultivation compared to the returns it gives. No intensive care is required for its cultivation. The ropes produced from the grass are very strong, heat resistant and durable because the grass contains a high proportion of silicon dioxide. It is a species of grass that is hardy and strong. Its products are in demand throughout the country. The ropes made of it constitute best material available for charpai (cot) making in the country; they are comfortable and light.

Objectives the Sabai Co-op

The Mayurbhanj Sabai Processing and Marketing Co-operative Society Ltd. was registered as a co-operative society under the Orissa Co-operative Societies Act 1962. Its area of operation extends to the whole of Mayurbhanj district. As per its bye-laws, the main objectives of the society are as follows :

- a) To raise the economic standard of the sabaigrass grower members whose main occupation is cultivation and collection of sabaigrass;
- b) To arrange for the sale of sabaigrass of the members to their best advantage;
- c) To borrow money from institutional sources and advance loans to the members on the pledge of their produce offered for sale;
- d) To rent or own godowns and sale-depots to facilitate the grant of loans to the members and sale of their produce when prices are good;
- e) To disseminate among the members information about the latest developments in the cultivation techniques of sabaigrass through arranging demonstrations according to the advice of the concerned Orissa Government departments;
- f) To take up grading and standardisation of the produce, whenever necessary;
- g) To act as an agent of the Orissa Government or other recognised institutions in the spheres of procurement and distribution of sabaigrass;
- h) To take on lease sabaigrass area from the concerned Department of the Orissa Government to facilitate the business of the society on behalf of the members;
- i) To arrange for processing, manufacturing and marketing of sabaigrass ropes and other products of sabaigrass;
- j) To do all such other things as are conducive to the attainment of the above objectives; and
- k) To encourage self help, thrift, and co-operation among the members.

Though all the above-mentioned things are the stated objectives of the Sabai Co-op, in actual practice, its main activities are purchase and sale of sabaigrass and sabaigrass ropes, and production and sale of very limited quantities of such sabaigrass products as mats and wall hangings, etc.

Organisation and Management

The Board of Directors

The society is governed by an elected Board of Directors (BOD). The BOD remained in office for the full term of four years until January 11, 1992 when its term expired and the election of a new BOD was stayed by the district court [4]. Since then, the administration of the society has been vested in the Assistant Registrar, Co-operative Societies (ARCS). The BOD had 15 members of which 12 were elected and three were nominees of the GOO, Of the 15 members of the BOD, eight were representatives of the 'A' class members, four represented the 'B' class, and three were government nominees. The BOD elects an Executive Committee (EC) consisting of five members of whom the President is the key actor responsible for conducting the business of the society.

As per the bye-laws of the society, the BOD has the power to undertake the following activities:

- a) Admission of members and allotment of shares.
- b) Borrowing from financing agencies and from the government.
- c) Investment of reserve and surplus funds of the society outside its business.
- d) Establishment and conduct of new lines of business with the approval of ARCS.
- e) Appointment and renewal of paid staff.
- f) Convening the Annual General Meetings (AGM) within two months of receipt of audit note.
- g) Preparation of Annual Report and placing it before the General Body Meeting (GBM).
- h) Preparing proposals for distribution of annual profits and placing it before the AGM for its approval.
- i) To enter into any contract or agreement with the State government and apex level federations for procurement, purchase and the sale of sabaigrass ropes and other finished products.

The President presides over all the meetings of the General Body (GB) and the EC and in his absence the Vice-President and in absence of both, the GB, BOD, or the EC may elect one of its members to preside over the meeting of the day.

The ultimate authority in all matters relating to the administration of the society is vested in the GB which meets

from time to time but at least once a year to discuss the business of the society. Besides these, the GB has the following powers.

- a) Removal of Directors;
- b) General administration of the society;
- c) 'Annual' audit report and audit certificate;
- d) Amendment or annulling of any existing bye-law or the enactment of new bye-laws;
- e) Expulsion of members for misconduct;
- f) Distribution of profits; and
- g) Transaction of any other business.

Besides these, the day to day activities such as purchase and sale of grass, ropes, and maintenance of stock are undertaken by the staff of the society who work under the close supervision of the Secretary of the society and within the budget limits sanctioned by the BOD.

Membership

The total membership of the society as of April 1992 was 533. Of the total members, 350 (66%) belonged to the Scheduled Tribes, 50 to the Scheduled Castes, 132 to other castes, and one was a nominee of GOO. Of the total members, 433 (81%) were males and the remaining 100 (19%) females.

According to the bye-laws of the society, the following are the eligibility criteria for membership;

- a) He/she should be above 18 years of age, have a good moral character and be a resident of the area falling within the jurisdiction of the society;
- b) Any person who is a sabaigrass grower and undertakes to supply sabaigrass to the society;
- c) Any landless forest labourer collecting sabaigrass;
- d) Any other person having good character and having some contact with the society;

Table 2 shows the number of members of the society by class for the last four years, 1987-88 - 1990-91.

There are four types of membership of the Society, viz., 'A' class, 'B' class, 'C' class and Special class. The 'A' class members comprise individual sabaigrass growers (farmers) and the value of share is Rs. 10 each. The 'B' class members consist of primary co-operative societies and

the value of share is Rs. 100 each. The 'C' class members include sympathisers other than sabaigrass growers and the Special class is exclusively for the GOO.

Though according to the bye-laws, only those persons who are sabaigrass growers or suppliers can become members of the society and avail of its services, in practice, this is not happening as the society functions more like a commercial organisation than a co-op; it purchases sabaigrass from anybody - members as well as non-members. Before the society came into being, there was no such organisation existing in the area and consequently, the sabaigrass growers and collectors used to be exploited by the local business men. They were often compelled to sell their produce under distress. So to help them out of this situation, the Sabai Co-op was registered on May 27, 1980 and the actual business started in July 1982 with 30 members. Thereafter, on the initiative of the GOO, the society enrolled many members from the *Lodha* tribe from the Suliapada and Morada Blocks of Mayurbhanj district. The *Lodha* tribals are professional hardcore criminals. The GOO wanted to help them out so that they stop their criminal activities and take up sabaigrass production and processing activities. The GOO granted them subsidy of up to Rs. 500 each for free distribution of sabaigrass through the society under the Integrated Tribal Development Project (ITDP). Consequently, the society undertook the distribution of sabaigrass to the members of the *Lodha* community. The society distributes sabaigrass to the beneficiaries once every week free of cost against the amount of subsidy received. The beneficiaries of the free sabaigrass are supposed to produce sabai ropes and sell them in the market or to the society, wherever they get a better price. But actually this is not happening. The beneficiaries take the sabaigrass and sell it immediately without producing any ropes or any other products and thereby defeat the whole purpose of the scheme.

Out of total 533 members, 435 (82%) belong to the *Lodha* community all of whom grow sabaigrass. Of the remaining members, only 30-40% are growers and the rest are non-growers. The non-grower members naturally do not take part in any of the activities of the society but they are the initiators of the society and the member growers (30-40 %) are also not supplying their produce to the society due mainly to the following reasons:

- a) It is a centralised society whose area of operation is throughout the Mayurbhanj district. So, members located very far away for its headquarters do not supply their produce due to high cost of transportation and the inability of the society to pay high price to the suppliers to compensate them for the high cost of transportation incurred by them.

- b) The price of sabaigrass fluctuates very widely and the official procedures are too rigid to cope with this problem. So the members prefer to sell it in the open market according to their sweet will.

On the basis of our observation of the way the society functions and the extent of members' participation in its affairs, it is quite clear that the members have, no loyalty towards the society and there are no interactions between the society and its members and among the members themselves. But to our surprise, the Lodha members do attend all the meetings of the society but they do not take part in the society's functioning.

Some of the people of the area complained to us that there was no membership drive, and no extension work was ever taken up by the society for increasing the membership.

Personnel and Personnel Policies

As of April 1992, the society had six paid employees on its roll. The designation and monthly salary of each of the six employees are presented in Table 3. The Secretary is the Chief Executive Officer of the society responsible for its overall administration and management. More specifically, his duties include:

- a) To carry on the correspondence work of the society and maintain all books of accounts.
- b) To receive and disburse money on behalf of the society under the order of the BOD.
- c) To attend the meetings of the BOD.
- d) To prepare vouchers, receipts, balance sheets and other documents required for carrying out the society's transactions.
- e) To place the auditors' report before the ARCS.
- f) To guide and supervise the work of all the society staff.
- g) To keep the society's cash and other stocks safely.

The Accountant is responsible for safe custody of cash and other assets of the society, and for handling financial transactions and other business matters. The main responsibilities of the Business Manager are purchase and sales. He is also incharge of the society's stocks of sabai ropes and other products. The Sales Assistant looks after the sale of sabaigrass and sabai products under the guidance and supervision of the Business Manager.

The staff of the Training Centre include one Junior Instructor at a monthly salary of Rs. 900; one Male Attendant (Rs. 600); one Female Attendant (Rs. 600); and one Watchman (Rs. 450).

The pay scales adopted by the society for its employees are not commensurate with the responsibilities, nature of work, and work load of the employees. For instance, the pay scales of the employees posted in the Training Centre are better than those of their counterparts in the society although the work done by the latter is more difficult, challenging and critical for the success of the society. Besides, within the society itself, the difference in the salary of the Secretary and the other staff is very big indeed. This acts as a demotivating factor for the employees. So there is need for rationalisation of salary structure considering the nature of work, work load, experience, etc.

Business Operations

The society has undertaken purchase and sale of sabaigrass, sabai ropes and other finished products made of sabai rope. The performance of the society in terms of purchase and sales in the last four years, 1987-88 to 1990-91, is given in Table 4.

Initially for many years, the society operated from a rented premise. Now, it has two godowns of its own constructed at a cost of Rs.5.74 lakh under a project funded by the world Bank and the National Co-operative Development Corporation (NCDC) . One of the godowns has a capacity of 500 other of 250 mt.

The society has undertaken the job of distribution of sabaigrass to some of its members, Lodha community members at the behest of the GOO. In 1988-89, it distributed to 148 families some 263 mt of sabaigrass valued at Rs. 63,273. It has been proposed to extend the scheme to include other tribals of Suliapada and Morada Blocks and also the tribals of Barsahi, Betnoti and R.G. Pur Blocks.

Sabarigrass Processing Unit

It has been proposed to establish three processing units of sabaigrass to produce mesh mat sofa sets, corridor mats and other handicraft products to provide employment to the trained personnel of the district. However, due to lack of funds, the society could not establish the processing units. The society has taken over the charge of the Sabai Training Centre, Baripada from the District Rural Development Agency (DRDA), Mayurbhanj on May 4,1988. Since then, it has been producing different types of finished products out of sabaigrass and sabai ropes. It sells its products to the Orissa State Forest Corporation (OSFC), the

Orissa State Co-operative **Federation**, the Orissa State Handicraft Corporation, Alaka, **Rourkela**, Wholesale Consumer Co-op. Store, Rourkela, Hindustan Wholesale Consumer Store, Rourkela, etc. During the years, 1988-89 and 1989-90 the society supplied Sabai ropes worth Rs. 13 lakh and Rs. 39 lakh respectively to the Orissa State Forest Corporation.

Training Centre and Training

Besides the purchase and sale of sabai grass and its products, the society also conducts training programmes for its members and officials. Under the Training of Rural Youth for Self Employment (TRYSEM) Scheme of the District Rural Development Agency (DRDA), a Sabaigrass Training Centre was set up in 1987 to train the young men and women to earn their livelihood. The society was given the charge of management, of the Centre in May 1988. The society converted the Training Centre into a **Production-cum-Training Centre**. Since May 1988 when it took over the charge of the Training Centre till April 1992, it had trained 85 members and officials.

The DRDA, Mayurbhanj has given an amount of Rs. 1.30 lakh to the society for meeting the cost of running the Training Centre. Besides this, the DRDA paid to the society Rs. 300 per student per month as stipend and Rs. 160 per student as education charges from the second year onwards.

Though the DRDA had undertaken to depute students for training at the Centre, no student had been to the society since August 1991. This is due to the corruption at the lower level in the DRDA office; they depute the trainees to the private training centres by taking bribes. So from August 1991 onwards, the society has been bearing the establishment and other costs of the trainers as well as the house rent of the building being used as the training centre which is not functioning at all. The ARCS has protested against this by stopping the payment of salaries to the employees of the Training Centre.

Profit and Loss

As per its audit report, the society has been making net profits year after year except in 1987-88. The year-wise amount of profit/loss is given in Table 6. The Registrar, Co-op Societies, Orissa has sanctioned a sum of Rs.95,000 as managerial subsidy to the society over the period from 1981-82 to 1990-91. As per the bye-laws of the society, the net profit, of the society as approved by the Registrar, Co-operative Society, GOO is to be disposed of every year as follows: a) reserve fund (25%), b) price fluctuation fund (10%), c) dividend (9%), d) education fund (5%), f) turnover bonus (20%), g) honorarium to Directors and members taking active interest in the business of the society (5%), h) bonus not exceeding one month's salary or 8.75% of the net

profit whichever is more, and i) a sum not exceeding 2 0% of the net profit for the building fund.

Impact of *the* Co-operative on Members and Non-members

As described earlier the society is functioning more like a private commercial entity than a co-op. The quantum of profit is very low due to the nature of product, wide price fluctuations, and poor forward linkage of the society. The interaction of the members with the society is almost nil. The society purchases and sells sabaigrass in the open market and the members do not get any benefit out of its operations. Whatever little surplus is generated is not distributed among the members; it is ploughed back in the society's business. So the members do not have any stakes in the society.

As far as the attitude of the members is concerned, they were mostly indifferent. During the course of our talks with them, they told us that they had nothing to do with the society and that its activities were completely politicised. The members of BOD were using it for maximising their personal benefits and interests. The bulk of the benefits are siphoned off by the influential members and even non-members .

There is a rift among the members of the BOD. They are divided into two major political factions--one owing allegiance to the Janata Party and the other to the Congress Party. The Secretary virtually controls the President. Previously, when the BOD was in command, the things were slightly better but after the ARCS took over the charge it has been doing badly. The ARCS is unable to devote the needed time to the society's affairs as he has to look after 98 other co-ops in the district which is not possible for him. For everything the Secretary has to take the permission of the ARCS which acts as a hurdle in the smooth working of the society. There is a need for holding fresh elections and installing an elected BOD and EC to save the society from going bankrupt and defunct.

Major Issues and options

The society has been facing a number of problems in conducting its business operations efficiently. Some of the major problems that require urgent attention and some alternatives for their resolution are briefly discussed in this section.

- Poor Marketing:

The society has not been able to secure remunerative price for the produce of its members as well as its own products. The main reason for this has been lack of

forward linkages with apex marketing organisations within and outside the

The volume of business is very large and the competition with the private traders engaged in the business is stiff. The society has certain inherent disadvantages vis-a-vis the private traders. First7~"uM~tlr@ private traders, the society cannot transact its business, particularly sales on credit basis. This forces the society to sell all or most of its products to OSFC, and other GOO undertakings. Besides, OSFC has also reduced by 4 0% their requirements of various products which they wanted the society to supply to them. The ARCS is hesitant to file a case against OSFC for their failure to buy the quantities that they had ordered. This is because the society does not have any alternative channels for disposal of its products.

This problem can be resolved by establishing forward linkages with various apex marketing organisations. To fetch remunerative price for the produce, storage facilities for the produce will be required. According to the Secretary of the society, it is possible to rent in needed storage facilities and manage them.

2. Rigid Purchase and Sale Procedures

The sale and purchase of the safoaigrass and its products are made by a Sales and Purchase Committee as approved by the BOD, This system makes it very difficult for the society to take critical decisions immediately on-the-spot and thereby reduces its competitive strength vis-a-vis the private traders who respond immediately to changing conditions in the market, This problem can be resolved by making the purchase and sale procedures flexible and decentralising the decision-making process so that the persons responsible for purchases and sales can take the right decision on the spot.

Bulky and Perishable Products

There are many inherent characteristics of sabaigrass that make it difficult to store, process and market it efficiently« Some of these characteristics are bulkiness in relation to value, variations in quality particularly moisture content, perishability and vulnerability to damage by white ants and fire while in storage. All these characteristics cannot be changed through processing. But the quality of the produce can be improved through strict quality control measures adopted at the processing and grading stages. To some extent the quality of the products can also be improved by imparting training to the sabaigrass producers.

Pay Scales and Incentives

The society has pay scales that are not commensurate with the nature of work, work load and the nature of responsibilities shouldered by various categories of its staff. In addition, there are disparities in the pay scales of employees working in the society and in the Training Centre managed by it. Such anomalies in the salary structure have a dampening effect, on the morale of the employees of the society reducing their efficiency. ...

Besides, the present rates of travel and daily allowances are miserably low vis-a-vis the difficulties involved in performing the tasks, particularly purchase and sale of sabaigrass and its products. Consequently, the staff of the society do not have any incentives for doing a good job. They generally avoid going out and if and when they go out they come back saying that grass or ropes were not available at the prices fixed by the society or that they did not have enough cash to buy all the quantity available.

There is therefore, need for rationalising the salary structure, raising the travel and daily allowances, and providing monetary and non-monetary incentives to the staff commensurate with their work load and responsibilities.

5. Excessive Dependence on Government

The society is dependent on the government for many things such as subsidies for running the training centre, managerial subsidy and subsidy for distribution of sabaigrass to the members of the *Lodha* community. In addition, the ARCS has been administering the society for quite some time and this has created a lot of problems in the smooth functioning of the society. To improve the performance of the society, it is necessary that it is governed by an elected BOD and an Executive Committee constituted by the BOD. The sooner it is done the better it will be for the society.

Conclusions and Implications

On the basis of our research findings and their analysis presented in this paper, many conclusions can be drawn. Some of the major conclusions that we have drawn and their implications are briefly stated in the following paragraphs.

1. The Sabai Co-op has not been successful in achieving its intended objective of improving the economic well-being of its members by arranging for grading, storage and sale of their produce to the best of their advantage

and helping them secure loans from institutional sources. It has operated more like a private commercial enterprise run by its employees rather than as a member-controlled co-op* This was because the members were all small scale producers scattered all over the district having no good leadership to take care of their interests. Given the high transaction costs involved, there was very little interaction among the members of the co-op and their participation in the affairs of the co-op was negligible* This in conjunction with the power struggle among the members of its Board of Directors resulted in the mismanagement of its business operations and the take-over of its management by the government. All these problems could have been avoided if the co-op had been controlled by its members, and policies determined by genuine elected representatives of its members (Board of Directors) and its operations managed professionally by its staff accountable to its members.

2. The Sabai Co-op failed to perform its major function, i.e., marketing of its members' produce to the best of their advantage. This was mainly because it had very rigid purchase and sale procedures and it had no effective forward linkages with apex marketing organisations within and outside the state. Part of the failure on the marketing front could also be attributed to some inherent physical characteristics of sabaigrass and its products such as high volume-price ratio, highly heterogeneous products in terms of quality, difficulties in quality control and so on.
3. In a business organisation, personnel policies are an important factor affecting the performance of the organisation. Irrational salary structure and pitifully low travel and daily allowances admissible to the employees of the society led to wide-spread shirking and inefficiency among the employees which was eventually reflected in the poor financial performance of the co-op. All these problems could be resolved through rationalisation of the present salary structure, raising of travel and other allowances commensurate with the needs of the tasks involved and provision of productivity-linked incentives to the employees.

Table 1.
Year-wise Total Cost, Yield, Gross Returns and net Returns
from Sabaigrass at 1992 Prices

Year	Total cost (Rs./acre)	Yield (Qt./acre)	Gross returns (Rs./acre)	Net returns (Rs./acre)
1	1800	0	0	-1,800
2	450	4	1,400	950
3	525	7	2,450	1,925
4	525	9	3,150	2,625
5	525	12	4,200	3,675
6	525	12	4,200	3,675
7	525	12	4,200	3,675
8	525	12	4,200	3,675
9	525	10	3,500	2,975
10	525	8	2,800	2,275
11	150	6	2,100	1,950
12	100	4	1,400	1,300
Total	6,700	96	33,600	26,900

Source: GOO (nd).

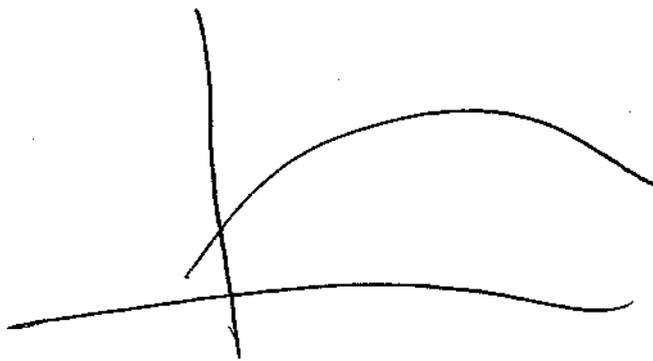


Table 2
 Number of Members of the Sabai Co-op by Class

Class of Member	1987-88	1988-89	1989-90	1990-91
'A' Class	389	483	486	516
'B' Class	16	16	16	16
'C' Class	-	-	-	-
Special Class	1	1	1	1
All	406	500	503	533

Source : Anonymous (1991).

Table 3
 Designation and Monthly Salary of the Employees of the Sabai
 Co-op as of April 1992

Designation	No. of post	Salary (Rs./month)
1. Secretary	1	4,000
2. Accountant	1	750
3. Business Manager	1	700
4. Sales Assistant	1	600
5. Peon-cum--Purchase Assistant	1	550
6. Watchman	1	500

Source : Office Records of the Sabai Co--op.

Table 4
Purchase and Sale of Sabaigrass, 1987-88 to 1990-91
(Lakh rupees)

Item	1987-88	1988-89	1989-90	1990-91
Purchase	6.79	15.82	26.55	17.99
Sale	7.82	18.67	27.85	22.60

Source : Anonymous (1991).

Table 5
Year-wise Amount of Managerial Subsidy Granted to the
Society

Year	Amount (Rs.)
1981-82	25,000
1982-83	25,000
1983-84	5,000
1989-90	15,000
1990-91	25,000
Total	95,000

Source : Anonymous (199.1) .

Table 6
 Yearwise Amount of Profit/Loss Made by, the Society (Rs.)

Year	Profit	Loss	Cumulative profit
1984-85	17,531	--	35,088
1985-86	4,862	--	39,950
1986-87	19,927	--	59,874
1987-88	--	8,530	51,347
1988-89	12,247	--	63,594
1989-90	19,213	--	82,807
1990-91	10,713	--	93,521

Source : Anonymous (1991) .

Marginal, given size.

Motes

- [1] Sabaigrass has an average life span of 10-12 years but in many cases it is found surviving upto 18-20 years. It grows well on steep slopes, foot hills and uplands upto an elevation of 500 feet above the mean sea level. It thrives well in hot and dry climate. It has 60-90 cm long erect, slender culms. It is propagated through both vegetative slips and seeds.
- [2] According to knowledgeable sources, the tribals of Mayurbhanj district were the first to identify sabaigrass as a useful species and then the Maharaja of Mayurbhanj, Purnachandradev, started its cultivation on an experimental basis.
- [3] This information is based on the office records of the Orissa State Forest Department.
- [4] The society had its last election for the BOD and the EC due in February 1992. It was observed that the membership rose suddenly just before the election because all the members of BOD got their men enrolled as members in their absence and even without consulting them. On verification, it was found that some of the members so enrolled had not even seen the society and did not know what the society actually does. In view of this development, the President of the EC objected, filed a suit in the district court, and asked for physical presence of the persons interested in being enrolled as members. This led to a conflict between the Janata Party loyalists and the Congress Party loyalists including the President and ultimately the district court issued an order in the month of January 1992 staying the elections and from that day onwards the ARCS is the Administrator of the society.

References

- Anonymous (1991). The Mayurbhanj Sabaigrass Processing and Marketing Co-operative Society Ltd., Betnoti : At a Glance. Betnoti : Office of the Secretary, The Mayurbhanj Sabaigrass Processing and Marketing Co-operative Society Ltd.
- ∞ (1991 a). Report on Agricultural Strategy Committee Meeting of Kharif. Bhubaneshwar : Directorate of Agriculture, Government of Orissa.
- ∞ (1991 b). District Statistical Handbook 1990-91, Mayurbhanj. Office of the District; Statistics Officer, Government of Orissa, Baripada.
- ∞ (nd). Report on Sabaigrass Plantation. Baripada : Office of the Assistant Director, Soil Conservation, Government of Orissa.

THE KANGRA FOREST CO-OPERATIVE SOCIETIES IN HIMACHAL PRADESH :
A CASE-STUDY

Chetan Agarwal and Katar Singh

Abstract. Like the village *Van Panchayats* (forest councils) in Uttar Pradesh hills, the Village Co-operative Forest Societies (VCFS) in the Kangra district of Himachal Pradesh represent an organisational innovation in co-management of natural forests, VCFS are statutory bodies established under the Kangra Forest Society Rules 1941 and as of May 1992 there were some 70 VCFS existing in the Kangra district of Himachal Pradesh. This paper presents an overview of the evolution, functions, and management of VCFS and the main findings of an in-depth case study of a VCFS--the first of its kind established in 1941'.

It is argued in the paper that if backed by appropriate legislation and technically and financially supported by the government, the VCFS could be an important instrument of protection and management of natural forests, particularly in the hills and the tribal areas inhabited by relatively small and homogeneous communities. The case study revealed that the local people in the study area were able to formulate, implement and monitor rules and regulations necessary for protection of the forest estate assigned to them, distribution of forest produce, and managing the VCFS. This was possible because the VCFS were granted legitimacy, full autonomy and financial and technical assistance by the government. Of late, however, due to the indifferent attitude of the government (Forest Department) towards them and withdrawal of financial support, most of the VCFS are in a bad shape and their saliency has been declining. In the context of the recent resurgence of interest in co-management of forests, it is important that the Forest Departments and the non-governmental organisations in India engaged in the task learn from the experience of VCFS.

Keywords : biotic pressure, co-management, co-operative forest societies, forest estate, forest policy (of the government), natural forests, organisational innovation, working plans.

Introduction

Conventional wisdom holds that the 'anti-people' forest policy practised by the Government of India (GOI) is a legacy of the British. The Forest Acts of 1878 and 1927 are faulted for alienating village and forest communities from their forests, and denying them their legitimate rights. Whereas the broad trend of the forest policy has been in this direction, there were localised experiments in turning over management of forests to the village communities. The village Van Panchayats (forest councils) in the Uttar Pradesh hills and the Village Co-operative Forest Societies (VCFS) in the Kangra district of Himachal Pradesh are two such examples [1]. Both, the village Van Panchayats and the VCFS represent an organisational innovation in co-management of natural forests.

In the face of the revival of such efforts at local management of forest resources, it may be useful to study the earlier initiatives in co-management of forests to understand how the local people's institutions managed the forests, what problems were encountered by them and what lessons from their experience could be distilled for the future [2].

The VCFS are statutory bodies established under the Kangra Forest Society Rules 1941 and as of May 1992 there were some 70 VCFS in the Kangra district of Himachal Pradesh. This paper presents an overview of the evolution, functions, and management of VCFS and the main findings of an in-depth case study of a VCFS—the first of its kind established in 1941.

Background

Kangra is one of the 12 districts of the state of Himachal Pradesh. Bound by the outer Dhauladhar range in the north and the river Beas on the south, virtually the entire district serves as a catchment for Beas [see Map]. In fact, many sub-catchments directly feed the reservoir of the Pong dam on Beas.

Broadly speaking, the main valley has a warm monsoon climate with dry periods in the spring and the autumn, separated by monsoon with heavy rainfall. Three quarters of the rain falls during the monsoon months i.e. from July to September.

The forests fall in three broad categories. The Himalayan moist temperate forests lie on the slopes and inner valleys of the Dhauladhar and on the small hills of the main valley. Comprising largely of oak (*Quercus semecarpifolia* and *incana*) and fir (*Abies Webhiana* and *Picea Morinda*), these forests are heavily grazed. From about 1,600 m downwards are the dry sub-tropical pine forests (*chir* or *pinus longifolia*) largely on the small hills of the main valley. Dry evergreen tropical forests of thorny scrub species and

bamboo are found at the lower elevations down to 400 m above the mean sea level,

In terms of ownership and management, there are seven different classes of forests ranging from the reserved forests that are completely owned and managed by the Forest Department (FD) to private forests owned by proprietors of tea estates and other persons. In the last century, the government decided to set up tea estates in Kangra district. Land was acquired for that purpose and in return the British government had to forgo all the rights in an equivalent forest area. These areas were called *Ban Maufi* forests and they are the exclusive property of the villagers. Similarly, the *quid pro quo* for creating the reserved forests which were formed to afford protection to certain tracts were unclassed forests, where greater rights were granted to the villagers.

Management of forests under the Working Plans started in the early 1900s and it still continues. These plans laid stress on rotational closure of plots for regeneration and phased felling in forest areas. The Working Plans also contained detailed prescriptive directions for the management of all forest areas.

Evolutions and Functions of Forest-Co-ops

Traditionally, the village communities in Kangra district had well-established rights in the forests within their jurisdiction. However, in course of time, in view of the depletion of forest resources due to ever increasing biotic pressure on them, many of the local people's rights were curtailed by the government through various measures. For example, the General Rules for forest conservation introduced in the Punjab hills in 1855 regulated the communities' access to timber and the Land Preservation (chos) Act of 1902 enabled closure of non-protected forest lands in the Shiwalik. Despite various Regulatory measures adopted by the government, degradation of forests continued unabated. The situation finally came to a head at the **Forest Officers Conference in 1935** and a resolution was passed recommending that the possibility of forming village forests be examined and a commission be appointed to decide the steps to be taken in each district of the outer Himalayas to involve the villagers in the conservation and management of forests.

Accordingly, the **Garbett Commission** was appointed under the presidentship of Sir Colin Garbett in September 1937. The Commission's terms of reference were focussed on three major issues/questions described below:

1. What are the difficulties experienced by those who live in and near forests as a result of their existing system of management?

2. How can these people be best interested in conserving and managing the forests?
3. How can their co-operation with the FD be encouraged and secured?

The Commission observed that in Kangra district (excluding Lahaul and Kulu area), only about 20.4% of some 8.08 lakh acres of forest was being managed scientifically and the rest (79.6%) was over-burdened with rights of the users and was fast deteriorating. Further, only about 2.25 % of the total forest area in Kangra was closed to grazing.

The Commission stated that, villagers will be interested in management only if profits accrue to them. Therefore, it was recommended that special panchayats should be set up which would manage the forests in line with the simple Working Plans and implement voluntary closures wherever necessary. They were to manage all classes of forests as a composite village forest (including the protected and the reserved forests with the aim of securing the maximum crop (of forest produce) for the benefit of the villagers. These forest estates were co-terminus with the ancient fiscal divisions of *mauzas* (villages). In Table 1, we present the estimates of the area under different classes of forests existing in 1937.

The cost of management was to be met from the proceeds of the sale of forest produce. It was suggested that panchayats may be associated with the management of forests.

The Punjab government accepted the recommendations in 1938 with the modification that instead of panchayats, village level co-operative societies be made responsible for the management of the village forests. A full-fledged division namely, the Kangra Village Forest Division was created in 1938 to manage the scheme*

The Registrar, Co-operative Societies, was also asked to step in. Accordingly, a VCFS Cell was constituted to supervise the distribution of revenue, audit the accounts and oversee the business activities of the societies. Thus, three government departments namely, the FD, the Co-operative Department and the Revenue Department represented by the Deputy Commissioner, Kangra were associated with the scheme.,

On September 26, 1941, the FD issued a set of rules called the Kangra Forest Society Rules to facilitate the implementation of the government's decision to manage the state forests through the VCFS. These rules specified various provisions of the scheme. Some of the main provisions were : a) that all types of forest land could be transferred to the VCFS; (b) that management was conditional to the acceptance of the Working Plan; and (c) that the powers and duties of the Forest Officers and *Rakhas*

appointed to assist the society had a legal basis. Extracts of the important rules are given in Annexure 1.

Two further notifications, similarly dated, transferred certain powers to the Forest Officer and the *Rakhas* under specified sections of the Indian Forest Act, 1927.

The first VCFS was formed in Bahnala village in 1941. By the time of Independence, some 52 VCFS had been formed in the district. The pace slowed down thereafter and by 1953, when the last society was formed, some 70 societies were in existence. These societies were managing over 58,000 acres of forest land, 47.3% of which was undemarcated protected forest (Tables 1 and 2).

The objectives of these societies, as stated formally, were:

1. To protect, improve and regenerate the forest.
2. To meet village requirements of timber, fuelwood and fodder.
3. To increase grazing and fodder resources by rotational closure and by planting fodder and economic crops (forest products).
4. To prevent erosion and denudation of the forest areas.

Income and Expenditure

The main source of income of the VCFS was the government grant. After paying the zamindari share the remaining sum was called the net government grant [3]. A secondary source was the miscellaneous income to which the proprietary body had exclusive title [e.g. grass, fruits, revenue from quarrying stones and income from water mills] which was first distributed among the *khewatdars* according to their rights and the remaining amount was the net miscellaneous income.

The net government grant and the net miscellaneous income together constituted the net distributable income. After deducting amounts for various funds such as reserve fund, forest improvement fund, common good fund, etc. followed the deduction of the amount of working expenses incurred by the society in the past year. The remaining sum was then distributed among the members. The system of distribution, however, varied from society to society.

Financial Assistance

From 1940 onwards, the FD used to make an annual grant-in-aid of Rs.50,000 to establish and manage the VCFS. Shortfalls in the revenue of the societies was met from this grant-in-aid, especially for plantation and forest improvement activities.

Since 1961, however, the government's contribution to the grant-in-aid was discontinued and each society simply returned its own income in the form of grant-in-aid. The procedure of securing the grant-in-aid was cumbersome involved as it did the Co-operative Department, the Treasury and the FD. Since 1971, however, this too was stopped and no grant-in-aid has been given in the last 20 odd years.

External Control of the Forest Societies

The VCFS, by virtue of managing forest lands, had been devolved certain powers by the FD. These powers included the right to frame their own rules and to fine offenders at their own rates. In fact, the Forest Officers were given powers equivalent to those of the Divisional Forest Officer (DFO).

The FD had transferred the forest estate to the VCFS subject to their acceptance of the Working Plan prepared for the forest estate. The main role of the FD was to provide technical guidance to the VCFS and prepare their Working Plans.

The Co-operative Department was to look after the business aspects of the societies, including conducting regular elections and distribution of income. The administrative control rested with the Registrar, Co-operative Societies, including the power to remove employees, dissolve a VCFS, hear appeals, etc.

This dual control led to less than efficient control of the VCFS. Society formation slowed down in the post-independence period and eventually in 1953. The Rawal Working Plan mentions that the FD has not been able to provide adequate guidance to the VCFS. In 1971, an effort was made by the FD to push through a total of 5 amendments to the bye-laws. These amendments were essentially aimed at replacing the Registrar, Co-operative Societies as the controlling authority over the VCFS, with the Conservator of Forests. These bye-laws dealt with the power to appoint and dismiss the Forest Officer and the *Rakhas*.

The threat held out for the non-complying VCFS was that the grants-in-aid, which had to be finally sanctioned by the DFO would be withheld. Some 15 odd societies agreed to these amendments imposed by the FD and got grants-in-aid for another year.

In 1973, however, the government notification regarding the continuation of the VCFS scheme, lapsed and was not issued. No grants-in-aid were issued after 1973.

Thus, legally while the VCFS were in existence (and were even audited by the Co-operative Department which charged an audit fee); their income was restricted. The VCFS were entitled to only meagre sources of income such as fine

recovered from offenders, sale of minor items like grass, auction of small amounts of seized timber and grazing fees, The bulk of the income, coming from the zamindari share of the *khewatdars* in the sale of timber and resin from the CFS forest estates was stopped and the societies slowly slipped to low levels of income and performance.

Salaries of the Rakhas and Forest Officers remained pitifully low - (ranging from Rs,10-40/month) and were obviously not conducive to effective conservation.

Forest improvement works also received a set back. Paths and boundary pillars were not repaired and planting of trees was not taken up.

The controversy over the role of the FD and the Co-operative Department in forest management is yet to be resolved, and the high powered committee appointed in 1990, to resolve this issue is yet to meet.

The Bahxiala Co-operative Forest Society

To understand and analyse the internal management practices which have evolved in these societies and the manner in which the local people have been managing their common property resource (in the absence of government support)/ three societies were studied in Kangra district. These were Bahnala and Khaniyara VCFS in Kangra tehsil and Paisa VCFS in Dehra tehsil.

The main case study presented in this section is based on the Bahnala CFS and the insights gleaned from the study of the two other societies are used to highlight the important similarities and differences in management practices. A profile of these three VCFS is given in Table 3.

Managing an area of 832 acres, the Bahnala CFC Society is based in the *mauza* of Bahnala [see Map].

The village is composed of nine *tikas* (hamlets), namely, (1) Gorda, (2) Kamlahari, (3) Bahnala Khas, (4) Basa, (5) Dharamsal, (6) Chauri, (7) Hada, (8) Kasar, and (9) Nahalan.

Bahnala is a village of some 500 odd households in the district and tehsil of Kangra, 4 km off Shahpur, which lies on the Dharamshala - Pathankot motorway.

Characteristics of the Resource

The forest managed by the society is a predominantly Himalayan sub-tropical *chir pine* jungle with large tracts of *chir* (*pinus roxburghii*), with a mix of broad leaved

species like *ban oak*, *dhaman*, *krail* and others commonly known as *hansu* (scrub species useful for fodder and fuel). Grass yield, once plentiful is now declining, though it is better on the higher patches. The village is about 1,200 m above the mean sea level. There is a profusion of 'weed' shrubs in the mixed broad leaved jungles, chief among which is *lantana* (*lantana camara*).

The *chil* jungles, of course, have limited undergrowth of both shrub and grass which varies inversely with the density of crown cover. The forest cover is comparable to the reserved forest nearby and is quite commendable, given the penurious state, of the Bahnala CFS.

The forest is a source of fuel and fodder for the village folk. There is partial subtractability in the use of fuelwood and fodder (grass and leaves) as each individual is potentially capable of subtracting from the quantity available to others but within limits, so that all users can derive benefits jointly. There are limits to grazing, beyond which sufficient quantity of grass will not regenerate. Similarly, cutting green branches indiscriminately will reduce the stock and retard future growth. Most importantly, perhaps grass should be allowed to flower and shed seeds before being cut and trees/shrubs should be allowed to grow unhindered during the rainy season when the rate of growth is highest.

Access to fuelwood and fodder is partially controllable in the Bahnala CFS, wherein people not having rights in the forest estate may be denied entry.

These, common property resources are also physically divisible and rights use can therefore be divided among private property holders. This, in fact, is accomplished via the grass auctions which privatise the access to grass in compartments closed to grazing from August to March every season.

Governance

We shall now focus on the rules that structure the individual and collective choices with respect to the Bahnala CFS forest estate. The General Body of the CFS has 360 members, out of which 85 are from the Scheduled Castes. In 1991, the village population was 3,229 of which 1,012 (about 31%) were from the Schedule Castes.

Membership

The criteria for membership of the CFS are as follows:

1. The person should be a *khewatdar*, i.e., an owner of agricultural land in the village and paying land revenue. He must also be a right holder of the first

class listed in the Kangra Forest Settlement Report by Anderson.

2. The person should be a permanent resident of the village, The Gaddis from Chamba who reside in the village but also maintain their Chamba house and derive benefits there, have not been granted membership.

For new membership, each name has to be proposed in the village general body meeting and approved by the house.

New members are admitted in the society at the time of the general body meetings. (usually twice a year). The membership fee charged is Rs. 5 only.

The village having some 500-600 households has only about 360 members. A small percentage of people are not eligible for membership as they are not *khewatdars*. Thus the poorest in the village are not eligible to be the members of the society as evidenced from Case 1 cited below.

CASE 1

Purushottam Ram of tika Bahnala Khas was not a *khewatdar*, but became a member by professing to be a *khewatdar* in his application. However, his case was detected soon, and his membership cancelled. While such cases are rare, they highlight the inequitable and restrictive norms of membership.

A significant minority, however, are not members despite being eligible. Thus, it seems that there is no major difference in the treatment of member and non-member *khewatdars* by the society [4].

The Managing Committee

The members of nine *tikas* choose seven representatives for the Managing Committee (MC), one from each *tika*. The exceptions are Kasar, which with 4-5 households does not send any members and Chauri and Hada, which are clubbed together as one ward - there are therefore seven wards for choosing the members. Each ward votes separately for its member. Thus each member is directly responsible to his own ward. In the past, the elections were held by a show of hands. In 1991 however, on demand from the people, they were held via secret ballot.

The Managing Committee currently in power consists of the following:

Post	Name	Tika
1. President	Rustom Singh	Nahlan
2. Vice-President	Prem Lal	Gorda
3. Cashier	Beni Ram	Basa
4* Members	Amar Singh	Kamalahadi
5. -do-	Ravinder Singh	Bahnala Khas
6. -do-	Joginder Singh	Chauri
7. -do-	Bhagat Ram	Dharamsal

Source: Audit Report 1991 and personal communication.

The posts which are honorary are filled up by indirect election. Once elected, the MC appoints the office bearers from amongst its seven members. The MC meets twice a month to discuss the affairs of the CFS. A simple majority of the MC members is necessary to complete the quorum.

The MC is aided by one Secretary, one Forest Officer, and three *Rakhas*. The Secretary handles all the books of accounts and records of the society. The Forest Officer is supposed to manage the *Rakhas*, collect the dues, and implement all forest protection and improvement schemes. The *Rakhas* or forest guards protect the forest and catch the offenders.

The MC appoints the Secretary, the Forest Officer and the *Rakhas*. The right of dismissal also rests with it. The employees however have the right to appeal to the Registrar as per the Co-operative Societies bye-laws.

The MC is responsible for the day-to-day supervision and formulating working rules e.g., rules for grass auction, beat of the *Rakhas*, etc. A substantial change in the rules requires an amendment which has to be ratified by the General Body.

The term of the MC was originally one year extendable to 18 months (2 years in practice). This has been amended to two years, extendable to three years. The membership fee has been increased from Rs. 3 to Rs. 5, the upper limit for penalties increased from Rs.100 to 500 and the lower limit below which there is no appeal increased from Rs. 10 to 50.

All these changes were made on February 19, 1988 during the presidentship of Major Hukam Singh, one of the more energetic Presidents of the CFS.

Functions and Management

The Bahnala CFS is supposed to undertake the following functions:

1. Protection of the forest
2. Damage collection
3. Enforcement of rotational closure of plots
4. Managing grass auctions
5. Ratifying timber distribution and *bartan* applications.
6. Effecting improvement in the forests by building boundary pillars, paths, and plantation
7. Putting out fires which frequent chil forests.
8. Preventing encroachment of the forest estate of the CFS.

The society has evolved the following rules and norms to manage their forest estate in an equitable and efficient manner.

Protection and Damage collection

The *Rakhas* patrol the forest area of the VCFS. They have a list of offences and the corresponding fines. Offenders are charge-sheeted on the spot and made to acknowledge their infringement.

The VCFS's are allowed to fix their own damage rates as per their bye-laws and the Kangra Forest Rules. While the rates are fixed for small infringements, for major damages, like felling a tree - the fine depends on the species and the girth of the tree. The actual amount of fine is determined by the Managing Committee which often exercises leniency in such cases. Fines are often reduced keeping in view the economic condition and attitude of the person - the idea being that if full fines are levied unilaterally, then the offender will merely cut more trees to recoup the loss.

Thus, society fines are invariably lower than the rates prescribed by the FD.

Rotational Closure

Rotational closure is usually recommended by the FD for regeneration of grass and trees. Plots which are freshly planted are also closed for about two years, to give the trees a chance to establish themselves. Enforcing closures with village support was one of the prime reasons for setting up the Kangra VCFS's. Closure has been successful in the Bahnala CFS.

Grass Auction

Closure is intimately linked to the auction of grass. The right to cut grass in the closed plots (where entry of cattle is prohibited) is auctioned. In other forest areas cattle are allowed free access. This right to auction grass from the forest estate under its management vests with the CFSs and the FD upholds this right as is evidenced by Case 2 cited below.

CASE 2

A religious group, Samleshwar Nag Samiti, in Yol VCFS staked a claim on the proceeds from the grass auction, for building a temple, saying that grass belonged to the whole village. This view was not accepted by the FD, which affirmed the right of the VCFS to auction grass.

Any inhabitant of the village (mauza) can bid for the right to cut grass. Compartments (demarcated and coded by the FD) are auctioned to individuals who later divide them into parcels and lease out to actual users for the year. The grass season extends from July-August to 31st March. Fifty percent of the amount*has to be paid on the spot and the rest may be cleared by the year end. In practice, however, the balance is invariable overdue in every year.

Players in the grass auction

Managing Committees conducts the auction)

Contractor : buys grass rights for a compartment

Lessee : buys rights for a sub-compartment

The auction serves to partition the main grassy areas between the users. Use rights are given to the contractor for each plot who in turn passes them on to the actual users. The onus of protecting the closed areas is Ibhush transferred from society to the right stakeholders who protect their own patch of grass. The Rakhas merely have to *guard* against grazing and damage to trees. For his troubles, the contractor gets free access to one of the sub-plots (he may not charge more than what he has paid for the plot) . The society in turn is saved the bother of collecting dues from a large number of people.

The dynamics of grass auction is somewhat as follows. There is usually a small set of people who bid for the compartments. The users who take lease rights consider factors like their proximity to the plot, the quality and

quantity of grass obtained from the plot and their personal requirements (which depends upon number of livestock).

A tradition has been established in the village whereby the annual lessee of a sub-plot has the first option of taking that sub-plot. Usually this does not change from year to year, even though the contractor might change occasionally.

The contractor's stake in the plot is limited to the free subplot which he gets, a high bid simply means that he will have to collect more rent from unwilling lessees, that too for the VCFS. Further, as each sub-plot is not auctioned individually, a high price will hurt the lessees collectively - as a result [bids] stay quite low in Bahnala CFS. There are year-to-year fluctuations, of course, and bids may rise, especially if there is a tussle between two bidders.

The MC sets a *Sarkari* (reserve) price for each plot and tries to push up the price to at least half the *sarkari* price.

Timber Distribution and *Bartan* rights

The restrictions on the rights to timber and *bartan* (fuelwood) by the FD are one of the sore points with the office bearers of the CFS.

There are three types of issue rights:

1. Timber is granted exclusively for building purposes at a nominal rate of Rs. 1 per tree (its market rate would be a few thousand rupees). Only *khewatdars* are eligible for this.

The CFS, on receipt of his timber right application, checks that the person has not availed of his timber right in the last five years, and that he needs it for a genuine reason. It is then ratified by *the Patwari, Pradhan*, forest guard and the CFS and sent, along with other applications, in one lot to the DFO, the competent authority for approval.

In a bid to provide a differential benefit to its members, the Bahnala CFS forwards the applications of members only.

2. *Bartan* is granted for ceremonial use, e.g., marriage, death, etc. The President has to ratify the application while the sanctioning authority is the

Range Officer. In practice, usually, the tree is first cut and then the application is forwarded.

3. The third type of *bartan* right extends to dry, dead and fallen trees. Applications of both members and non-

members are ratified, the stated logic being that no one should bear hardships in times of ceremonial need. In this case the MC has the authority to grant the tree to any one it deems fit - this is the major discretionary power currently at its disposal. About 15-20 trees are culled annually.

Till 1966, the MC had an annual quota of broad leaved trees earmarked for *bartan*. This practice has been discontinued and the Range Officer appointed as the sanctioning authority. This curtailment has created considerable resentment within the society. It has also led to a situation where the CFS and the entire village has a vested interest in damaging healthy trees, so that they dry up and die - thus becoming available to the society as *bartan*.

Forest Improvement

Previously, forest improvements were implemented from the grant-in-aid funds. Thus the Bahnala CFS records speak of check dams, paths and boundary pillars built in the 60s. However, with the drying up of grant-in-aid, these activities could not be continued. Recently, resolutions have been passed in the meetings of the MC and sent to the DFO, regarding construction of check dams in P~7, a compartment in the protection circle and facing severe erosion. The response however is nil. Plantation is another activity that was initially entrusted to the CFS. In the 40s and 50s extensive plantation work was carried out by the CFS., e.g., in 1947, over 2,500 saplings of 18 broad leaved species were planted in Bahnala itself.

Now, however, the FD's accent is on species like chil, sal and eucalyptus - all economic species which do not give fodder. A small social forestry plantation has been raised, but it is not perceived by the villages to be their own (Case 3).

CASE 3 Species preference

An exercise was undertaken to ascertain the species preferred by the village folk. The most significant response was from a couple. Prithvi Singh suggested economic species with valuable wood - e.g., Tali (*Dalbergia sisoo*). His wife retorted that tali is useful only for thieves - fuel and fodder species would be more useful. A majority of the men spoken to suggested a mix of economically valuable species and *bansu* species (scrub trees, useful mainly for fuel and

In 1990, the MC decided to fence and plant a small compartment (U-20) in the middle of the village. The

species chosen was *ritha*, preferred as the fruit is inedible and has an economic value. This was done to restrict its use as a path by people entering the forest and to preempt the encroachment. However, plantation by the CFS is very rare now, as revoking of the grant-in-aid has shrunk the income of the society.

Forest fires

Similarly, the villagers are largely apathetic towards fires in the forest. This was not the case when they received their share from sale of timber and resin. An old timer, Dharam Singh, talks of the many nights spent in the forest, putting out fires in his youth. The lack of support is evident from a resolution passed in the MC (dated 20.7.89) which says that in case of a fire in the jungle, those who do not assist will not be given *bartan* in future. In fact now, perversely, a fire is in their interest as they have a right to the dry and dead trees.

Encroachment

There have been 4-5 cases of encroachment in the society's forest estate, mostly in the undemarcated areas. Apart from one or two blatant encroachments, most of them involve landless people legally settled on revenue land falling within the forest estate, who slowly extend their boundaries and usurp the forest land.

The threat of encroachment has influenced the actions of the CFS as well. One of the reasons for planting on plot U-20 during 1990 was to prevent encroachment of the same.

The society's experience with the revenue authorities in this matter has not been heartening. Despite much effort, the society could not evict one Mr Churu Ram who had settled on the village forest land. The required support from the revenue authorities was not forthcoming.

This then is how the Bahnala CFS manages its forests and fulfills its functions. The next part examines the rights and behaviour of members and non-members vis-a-vis the Co-operative Forest Society. This section is rounded off by a brief examination of the internal and external environment of the society and its impact on the operations of the society.

Members and Non-members

The state of the members and the non-members of the VCFS is not widely different, as Table 4 highlights. Non-members can not have their applications for timber rights forwarded by the society. But so far as the *bartan* rights are concerned,

although they are given lower priority than the members, they are not denied *bartan* in times of necessity [Table 4]. Further, both the members and the non-members are actively involved in the theft from the forest estate, and causing damage to it; membership does not deter theft [Table 5].

In better days (pre-1971), dividend used to go to the members. This practice has now stopped. Thus the stake of the members in the society is rather low now as the economic benefits from this resource are not flowing to them.

The worst off are **the** non-khewatdars who neither have any timber right nor are eligible for membership. As expressed by one of the *Rakhas*, Puran Singh, "they are really in the hands of god". The landless households, however, are very few in the village; many of them have been allocated land in the last two decades.

The External Environment and its Impact on the Operations of the Society

The curtailment of *bartan* sanctioning powers of the MC and the drying up of grant-in-aid has made both the members and the officers quite apathetic towards the society. Their only source of income are interest on deposits, fines and revenue from grass auction (Table 6). These barely cover the salaries of the staff which any way are quite meagre. The *rakhas* after a massive increase in salary, now get only Rs.100 per month. So, obviously they cannot be expected to **fulfill** their duties conscientiously. The *rakhas* visit the forest some 3-4 times a week only. With such low salary levels, the MC authority to effectively haul up the *rakhas* is eroded. Similarly, the Secretary and the Forest Officer too get just Rs.2 00 each per month. Secondly, plantation and forest improvement an essential function of the CFS has stopped entirely due to lack of funds. This is a far cry from the 1940s when large plantations were undertaken.

The revoking of the government grant-in-aid has really pushed the society to a sub-optimal level of performance. Also, previously the labour for tapping of resin was hired from the village itself. For the last three years, however, the Forest Corporation has been getting labour from outside the village. This has reduced the income flow to the villages, further alienating the community from the forest.

This alienation is reflected in the damage reports, where a majority of the offences are caused by members themselves (Table 5).

The number of damage reports filed, however, does not seem to change very much, usually hovering around the 100 mark.

Also, when a few people are observed to be taking thick or green branches for fuel (both are infringements) and they are not stopped, then mutual forbearing behaviour breaks down and more and more people adopt similar damaging behaviour.

This is not to say that there is no order in the Bahnala CFS. The *rakhas* still do their patrolling and catch offenders. Their real skill lies in catching those who indulge in illicit felling, around ten cases are ferreted out every year. It is rare that people are caught on the spot, it is usually an information leak which gives them away. It is here that the character and the credibility of the *rakha* come into play. Some *rakhas* are very effective in managing their fellow villagers and digging out information. But despite all these efforts, the productivity of the forest is not being maintained. ■

Thus, we see how factors in the external environment like government notification, curtailment* of the flow of grant-in-aid and other rights combine with internal ones, e.g., nature of management, to influence the enactment and enforcement of rules in a common property resource situation. Besides, the characteristics of the resource impose other conditions on management, viz., seasonal closure, rotation, etc.

Conclusions and Implications

On the basis of the overview of the evolution and functions of the VCFS and the analysis of the experience of the Bahnala CFS presented in this paper, the following conclusions can be drawn:

1. Local people can and will co-operate to protect natural forests if they are granted exclusive property rights in them, have high stakes in them and are assisted technically and financially by the government. Property rights are required to assure the people that they will receive the benefits from their contribution to protection of forest and high stakes will ensure sustainability of their interest in co-op protection and management of forest.
2. Given the necessary autonomy, flexibility, and administrative and financial powers, the VCFS can formulate, implement and monitor rules and regulations for the protection of their forest; harvesting, distribution, and marketing of forest produce and for excluding the free riders from having access to their forest estates. Autonomy and flexibility are needed to frame and change rules and regulations according to peculiar and changing physical and technical characteristics of forest, socio-economic characteristics of local people and their needs, and the

decision making environment--both internal and external to the forest co-ops. Administrative and financial powers are required for ensuring smooth and successful operation and management of the forest co-ops.

3. The role of the government should be confined to providing legitimacy and technical and financial support to the forest co-ops. It should refrain from attempts to take over the control and management of the co-ops and view them as partners, not as adversaries.

Table 1
 Area Under Different Types of Forests in Kangra, 1937

Forest Type	Area (Acres)
1. Reserved Forest	1,590
2. Demarcated protected	17,460
3. Undemarcated protected	27,554
4. Uncleared forest	9,317
5. Ban Maufi	178
6. Shamlat	235
7. Private route	823
8. MalJciyat shamlat	1,070
Total	58,221

Note: These figures are dated and not adjusted downwards for a) allotment to landless people, b) transfer to other uses, and c) encroachment.

Table 2
 Tehsil-wise Number and Area under Co-operative Forest
 Societies in Kangra District

	Tehsil	No. of CFS	Area (acres)
1.	Kangra	16	20,986
2.	Palampur	17	7,380
3.	Dehra	11	10,508
4.	Nurpur	26	19,347
	All	70	58,221

Sources Rawal's Working Plan for CFS's, 1968-69 to 1983-84.

Table 3
A Profile of the Selected Village Co-operative Forest Societies

Particular	Societies		
	Bahnala	Khaniyara	Paisa
1. Year when registered	1941	1945	1944
2. Gram Panchayat	Banhala	Khaniyara Darhi	Paisa Khafoli Shivnath Muhl
3. No. of <i>tikas</i>	9	9 + 8	n.a.
4. Forest area type	All types*	All types	All types
5. Working Circle classification (in ha)			
Chil	190.98	-	-
Oak	-	117.34	-
Fuel and Fodder	71.61	1576.33	195.43
Coppice with Standard	42.88	-	126.64
Bamboo Plantation	-	607.31	60.29
Protection	31.16	2855.25	431.71
	-----	-----	-----
Total	336.63	5156.23	814.07

* The societies covered all types of forest land including reserved forest.

Table 4
 Access to VCFs Forest Benefits by Members and Non-members

Benefits	Members	Non-members
1. Forwarding of TD form	yes	no
2. Bartan	yes	yes
3. Utensils for hire	yes	yes
4. Plot in grass auction	yes	yes
5. Service of inns	yes	yes
6. Firewood collection	yes	yes

Table 5
 Year-wise Number of Cases of Damage to the VCFS Forest
 Caused by Members and Non-members

Year	Total number of damage reports	No. of Damage reports against	
		Members	Non-members
1991-92	102	--	--
1990-91	84	80	4
1988-89	135	120	15
1987-88	67	--	--
1973-74	103	94	9
1972-73	90	87	3
1971-72	90	85	5

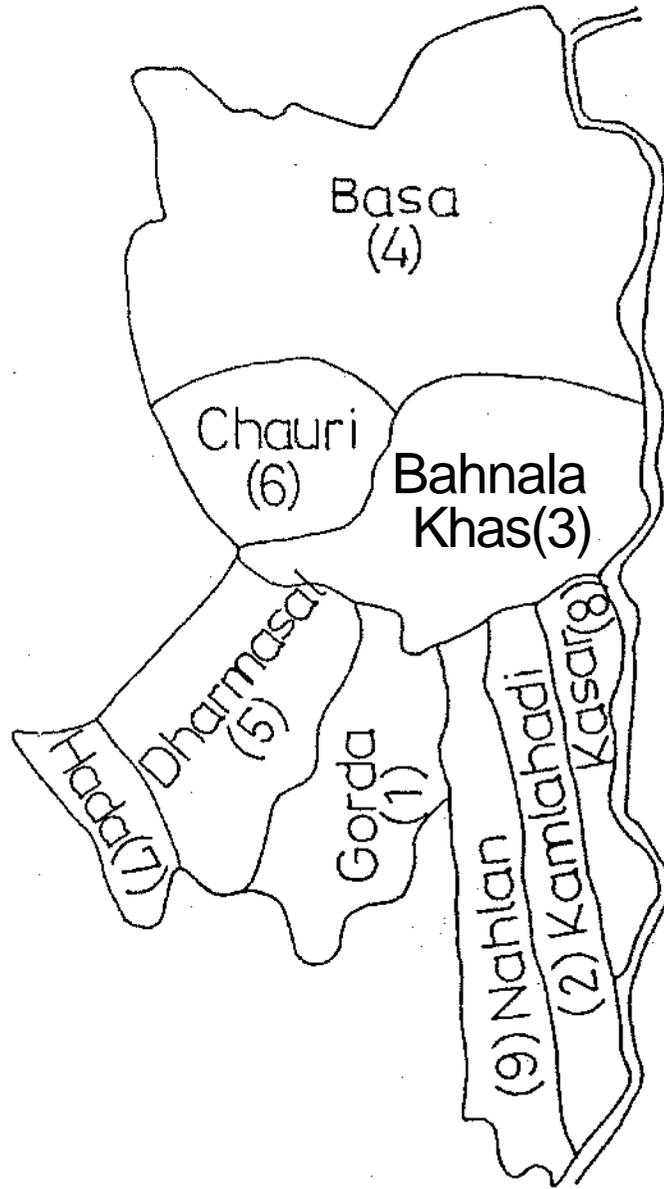
Source : Audit reports for various years.

Table 6
 Income and Expenditure of the Bahnala CFS
 Under Selected Heads

(Raw)

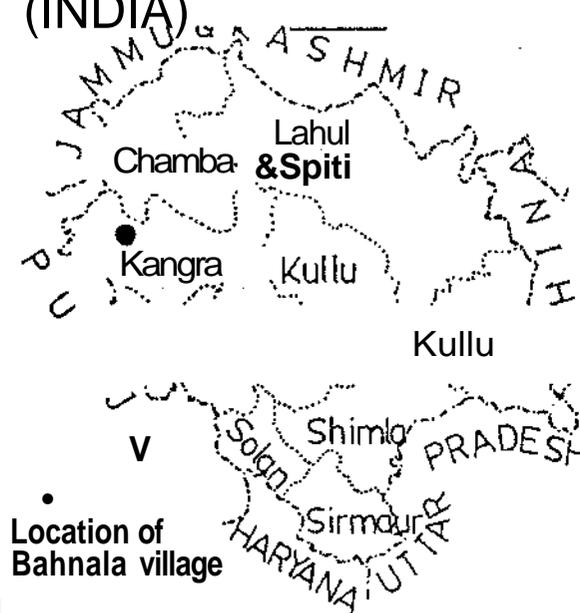
Item	Years		
	1990-91	1989-90	1988-89
Income			
Interest	5,098	7,685	5,145
Trees auctioned	750	400	1,350
Grass auction	3,325	2,655	3,065
Penalty	1,554	1,918	2,416
Grant-in-aid	--	--	--
Total income	10,727	12,658	11,976
Expenditure			
Salaries	5,880	8,020	7,326
Forest dev.	-	-	-
Building repair	700	-	-
Total expenditure	6,580	8,020	7,326
Net Profit	4,147	4,638	4,650

Map showing the mauza of Bahnala village, kangra Block,
Dist Kangra, Himachal Pradesh (India)



Not to scale

Map showing the location of Bahnala village,
Rangra Block Dist-Kangra, Himachal Pradesh
(INDIA)



Annexure 1

Extracts from the Kangra Society Rules*

(Issued vide Notification No. 2742 Ft. dated September 20, 1941, exercising the powers under Clauses (a) and (b) of Section 76 of the Indian Forest Act, 1927)

Rules

1. These rules are called the Kangra Forest Society Rules. Their aim is to give effect to the decision of the government to manage the State forests in certain selected areas of Kangra district through the Co-operative Forest Societies (CFS).
2. All Kangra CFS fall under The Co-operative Societies Act II of 1912.
3. Subject to such limitations as it may deem fit, the government may appoint any Society to manage all types of forests-reserved, demarcated, protected, undemarcated protected, and unclassified forests and form one economic unit for their management.
4. The management of the forests will be done as per the provisions of the Indian Forest Act 1927 and according to the Working Plan drawn up in consultation with the CFS by a Forest Officer (FO). The management by the society will be conditional upon the acceptance of the Working Plan by members of the Society.
5. The FO and the *Rakha* will assist the Society to manage the forests according to the Working Plan. In dealing with any member or his rights or property, the FO and the *Rakhas* will be bound the by-laws of the Society, wherever applicable. For non-members, they will exercise the powers conferred upon them under the Indian Forest Act, as servants of the government under the direction of the Divisional Forest Officer (DFO), Kangra Forest Society Division. Such powers will be exercised to carry out the management of the forest in accordance with the Working Plan prepared for each Society.

The Forest Officer shall perform the following duties:

- i) In case of damage to the forest done by non-members, take cognisance of and report to the DFO.
- ii) Supervise the work of the *Rakhas*
- iii) Perform the duties of the *Lamhardar* for the purpose of certain specified rules.

6. For the purpose of these rules the officer mentioned here is the DFO or the FO on his behalf.
7. The Societies will be responsible for all expenditure for conservation of forests according to the Working Plan. Where the net income is low, the expenditure on works including pay may be met by the government.

* Extracted from Glover (1944 ; 95-96).

Notes

- [1] For details of *Van Panchayats*, see Ballabh and Singh (1988).
- [2] Ten states in India have already issued government decrees/orders enabling community participation in forest management.
- [3] Conventionally, the *zamindars* of Kangra and the village servants used to have a share in the revenue from the forests. The share used to be locally known as *zamindari* share or *haq-zoharrum*. The *zamindari* share was due from the following sources: market sale (24%); corporation lots (25%); and timber distribution (50%). The *zamindari* share used to be distributed as follows: share of *Khewatdars* (50%); share of *Lumbardars* (19%); share of *Patwari* (12%); and share of the *Rakhas* (19%).
- [4] In 1942, out of 468 right holders, only 179 (38%) became members of the CFS. (Sources seen from an Inspection Note of 1942 in the Files of FD).

References

- Ballabh, Vishwa and Katar Singh (1988). Van (Forest) Pancha ats in Uttar Pradesh Hills; A Critical Analysis. Research Paper 2. Anand : Institute of Rural Management.
- Glover, Sir Harold (1944). Erosion in the Punjab : Its Causes and Cure (A Survey of Soil Conservation). Lahore: The Civil and Military Gazette Ltd.
- Singh, Katar (forthcoming). Managing Common Pool Resources: Principles and Case Studies. New Delhi : Oxford University Press.

Workshop-9

PROBLEMS MID PROSPECTS OF **CO-OPERATIVES** IN MANAGING
DEGRADED LANDS - A CASE OF SALXME AMD WATER-LOGGED SOILS

K.K. Datta and F.K. Joshi

Abstract. The study is intended to identify problems and prospects of community approach in the form of co-operatives in curing or preventing saline and water-logged soils. The study is based on some Operational Research Projects on sub-surface drainage in Haryana and Gujarat. The technology of sub-surface drainage as a measure to control salinity and water-logging is technically feasible and financially viable. In the absence of appropriate institutional set-up> the technology could not be widely adopted. Management of saline and water-logged soils seek community approach and collective vigilance. In this context, co-operatives may have a significant role. However, several factors determine success of the drainage co-operatives. These are: a) problem of free riders/ b) disparity in assets, c) heterogeneity of caste and religion of members, d) participation of beneficiaries, e) conflicting objectives, and f) perception of the programme objectives. The participation score in managing saline and water-logged soils was found higher amongst poor farmers. Differential persuasion and education strategies depending upon the need and participation score may facilitate managing problem soils through the co-operatives .

Key Words, Operational research project, aline and waterlogged soils, sub-surface drainage.

Introduction

Land is one of the most important natural resources. It has alternative uses to meet the diverse needs of mankind. Intensive application of complex agricultural, technologies and unabated exploitation of land has attained higher agricultural growth. Ironically, in the race of increasing agricultural production, the health of the land was largely unattended. The long-term impacts of such actions started threatening the sustainability of natural resources. Of the several examples, land degradation is reckoned a serious problem at global level.

It has been reported that all over the world 4.5 thousand million hectare area is degraded (Mabbutt 1984) and is threatening the sustainability of agricultural growth. India is no exception to this menace. There are many causes of land degradation. Among other causes, soil salinity and water-logging are most critical in arid and semi-arid

regions of surface irrigated areas. The present paper focuses on the technologies and co-op management of these soils.

The available estimates show that at the global level, about 1.5 million ha is lost annually as a result of excess salts in soil and water-logging (Brundtland et al. 1987). Diverse statistics is available on the extent of these kinds of soils in India. The existing estimates range from 5.5 to 13 million ha. Ironically, neglect towards the health of land and excessive human interference are responsible for emergence of these soils.

Management of these problem soils depends upon their genesis. Technologies are available to cure and prevent these types of soil degradation. The important measures are provision of appropriate land drainage, improved water management practices, selection of crop-mix of low to moderate water requirement. Among available technologies, agricultural land drainage [1] is gaining importance as curative or preventive measure. Unlike seed-cum-fertilizer technology, the success of agricultural land drainage largely depends upon the nature and extent of participation by the farmers as a group or community* The technology was found technically feasible and financially viable under a set of environment, The socio-economic and organisational environments were overlooked in managing problem soils through agricultural land drainage. That is why the technology could not be widely adopted by the farmers.

In the past, there were some passing references that a formal or informal group approach has immense role in managing such soils. Community management of soil resources requires a different strategy in comparison to production and marketing of agricultural and livestock enterprises. This area is yet to receive the needed research and policy attention. Therefore, a study that identifies problems and prospects of group approach in the form of co-ops in curing or preventing land degradation may provide useful policy prescriptions for sustaining the productivity of land in a rapidly rising population age.

Keeping in view the urgency to efficiently utilize degraded lands and avert the process of land degradation, the present study was undertaken with the following objectives: a) to show the technical and financial feasibility of sub-surface drainage for control of soil salinity and water-logging, b) to address the rationale of co-ops in managing degraded lands, c) to explore a case of a drainage co-op, and d) to identify factors determining success or failure of co-ops in managing degraded lands.

The study Area

The study is based on a few Operational ^AResearch Projects related to the management of water-logged saline soils in two states, namely, Haryana and Gujarat. A large part of the population of these two states is predominantly dependent on agriculture. A sizeable area in these states is subject to the risk of land degradation. In Haryana, an area of about 0.4 million ha is seriously affected by these problems. There are reports that it may increase to about 1.5 to 2.0 million ha in the next two decades. Considering the seriousness of the problem, a number of research/pilot projects were undertaken in several villages throughout Haryana. We selected five sites, namely, village Ismaila in district Rohtak; Ujahana, Bhana-Brahamana and Kola-Khan villages in district Jind; and village Mundalana in district Sonapat.

Introduction of surface irrigation through major irrigation projects is posing a serious threat to the agricultural economy of Gujarat. It has been reported that an area of 1.7 million ha is facing marginal to severe problem of soil salinity and water-logging. We selected four drainage sites in district Kheda. These were executed in a collaboration between the Indian Council of Agricultural Research and the Water and Land Management Institute (ICAR-WALMI) under the technical support of the Central Soil Salinity Research Institute during the period 1987-88 to 1990-91. The sites were located at village Dabhau in Petlad taluk and Moraj, Vally and Padra villages in Khambat taluk.

Data and Analytical Technique

The study was based on primary data collected from the beneficiaries. In all the sites, a bench-mark survey was done before taking up the drainage measures to control salinity and water-logging. Their performance was regularly monitored by interviewing the farmers. Time-series information of each beneficiary was generated on land and resource use pattern, crop choices and their yields, prices of input and output, improvement in the soil, etc.

To work out the cost of agricultural land drainage, the official records were also used. Itemwise and operationwise costs of land drainage were worked out for each site. To demonstrate the financial feasibility of agricultural land drainage, benefit-cost analysis was carried out with the help of conventional methods, namely the benefit-cost ratio, the net present worth and the internal rate of return.

To show the rationale of co-ops in managing saline and water-logged soils, the experiences gained from various locations are addressed. These are essentially intended to demonstrate that future of agricultural land drainage is bleak in the absence of appropriate institutional structure,

including co-ops. The Gini concentration ratios of land holdings of beneficiaries for each site were calculated to see the disparity in the land ownership. It was viewed important factor in the formation of co-ops. An in-depth case study of a co-op on agricultural land drainage located at village Dabhau in Gujarat is presented. The society is the first and only one of its type in India.

The attitude of farmers' participation in drainage co-ops was studied by developing an index as suggested by Singh (1992) [2]. It was measured as a proportion of the target group of people who were expected or potential beneficiaries in relation to their participation in adopting the technology, forming the co-op and sharing or pooling the money, labour and other resources for managing saline and water-logged soils. To capture the potential participation of beneficiaries, a set of questions were asked. The answers were assigned arbitrary but logical numbers ranging from 0 to 1. Each question was assigned some weight depending upon its relative significance on the basis of value judgment so that the sum of the weights was equal to 100. The potential participation score of individual beneficiary was worked out as follows:

$$P_i = \sum_{j=1}^k W_j X_{ij}$$

where, W_j is the weight assigned to j th question; X_{ij} is the code of the answer given by the i^{th} beneficiary to j th question; P_i is the participation score of i^{th} beneficiary.

The average participation index, P , is calculated as:

$$P = \sum_{i=1}^N P_i / N$$

where N is the number of sample beneficiaries.

Feasibility of Sub-surface Drainage

Preventive or curative measures of saline and water-logged soils involve lowering of water table below the root zone of crop followed by leaching of excess salts. The salts displaced by leaching need to be removed from the soil by sub-surface drainage system, if natural drainage is inadequate (Rao and Singh 1990). The history of horizontal drainage in India started in 1925 at Chakanwali (now in Pakistan) and in 1928 at Baramati in Maharashtra. Since then, some projects were implemented here and there. It has now been realised that sub-surface drainage is most important component of irrigation system management to maximize the benefits from irrigation investment. In the late 1980s, a few drainage schemes were launched in some

parts of the country. In this section, feasibility of these schemes as a measure to control salinity and water-logging is briefly examined.

It has been widely recognised that the cost of installing sub-surface drainage depends upon several factors. These are type of drainage material, soil type, depth and spacing of drains, area under drainage and wages of labourers. The initial cost of manually installed sub-surface drainage in Haryana varied between Rs. 10,300 and Rs. 14,874 per ha at 1987-88 prices (Table-1). For Gujarat, it ranged from Rs. 9,709 to Rs. 13,501 per ha. Investment in drainage for salinity and water-logging control was found financially feasible in all the sites (Joshi et al. 1987 and Datta and de Jong 1991). The calculated internal rate of return, benefit-cost ratio and net present worth justified the financial feasibility of investment in drainage to control the problem of soil salinity and water-logging (Table-2).

The immediate gains from the improvement in soil were realised in the form of increase in cropping intensity, higher crop yields, lower cost of cultivation on per unit basis [3]. Benefits were also observed in the form of additional gainful employment opportunities [4] in rural areas and strong inter-sectorial linkages.

Despite yielding high dividends by providing sub-surface drainage, the scheme could not be implemented at a large scale. It is because the development of organisational structure for its wide spread adoption has yet to receive due recognition by the scientists and planners. There may be several alternative organisational set-ups, each having some advantages and limitations. We believe that co-op may be a socially feasible alternative, better than any other institutional or organisational set-up,

Rationale of Drainage Co-ops

A collective action is required on area (affected) basis to realize potential benefits from sub-surface drainage. In this context, co-ops are expected to emerge in response to the common interest of affected farm households to fully utilize the potential of the degraded lands. The participation of affected farm households is sought *tot* a) adopt various components of drainage technology and other agronomic practices to improve the soil, b) share or pool the money, labour or both required to execute the drainage systems, and c) provide access to dispose the drainage effluents. The significance and need for co-ops in managing saline and water-logged soils is realised in view of; a) indivisible nature of technology, b) no attraction to an individual farm household on investment to prevent or cure the degraded lands, c) cost-sharing of alternative options, and d) water-sharing.

Indivisible nature of technology

The drainage technology is indivisible and cannot be executed in parts. Unlike co-ops for afforestation, milk production, oil seed production, where members and their holdings may be scattered, drainage has to be provided in a large and compact area. Ironically, the holding size under Indian context are fragmented and too small. The average size of holding in India was 1.54 ha in 1990-91 and is expected to be 1.40 ha by the end of the century. Our field level studies have shown that the average size of holding ranged from 1.12 to 5.33 ha with 1 to 10 fragments per holding. Under such circumstances the adoption of any option by an individual farmer alone may not improve the problem soils.

The success largely depends upon a certain minimum area brought under sub-surface drainage, it is because salinity and watertable movement is a dynamic process in the sub-soil zone. An individual or few farmers with marginal to small land holdings may not change the dynamics of salt and water movement. Their investment in isolation will not yield the desired results to improve soil.

The fact is that all options to control soil salinity and water-logging require community approach and collective action and vigilance. In the absence of formal or informal participation of affected farm households, even the rich resource and high growth regions, like Punjab and Haryana, could not implement these measures in severely affected areas. It is clear that with the existing research and technological knowledge, the salinity and water-logging control needs a group approach. Therefore, a formal or informal participation of affected households will positively facilitate the utilization of the potential of saline and water-logged soils. Thus, formation of co-ops is one possible answer to the problem of managing the degraded lands.

Preventing or curing land degradation

The land degradation is an insidious process. During the initial stages it is a hidden externality and with the passage of time it takes a serious dimension. In the beginning, therefore not much significance is attached to such processes. Farm level adjustments, for example, reallocation or higher doses of inputs, are made as strategies to cope with. These adjustments continue till the marginal revenue equals the marginal cost. After the optimum point is reached, the higher doses of inputs become unprofitable. As a result of this, reverse process starts in allocation of resources. It is because the productivity of various inputs used in degraded soils start declining and their use becomes unprofitable. Eventually, the land is left fallow. Ironically, the rate of degradation is not uniform

within or across the farms. The differential pattern of degradation results in differential measures temporally and spatially.

In case a few affected farmers go for some preventive measures, they find it unattractive. For them, there is no incentive to take up any measure. The fact is that they adopt preventive measures in isolation which are financially non-viable at the present state of knowledge. To make it a viable proposition, joint effort in the form of community approach is sought. The area is to be identified where problem has appeared or expected to take a serious dimension in near future, the farmers have to come together to save their land from any kind of degradation.

Cost-sharing

Broadly, the cost of installing agricultural land drainage is incurred on: a) earth work either manually or mechanically, b) drainage material, and c) operation and maintenance. Yet these costs are being borne by the government in all the developing countries. The experiences of Egypt and Pakistan,, where large acreage is under sub-surface drainage, are also not encouraging in so far as sharing of the costs by the beneficiaries is concerned. India is following a similar pattern where all the drainage schemes are either sponsored and funded by the government or some foreign donors/aid agencies. The government has already expended a huge amount of subsidy on creating irrigation infrastructure to increase the production potential of the existing land resource. The experience has been that the mismanagement of irrigation has led to the problem of soil salinity and water-logging. Can the government afford to spend the huge sum of money required to prevent the land degradation? If the government plans to do it, a mammoth sum of Rs. 55 to 85 thousand million will have to be expended initially. In subsequent years, a sum of Rs. 2.65 Rs. 4.25 thousand million will be needed to meet the recurring expenses on account of operation and maintenance. There are remote prospects that any government can afford this huge amount at a time when there are other pressing problems to be solved. Carruthers and Smith (1990) have rightly argued, "... our growing recognition of technical means to control water-logging and salinity through drainage comes at a time when the public sector is widely regarded as over extended and with profound macro-economic instability, large public sector deficits, high inflation rates and balance of payments deficits and therefore our capacity to respond in conventional way is limited."

Therefore, an urgent need is to find out some alternative mechanism and institutions to develop a viable and sustainable system to meet the drainage investment costs. One possibility may be in the form of cost-sharing by

beneficiaries through their co-ops. The earth work can be done by the beneficiaries in their own fields. It has been estimated that the share of labour in **the** total cost ranges from 26 to 40 percent. The **remaining** cost may be shared by the beneficiaries. The amount required is estimated to be between Rs. 6,000 to Rs. 7,400 per ha, This amount may be borrowed by the beneficiaries⁵ co-op from any financial institution. It is not difficult to repay this amount since the land yields higher returns after **the** provision of sub-surface drainage. Similarly, the operation and maintenance cost which is essential to be in the neighbourhood of Rs. 750 per ha annually may be shared by **all** the beneficiaries on quarterly or half yearly basis.

Water sharing

Role of water and its management is crucial in aggravating or mitigating the problem of soil salinity and water-logging. Improved water management system should be complementary to **the** sub-surface drainage system to efficiently manage saline and water-logged soils. A mismanaged **on-farm** water allocation sub-system is not only inefficient but hastens the process of land degradation. On the other hand, an efficient and **well** managed water allocation sub-system prevents the soil salinisation and water-logging, besides enhancing water productivity. It has been well recognized and adequately documented that the major problem of soil degradation can be postponed by providing efficient water management sub-system. The efficient system minimizes water losses during application and conveyance. It can be achieved by providing precision land leveling, sprinkler or drip irrigation system, etc. Their success in minimizing soil degradation largely depends upon people's participation. Unless these measures are adopted on compact area basis at a large scale, the problem will remain unsolved. It is because the adoption of necessary water management measures in isolation by one or few in scattered locations may partly control the sub-surface water movement. The mismanagement of water by rest of the farmers may render the good lands and water management works done meaningless.

Such kinds of situations may be solved in case the farmers of the affected area share and manage the irrigation water collectively as has been done in the case of *Parti Panchayats*, The examples of sharing water are of Sri Ram and Chanda (minor no 7) Co-op Societies in Maharashtra. A system has to be developed for water distribution, management and application so as to minimize the water losses to avoid the process of soil salinisation and rise in the water table. It is therefore important that water-sharing be an integral part of agricultural land drainage in managing problem soils.

The Case of a Drainage Co-op

The history of drainage co-ops organised to solve the problems of soil salinity and water-logging started in a village, Dabhau, in Gujarat. As stated earlier, an 'Operational Research Project' on reclamation of saline and water-logged soils under ICAR-WALMI collaboration was started in 1987. The drainage measures yielded encouraging results. The need for forming a drainage co-op was felt when the WALMI had to hand over the operation and maintenance of the drainage area to the beneficiaries* Gujarat is well known for co-ops in India. WALMI authorities decided to hand over this activity to the beneficiaries after constituting a co-op. It was necessary to meet the operation and maintenance charges, run the drains smoothly, overcome the choking problems of drains, etc.

With this brief background the co-op on drainage was conceived (Table 3). It was registered as 'Saline Land Agricultural Development Co-operative' in 1989-90 under the Gujarat Co-operative Registration Act of 1860 and head quartered in village Dabhau. The main aim of this co-op was to increase the agricultural production on marginal lands on a sustained basis. The main activity of this co-op was to share the operation and maintenance costs of operating the drainage system. It was decided that the entire operation and maintenance charges will eventually be met by the members, but for the first two years WALMI agreed to meet these costs from its operational research project*

Presently there are 50 beneficiaries and all are members of the said co-op. The initial membership fee was a meager amount of five rupees per head. The costs of operating and managing the drainage system are yet to be determined.

After the formation of this co-op, the members realised that with the passage of time the scope of the co-op will have to be widened to include other activities. Important functions may be to; a) get electricity connection to reduce the cost of pumping saline water from sump to main drain; b) provide credit for agricultural activities to enable the members to adopt the best practices for maximising profit; c) supply fertilisers at reasonable rates; and d) develop a system of water sharing on the pattern of *Pani Panchayat*. It is essential to widen the activities of such co-ops for their sustainability in the long run. It is because the need for soil improvement will not be uniform in the entire drainage area. It is bound to vary across farms. The farmers located in advantageous position may not be enthusiastic to participate in such co-ops in the long run.

Determinants of Success of Drainage, Co-op

There are several factors determining the success or failure of the drainage co-ops. These may be a) problem of free-riders, a) disparities in assets, c) heterogeneity of caste and religion of members, d) degree of participation of beneficiaries, e) conflicting objectives, and f) perception of the programme objectives. These factors are discussed in view of their possible role in accelerating or decelerating the success of drainage co-ops.

Problem of Free-riders

It is universally true that each society consists of few people who derive pleasure or benefit at the cost of others. Singh (1992) characterized such persons as free-riders. Invariably, free-riding may be very common in implementing agricultural land drainage programmes. In this context, there may be two kinds of prospective free-riders: a) those located within the drainage periphery, and b) those located outside the drainage area.

The first category of free-riders may not at all participate or passively participate in meeting the initial cost or extending labour despite the fact that their land falls within the jurisdiction of the drainage system* There may be chances that such people withdraw at some later stage and do not contribute towards the operation and maintenance costs or do not pay the expenses in case of system failure. Such people believe that they would continue to derive the benefits of the drainage irrespective of their contribution. With the existing system of providing drainage where all expenses were met by the government or some other agency, such cases were difficult to identify. Once the people of the area are required to participate, especially by paying for the operation and maintenance expenses, we could identify the free-riders easily. Such persons may induce others also to free-ride and this would eventually affect efficiency of the system adversely. It is therefore necessary that some mechanism is evolved to avoid such problems in the drainage area.

The other category of externality is realised by those located outside the drainage system. There are evidences that the neighboring area is also benefited overtime. In a study at Kailanakhas, where open sub-surface drainage was installed to control saline-water-logged soils, marginal to modest benefits were derived by neighbouring farmers as a consequence of their land improvement. The yield of wheat increased from 600 to 1,600 Kgs per ha. Similar results were observed for mustard, *bajra* and other crops. Such cases are expected to be observed in all the drainage systems unless a peripheral drain is provided. The peripheral drain will have additional cost and that will further escalate the cost of

the entire system. A peripheral drain will be desirable if its cost is less than the benefits from the improvement in the system efficiency.

Disparity in assets

The success or failure of any co-op depends upon the degree of disparity in the distribution of assets, especially the land holding. It is also true for managing degraded saline and water-logged soils. We have two contrasting cases of Haryana and Gujarat. The average size of land holdings are relatively smaller with less number of fragments in different drainage locations in Gujarat as compared to Haryana (Table-4). Farmers located in the drainage sites of Gujarat are more enthusiastic for the success of land drainage than their counterparts in Haryana. To cite an example, in village Dabhau in Gujarat, the cultivated area in kharif season of 1987-88 jumped from 32 to 90 ha over a period of two years after the installation of the drainage system. Contrary to it, a large part of *kharif* land is still kept fallow in Haryana even after five years of installing the drainage system. Although there may be a number of factors responsible for such differences, the size of land holding seems very important. A large number of farmers (21-83 percent) having more than four ha area falling in the drainage sites of Haryana still allocate more resources to their normal soils. This is because farmers derive higher marginal returns from different resources on normal soils in comparison to the problem soils of the drainage area. Resource constraints compel the farmers to allocate resources as per the marginal returns on lands of different quality. On the other hand, 47 to 86 percent farmers have less than one hectare area falling in the drainage sites of Gujarat. This induced them to efficiently use the available land and other resources. The interest of farmers in the drainage area of Gujarat in reclaiming their lands is an indication that the prospects of their participation in drainage co-ops would be bright. However, with the present state of affairs in Haryana, the expectancy of farmers' participation in such programmes seem to be a remote possibility.

Heterogeneity in Caste and Religion

The caste and religion politics are strongly emerging in India. These have deeper roots in rural areas. Inevitably, like other co-ops, these will play a significant role in forming drainage co-ops. Homogeneous caste system and religion will have an edge over diverse caste and religion to form and manage co-ops. For example, at Mooraj in Gujarat, majority of the farmers belong to Muslim community, Similarly, at Dabhau majority of farmers belong to Patel community (Table-5). Majority of farmers in these sites reported that they would take-up the drainage programme in

case the government decides to withdraw the financial assistance. It is evident that in these sites the possibility of success is very high, It is therefore suggested that while selecting an area for a drainage programme as well as for establishing a co-op, homogeneity of caste and religion should be given high priority, besides other techno-economic parameters, such as spacing and depth of drains, expected returns, etc.

Participation of beneficiaries

Participation of member beneficiaries is widely accepted as the key to successful management of co-ops. So is true for the co-ops for managing degraded lands. The higher the degree of participation of the affected population, the greater will be the success. It has been realised that mere planning and executing the drainage systems to manage saline and water-logged soils by government agency may not yield the desired results unless there is a positive attitude and strong will of the beneficiaries to participate in the programme. To determine the degree of participation of the beneficiaries to cure or prevent degraded lands, the participation scores were worked out for two sites, namely Dabhou in Gujarat and Ismila in Haryana.

There was a conspicuous difference in the participation scores in these two sites (Table-6). It was 78.5 percent in Dabhou in Gujarat, where some preliminary exercise has been done to form a drainage co-op, while it was 49.15 percent in Ismaila in Haryana. Ironically, the participation score was very skewed in Haryana as compared to Gujarat as high as 54 "percent of the total respondents have less than 50 percent" participation score in Haryana, indicating a bleak participation attitude of the beneficiaries. No respondent in Gujarat scored less than 55 percent participation score. On the other hand, 60 percent beneficiaries in Gujarat have greater than 70 percent participation score. The corresponding score in Haryana was 38 percent. Interestingly, the Coefficient of variation of participation score was too low (about 17 Percent) in Gujarat as compared to Haryana (about 74 percent). These evidences indicate that more clashes and conflicts are expected in Ismaila Haryana, type of social, and agrarian structure as compared to Dabhou, Gujarat, in managing saline and water-logged soils by forming drainage co-ops. Such a situation calls for persuasion, education and demonstration of the beneficial role of drainage co-ops in managing such type of problem soils.

The participation of the potential beneficiary is not an independent decision but often depends upon several other factors* These may be the location of the farm from the water disposal sub-system, extent and magnitude of the problem, size of land holding and number of fragments, existing crop-mix, resource endowments/ etc (Table 7). Some

conflicting objectives are bound to appear amongst beneficiaries having low and high participation scores. It was observed that participation score was low under four situations: a) larger acreage under high water requirement crops, like paddy and sugarcane; for higher size of holdings; c) more number of fragments; and d) higher fertilizer consumption. Precisely, these are the characteristics of affluent farmers. The small farmers with higher problem area recorded higher participation score. Obviously, the better-off farmers may not be inclined to participate in managing problem soils in contrast to the poor farmers. Number of fragments per land holding is also a constraint in managing degraded soils. It calls for urgent measures to consolidate land holdings. It may be suggested that the consolidation of land holdings should receive high priority in problem areas. Similarly, it would be easy to form co-ops of smaller farmers with higher problem area. It would be advisable to identify small farmers in the affected areas to form co-ops for management of saline and water-logged soils. Considering these factors, the persuasion and education strategies supported by the appropriate legislation to effectively utilize the potential of existing problem soils from area to area will vary.

Conflicting Objectives

The tendency of the typical farmer is to maximize his private profit with the available resources, technology and knowledge. Differential resource endowments may cause conflicting objectives amongst individuals. These determine allocation of resources, including land, to different crops. It is likely that efficient individual decisions may lead to system inefficiency. It calls for collective vigilance and group management. Any kind of formal or informal group approach to managing the problem soils will have to assure each individual participant that the decisions of other individuals will not cause any negative externality. The benefits to each individual participant from the group approach should be much higher than in the case of individual decision. Such an approach will have considerable potential to actively involve individual farmers.

The potential and existing saline and water-logged areas need appropriate choice of crops as a strategy for prevention of further spread of the problem as well as for their reclamation. Very often crops which have low to moderate water requirement and are salt tolerant are suggested for these problem soils. A differential crop-mix in a drainage area may lead to conflicts amongst the beneficiaries. An interesting feature is observed when low water requirement crops, like *bajra*, *jowar*, etc., and high water requirement crops, like paddy and sugarcane, are grown along a lateral drain by two different farmers. The conflict starts when the farmer with low water requirement crop wants to lower water table while the farmer with high water

requirement crop prefers water to remain in the fields. Such conflicts are obvious and bound to appear in the absence of pre decided crop-mix for the drainage area. These have to be solved to achieve higher efficiency of the investment in drainage to control salinity and water-logging.

Such problems can be overcome by developing crop plans for the entire drainage area. The crop plans should be formulated according to the location of the laterals, it would be desirable to have one kind of crop along a lateral drain. High water requirement crops may be preferred nearer to the sump. Its advantage will be that the excess water of the drainage area would be recycled to supplement canal water, as the fields are located farther from the sump, crops having moderate to low water requirement may be preferred. This proposition may not be pragmatic from the farmers' point of view. Their interest lies in the maximisation of profit or production per unit of land and other resources. The clash between the objectives of the system and the individual farmers is obvious. It could be resolved in two ways. One, the drainage system should have some built-in mechanism that facilitates retention or release of water from the field. In this context, junction boxes may play an important role. Each farm household may have one junction box to manage the excess water. Two, larger acreage should be allocated to one type of crop along a lateral. The first option may serve the purpose but will not be very effective. Its efficiency will also depend upon the action of the neighbouring farmers. The second option may be made more feasible if the scope of the drainage co-op is widened to the marketing or processing of one or two enterprises. For example, the drainage co-op may include the marketing and processing of oilseeds or any other crop to avoid any conflict related to crop activity. Such a provision will rather encourage the members to grow a few selected crops of mutual interest. In the absence of right choice of crops and their appropriate area allocation, the efficiency of the drainage system in controlling the salinity and water-logging will be far below than the expected.

Perception of the Programme Objectives

One of the most crucial factors that determines the success or failure of drainage co-ops is how the potential beneficiaries perceive the programme objectives. And, it is dependent on how the farmers are educated or persuaded about various components of the technology and their participation in forming the co-ops. An effective programme will simplify the persuasion process. Different extension techniques should be adopted for the purpose. These may be arranging training programmes, screening films projecting with and without preventive or curative measures in different areas, arranging field visits of potential participants in curative areas, demonstrating technological packages, etc. These

extension activities should be supported by arranging credit and other important measures, Failure to do so will reduce the chances of success of drainage co-ops.

The question may be raised as to who will organise farmers to form co-ops to manage their problem soils. This task may be taken up by the government as well as non-government agencies. At the initial stage, it would be more appropriate that the department of soil conservation or any department dealing with the problem of soil salinity and water-logging in collaboration with the departments of co-operation and extension under the Ministry of Agriculture should be responsible to identify the affected areas and organise farmers to form co-ops. The Department of Soil Conservation should also be responsible for technical supervision during the installation of drainage system. At a later stage, "Drainage Co-op Federation" in the line of National Tree Growers¹ Co-op Federation Limited may be formed.

Conclusion

Presently, management of saline and water-logged soils in India is in an incipient stage. It is expected that in future several programmes will be launched in different parts of the country to use the available land for agricultural purposes. It is because several potential or existing problem areas need preventive or curative measures for sustainable use of available soil and water resources. There is an urgent need to develop an institutional set-up that can facilitate adoption of the existing alternative technologies. It is essential in view of the huge investment that has already been made in creating a gigantic irrigation network which is now facing the problem of soil related problems in the absence of adequate measures. Considering the nature of the problem, available technology and existing agrarian structure, necessary measures may be successfully executed by initiating effective people's participation in the problem areas. It can be possible by forming co-ops to derive full benefits from irrigation investment and to manage problem soils in most effective way.

Although the co-op is an answer to manage degraded soils for agricultural uses, there are several social and institutional problems in organising and managing them. Effective leadership and political will may play the crucial role in solving several obstacles in the initial stages. This may require continuous persuasion and education of the farm families having low participation score. These may be undertaken through effective extension programmes by organising field day, exhibiting beneficial role of preventive or curative measures, demonstrating various components of the technology, etc. These activities may require considerable time as well as money. There is no harm if some legislative measures are employed to form co-ops to manage saline and water-logged soils for production and

ecological sustainability. To sustain such co-ops, their scope has to be widened to include other activities of mutual interest amongst the members. These may be to arrange credit, crucial inputs, like better seed, fertiliser, irrigation water, etc., and create marketing or processing facilities.

Limitations of the Study

It was stated earlier that organizational and socio-economic environments were not considered while designing strategies for managing degraded soils. Therefore, information is lacking on these important aspects to tackle the problem from beneficiaries' perspectives. All the schemes on agricultural land drainage were executed under the government sponsored or foreign aided programmes. It is now seriously intended to hand over these schemes to the beneficiaries. Yet no organizational/institutional structure has been developed for making the schemes successful. So far only one attempt has been made in this direction at village Dabhau, where a formal drainage co-op was constituted. Therefore, the experience on a co-op at single site is a major limitation of the study. However, it is tried to overcome by suggesting future course of action on the basis of the experiences gained from other areas.

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Table 1
Installation Cost of Sub-Surface Drainage in Haryana and Gujarat

Location	Installation year	Drainage area	Drainage Cost (Re/fta)		Beneficiaries (no.)	Labour cost
			Current price	1987-88 price		
Haryana						
Bhana-Brahamana	1988-89	110	11,115	10,389	27	31
Ismaila	1987-88	28	10,999	10,999	28	40
Role Khan	1988-89	41	11,021	10,300	12	32
Mudlana	1985-86	49	12,799	14,874	Common land	36
Ujana	1987-88	32.38	12,799	12,799	12	26
GUJARAT						
Dabhau	1987-88	50	13,501	13,501	50	26
Moraj	1990-91	52	10,387	9,709	92	30
Padra	1989-90	53	13,565	12,679	70	36
Vally	1990-91	49	11,935	11,155	25	37

Source : Datta and Joshi (1991)

Table 2
Financial Feasibility of Sub-Surface Drainage in
Haryana and Gujarat.

Criteria	Israaila (Haryana)	Dabhau (Gujarat)
Benefit-cost ratio	1.26	1.49
Net present worth (Rs/ha)	4,659	9,505
Internal rate of return (%)	13.33	14.75

Table 3
Profile of a Drainage Co-op

Particulars	Description
1. Name of the Society	Saline Land Agricultural Development Co-op.
2. Registration Act	State co-op Registration Act 1860.
3. Registration Year	1990-91
4. Initial Financial Support	WALMI, Gujarat
5. Secretary of Society	Elected member
6. Objective	Increase agricultural Production on a sustained basis on marginal lands.
7. Activity	Share the O & M charges to manage the drainage system
8. Number of Members	50
9. Membership fee	Rs. 5.00
10. Caste (%)	
Patel	70
Rajput	10
SC/ST	20

Table 4
 Frequency Distribution of Farmers According to the
 Number of Fragments and Size of Holding in Different
 Drainage Locations (Percent)

Fragments	Haryana		Gujarat	
	Ismaila	Bhana-Brahamana	Dabhau	Moraj
1	—	3.7	10.0	78.4
2	32.2	18.5	46.0	3.3
3	10.7	11.1	24.0	3.3
4	14.3	14.8	10.0	4.3
5	21.4	11.1	2.0	2.2
6	14.3	7.4	4.0	2.2
7	7.1	7.4	4.0	4*3
8	-	3.7	—	-
9	-	3.7		-
10 or more		18.6	-	—
Size of holding	2.63	4.96	1.12	1.37
Gini concentration ratio	0.76	0.49	0.34	0.86

Table 5
Caste-wise Composition of the Beneficiaries in Different
Drainage Locations in Gujarat (Percent)

Location	Dabhau	Moraj	Val	Padra
Patel	70	10	30	
				20
Rajput	10	10	-	
Solanki	-	10	10	
Muslim		60	50	
SC/ST	20	10	-	50
Others		-	10	30

Table 6

Frequency Distribution of Participation Score in Different Locations (Percent)

Frequency of participation	Dabhau	Small
< 50	—	54
51 - 60	30	8
61 - 70	10	—
71 - 80	40	15
> 80	20	23
Participation score	78.5	49.15
Coefficient of variation	16.7	74.30

Table 7
 Average Values of Important Parameters Determining
 Participation Score

Particulars	Participatio score	
	Low	High
	41.36	35.77
1. High water requirement crops (%)		
2. Low water requirement crops/ fallow (%)	58.60	64.23
3. Size of land holding (ha)	3.30	1.57
4. Number of fragments (No)	5	3
5. Problem area (ha)	55.40	75.80
6. Fertilizer consumption (kgs/ha)	153.70	63.50

- [1] Agricultural land drainage is removal of excess water and salts from an area. It can be natural or artificial. In the absence of natural drainage, the excess water and salts from the area can be removed by providing: a) surface drainage, and b) sub-surface drainage. The former is removal of excess water from the surface of the land through land shaping and construction of field channels and drains. The sub-surface drainage refers to the removal of excess water and salts below the soil surface. It can be achieved by providing sub-surface drains either horizontally or vertically. The excess water can also be removed by plants through evapo-transpiration commonly known as bio-drainage.
- [2] For detail see Singh (1992) .
- [3] For detail see Datta and de Jong (1991).
- [4] For detail see Joshi, Agnihotri and Singh (1985).

References

- Brundtland, G.M. and M. Khalid (1987). "Our common future". In Report of World Commission on Environment, UNEP Governing Council, Oxford: Oxford University Press,
- Carruthers, I and Laurance Smith (1990). "The Economics of Drainage". In Land **Drainage** for Salinity Control in Arid and Semi-Arid Regions, Vol. I. Cairo: Egypt, 152.
- Datta, K. K. and C. de Jong (1991), "The Effect of Sub-Surface Drainage on Farm Economy", Wageningen: International Institute for Land Reclamation and Improvement.
- Datta, K. K. and P.K. Joshi** (1991). "Cost and Benefit of Sub-surface Drainage for the Control of Soil Salinity and Water-logging". In Better Farming in Salt Affected Soils, No 20. Karnal : Central Soil Salinity Research Institute.
- Joshi, P.K., A.K. **Agnihotri** and **O.P.** Singh (1985). "Cost of Sub-surface Horizontal Drainage for Reclamation of Saline Soils", Project Report No. 1.5. Karnal: Central Soil Salinity Research Institute.
- Joshi, P.K. et al. (1987). "Sub-Surface Drainage for Salinity Control: an Economic Analysis, Indian Journal of Agricultural Economics. 42 (2): 198-205.
- Mabbutt, J.A. (1984) . "A new global assessment of status and trends of desertification", Environmental Conservation. Vol. **III**, No 2: 103-113. Switzerland: The Foundation for Environmental Conservation.
- Rao, **K.V.G.K.** and O.P. Singh (1990). "Waterlogging and salinity problems: the management **alternatives**", In Technologies for Wastelands Development, Eds. I. P. Abrol and V.V. Dhruvnarayananana, pp. 338. New Delhi; Indian Council of Agricultural Research.
- Singh, K. (1992). People's Participation in Natural sources Management. Workshop Report No.8. Anand Institute of Rural Management.

Sunil Ray

Abstract. Sheep breeders¹ Co-operative Society is indispensable in the state of Rajasthan not only for rangeland development but also for development of sheep raising the bargaining strength of the sheep breeders, present, the sheep breeders are deprived of a fair share of the value of the sheep and their products. The proper management of common pool resource as a strategy must not fall short of the expectations of the commercial gains of the members of the society* If it does, sense of involvement of the members dilutes, they become alienated from **the** society **gradually**, and eventually the objective of **the** society gets **defeated**. These are some of the important lessons of Pataliwas Sheep Breeders¹ Society,

Keywords: breeders, co-operative society, Rajasthan/ sheep, wool.

Sheep husbandry, interwoven with the whole texture of the arid and semi-arid parts of Rajasthan has traditionally been one of the most viable elements of the agro-economic system of the state of Rajasthan. It is the one whose marketable produce, is governed by its ecological imperatives. The¹ natural vegetation, i.e., open grass land or grass land with; scattered and stunted trees and thorny bushes is the only source, so to say, that ensures the viability of this industry,, However, over the years such productive rangelands have been subject to indiscriminate and unrestricted grazing everywhere by sheep, goat and **cattle**. Such onslaught on grassland with excessive grazing seems to have upset the balance resulting in deterioration of vegetation and the soil. The estimate shows that 23.14% of the total geographical area of the state is available as grazing land and grazing land per head of livestock is $G \gg 2G$ ha which is very small.

It indicates that the livestock population is considerably high and hence the pressure is great. Studies on the improvement on range land conducted at the Central Arid Zone Research Institute (**CAZRI**) show that protection of range land against biotic interference has been found to be essential for improvement and subsequent management of this important natural resource. The study also shows that if the rangeland is adequately protected from unauthorized

grazing by effective fencing and allowing grazing at controlled rate, based upon the **grazing** capacity of range, production doubles within three years.

is perhaps why range land development programme was taken up by the government... in collaboration with the World Bank in late 50s and 60s. And to stop the misappropriation and higher exploitation of this resource it was felt that management of the resource by the local people, the user, is indispensable. The formation of co-op society that helps minimizing externality was considered as the best strategy for this. The emergence of the sheep breeders' co-op society in late 70s in the state is an **outcome** of it. **Although** many societies were formed but before taking off, almost all were extinguished. Few could survive and have been able to continue to perform.

Pataliwas Sheep Breeders' Cooperative society located at Bilara of the district of Jodhpur which falls in the arid zone of the state is **one** such society. The present paper is devoted to the study of this society. The first part of the paper briefly explains the background of the society, profile of the area and the members of the society are given in the second part, the third part concentrates on the performance of the society. The main features of the bye-laws of the society are explained in the Part-IV and Part-V of the paper sums up the observations of the study and presents a few conclusions.

During 1959 with the assistance of the World Bank common grazing land was developed in many places in the Central Arid zone of the state of Rajasthan. Attempts were mainly made to grow grass and fodder for grazing. Such grazing lands were also fenced. Of course, there was no idea of sheep breeding in the land at that time* **One** such grazing land was developed at pataliwas village of Bilara Tehsil of the district of Jodhpur. The CAZRI subsequently took it from the Bilara Municipality to carry out its own experiment on sheep development. After having completed their experiment they wanted to hand over it to the municipality at Rs. 6,000. as this **amount** covered the cost of construction of sheep **shed**, office room, etc. Since the municipality failed to pay such amount CAZRI donated the land to the District Collector of Jodhpur who in turn gave it to the sheep and wool Department, Government of Rajasthan (**GOR**) under the auspices of Drought-Prone **Area Programme** (DPAP) which came into being in 1977. It is Dr> Ananta Rao, the then DPAP Project Director who came up with the idea of developing the grazing land further for the purpose of sheep breeding. in line with the objective of DPJU. Under DPAP waste land development; programme was taken, up in. which, 100 hectares of land in one plot was identified* fenced and provisions for **supplying drinking** water, sheep shed etc. were made.

Aprovision for 400 sheep in such identified land was also made and four sheep per hectare were **alloted**. According to the bye-laws of the society the land is supposed to be at the control of the government for the first three years and then it should be transferred to the society. At **that time** there were 49 plots of such type in the district of **Jodhpur**. Although it was envisaged that breeders' society **would come up in** all such plots but due to lack of initiative and organizational ability most of the societies failed to **come up** with a minimum satisfactory level of performance. **This** led the government during 1983-84 to pass an order for the transfer of almost all such plots to the Forest **Department**. However, a few plots were exempted from such government order. The society under study is one such **case**. It was allowed to function since it was the most active society and could mobilise a reasonable number of sheep breeders under its umbrella.

Leadership

As a matter of fact, credit goes to Sri Pannalal **Choudhary**, a resident of the Bilara village and employee of the extension centre of Sheep and Wool **'Department'**, GOR, **Pichiak**, for the initial success of mobilising the breeders of two *Dhanis*, viz., a) *Chain-pura-ki dhani* and b) *Bag-ki-Dhani* and bringing them under the fold of this society. The Society at his initiative was registered under Co-op Societies Act on **4.10.77** with 100 hectares or 625 bighas of land at its disposal. During 1977, 35 breeders, from two *Dhanis* joined the **society as** members. Membership was given to those breeders who own minimum 30 sheep. Of course, they had to satisfy other conditions as are stipulated in the society's bye-laws. Initially as it happens Mr, Pannalal **Choudhary** had to fight out so many odds while pursuing the breeders to become members of the society.

Membership fee and Share value

The entry fee is Re.1 and the minimum share price is Rs 10.10. Sheep breeders in most of the cases purchase shares based on the value of the sheep they give to the society. **Suppose**, if the value of a sheep is Rs. 400 in terms of its **weight**, it means that the breeder has purchased 40 shares. **The number** of sheep being given to the society ranges between **two to four** with different weights. Sheep breeders purchasing shares in terms of cash payment is a rare **phenomenon**. During 1982 the society became the member of Sheep and Wool Federation, GOR with the share price of Rs.100. However, It could not afford to continue to keep up its link **with the** Federation because the latter having purchased raw wool from the society kept the payment pending for nearly **6 months**. This created uncertainty in the minds of the **members of the** society.

Profile of the Area and the Members

As has been mentioned earlier members of the society come from two *dhanis*. The distance between two *dhanis* is 3-4 kilometers. The total number of households living in two *dhanis* is around 90, of which 40 households live in **Bag-ki-dhani**. Thirty members of *Bag-ki-dhani* and a few non-members of the society were contacted and interviewed. The total number of population of *Bag-ki dhani* is 200. Most of them belong to what is called *Raika* community which is traditionally known as 'sheep breeders' community.' The area appears to be relatively agriculturally prosperous having reasonably good groundwater level sufficient at present to carry out agricultural operations.

Out of 140 bighas of land, 95 bighas are well irrigated and the rest is rainfed. The land is devoted to the cultivation of cotton, *rayara* (Oilseed), jowar, til and wheat. Normally jowar, til and wheat are not sold out in the market. They are for the domestic consumption for the whole year. However, commercial crops like *rayra* and cotton are sold in Bilara market.

Grazing land

Before the implementation of DPAP or the formation of the society, 4,000 bighas of *Gochar bhoomi* (grazing land) was available to *dhanis*. There hardly used to be any problem for grazing. However, after the society came into being, the entire land is divided into two parts. While one part is left with the residents of these *dhanis* the another part is divided into four parts. This is shown in Table 1.

It means that out of 4,000 bighas of land which were used by the people living in two *dhanis* since time immemorial, 2,475 bighas land is left to them at present. Now in two *dhanis* there are around 3,500 sheep and goat population of which 1,713 sheep and goat are owned by the households of **Bag-ki-dhani**. Assuming that 1 hectare of grazing land is necessary for four sheep or goats for grazing (this assumption is based on the allotment made while forming the society with 100 hectares of land in that 1 hectare i.e. 6.25 bighas of land is allotted for 4 sheep and goats for grazing), ; per sheep or goat 1.55 bigha is to be allotted. It means that the land required for grazing is 1.55 bigha x 3500 sheep and goat = 5,425 bighas of grazing land is required for 3,500 sheep and goat. How that only 2,475 bighas of grazing land is available, breeders are resenting because the land available to them is limited and over-grazed. In this regard they also have considerable resentment against the society. For, at the initial stage of the formation of the society when they became member they were under the impression that once the society is formed patta or ownership of land would be given to them. As a matter of fact, this is one of the factors that prompted them to join the society. **Once they**

clearly learnt about the norms and bye-laws of the society they could shake off their wrong **impression**. However, this has irked them considerably and developed **a sense of antagonism** against the society to some extent. **Now that the area of the grazing land has reduced they are migrating with their sheep flocks to other places.**

Livestock

In so far as livestock position of these dhanis is concerned sheep population is predominant and then comes goat in order. There are a few camels and **cattle**, population of which does not appear to be significant. A detailed enquiry on the livestock position of *Bag-ki-dhani* reveals that there are altogether 300 goats and 1413 sheep **owned by the 40 households**. The distribution of **sheep flock among the households** is shown in Table 2.

It appears from Table 2 that the flock **size of majority of the households** is within the range of 1 to 50 **sheep** while relating it to the land holding pattern of 40 households, 26 households are landless and 14 households own land of which 10 households belong to the category of marginal farmers. It means that only 4 households own more than 3 acres of land. It appears that the households belonging to the marginal farmers and landless category own the flock whose size does not exceed 50.

Education level

Educational level of the member households appears to be very poor. Only one person among them so far has been able to come up to the undergraduate level. Although a school up to middle class is located adjacent to the dhani it is yet to evoke considerable interest in the minds of the member breeders to provide education to the children beyond a minimum level. The urge for receiving education appears to be absolutely missing.

Production of raw wool

Annually on an average 14 quintals of raw wool is produced in *Bag-ki-dhani* from the 'marwari' breed. Wool production per sheep in the village is shown in Table 3.

Now if the average annual price is **Rs.21 per kg** member breeder with the flock size of 50 gets **Rs. around Rs.1,300** per year from the sale of raw wool. They also sell male sheep which is **infact** the major source of their **income**. Since agents used to pay them less they started selling at *Bewar Mandi*. However, even now sometimes some of them who cannot sometimes afford to go to sell to *Bewar Mandi* which is located in a little far off place from **the village sell**

to the agents who come to purchase at their door step, The channel through which they used to sell raw wool to the middleman continues to be same even after the formation of the society.

Performance of the Society

Members' Investment

The performance of the Society is shown in Table 4 in terms of investment made by the members by way of purchasing shares from the society. The member sheep breeders purchased share from the society not by paying cash but by giving sheep to the society. The market value of the sheep is taken into consideration to work out the total value of the share. The price of sheep is decided based on the weight of the sheep

It appears from Table 4 that the number of breeders joined the society as members has increased over the years. In other words, majority of the breeders of two *dhanis* have joined the society. Another interesting observation one could make is that there is no incidence of drop out of members from the society. During 1977-81, there has been an increase of members and then remained same at 56 for 5 years until 1983-84. However, subsequently the number rose to 85 which is still continuing. The reason for the further addition of 9 breeders in 1985-86 from the *dhanis* is the Increasing uncertainty due to the severity of drought condition which Intensified in the subsequent years. And perhaps this could be the reason as to why there is no incidence of drop out notwithstanding their alleged resentment against the society. The stock position of sheep shows an increasing trend over the years. However, one may not see any one to one correspondence between the stock position of sheep and the total share value. For the society of its own also, owns sheep which have nothing to do with the share value. The final position of the sheep stock at the end of the year as is shown in table 4 depends upon a) sale and purchase of sheep; b) issuing new share; and c) death of sheep. However, so far as the response off the breeders to the society Is concerned one may tend to believe that the society is fairly stable but operating at a sub-optimal level.

Earnings

The major source of earning of the society Is shown year-wise since the formation of the society in Table 5.

As it appears from table 5, one of the major sources of income of the society is the grazing charges. Initially income from this source was not significant because during this time all-round effort was being made to grow grass in

the entire land. It could only pick up during 1985-86.-86. Society charges Rs. 10 per animal (cattle or buffalo) per month and allows them to graze in its grazing land which is fenced. In so far as wool yield is concerned it really does not vary much from the wool yield of the sheep being maintained by the breeder member themselves outside **the** society. The major items on which expenditure of the society is Incurred during the same period is shown in Table 6.

The major source of expenditure of the **society appears to be** the expenses incurred on the purchase of sheep **and the goods** required for maintaining the society and the salary paid to the manager and two other assistants of the society. The difference between the major earnings and major expenses indicates the cash in hand of the society. Based on the data provided by the society net profit has been worked out and shown in Table 7. It appears from the table that the society has not incurred any loss In any year ever since It began its operation. Instead, its net profit consistently increased from 1977-78 to 1986-87. Although it had fallen to **Rs.13,859,** it increased again in 1989-90 to Rs.21,812. **However,** in the recent past, net **profit of** the society has declined. The reason for such a decline is that there has been a sharp decline of gross profit from trading account accompanied by no reduction of loss account. **Instead,** it has increased. If we look in Table 5 we find that **the sale** of sheep has drastically come down during 1990-91, **but the** purchase of sheep and other expenses related to loss account have not come down.

Payment of Dividend

As per the bye-laws of the society each member breeder was paid dividend to the tune of 25% of the share value during the first year, 27% in the second year and 29% in the 3rd year after the inception of the society. After three years the members are to be paid dividend to the tune of 10% of the share value. There seems to be some confusion regarding the payment of dividend after the first three year especially from 1981 to 1984, According to the **manager,** dividend has been paid for these years while no single document is found to substantiate his version. **However,** from 1985 onwards no dividend has been paid to the **members.** The manager also admits this, It means that around Rs. 32,000 at the rate of 10% is blocked and is **yet** to be disbursed among the members. No convincing reason appears to be in sight to explain as to why dividend was not disbursed. This seems to be the other important factor diluting the sense of involvement of the members leading to the postponement of sorting it out with the administration of the society. They excessively depend on the manager and think since manager is there he is supposed to do all and he will do it. Even the members of the Managing Committee which is an elected body and where election takes place regularly appear to be Indifferent about this.

Election

Election of the full Management Committee including the Chairman takes place once in every three years. However, nominated members in the Committee from the government side has nothing to do with the election. Although election takes place but every year two members are replaced through lottery system. The system works in the following way. Names of all the elected members of the Managing Committee are written in small sheet of paper and folded separately. Somebody is asked to pick up two folded sheets after proper reshuffling. The persons whose names appear in the folded papers are replaced by the new ones. If more than two persons' names are picked up, election is held for the final choice.

Executive Committee

At present there are nine members in the Committee of which three members are nominated ones. The members are as follows

- | | |
|---|---------------|
| 1. Shri Amanran Debasi | Chairman |
| 2. Shri Dungaram | Vice Chairman |
| 3. Shri Harziram | Secretary |
| 4. Shri Kannaram | Member |
| 5. Shri Haralalram | " |
| 6. Shri Jodhram | " |
| 7. Development Officer
Bilara Panchayat Samiti | " |
| 8. Literacy extn. centre, Bilara | " |
| 9. Sheep and Wool Dept. extn.
centre, Pichiak. | " |

All the six members of the Committee belong to one particular caste called 'Raika' which is commonly known as breeders' community. And out of the 65 members of the society, 55 comes from Raika seven from sirvi, two from Jat and one Scheduled caste (Meghawai) community. The Society appears to be dominated by the Raika Community.

Meeting

Meeting takes place once in a month. Notice is served by the manager seven days earlier. He fixes up the agenda related to the different aspects of the society, such as sale

of fuel, wool and manure, disease of the sheep and arrangement for. medicine, **encroachment of** the grazing land etc. Land owners having land adjacent' to the grazing land of the society frequently try to encroach upon the **society's** land. This is why encroachment **of - land** has turned out' to be an issue which is taken up for discussion almost every time. And then members keep pursuing those land **owners to** refrain from it. Land owners try to make use **of their** political party affiliation to encroach upon the society's land. However, pressure is constantly being built **up by the** society to dismantle such effort.

Bye-laws of the Society

The bye-laws of the society are framed in the light of the Rajasthan Co-op Societies Act, 1965. The important features of the bye-laws are summed up and given below.

Objectives

Objectives of the society as have been enumerated in the bye-laws are as **follow:**

- A. i) to develop pasture land.
 - ii) to adopt scientific breeding system and to encourage cross breeding with good quality sheep.
 - iii) to purchase and sell sheep and sheep products.
 - iv) to arrange loans for the member breeders in order to purchase good quality breed for themselves.
- B. For the benefit of all breeders, **members or non-**members, the society should encourage cross breeding, provide health coverage and marketing facilities for selling wool and sheep. In order to meet the expenses while performing these jobs society should consult **BDO,** District sheep and Wool Officer and DPAP Project officials. These are all to be done while looking after the society simultaneously.

Membership

Membership of the society is granted to those who satisfy the following conditions:

- i) Breeder should come from the area which is demarcated by the society. He or **she should be a breeder and at** least 18 years old.
- ii) Majority of the members of the **Managing Committee** should approve the application for membership of a new **entrant.**

- iii) Member should purchase at least one share and pay Re.-1 . .as the entrance fee.
- iv) ' Member, should not commit any illegal offence.
- v) Those who are small and marginal farmers willing to take up sheep breeding as primary or secondary activity and applied for assistance to DRDA are also eligible for membership.
- vi) Priority is to be given to those members who would like to purchase share from the society by way of giving sheep to the society.
- viii) State Government is also eligible to be the the society.

Funds

From the following source or sources, the society is entitled to procure finance for its growths

- i) Share Capital of the members.
 - ii) Share purchased by the State Government.
 - iii) If any assistance in any form is given to the society by anybody, society can accept it.
 - iv) Credit.
 - v) Donation.
 - vi) Deposit of the members,
 - vii) Entrance fee.
1. Society can float shares worth Rs. 100 or Rs. 10. shares worth Rs. 100 can only be sold to the state government while shares of Rs. 10' can be sold to the breeders. The limit of issuing shares is to foe. decided by the number of sheep the grazing land can accumulate.
 2. An individual member can purchase shares up to either Rs. 2,000 or 1/10 of the total, value of the shares of the society whichever is minimum to be applied.
 3. If anybody intends to transfer the share to somebody he cannot do it before the completion of the year.

Liability of the member is five times more than the value of the shares he" purchases. However, for the state, liability is limited to its share values.

All share holders are the members of the General Body of the society. General Body meeting should take place as it is needed but at least once in a year it has place. The secretary of the society is entrusted responsibility of convening the meeting. If 25% of members feel together that a meeting should be convened to sort out any problem and if it is turned down Secretary, those members can bring it to the notice office and can arrange a separate meeting.

The total number of the members of the Committee should be nine of which 1/3 of the total members or three whichever is less should be nominated by the Government. Out of six elected members, four members should come from the small/marginal and landless categories who purchase share capital in the society by way of giving sheep. The other two members are elected from other breeders. They are not eligible for contesting for president or vice-president's

Under the following conditions, breeder is not eligible to become a member of the Managing Committees

- i) Breeder who is not even 21 years old.
- ii) Person who is working in the bank with which the society is having transaction,
- iii) The person who is already convicted by **law**.
- iv) The person who has gone bankrupt ceases to be the member.
- v) Mentally retarded person is not eligible.
- vi) If a member of the society after receiving loan from the society is found **to have failed** to repay the loan within three months from the date he received lie ceases to be the member of the Managing **Committee**. -
- vii) Those who are working and earning salary from **the** society cannot be entertained in the **Managing Committee**«,

- viii) Person who is no longer a sheep breeder cannot member of the Managing Committee.
- ix) The person who is found to be encroachment of society's land cannot secure membership.
- x) A member can retain his membership for three years unless he gets reelect
- xi) Every year 1/3 of the members are to be replaced by the new ones through the system of lottery.
- xii) District Collector is empowered to extend the period of the first Managing Committee, if necessary.

Managing Committee can frame any bye-laws on its own for its own sake but it has to be approved by the Registrar of Co-operative societies.

Dividend

After having worked, out the net profit as per the co-op society's rules dividend is given. The following norms are to be followed while giving the dividend to members/share holders.

25% of the share value during the first year of society's inception.
 27%^B second year 29%
 31%^H Third year 31%
 Fourth year

After fourth year, based on the recommendation of the Managing' Committee, decision about the payment of dividend is to be taken in the General Body meeting. If the society is found to be incapable in making the payment of dividend fully for the first four years, state government has to cover the gap.

Rules of distribution of net profit

1. 25% of the net profit is to be kept aside as the reserve fund of the society.
2. 1 % should go to the Co-operative Education Fund.
3. 10% of share value is to be given to the members as dividend.
4. Employees of the -society can be. Given bonus, but its limit should not exceed the salary of four months.

There are other features of the bye-laws such as power of the Managing Committee, how to maintain the Registrar, rules of auditing etc. which have not been discussed here.

Summary and Conclusions

The major findings of the society are summed up as follows.

1. The response of the breeders to the building up of the society is found to be considerable. However, initial enthusiasm and sense of involvement appear to diluting gradually.
2. Organisational control by and large is at the society. Government's intervention does not appear to exist in this regard.
3. In respect of developing, maintaining and protecting the rangeland, the society appears to have been doing well.
4. At the initial stage while motivating the breeders the latter were not made fully aware of the purpose of the formation of the society. They appear to have been carried away with misinformation regarding the distribution of the grazing land.
5. Although the society is able to make profit irregular in the payment of dividend* It has not been paid for last several years. This has injected uncertainty in the. Minds of the members.
6. Society is yet to have optimum number of sheep in terms of the grazing land available with it. It seems grazing land is developed more for the purpose of earning from grazing charges and the sale of grass than for sheep development.
7. Cross breeding with better quality sheep hardly takes place in the society*
8. No non-members appear to be interested in becoming members of the society.
9. Although election takes place regularly but active participation of the member breeders appears to be lacking greatly. A sense of indifference appears to be dominant among the members. It is finally the manager, a paid employee of the society, who appears to be running the entire show.
10. The society is resourceful and has potential to grow further and reach it benefits especially to the poor breeders but its level of performance can be made much more satis factory.

11. There is no Incidence of dropping out of members from the society.

The formation of sheep breeder's society in the state of Rajasthan was well thought out by the government. **However**, the initiative taken did not bear any major fruit even to a limited extent. As has been mentioned earlier almost **all** the societies which began to take some shape failed to gear up their activities, even up to the level it could ensure its sustenance.

Apart from restoration and proper utilisation of rangeland and minimisation of externalities, the formation of breeder's co-op societies assumes tremendous significance in the context of Rajasthan. Firstly it might help in encouraging cross breeding with good quality sheep in an organised and scientific manner. Through demonstration effect, this will certainly enhance the quality of raw wool which is important for the development of wool-based industry in the state. Secondly and very importantly it would ensure a source of livelihood when no other source is available to the poor breeders especially at the time of draught. And thirdly it can free the breeders from the clutches of the middleman who purchase raw wool and sheep from the breeders at ^{VPTV}very low prices*.

All these factors are equally important and all of them can be ensured perhaps through the formation of the society. It is true that the society under study suffers from serious administrative **limitations**, especially related to the disbursement of dividends to the member breeders and its failure in injecting a sense of responsibility in the minds of the members. Notwithstanding these Limitations, the study shows that the Wool Growers' Co-operative Society has immense development potential in the State of Rajasthan which is yet to be harnessed.

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Table 1
Division of Grazing Land

1.	Society	625 bighas
2.	Encroachment by the people of Gurjar Community for housing	100 bighas
3.	Encroachment by the farmers who are having land adjacent to the grazing land	300 bighas
4.	Mining	
	Total	1,425 bighas

Table 2
Distribution of Sheep Flocks among the **Households--**
of *Bag-ki Dhani*

Size	Mo. of Households
1-20	21
21-50	15
51-100	3
101-150	1
Total	

Table 3
Production of Raw Wool Per Sheep

No. of sheering	Months	Production sheep	Rate per quintal (Rs. .)	per
I	March-April	400 grams	1, 250. 00	
II	July-August	400 grams	1, 750. 00	17,50
III	October-Nov.	400 grams	3, 250. 00	

Table 4
Performance of Society In Terms of Share Purchase

Year	No. of members	No. of sheep	Total Value share (Rs.)
1977-78	35	~	2,18G«0Q!
1978-79	46	96	10,400.00
1979-80	55	204	25,340.00
1980-81	56	206	25,670*00
1981-82	56	172	26,150,00
1982-83	56	131	26. 150.00
1983-84	56	141	32,540*00
1984-85	65	236	42,010*00
1985-86	65	275	42,010.00
1986-87	65	276	42,010.00
1987-88	65	256	42,010.00
1988-89	65	256	42,010.00
1989-90	65	257	42,010.00
1990-91	65	314	52,910,00
1991-92	65	300	52,910.00

Table 5
Earnings of the Society from the Major Sources 1977-78 to 1991-92

Year	Grazing charges (Rs.)	Sale of manure (Rs.)	Sale of wool (Rs.)	Sale of sheep (Rs.)	Sale of fuelwood <Rs.>	Sale of Dung-cake(Rs.)	Interest from bank <Rs.>	Other (Rs»)	Total Income (Rs.)	
1977-78	999	—	—	—	—			13		
1978-79	3711	124	1758	25	—			31		
1979-80	3150	2415	3029	2045	—					
1980-81	773	2015	5864	5375	—			437		
1985-86	12346	18164	5488	6690	4163	305	-	557	650	
1986-87	14170	8871	7552	10550	805	125	-	5052	5944	52969
1987-89	17827	13460	12660	19605	3788	625	"	8.	9289	77262
1989-90	15711	11887	7594	24816	2650	205	245	1	1250	64359
1990-91	15404	9062	3941	9925	—	275	10124	5343	1903	56077
1991-92	16368	11003	7120	15464	—	540	12004	22965	5735	91139

Table 6
Major Items of Expenditure of the Society

Tear	Dividend	Sheep & goods purchased	Exp.of Sheep Maintenance	Salary of staff	Interest paid to the Bank	Adms. & Misc.	Exp. on bore-well	Total
1977-78	-	-	-	-	-	-	-	-
1978-79	458	9940	-	-	-	-	-	10398
1979-80	25271	4850	1392	420	-	-	-	19189
1980-81	6438	32 0	5583	2310	-	-	-	14651
1985-86	-	9236	6246	13620	1109	2734	-	32927
1986-87	-	17912	3492	13843	1224	2949	-	39420
1987-89	-	28610	-	26919	6016	4976	20204	86725
1989-90	-	17513	-	17969	2417	15362	-	53261
1990-91	.	20744	-	23208	1979	1527	-	47485
1991-92	.	20942	-	25086	2038	9256	7067	64889

Table 7
Net Profit Earned by the Society (1977-92)

Year	Net profit
1977-78	965.00
1978-79	5,184.00
1979-80	7,596.00
1980-81	7,732.00
1985-86	14,493.00
1986-87	22,11.7.00
1987-89	13,367.00
1989-90	21,814.00
1990-91	7,812.00
1991-92	8,011.00

Sen, A-K- et al. (1981) . Sheep in Rajasthan. ICAR. Jodhpurs
Central Arid Zone Research Institute. Monograph No*14*

Joshi, M.C. (1977). "Grasslands and Range resource Studies
of Shekhawati Area. Rajasthan" in the Natural Resource
in Rajasthan. University of Jodhpur, Volume I, p. 99,

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*PROPERTY RIGHTS, TRANSACTION COSTS AND COOPERATIVES IN
MANAGEMENT OF COMMON POOL NATURAL RESOURCES:
A SURVEY OF INDIAN EXPERIENCE*

V Ballabh and Randall A Kramer

Abstract. Property rights paradigm explores the manager's behaviour and business output in-different property rights, incentives structure" to managers, and users of the resources. Using property rights and transaction cost framework, this paper seeks to explain the capability of cooperatives to manage common pool natural resources, Common pool resources are found in a variety of property rights regimes. These resources are characterized by high costs of excluding users -and rival consumptions; hence "free riding" is quite possible.

A successful cooperative in natural resource management "could reduce these transaction costs by acquiring exclusive property rights in resources and devising rules and regulations such that "free riding" is not possible by members and non-members. In India, property rights allocation in natural resources to co-operatives entails significant costs that are usually borne by outside agencies. However, enforcement of these property rights is best achieved through innovative methods and using local customs and traditions. To avoid "free riding" by members and non-members,, several innovative social structures, rules and norms have been developed in past 10-15 years, Sometimes, local leaders and social reformers bear these costs. When these costs are significantly higher and co-operatives could not reduce these costs, co-operatives have failed.

Key words. Property Rights, Transaction Cost# Common Pool Natural Resources, Cooperatives, India.

The use and management of world common pool resources has become one of the hotly debated issues in recent times! Until recently, the answer to management problems of common! was to convert these resources to private property regime. This notion receives support from the "property right: school" (Lachlan and Deserts, 1973; Cheung, 1970; bemsetz; 1967; Furuboton and Pejvoich, 1972). Under the rules o' common,, individuals typically lack exclusives, transferable rights of the resources. Since individuals do not exercise full rights to the product of any investment including the postponement of the capture they might make in commonly owned

resources, they have less incentive to conserve the resources. (De Alessi, 1980). Privatization of these resources give **exclusive**, transferable rights to individual; therefore, the resources are likely to be more judiciously used.

However, **theoretically possible** to prove **that private** property *regimes* need **not necessarily** lead to Pareto efficient utilization of natural resources in all circumstances; often it leads to over-exploitation of these resources. This is because "private" property" regimes give incentive to produce high market value goods and ignore interest of non-owners of resources, and may not produce sustainable goods, which are otherwise important, Privatization of natural resources may also lead to increased disparity in income distribution• Recent empirical evidence suggests that privatization of commons in many parts of India has not improved their management; instead, poor people who were relatively more dependent on these resources lost their control. It also led to increased disparity (Jodha, 1986).

This paper is an attempt to identify **transaction cost** associated with management of common pool resources and a method to reduce these transaction costs by cooperatives. Cooperatives are used in abroad sense and not necessarily are those organisations which are registered under the Indian Cooperative Act.

The property rights paradigm perspective represents historical and methodological Improvement and development of the **neoclassical**, micro-economic paradigm. The new approach assumes that individuals act to maximize the utility function within an opportunity set defined by external constraints, to study the economic performance of the modern firm, the property rights theory looks to the effect of different institutional arrangements on the cost and reward calculations of individual managers. By establishing different structures' of property rights^ these arrangements confront decision makers with different incentive structures and so can be assumed to pattern management behaviour and business output (Denning, 1982).

The recognition of positive transaction costs in the development of a firm by (Coase, 1952) improved our understanding an out role of Markey and firms. Transaction costs are the information, negotiation, and enforcement costs that accompany the contracting of exchange between individuals. If the gains from trade between individuals are less than the transaction cost, the market would fail to undertake that activity. However, where he transaction costs are reduced by the coordinating mechanism of the firm, the market alternative would be replaced by the existence of

the firm. In the context of natural resources once property right on the resources is determined, the associated transaction cost would determine whether a resource would be well managed or not.

In analysing the use and management common pool resources, it is necessary to specify the property rights regimes governing resource access. Property rights can be categorized as: (i) private property, (ii) state property (iii) common or communal ownership, and (iv) open access. Each of these property regimes has different incentives and disincentives for joint resource users and managers. While open access is widely deplored, each of the other property rights regimes has advocates (Kramer and Ballabh, 1991; Singh and Ballabh, 1992). The management and use of common pool resources becomes more complex when the same resources produce flows that are subject to different property regimes. For example, a forest may be located on land owned by the state and contain trees that are managed and harvested by private firms with concessions rights. It also provides habitat to wildlife that is available for hunting on an open access basis. A further complexity is that some environmental services (e.g. biodiversity protection) can only be provided if the forest is maintained as an intact ecosystem. This implies that coordination is needed between different sets of users of goods and services-forest for sustainable management; otherwise, the forest is likely to be over-exploited.

Most common pool resources have two key characteristics, : non-exclusion and separability of consumption. This implies that common pool resources share 'the characteristic of pure public goods (high exclusion cost) and the characteristic of private goods (Ostrw, 1986) . Exclusion difficulties arise for common pool resource owing to the physical nature of resources. For example it may be impossible or extremely costly to restrict access to the flow of goods or services from a forest or marine fisheries; in the case of groundwater, the nature of aquifer *may* not be known with certainty. The other distinguishing characteristic of common pool resources, rival consumption, also poses difficulties from the standpoint of efficient management. Since consumption from the pool by **one** individual reduces the welfare of others, what is economically rational for the individual *may* not be rational from the collective view-point* Hence joint use can lead to over-exploitation. For example, the harvesting of medicinal plants in a natural forest by individual collectors may increase the gathering cost of other collectors. This is analogous to the common-pool groundwater problem; as more wells are drilled into an aquifer, existing users find their pumping costs increasing as water is extracted in excess of the recharge capacity (Kramer and Ballabh, 1991).

If co-ops have to manage successfully natural resources or flow of goods and services from these resources, the first

pre-condition is to acquire exclusive property right in the resource. Once the property right is assigned to the co-ops or its members, 'the resource becomes private property to group co-owners like, common property resources (Bromley, 1991 p.25). Once the property rights are assigned to the "co-ops, its success would depend, upon two sets of issues. First, the co-ops ability to enforce its property rights, restrain and non-owners from using the resources, the co-op should be able to coordinate use among its members and avoid "free riding". Failure to evolve proper-enforceable mechanisms would turn the resource to be an open access resource, and inevitable degradation would follow.

Acquiring and enforcing property rights and devising rules and regulations, on natural resources entail significant transaction costs. Even if rules and regulations about the proper use and management of resources are **evolved**, there is the monitoring cost, which is related to the enforcement of the contract among members of the co-op. The cost of monitoring (i.e.: enforcing) this contract involves both the cost measuring members' behaviour and the **cost** of correcting, if *tie*. or she is discovered to be **shrinking**. If the co-op has to succeed and compete with other systems of resource **management**, a necessary condition is that the co-op should reduce these costs as much as possible. It should be noted, however/ that first set of transaction cost, i.e. assigning property right to resources and its enforcement, is largely external to the co-op; however the second set of transaction costs is more or less **internal**, and largely depends upon the internal design and structure of the co-ops.

Cooperatives as Resource Managers in India

In India, resources management around the co-op is considered as ideologically and morally superior to other competing forms of **organization**-. One reason for their superiority is **1•their** governance structure and control which ideally **should-be** democratic*." It is also believed that the distribution of gains from the co-op would be fair and **equitable**. Because of this ideological and moral **superiority**, co-ops have been promoted in a variety of situations; particularly when **1** all other forms of organization did **not succeed**. **Cooperatives** are also provided government subsidies and 'occasionally exempted from taxes/ levies, etc. However, all this support have not make the **co-op** a superior form of organization. Below we describe the difficulties encountered by co-ops in obtaining' property rights in natural resources.

Assignment of Property Rights to Cooperatives: Forest and Lands Revenue

Formal natural **resource management co-ops** are relatively new, although there several **traditional, time tested**

by the villagers using the co-op experience of past 10-15 years has shown that co-ops face a daunting task in acquiring of property rights to natural resources. Traditionally, for example, there was- no property rule on forests, ' they were managed on customary laws and conventions. Laws were introduced in the evolution of forestry in India, in the transition from customary law to statute law (Guha, 1983) the rights of the local people were marginalized. Under the Forest Acts of the states, the state owns the forests land and are its exclusive property (Pathak, 1990). The Forest Conservation Act of 1980 further¹ complicated the matter. According to this act, forest lands **cannot be** transferred for whatsoever reasons without prior **approval** from the central government* However, a government of India order of June 1, 1990, states that, on degraded forest land, communities could be involved and may form organization including co-ops for joint management of forest with the forest department (GOI, 1990) .

This order has paved the way for co-ops to acquire forest land. Experience, however, its acquisition is not at zero cost for the fact that the same government order suggests, that no ownership or lease rights over the forest land should be given to the beneficiaries or to the voluntary agency/NGO« Nor should the, forest land- be assigned in contravention of the provisions contained in the Forest (Conservation) Act, 1980". This provision gave the forest department and its officials discretion about allotment of land to-co-ops. For example the Gujarat forest department used this provision against a voluntary organization, simply because the latter was laying underground pipeline for irrigation, which was passing through state forest land. However, assignment of property right on particular products or services from the forest is possible. For example, local people are allowed to collect minor forest produce from forest land. The co-op of local people who are dependent on these could acquire usufruct property rights on these products. However, enforcing property rights on flow of goods from the forest is extremely costly (Marothia, 1992).

The assignment of property rights or lease right to the coop in government revenue and panchayat land is not difficult but takes considerable time and efforts (Raju and Sarabhai, 1992) . Once the property right is assigned the co-op becomes the statutory owner of these resources; therefore, anyone who is not owner of the resource the resources through legal **means**. Property through legal means may be costly. Alternatively, the co-op could make most of users **it's** members and internalize the cost of exclusion. For example, the Rabaries in Vatra village were hurt, when the Vatra Tree Growers Co-op Society was constituted on village revenue land (Saxena, 1992). The Rabaries do not form more than 6-7

percent of the village but-they were the sole users of the village revenue wasteland before the co-op was formed. However, as the size of members increases, transaction associated with use and management of resource members increases sharply. It is likely that those of the co-op who have marginal interest in the resource m become "free riders" or' those who were absolutely riders" before formation co-op may thwart any attempt to disciplined use of resources.

Groundwater

Geohydrologically, India could be divided in three broad categories (i) unconsolidated, (ii) semiconsolidated, (iii) consolidated regions. The unconsolidated (north-India) region has the biggest groundwater potential followed by- the semi consolidated (north-west India) region, region most poorly endowed with groundwater is consolidated^ area of entire South Indian Peninsula, consisting of hardrock regions (Saksena, 1989). The property right issue in groundwater perhaps is more important, in hardrock areas of the Southern Peninsula, However, in this region the underlying rock is often **folded**, fractured, jointed, and channeled, and thickness of the groundwater bearing weathered mantle varies considerably (**Sivanappan, 1989**). Therefore, determining the characteristics of aquifer is a formidable task.

Assigning property rights .in groundwater is for more difficult. A specific property right might best be characterized by the right to exclude from modifying, transporting, or using a particular thing. In the case of groundwater, **a well** owner cannot exclude others from **digging** a **well** drawing water from the same aquifer, nor can a identifiable group, say all farmers, exclude others drawing water from the village aquifer. Nor can the government prevent farmers from pumping water under their field. Groundwater in' India is a free but scarce resource (Ballabh and Shah, -1989).

The efficacy and wisdom of assigning property right through legislative measures is also questionable. Because there are numerous users, the administrative machinery will have to deal with millions - of farmers, and, therefore, property right in groundwater is -difficult to establish cost effectively. However, there is no restrictions to a group of coming together to form a co-op around lift irrigation capture:-the groundwater as if it is done by an individual owner. This capture cost- of groundwater would be same to the co-op as it is to any individual owner of the **well**. **Therefore**, the property right issues are not important for **management of successful** lift irrigation co-ops. There is, however, evidence to support that some of the regulatory **regulations to** conserve groundwater are likely to be imposed more **stringently on** co-ops than on private individual well owners.

Cooperative Management of Common Pool Natural Resource : Approaches to Reduce Transaction Cost

The "free rider" problem results when an individual member of a co-op shirks responsibility. Runge (1985) argued that if there are n members to use a resource and k members cooperate (where $k > 1$) and the rest defeat, those who cooperate are still better off than if they all had defeated. In such a situation k represents the minimum coalition that can make positive gains by cooperating with the rule even though others do not. Where $k = n$ no one gains from cooperation unless it is universal and there are no free riders. Where $k < n$, some free rider ($n-k$) can be tolerated while the k cooperators gain, although ($n-k$) cooperators gain more than do the cooperators (Runge, 1985). However, when only k members cooperate and $k < n$; cooperation may not be at stable equilibrium,

One way to solve the problem of transaction cost of coordination among large number of users is to make the group (n) very small. This approach has been adopted by many NGOs /voluntary groups to promote small saving groups and lift irrigation co-ops. This approach was adopted in some of the cooperative lift irrigation in the Indo-Norwegian Agricultural Development Project (INADP) in Deoria district of Uttar Pradesh and the Vaisaii Area Small Farmers' Association (VASFA) in Vaisaii. district of Bihar

When the user group is very large, the members have been divided in homogenous groups based on their caste, class, and resources requirements. A unique approach of management and group decision making which combines private strength with collective strength (Kumbhar, 1979; Shah and Ballabh, 1986), was adopted in the Gambhira. Farming Cooperative in Gujarat. In this society, the membership is divided into 28 groups of 8-16 members. Each group is allotted plots of land in proportion to group size at the rate of 1.5 - 1.7 acres/member.. Each group elects its leader. The draws up a crop plan, indents requisite amount' of bullock power, and provides overall supervision in addition to his share of work as a member. • For. additional work, the leader is paid a bonus in proportion (0.75%) to the group's overall productivity. All members together elect a management committee of 7 members and the chairman is nominated by the Cooperative Department - (Shah and Ballabh, 1986). The co-op has reduced the transaction cost associated with monitoring members' behaviour and provided incentives to perform better. This approach, however, did not succeed in hill resource management societies in Haryana the different users of forest resources were divided in to groups and for each group a separate society was established. This process of division reduced the transaction-cost among the members but increased the cost of coordination among different societies. To quote from one consultant working on the

project: The situation gets more complicated—if different villages (or different groups of people from the same village) sharing rights in the same area have interests in different produces, for example bhabbar and fodder grasses. If one society is given a lease for fodder grasses and another one for bhabbar in the same area, the danger is that conflict will arise between the society and people over accountability. Fresh bhabbar can also be used as fodder and those entitled to cut -fodder may be tempted to cut some of the bhabbar as fodder. But bhabbar now has high commercial value and its lease price is much higher. If society suspects stealing of resource society conflict cannot be easily resolved, work only on complete trust situation is rare, given the existing social **hierarchy** (Sarin, 1990). As far as we know, these conflicts have not been resolved. We also do not think that this is a robust approach either, particularly in India. Indian society is quite segregated on caste and class lines - except in isolated areas. Therefore, it would: be such approaches on a large scale. It would be no wonder that **co-ops** disintegrate once the promoting, agency exits.

Evidence is however available, which supports the view a co-op of large members can remain stable over-time support from external agencies. For example, Sadguru Water and Development Foundation lift irrigation co-ops have on an average 117 members and have proved stable (Chambers, **Saxeia**, and-Shah, 1989). The Foundation provides assistance to the co-ops in resolving, conflicts among **the** members. There are spontaneous large group irrigation companies having **Over 50 members**. Sometimes membership goes above 100 in-parts of Gujarat; in Kheda and Hehsana districts companies have survived 30-35 years. One reason **for** their success- is the acceptance of proportionality in capital **contribution,-landholding** within the command area, patronage share in profit and. risk (Shah, 1992). principle made reward commensurate with effort for every member and gave no incentives for free riding. These lift Irrigation companies use market mechanism to. sell water to members and **no n-members**. In contrast, many lift irrigation co-ops—in "the- same-area sell water to members: and ;nort-members at predetermined price (usually on a no profit no.,loss basis) set; ;by the Groundwater Irrigation Board, does not provide incentives to the **managers** of co-op to improve their performance (Shah, 1992).

Large spontaneous groups are also found in forest management. Several van (forest) panchayats working in the hilly **regions** of Uttar Pradesh are a testimony to it. Although *most* van panchayats are governed by a compact **village**. But there are instances where 4-5 villages have user rights over a particular piece of the Van Panchayat forest land. For example, the-Kandolia Van Panchayat in Pauri Garhwal is a multi-village **panchayat**, and households from four villages (Pauri, Kandolia, Chuiencha, and Kandar)

have proprietary rights (Ballabh and Singh 1988). This Panchayat sells timber and fallen trees at market price and proceeds are used to pay the forest guard. Although, there are numerous examples where van panchayat forest is guarded by members themselves. Using the market mechanism to distribute the resources, the panchayat avoids the coordination problem among the four villages. The management committee monitors effectiveness of the forest guard. If the committee is unable to monitor the behaviour of the forest guard, it is replaced in the next election or even before it completes its term (Ballabh and **Singh**, 1988).

Several other innovative approaches have been a natural resource management co-ops. Assigning individual and joint responsibilities has a positive influence in the functioning of co-op lift irrigation schemes in **Karimnagar** district in Andhra Pradesh* The joint responsibility was so fixed that if an individual failed to repay the loan installment towards the capital borrowed from the bank for construction of lift irrigation system, the entire group forfeits the right to use the pumpset (Nagabrahmam, 1989). It generated internal pressure on members to stick to the rules for use and management of lift irrigation, and deposit the loan installment as and when due. The bank's cost of monitoring is also reduced. In contrast, in INADP - promoted tubewells the incentive structure was such that it **promoted** free riding from the beginning (Ballabh, 1989). Electricity connection was in the name of the member secretary of the project, who happened to be ex-officio District Agriculture Officer. This gave members leverage not to pay water charges on time. This also resulted in heavy dues and eventually by 1990 most of co-op was privatized.

In most of the examples cited above, a leader or an outside agency has played a crucial role. In such **systems**, the roles of a leader or an outside agency are those of (i) an entrepreneur setting up a new business and (ii) resolving the assurance problem (Shah, 1989). The leader or the outside agency has borne the cost of allocation of property rights in resources to the co-ops and provided assistance and coordination in the initial stages to evolve rules for their governance,, Because leaders are difficult to replicate, it is important that systems are evolved which could be replicated. One reason the systems are difficult to replicate on a large scale is that the systems **is** most often forced to work against market forces for equity consideration. We believe that time has now come to incorporate the market mechanism with institutional innovations to reduce the cost of resource management, A related issue why do leaders bear these costs. We suspect they do it to maximize their own utility function and enhance their non-pecuniary benefits **in** terms of social **status**, which provides legitimacy to their leadership.

Conclusions

This paper uses property rights and the transaction cost framework to analyse the behaviour of resource users and effectiveness of co-ops to manage the common pool resources. We identified two sets of transaction: cost associated with management common pool resources by cooperatives, The first is related to obtaining property rights in the source. The second is associated with devising rules and regulations and coordination of use of resources among **co-owners**. Both are significant costs. The transaction cost associated with obtaining property rights is largely external to the co-op. However, enforcement of this right could be best achieved through local customs and conventions rather than using legal means. The second cost is largely internal to the **co op**. It depends upon the rules and norms developed by the co-op. We have cited several examples where innovative mechanisms have been evolved to reduce the transaction cost associated with resource use and prevent free riding* However, we have not found any robust and versatile mechanism which could be replicated, **except** those developed traditionally. This, however, ignore the several innovative mechanisms developed institutions. What is perhaps needed is to mechanisms which have capacity to handle large **agenda on a** sustainable basis.

References

- Alchian, A and Demsetz, M (1973). "The Property Rights Paradigm", *Journal of Economic History*, Vol.13, pp.16-27.
- Ballabh, V and Singh, Katar (1988). "Van (Forest) Panchayats in Uttar -Pradesh Hills : A Critical Analysis", mimeo, Institute of Rural Management, Anand.
- Ballabh, V (1989). "Decline of Community Tubewells in Deoria - Opportunities and Options for Small Farmers", paper presented, at the workshop on Efficiency and Equity in Groundwater Use and Management held at Institute of Rural Management Anand, January 30 - February 1.
- Ballabh, V and Shah, Tushaar (1989). "Efficiency and Equity in Groundwater Use and Management", Workshop Report No.3, Institute of Rural Management Anand, Gujarat.
- Bromley, D.W. (1991).. "Environment and Economy Property Rights Rights and Public Policy", Oxford: Blackwell.
- Chambers R, Saxena. N.C., and Shah Tushaar (1989). "To the Hands of the Poor - Water and Trees", New Delhi : Oxford and IBH.
- Cheung, Steven N.S. (1970). "The Structure of a Contract : and the Theory of Non Exclusive Resources", *Journal of Law and Economics*, Vol.13, pp. 49-70.
- Coase, R.H. (1952). "The Nature of the Firm" in G.J. Stigler and K.E. Boulding (eds.), Reading in Price Theory, Illinois : Richard D Irwin.
- De Alessi, L (1980). "Economics of Property Rights : A Survey of the Evidence", Research in Law and Economics, Vol. 2, pp. 1-47.
- Demsetz, M (1967). "Toward a Theory of Property Rights", American Economic Review, Vol. 57, pp. 347-59.
- Denning, M (1982). "The Public Ownership of Productive Resources : An Economic Analysis of Public Enterprise", paper presented at the 1982 Annual Meeting of the Western Political Science Association, San Diego, California, March 25-28.
- Furubotn, Erik and Pejovich S. (1972). "Property Rights and Economic Theory : A Survey of Recent Literature", Journal of Economic Literature, Vol.10, pp.1137-62.

- Government of India (1990). "Government Order of June 1, 1990 - Environment of Village Communities and Voluntary Agencies for regenerated of Degraded Forest Land, Letter to Forest Secretaries", Ministry of Environment and Forests, Paryavaran Bhavan, New Delhi.
- Jodha, N.S. (1986). "Common Property, Resources, and Rural Poor In Dry Regions of India", Economic and Political Weekly, July 5.
- Kramer, R. A. and Ballabh V. (1991). "Management of Common-Pool Forest Resources", paper presented at the Triennial Conference of the International Association of Agricultural Economists, Tokyo, August 22-29.
- Kumbhar, L (1979). "A Successful Experiment in Group Farming", Gujarat Institute of Area Planning, Ahmedabad, September.
- Marothia, D.K. (1992). "Cooperative Management of Minor Forest Products : Lessons of Madhya Pradesh Experience", paper presented at the International Symposium on Cooperatives in Natural Resources Management Workshop, Institute of Rural Management Anand, December 7-11,
- Nagabrahman, D. (1989). "Small Groups and Ground-water Management", paper presented at the workshop on Efficiency and Equity in Groundwater Use and Management held at Institute of Rural Management Anand, January 30 - February 1.
- Ostrom, E (1986). "Issues of Definition and Theory : Some Conclusions and Hypotheses," Proceedings of the Conference on Common Property, Resource Management, Washington D.C. : National Research Council.
- Pathak, A. (1990). "Management of Forests and Wasteland Development", paper presented at the workshop on Wasteland and Forest Management, Institute of Rural Management Anand, March 15 - 17.
- Runge, C.F. (1985). "Common Property and Collective Action in Economic Development". In Proceedings of the Conference on Common Property Resource Management, Washington D.C. National Academy Press.
- Sarine M. (1990). "Working with Village Groups", paper presented at the workshop on Sustainable Forestry, Indian Environmental Society and Ford Foundation, September 10-12.
- Saxena, R.K. (1992). "A Case Study of the Vatra Tree Growers' Cooperatives Society Limited," Working Paper No.32, Institute of Rural Management Anand.

- Saksena, R.S. (1989). "Present **Status of Groundwater Management in India and Perspective for Future**", paper presented at the workshop on Efficiency and Equity in Groundwater Use and Management Institute of Rural Management Anand, January 30 - February 1.
- Singh, Katar and Ballafoh, V. (1992). "Cooperatives in Natural Resource Management : Experiences, Issues and Agenda for Future Research" Theme Paper for the International Symposium on Cooperatives in Natural Resource Management, Institute of Rural Management **Anand**, December 7-11.
- Sivanappan, R.K. (1989), "Groundwater Management in Hard Rock Areas - Current Status and Future Focus", paper presented at the workshop on Efficiency and Equity in Groundwater Use and Management Institute of Rural Management Anand, January 30 - February 1.
- Shah, Tushaar (1989). "Collective Action on Village **Commons** : Community Fodder Farms in **Kheda** District, Gujarat", Case Study No. 5, Institute of Rural Management, **Anand**, November.
- Shah, Tushaar and Ballabh, V. (1986). "Ownership/Use Rights and Community Involvement in Wastelands Developments : Experiences from Gujarat", **mimeo**, Institute of Rural Management Anand.
- Shah, Tushaar and Saumindra, **Bhattacharya** (1992). "Farmer Organisation for Lift Irrigation Companies and **Tubwell** Cooperatives of Gujarat", paper presented at the International Symposium on Cooperatives in Natural Resources Management Workshop, Institute of Rural Management Anand, December 7 -11.

THE SALT MINERS' CO-OPERATIVES IN THE LITTLE RANN OF
KACHCHHA-IN-GUJARAT : A CASE STUDY

Katar Singh and Saumindra Bhattacharya

Abstract. Inland salt production has a very high potential as a source of income to the farmers in and around the Little Rann of Kachchha (LRK) in Gujarat. Salt in LRK is produced from brine by four categories of producers, viz., licensed public, private, and co-operative firms and unlicensed individual proprietors. Salt Miners' Co-operatives (co-ops) locally known as *mandalis* were established to improve the socio-economic condition of the salt miners by unshackling them from the clutches of the private traders-cum-money lenders. The co-operatives account for nearly 20% of the total salt produced in the LRK. This paper presents the results of a case study of salt miners' co-ops. The study aimed at examining the operations, management, effectiveness and the impact of the salt miners' co-ops. It revealed that a lion's share of the profits from salt production is grabbed by the private traders-cum-money lenders and that the poor salt miner receives only about four per cent of the consumer's price. The authors highlight the need for restructuring the existing system of salt production and marketing in the area on the lines of Anand pattern co-operatives and improving the existing marketing system and the basic infrastructural facilities in the area. The Sabarmati Salt Farmers' Society has been spearheading the task of reorganising the existing co-operatives on the Anand pattern and helping the salt miners in obtaining credit from institutional sources. It is hoped that the exploitation of poor salt miners by the traders and money-lenders will gradually decline and their lot will improve. The authors conclude that it is only after the existing *mandalis* are reorganised into genuine producer-owned and controlled co-ops that the goals of equity, efficiency and sustainability in the use and management of brine which is a common pool resource can be achieved.

Keywords: Anand Pattern, brine, common pool resource, equity, Gujarat, Little Rann of Kachchha, salt miners, Sabarmati Salt Farmers' Society.

= Singh - 2021

Introduction

The table salt (sodium chloride) is an essential ingredient of human diet, and is therefore considered as a basic necessity of life. With its annual production of around 10 million metric tons (mt), India is the sixth largest producer of salt in **the world (NDDB ud)**. Nearly 77% of the total salt produced in India comes from the sea and the remaining from inland subsoil brine (water **full** of salt) which is a common pool natural resource, i.e., a resource that is used in common by a group of people. The state of Gujarat lying in the western region of the Indian subcontinent is the single largest producer of salt in the country accounting for nearly 64% of the total annual salt production. Gujarat is also the largest exporter of salt. In 1990, Gujarat contributed about 60% of total marine salt production and about 68% of the total inland salt production in the country.

Of the total salt production in India, some 52% is consumed as table salt, 34% is used for industrial purposes, 5% is exported and the remaining 9% is either used for **miscellaneous** purposes or wasted. India is an important exporter of salt and earns valuable foreign exchange from salt export. In 1990, India exported 5.62 lakh of salt of which 73% was contributed by Gujarat.

There are four categories of salt producers operating in the **LRK**. They are licensed public limited companies; licensed private limited companies and partnerships; licensed **co-ops** of salt miners/farmers locally known as *atgarias*; and licensed and unlicensed individual proprietors. Of the four categories of producers, the private companies and partnerships account for about 65% of the total salt produced in the **LRK**. The co-ops come next contributing about 20%. It is estimated that there are some 2,000 to 2,500 households engaged in salt production in the **LRK** (Das and Mondal 1991 : 1). The plight of the *agaria* is worse than that of the bonded labourer as he cannot even claim the minimum wages stipulated by law. Whatever the system of salt production, it is **the agarias** who have to bear the brunt of actual mining of salt and yet, ironically, it is they who are deprived of the fruits of their labour. It is estimated that the average annual income of a typical *agaria* family of five members in **1989-90** was Rs. 5,835 of which Rs. 4,851 (83%) was contributed by salt production and the remaining Rs. 984 (17%) by other activities (Das and Mondal 1991 : 30). There is an acute shortage of drinking water in the area, and education, public health, transport, and communication facilities are deplorably inadequate and poor in quality. Just how the *agarias* make both ends meet is anybody's guess. In the absence of any other alternative employment opportunities, they are compelled to take to salt mining and production which is a hazardous, back-breaking and low-income occupation.

The salt miners co-ops were organised at the behest of the Government of Gujarat (GOG) to improve their lot. There are 116 primary salt miners's co-ops registered in Surendranagar district alone. But most of the co-ops are defunct due to their failure to pay back their loans to the banks from whom they borrowed the money. Another reason for their sorry plight is that their leaders and employees play second fiddle to the private traders-cum-money lenders operating in the area.

This study was undertaken to explore how the salt miners' co-ops operate, how they are managed, what impact they had on their members, what afflicts them, and what needs and should be done to redeem them.

Research Methodology

The study was conducted in Surendranagar district of Gujarat which was purposively selected because it had the highest number of the salt co-ops and the Sabarmati Salt Farmers' Society (SSFS) located in it. The SSFS was established by the National Dairy Development Board (NDDB) on the request of the GOG to save the *agarias* from the clutches of the traders. For a detailed study, a sample of 13 functional profit-making and six defunct loss-making salt producers co-ops was selected randomly out of a total of 116 co-ops in the district. Then, a sample of 65 *agarias* comprising five from each of the 13 functional co-ops was selected randomly.

Both primary and secondary data were collected from the sample co-ops and *agarias*. The data collection work was conducted in two rounds--once during the production season (October 1991) and the second time during the procurement and marketing season (May 1992). The primary data were collected through the Rapid Rural Appraisal (RRA) methods and individual and group interviews using structured questionnaires.

In the first round, a few selected production sites were visited and an RRA conducted to have a feel of the general production system, various operations involved and the problems encountered by the *agarias* in salt production and marketing. Informal discussions with a few selected *agarias*, Secretaries and Chairmen of five of the sample co-ops, officials of the SSFS and of the Salt Commissariat, Gandhinagar were also held in the first round. In the second round, data were collected from the sample *agarias* through the individual interview method using a pre-structured questionnaire. Besides the sample *agarias*, eight individual proprietor producers each holding a 10-acre brine area, five private traders, two transport contractors and two labourers were also interviewed to get a broader perspective on salt production and trade in the area.

The Oakerson model (Oakerson 1986) was used to analyse the salt production and marketing system, to diagnose various strengths and weaknesses in the system, and to identify appropriate measures to improve the system as well as the socio-economic condition of the *agarias*.

A Characteristics of the Study Area and the Resource

The study Area

The LRK has an expanse of about 2,000 sq km. Once upon a time, the LRK was part of the sea. Following an earthquake years ago, the seabed turned into a desert with reservoirs of brine underlying it. A 15 km wide belt around the periphery of the LRK has been demarcated by the Government of India (GOI) beyond which brine extraction is not to be carried out. The total salt producing area of the LRK and the salt producing districts of Surendranagar, Rajkot, Kachchha, and Banaskantha measure nearly 500 sq km. and produce about 30 % of the total salt produced in the state. The LRK provides unique natural conditions for production of inland salt. It is a vast low lying desert of salt encrusted sand barely above the mean sea level. It remains submerged with sea water throughout the monsoon season and thereafter, it is drained by Luni, Banas and Saraswati rivers. There are some 42 villages situated around the periphery of the LRK from which the *stgarias* come to the Rann to extract salt. Though the LRK is a distinct geographical area, it is neither clearly demarcated by physical boundaries nor does it provide any obstruction to human movement across it except when it is inundated by flood waters, and for several months after the inundation while the mud is still wet. The climate prevailing in the area is extreme like that of all desert regions. In fact, the LRK is part of the great tropical desert belt stretching from Sahara through Egypt, Arabia and along the Meharan coast to the Thar desert. As far as the soil conditions are concerned, superficially the flat Rann appears to consist of a uniform fine salt encrusted sand. However, the soils of LRK have various layers or horizons. At about three to four metres below the surface, there is bluish clay over which porous soil lies. The water overlying this impervious clay layer is highly concentrated brine which has percolated through layers of sand.

As far as the flora and fauna are concerned, hardly any vegetative cover is found in the LRK. Even the most hardy xerophytic species cannot grow in the Rann. Besides the common animals, one would find the wild asses (*Equus Lemionis*), for which LRK is famous. This species is existent only in the LRK and is now on the decline.

The Resource* and the Salt Production System

As mentioned **earlier**, inland salt in the LRK is produced from the brine extracted from the underground layers of the earth. The brine is normally struck at the depth of 25 to 40 feet. The brine from the wells is extracted from seven in the morning till six in the evening by pumps that operate on crude **oil**. The density of brine varies from 15 - 20 degree brine concentration (BC) as compared to three to four degree BC of sea water.

The **availability-of** brine in the area is highly random and uncertain. There are no scientific rules for predicting its availability [1]. The *agarias* select the sites for digging wells for extraction of brine based on their experience. The depth of occurrence of brine has been reported to vary within a wide range of 7 m to 120 m from the ground level.

Irrespective of who owns the brine wells, the primary and the most difficult job of extraction of brine is done by the *agarias** Typically, the salt production process consists of the activities of site selection digging of wells, installation of pumps, pumping out brine, petssing it out through outlets to condensers for evaporation and to pans for crystallisation, and finally collection and storage in heaps. For all practical purposes the primary operations and their management are all done by the *ag&rias** However, the decision making process varies across the ownership categories including the co-ops. For the co-ops, some of the functions like the supply of the crude oil, hiring of the pumps, supply of drinking water, transportations, etc. are performed on a common basis by the Chairmen of the co-ops for which they charge administrative fees varying from Rs. 300 to Rs.1,000/annum.

The brine is conveyed through make-shift channels into condensers each measuring about $20^1 \times 20^1$ in size and numbering from 8 to 10 per typical unit. When the brine concentration in the condensers reaches 24 BC, it is fed into a pan measuring about $100^1 \times 100^1$ for evaporation, To get the crystals of large and uniform size, the crust formed in the pan is broken manually at regular intervals with the help of primitive tools. This back-breaking age-old practice of crystallisation of salt still continues; no new scientific methods of automated and faster crystallization are yet available to the *agarias*. There is a need for developing appropriate tools and equipment that could perform those functions more efficiently and reduce the drudgery and health hazards of the existing methods. Finally when they are ready, the salt crystals are removed from the pan and the earth is padded/pressed by the feet to make the surface hard. At the end of the season, a single pan on an average yields about 400 mt of salt.

The preparation of -the pan- is a very crucial activity.- The type of the salt that is finally produced mainly depends upon the process of crystallisation which in turn is regulated by the condition of the pan, the frequency of padding, the depth of raking, and the extent of exposure to sunlight by changing faces through turning the salt particles upside down. From a single pan one to six crops can be harvested in one season. This, however, varies according to the conditions prevailing in the pan and is highly region specific. The reason for this variation can be mainly attributed to the difference in quality of the brine. For example, a pan in Halvad region yields three to four crops of sparkling white colour whereas only one crop of pale white colour can be obtained from the Kuda region. Also the crystal is smaller and more brittle in Halvad than in Kuda. However, to ensure high quality, it is advisable not to harvest more than four crops/pan/season.

As per the GDI stipulation, edible salts are required to be iodised. This is done by the traders in their iodisation plants located in the heaping centres. The total expenditure incurred to set up an iodisation plant is estimated around Rs. 1 lakh to Rs. 1.2 lakh. The *agarias* have no role in this process. According to the stipulated norms, iodine should be added in the proportion of 35 to 50 pro. This requires one kg of Iodine to treat 21 kg of salt. The average market price of iodine varies from Rs. 330 to Rs. 350 per kg. As usual in the Indian context, this norm has been found to be frequently violated; the traders have been reported to use only one kg of iodine to spray as much as 40-45 mt of salt. This practice is followed in spite of the existing government subsidy on iodisation.

It needs special mentioning that a high degree of risk is involved at various stages in the process of salt production. Though the creditors do bear some of the risk partially, in most cases, it is the poor *agaria*' who has to bear the lion's share. The probable risks associated with salt production are as follows :

- a) Failure in striking brine.
- b) Very low discharge rate of brine.
- c) Sudden stop of brine flow within a week of striking.
- d) Lack of required intensity of sunlight for evaporation
- e) Health hazards and other casualties.

After the salt is finally collected from the pans and stored in heaps, the trader/agency who has entered into the contract of buying the produce bears the risks. However, if the produce gets washed off due to sudden rain before the actual collection and lifting by the trader/agency, then the *agaria* has to bear a substantial portion of the loss.

The extent of the loss to be borne by each party is decided by a bargain between the *agaria* and the buyer.

Characteristics of Resource Users

As many as 2,000 to 2,500 *agaria* households are estimated to be engaged in the traditional occupation of salt production in the LRK. For several decades, salt production has been the back bone of the economy of the villagers living in and around the LRK. The major sources of income of 80% of the *agarias* in this area are salt production, agriculture, and agricultural labour (Das and Mondal 1991). However, none of the sample *agarias* had irrigated land. The distribution of land holding in the area was highly skewed. About 77% of the *agarias* were landless and the remaining had land holdings varying from one to five or more acres. According to Das and Mondal (1991: 4), 80% of the *agarias* were illiterate and out of the 19 per cent of the total population who were in the age group of six to nine years, only 23 per cent were going to schools. Nine per cent of the villages had no schools at all. Though 70 per cent of the villages had primary schools, only 15 per cent villages had schooling facilities up to 8th standard.

The housing condition was also very poor. Most of houses had walls made of mud and had thatched roofs. As soon as they move into the LRK, they make make-shift huts of mud and gunny bags/straw for their stay for eight months or so while they work there for producing salt. In terms of live-stock assets, only five percent of the total respondents owned bullocks, 14% of them had milching animals and 10% goats (Das and Mondal 1991). Lack of potable water and fodder in the Rann acts as a constraint, on taking up animal husbandry activities. The water scarcity is so acute that the *agarias* are reported to take bath only once a week and cannot use water for washing clothes or cleaning utensils as per normal requirements. According to Das and Mondal (1991), 35% of the medical needs of the *agarias* are met through the public hospitals and 43% by private doctors in the surrounding villages. Some 16% of the respondents mentioned that the SSFS and other societies helped them get needed medical care (Das and Mondal 1991). The transportation facilities available in the Rann include motor bus, trucks, tractors, camels and cycles. When the soil is still wet, walking is the only alternative available. The villagers have access to nearby markets for buying their daily necessities.

The Decision-Making Environment

For decades the local people have had an open access to brine and had used it for making salt. In the pre-Independence era, the British Government imposed

restrictions: on the use of this resource and levied a tax on salt production. In protest against that policy, Mah-atma Gandhi organised a political agitation on 6 April 1930. People protested vehemently against that move of the British Government to extend the state control over an open access resource. Gandhiji used the weapon of *satyagraha* and broke the law of salt that prohibited salt production by people. Immediately after Independence, an attempt was made to nationalise this resource. But unlike the case of nationalisation of the coal mines, no formalised organisational structure was created for implementing the policy. Since that policy did not work, GOI decided to go in for privatisation of the salt lands in the LRK by leasing them out to registered *agarias*. For facilitating the privatisation, GOI created two central bodies : one Commissariat of Salt at Jaipur (Rajasthan) and one Office of Assistant Commissioner of Salt at Gandhinagar (Gujarat).

As far as the legal ownership is concerned, the LRK was declared a Wild Ass Sanctuary under the Wildlife Act 1972 on 12 January 1973. But *de facto* some land falling within the revenue boundaries of the peripheral villages which was notified as part of the wildlife sanctuary has not yet been transferred to the Forest Department and the concerned Deputy Collector still continues to lease out the notified salt lands to salt producers. A good deal of encroachment on the salt lands by cultivators has also been reported which has come in the way of completing the proposed ground surveys to delineate the notified areas within the salt sanctuary.

Under the existing arrangements, salt lands are leased out to different types of producers, viz., public, private, co-operative and individual manufacturers. The private sector dominates the scene contributing about 65% of the total salt produced in the LRK. The co-op sector comes next accounting for about 20% of the total salt production, The shares of the individual manufactures and the public sector companies are estimated to be 10% and 5% respectively. The Hindustan Works, a public sector undertaking, which has a reserved area of 7 km around its salt works (in the periphery of the LRK) has been utilising only 800 acres of land out of 23,000 acres expected to be utilised over the years. Thus, the use of the nearby salt lands has been restricted. As a result, *agarias* and co-ops have to go further deep inside the LRK for salt farming. This leads to increase in transportation cost of the salt produced by the *agarias* and the co-ops who have to move 25-30 km away from Kharagada, bear to and fro haulage, which could be avoided if the salt lands reserved for the Hindustan Works but not being utilised are leased out to the co-ops of poor *agarias*. The other categories of salt producers are the licensed private salt works having more than 100 acres, those having between 10-100 acres, licensed co-ops and unlicensed private salt works.

The contribution of **the** co-ops is substantially lower than their actual potential. The *agarias* even-when they are organised into co-ops are exploited by private salt producers-cum-traders who generally hold salt production sites of both 10 acres and more than 100 acres. Since there is a cess levied @ **Rs. 3.50/mt** on the produce of 100-acre holders and the **10-acre** holders are exempted from the cess they show book losses in the cases of **100-acre** sites and channelise the profits through the 10-acre sites to evade the cess. The **process** of leasing the salt lands to the co-ops of *agarias* started way back in 1950. After the establishment of co-ops, the lot of the *agarias* has improved, albeit marginally, as **compared** to when the production was wholly under the control of the East India Company and private firms. The total salt area under the control of private works and 10-acre holders is estimated to be 5,000 and 2,500 acres respectively. Recently, some political pressure was exerted to stop the renewal of the **10-acre** contract leases to private traders but it failed to achieve its objective thanks to strong vested interests.

Allocating more of the salt lands in the LRX to the co-ops would enable the *agarias* to work on bigger production sites and produce more salt using their family labour more fully. This would improve their economic condition and also achieve the objective of equity as the benefits from brine would be more uniformly distributed among a large number of *agarias*. In our opinion, the duration of lease should also be increased so that the lessees take interest in using the natural resource judiciously and sustainably.

The Role of SSFS as an Intervening Agency.

Duly recognising the need for improvement in production and marketing of salt and in the level of living of the *agarias*, GOG requested the NDDB to intervene. As a consequence, the SSFS came into being in 1987. Its objective is to save the *agarias* from the clutches of the traders and help improve their level of living. It is also working as a catalyst for some developmental programmes like medical and health care, education, etc. During the first year of its operation, the SSFS procured 16,000 mt of salt from 27 *agarias* at Rs. 2.6 per mt. The price offered by the SSFS was about 25 % higher than what **the** *agarias* used to receive in the earlier years. During 1988-89, the society procured 40,000 mt from 81 *agarias* at an average rate of Rs. 27 **per** mt and an additional Rs. 2 per mt was distributed as price difference, a result of the efficient marketing done by the SSFS (NDDB ud). The branded salt introduced by the SSFS under the brand name of **BANS A** could not do well in the market, mainly due to inefficient distribution and its insignificant share in the salt market.

The SSFS persuaded the State Bank of Saurashtra to arrange a loan of Rs.10,000 to each *agaria*, for meeting the expenditure on salt production. The SSFS served as a guarantor for the

loans. Since the recovery was 100% during the first two years, the bank is now prepared to advance money to any number of *agarias* in the coming years.

The SSFS in collaboration with the Tribhuvandas Foundation (TF), Anand has trained many health workers selected from amongst the *agarias* for curative and preventive health care measures. These health workers in turn treat their fellow *agarias*. With the help of the Central Salt Marine Chemical Research Institute, Bhavnagar, the SSFS is in the process of developing modern harvesting technology and new methods to replace the age-old practices and thereby increasing the production per pan. The SSFS in collaboration with the Rajasthan Electric and Instruments Limited, Jaipur has installed two solar-operated brine pumps and two portable black and white TV sets for the first time in the history of the LRK. The SSFS also proposes to distribute bicycles and other accessories like gumboots to the *agarias* and launch adult education programmes.

However, the utmost need at this juncture is to launch an effective marketing intervention programme by which the *agarias* could be assured remunerative prices for their produce. Due to unavailability of committed personnel ready to work in the LRK, limited level of operational capacity, inadequate basic infrastructure, the SSFS' efforts can hardly be called adequate, considering the unfathomable ocean of exploitation, poverty, and misery prevailing in the LRK.

Role of the Government

The need for intervention by the government is also highly felt. The funds collected towards the cess by the GOI were supposed to be utilised for promoting the welfare of the *agarias* and for the development of salt industry. During 1987-38, in Gujarat alone, an amount of Rs. 122.40 lakh (highest among all the other states) was collected as cess. Out of that, only a sum of Rs. 22.65 lakh was released for development and social welfare activities in the state (Joshi 1989). Generally, the execution of welfare activities gets delayed and the funds lapse every year.

Efforts should also be made to reduce the high uncertainties and various risks associated with the activities of salt production, procurement and marketing.

This might lead to the optimal use of the natural resource, brine, that is available in plenty in the LRK.

Outcomes and Consequences

In this section, we study and evaluate the outcomes and consequences of the existing system of resource use and salt production and marketing systems.

The Economics of Salt Production

The cost of salt production includes both tangible and intangible costs whereas the benefits are mainly tangible arising from the sale of salt. As we stated earlier, the production process essentially starts with the entry of the *agarias* into the LRK for extraction of brine and lasts till the salt from their pans is collected in the heaps. Thereafter all the operations are done by the trader/buying agent. Table 1 presents the average cost figures of sample members of 13 successful co-ops. The cost of production varied within a narrow range. On the other hand, the sales realisation varied to a great extent depending upon the following major factors :

- a) Quality of the produce.
- b) The time of extraction.
- c) The bargaining power of the *agaria*/co-op.
- d) Credibility of the *agaria*/co-op among the traders.
- e) Prevailing price in the region.

The *agarias* move into the Rann immediately after the water recedes and after the desert sand dries up. Along with his family an *agaria* also carries his tools, equipment and other essential materials. The transportation cost presented here is mainly for the tractors hired for this purpose.

The *agarias* have to hire labourers also. The number of labourers hired varies with the ability of the *agaria* to contribute his own family's labour. The labour is mainly hired for carrying out the operations of digging of wells and preparation of pans. The cost of digging the wells varies within a broad range. The *agarias* cannot afford circular iron rings for fixing in the wells and hence a cheaper substitute - a structure made of bamboo - is used. The cost also varies depending on the number of attempts made before the brine is struck. The cost figures presented in Table 1 include some allowance for the risk involved in striking the brine as well as other risks such as the risk of collapse of the well, drying up of the well after a few days of pumping, and so on. The amount of the allowance is estimated on the basis of the experience of the sample *agarias* with digging wells.

The average cost figure that we have used is as high as Rs. 840 whereas the actual average cost of digging is only Rs. 600 if the brine is struck in one go. Thus, an allowance of Rs. 240 is made to cover all the risks involved. The average expenditure incurred on crude oil required to pump out the brine from the well was found to be as high as Rs. 1,610 which was about 16% of the total cost, The *agarias* have to

purchase water from private suppliers at the rate of Rs. 20 per barrel as the quantity supplied by the Panchayat tankers is both inadequate and irregular [2].

Most of the *agarias* have to hire the pumps on contract basis either from their respective societies or from private suppliers. The average cost of hiring accounts for about 8% of the total expenditure. The land preparation cost includes expenditure on preparing channels, condensers, levelling and padding the pans, etc. The *agarias* have to pay an administrative fee which covers the Secretary's salary, expenses incurred for road building, rent for the land, and other miscellaneous expenses. The fee was found to vary from Rs. 350 to Rs. 1,000 per year across the sample co-ops. This reflects the variation in the performance and efficiency of the co-ops. Besides, the *agarias* also have to spend a substantial amount on repairs of pumps at the onset of every season. The imputed cost of the family labour works to Rs. 1,625 which is the highest of all the items of expenditure. We have not included in our estimates of costs any allowances for such harmful externalities as lesions and sores of the lower portion of legs and feet that are caused by prolonged exposure to brine and salt and other casualties due to the awfully hot desert climate [3].

The average production per pan was found to be 408 mt per season and the average price realised by the *agarias* from the sale of salt was estimated at Rs. 40.65 per mt.

A comparison of these cost figures with the average cost and revenue figures of eight selected individual *agarias* operating five to ten acres of salt lands showed better economic performance in the case of the latter (Table 2). The affluent 10-acre holder *agarias* were found to be in an advantageous position in terms of the following :

- a) Their dependency on external sources of credit was very low; 60-70% of the investment was self-financed.
- b) This category of salt producers have pumps of their own. Thus their cost of production is lower. They do not have to pay exorbitant hire charges; their costs mainly consists of repair and depreciation charges.
- c) Due to better management, the produce obtained is quite timely and of high quality.
- d) They are in a better position to bargain with the traders.

The average cost per pan for this category of producers was estimated at Rs. 8,385, the average production per pan at 565 mt, and the average price realised at Rs. 44.25 per mt. All these figures show that the individual 10-acre holders were more efficient, on the average, than the typical member of the salt co-ops.

Since both these categories are exempted from tax payment, it was found that the actual profit per pan for the 10-acre holders was Rs. 16,616 which was 159% higher than the average profit of Rs. 6,405 earned by the *agarias* operating through the co-ops (Table 2). This affluent category of *agarias* also possess brine resources five time the average holding (about two acres) of their counterparts in the co-ops* Besides, the 10-acre-holders also harvest three to four times the total number of crops harvested by the members of the co-ops.

Marketing

To meet their consumption and salt production expenditures, most of the *agarias* in the LRK borrow heavily from the private **traders-cum-money** lenders. However, credit is also available from institutional sources like banks, and co-op societies. In as many as 90 % of the cases, it is the private traders who do the required funding in instalments locally called *hapta*. The instalments are normally released at an interval of 15 to 25 days. The loans from the private traders and the money lenders usually bear an interest of 18% to 24% per annum. Besides, the credit is fully tied to the marketing of the final produce. Under this system, the *agaria* is totally bound to sell his produce to his creditor as per the pre-specified terms and conditions of the contract.

There is a cartel formed by six to eight big traders in the area, It plays a vital role in price fixation. Over a period of time, through the use of various market manipulation techniques, the cartel has assured for itself a safe and secured position in the trade. The small traders are compelled to get out of the salt trade. In the last five years, as many as 15 small traders have been kicked out of the salt trade.

Once the salt is extracted from the pans, procurement starts. The salt is brought from the pans in trucks to the heaping centres at Halvad, Kuda, and Kharagoda situated 30 to 65 km away from the centres of production. This operation is either supervised by the trader himself or by a transport contractor. Here too, the big traders are in an advantageous position since most of them have a requisite number of trucks to procure the entire produce from the Rann before water enters the desert after monsoon rains. The ingress of the sea water is highly unpredictable. It has been observed that a cyclone with a velocity of 60-80 km per hour lasting over two days is enough to draw in the sea water and completely wash off the salt. This warrants the completion of procurement in a very short period of time, 30-40 days to avoid the risk of the salt being washed away. It also does not give much flexibility to the small traders who have to largely depend upon the availability of trucks for procurement. Losses in **transit** are borne not by the trader or the transport contractor but by the *agarias*.

The lands in the heaping centres are taken on lease by the *agarias* either from the village *panchayat* or private landlords at a fixed rent, and the lease contract renewed annually. Different rates exist for leasing out these lands. An annual rent of 35 paise/sq.ft. is charged by the *panchayat* whereas 50-75 paise/sq.ft. by the private land owners. Estimation of total salt production is also done on this basis by the Salt Department. The product sold as industrial salt accounts for 45% to 60% of the total production. It is mainly transported by trucks to user organisations such as Gujarat Heavy Chemicals Ltd., **Dhrangodra Chemical Works** and other industrial houses engaged in manufacturing soda ash. The product sold as table salt is mainly transported by railways. Every trader having authorised procurement (i.e., produce procured from the authorised co-ops, or **10-acre-holders** or other licensed producers mentioned earlier) is allocated a quota of railway wagons. The quota is equivalent to 25% of the total authorised procurement of a trader. The traders contact different markets all over the country and assess the demand for their produce. Thereafter, they book the railway wagons as per their requirement for transporting their produce. However, the railway wagons are made available at a very short notice. Hence, the traders have to keep their stocks of iodised salt ready for immediate despatch. Any delays attract high rate of demurrage charges.

One of the most crucial factors determining the success in salt business is marketing. By forming an oligopsonistic market structure, big traders exploit the *agarias*. Due to lack of infrastructural facilities, even the co-ops are compelled to sell their produce to these private traders at very low prices. The private lenders present themselves as an easily accessible source of loans. A pre-requisite for granting the loans is an agreement stipulating that the borrower **will** sell all his produce to the lender only. The price paid by the **trader-cum-money** lender is usually lower than the prevailing market price. In addition, manipulations of records and accounts by traders with the intention of cheating the salt producer is also very common. In fact, the traders never allow the poor *agarias* to get out of their clutches. Hence, the *agarias* is damned to indebtedness and poverty generation after generation and the trader-cum-money lender becomes richer and richer.

The net margin of the traders is as high as 52% whereas the *agarias* get only 2% to 4% of the consumer's rupee on branded salt. There are several ways by which the big traders **manipulate** and regulate the market forces. For example, in 1990-91 the private traders initially quoted a very high price of Rs. 72 per mt for a few selected pans. This apparently increased the market price. The SSFS got misguided so they had to increase their procurement price also which was earlier fixed at Rs. 52 per mt. Due to the limited funds available with it, the SSFS could purchase only a limited quantity at the increased price. As soon as

the SS'FS's procurement stopped, the traders lowered the price drastically to Rs. 38 per mt. In the case of allocation of quota of wagons too, the big traders got away with the major proportion by colluding together.

Most of the times, the traders contact the Chairmen of co-ops for procuring the required number of salt pans from the member *agarias* of their co-ops. Due to this, it so happens that at times the *agaria* is not at all aware of the actual bargains. This system gives enough scope for misappropriation by a dishonest Chairman. The traders employ other tactics too to control the market forces. For instance, when they find that the production in a certain year is much more than the estimated demand, they do not lift the produce from the Rann itself. Consequently, they save the transportation cost which is almost equal to the cost of salt itself and also save on the money paid to the *agaria*; the saving being as much as 20%-30% of the total value of the produce. In the process, the poor *agaria* suffers as he is paid only for the amount of salt that is actually lifted by the trader. To maintain the balance of demand and supply in the market, the big traders form a cartel and restrict the supply through manipulating the transportation arrangements. It was reported that they bribe the railway authorities, so that less number of rakes (than the allocated) are made available. Again, when the demand is very high they can manage to have more railway wagons allocated to themselves. To ensure high procurement and to wipe off the small traders from the competition, the cartel announces very high rates for procurement of the pans. They allow this inflated rate to prevail for a good number of days. As soon as the news spreads, the *agarias* swarm in to offer their produce. However, only very little amount and that too from those producers who have the reputation of producing high quality salt is accepted. The others are not given any final word but left with optimism. In the meantime, the small traders find it very difficult to make deals with the *agarias*. As they cannot afford to delay their procurement contracts, they are bound to make deals on a higher price. After having done so, they find that the big traders have now lowered the price. All this explains a good part of the salt trade practices prevalent in the area.

An in-depth study of five selected traders was done to develop further insights about the trade. It was found that all these traders were in this profession for the last 20-30 years. The average volume of transaction was estimated to be 42,000 MT/year/trader. The average quality of the salt produced in this area face tremendous competition in the market from the sea salt. Besides, most of the times in a year, the supply exceeds the demand. As a result, as much as 30%-35% of the stock remains heaped in the heaping centres throughout the year. This is highly prone to be washed off by the rains and ingress of sea water during storms. Also a substantial amount of capital remains locked up and consequently the interest cost keeps mounting up.

To find out the net profit enjoyed by the traders in the area, an exploratory study was done on a sample of five traders operating in the area. The results of the study are presented in Table-3. The average price paid by the traders to the *agarias* was Rs. 40 per mt. The traders sold table salt at prices ranging from Rs. 230 to Rs. 275 per mt and industrial salt at prices varying from Rs. 140 to Rs. 190 per mt. Taking the average price of table salt at Rs. 250 per mt and industrial salt at Rs. 165 per mt and their proportions at 55% and 45% respectively, we estimated the weighted average price of salt at Rs. 212 per mt. At this sale price, the average net profit margin of the traders without any allowance made for the risks borne by the traders was Rs. 62.68 per mt. After making an allowance of Rs. 35 per mt for the various risks borne by the traders, the net profit margin of the traders works to Rs. 27.68 per mt, or about 8% of the weighted sale price. Thus, a trader handling the average volume of 42,000 mt of salt earns a minimum profit of Rs. 11.63 lakh per annum (to be precise in every season). It should be noted that there are traders in the LRK handling as much salt as 90,000 mt.

Some scholars hold that the margin of this magnitude enjoyed by the traders is quite normal. They argue that this is justified by the amount of risk borne by the traders at various stages. Given the limited scope of the present study, we did not quantify the various risks involved and borne by the traders. A rough estimate of the allowance needed, to offset the various risks borne by the traders worked to Rs. 35 per mt [4].

Due to the limited time available for completion of this study, we could not study the entire marketing channel from the producer to the consumer and the price spread. However, we estimated the salt producer's share in the consumer's price based on the average price of unbranded salt in 1991-92 at four per cent. This indeed is very low considering the back-breaking and hazardous work involved in salt production. There is therefore need for intervention in the present marketing system to enhance the producer's share in the consumer's price.

Member Participation in Salt Co-ops

An attempt was made to measure the level of members' participation in the activities and management of the sample co-ops. *Prima facie* it appeared that the main reason for 36 salt co-ops out of the 116 becoming defunct was the low level of members' participation, deficient marketing system and an inappropriate design of the co-ops. We designed a questionnaire comprising 11 questions to elicit from the sample *agarias* the information necessary for determining the extent of members' participation (Annexure 1). We employed the People's Participation Index (PPI) developed by Singh (1992) to measure members' participation.

Each of the questions was framed so as to have responses that could be assigned values of either 1 or 0 or 1, 0.5, or 0. 'Yes' and 'No' answers were assigned the values of 1 and 0 respectively and the responses 'Always', 'Sometimes' and 'Never' were assigned the values of 1, 0.5 and 0 respectively. A total of 65 respondents were interviewed. Their responses are summarised in Annexure 2. Each of the questions, was assigned a weight showing its relative importance as a measure of participation. The relative importance of the different factors was estimated on the basis of our preliminary surveys. The sum of the weights assigned to all the questions was 100 and thus the scale assumed values ranging from 0 to 100. Using this method we computed a score for each of the sample respondents and all the scores thus computed were added and then divided by 65 to compute the mean participation rate. This expressed in percentage terms yielded the PPI which was estimated at 38% which was judged to be low as the norms indicated by Singh (1992). We believe this explains quite a good part of the low performance of the sample co-ops. However, how much of the low performance level could be attributed to this factor is difficult to estimate.

Conclusions and Implications

On the basis of our research findings and their analysis presented in this **paper**, we can draw many conclusions. Some of the important conclusions and their implications are briefly stated in the following paragraphs.

1. Most of the salt miners in the LRK lead a precarious existence devoid of bare necessities of life. It is an irony that those who produce one of the basic necessities of the life, i.e., salt are denied the access to the other basic necessities of life such as potable water, safe shelter, health care, education, transport and communication. Establishment of salt miners' co-ops was a good measure undertaken by the Government of Gujarat to improve their social and economic condition but it failed to achieve its objectives. The *agarias* are still in the clutches of the traders and money lenders and therein the consumer's price continues to be deplorably low at around four per cent.
2. The brine from which salt is made is a natural resource owned by the GOI and GOG. Therefore, the government can play an important role in regulating its use in such a way that most of the benefits from this resource go to the poor salt miners. For this to happen, it is necessary that the lease of salt lands are made exclusively to the salt miners' co-ops or at least the highest preference be given to them in the leasing out of **such lands**.

3. As the findings of this study show the salt miners' co-ops are not going to succeed so easily. The salt miners are pawns in the hands of the traders and money lenders. They need to be unshackled from the clutches of the private traders and money lenders. This is possible only if the existing co-ops are reorganised on the Anand pattern of dairy co-ops and are financially supported initially to come out of the red. The intervention made by the SSFS with the aims of improving the marketing and credit systems and reorganising and revitalising the existing co-ops is a right step in this direction. But much more needs to be done on a bigger scale to make a significant dent on the problems of the salt miners.
4. A lot of revenue is earned by the GOI from the salt cess. Part of the cess is supposed to be utilised for the welfare of the salt miners but very little amount is released to the Gujarat Government by the GOI. There is a need for allocation of higher share of the cess revenue to the state government so that the latter could use the money for improving the basic infrastructural facilities including supply of potable water, health care, schools, transport and communication in the area.
5. The salt miners have to bear a lot of drudgery besides health hazards, in doing various activities like digging wells, breaking the salt crust manually, padding the surface of pans by feet and so on. Both the drudgery and health hazards could be reduced significantly if scientific methods for detecting brine reserves and scientific techniques for breaking salt crust and crystals and padding the surface of pans are developed and made available to the salt miners,
6. Most often, sea water washes away the salt collected in heaps by the salt miners resulting in substantial losses to them. These losses could be reduced if a number of platforms sufficiently raised above the ground level are constructed in the area for storage of salt. The cost of constructing such platforms could be met. out of the cess funds or such works could be taken up under the Jawahar Rozgar Yojana.

Table 1
Average Cost of Salt Production per Pan for Sample Members
of the Co-ops, 1991-92

Item	Cost (Rs.)	% of total cost
1. Cost of moving into the area	325	3.19
2. Digging of well	840	8.25
3. Crude oil	1,610	15.82
4. Land preparation	870	8.55
5. Hired labour	610	5.99
6. Water	910	8.94
7. Hire charge for pump	830	8.15
8. Repair and maintenance of pumps	1,205	11.84
9. Administrative expenses	890	8.74
10. Imputed wage of family labour	465	15.96
11. Miscellaneous	1,625	4.57
Total expenditure	10,180	100.00

Table 2
Comparative Economics of Salt Production by Members of the
Salt Co-ops and Selected Private Producers,, 1991-92

Particulars	Members of salt co-ops	Private producers
1. Average size of salt land holding (acre)	2	10
2. Average cost of production (Rs./pan)	10,180	8,385
3. Average yield of salt (mt/pan)	408	565
4. Average price realised (Rs./mt)	40.65	44.25
5. Average cost of production (Rs./mt)	24.95	14.84
6. Average net profit (Rs./mt)	15,70	29.41
7. Average net profit (Rs./pan)	6,406	16,617

Table 3
Price Spread between Salt Producers and Traders in LRK,
1991-92

S1. Item No.	Cost (Rs./mt)	Percent of total cost
1. Average price paid to <i>agarias</i>	40.00	26.79
2. Transportation (LRK to Halvad)	35.00	23.44
3. Loading, unloading and heap making	9.00	6.03
4. Iodisation	17.52	11.73
5. Plant charges for iodisation	6.80	4.55
6. Loading in wagons	16.75	11.22
7. Bagging	18.25	12.22
8. Cost of additional <i>tukris</i>	5.00	3.35
9. Wagon demurrage	0.90	0.60
10. Tips and miscellaneous	0.10	0.07
11. Total cost borne by the traders	149.32	100.00
12. Risk allowance	35.00	
13. Total cost + risk allowance	184.32	
14. Average weighted price received by the traders	212.00	
15. Traders' average net profit margin without risk allowance	62.68	
16. Traders' average net profit margin with risk allowance	27.68	
17. Percentage Share of the <i>agarias</i> in the weighted price received by the traders	18.86	

Annexure 1

Questionnaire used for collection of information about Members' Participation in Co-op Management.

1. Are you a member of any registered **Mandali**? (Y/N)
2. Did you participate in any meetings called by the Mandali? (Always/Sometimes/Never)
3. Are you a member of the Management Committee ? (Y/N)
4. Did you make any significant contribution towards implementation of any existing norms or towards introducing a change in the rules and regulations?
5. Do you abide by the norms and regulations of the *Mandali*? (Always/Sometimes/Never)
6. Did you ever consult your fellow producers about your problems? (Y/N)
7. Did you hire the pump from the *Mandali*? (Always/Sometimes/Never)
8. Did you contribute towards building a corpus fund of the *Mandali* to meet the contingencies? (Y/N)
9. Did you contribute any money or labour towards construction or repair of the roads in the LRK? (Always/Sometimes/Never)
10. Did you contact the traders for marketing your produce through the *Mandali*? (Always/Sometimes/Never)
11. Did you participate in the Health Training Programme organised by SSFS in TF? (Y/N)

Annexure 2
 Percentage of Sample Agarias Responding to the Questions
 about their Participation in Co-op Management

Q.No.*	Yes (1)	No (0)	Always (1)	Sometimes (0.5)	Never (0)	Weight assigned
1	71	29	—	—	—	12
2	—	—	12	20	68	12
3	8	92	—	—	—	5
4	5	95	—	—	—	10
5	—	—	12	29	59	12
6	43	57	—	—	—	9
7	—	—	22	31	47	5
8	19	81	—	—	—	9
9	—	—	11	17	72	9
10	—	—	22	19	59	7
11	34	66	—	—	—	10
All						100

* The questions are listed in Annexure 1.

Notes

- [1] There is a need for development of scientific techniques/methods for predicting the availability of brine and its extent. This would save the *agarias* a lot of money and energy that they spend on digging wells that do not have brine*.
- [2] It is estimated that the *agarias* spend about Rs. 8 lakh annually on purchase of water (Joshi 1989).
- [3] The working conditions in the Rann are horrible and tell upon the already poor health of the *agarias*. Since they are poor they cannot afford gumboots which are necessary for protection of their feet and legs from getting lesions and sores. Similarly, they cannot afford sunglasses which are required for protection of their eyes from the glaze of salt pans as well as the blazing sun light.
- [4] A rough idea of the risks and losses borne by the traders can be had from the following observations that we made on the basis of our discussions with the sample traders.
 - a) On the average, 10% of the total amount lent to the *agarias* could not be recovered in the same year.
 - b) On the average, the traders did not intentionally lift 5% of their total procurement to regulate the supply.
 - c) About 8% of the accumulated account receivables (of the year 1991) had to be written off as bad debts.
 - d) Loss of salt due to washing by rains/sea water was about 8%.
 - e) About 5% and 4% of the total quantity contracted is lost in the transit from the Rann to the heaping centres and from the heaping centres to the market respectively.
 - f) Loss of weight due to evaporation of moisture from salt is estimated at 12%.
 - g) About 20% of the residual stock in the *ganja* (market) had to be sold off at a price that was lower by Rs. 60 per mt than the market price due to degradation of the quality.

These losses amount to about Rs. 35 per mt for an operation handling 10,000 mt of salt per year.

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- Das, V. Mukunda and Swapan Mondal (1991). A Study on the Salt Farmers of the Little Rann of Kutch. Final.
Anand : Institute of Rural Management
- Joshi, Kaushik (1989). "Just a Flash in the Pan". Times of India (Sunday Review) August 20.
- NDDB (ud) . Sabarmati, Salt Farmers. Society : A Pioneering Pilot Project. Anand : National Dairy Development Board.
- Oakerson, Ronald J. (1986). A Model, for the Analysis of Common Property Problems. In Proceedings of the Conference on Common Property Resource Management, National Research Council, Washington, D.C.: National Academy Press,
- Singh, Katar (199 2) . People's Participation in Natural Resources Management. Workshop Report No. 8 . Anand: Institute of Rural Management.

**CO-OPERATIVES IN NATURAL RESOURCE MANAGEMENT: CASE
STUDY OF A CO-OPERATIVE LIFT IRRIGATION' SOCIETY
IN WESTERN MAHARASHTRA,**

Abstract. This paper deals with a successful experiment at collective management of a natural resource, water, in a predominantly drought prone area of western India. Against the backdrop of the scepticism expressed by the influential theories of co-op action, it analyses the institutional arrangement that enabled the effective and equitable utilisation of a natural resource. The dynamics of its origin, the processes involved in its survival, and the basis of its success are examined. The system evolved and the factors that have contributed to the effective functioning of the co-op hold important lessons for all those concerned about the just and efficient management of natural resources on which depends the livelihood of many rural households.

Keywords. common-pool resource, collective management, lift irrigation, water management, water distribution.

Introduction

In a predominantly drought prone area like the one under study where for the vast majority of the cultivators, the chances of securing their livelihood depends crucially on rainfall, water becomes the most critical input in agricultural production. Consequently management of this natural resource assumes an importance and urgency felt in few other agro-climatic regions.

However, water being a natural resource used by many individuals in common, its governance - as in the case of other natural resources - has for long vexed both analysts and policymakers. Much of the early theorising on how best to manage such natural resources has resulted in pessimistic conclusions regarding the success of any attempt at managing them collectively. Hence leading theorists have suggested management by the State, or handing it over to private groups, as the only viable solution to the problem. On the other hand, field experiences have made others realise that the above pessimism might be exaggerated, and experiences of successful cases of managing natural resources collectively have made them argue that such resources are much better managed on a collective basis.

The present study is about one such successful experiment at managing water collectively. The field work for the present study was carried out in July-1992. It involved interviewing the members of ALICS, few non-members...from the same village, the secretary of the village PAC'S as well as the staff of SCSF and the NGO connected with the setting up of the ALICS. The quantitative data used in the study comes from a more structured questionnaire administered to 25 per cent of the members. Though sample size was small, (14), the reliability of the data could be verified and supplemented by the researcher's earlier year long study on the agrarian structure of the village completed in 1990, and which Included also the members of ALICS (Palakudiyil 1990).

A co-op is said to be successful when the objectives for which it was established are achieved (Dare 1971). The primary objective, in the case of a lift irrigation co-op, is the efficient and equitable distribution of water among its members. Hence the degree of its success is to be measured on the basis of the extent to which the above objective is achieved. The paper begins by presenting the agro-climatic features of the study area which underscores the importance of efficient management of this scarce resource. A brief review of the more influential theories on the management of common property resources given in the next section provides the backdrop for the analysis of the genesis and growth of the experiment under study which forms the third part of the paper. One of the objectives of the study is to elucidate the factors which have contributed to the success of this experiment. This is taken up in the penultimate section which also serves as a critique of the pessimism of the earlier theories. The concluding remarks comprise the final section of the paper.

The Setting:

The village Jakhori in Sangainer Taluka belongs to Ahmednagar district, which along with seven other districts constitutes the scarcity zone of the Maharashtra state where the average annual rainfall is between 508 mm and 635 mm (Vincent 1981). Analysis of the rainfall data for a period of 78 years (1901-78) led Sathé to conclude, "by any objective standard, there is a widespread problem of drought in Ahmednagar district" (1987: 924-25) -a conclusion corroborated by various commissions appointed by the government to study the scarcity situation in the state. For instance, both the Sukhtankar Committee (1973) and the National Commission of Agriculture (1976) identified all the 13 talukas of the district, except the irrigated canal zone, as drought prone. Consequently the cropping pattern in Ahmednagar is dominated by rainfed crops such as bajra, jowar and pulses. These accounted for 70 to 75 per cent of the gross cropped area in the district (SERDSA).

Inadequate water availability meant that for the majority of the cultivators, all farming activities were confined to the kharif season. Many secured their livelihood through a combination of cultivation during the jcharif season and migration to the urban centres like Bombay and Pune, or the cotton fields of Jalgon and Dhule for wage labour, or work on the public employment schemes.

That this was the fate of the majority of the households in Jakhori until the late seventies, will be difficult to visualise if one were to visit Jakhori today. For, today it is no longer the single crop dry village that it was fifteen years ago. The fields are green; the gentle whir of the electric motors can be heard and many fields are irrigated. Crops are seen standing even in summer, and the majority of the people are to be found in their fields. Other signs of prosperity such as healthy animals, brick houses, pucca school buildings and village offices also catch the eye of the visitor. Even more striking is the fact that there are many houses come up in the fields, a clear sign that agriculture has now become a full-time occupation and that increased farming activities in the wake of irrigation has necessitated people moving out of the village centre into the farms to be able to devote more time to farming and supervision of the crops and livestocks.

Jakhori lies 15 kms to the south east of Sangamner, the taluka centre, on the Sangamner-Rahuri road. It is a middle-sized village with 197 households. 168 (85 per cent) of these are Marathas divided into several clans. The rest consists of households belonging to the artisan castes (7), the scheduled castes (13) and the tribals (4) . The Maratha dominance of the village is not only in terms of number but also economic power, as 96__ger_cent of the land is owned by them.

Along the northern boundary of the village, two miles from the village centre flows the river Pravara, a tributary of river Godavari, on which four lift irrigation schemes have been set up since 1976. As a result, of the 532 hectares of cultivable area in the village, around 400 hectares are irrigated.

The major crops today are sugar cane, lucern grass, onions, wheat, HYV bajra, HYV jowar and vegetables. Dairying has also become an important subsidiary occupation since the establishment of the Milk Co-operative in 1986.

In short, the picture that Jakhori presents today is that of a prosperous village of the seventies. The single most decisive event in the transformation of Jakhori has been the setting up of a co-op lift irrigation society. Through this co-op, the water that has been flowing in the river Pravara for generations, but which could not be made use of for want of a means to

bring it into the village, was for the first time in its history, brought into the village.

The devising of a system which gave the villagers the access to a resource that until then had remained inaccessible is therefore, at the bottom of the transformation, This study aims to present the institutional arrangement that enabled the effective utilisation of a natural resource, the processes involved, in its survival and the secret of its success. The evolution of the system the processes involved and the factors that have contributed to its effective functioning hold important lessons for all those concerned about the just and efficient management of natural resources on which depends the livelihood of many rural households.

Theories of Collective Action

At the root of the problem of natural resource management is its nature of being a "common-pool resource" (CPR). By the term CPR is meant a "natural or man-made resource system that is sufficiently large as to make it costly (but not impossible) to exclude potential beneficiaries from obtaining benefits from its use." (Ostrom 1990: 30), The other side of non-excludability is interdependence. Even individual action affects all. For instance, the benefits from repairs carried out on an irrigation system by one member is enjoyed by all, whether or not they contribute anything to the repair. Or the impact of depleting a resource through wanton use by one will be felt by all. It is this aspect of the CPR that is held in common and used in common, that is, it is not anyone's personal property nor personal responsibility - which makes collective management vitally important.

Under these conditions, the total net benefits from individuals acting independently with regard to a CPR will be less than what could have been achieved if they had organised themselves to take a collective action. "At a minimum, the returns they receive from their appropriation efforts will be lower when decisions are made independently than they would have been otherwise. At worst, they can destroy the CPR itself" (ibid: 38-39). In Hardin's celebrated example, what brings about the "tragedy of the commons" is the herders deciding independently to increase the number of animals, without concern for its effect on the grazing land (Hardin 1968). Hence the problem of managing the CPR boils down to one of organising the users of the resource, so that from a situation in which they tend to act independently they would agree to adopt coordinated strategies which will ensure higher joint benefits or reduce their joint harm (Ostrom 1990: 39).

Not all theorists share the same views about the possibility of co-ordinated action for joint benefits. The more influential of them have been quite pessimistic. Hardin, one

of the pioneers, could only foresee the degradation of the CPR whenever many individuals use it in common - the 'tragedy of the commons' exemplified in the case of the pasture open to **all**, where "each man is locked into a system that compels him to increase his herd without limit - in a world that is limited. Ruin is the destination toward which all men rush, each pursuing his own best interest in a society that believes in the freedom of the commons" (Hardin 1968: 1244).

Olson also challenges the optimistic view regarding the possibility of individuals being motivated to collective action in pursuit of common benefits. He was convinced that "unless there is coercion or some other special device to make individuals act in their common interest, *rational, self-interested individuals will not act to achieve their common or group interests*" (Olson 1971: 2). In other **words**, the mere realisation that the entire group stands to gain from the collective action, is not sufficient to elicit commitment to joint action. Hence Olson maintains, those instances of collective action one comes across, are to be explained not in terms of rational voluntary choice of individuals but in terms of either compulsion or inducement which they cannot resist.

The problem of collective action for common benefits is perceived in terms of the Prisoners' Dilemma wherein the dominant strategy chosen by both the players produce an equilibrium that is the third best result for both (see Ostrom 1990).

At the heart of the pessimism evident in the above theories, Ostrom holds, is the difficulty in coping with the free rider problem. "Whenever one person cannot be excluded from the benefits that others provide, each person is motivated not to contribute to the joint effort, but to free ride on the efforts of others. If all participants choose to free ride, the collective benefit will not be produced. The temptation to free ride, however, may dominate the decision process, and thus all will end up where no one **wanted to be.**" (ibid: 6).

The pessimism evident in the understanding of the problem surrounding collective management of a CPR has led to policy recommendations which suggest that the tragedy of the commons can be averted only by either establishing full private property rights over the CPRs or giving the entire control of the CPRs to the State. However, Ostrom argues, not only are these solutions too sweeping in their claims, but the difficulty of developing private rights to some of the CPRs as well as the costs of information and monitoring involved in the State controlling of CPRs, make the solutions suggested even more costly than the problems they set out to resolve (ibid; 8-13). Instead of assuming that there is **only a** single solution to a single problem, she calls for the acceptance of the existence of many solutions

to cope with many different problems. For, not all experiments at collective management of the CPRs have been futile. Their success is the refutation of the fatalism of the dominant theories that the individuals sharing a CPR are inevitably caught in a trap from which they cannot escape. They also prove that the "capacity of the individuals to extricate themselves from various types of dilemma situations varies from situation to situation". Hence the task of theorising is to first of all accept that not all individual users of the CPRs are like the prisoners in the Prisoners' Dilemma, incapable of changing their constraints, and then, to search for ways "to enhance the capabilities of those involved to change the constraining rules of the game to lead to outcomes other than remorseless tragedies" (Ostrom 1990: 7).

The case under review also shows that there do exist alternatives other than private property rights or State control, to cope with the CPR management problems. It recounts how a group of farmers in a climatically precarious zone came together and agreed to bear the monetary and other costs involved in managing a scarce natural resource, water, and designed a system that is able to do this in a manner that ensures the collective interests of the members, succeeding to keep the conflicts within tolerable limits. The process involved in its genesis and the factors that have contributed to its sustained efficient functioning are examined in the following section.

Amrutvahini Lift Irrigation Co-operative Society (ALICS)

The realisation of the potential benefit to be reaped if people agreed to come, together and co-operate to set up a lift irrigation scheme is what led the farmers of Jakhori to set up the ALICS. For, everyone in the village was aware of the river flowing along the boundary of the village. What prevented them from making use of the river water was the costs involved in lifting water from the river and bringing it to the village. This was beyond the capacity of even the richest cultivator in the village. What motivated them to look for ways of overcoming this hurdle was of others in the villages similarly situated along the river Pravara who came together as a group and succeeded in getting water to their fields.

Their efforts to set up a lift irrigation co-op were greatly facilitated by the intervention of three external agents- a political leader who had a big say in the running of the co-op institutions in the district and the state, and who had been a patron/guide to the people of Jakhori for long; the *Sugar Factory* in the nearby town Sangamner; and a non-government organization (NGO) working in the district. The nature of the help extended by them and

the motivations behind their help are analysed in a later section. But their help was crucial in obtaining the necessary permission and above all, the loan from the Ahmednagar District Central Co-operative Bank (ADCC).

The ALICS was formally registered on 14th April 1976 (AH RLFT 46/76) with 54 members. Except for two, all of them were Marathas, The source of the water as already mentioned was the river Pravara, flowing two miles to the north of the village. The river itself received the water from the reservoir Bhandardara, built in 1926 upstream in the neighbouring Akola Taluka. Except for a month rainy season, the amount and the duration of the water in the river depended on the decision of the Irrigation Department, and hence the word *kosher* (closure) has become an extremely significant word in the local vocabulary.

The scheme involved digging an intake well on the river bank, laying a pipeline to take the water to the village fields and installing the electric pump set (see Table 1). Except for the membership fee of RS. 75, the initial contribution of labour (*shramdan*) for digging the well and the trenches for the pipeline (35 feet per acre/share as the command area consisted of 200 acres, and the distance of the pipe line was 7,000 feet). The capital was raised through loans (Rs. 2,00,000 from the ADCC; Rs.50,000 from the Sangamner Co-operative Sugar Factory (SCSF) and Rs. 10,000 from the NGO.

Organisation of ALICS

The *raison d'etre* of the ALICS is the efficient and just distribution of the river water to the fields of the members. The efforts made to ensure equitable sharing of both, the benefits and the costs is recognised as an important pre-requisite for enlisting and sustaining people's participation and commitment to a collective enterprise (Singh 1992: 30). Ensuring this is the primary responsibility of the managing committee (MC) of the ALICS. Operationalisation of this principle in the case of the ALICS involves ensuring that no one is deprived of his legitimate share, nor does any one appropriate what is not due to him. This meant that the MC had to see to it that the distribution of water was done strictly on the basis of the shares owned by the member.

To assist the MC in carrying out its prime responsibility-, a motor man and a water distributor have been employed. Besides general maintenance of the electric motor, the duty of the motor man consists of starting and putting off the motor, keeping a record of the time when the motor was started, for how long it worked, and whether there were any power or mechanical breakdowns. The role of the water distributor is even more important. It is he who oversees the actual distribution of the water. It is his

responsibility to see that the water is released to the field at the exact time, and is shut off at the exact time; that no channels are breached either accidentally or deliberately; that the member whose turn it is next, is already informed about the approximate time of releasing the water into his fields so that he will be ready in the fields when the water is released. It is also the duty of the distributor to report to the chairman any incidents of free riding or any other breach of the code of conduct.

The ultimate responsibility for equal distribution of water is on the chairman and the MC. At its monthly meeting, the committee decides on the number of hours of watering per share to be permitted. The practice has been to permit four hours in the knarif season, three hours in the rabi season and two hours in summer, though current situation may bring some modification in these, the water charges per share for that month are also decided at the meeting.

Water is released from all the three chambers simultaneously. When the field is watered the distributor gives the members a credit memo from the *pan! patti register* showing the hours and minutes of watering, and the payment due. The payment is to be made before the next watering (and the rule is that no water will be given at the next round to the members who have not paid, though in case of genuine difficulties exceptions are made), When the water and electricity supply are normal, one round can be completed in about 20 days whereas breakdown in either or the motor prolongs the round and distribution is adjusted accordingly. In fact, with many other Lifts coming up along the river in recent years, the water supply has become a major problem, and "closures" have become longer and more frequent, leading to a very alarming situation where sometimes it takes upto two months for a round to be completed. The members consider this the most serious problem facing the ALICS today. The ALICS has been in operation for the last fifteen years and despite problems and difficulties it has managed, to sustain the commitment and loyalty of its members. And the conclusion one is led to, is that it has been a successful experiment at collectively managing a CPR.

Performance of the ALICS

Even though the specific task of the ALICS is to make the river water available to the members, providing water is only a means to higher output and prosperity of the members. Hence what will determine the level of commitment and participation on the part of the members to the scheme, and hence the acid test of the success of the scheme is the impact the scheme and the provision of water has had in the long run on the lives of the member households.

In analysing the impact of collective action, the tendency is to confine it to the quantitative increments in the

dominant variables to the neglect of often more significant qualitative changes in the life and culture of the group concerned (Deshpande and Reddy 1990:357). Though the indicators selected here do not capture the changes brought about in areas like increased cooperation, resource **literacy**, awareness of the opportunities available and the confidence to make use of them, they are sufficient to indicate the significant changes brought about in **Jakhori** in the wake of establishing the ALICS, The indicators relate to changes in the crop production, the level of living and the economic status.

If water is said to be the most critical input in this agro-climatic region, and the primary objective of the ALICS is the provision of this input, then its impact **will** be manifested, first of **all**, in the crop production: the change in crop intensity, in the kind of crops grown, in yield and crop income. The data in Table 2 point to changes in- all these indicators, signifying the substantial transformation brought about in the crop **production** as a result of water being made available to the fields.

The improvement in crop yield and crop income will show itself in the improvement of the level of living; more specifically in the quantity and quality of food available for consumption. The ability to secure two square meals a day remains one of the most revealing indicators of a household's level of living, and from the data it can be seen that before the ALICS this was a real problem for the majority of the members.

What is an even more significant index of the long term impact of a project is the changes brought about in the means of earning one's livelihood, in the capacity to undertake accumulation and in the economic status ascribed to on the basis of the ownership of the means of production. For instance, a substantial reduction- in the dependence on wage labour is considered an indicator of improved economic condition.

In the case of the members of the ALICS, on all these criteria substantial changes have taken place, and our enquiry revealed that there is no doubt in the minds of the members that the single most important cause of all these changes has been the setting up of the ALICS in 1977. In the words of one of the members, "What the Lift brought is literally *amrut* (nectar) for our children and our families".

data presented and the discussion so far point to the ALICS having been a successful venture at managing a CPR which is scarce, but central to the livelihood of the members. We now examine the factors that have contributed to the ALICS achieving success of a remarkable degree.

The conditions that contribute to the success of an institution can be grouped into those that facilitate the emergence of the institution and those that help to sustain it (Ostrom 1985b cited in Wade 1988: 188).

Conditions Facilitating the Emergence

Resource-specific Factors.

- 1) *Resource Centrality.* Resource centrality and, shared interest in its supply being an **important** determinant of **people's** participation in programmes of resource **development**, conservation and management is proved by the experiences of several organisations in the field (Singh 1992:15). The critical role of water in the agrarian economy in a rainfed area, we already referred to earlier. The very name chosen for the co-op venture by **the** members of the **ALICS, Amrutvahini** - carrier of the life giving nectar - reveals their perception of the centrality of this resource to their well being. And the data in Table 2 provide evidence of the considerable transformation brought about in the economy when water **was** made available. That the ALICS is engaged in making available this scarce, yet critical input, is the first reason for eliciting member participation and **member** commitment.
- 2) *Location of the Resource,* The source of water being two miles away from the **village**, the costs involved in bringing water to the village fields was beyond any one individual's bearing capacity. This also made the people realise that the only way forward to their prosperity was to agree to undertake the project on a collective basis. In other words, what was until then a resource unavailable to **them, could be** made available if they were willing to come together.

Environment-specific Factors.

- 1) *Supportive State,* Here we refer to the environment created by the Maharashtra state which has facilitated the emergence of the co-op. This state is considered one of the foremost in India in the promotion of co-op Institutions, and in Maharashtra, **Ahmednagar** district ranks first where the total number of primary agriculture credit societies are concerned (1062), and ranks third where the total number of co-op productive enterprises are **concerned**. There are as many as 15 coop sugar factories in the district and in the **Sangamner** taluka alone, in 1988, there were as many as 350 co-op lift irrigation societies (Commissioner for Co-operation 1991). The motif on the District Census Handbook states explicitly that the district has chosen "the co-op form of organisation as a major Instrument for ushering in a

socialistic pattern of society and bringing about the desired changes in the economic structure", and proudly claims to have set an "example of what poor and illiterate farmers can achieve by adopting the principle of cooperation" (District Census Handbook 1981). Hence the environment has been very conducive to the emergence of ventures like the **ALICS**. This support is made operational above all in the loans made available at concessional rates and the subsidies provided to these societies. The formalities involved in getting the required permission from related departments like the Irrigation Department and the Electricity Board are completed with fewer difficulties when the applicant is a co-op society.

Supportive External Agents. The help received from external sources has been crucial especially in the early stages. This has come from three different sources. The first was a political leader for whom Jakhori was an important constituency both on political and personal considerations, many in Jakhori having been his childhood friends. Being a member of the Board of the Maharashtra State Co-operative **Bank**, the apex body of all the District Co-operative Banks; Chairman of SCSF and active in the district and state politics for years, the patronage **resources at** his command were considerable. Personal considerations apart, there was another important reason for his interest in the promotion of the ALICS. It was a precondition for the expansion of sugarcane cultivation. Sufficient supply of sugarcane was vital for the survival and viability of the SCSF which was established only in 1967. And he being its chairman was very keen to provide the conditions that would encourage farmers to go in for sugarcane cultivation.

That also explains the intervention of the SCSF, the second of the external sources of support for the ALICS. While granting licence to a sugar factory the government demarcates its command area, from within which alone the factory is allowed to collect sugarcane. Constraints internal to the sugar production process makes adequate supply of cane imperative. Because efficient extraction of sugarcane juice requires heavy industrial equipment. **But**, for it to be profitable, utilisation of the equipment at full capacity is essential* This implies an adequate supply of sugarcane (Attwood and **Baviskar** 1987). Unlike the command areas of **its** rivals in the southern **Shrirampur** and **Rahuri** talukas, the **SCSF's** command **areadid** not have assured canal irrigation, as the canal network, starts at the end of Sangamner **taluka** and historically, water was assured for the downstream talukas. Hence the cultivation of sugarcane was not at all as widespread in Sangamner as it was in Shrirampur and Rahuri.

Yet, for the viability of the SCSF, assured supply of cane of a minimum quantity was absolutely critical. It meant that the farmers in the command area had to be induced to switch over to sugarcane cultivation. The first prerequisite for this was that the farmers be guaranteed assured supply of water. The only option left in a taluka with undulating topography where surface irrigation was difficult, was lift irrigation. This explains the involvement of the SCSF in the formation of the ALICS. It took the form of free supply of all the technical consultancy and supervision services required in choosing and installing the equipments as well as a loan of Rs. 50,000. Subsequent to the formation of the ALICS, the SCSF has continued its association and support, as all the members of the ALICS are also its members. The present support is in the form of supply of inputs, services like aerial spraying, and harvesting. The payment for all these is deducted at the harvest time from the payment due to the cane. Besides, the SCSF also acts as an intermediary between the farmer member and the ADCC so that the loan instalments due to the ADCC by the farmer is deducted by the SCSF at the time of harvest, thus solving the problem of the farmer having to prove his credit-worthiness. The initial loan given by the ADCC for setting up the ALICS (Rs. 2,00,000) was also disbursed and repaid in this manner.

The third source of external support was a local NGO, which had been working for the development of small and marginal farmers in the District. Their decision to be involved in the setting up of the ALICS was partly due to the rapport the leader had with the management of the NGO. The contribution of the NGO consisted in providing all the guidance and advice at the time of its formation. As attested by the experience of other NGOs in similar situations (see Barik 1991; Shah 1991), the involvement of the NGO under discussion was greatly instrumental in the ALICS succeeding to cope with the problems of the early Phaser misgivings, doubts and fears. This role, the NGO continued to play even after the scheme was established. In addition, the NGO had devised an innovative scheme to help the members. It launched an interest subsidy scheme in which the NGO agreed to pay the interest on the initial loan on behalf of every member who paid the instalment on time. This was to provide the borrower the incentive to clear their debt as early as possible, as those who failed to repay their installments on time would not only forfeit the benefit from the interest subsidy scheme, but they would also have to pay the interest over and above the instalment on the principle

- 3) *User-specific Factors*. That a joint effort is the only feasible strategy to realise the potential benefits from the scarce resource is accepted by all the

members, This arises both from the realisation of the costs involved in lifting water from, the river two miles away, which no one individual is in a position to bear **single-handedly**, as well as the appreciation of the complexities involved in its equitable distribution.

- 4) *Homogeneity of Members.* Medium and small cultivators dominate the structure of agrarian production in Jakhori. Though agriculture here has witnessed a substantial degree of extended reproduction and modernisation, it was found in an earlier study that accumulation and modernisation had not led to the kind of differentiation and polarisation reported in other areas of agricultural modernisation. What one witnesses is not so much the emergence of a class of capitalist farmers as the persistence of petty commodity producers, who have succeeded in making use of modern techniques of production and are able to carry on agricultural production. Hence the study concluded that the structure of agrarian production in Jakhori is best described as a form of petty commodity production (Palakudiyil 1990) . As many as 87 per cent of the members of the ALICS own less than 5 acres of **land**, and those with more than 10 acres are only 2 (Table 3). Hence the members of the ALICS are also predominantly small and medium cultivators. This has had important bearing on the formation and survival of the venture. The vision of being a *bagaitdar* - owner of *bagait* (irrigated) land - one day, is a much cherished dream in the heart of every Maratna peasant. At the same time every one is aware of the limited resources at one's command. This realisation is at the bottom of the shared consciousness of cooperation and collective endeavor being absolutely essential, if that dream is to be fulfilled.

Factors Sustaining the Organisation

Sustaining the organization depends to a large extent on the structure of authority and the manner in which it is exercised, Accountability, **credibility**, and above all, the degree of success with which it is able **to deliver** the goods, all these become important determinants.

Structure of Authority; All **authority** in the ALICS is vested in the MC, Its authority *is* respected because it is by and large democratically elected. Moreover, there has been wide sharing of authority. During the fifteen years of its existence as many as 16 put of the 54 members have been elected to the MC for one or more terms. That even the 'small member has a voice;' is seen from the fact that the only two **non-Maratha** members (one Teli and one Gosavi), both have been elected to the MC. The adherence to democratic principles, insisted upon by the NGO involved with the ALICS, has also been an influence.

From its inception to this date there have been five MCs. The MC meets at least once every month; more if the situation calls for it. The regular **business** includes; the determination of the number of waterings to be allowed in the following **month**, the number of hours of water per share, and **the** cost per share. The last is arrived at, after adding up the salaries for that **month**, electricity **bill**, any expenses that may have been Incurred on account of repairs or other reasons. The total sum is then divided by 2 00 (the total number of shares in the **ALICS**) and that **will** be the water charge for the current month. Since any conflicts related to water distribution that may arise, is tackled on a day-to-day basis, such **matters** are brought up in the MC meeting, if they become frequent or the **same** individuals are involved.

Enforcement of Rules. One of **the** crucial factors on which the authority and credibility of the MC depends is the ability of the MC to ensure **that** a) equitable distribution of the benefits takes place, and b) a free rider is penalised. Towards this end, several, rules have been formulated. Thus, i) one's share of water **will** be determined by the number of shares possessed; ii) every member will respect the. water rotation schedule; iii) it is each ones's responsibility to be in the field when the water is released; iv) no one may in any way interfere with the smooth **flow** of water to the allotted field; v) the payment **will** be made in time; vi) any misconduct **will** be reported to the MC etc,

The built-in mechanism arising from the resource **centrality** of water to **the** livelihoods of the members greatly assists the enforcement of the above rules and thus ensures the equitable distribution of the common resource and the prevention of free riding, The possibility of undetected cheating is further reduced by **the** system adopted for the distribution of water. The members whose fields will receive water in the coming 24 hours are given advance notice by the water distributor along **with** the approximate time they should be in their field. This rules out any member taking more water than is his due since the next member is already waiting. It could happen that while one field is being watered another person diverts some water to another field by breaching **the** channel - a case of free riding. To make sure **that** this does not happen is one of the main duties of the distributor. This **is** not **always** possible since the command area is quite extensive and the distributor cannot be on a constant patrol. Hence mutual patrolling is the more efficient means. From experience, each member knows what should be the normal force of flow, and the **approximate time** required to fill each plot in his field etc. If it takes longer to **water** each of the plots or the **flow** is visibly less forceful, then it is a sign that there has been **a** breach somewhere. That **will** be a signal to look out for the breach and on inspection it can be determined whether it was an accident or a deliberate

breach.. If the **latter**, the case will be reported to the MC and the erring member will be penalised. The penalty consists not only of the fines to be paid but also the loss of **reputation**, and **in** the small world of the village community reputation is not lightly exposed to attack (Wade 1988s 193).

Enforcement of the rules and making sure that whatever penalties are imposed are paid, is an arena for the MC to prove its authority and impartiality. No matter who the member, if it is proved to be a wilful attempt at cheating, then the prescribed fine is imposed. And there have been cases of even the kin of the then chairman being penalised for such breaches. As proved by the experiences of many other organisations, **the** willingness to enforce the rules without fear or favour is an important means to maintain the credibility, respect and allegiance of the members.

Accountability. There are several features of the organisation that motivate the MC to remain accountable. One is **the** tradition of broad sharing of the membership of the MC. As already noted the majority of the **members** have served one or more terms on the MC; hence neither the MC nor the **ALICS** is regarded as anyone's monopoly. Second is the high degree of homogeneity among the members. In effect it means that no one member is so rich or so powerful as to browbeat the rest or dictate terms to the others. Third is the tradition of the annual general body meeting (held on 15th November every year) being an open meeting where the members will not desist from raising uncomfortable questions. As a result, meticulous records are maintained, especially of the finances. For instance, a separate ledger is maintained for all the repairs, as it was observed that the repair bills were rather high. Though the bills were genuine - since a technical flaw in the quality of **the** couplings used led to frequent leakages necessitating the repairs - ,it was decided to maintain a record with all the details of the repair work i.e. , the date of the leakage, the **member's** name in whose field the leakage occurred, the signature of the mechanic who was called to repair, the cost of repair and the amount paid. The practice is similar with other repairs and maintenance jobs which are normally done through hired mechanics.

Homogeneity of the Members. This has been a facilitating factor not only in the genesis of the ALICS, but also in its sustained growth. The realisation on the part of the members, of the need for mutual help and continued team effort, if they are to continue to benefit from the cooperative venture, has greatly helped to elicit continued cooperation and support of the members. What has befallen the Jagadamba Lift Irrigation Co-operative Society, **one** of the other lifts in Jakhori has brought home this fact powerfully. Here also the majority of the members are Marathas, but of the Deshmukh clan, the richest clan in the village. Besides the Marathas, towards the tail end of the

scheme there are a few households belonging to the Rahane clan who are mostly small and medium farmers. Initially, the dynamism lent by the Deshmukhs who were used to dealing with outsiders, was helpful in getting the formalities of registration completed. And the lift was set up in a short time. But in the course of time, most of the Deshmukhs were able to sink new wells or deepen the old ones and thus reach a position where they had their own means of irrigation. This meant that even if the lift did not work, their fields would not lack water. The Rahanes, however, lacking in resources, could not emulate the Deshmukhs, and for them, the lift continued to be vital. The problem arose when due to some fault of the motor, water could not reach the tail end with adequate force. The chairman who was a Deshmukh as well as most of the other members on the MC who were also Deshmukhs did not show any concern, and that led to intense disillusion among the Rahanes, and at the time of the investigation the mood among the Rahanes was one of resignation coupled with resentment. Most of the Deshmukhs are now apathetic because for them the lift has ceased to be the crucial system it was when set up in 1979. Whereas, for the Rahanes it continues to be so. If there has been no such incidents in the ALICS, it was because no one could afford to go it alone. Experiences from other areas corroborate this observation about the homogeneity of the group in terms of caste, class and assets being an important determinant of co-op management of natural resource (Singh 1992: 21).

Conclusion

The foregoing discussion dwelt on an experiment at collective management of a natural resource by a group of farmers living in a precarious agro-climatic zone. The experiences of farmers in neighbouring villages made them realise that the constraints imposed on their prosperity by the unfavourable weather conditions could be overcome provided they come together and agree to set up a lift irrigation co-op. The key to their success lay in making water available to their fields. This would be possible only if they were ready to act together since getting the water from the river two miles away would be too costly for any one person to undertake on his own. Hence,, the decision to set up the ALICS was taken.

While a similar realisation had dawned on farmers in other villages, not all of them were able to translate their knowledge into viable schemes. That the ALICS was able to do this, it was pointed out, was due to several factors, both internal and external to the group. All these factors combined to ensure the successful functioning of the ALICS, and problems notwithstanding, it has managed to sustain the commitment of its members and deliver the goods for the last fifteen years.

The conditions that contributed to the emergence and survival of the ALICS are of relevance to the success of similar ventures at collective management of natural resources. A summary of these conditions is given below.

The survival and prosperity of the members depended critically on the availability of water. And the members were aware that if this critical resource is to be made available they must come together and stay together. That the ALICS was the only means of access to this critical input is the most important explanation for the members' commitment to see that they do everything within their capacity to make it succeed. A similar level of commitment is difficult to visualise if the ALICS were to be involved in managing a resource less central to the members' lives,

Economic Benefits

The benefits resulting from collective action, be it higher output or higher level of living, is in the long run the most powerful motive for members' participation in, and continued support to, the venture. In proportion to the benefits arising from the joint effort, the stakes in its survival changes. If the members realise that the benefits they receive from joint action cannot be obtained through individual initiatives, that alone is sufficient reason for their cooperation.

Homogeneity of Members

The fact that the members of the ALICS were predominantly small and medium farmers has also contributed to its success. The fact that water was crucial, and at the same time one was not in a position to make it available on one's own, meant one had to stay with the group and abide by its rules. The experience of the Jagadamba Lift Irrigation Co operative in the same village, as well as evidence from other parts of India corroborate the view that a more equal wealth and power distribution makes corporate venture easier (Wade 1988: 152-57), Member homogeneity was a facilitating factor also in maintaining the democratic structure of the group. It ensure that no one could turn the co-op into his fiefdom nor dictate terms to the others on the strength of his economic superiority.

Supportive Environment

The most effective argument for cooperation was the evidence before the eyes of the members, of the changes brought about in the lives of those in the neighbouring villages who agreed to cooperate, and the missed opportunities in the case of those who failed to do so. Examples of both the types abounded in Sangamner taluka. Moreover, the level of awareness about co-op institutions, their working and

potential benefits from them, is exceptionally high in the villages in this region, and that has been helpful in keeping people's morale up in difficult phases. The ALICS experience also highlights the constructive role that external agencies can play in collective effort for rural development and rural change.

In addition to the above lessons which have a bearing on corporate venture in natural resource management, the experience of the ALICS is also relevant to the debate on collective action reviewed in the earlier part of this paper.

Not only does it prove that collective management of natural resources is possible, but it also shows that under certain conditions; it may provide a solution far superior to that offered by either of the solutions generally prescribed. In the case of the ALICS, the agrarian structure of the village coupled with the costs involved, ruled out privatisation as a viable option. As for the possibility of the State taking over control, it is in no position to enforce the kind of monitoring needed to ensure equitable distribution and to prevent the tendency to free ride. Instead, by setting up a lift irrigation co-op, the villagers have designed a system which has a built-in mechanism to ensure both equitable distribution and prevention of free riding.

As in the case of some of the successful irrigation co-ops in south India studied by Wade (Wade 1988: 207), neither selective inducements nor selective punishments can be said to be the central motivating factor in people's allegiance to the ALICS - Olson's predictions notwithstanding. Nor is the ALICS arriving at a viable management style hampered by the lack of information, which is instrumental the herders in Hardin's example not knowing that the grazing commons is heading for collapse. Likewise, the management of a natural resource which is a recurring event, need not be reduced to another variant of Prisoners' Dilemma, because a venture like the ALICS varies from a simple Prisoners' Dilemma in a number of important aspects. First of all, whereas the two suspects have no communication, the members of the ALICS learn from the choice of others in the previous round, and can adjust their choice accordingly. Under this condition, Wade argues, the rational strategy is one of conditional cooperation; that is, 'cooperate first, defect if the other defects' (ibid: 202-03). Further, unlike the prisoners, the members are not mere rule-takers, but they are also rule-makers. They could introduce new rules, and one of the new rules could be relating to penalty for violation of an agreement, which can encourage cooperation by deterring defection. Hence as Wade observes, "free riding ... remains a possibility, but not, as in Prisoners' Dilemma, an imperative... Institutions which give people the assurance that if they do comply with the rules they will not be the sucker - that those others who do not comply will be

punished greatly increase the chances of voluntary compliance" (ibid: 203),

The ALICS in the fifteen years of its existence has succeeded in giving its **members** such an assurance, and in the process has shown that co-op management of natural resources is not only possible but desirable.

Table 1
 Amrutvahini Lift Irrigation Co-operative Society
 (Technical Details)

1.	Number of members	54
2.	Total command area	200 acres
3.	Source of water	River Pravara + intake well
4.	Electric motor	1 x 40 h.p.
5.	Length of the pipeline	7000 ft
6.	Gradience	30 ft
7.	Number of delivery chambers	3
8.	Total cost	Rs. 2,60,000/-
9.	Cost per share/acre	Rs. 1,300/-
10.	Date of commissioning	November, 1977

Table 2
Impact of Amrutvahini Lift Irrigation Scheme

Indicators	Before	After
On-farm changes:		
Cropping pattern	Mostly rainfed crops (bajra, jowar, pulses, wheat)	Sugar cane, HYV bajra, HYV jowar, onions, lucern, vegetables
Cropping intensity	Mostly kharif only	Majority all three seasons
Yield per acre	<u>1 - 2 bags of bajra</u>	<u>5 - 10 bags of bajra</u>
Crop income	--	Rs. 10,000 - 20,000
Change in levels of living		
Supply of food grains for home consumption	sufficient for 6 months of the year (2 respondents not for a single month)	sufficient for all 12 months (All)
Two full meals	for majority it was problem specially in summer months	two meals guaranteed
Consumption of milk and sugar	very little	regular
Change in economic status:		
Occupation	cultivation + wage labour (4 wage labour only)	cultivation (3 also go for wage labour)
Accumulation during last 10 years {*}	--	Ranges from Rs 10,000 to Rs 2,57,500
Economic class (**)		
Poor to Rich		14
Poor to Middle		15
Middle to Rich		5
No change		22
Extent of change in rupee terms (***)		Ranges from 8 annas to 15

Source: Interview with the members of ALICS, July 1992.

Notes (Table 2)

- * Accumulation consists of: investment in irrigation (wells, electric pump sets, pipelines); livestock (specially after the establishment of the Milk Cooperative in 1986), new houses; and marriages.
- ** Classification on the basis of "labour exploitation criteria" developed in Patnaik (1987), and applied in Palakudiyil (1990).
- *** Though *annas* are no longer in circulation, measuring changes as fractions or multiples of a rupee (16 annas) 4 annas change implying a 25 per cent change - is a system of measurement easily grasped by the villagers and still widely used by the villagers.

Table 3:
Land Ownership of Members

Size category (acres)	No. of members	As % of total members
< 1.00	1	1.8
1.00 - 2,50	25	46.3
2.51 - 5.00	21	38.9
5.01 - 10.00	5	9.3
> 10.00	2	3.7
	54	100.0

References

- Attwood, D. W. and B. S. Baviskar (1987). "Why do Some Cooperatives Work but not Others? A Comparative Analysis of Sugar Cooperatives in India." Economic and Political Weekly Review of Agriculture. 27 June.
- Barik, B. C. (1991). "Tribal Farmers, Lift Irrigation and rural development." Social Change 21 (2),
- Commissioner for Cooperation (1991). Cooperative Movement at a Glance in Maharashtra. Pune: Office of the Commissionerr and Registrar of Cooperative Societies.
- Deshpande, R.S. and V. Ratna Reddy (1990). "Social Dynamics and Farmers' Society; A Case Study of Pani Panchayat." Indian Journal of Agricultural Economics. 45 (3) , 355-61.
- District Census Handbook, Ahjmednagar District: (1986). Bombay: The Maharashtra Census Directorate.
- Dore, R. (1971). "Modern Co-operatives in Traditional Communities" in P> Worsley (ed.). Two Blades of Grass. Manchester: Manchester University Press.
- Hardin, G. (1968). "The Tragedy of the Commons." Science 162 December, 1243-4
- Olson, Mancur (1971). The Logic of Collective Action: Public Goods and the Theory of Group. Cambridge: Harvard University Press.
- Ostrom, Elinor (1990). Governing the Commons: The Evolution of Institutions for Collective Action. Cambridge: Cambridge University Press.
- Palakudiyil, Thomas (1990). "Agrarian Structure and Rural Poverty in Western India." Unpublished Ph.D. thesis, University of East Anglia.
- Patnaik, U. (1987). Peasant Class Differentiation: A Study, in Method with referrence to Haryana. Delhi: OUP.
- Sathe, M. D. (1987). "Drought prone Area Programme in Ahmednagar." Economic and Political Weekly 5-12 September.
- Shah, Anil C. (1991). "Samadhiala: Story of Development through Disciplined Democratic Process". Miraeo. Ahitiedabad: Aga Khan Rural Support Programme (India).
- Singh, Katar (1992). People's Participation in Natural Resource Management Workshop Report. No. 8 Anand: IRMA.

SERDSA Socio-economic Review and District Statistical
Abstract of Ahmednagar District - various years.

Vincent, L. (1981). Dry Spells, Drought Risk and
Agricultural Production in Maharashtra State. Monograph
in Development Studies No.9. Norwich: School of
Development Studies, University of East Anglia.

Wade, Robert (1988). Village Republics: Economic Conditions
for Collective Action in South India. Cambridge: CUP.

SAHADA LIFT IRRIGATION CO-OPERATIVE SOCIETY REVISITED :
RETROSPECT AND PROSPECT

B.C. Barik

B.C. Barik

Abstract. Several voluntary organisations are now engaged in programmes of natural resource development in the rural and backward areas of the country. This paper deals with a case study of a lift irrigation work undertaken by the Sadguru Water and Development Foundation—a voluntary organisation based in the Panchmahals district of Gujarat state. Among various development schemes, the Foundation has given top priority to lift irrigation schemes as there is a lot of untapped surface water available in the area which can be used for irrigation. A salient feature of the lift irrigation schemes is that the beneficiary tribal farmers are mobilised and involved right from the initiation of the project work and they manage the system after it is handed over to them by the Foundation.

The author highlights certain management deficiencies which may affect the financial viability and sustainability of the Lift Irrigation co-operatives in long run.

Keywords. Gujarat, Panchmahals, lift irrigation co-op, Sadguru Water Development Foundation, tribals.

Introduction

The "trickledown" philosophy of countering abysmal poverty through over - bureaucratisation of the "target group" approach could not yield the desired results during the last three decades of planned development. Scant village common property resources meant for productive development have been, by and large, poorly utilised and unattended. Moreover, the resources allocated for the poor and needy have hardly reached them. Most of the rural development schemes launched by the government during the 1970s and 1980s failed miserably because they were thrown upon the target population without properly assessing their needs and requirements. Moreover, there was hardly any involvement of the beneficiaries in implementing the schemes. The experiences gathered during the last two decades warn us that without the beneficiaries' productive participation, no development programme can be meaningful and real. The voluntary organisations which are not germane to the soil, have however achieved some success in their rural development activities (Deshpande and Reddy 1990 :354).

This might be due to the active involvement of the beneficiaries in the development schemes in a meaningful way right from the time of initiating action. These methodologies too are altogether different and more specific to the need of the situation and project objectives. The aim of this paper is to highlight one such effort by the Sadguru Water Development Foundation (SWDF) [1] wherein the tribal farmers of a backward district in Gujarat have been effectively organised to form a lift irrigation (LI) water co-operative.

The broad objectives of this paper are: a) to examine the methodology of the voluntary organisation in mobilising and involving the tribal farmers in the LI co-operatives; b) to study how the tribal farmers deal with the day to day administration and management of the society and; c) to assess the economic implications of the beneficiaries' participation in the context of irrigation management. The paper deals with data derived purely from secondary sources, substantiated by the author's personal observations made during his occasional field visits to some of the schemes run by the SWDF in 1987, 1989, 1990 and 1992.

The plan of this paper follows: Section 1 presents a brief account of the district and the natural resources available; Section 2 deals at length with the emergence of the voluntary agency in the project area and its institutional efforts at creating and popularising LI co-ops among the tribals; economic implications of the beneficiaries' participation in the management of the society. Section 3 gives with the author's observations and suggestions for future sustainability of LI schemes. In the last section, we shall attempt to synthesise the discussion and derive some crucial lessons.

The Panchmahals and Their Natural Resources

The Panchmahals district located in the extreme eastern part of the state, share its border with the states Rajasthan and Madhya Pradesh. The district covers only 4.5% area of the state and accommodates nearly 7% of the state population. The district is thickly populated by tribal population: 42% against 20% in the state. If we combine the SC population with the ST population, together these make up half of the total population of the district. The density of population is very high in the district (262 per sq.km) compared to that of the state (174 per sq.km). Considering the heavy population pressure and the kind of population, the literacy rate cannot be expected to be high in the district. The literacy rate in the Panchmahals is only 28% against 49% of the state.

Earlier the hilly district had thick forest coverage covering 75% of the total area. Today "forest land" has been ruthlessly denuded over the years, and in 1985, remote

sensing of the area revealed that there was less than 3% tree coverage (Grant 1989). The rapid degradation of the forest has had a severe impact on the ecology and the environment of the area. The district which used to receive plentiful rainfall, is now reeling under frequent droughts. The undulating topography, and high water velocity do not give sufficient time for the water to infiltrate into the subsoil. The water table varies from 3m to 9m with a very low rate of recharge is found. Which to be limits the scope of group water use on a large scale. The greater, on the other hand, high rate of run-off and drainage density have led to the formation many rivers, rivulets and tanks spread all over the district, forming the major source for irrigation and domestic use.

Only 53% of the total land area (88,500 hectares) formed the net sown area. The gross area irrigated through the flow and well irrigation stands at 41,100 hectares. That means only 8% of the net sown area is covered under irrigation. The contribution of canal irrigation is very meager. It covers only 34% of the net irrigated area while the tank and well irrigation together cover 61% of net irrigated area. There are nearly six medium irrigation projects commissioned in the district with irrigation potential to cover 7,750 hectares (District Handbook 1981). But these irrigation projects do not cater to the needs of the tribal peasants. Only 22% of the irrigation potential has been utilised in the district, while 78% of the potential has been utilised elsewhere in the state. Hence, the tribals see the catchment area of the dam, and they also, see the water flowing in the canals to the downstream command areas located nearly 150 km away, into an agriculturally prosperous district. Their inability to harness the canal water for their own development has led to poor crop yield, inadequate utilisation of modern technology, fertiliser pesticides, and livestock animal in agriculture. On the socio-economic front a study conducted on 10,000 families live below the poverty line (Sadguru Water Development Foundation 1989:14). Thousands of tribals from this area migrate, for about six months every year to the more prosperous areas Surat, Bharuch, Nadiad, Afiand, Baroda, and Ahmedabad to earn their livelihood.- They are locally called "Mammas" and they work mostly in construction and agricultural work at very low wages. To make the life of the tribal peasantry more prosperous through improved irrigated agriculture, the director of SWDF has in order to stop this seasonal migration of the people and to improve their socio-economic condition visualised the commissioning of more LI projects in the districts. That, the existing water resources such as tanks, nallas and canals, can support 650 LI projects can built on a total cost of Rs.50 crores be commissioned in the district. To put it in conservative terms, 500 LI schemes with an average of 200 acres could irrigate one lakh acres of land which will benefit nearly fifty thousand tribal families. The total cost of the projects would be around fifty crores. Further,

he also visualises the scope of checkdams for water harvesting in the district. As per his estimation, nearly eleven hundred small checkdams at a cost of Rs.22 crores can be constructed which will irrigate another seventy five thousand acres of land benefiting twenty seven thousand tribal families. If we club together the irrigation potential created through LI and checkdams, it would generate agricultural produce worth Rs.72 crores in rabi season alone (Jagawat 1992:10).

During the 1970s the government of India, encouraged the industrial houses in the country to invest directly in rural development activities as a part of massive tax rebate. Accordingly, the Mafatlal Group of fabric industries entered the tribal areas of the Panchmahals district with a variety of development programmes. Aimed at raising the living standard of the tribal population. In order to implement these programmes, a voluntary agency called Sadguru Seva Sangha Trust was set up with the financial assistance of the company. To begin with, in 1975 the Trust made a detailed survey fields. The survey was conducted to assess the extent of unutilised potential resources (both government owned and village common property resources) and to finalise the location for the different projects by a team of experts drawn from various fields. The survey revealed prevalence of abundant water resources laying totally untapped in Dohad and Jhalod taluks, which could possibly be harnessed for productive use in agriculture through modern technology. As far as infrastructure is concerned, both the talukas are closely linked with urban centres and considerable impact of urban culture on the Bhils - a numerically dominant tribe - is apparent. The communication network is not particularly bad. The tribal population constitutes the highest, 73% in Dohad taluka followed by 86% in Jhalod. Nearly 25% of the tribals are cultivators. In other words, the tribals in both the talukas own some land but it should not be misconstrued that they belong to a homogeneous group (Pathy 1982). The impoverished tribals who either landless or with little land on the barren hilly slopes continued to migrate for a considerable period in a year. The topography of both the talukas is hilly and slopy with rich soil and water resources. The canals at low elevation and the traditional village ponds formed the major source of water resources. Despite these, only 4% of the area was covered under flow irrigation.

Seeing the potential of the area of SWDF decided to implement its project here with the active involvement of the local people. The project would also qualify for higher subsidies from the government as the beneficiaries are predominantly tribals. In fact, the Government of Gujarat provided capital cost through its Drought Prone Programme (DPAP) for the construction of LI schemes, while the operation and management remained initially with the SWDF, until such time that the beneficiaries could organise themselves to register as co-ops societies and acquire the

necessary technical knowledge to manage the whole system. The first four schemes were commissioned in 1976 and, at present, the SWDF has covered 6,053 acres of land benefiting over 5,501 vulnerable tribal families under 51 LI schemes. If we include other schemes such as wells and checkdams put in operation by the SWDF, the number of beneficiary families will go up to 13,001 and, correspondingly, the land brought under irrigation would go up to 18,803 acres (Sadguru Water Development Foundation 1992). Besides, the Foundation has expanded its activities to other potential areas such as social forestry for water conservation, watershed management, social health and allied sectors which will help in the economic betterment of tribal people.

SWDF **Organisational** Efforts and Lift Irrigation Schemes

The SWDF spent the first few years among the tribals' to build good rapport and confidence with them and neutralise the hostility towards the plain (urban) people, "the exploiters". To quote the feelings of SWDF team, "many of our selected villages were notorious for their criminal activities. In some of the villages, the outsiders and strangers dared not enter even during the day time" (Sadguru Water Development Foundation 1989). The SWDF began by, rendering free medical services and during the course of contact, tried to gain the confidence of the local sarpanch, the police patel and village school teachers who are looked upon as the ideal persons in the village. The scope of mobilisation further got momentum with the induction of the director's wife in the team who worked among the tribal women. From each village, the Foundation selected a person to act as a 'linkman' between the agency and the beneficiaries. The Foundation also mobilised the local branches of national and co-op banks to advance loans either interest free or highly subsidised for crop, irrigation, fertiliser and animal husbandry, under its control. This was an effective way of building confidence and trust as it replaced the control of money lenders, merchants and landlords.

Since its inception, the SWDF has commissioned 51 LI schemes. Before laying down the system, a thorough study of the system design was carried out by a highly qualified and experienced professional based at Pune. The best quality materials like Kirloskar electric motors, PVC and RCC pipes were used to carry water underground in the command areas. Standby diesel pumps are available in all the schemes in case of power failure. Good workmanship can be seen in masonry works, design and installation of electric pumps and in the laying of the underground pipes. The system are perfect and have been maintained very well. Spare parts of high quality with mechanics (repairer) are available at the zonal offices so that any complaint can be attended to within no time.

Sahada Lift Irrigation c o - o p e r a t i v e

Sahada an indigenous tribal village is situated about Bhills and Rathwas 12 kms from Dohad town, on the Dohad-Alirajpur road. The villagers both number around 1,588 and are distributed among 230 households (Barik 1990). The infrastructure of the village includes a primary school, two adult literacy centres, the village panchayat office and one Ayurvedic dispensary, beside electricity supply and several bio-gas plants for domestic use. Two flour mills and one tractor are available for public use in the village. The literacy rate is very poor at 17%. All the households in the village own some land and only two families were found to work agricultural labourers (as per 1981 census).

In 1952, the Patadungri medium irrigation project commissioned very close to the village, submerged a substantial amount of fertile agricultural land of Saha'da. Many villagers were rehabilitated elsewhere while those whose land did not submerge stayed back in the village.

The land owned by these people, though situated very close to the reservoir and main canal, did not get any irrigation upto 1983 since the land was a higher level than the water level in the canal. In 1983, at the request of some of the enlightened villagers, the SWDF agreed to take up the LI project. The technical design of the project was prepared by the Foundation with financial support of the District Rural Development Agency under the DPAP. The project is located on the main canal very close to the head reach of the reservoir. The SWDF used two sets of 50 H.P motors and R.C.C. pipes of various diameters on the main and branch lines. In all 3,670 mts R.C.C. pipes were used to provide 17 outlets at various locations to spread water in the command area of 300 acres to benefit 202 households. The project was laid at a cost of Rs. 9.50 lakh under 100% subsidy. The scheme has been taken over by the beneficiaries and is being managed by the board of the society. The SWDF now provides only technical services and repair of machinery whenever required.

Management of the Irrigation System

The Sahada LI scheme has been registered under the Co-operative Societies Act. Managing Committee consists of a chairman, and 11 members either (A) elected or nominated from each hamlet (locally called Falia). The committee looks after the day to day administration and management of the society. The tenure of these posts is for three years. The ex-officio members include the directors of the SWDF and the District Rural Development Agency, the Assistant District Registrar of the co-ops; representatives of financial institutions; and a representatives from the SWDF. The management committee is custodian of the entire system - the machines, materials, employees and users. The committee

members are assisted by a secretary, pump operator, two water distributors and a watchman. The secretary is appointed for a year with a fixed salary of Rs.1,000 per month and the other employees are appointed seasonally based on a consolidated salary. The secretary helps the committee members in decision making and also keeps the day to day accounts of the society, water allocation and budget while the pump operator runs the system during the irrigation season. The water distributor's job is to operate the outlets (locally called kundis) as per the irrigation schedule drawn by the committee members. In case of any breakdown, or tampering noticed in the system, the matter is reported to the secretary and the managing committee members immediately. The secretary, the pump operator and the water distributor are given training in their respective fields by the SWDF staff in the initial period of commissioning of the project. Their functions are also monitored periodically by the members till they acquire the proficiency for self - management. The SWDF arrange 3 to 4 days workshops for at regular intervals for all the secretaries of the LI projects to discuss their problems in dealing with water distribution, record keeping and collection of dues from the beneficiary farmers. The managing committee is entrusted with the responsibility of overall operation and maintenance of the irrigation system such as :

- (1) arranging the necessary finance for operating the scheme;
- (2) crop planning and arrangement of quality inputs such as seeds, fertiliser, pesticides etc.;
- (3) deciding the irrigation schedule and settling disputes if any;
- (4) purchase and replacement of machinery spares and supervision of staffs;
- (5) fixing water rates for each season and crop and collection of water cess (Satish and Sunder 1990:15).

Distribution of Water

Water from the main canal of the Pattadungri project, is lifted to the main distribution chamber situated at the highest location of the command area from where water flows by gravity to 17 distribution chambers located in the entire command area. To ensure free flow of water to each chak ? rotational water distribution method is followed. Before the start of the rabi season, the secretary fixes the operation schedule in consultation with the managing committee members. Prior to the release of water to each chak, the secretary requests all the farmers in the command area to clean their portion of the field channel. In case a farmer does not clean his portion of the field channel, he

is pressurised by the secretary of the society to do so. But the society does enjoy any right to penalise the farmer who disobeys. The 17 outlets have been divided into three to four groups depending upon their location from the main distribution chamber in the command area for delivering timely irrigation water to all the beneficiary farmers. Below the outlet, the farmers divert the flow of irrigation water to their fields one after another. Instances of diverting water below the outlet out of turn are noticed very frequently and these unpleasant situations are dealt by the secretary and committee members.

Appendix 1, Table 1 prepared by the SWDF throws light on the irrigation achieved, gross income, total expenditure and net profit earned by the beneficiary farmers of the project as a whole. The net profit over the years has increased from Rs.6 lakh in 1984-85, to Rs.16,90 lakh in 1991-92. However, we have certain reservations with these figures which will be discussed in the post observation note.

Case

Kanubhai R Rathod owns five acres of land in the L1 command. In two acres he cultivated wheat. In his field he used 1 1/2 bags of DAP, 20 kgs. of Urea, and three cartloads of home made compost (locally called Chhani Khattar). He did not use pesticides for his wheat crop at all. His production of wheat was 13 quintals of which he sold four quintals at the rate of Rs.250 per quintal in the local market to meet the household expenditure. In another three acres of land, he grew gram. He used 4 bags of DAP and 2 quintals of Diwelkhod (local manure). He produced only 19 quintals of gram. He worked in the field with his family members and employed labourers only when he required more assistance.

Post Observation, Some Issues and Suggestions

The author of this paper visited the Sahada LI scheme in July for three days and held wide range of discussions with the managing committee members and the secretary of the society. Besides, the author also conducted independent interview with 12 beneficiary farmers randomly selected. Some of them were interviewed at their residence and some other at different field sites. These interviews were held to cross - check the information supplied by the secretary and the committee members about the functioning of the LI scheme and to gauge the feelings of the farmers about the management of the LI scheme.

C The efficiency of the scheme depends a great deal on regular supply of electricity. It has been observed that the supply that the supply of electricity during the Rabi season is highly erratic. Many times even if the electric

200 Rs per ha erratic

near the main
wharf - 304 m

far away
grow gram

supply is on, the voltage would be at so low that the pump cannot be operated to lift water for supplying irrigation in the command area. Moreover, the Gujarat Electric Board charges the LI schemes at a flat rate depending upon the horse power of the motor. So, the management committee often decides to supply irrigation to command areas and when electric supply is available. Operating a diesel pump during these erratic electric supply periods in order to maintain the irrigation schedule would be highly cost intensive and per acre irrigation charges will go up to such a price level that the beneficiary farmers may find it difficult to pay the charges. Therefore, the management committee is not in a position to adhere strictly to the rotation 1 irrigation scheduling among the 17 outlets in the command area. As revealed to the author by several farmers, some of the outlets located far away from the main distribution chamber hardly get one irrigation during the Rabi season. These farmers are forced to grow gram instead of wheat. It was further revealed during the discussion, that due to uncertainty of the water supply, the beneficiary farmers do not follow the discipline of rotating water one by one among themselves. On many occasions the principle of might is right prevails. These unpleasant situations and conflicts are amicably resolved by the managing committee members.

②

There is growing dissent among the beneficiary farmers in respect to irrigation charges collected by the society. As per the present practice, charge is levied on acreage basis irrespective of crops grown and amount of irrigation flows supplied. This policy has created disparity among the beneficiary farmers. The farmers who grow wheat and are nearer to the main distribution chamber pay Rs.200 per acre irrigation charges for availing three to four irrigations (at times, five, if the electricity supply is normal as it does not cost more in terms of consuming electricity and water). The farmers located far away from the main distribution chamber who grow gram due to inadequate supply of irrigation water also pay the same amount of irrigation charges for availing just one irrigation. They feel that the flat rate of irrigation charge is not rational.

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This anomaly in the pricing structure of irrigation charges has resulted in default payments. It was revealed that the number of beneficiary farmers not paying the dues over the year is alarmingly increasing [2]. The default amount accumulated over the years was around Rs.79,000 which is nearly half of the budget provided for the annual expenditure of the LI scheme. To deal with this deficit, the society has taken loans from the SWDF and the bank. The president and the secretary are much worried about the non-payment of

of defaulters

irrigation dues by the beneficiary farmers for if this is not remedied the future, of the society-would be in jeopardy.

- Handwritten notes on the left margin:*
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- 4) The LI scheme of Sahada is ten years old. The society has already used one third life of the electric motor and one fifth life of the physical system. The electric motor and the system may both require major repair in near future. The managing committee so far has not taken serious notice of this issue and has not planned to generate some extra capital in the budget to meet any kind of major breakdown in the system. In case of its occurrence, it would be beyond the reach of the beneficiary farmers to collect such a huge amount at a time. Financial assistance from external agencies like banks and other credit institutions will be available only when the tardy and long procedural complications are fulfilled. Till then the society will remain defunct.
 - 5) It was also observed that the organisational structure is weak and the beneficiary farmers' co-operation is not forthcoming as expected. The Annual General Body Meeting was held on 22nd July 1992. Although the each Falia was informed well in advance only 70 members out of 202 turned up for the meeting. This had happened in the past meetings too. This is not a healthy sign for co-op movement to sustain. The beneficiary farmers should be productively and increasingly involved in the decision making and management processes to avoid disinformation and absenteeism. More awareness building measures are necessary so that the tribal farmers feel that the project is theirs and they have to manage it only through the community approach.
 - 6) Table 1 presents data on the annual irrigated area, gross income, total expenditure and net profit, the project has achieved over the last eight years after its commissioning. The value given for different units such as per acreage production of wheat/gram, fertilisers, pesticides and labour etc., for calculation is on the higher side. For example, per acre production of wheat is calculated by the SWDF as 16 quintals. On cross checking with some beneficiary farmers in the project command area, the average figure was eight to ten quintals per acre. Moreover, the beneficiary farmers reported that only a few of them could use the recommended quantities of fertiliser and pesticides. One can easily see the economic betterment the LI scheme has brought in the lives of the tribal peasants. But the scale of impact is not as high as claimed by the SWDF through the figures presented in the table.
 - 7) The farmers of the Sahada LI scheme draw irrigation water from the main canal of Pattadungari project. As

per the irrigation department rule, the farmers are required to apply in a prescribed form stating the size of area and the crop to be grown well before the onset of the irrigation season along with the requisite fees. After scrutinising the applications, the irrigation department issues a pass authorising the applicant farmer to draw the number of irrigations/quantum of water applied for, to irrigate the crop area in the entire season period. Without this, the farmers cannot draw a drop of water from the flow irrigation system. It was revealed by the Deputy Executive Engineer of Pattadungri Project that only 40% to 50% farmers of the Sahada LI scheme apply in the prescribed form in time for the Rabi season. Thus, the irrigation department can only allow these farmers to draw the quantum of water applied for. This creates enormous management problems for the committee members as they are unable to draw the total quantum of water required for irrigation in the entire command area as they are not authorised to do so for the other farmers who have not applied earlier. But, the management committee members maintaining cordial relationship with the irrigation department officials obtain permission to draw the total quantum of water during the rabi season with the understanding that the other farmers would submit their applications along with the required fees well before the closing date of the irrigation season. As long as this understanding continues between the committee members and the irrigation department officials, the LI co-op society may not face any kind of problem. But we would like to suggest that the co-op society should take the responsibility of collecting the application forms from the beneficiary farmers and submit them to the irrigation department well in advance of the irrigation season and obtain permission to draw the total quantum of water.

The SWDF must concentrate more on these aspects and try to review and sustain the Sahada LI scheme before attempting to replicate the scheme in other areas.

Table 1
Irrigation achieved during Rabi season and the value of yields in Rabi

Year	Actual irrigated area (in acres)	Earnings (Rs.)		
		Gross income	Total expend.	Net profit
1983-84	159	3,33,000	95,000	2,38,000
1984-85	300	8,13,000	2,13,000	6,00,000
1985-86	-	-	17,500	-
1986-87	-	--	12,300	-
1987-88	230	5,88,000	1,63,000	4,25,000
1988-89	260	9,03,000	2,23,000	6,80,000
1989-90	275	15,67,000	1,92,000	13,75,000
1990-91	250	10,06,000	1,30,000	8,76,000
1991-92	305	19,04,000	3,86,000	16,90,000

In 1985-86 and 1986-87, no irrigation was available due to non-availability of water.

In 1987-88, only one watering to gram was given due to inadequate water in the canal.

In 1988-89, about 40 acres of the land was under the crop of Pigeon Pea, which was the extended to kharif crop, which did not require irrigation. Hence, irrigation in 1988-89 was 260 acres, i.e. 40 acres less than maximum achievable.

The variations in the value of yields could be attributed to the cropping pattern and the price fluctuations.

Irrigation Cost :

The actual irrigation expenses incurred by the cooperative society in different years.

Year	Actual expenses in Rs.				Total expenses	Aid/subsidy from companies/SWDF
	Diesel oil/electric bills	Maintenance & spares repairs	Staff salary	Diesel carting/water distributors		
1983-84	23415	913	5616	1568	31512	12040
1984-85	23500	1598	15060	-	40158	7757
1985-86	4400	1700	11400	-	17500	4240
1986-87	7338	-	4962	-	12300	2975
1987-88	19861	800	11300	-	31961	-
1988-89	19663	1356	16325	-	37344	-
1989-90	20912	1556	18315	-	40783	-
1990-91	19924	10303	18870	-	49097	-
1991-92	Not available					

Appendix - 1

Salient Features

1. Location : Sahada village is situated at about 12 kms. from Dahod and approachable by road
2. Source of supply : Medium Irrigation project, Patadungri's main canal
3. Static Head : 24.50 mt.
4. Gross Head : 24.50 mt.
5. Design Discharge : 150 LPS
6. Pumping Capacity : 100 HP (2 sets of 50 HP each)
7. Pipe lines :

i. Rising main (RCC pipe)	:	Pipe Dia.	Class.	Length.
		450mm	P3 & P2	300
		450MM	P1	360
				660mt.
ii. Branch- lines (RCC pipes)	:	400mm	P1	585
		3 00mm	PI	930
		•300ram	NP2	225
		250mm	NP2	1,150
		150mm	NP2	120
				3,010mt.
		Total pipes:		3,670mt.
8. Total irrigable area :

	Acres
Kharif	300
Rabi	300
9. No. of distribution outlets : 17
10. No. of beneficiaries : 202 families
11. Members of co-op : 210
12. Cost of scheme : Rs. 9,50,000 (roundup)
(100% subsidy)
13. Year of completion : 1983-84

Notes

1. Before 1986, SWDF worked under the name Sadguru Seva Sangh Trust. The Foundation was subsequently registered under Bombay Public Trust Act 1950 and also under the Societies Act 1860. Very recently, NM (Navinchandra Maftlal, the founder of this organisation), has been added as prefix to the SWDF. Now the Foundation is known as NM SWDF.
2. It is beyond the scope of this paper to examine in detail the background of defaulters. It was informed that mini progressive farmers are found in the defaulter's list.

References

- Barik, B.C. "Rural Development for Whom". Forth-coming.
- Bureau of Economics and Statistics. (1983). State Economy in Figures, Government of Orissa.
- Deshpande, R.S. and V Ratna Reddy. (1990). "Social Dynamics and Farmers' Society : A Case Study of Pani Panchayat". Indian Journal of Agricultural Economics, Vol. XIV.
- District Census Handbook, (1981). Panchmahals District, Census of India, Series-5, Gujarat.
- Jagwat, H. (1992). "Panacea for Panchmahals". The Times of India.
- Grant, Nadine (1989). A Study of the Impact SWDFs Social Forestry Programme on Women, SWDFs, Mimeo. Pi".
- Pathy, J.N. (1982). Agrarian Structure in Tribal Gujarat and Its Implications for Tribal Policies, Mimeo, Department of Sociology, South Gujarat University, Surat.
- Sadguru Water Development Foundation. (1989). Achievment Report - II.
- Sadguru Water Development Foundation. (1992) Annual Report.
- Satish, S. and A. Sunder. (1990) People Participation and Irrigation Management, New Delhi : Common Wealth Publishers.

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**IRRIGATION CO-OPERATIVES IN MAHARASHTRA:
EXPERIENCES AND LESSONS**

R. K. Patil & S. N. Lele

Abstract. After a review of the present status of irrigation management in India, the paper briefly summarises the work of five irrigation co-operatives recently set up in Maharashtra for water management in the command areas of major and medium projects. Based on this experience, measures needed to accelerate the process are suggested. In particular, the authors emphasise the need to have transparent operational rules, water allocation norms and adopt other measures required for updating the micro-disne[^]- in the jurisdiction of societies. The problems in operation and maintenance, monitoring, water accounting and audit, financial audit, etc., are discussed and solution indicated. A fervent plea is made to synthesise advantage of centralised clarity and consistency with creativity and specificity of decentralised farmer-managed water users' co-operatives.

Key Words. Conjunctive use of water, farmers' involvement irrigation co-operatives, micro-disnets, operation and maintenance, volumetric delivery, volumetric pricing, water accounting and audit, water allocation.

Introduction

The massive development of major and medium irrigation systems, since Independence, has certainly contributed to an increase in food production and improved availability of food, particularly, for the urban and industrial population. However, the growth in production is highly concentrated in terms of crops and areas. Further, it has been accompanied by soil erosion and socio-economic inequities. On the physical side, there are problems of silting, soil erosion and deforestation in the neighbouring rainfed areas. This has been due to preoccupation with irrigation *per se* as opposed to its integration with watershed development, especially in rainfed areas outside the service areas of the projects.

Despite the best efforts of the irrigation agencies, the gap between the potential created and actual utilisation is gradually widening, from 9.8 % in the First Plan to 16 % in the Seventh Plan.

In the existing situations, the preoccupation of the farmers is to maximise production per unit of land rather than per

unit of water. So, more water is captured by those who have an easy access compared to the weaker and disadvantaged sections of farmers.

The technology has been extremely deficient with regard to irrigation channels, especially at the tertiary and quarternary levels, drainage systems and timing of water delivery. Evidently, the quantum of water application has been larger than needed, as the optimal timings cannot be guaranteed. It is only in the alluvial plains of the north that a very small and strict ration is enforced under the Warabandi system and where most of the farmers have access to a tube-well and electricity supply network that water use efficiency has been realised. Here also the subsidies for fertilizer have resulted in its sub-optimal application and sustainability of yields has been in question. The pricing of water has no relation to the opportunity cost of scarce resource and there is no incentive for saving water. Low area rates for high water demanding crops (sugar-cane and paddy) in low rainfall areas and heavy water consuming second crop of paddy are prevalent for the last four decades, distorting the basic economics of irrigation. Little consideration has been given to volumetric pricing and rationalising water rates in relation to the scarcity of water and for creating incentives for water saving. It is not a simple matter to restructure a system which has created concentrated pockets/areas of benefits and a highly privileged access to water with implicit license to wastage. Restructuring will require co-ordinated efforts of the administration and the irrigation system management on one hand and farmers and rural communities on the other. Major policy changes are necessary to diversify production, extend the service area and bring about equity not only among the tail-enders and head-enders but also among the farmers outside the service area and those in the command area.

A commitment to productivity without compromising sustainability and efficiency in the use of water is also essential. This will call for appropriate packages of pricing and rationing. Implementation of these measures would require participation and involvement of farmers. To organise and motivate the farmers is a task which is presently beyond the capability of the irrigation department bureaucracy.

Finally, a serious lacuna in development has been the failure to adopt farming system approach where it must be recognised that water is only one of the inputs and the viability of farming operations is determined by several other factors, such as the adequacy of technical support services with regard to crop production and a host of services relating to the post-harvest technology (processing, storage and marketing). The farmer must get a due share of the value addition realised through processing and marketing. The water charges have to be raised to cut

out the deficit of irrigation management and mobilise resources for further development. The adverse impact can only be cushioned through an overall improvement of the farming system to create income stability for small and marginal farmers.

To remedy the situation, among other measures, it is suggested that the management of water at the tertiary and quarternary levels should be handed over to the farmers, especially to their groups and societies. The National Water Policy of 1987 lays down that the formation of such irrigation groups should be high on the agenda for improvement of the irrigation system.

With the policy support and genuine desire of the state governments for better utilisation, efforts towards the formation of the Water Users' Associations (WUAs) are gaining momentum especially in the states of Gujarat, Maharashtra, Karnataka, Kerala, Bihar and UP. The rest of this article deals with the problems encountered in these efforts.

Rationale for Collective Action

The need for collective action on the part of beneficiaries of irrigation facilities, for adequate, timely and predictable supply, is now well realised. Depending on the situation, there are different types of irrigation co-op's. For example, lift irrigation co-operatives are concerned with acquisition and development of the water source through conveyance and distribution to individual farmers and members. In this paper, however, we shall deal with surface irrigation systems where the development of the water source and conveyance of water are looked after by the government agencies (owners of the system) and the distribution of water to individual farmers by the co-ops. As a matter of fact, barring a few exceptions, surface irrigation systems in our country are planned, constructed, operated and managed by the Government departments, right upto the farm. That the present management system is wasteful, counter-productive and injurious to the soil is well-documented in the literature, the latest being the theme paper prepared by Dr. Katar Singh.

The panacea suggested is a change-over to co-operative/collective management by the farmers at least from that level where the farmers in sizeable numbers can manage the system in a defined jurisdiction of a lateral/distributary/minor projects. The implicit assumptions are:

1. Given the technical complexities of operating dam and canal system (catering to over 20,000 ha), irrigation co-ops would not be able to manage and operate the entire system. It requires technical inputs far beyond

the capabilities of the irrigators, at least, as of today.

2. Armed with local knowledge of soils, climate, crops, etc., farmers are in a better position to control and regulate water supplies in a defined jurisdiction of, say, 1,000 to 1,500 ha.
3. With the formation of one entity (viz., the co-operative) to negotiate with the Irrigation Agency (viz., the government department) considerable efforts — physical and financial -- of individual irrigators would be saved. The Agency also benefits from dealing with one entity, thus reducing its management and cost recovery efforts.
4. The possibility of reducing/eliminating arrears of irrigation charges are bright in view of the fact that the local co-operative knows the situation of every irrigator and can exert social pressures or make rules and regulations and ensure strict adherence to the rules.
5. As every irrigator has a say in the co-operative, the discipline - financial as well as managerial - is likely to be maintained. In parenthesis, it may be added that our experience shows that the defaulting irrigators in the earlier regime promptly paid the dues in time, as the rules thereof were made in the open meeting to which they were a party.

Why Cooperatives?

At the outset, let it be noted that the concept of co-operation used here is a broader one, encompassing any collective or joint action by the beneficiaries, irrespective of the fact whether the societies are registered as such or not. As stated in the Theme Paper, co-operation is group behaviour - joint or collaborative - directed towards a desired-goal in which there is common interest or hope or reward.

Viewed this way, the first question that arises is : what is the goal of (surface) irrigation societies and why are they needed? Further, the **co-operatives do not** exist in a vacuum. Already there is an environment with physical, managerial and socio-economic attributes. So, these aspects have to be considered for a healthy growth.

The general and common answer to the above question is that the goal is to use surface waters optimally, ensuring equity, adequacy, timeliness and predictability. Now, if **this goal can be or is achieved through the** existing management system, then there is **no** need for co-operative action. Unfortunately, this is not so in all the major,

medium and minor systems that have come up in the last 100 years or so. True, some influential and dominant farmers have benefited from the existing system, mostly at the cost of the small and marginal as well as the tail-end farmers. But then the totality or groups as a whole have not benefited, nor the targets of irrigated areas set by the Irrigation Agencies achieved. The next question is: can this goal be achieved through streamlining the current management system? The answer is definitely in the negative.

Now, if it is desired to substitute the present management by a co-operative one, it has to be seen that the potential beneficiaries perceive the weaknesses of the present system, what pinches them presently and whether, by coming together, they can manage better. This process of enlightening them and creating confidence for self-management is likely to be a long drawn process depending on their perceptions and past experiences. Through this process, a sense of commitment is likely to emerge. Commitment is an outcome of learning process. It takes time. The main tools for encouraging the learning process are analysis, dialogue and persuasion (Overseas Development Council 1986). It may be noted that the commitment is of two types : passive and active, which are exhibited by the actions of the participants (irrigators) accepting the co-operative philosophy. Thus, some participants who feel the need for collective action may not participate actively in the decision making process, but would follow the agreed rules and regulations, maintain discipline and shun any opportunities for free riding in the collective interest. While the others, actively committed would take part in decision making, observe the behaviour of fellow irrigators and report misbehaviour and ask for remedial action. The latter type would normally be represented in the Managing Committees.

If the above analysis is accepted, one can find one of the reasons why despite isolated successes and policy directives, irrigation co-ops have not proliferated. In general, the task of formation of such societies is entrusted to Government officials, especially from the Irrigation Department. These officials approach the would-be members by saying that "it is the policy¹ and hence societies are to be formed. There is no question of asking them "What pinches them at present". For the answer is likely to be an adverse comment on the system of which the officials are part and parcel. So, without adequate understanding - analysis, dialogue and persuasion - the package is presented as a policy with the inevitable attraction/incentives of grants and subsidies. Thus, we get stuck with a large number of registered societies - promoted, supported and managed by the government officials, with a mechanical set up. We feel that this absence of prolonged dialogue with the beneficiaries is responsible for the present deadlock. The inevitable question then is whether this 'awakening' stage should be handed over to the

NGOs or the government officials. At this stage, we would not deal with this subject, as it is a separate issue.

Some Historical Experiences

Despite the positive features and an urgent need for collective action, unfortunately very few co-ops have come up on surface irrigation systems [1]. The earliest example is that of the Samvatsar Co-operative Water Distribution Society which was registered in Godavari canals as early as 1932. Another society, viz., Malinagar Irrigators' Water Supply Co-operative started functioning from 1957. Both these societies are stabilised and are functioning well even today.

However, these societies came into existence under some special circumstances. The members belong to only one community, viz., Mali. They were suspicious that the private sugar factories set up in the area in 1930s would take over their lands and they felt that with the formation of societies, take-over would be difficult. No effort was made either by the government or concerned irrigators to replicate these in the commands of the same projects or elsewhere.

The latest success story is that of a well-researched society at Mohini in Gujarat, established in 1978. Though many societies have been registered in Gujarat thereafter, their functioning does not evoke any hope or promise nor inspire any confidence rapid replication.

As early as 1984, Centre for Applied Systems Analysis in Development (CASAD) decided to study this problem, specially in the light of policy pronouncements for encouraging such type of collective action. The resulting study was published in 1987 titled, "Farmer Managed Irrigation System" (CASAD 1987).

On completion of this study, CASAD felt that in order to understand the problems in depth, it would be better to launch an Action Research and document the experience. So, in 1987 with the support of Ford Foundation and in active collaboration with the Government of Maharashtra (GOM), CASAD decided to establish a co-op society at Chanda, a village which falls in the Mula Irrigation Command, located about 40.0 km off the Mula Right Bank Canal. The society started functioning from July 1989. The society is now stabilised. Water management is looked after by the society. Every irrigator who demands water gets it on time and the recovery of irrigation charges is 100%. CASAD has withdrawn from active association since June 1991 and the society is now functioning on its own.

The activists of Samaj Parivartan Kendra, (SPK) Nasik who attended a seminar on Chanda Society and who visited the

Action Research Area in 1990 were impressed and decided to start three such societies at Ozer in the command of Waghad project in Nasik district. These societies are now well established after overcoming the initial teething troubles. These societies would need another couple of years to stabilise and prosper, but indications are that they would succeed.

As a result of these development the **COM** decided to organise societies on an extensive scale. The **COM** claims that it has formed 67 Water Users' Associations (WUAs) of which 21 are functioning. But a cursory analysis of these 21 WUAs shows that only about 7 or 8 societies are organised and functioning. The rest of them are either moribund or are facing difficult problems of survival.

The rest of the paper is devoted to an analysis of CASAD's own experiences, functioning of government sponsored WUAs and to find out the problems and issues that need to be tackled for as acceleration of the movement towards farmers' participation in irrigation management.

Shri Datta Water Distribution Co-operative Society, Chanda

Early in 1986, when CASAD decided to undertake an Action Research, they surveyed Minor 5 of Mula Right Bank Canal for the purpose. Under the able leadership of the then CASAD Administrator, the physical system was updated; as the Minor was a direct one near the head reach of the canal, water was guaranteed and a successful Rotational Water Supply System (RWS) was established. The Administrator trained the government *Patkaris* and saw to it that the timings of RWS were strictly observed. With these changes, farmers got regular and timely water, crop yields increased and they were generally satisfied. Most of the farmers belonged to the *Wanjari* community, which is educationally backward and which has a high respect for the traditional leaders. They grow mainly foodgrains and groundnut and to a small extent, sugar-cane (sugar factory is nearby). They had the problem of unequal distribution specially at the tail-end, but the updating measures taken by the Administrator solved the problems.

So when CASAD approached them with a proposal for a formation of co-op, the traditional leaders' question was, "What for?" They were satisfied with the informal committee and time-based water deliveries (RWS) enforced by the Irrigation Department, and felt no need for any action to 'own' and distribute water.

CASAD learnt its first lesson, i.e., if the current management satisfies the perceived needs of the farmers, no further group action is needed. (Retrospectively, it may be stated that with the transfer of the Administrator, the situation slowly started deteriorating and with the success

of Shri Datta Co-operative Water Distribution Society in the nearby Minor 7, presently they are in a mood to consider the suggestion).

CASAD then approached the farmers on Minor 7. The farmers were progressive and belonged to the Maratha and Mali communities well known for good farming; about 12 farmers were degree holders.

The major crop was sugar-cane. Apart from canal waters, there were 184 wells (almost all, dug after the canal irrigation began). The local leadership was politically well articulated and in a way, ambitious.

The main problems were: the physical system was in a dilapidated state, deliveries were irregular, tail-enders starved and there was a lot of corruption at the lower level of bureaucracy. Obviously this situation led to unavoidable visits to the section office, waste of time, poor water deliveries and loss of potential yields.

When the question of setting an irrigation co-operative was posed before them, they were enthusiastic. Besides, they did have the experience of managing a multi-purpose society in the village. However, as the management of Common Property Resources (CPR) in this area being a new concept, they were not sure of themselves for carrying out the take-over procedures. Further, the whole system was owned by the government; and they were not sure whether the Irrigation Department would co-operate. Even if co-operation was forthcoming there would be some intricate technical problems for negotiation on which they had no expertise. When CASAD assured them of assistance in solving the problems - technical as well as organisational - they readily agreed to accept the proposal.

However, it took two and half years to establish the society due to various reasons. First, negotiations had to be had with the Irrigation Department on volumetric rates, water allocation in different seasons, operation and maintenance issues, etc. As it was the first society in the state organised on the new lines, it took time, as other departments like Finance, had to be consulted. Second, the Cooperative Department had not registered such societies in the last 20 years and many issues had to be decided afresh. It took almost a year to convince the senior officials of the Department. Once the society started functioning from July 1989, further progress was relatively easy, though there were minor teething troubles.

CASAD made a few suggestions to make the society more helpful to the members and also for augmenting the society's income. These were:

- a) The society should purchase some agriculture implements such as sara yantra, seed drills, groundnut decorti-

cator, etc., for giving them on hire to the needy. This could also augment the income.

- b) Trees should be planted along the Minor. In about 3-4 years, the timber and fuelwood thereof could be sold, adding to the society's income.
- c) En route storages and/or farm ponds should be built in the command to ensure flexibility in water deliveries and for saving/conserving water. This could indirectly help to reduce financial expenditure.

The society has so far implemented the first suggestion. While the farmers understand the need and utility of the other two, they have not taken any steps. Apparently they are satisfied with the present situation - timely supplies, freedom of choice in crops and deliveries regulated by the farmers; and hence are complacent. The society has paid irrigation charges in full before the due date, since its inception. Further, there are no complaints of anybody not getting water. They are, at this stage, not willing to experiment with high value crops requiring higher frequency of water deliveries and a change in farming system. However, it may be added that they are not willing to give up the efforts for collective action after experiencing the benefits, howsoever small or preliminary, and they may look for the cognoscenti.

Waghad Societies

As stated above, CASAD later associated with SPK in the formation of three irrigation societies at Ozer in the command of Waghad Project. Here the environment is quite different. Farmers are progressive; they take crops like grapes, vegetables, etc. The command is located on the Agra-Bombay Road, at a distance of 20 km north of Nasik. The physical system was literally in shambles; low irrigation intensity, irregular water supplies, undeveloped micro-system and waters received in only 30 ha out of a CCA of 1,100 ha. Soils are light and hence require light, but higher frequency deliveries. In general, the educational level of the farmers is relatively better and they have a good grasp of the irrigation problems. Though ground-water is available, the quantum is much less due to difficult soil conditions. There is a wide gap between availability and demand.

The main interest for collective action was in acquisition and procurement of water from the Irrigation Department and equitable distribution. (Parenthetically, it may be added that at Chanda, water was available, but the supply was irregular, uncertain and untimely - a man-made problem). So the objective was to get enough water for all.

There were the usual problems in registration, negotiations with the Irrigation Department, etc. However, the time taken was almost half of that in the Chanda Society (i.e. 18 months). The societies have taken over the management in January 1992 and so far the functioning is quite satisfactory. Recovery of irrigation charges is 100%.

Ground-water is negligible, but with assured deliveries of canal water, it is likely to rise as a supplement. So, these societies are, now seriously thinking of controlling and regulating ground-water supplies, as the ground-water is likely to be augmented through canal recharges. They also found that if they can regulate the water flowing in a rivulet running through the command, they would have better availability. This was felt necessary as due to the design and construction problems, canal frequency of canal supply is low. If they want higher frequency of water supply, local water resources have to be developed. This led the members to think of 'integrated' management of canal, groundwater and rain-water. A new and innovative avenue was opened for collective action out of the felt needs and exploring the possibility of satisfying them through favourable local environment.

The binding forces for these three co-ops are :

- a) Need to procure water from canals which, presently, is of grossly inadequate frequency.
- b) Need to supplement canal waters with groundwater for higher frequencies.
- c) Need for timely supplies to all the farmers, i.e., the equity principle.

These needs can be satisfied only through collective action. Further, as the farmers had adequate experience of co-op organisation - maintenance of discipline, keeping updated financial accounts, and the follow-up of procedures, etc., the societies are on way to stabilisation and progress.

Kurnoor Project

Motivation for collective action, arising from current inefficient government managed water distribution and the desire to reap benefits from the developed water resources is illustrated in Andur village in Osmanabad district lying in the command of Kurnoor Project. This is a medium project constructed in 1966-67 to benefit about 6,575 ha. However, after 25 years the project irrigates only 2,400 ha. The low utilisation is due to the lack of systematic plan for operation and maintenance. As the 'owner' is the government department and has no incentives (penalties) for poor operation, water is wasted. The situation is similar to

Ozeir, but far more serious. Soil variations are large; groundwater is undeveloped; large areas of the village are out of the canal command and the micro-system is undeveloped.

These disadvantages (pinches) and the good work done by Tata Institute of Social Sciences for developing dryland farming in the vicinity of village led the farmers to go in for collective action under the leadership of Dr. Ahankari, social activist in the village. Two irrigation co-operatives are in the process of formation. Notable features of these co-operatives are :

- a) An integrative approach to water distribution, i.e., consideration of rain-water groundwater or local surface water to be developed through watershed programmes and the canal water.
- b) As water is scarce in the region, it was decided to give water to only three acres per family unit. These characteristics are an indication of the desire of the farming community for equity, in the face of scarcity.

Analysis and Discussion

This analytical narration of a few cases in Maharashtra shows that the irrigation co-operatives would not come into existence by a government fiat nor through expression of goodwill nor through policy statement bereft of any concrete action for their promotion. The irrigators' problems and the underlying situational environment have to be studied to find location specific solutions. At least the situations need to be categorised and the probable solutions indicated.

Farmer Involvement. The first question that is posed by the farmers is, "In what way WUAs are a better organisational devices than the departmentally managed system?" The advantages of WUAs have to be clearly brought out to the farmers. This task cannot be done by the irrigation officials, as it means finding faults with the departmental management itself.

While it is in the farmers' interest to increase farm productivity through irrigation, water management policies may be governed by multiplicity of goals, some of which may conflict with the farmers' interests and this conflict may be one of the factors responsible for the lack of farmers' involvement. For example, the farmer may not be concerned about increasing the productivity of specific crops such as foodgrains, oilseeds and pulses, if it does not add to his income. A majority of the more influential among the farmers may not be concerned about beneficiary target groups such as marginal and small farmers. The farmers often demand better standards of maintenance of the irrigation system. Yet they may not be concerned about the

cost of maintenance or the return on the public outlay on irrigation. This wider concern for irrigation productivity has to be emphasised. In fact, what the farmers want, can be done in a better way, if they take over the management responsibility at the tertiary level.

A pre-requisite for farmer involvement in water management is that the economic gains of irrigated agriculture must be visible. This requires adoption of improved production technologies along with assured water supply.

At present, the farmers are not required to put in efforts (in kind as well as in cash) to get water facilities from the surface irrigation systems. The state identifies the projects, prepares designs, constructs the system right up to farm gates and also maintains the same. Thus, the state becomes the provider, controlling all the operations and the farmers are left only with the role of supplicants. In such a situation, there is little incentive for the farmers for any collective action. Hence, they prefer easy methods of getting water through maintaining better relationship with, the field functionaries or pleasing them either through social influence or "palm greasing". The farmers moreover, have no voice in framing the rules and procedures for water distribution. Further, in contrast with the pre-Independence era, the general tendency of the populace is to depend for everything, benignly, on the government. No initiative comes from the people and, if it comes, it is stifled for political ends. These facts have to be highlighted during the discussions with the farmers. This was done in all the experiments cited above.

For participation to succeed, beneficiaries must bear costs-capital plus working expenses. These should have some relationship with the expected gains. In other words, there must be something which pinches the beneficiaries for which they must come together and this coming together must be motivated by costs which should have some relationship with the perceived gains (gains must exceed the costs).

It therefore appears necessary to devise methods of associating the farmers right from the planning stage of the project to operation and maintenance. Their stakes in the project need to be raised by asking them to contribute to the costs, at least partially. Of course, the farmers cannot be associated with the planning process of the major and medium projects. Yet, it is possible to involve them by "decomposing" or sectioning the system from dams, through main canals, branches, up to the minors. At the minor level, the farmers understand the problems and are in a position to offer suitable suggestions. Naturally, this can be adopted only in new projects. In the existing projects, especially when they are updated or modernised, the beneficiaries can certainly be involved at the planning stage. In the old functioning projects, participation can be ensured, by mandate if the state says that water would only

be delivered at the minor head to the water associations/societies and, further, distribution is the responsibility of the farmers themselves.

Similarly, collective water management may lead to better understanding of ground-water potential and its conjunctive use. Presently, the farmers look upon surface water seepage as a principal individual source (which is also cost free) and desire that the minors and distributaries be run for longer time to get more seepage contribution. Once the water supplies are allocated on some agreed and fair principles, the WUAs would be compelled to think of collective action to exploit and use the groundwater more efficiently.

If irrigated agriculture is to prosper, it is necessary for the cultivators to understand the concepts of water measurement and accounting and the simple hydraulic principles affecting the micro distribution network. Our experience shows that if explained in terms which they can understand, farmers do appreciate the basic concepts, as they deal with water all the while.

Another weakness in today's environment is that the farmers have no easy access to information relating to irrigation. It is time the Irrigation Department publishes, in local language, the availability of water from storage, seepage losses in the different sections of main canals, water consumed/used during every rotation etc. In fact, the periodic information transmitted by the section/sub-division officials should readily be made available to WUAs/farmers. It is through such measures that the "irrigation literacy" of the farmers would be raised and they would be induced to take more interest in irrigation management problems.

Operational Rules. One of the key principles of modern management is the clarity of authority, responsibility, rights and duties for all the concerned actors. At present, the beneficiaries/WUAs are not aware of the system constraints such as water availability, canal capacities etc. The result is that the farmers feel that they should get water supplies at any time and the Irrigation Department is acting capriciously.

It is, therefore, necessary to share this knowledge with the farmers so that they know the constraints and press for their due rights within the existing framework. This also acts as a check on possible malpractices. Further, the honest staff would also know their duties, if they are written and codified. All the personnel of the operating staff and the farmers should be provided with relevant policy statements and operating rules in a compendium form.

Water Allocation. The general policy should be that water be allocated in proportion to the area covered by the minor. However, some weightage will have to be given for different

situations of soils, cropping pattern, etc., in the initial period, till a major area is covered by farmer managed societies.

- a) Availability of groundwater : In Maharashtra, for example, the groundwater availability is not uniform in the command. In areas with underlying solid rock or in deep black soils, the availability is poor or negligible, whereas in areas situated close to the main/branch canal, or with underlying *murum* layers, the availability is good. The cropping intensity, where abundant groundwater is available, is of the order of 175% to 200% percent, whereas in areas with poor availability of ground water, the intensity is only of the order of 110% to 125%. Objective criteria for allocation of water after taking into account the exploitable groundwater need to be developed.
- b) The soils in the command of irrigation projects vary considerably between sub-commands of the minors and, at times, in the individual fields. The traditional farming practices do change according to the soils and the nature of rainfall. These facts should be taken into account while fixing the quotas.

The experience is that the water releases/utilisation in the head reach minors is higher than the tail minors. If proportionate water allocation is considered, farmers from such head reach minors, who are accustomed to draw more water and have high water intensity crops, or higher coverage of irrigated crops, compared to the average irrigation intensity as per the project design, will be put to loss and may not come forward for self-management with fixed water quota. It would be necessary to allow additional quota, temporarily for four to five years, which can be reduced to proportionate quota gradually.

The system losses play a vital role in deciding the water allocation. The actual seepage/operational losses are generally mere than the designed ones. Hence, if the water allocations are made according to the designed figures, the farmer groups coming for negotiation later would get very little water. At that time, the allocation of all the groups/minors would be required to be revised, leading to unpleasantness. To avoid such situation, the following method is suggested.

- a) The system losses should be assessed precisely, through actual observations and measurements, and net quantity of water available at all the Head-Reaches of minors worked out in advance.
- b) The water allocation should be based on net water availability at the minor heads.

- c) The annual allocation should be broken down into seasonal quotas. The actual cropping pattern, evolved on ground, is generally different from the designed one. Hence, it would be appropriate to consider proportionate water allocation for different seasons as per the design cropping pattern.
- d) Inter-seasonal and intra-seasonal water supplies should be such as to create a mild water stress - not too much water nor extreme scarcity. This is a facilitating condition and is amply fulfilled in respect of lift societies and the successful societies in the surface irrigation systems. In a sense, this ensures the relative scarcity which is necessary for the emergence of collective action.

Once the principle of allocation to groups/societies of farmers is accepted, volumetric supply and rates become a necessity. The arrangements for measuring and rate fixation, thus, become paramount.

Modernisation/Updating the Micro Disnets. The physical conditions of the field channels, outlets, outlet gates, measuring devices, field drains also change from project to project, according to the efforts made by the farmers and special repairs, updating work carried out from time to time by the Irrigation Department.

The Irrigation Departments are taking modernisation/ updating of some systems along with the main/branch canals, which is quite necessary for better water management/ utilisation. However, such programmes are taken up either on externally aided projects, or due to pressure from the local leaders or farmers. If the policy of involving the farmers in water management is to be pursued, some rational approach needs to be thought of, which would induce the people to come forward for self-management on one hand, and reduce government spending, on the other, through contributions and participation by the users.

Rational norms need to be evolved for a good micro-disnet system which can be provided by the state, within the budgetary allocations. These norms should specify:

- a) Maximum allowable command of an outlet (40 or 25 ha) and maximum permissible length of field channels.
- b) Type of measuring devices, standing wave flumes, parschall flume, V-notch, Roploge flume, cut-throat flumes, etc.
- c) Type of gate for outlet : lift screw type, or more sophisticated like delivery constant discharges at variable water levels in the main canal.

- d) Cross regulation for main/branch canal, upstream control, downstream control, automatic, constant volume concept between the CRs.
- e) Gradients and sections of field channels.
- f) Standard discharge at outlets, namely 20 litres per second (lps), 30 lps, etc.
- g) Criteria for lining the FCs, whether in all embankment stretches, approaches of structures, curves, high seepage lengths, or percentage of the total length.
- h) Number of crossings, whether on all authorised roads at certain fixed intervals, bridal paths, or every field.
- i) Division boxes, turnouts : pucca, in masonry/precast, for different soil situations.
- j) Lining of FCs and controls on minors.

A time bound programme of updating/modernising of the system, wherever the farmer managed societies come up should be undertaken. The cost of updating minors/distributaries and that of micro disnet, according to the norms, should be borne by the government.

However, instead of undertaking this activity by the irrigation Department on **their** own, it would be more **appropriate** if the WUAs are fully involved in the programme and the items for modernising/updating are discussed with them and the WUAs are invited to contribute in terms of effort and/or in cash. The inventory of the existing system and its structures could be prepared along with the farmers.

Estimates may be prepared to cover all the items agreed to between the Irrigation Department and the farmers. The Irrigation Department may indicate the extent of spending from their side, as per the norms fixed by them for a better system and request the WUAs to contribute the balance costs.

It may happen that the farmers may not accord priority to the items identified by the Irrigation Department and may insist on farm ponds, lift schemes on *nallahs*, construction of additional public dug wells or tubewells. In that case, government spending may be restricted to the items as per the financial norms and the remainder cost should be borne by the WUAs.

Once the items and cost sharing principles are agreed upon, the Irrigation Department can offer the WUAs to execute the works by themselves, if they can do so. In this situation, overheads could be reduced and more work can be carried out on the ground.

Operation and Maintenance. That the operation and maintenance of public irrigation systems is grossly inadequate in our country is* a well known fact. Severe budgetary constraints, relatively low irrigation rates and poor rate of collection have led to the neglect of repairs and maintenance. However, it is not well appreciated that poor maintenance directly affects the irrigation efficiency and leads to lower agricultural productivity, thus fueling the vicious circle.

It is to be conceded that this is not peculiar to India, but it is a global phenomenon. Carruthers (1981) focussed on these problems and showed that the poor operation and maintenance results in :

- a) below capacity operation/erratic water supplies, leading to contraction of irrigated area and low yields;
- b) a shift to low value crops;
- c) lower variable inputs; and
- d) reduced outlays on farm investments.

One of the expected results of the WUAs' participation is that these associations may be able to devote larger funds for maintenance and execute the works at less costs. The experience so far gained in the above societies shows that the irrigators would be willing to pay, if they are satisfied that such expenditure, in fact, leads to increased production.

Monitoring. The principal aim in handing over water management below minor should be to see whether the WUAs are able to receive water by volume and distribute equitably as per some agreed norms/principles/policies to its members. It is also necessary to see that the waters are used judiciously and more productively. The Irrigation Department should monitor the "effectiveness" of the society on these counts. The indices for judging the effectiveness in performance could be :

- a) whether all farmers, who have applied, get water;
- b) whether all farmers get equal share in all the rotations in the season;
- c) increase in membership of the society due to confidence established among the farmers; decrease in the number of complaints against the society like discrimination in supply, stoppage of water to any individual/group; whether the society is able to recover the water fees from members and pay to the Irrigation Department in time; whether the micro-system is maintained by the WUAs.

Once the effectiveness of the society is established and accepted by the farmers, the irrigation Department should request the society to concentrate on the next objective, i.e., of 'efficiency' in water distribution and use, by updating the system from their side and insisting on better field layouts, irrigation methods, precision in the preparation of water distribution schedules, adherence to the time schedule by the farmers, etc. The indices for this stage of efficiency could be :

- a) conveyance efficiency of the minor and field channels, i.e., the ratio of water received at head reach of the minor and that diverted to outlets and further on to the farms;
- b) application efficiency at farm levels;
- c) skills and precision in preparing water distribution schedules below outlet, as well as cut-off statement for the outlets;
- d) identifying crops suitable to the area, soils, and the climate;
- e) timely sowing of principal crops in the command.
- f) ability to understand crop water requirements for different crops in different periods as per data, i.e., net irrigation requirement supplied by the Irrigation Department and the preparation of distribution schedules accordingly, to meet the total requirement when water is adequate and at critical stage when water is short;
- g) judicious use of irrigation water at critical stages, when the availability is less and conjoint use of groundwater and surface water;
- h) ability and achievements in procuring implements needed for better field preparation, like sara yantra, or for uniform distribution of water in fields, like siphon tubes, and lending them to farmers;
- i) ability to convince the farmers to accept the adoption of improved field water management, like borders, furrows, etc.;
- j) whether the society can meet the management costs from the surpluses generated from water rates, or from contribution from members as service charges.

Audit. Periodical audit and objective evaluation along with appropriate suggestions from time to time provide encouragement to good workers and also provides checks and warnings if the management is departing from the set aims

and objectives. In the case of the WUAs, two different audits would be necessary:

- a) engineering or irrigation audit;
- b) financial audit.

Irrigation audit should be undertaken by the Executive Engineer and the Assistant Engineer and it should include the following:

- a) Water budgeting and accounting.
- b) Irrigation efficiency, area irrigated in unit volume of water.
- c) Water scheduling, matching water supply with crop requirement.
- d) Methods of irrigation and application efficiency.
- e) Irrigation fees charged by the WUAs to the farmers.
- f) Irrigation offenses and actions taken by the WUAs to curb them.
- g) Decision/policy making procedures, whether more farmers participate or not.
- h) Preparation of water budget or irrigation operation plan.
- i) Regularity in the meetings of the Executive Committee and the General Body.

The financial audit should cover:

- a) Day-to-day maintenance of accounts.
- b) Balance Sheet and Profit & Loss Accounts.
- c) Investments of the WUAs in interest bearing securities, implements, other assets, etc.
- d) Preparation of annual financial budget.

Summing Up

If these steps are followed to create confidence among the farmers, we believe that the farmers would come forward for take-over of the system below minors/laterals enthusiastically.

Our experience in Maharashtra and Karnataka shows that once the doubts are cleared, the farmers are willing to form WUAs and abide by the reasonable rules and regulations framed in

consultation with them. The real problem is the unsatisfactory conditions of the physical system below the minors and laterals. In the present circumstances, where water rarely reaches the tail-end farms, many of the farmers are deprived of the likely gains. The result is a legitimate question viz., "why should we take over an undependable, unreliable and failing system?" Serious and sincere efforts need to be made to allay the apprehensions, misgivings and anxieties of the farmers. This task apparently cannot be done by the Irrigation Department, as it is not attuned to such tasks. At the initial stages, this has to be performed by independent and outside agencies like voluntary and private development organisations.

Initially, the response of the farmers is likely to be lukewarm for taking over the management of tertiary distribution system, for three reasons. They are not sure of the technical management aspects: indenting scheduling and implementation. They have, for long, been dependent on the government agency for these tasks. Secondly, the physical systems below the minors which they are supposed to take over is defective. They feel that they do not have enough financial resources to recondition it. Further, the head-enders and the influentials do benefit from the present state of affairs. How to persuade them is also a problem. Third, they are apprehensive of the fact whether the costs thereof would exceed the projected benefits. On all these counts, it is necessary to hold meetings and small group discussions, where their doubts and apprehensions can be removed. Our experience is that this process takes about anything from six months to twenty months and hence the NGOs/Agencies must have patience. Once this hurdle is over the process gets snow-balled. It has also to be realised that the Irrigation Departments have an important role in speeding up the process by initiating prompt measures to rehabilitate the disnet.

The basic question is: "Are the Irrigation Agencies prepared to share their powers with the farmers?" Much would depend on the answer that we get. If the agencies want irrigation co-operatives to be a supplement to be used for furthering the departmental interests, there is nearly no chance of success. Further, with the irrigation co-operatives, the plan for canal operation has to be drastically streamlined. The Agencies would have to take responsibility for delivering water at strategic points in time and in adequate quantity.

Penalties should be provided for non-performance. Today there are penalties (hidden or explicit) for the farmers, but the Agencies have no such obligations. In fact, if farmers are to come together for a common goal, adequate technical, administrative, social and economic environment has to be created.

Our irrigation sector can only be improved through the collective action of the farmers. On gaining the experience at the tertiary level - minors and laterals - the experiment can be extended to the distributary and branch levels. This would be difficult but tractable task, if the co-ops are in a position to hire technical expertise.

It is our firm belief that with the Irrigation Department managing operation and maintenance of the dam and the main canal systems and the irrigation co-ops taking the responsibility of distribution, operation and maintenance at the secondary and tertiary levels, a synthesis of the advantages of both centralised clarity and consistency and the creativity and specificity of decentralisation would be obtained. This would lead to optimisation of water use and consequent increase in productivity and production.

Notes

- [1] Here we would like to exclude the traditional systems of collective action prevalent in Tamil Nadu in south India to Bihar in northern India on surface irrigation systems, inclusive of Phad System in western India. The concern here is on the systems built up by the government from 1870 onwards, more so, those built after Independence.

References

Carruthers (1981). "Neglect of O & M in Irrigation - the Need for New Sources and Forms of Support". Water Supply & Management.

Datye and Patil (1987). Farmer Managed Irrigation Systems. Pune, CASAD.

Overseas Development Council (1986). Between Two Worlds : The World Bank's Next Decade. Washington D.C. Autobiographical write-up

PHAD - A COMMUNITY MANAGED IRRIGATION
SYSTEM OF MAHARASHTRA

O.T. Gulati

Abstract. The need for active and effective farmers' participation and organisation in the management of large and medium irrigation projects is widely recognised. However, despite this and the concerted efforts made by several non-governmental organisations, very little success has been achieved in involving farmers' in irrigation management. This paper discusses various short-comings in the process of enlisting farmers' participation in canal water management and draws some lessons from the experience with the *phad* system of irrigation in Maharashtra.

The *phad* system of irrigation is practised in Nasik and Dhule districts of Maharashtra. There are 66 such systems covering approximately 5,500 ha. of command area in these two districts. The command area of an individual *phad* system varies between 8-480 ha. The paper presents a detailed outline of the management method, identifies various variants of it and the factors affecting its success. Some of the factors identified included a) the system serves only one single village; b) a small community in which social group pressure works successfully; and non-interference of government.

This paper presents the need and benefits of farms participation in the management of large and raec irrigation projects, along with the reasons for reluctance the farmers for participation. The experiences traditional irrigation systems, being managed by farms like *phad* system of Maharashtra, need to be incorporated suitably and appropriately in the stratagies of enlisting farmers' participation and developing people's institution for management of large canal systems.

Keywords. Beneficiary participation, bandharas, community managed irrigation system,, command area, Maharashtra, *phad*.

Introduction

Water being a natural and common property resource, its scientific and optimal utilisation has become imperative for economic and ecological survival and sustenance of mankind. In India, it assumes a greater significance due to limited extent of water resources, and increasing demands from various sectors.

The management of state owned surface irrigation projects face a complex situation, wherein the acquisition, conveyance and distribution of water resources including operation and maintenance of the system are being done by state agencies; while application and utilisation rests with the beneficiaries i.e. farmers. The beneficiaries' participation in system management or beneficiaries managed irrigation systems have become the need of the time due to -

- a) Sub-optimal performance of irrigation systems; in terms of utilisation, production and productivity,
- b) Inequity in distribution among the designated beneficiaries, resulting into uneven development, and
- c) Deteriorating financial performance of irrigation systems like increasing costs of construction, operation and maintenance; delayed gestation periods and reducing revenue recoveries.

The beneficiaries' participation in irrigation system management through various organisational modes can lead to (Uphoff 1991:59-60):

- a) Enhanced productivity and production per unit of land and water by;
 - i increasing crop yields,
 - ii increasing cultivated area, and
 - iii increasing cropping intensity.
- b) Improved water distribution by;
 - i improving reliability and predictability in the quantity and timing of water distribution,
 - ii improving equity in distribution in spatial and temporal terms in the command.
- c) Reduction in conflicts;
 - i among the farmers and state agencies,
«
 - ii among the upstream and downstream farmers,
- d) Greater resource mobilization by farmers for adoption of improved agronomic and irrigation practices, labour needs, operation and maintenance of the system ;
- e) sustained system performance;
- f) Improved collection of irrigation fees, better operation and maintenance of system and reduction in cost of irrigation.

The beneficiaries' participation in irrigation system management needs to be "organisational" for effective and sustainable participation in decision making regarding :

- acquisition,, allocation and distribution of water,
- planning, design, construction, operation and maintenance of the canal system,
- resource mobilization and management,
- communication and conflict resolution.

The 'organisation' in context of irrigation management means that the farmers have some structured way of working together for water management which is generally acceptable to almost all the farmers and is supported by them. Without the "organisation" the concept of participation is "pseudo-participation", only words, without any sharing of authority, accountability and responsibility.

Irrigation being a complex, multi-disciplinary and multi-faceted process, no single model for beneficiaries' organisation can be prescribed. Each beneficiaries' organisation must respond to its peculiar environment and system requirements including agro-climatic and crop requirements, the local cultural system, and the legal and organisational environment.

Farmers' reluctance for participation

Despite the obvious need and benefit of participation in irrigation management, the farmers are reluctant to participate in irrigation management. The probable factors causing the reluctance are :

- a) In large state owned and managed irrigation projects, water is supplied to the users by an external agency. The farmers have not been involved in any stage of acquisition, allocation operation and maintenance. They are the passive recipients of a valuable common natural resource supplied of them on payment, but without any commitment, or responsibility,
- b) In large irrigation projects, the farmers are involved in irrigation as an individual and not as a group or organisation. No group responsibility or organisational accountability is expected from them, and the individual is left to fight his own cause.
- c) The state owned and managed large irrigation projects create environmental compulsions which alienate the user from each other and from the agency. Water being a valuable source, but lack of effective controls and discipline in distribution and application become the

prime temptation factor for owning and controlling it beyond the appropriation.

- d) The farmers' participation in irrigation management, including the willingness to contribute labour, cash and other resources in operation and maintenance is directly related to their power to make real decisions that affect irrigation system performance. As such no effective mechanism for participation in decision making has been evolved, the farmers are reluctant to participate in irrigation management.

Various models for beneficiaries' participation in irrigation system management have been evolved and experimented in various parts of the country. Similarly, various measures for enhancing beneficiaries' participation in irrigation system management and creating conducive conditions are also being evolved. At this juncture, we need to retrospect the community managed traditional irrigation systems of India to find the forces responsible for their survival and sustenance over centuries. Phad irrigation system is such a community managed traditional irrigation system of Maharashtra whose antiquity is between 300 to 700 years.

Phad Irrigation System

The Phad irrigation system is being practised in parts of Nasik and Dhule districts of Maharashtra in the Tapi basin. These are run-off the river schemes managed by the community. At present, 66 such Phad irrigation systems are in operation covering approximately 5500 ha. of command area in Dhule and Nasik districts. Command area of an individual irrigation system varies from 8 ha. to 480 ha. (WALMI 1991:1)

System z. Physical Features

The main features of the Phad system are :

- a) *Bandharas (diversion weir)*

Bandharas are masonry structures constructed across the river with height above river bed varying between 2 m. to 10 m. and they rest on solid rock foundation. These *bandharas* head the water to allow the required discharge flow into the *Pat* or *Kalva*. The maintenance of the *bandharas* is being done by the state agencies. Mostly command area served by a *bandharas* is a compact unit, within one village only.

- b) *Main channel (Pat or Kalva)*

The main channel off-takes from the *Bandharas* wherein openings in the masonry structures regulated by wooden planks are provided. The length of main channel varies from

2 kms. to 12 kms, from source to the irrigation fields. Normal flow in main channel varies between 10 to 15 cusecs at the head and at certain places escapes from the main channels are provided to dispose the surplus water. The capacity of the main channel is almost the same from head to **tail**. The escapes are also useful for silt removal of the main channel. The responsibility for the constant surveillance and upkeep of the main channel rests with the beneficiaries.

c) Command area divided into parts (blocks) known as Phad served by branch channel (i.e. Charis) and field channels (Sarangs)

The command served by unindividual *foandharas* is usually divided into 3 or 4 *Phads* depending upon the topography and physical boundaries. Each *Phad* is supplied irrigation through branch canals and network of field channels connecting individual fields. All the *Phads* avail irrigation simultaneously, if the flow in the river is sufficient, otherwise, the irrigation is rotated among the *Phads*. Irrigation is availed within an individual *Phad* from head to tail. Each *Phad* grows the same crop in an irrigation season. The individual holdings in the *Phad* are developed flat slopes by bench terracing. The reuse of drain water wherever topography permits is also made.

The irrigation practice followed is serpentine furrows for sugarcane and large basin or border method for other crops. The water application is efficient and requires less labour and control cost due to good land shaping, levelling and appropriate irrigation layouts. Hence, the ill-effects of irrigation in the form of waterlogging and salinity are not observed.

Community Management

For irrigation management under each *Bandhara* there is a 'Panch committee' or 'Baghayat Panch Committee' which is a general body of the irrigators having lands in the command. The members of Panch Committee are selected by consensus once every two to four years in general meeting of all irrigators. The Chairman or Sarpanch is also selected in the general meeting. The members of the Panch Committee are changed more frequently and there is no concept on term of appointment, but the membership is changed by common consensus. The number of committee **members** is also not fixed and it varies from village to village and **time** to time. The Panch Committee has all the powers for surveillance, supervision and management of the irrigation system. The Panch Committee is also responsible for **the** mobilization of resources in the form of cash and labour. The Panch **Committee** also employs irrigation staff called **Havaldars**, Patkaris, Jaglias, and Salonias. The salary of the irrigation staff is fixed from time to time and they are accountable to the Panch Committee. Generally, the salaries

of the irrigation staff are paid in kind and not in cash and it is related to the general production level.

The organisational set up of the Panch committee, is shown in Figure 1.

The functions at each level are listed below :

(A) *Panch Committee (Management Committee)*

- i Deciding the crops to be grown in each Phad.
- ii Preparing time table for water distribution,
- iii penalise the persons not following rules and regulations made by the Panch Committee,
- iv looks after the maintenance of the whole system,
- v Keeps contact with Canal Officer (Revenue or Irrigation Department Official) for any help from Government in the case of major damages to the system.
- vi Keeps account of funds, fines, etc.
- vii Settles the disputes regarding water distribution,
- viii Appointment of Waterman, Watchman, Supervisor.

(B) *Supervisor (Hawaldar)*

- i Keeps watch on bandhara and main channel,
- ii Supervises work of Watermen and Watchmen,
- iii Reports to and consultation with Chairman about day to day work and functioning,
- iv Maintains discharge in the main channel.

(C) *Patkari (Waterman)*

- i Irrigates each field as per schedule decided by Panch Committee,
- ii If the channels are silted, to inform Chairman and get desiring work done through beneficiaries,
- iii If there are any complaints, to refer them to Supervisor or Chairman,
- iv Informs the farmer regarding any damage to his crop.

(D) *Watchman*

- i Keeps required discharge in the branch and field channels.
- ii Keeps watch on the standing crops in the fields,
- iii Helps Waterman in water distribution.

Crop Pattern

The crop pattern generally consists of sugarcane, groundnut and food crops like wheat, jowar, sorgam etc. Only one crop is grown in the *Phad* in an irrigation season. The type of crop and the *Phad* in which it is to be planted and the time of planting is decided by the Panch Committee, The cropping pattern and crop rotation for one village is shown in Table 1 (Singh 1991 :81).

The crop rotation among the *Phad* helps in maintaining the fertility of the soil and reducing the danger of waterlogging and salinity. Many farmers do have land holdings in more than one *phad*, and hence, the crop rotation affects all equally.

Dealing with Defaulters

Out of turn waterings, non-maintenance of field channels and non-participation in the maintenance of main and branch channels is considered a default for which the penalty is imposed in the form of fine by the Panch Committee. Of course, such cases are very rare.

Operation and ~~Maintenance~~ Maintenance

The policy decisions regarding water allocation, crop planning, water distribution etc., are decided by the Panch Committee and the routine operations are carried out by the irrigation staff appointed by the Panch Committee. The maintenance of *bandharas* is done by the State agency but the surveillance and maintenance of the canal system is done by the beneficiaries. The maintenance of the canal system is done twice a year. The field channels are maintained by the individual irrigators. The rules and regulations regarding maintenance are known to all the farmers as it is a written record and all the farmers are aware of their duties and responsibilities.

The water to the individual field is applied by the *Patkari* and not by the land-holder. Therefore, there is a fair and equitable distribution and application of water as the *Patkari* is an employee of the Panch Committee and he is accountable to the Panch Committee.

Factors responsible for the sustenance of
Phad Irrigation Systems

The *Phad* irrigation system has survived for more than 400 years. The factors responsible for sustenance of the *Phad* irrigation system are summarised (WALMI 1991 : 1).

- a) irrigation schemes serving one village;
- b) small command areas and easy access to water resource;
- c) small community in which social and group pressure operate successfully;
- d) no involvement/interference of Govt. in the management;
- e) management through committee of beneficiaries;
- f) appointment of irrigation staff by committee and payment in kind by individual farmer;
- g) clear operating rules and functional rules;
- h) the task of water application handed over to the staff to avoid conflict;
- i) stable and reliable water source;
- j) maintenance of the system by the beneficiaries themselves from their own resources;
- k) fixed water charges on area basis;
- l) dividing command into big blocks, planting same crop in one block rotation of crops from one block to other;

Learnings

Some generalised learnings drawn from the *Phad* irrigation system are noted below which can be helpful in planning measures for enhancing beneficiaries' participation in large irrigation systems :

- a) Adoption of village as an operational and institutional unit.
- b) Flexibility in institutional organisation.
- c) Minimum or nil state interference in organisational management.
- d) Well defined rights and responsibilities of the state agency, organisation and individual beneficiary.
- e) Accountability of field system managers to the beneficiaries' organisation.

Table 1

Cropping Pattern and Crop Rotation : Village Datarti

Year	Babhule Phad	Kamode Phad	Shivakhet Phad	Akhre Phad
KHARIF CROPPING PATTERN				
1980-81	Sugarcane	Bajra	Bajra	Paddy
1981-82	Sugarcane (Ratoon)	Bajra	Bajra	Paddy
1982-83	Paddy	Paddy	Bajra	Bajra
1983-84	Bajra	Sugarcane	Paddy	Bajra
1984-85	Paddy	Sugarcane (Ratoon)	-	Bajra
RABI CROPPING PATTERN				
1980-81	Sugarcane	Wheat	Wheat	Groundnut
1981-82	Sugarcane (Ratoon)	Wheat	Wheat	Wheat
1982-83	Gram	Sugarcane	Wheat	Wheat
1983-84	Wheat	Sugarcane	Wheat	Gram
1984-85	Gram	-	Sugarcane	Wheat

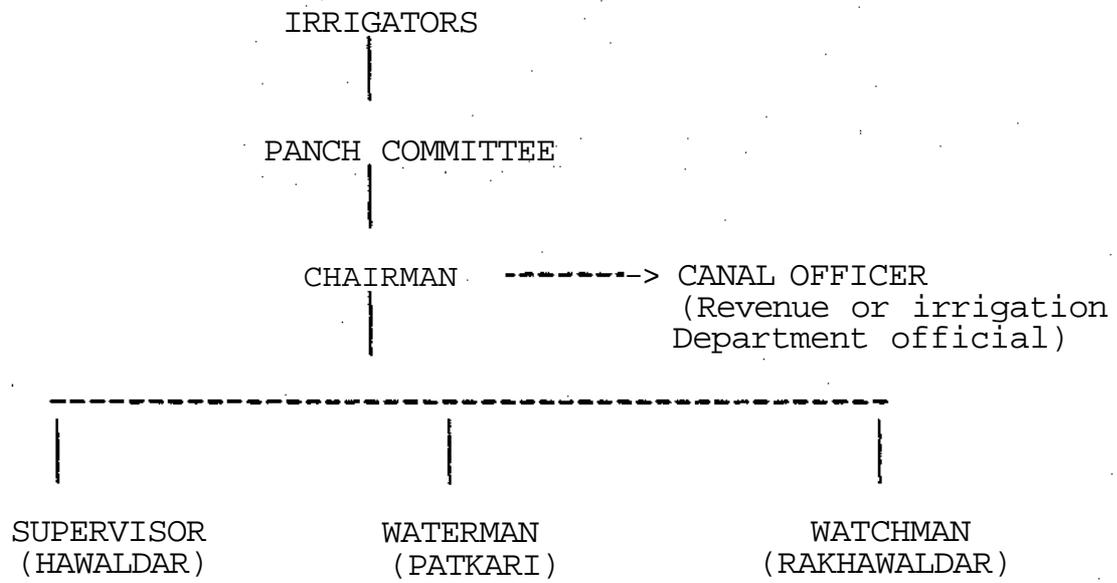


Figure 1

References

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Singh, K.K. (1991). Farmers in the Management of Irrigation Systems. New Delhi : Sterling Publishers Pvt. Ltd.

Uphoff, Norman, et al. (1991). Managing Irrigation: Analyzing and improving the performance of bureaucracies. New Delhi: Sage Publications India Pvt. Ltd.

WALMI, Aurangabad (1991). Approach Paper "Phad System of Irrigation in Maharashtra State. Aurangabad: WALMI

FARMER ORGANISATION FOR LIFT IRRIGATION:
IRRIGATION COMPANIES AND TUBEWELL CO-OPERATIVES OF GUJARAT

Tushaar Shah
Saumindra Bhattacharya

Abstract. Group ownership and management of lift irrigation become important where small and fragmented land holdings make individual ownership of wells unviable, where tubewell installation entails high capital costs and is fraught with high risks of failure. In central and north Gujarat where both these situations co-exist, a range of institutional innovations have facilitated the rise of a plurality of contracts and regimes for collective ownership and management of irrigation assets. Prominent amongst these are: water markets, tubewell co-operatives and irrigation companies. This study reports results of interviews with 27 co-operatives and 13 companies focussing essentially on their internal organisation, management and control. While member-owned irrigation companies appear uniformly more robust and productive compared to co-operatives, their equity impacts too are not necessarily inferior to co-operatives.

Introduction.

In the area of natural resource management, much attention in recent times has been paid to the question of equitable access and sustainable use. In the case of groundwater resource, for example, many scholars have argued that because of the absence of clearly specified property rights and on account of the chunky investments needed to lift groundwater, the resource has been pre-empted by the rural elite; and this disorderly process of pre-emption is governed by the rule of the jungle than by the rule of law. Indeed, the law has often abetted this iniquitous political economy; and the need for sustainability and ecological prudence have been used to erect and justify a plethora of barriers—licensing rules, conditionalities for provision of bank loans and electricity connections, etc— which keep resource poor late entrants from securing access to the precious resource (see, eg Chambers, Saxena and Shah 1982; Shah 1992). In early decades of Indian planning, socialisation of groundwater through state ownership and management of tubewells was seen as a major way out of this dilemma. In many states including Gujarat, however, early public tubewell programmes met with uniform and resounding failure results only in enhancing equity in access to irrigation but even terms of efficient and viable operation (see, eg, Abbie et al 1982).

Distrustful of private ownership and disenchanted with public programmes, many social workers and researchers therefore increasingly turned to group ownership and management as a potential solution to the question of equitable access. If the resource poor can somehow act collectively, they can not only overcome the capital and risk constraints but also avoid bureaucratic hassles through self-management and self-governance. The Indian search for an appropriate 'design-concept' of a group organisation for lift irrigation has however been dominated more by an idealistic pursuit of equality and democracy rather than a pragmatic search for a form that makes it easy for small holders to co-operate on their own. Thus experiments with irrigation groups which incorporate concepts of equity, democracy, participative decision making, etc in their 'core norms and rules' received a great deal of attention in the past decade.

There have been eloquent descriptions of the '*pani panchayats*' established in Maharashtra by the *Gram Gaurav Pratishthan*, the group irrigation schemes of Deoria and Vaishali in east Uttar Pradesh and Bihar, the Sukhomajari experiment in Haryana, the lift irrigation co-operatives of the Aga Khan Rural Support Programme and of the Sadguru Water and Land Development Trust in Gujarat. Each of these has incorporated into its 'design-concept' some unique and noble value or principle, evolved and advocated typically by the promoting individual or NGO. Thus, Sukhomajari gave water-entitlement to the landless members located in the command; and *Pani Panchayats* allocated water rights amongst members in proportion to family size rather than irrigatable land of members in the command. The AKRSP and Sadguru design-concepts too incorporated many noble values and principles of co-operation such as one-member-one-vote, group decision making, compulsory saving, equal base-level water rights rather than allocations based on irrigation needs.

Many of these normative principles fired the imagination of researchers, donors and government planners who, in turn, actively advocated the replication and scaling up of these experiments as a major institutional approach to groundwater development. However, experience and studies have now begun to show that while all these experiments have important lessons to offer, nevertheless, they are little more than mere experiments. They certainly exemplify the art of the possible, especially by illustrious individuals such as Salunke of the *Gram Gaurav Pratishthan* and Mishra of Sukhomajari; but none of them has the qualities and features required in the design-concept of a group organisation with a major possibility for up-scaling or replication on a sustainable basis, for: a) many of these experiments began to decay in less than a decade; b) the core values and normative principles seemed to begin to erode rapidly as soon as the prime-mover of the experiment turned his back; c) because of the heavy emphasis on 'core values and

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normative principles', many groups did not invest sufficiently in establishing widely accepted operating rules and procedures; d) as a result, the operating efficiency of the group projects tended to decline rapidly; and e) finally, it is seldom that 'replicas' of these successes came up on their own, even in their neighbouring areas; with sufficient 'coaxing', they did come up, but without the presence of a 'conscience-keeper', fell short of the original.

Thus the Deoria and Vaishali groups crumbled at the first sign of competition from private water sellers (Ballabh 1989); the replicas of Sukhomajari turned out far short of the original model; the number of *Pani Panchayats* in Purandhar taluka stagnated at 45 now for over a decade; and even in many of the old *Panchayats*, loss of operating efficiency and erosion of 'core norms and values' has been increasingly recognised. All these experiments will continue to embellish, for a long time, the oral and written history of Indian irrigation organisation as abortive efforts of outstanding individuals who gave good part of their lives to creating their own little Utopias; however, it would be naive to draw major lessons from them in finding general solutions to the question of assuring India's small holders access to groundwater irrigation.

The Setting

For finding general solutions, it seems important to skip the bizarre and look closely at the commonplace; underplay the values and norms outsiders like NGOs enforce on local communities and instead study the rules and procedures people evolve on their own; avoid concluding from early successes of novel experiments and stick to analysing design-concepts which have stood the test of time. This is what we attempt in this chapter. We compare two alternative forms of lift irrigation organisations that have a significant presence in Gujarat: lift irrigation co-operatives, which operate under direct and indirect patronage of the state and incorporate into their design-concepts core values and normative principles that the state machinery supports for whatever reasons; the other are tubewell companies which operate in large numbers completely outside the state's influence and whose design-concept is evolved entirely by groups themselves without any external input. One purpose in doing so is to explore whether the two forms of organisations display significant differences in their organisational performance; and if they do, the other purpose is to probe into the reasons that might explain them.

Our sample includes 26 tubewell co-operatives and 13 irrigation companies. All co-operatives are from Kheda district; and all companies are from Mehsana. This was an unfortunate though unavoidable sampling problem since

Mehsana has hardly any lift irrigation co-operatives. Kheda has irrigation companies too; however, most of these are small partnerships, partners usually drawn from the same extended family. The Mehsana companies can, on the other hand, commonly have upto 50 partners often belonging to several caste and religious groupings. The Mehsana irrigation companies are thus more than mere kinship based organisations.

Groundwater conditions differ vastly between the two districts. Mehsana has long suffered declining groundwater tables; current depths of tubewells range between 600-1200 feet. Well yields are relatively low; and the risk of failure in new borings significant (see, for a recent review, Bhatia:1992). Kheda, in contrast, is groundwater-abundant. In many parts of Kheda near the head-reaches of the Mahi Kadana canal, high groundwater tables, and the prospects of rapidly rising water table, represent a clear ecological threat. Even so, for the dynamics above the ground, Mehsana has more in common with Kheda than, for example, with Panchmahals, another water scarce district of Gujarat. Tubewell investments in Kheda as well as Mehsana are high compared to the borewells and filter points widely in use in Panchmahals. Electric tubewells dominate both Mehsana and Kheda; diesel engines are widely used in Panchmahals where shallow aquifers yield low water output in shallow borewells mounted with oil engines. Socio-economic setting of Kheda and Mehsana too are similar with their rural economies dominated by the sturdy, hard working *Patidars* with strong business sense. The two districts, likewise, have vigorous agricultural economies based on lightly irrigated cash crops such as tobacco, cotton, *jira*, *raida*, etc and well developed dairying. Finally, compared to many other regions of Gujarat, Mehsana and Kheda have also led in institutional innovations of various types which have fuelled rural economic upsurge during recent decades.

Sample

A majority of Kheda's tubewell co-operatives are the legacy of the 30-year long abortive effort by the Gujarat Groundwater Resources Development Corporation to manage tubewells under the public sector. While in relative terms, Gujarat's experience in public tubewell programmes has been somewhat less abject than in states like Bihar and Gujarat, in absolute terms, it has been far from reassuring. In any case, in recent years, the internal contradictions of the programme have increasingly come to the fore; and the Corporation has been looking for ways to salvage the resources sunk to establish some 3500 such tubewells through out the state most of which operate at less than 10-15% of their capacity, irrigate less than a fourth of their design commands and incur heavy cash losses year after year.

The key problem with the public tubewell programme has been with its 'design-concept'. In operational terms, the problems are similar to those that have afflicted public tubewell programmes in other states. Maintenance and repair suffer heavy delays; operators remain absent for long periods; pipelines are not maintained; farmers can not get adequate service without offering bribes ('illegal rents'); the operators can not be insulated from the local power games; operator salaries at government rates are already far above the surpluses the tubewells can produce, but operators' unions have demanded overtime for night irrigation thereby further reducing the viability of tubewells. None of these is an outcome that could not have been predicted; all of them could be traced to flaws in the basic assumptions made in the design of the programme.

In its strategy to salvage its investments, the Corporation hit precisely at these flaws. It offered to turn over numerous defunct tubewells to farmers in their commands provided they met certain conditions: a) at least 11 farmers in the command had to approach the Corporation for a lease of the tubewell; b) they had to form and register a lift irrigation co-operative under the Gujarat Co-operative Societies Act and accept the model bye laws designed by the Corporation; c) the promoters of the co-operative have to mobilise and supply a security deposit of Rs 5000 to the Corporation; d) the co-operative would manage the tubewell in the interest of its members with the help of hired operator who will be accountable to the Co-operative's management committee; and e) undertake such repairs and maintenance as may be needed to commission the tubewell and operate it. If these conditions were met, the Corporation would hand over the tubewell to the co-operative on lease at a rent of Re 1 per annum.

The Corporation turned over a total of some 30 public tubewells in Kheda district and less than 100 in the state as a whole during the 1988-92 period. If there were expectations that farmers would come forward wholesale to cash in on this new opportunity, thus they were largely belied. In much of north-Gujarat (including the districts of Mehsana, Sabarkantha and Basnaskanth), farmer response to the offer was lukewarm. This was understandable because farmers there realised that, even with good management, they could not supply water to members at the low rates as public tubewells are doing now. North Gujarat public tubewells use 60-75 hp motors which attract highest electricity tariff rates under Gujarat's progressive power tariff system; however, since the Corporation charges uniform water prices through out the state, there is heavy cross-subsidisation from water abundant areas to water scarce areas such as north Gujarat. In Kheda, however, the response to the Corporation's open offer was better. A total of some 90 applications were received during the 1988-92 period; and 30 public tubewells were handed over to tubewell co-operatives.

Our sample included 26 of these. Some of the tubewells so turned over ran into various problems and either became defunct or were taken back by the corporation.

The irrigation companies of Mehsana, on the other hand, represent a completely indigenous form of irrigation organisation. They are known to have been in existence for over four decades; new companies come up in sizeable numbers every year. Indeed, in recent times, the bulk of the new private investments in tubewells take place through these informal companies. In course of our fieldwork, we noted that as we move further north, companies become less popular and numerous; this is because in many areas of Banaskantha district, for example, land holdings are large and farmers afford and prefer individual tubewells. In our assessment, there are probably 5-7,000 such irrigation companies in Mehsana and Ahmedabad districts alone; relatively few farmers own their exclusive tubewells in these areas; correspondingly, few depend exclusively on purchase of tubewell water alone; a majority are members of at least one, but usually more, tubewell companies. In a survey of 96 farmers selected from Delwada, Itadra, Mansa and Parda villages of Vijapur taluka in Mehsana, Patel (1988) found that 71 used own tubewells and the rest purchased water from others' tubewells; however, from the 71 who used own tubewells, 64 were members of tubewell companies; only 7 large farmers had their own exclusive tubewells. A majority of the sample farmers were members of two tubewell companies.

Irrigation companies of Mehsana are informal organisations with membership ranging from 5 to 120 but with a modal size of 25-40 members; they are not registered under any act; as a result, in law, they are non-entities. The formation of a company is signified by the agreement on a Rs 10 non-judicial stamp paper entered into by all promoter partners of the company. Companies generally maintain bank accounts in the name of the manager (who is elected and the equivalent of the chairman of a co-operative) or in the name of the company itself. Other than the status of the agreement under the Contract Act, irrigation companies have no links with the 'State'. All the resources for the start as well as for its continued operation are internally generated; and all the authority needed to ensure the smooth running of the company is provided by its member-partners to the managing committee or the manager. This complete independence and the 'internal locus of control' that companies enjoy - in principle and in practice-- is amongst the most important features of their 'design-concept' and something member-companies place a great value on, as we discuss later.

Preliminary Comparison

Table:1 below provides a preliminary comparison of the companies and the co-operatives in our sample. In order to do this, we use average values as well as the range of values for the respective sample.

Table:1
Preliminary Comparison of Co-operatives and Companies

		Co-operatives (Kheda)	Companies (Mehsana)
Sample size		26	13
Age* (years)	Average	2.53	6.15
	Range	1-6	3-17
Member- ship	Average	24.3	15.84
	Range	11-115	6-26
Gross Command (acres)	Average	163	114.4
	Range	42-320	48-200
Hp of the motor	Average	25.13	27.23
	Range	15-38	22-40
Depth of the bore (feet)	Average	438.8	583.4
	Range	240-515	480-710
Length of Under Ground pipeline (m)	Average	1465.1	2427.3
	Range	400-4200	1750-3500
Capital cost (Rs)	Average	na	4.7 lakh
	Range	na	4.2-5.9 lakh

* We refer here to the age of the organisations and not of the asset.

Table: 1 presents some basic features of the two classes of organisations. We note the impact of the differences in groundwater conditions in the two districts: the depth of the bore in Mehsana's companies is significantly greater than in Kheda co-operatives; correspondingly, the average size of the motor too is larger in Mehsana. In reviewing the rest of the information, we need to keep in mind the fact that all Kheda co-operatives inherited tubewells which had already been established by the Corporation several years ago and therefore had to make no capital investment decision; in contrast, all of Mehsana companies began with a sizeable capital investment from resources contributed by members. It is significant therefore that the investments

made by companies in underground pipelines are substantially higher than those made by the Corporation not only per tubewell but, more importantly, per acre brought in the tubewell's command. It implies that companies have a denser network of pipelines; that a greater proportion of holdings are served directly by the pipeline. In contrast, in the co-operative tubewells, it is likely that water has to be conveyed through open field channels for a long distance before it reaches most holdings. Indirectly, it follows, somewhat counter-intuitively, that companies made larger capital investments to secure efficiencies in the use of power as well as water compared to the state-owned corporation. [1]

The significantly smaller membership and command area of companies relative to co-operatives can be explained by a combination of following reasons: 1) in designing commands and enrolling partners, companies are driven primarily by the aim to provide 'good' irrigation service to members; in contrast, the Corporation was guided by the aim to reach largest possible membership and command area even if it required making some sacrifice in the 'quality' of irrigation service; 2) securing membership of the co-operative entails insignificant one-time cost (of Rs 51); partnership in a company requires contributing to initial and subsequent investment costs in proportion to the one's 'stake' in the Company; for most partners, this would involve a major personal capital investment decision necessitating careful cost-benefit calculations for even acquiring a 1 paise share in a new company would entail in 1992 a capital contribution of Rs 4-6 thousand; 3) partly as a consequence of the cost-less entry into a co-operative, most co-operatives we interviewed had a sizeable number of 'nominal' members who had enrolled either as dummy members or in the hope of future benefits. Thus, it is certain that in no tubewell co-operative, it is the case that all members are users of the co-operative's service; in contrast, it is certain that there is no company which has partners who are not active users of the services of the company. In case of both the classes, however, it would be largely true that there are several non-members who are active users.

Operating Efficiency

Instead of technical efficiency in tubewell operation, in energy use and in water use, we focussed our investigation on overall operating efficiency as an important element of organisational effectiveness. Several criteria can be used to assess and compare the operating efficiency of a tubewell co-operative or a company. The critical dimension these criteria need to capture is the actual activity level of the organisation relative to the highest possible. We planned to use three criteria which seemed important and on which data was easily available. The first is the number of acre waterings in different seasons. These will naturally depend

upon a number of factors; demand for irrigation itself would be an important factor; but the quality and reliability of irrigation service too would be important. If alternative irrigation sources are available within the command, that may also affect the extent of irrigation service provided by the tubewell. Acre waterings would thus indicate a sum total of all the impacts of all these factors.

However, the irrigation organisation has no control over many of these factors; what it can control is its own tubewell, the quality of service it provides and the competitiveness of its terms of business vis-a-vis competitors. If one class of irrigation organisations manage their facilities more efficiently than another, we would expect that their facility would be used more intensively than would be the case in the latter class. Thus we would expect that the capacity utilisation of the former class of organisations would be better relative to the latter class. We tried to capture this by computing the average hours of operation of co-operative and company tubewells in different seasons. We also computed the average of the total hours of operation per year.

However, the over-riding constraint that limits the hours of operation of an electric tubewell is hours of power supply available which, in effect, fixes its upper limit. To incorporate this, we tried to compute a third index, namely, hours of operation as a proportion of the average hours for which electricity was available in the respective area during different seasons. Since demand for irrigation is high during rabi and summer and since power supply tends to be scarcest and least reliable during summer, we would pose that the proportion of power hours that a tubewell used for irrigation especially in summer would be a good indicator of its overall operating efficiency. Unfortunately, we found it difficult to get data on total hours for which power was supplied in our study area month-wise or even season-wise; what we did get were average figures 'guesstimated' by farmers and cross-checked with electricity board officials. We suspect that these figures have high degree of inaccuracy and therefore the estimates based on them, though presented here, can not be relied upon to draw any conclusion. Table 2 compares co-operatives and member-companies on these three criteria.

Table: 2
Comparison of Irrigation Performance

irrigation performance	Co-operatives (Kheda)			Companies (Mehsana)		
	acre waterings*	average per tubewell hours/day	% of power** hours used	acre waterings	average per tubewell hours/day	% of power hours used
rabi 1991-92	289.7 (13) +	7.09 (26) ++	43% (18) *+	314.2	9.59	64.3% (9) **
summer 1991-92	349.8 (13) +	6.31 (26) ++	34.8% (18) *+	273.1	7.31	48.56% (9) **
kharif 1991-92	98.2 (13) +	1.56 (26) ++	8.7% (18)	65.4	2.56	16.22% (9)
Annual avg.		1843.9 {17)			2784.7	
pumpage range (hours)		1260-2450			2000-3400	

* We have used acre waterings as a rough measure of the area irrigated. The number of hours of pumping taken for giving one acre watering may differ from crop to crop and area to area; however, within a given command, there is likely to be much uniformity in crops grown as well as time taken per watering.

** average number of hours of operation per day has been divided into average number hours for which electricity was available during a given season.

Table; 2 shows that, at least in our sample, member companies perform significantly better compared to co-operatives in terms of 'operating efficiency' as we have defined it. True, in terms of acre waterings, they fare poorly compared to the Kheda's tubewell co-operatives in rabi and summer; but this does not seem to have much to do with the tubewell and its management. For, there is clear evidence, that compared to co-operatives, companies are able to operate their tubewells for longer hours per day in all the three seasons. More, there is sketchy evidence that member-companies optimise better—uniformly and significantly—against the binding constraint of limited power hours per day in all the three seasons. As a result, a company managed tubewell operates for 50% more hours per year than a co-operative managed tubewell. This has dramatic impact on the economics of the tubewells managed by co-operatives and member-companies.

Economic Performance

In absolute terms, companies charged higher average water price to their members than co-operatives charged to theirs. A part of the difference is explained by the higher lifting costs as well higher scarcity value of water in Mehsana. However, even relative to their respective competitors' price, companies charged higher than co-operatives. The average price charged by tubewell co-operatives was 15% less compared to the average price charged by private tubewell owners in their commands; in comparison, companies charged only an average of 4% less to their members than what private tubewell owners would have charged them. Even so, an average member of a company depended far more heavily on the company's tubewell for his irrigation needs than an average co-operative member depended on the co-operative's. We take up this somewhat paradoxical situation for discussion in a latter section. We note here, however, that hours of operation have a bigger impact on the economics of tubewells than prices whose differences within a region, in any case, are not very significant. We also note that contrary to popular understanding, companies do not depend very much on water sales to non-members though they certainly sell more to non-members than co-operatives seem to do.

Companies incur significantly higher operating costs than co-operatives. The prime reason is differential electricity charges; in the progressive flat power tariff structure, companies come in the penal rate-slab of Rs 360/hp/year; that is, a 30 hp tubewell would have to find Rs 10,800 for electricity bill per year; a co-operative falling in the lowest bracket of Rs 192/hp/year would have to pay only Rs 5700 [2]. Even with higher electricity bills and higher repair and maintenance costs, companies in general posted superior financial results; all 13 have run in profit; and all systematically set aside earnings for depreciation and future investments. In contrast, 6 out of 18 co-operatives which gave us all financial figures were in loss in 1991-92. In the past, some tubewells leased to co-operatives have had to be returned to the Corporation because they could not be run viably. Thus an average company earns twice what an average co-operative earns in gross income but its impact on profit and reserves is manifold. Significantly, an average company undertakes considerable amount of capital accumulation which seems enough to keep it going in perpetuity. In contrast, co-operatives always seem to run short of capital.

Organisational Performance

In comparing the performance of co-operatives with member-companies, we believe that primacy should be accorded to the purpose for which these organisations were created. It is reasonable to think that when a group of farmers come

together to collectively create and manage an irrigation asset, their prime objective is to secure high quality irrigation service at a reasonable cost on a perpetual basis. We further propose that if the design-concept of a member organisation assures its members services they value in a manner that is consistent with member values and expectations, then a) it would come up on its own or with limited external effort; b) it will perpetuate itself by generating its own resources; and c) it will sacrifice, confront or mutate for self-preservation. An organisation which has these characteristics provides the proof of its usefulness to its members by the very fact that it exists and perpetuates. In comparing the organisational performance of different classes of organisations thus the presence or absence of some or all of these can be indicative of their vigour and vitality.

Tubewell companies of Mehsana manifest all these three characteristics; and the tubewell co-operatives of Kheda, none. Tubewell companies came up on their own, as 'swayamhoo' organisations; no agency went to create them by offering incentives, managerial and capital subsidies, technical guidance and political support, etc. They multiply and propagate themselves; new companies come up by the day; and all these are organised on the same lines as the earlier ones with few, minor variations. Tubewell companies are seldom known to fail or become defunct in the sense in which co-operatives fail or become defunct. There are well established mechanisms to cover all manner of contingencies and problems; tubewells owned by companies may fail, but Companies themselves seldom fail except when they have outlived their purpose. Finally, tubewell companies have actively sought to protect their 'design-sanctity'. Being in no way connected with the government system which, for all practical purposes, treats them as individual tubewell owners, these member-companies have not had to face any major onslaught of adverse change in macro-environment. However, companies could easily change their design and register as co-operatives to obtain the concession in electricity tariff; this has not been an insubstantial amount especially at the post-1987 tariff rate of Rs 660/hp/year. However, we heard of no company which has shown inclination to change their character; when probed, one farmer blurted: "what is that saving worth if we lose all our independence and 'sarkari sahib' will breath down on our neck night and day! . . . We are fine the way we are. we make our own rules. and when we do not like them, we change them. no hassle.."

Table: 3
Comparison of Economic Performance:1991-92

	Co-operatives (Kheda)	Companies (Mehsana)
Average hours of pumpage/year	1844	2785
% of pumpage supplied to members	82%	76.9%
simple average of price/hour (Rs)	18.37	25.23
Price charged by private tubewell owners (Rs/hour)	21.67	26.23
Gross income Average/year (Rs)	33874	~70266+
Operating expenses (Rs/year)	~ 22928	~33719
salary costs (Rs/year)		~7034
Replacement or new investment**		~2779
Profits Rs/year	~1133	" 7343
Accumulated Reserves (Rs)	4890 (12)*	26,000 (13)*

* Figures in brackets represent the number of organisations which reported accumulated reserves. While only 50% of co-operatives had accumulated reserves, all companies reported reserves.

** This is derived as a residual figure. Respondents told us figures on profits, on salary costs, on electricity and maintenance costs; but these did not reconcile- Upon questioning, items of expenditure were cited--such a rewinding of motors, deepening of bore, replacement of pumps or foot valves, repair or extension of pipelines and/or 'kundis' many of which were in the nature of capital costs. Since this figure is derived as a residual, it may also contain aggregated measurement errors in other figures.

+ ~ suggests approximate values.

Several tubewell co-operatives in Gujarat have come up without an official agency playing 'mother' to them. Each of these, however, is a special case because of the presence of some 'do-gooder' playing mother. Often, this 'do-gooder' is one of the co-operative's potential member-users but stretching himself considerably beyond the call of duty as a potential member. In the 40 year old Narsanda tubewell co-operative, thus A S Patel, a sociology professor, played mother; in Gambhira tubewell co-operative, Chhaganbhai Patel, a Gandhian leader experimenting with a joint farming co-operative played mother; in Lohej tubewell co-operative, Arjanbhai Patel, an exceptionally competent local politician played mother; in Samadhiala lift irrigation co-operative, the Aga Khan Rural Support Programme played mother. All these organisations are exceptional because they were born to mothers; member-companies of Mehsana had no mothers; they were 'swayambhoo' (self-created), and therefore, more robust in their design-concept.

All co-operatives in our study were mothered by the Corporation; they were nurtured on 'special food' of zero capital costs, nominal lease rent and subsidised electricity. Indeed, one can legitimately raise doubts about whether these organisations came up for the same purpose as member-companies of Mehsana did; for, it is plausible, indeed very likely, that the primary motivation in co-operative formation is to secure the subsidies; worse, in each case, it is possible that a large farmer mobilised 10 others to join with him to acquire lease on a valuable asset at extraordinarily low cost and to effectively privatise it. Indeed, this is exactly what we found in one of the villages where the chairman and a few of his stooges forced some members to withdraw their membership fees and used the tubewell acquired as a phony co-operative to establish a lucrative private business in water sale.

Likewise, there appears no sign that the 'design-concept' of tubewell co-operatives that the corporation has evolved has begun to self-propagate. After four years of open offer, no more than 50 of the 3500 odd public tubewells under the corporation management have been turned over. There is no evidence of any substantial interest amongst farmer groups to bring these assets under collective self-management. If anything, several efforts at take over have aborted and the lease terminated. Finally, tubewell co-operatives in general have shown high propensity to either fail outright--in which case the lease is terminated--or become defunct or near defunct because the original group has not been able to evolve effective mechanisms for problem solving and conflict resolution. As organisations, thus the tubewell co-operatives of Kheda are fragile and weak in comparison to the member companies of Mehsana.

Design-Concept

Why should the tubewell co-operatives of Kheda perform poorly as member organisations compared to the member companies of Mehsana? After all, the technology available to both the classes of organisations is the same. The people too are the same; if member companies of Mehsana are dominated by *Patidars* with exceptional entrepreneur abilities, so too, are the tubewell co-operatives of Kheda; indeed, more companies in our sample were mixed caste-mixed-religion groupings than Kheda's co-operatives. If anything, the member-companies face far more adverse groundwater conditions than the co-operatives of Kheda; the companies also do not have the advantage of zero capital cost, of nominal rent, and of subsidised electricity that the Kheda co-operatives enjoy. It is clear that what failed the co-operatives is not the technology nor the economic possibility but the organisation and its 'design concept'. The problem must be traced back to the birth conditions, the bye laws, the de jure and de facto rules, norms and authority structure, and all the rest that constitute their 'design-concept'. Perhaps the organisations to whom the tubewells are turned over are not designed to provide their members the services they valued in a manner consistent with their (members') values and preferences'; but member companies of Mehsana are.

Consider how and why a new tubewell co-operative comes into being. It is clear that if conditions were ripe for a group of farmers to come together to jointly own and manage an irrigation asset, it would have come up already without external stimulus. That it did not suggests either of two things: a) existing institutions—individual ownership, public tubewell, water markets—were widely considered satisfactory; or b) though the need is felt, farmers were not aware of a 'method' of organising that was readily acceptable to all potential members.

Now, the Corporation's offer provided a stimulus which was likely to be perceived differently by different groups. As we mentioned earlier, a large farmer can perceive it as an opportunity to privatise a public tubewell at low cost by creating a facade of a co-operative. At the other extreme, a group genuinely interested in co-operative self-governance and self-management of a member organisation for tubewell irrigation is likely to find the 'conditionalities' attached by the Corporation oppressive and unworkable. According to the bye-laws developed by the Corporation for a tubewell co-operative, for example: a) registration of the co-operative under the Gujarat Co-operative Act is compulsory; b) share capital can not be raised except within the framework stipulated by the bye-laws which offers no incentive to a member to supply more than the minimum required share capital; c) borrowings can not exceed eight times the share capital; d) funds have to be invested according to the provisions of the co-operative act; e) the chairman and the

management committee can not appoint, remove, punish or dismiss the manager without prior approval of the district registrar of co-operatives; f) members will have to put at least 50% of their land under food and vegetable crops (the violation of this will entail a penalty of Rs 25 per acre); g) net profit of the co-operative shall be applied in the manner prescribed by the bye laws; these require that 25% goes to reserve fund, that dividend can not exceed 12% and that compulsory contribution to the education fund is an increasing function of the dividend declared; that a member can not get more than 5% of the value of water purchased by him during the year as patronage bonus; that 20% of the surplus from profit must be assigned to irrigation development fund which can not be used except with the prior permission from the district registrar of co-operatives; that the bonus to the operator can not exceed one month's salary; and so on; h) the reserve fund can not be invested or used except with the prior approval of the district registrar; and g) a member can withdraw his membership by settling all his dues with the co-operative (and then refuse right of passage to convey water to distant fields).

To a group of farmers contemplating the formation of a co-operative, this sample of design-features of the new scheme poses a difficult set of conceptual as well as operational questions. The latter are immediate, 'here-and-now' kind, and therefore more relevant. The registration of the co-operative would, for instance, require anywhere between 5-12 visits to the District registrar's office in Nadiad. At least one co-operative we interviewed confessed that a bribe of Rs 1200 alone could do the trick. Who will make these visits? who will bear the cost of these visits and the 'chai-pani' involved?[3] The same hassle gets repeated with the Corporation and the insurance company and so on. In 'mothered' co-operatives, either an NGO or a resourceful, well connected promoter provides this invaluable service by taking over this process to complete which no ordinary farmer would have either the resources, time, energy or incentive [4].

But the hassle does not end there; in fact, this is the beginning. For there is hardly anything that the chairman and the management committee can do without getting the prior approval of the district registrar and/or the Corporation. True, if the Chairman or secretary has struck a good relationship with the registrar's office, a lot of the hassle can be avoided. However, even in these cases, the 'locus of control' still rests outside the co-operative. All in all, the 'design-concept' of a farmer organisation that is being offered by the Corporation to farmers makes it difficult for them to first create the organisation and then manage it in consonance with their goals, values and priorities.

At the conceptual level, this 'design-concept' ensures that except for an exceedingly high level of altruism, trust and

solidarity within the group, the effort and resources needed to smoothly manage the operations do not come about. The design-concept does not even encourage, leave alone stipulate, that capital contributions by different members match their land in command. Thus in Agas irrigation co-operative, the chairman and the secretary together control a fourth of the command; but like each of the 40 members, they too contributed only Rs 300 by way of share capital. This is clearly inequitable because the small holders in the command end up providing capital subsidy to the large farmers.

A variety of stipulations, some described above, which circumscribe the application of surpluses depresses capital formation and generates powerful incentives to pass on all surpluses to farmers in the form of low water price. Declaring dividends is costlier than building reserves since dividends divert surpluses to education and other funds; but 'building' reserves too is unattractive because using them for repair and replacement is full of hassles. Raising new capital in times of need is difficult because methods provided by bye laws are inequitable to members with small holdings in the command. Finally, at the level of the group, incentives are low for undertaking major long-term investment plans—such as extension of pipelines, replacing *kundis*, replacing motors, etc—since there is no guarantee that the Corporation will give another lease after the first five-year lease expires. In reality, it is not uncommon for the Corporation to take back a tubewell even before the lease expires on one pretext or the other.

Naturally, therefore, one of the principal operating problems that co-operatives face is of capital shortage. Many of them look up to the Corporation to provide them capital grants and to undertake repairs and maintenance. Those few which do not face any of these problems fall in either of two categories: a) they are backed by a resourceful leader/NGO; or b) the capital, time, effort and other resources needed to create and operate the co-operatives are provided mostly by a few members with large holdings in the command who will have a strong temptation to acquire complete control over decision making. Both these categories are co-operatives in name, oligarchies in fact.

The member-companies of Mehsana, in contrast, are oligarchies in name and co-operatives in fact and spirit. They come up with the sole purpose of serving their members' needs in perpetuity. They are completely self-financed with members contributing capital in proportion to the use they make of the company's services. All who are members are invariably users as well; some who are users but are not members have a strong incentive to enroll as members at the first opportunity. They are democratic in the sense that they are completely self-governed; and the distribution of voting rights is proportional to use when not equal. Membership to companies is as voluntary as it can be, given the peculiar characteristics of its business. Obviously,

companies do not accept as partners farmers way outside the potential command; nor is it likely that such farmers would want membership of companies which can not benefit them; but there is evidence that companies make substantial effort to persuade every farmer within the command to join, not out of any sense of altruism, but for the simple reason that it makes sound business sense. Finally, as a good co-operative, all benefits produced by member-companies are distributed in proportion to the use of the company' services by different members—as stipulated by the equity principle of co-operation.

The organisational structure and processes of a member company too are strikingly similar to an idealised co-operative. The general body meets once a year or in times of an emergency. A Managing Committee of 7-9 members meets once a month or once in two months. It is the (honorary) Manager, the equivalent of the co-operative's chairman, who runs the show and wields all the power of the general body and the managing committee while they are not in session. He keeps the accounts, supervises the operator, makes instant decisions about repairs, replacements, selling water to non-members, scheduling water deliveries, resolving conflicts amongst members, sacking a recalcitrant or corrupt or careless operator. For slightly weightier issues requiring quick decisions, he quickly consults two or three large stake holders, arrives at and executes a decision. Keeping the tubewell pumping is the mandate of the manager; and the members back him up to the hilt in doing so.

All companies we met claimed that in general body and managing committee elections and meetings, the principle of one-man-one-vote is followed. Instances were cited of noisy general body meetings and occasional instance of the replacement of the manager on one ground or another. Invariably, however, the manager in every company was a large stake holder. Examples of companies having managers with very small stake were as rare as those of companies having elected non-members as chairmen just because of the prestige and respect these individuals commanded. Where the manager was very busy with his own business, it was common for the company to maintain a paid assistant who would help the manager with the accounts and supervision work. There was much evidence, however, that at all times when decisions were needed, the buck stopped at the manager; and the survival of this apparently non-participative system seems to suggest its acceptability.

Perhaps, an important reason behind their smooth, trouble free management is the proportionality principle which is the hall mark of the design-concept of member companies (Phansalkar and Srinivasan 1992); since only large stake holders end up as managers and key decision makers, other members know that costs of decision errors will be borne by the manager in proportion to his stake. If the tubewell remains out of order for a long time, the manager will

suffer larger loss than most other members; as a result, it is not uncommon that even when companies have no savings, the manager and two or three other large stake holders cough up money to get a burnt motor replaced or other major repairs carried out in as short a time as possible; these are then split amongst members in proportion to their shares. Since smooth, trouble free management and absence of conflicts of interests are widely associated with the 'design-concept' of member-companies, when new tubewell investments are planned, people instinctively think in terms of this design-concept. Differences in the basic design across companies are thus minimal and inconsequential. Thus some companies are strong on distributing profits, saving less, and raising capital every time there is need. Others never distribute profits and save all profits. Some keep bank accounts; other do not; some pay the operator a fixed Wage and also enroll him as a member; others pay him on a per-hour-of-operation basis. Other than these minor variations in operating procedures, the design-concept of member-companies is the same throughout north-Gujarat and is distinctly different from the design-concept of lift irrigation co-operatives elsewhere.

How does a member company come into existence? Usually it is a large farmer who takes the initiative. If he needs to develop an irrigation source, his first preference would be a captive tubewell. Where this is feasible, as in parts of Banaskantha, private tubewells come up. Even with somewhat smaller holdings, private tubewells would still come up in areas like Kheda and Baroda where risk of well failure is not very high and where presence of active water markets increases the chances of the tubewell being utilised to viable levels. However conditions would become ripe for the birth of a member company where even large farmers are too small to: a) mobilise the capital needed to establish a tubewell; b) command enough of their own land to utilise the tubewell to viable levels; and c) absorb the risk of a failed well. The member-company is thus primarily a social device for spreading the risk of immediate or future well failure which may be too much for even a wealthy farmer to easily absorb. And members agree easily to participate in this device because they can determine in precise terms the extent to which they would be willing to share the risk.

The basic design-concept of a member company is simple. Anyone with land in the command area of a proposed tubewell can become a partner. The stake of a partner is determined by how many 'paise' (or, percent) share he owns in the company. No one would be normally allowed more than 45 paise share; but in general, in most companies, there will be 2-4 partners with 10-12 paise share each and a large number owning 1-5 paise share. The share holding would generally have close correspondence with members' land holding in the command. The initial capital is raised in proportional terms; subsequent capital too is raised in proportional terms; profits and losses are borne in proportional terms.

However, water shares have no strict correspondence with member stakes except in times of extreme shortages. Leaving a company is not as easy as leaving a co-operative; many companies stipulate, in the initial agreement that if a member withdraws from his membership, he cannot withdraw his capital before 10 years; however, transfer of shares is informally permitted if the transferee belongs to the company's original command.

One reason why member companies set their water prices close to market rates is to ensure that members do not grow water intensive crops which are not consistent with the water output of the tubewell; only rarely is group pressure used to discourage a member from growing a certain crop. The other reason is that larger farmers who generally manage companies do not have the undue incentive to keep water prices low which large farmers managing co-operatives would have; in companies, we note, subsidising water can not benefit large holders; in co-operatives, it can. Finally, the primary reason why a farmer becomes a member of a tubewell company is to obtain secure access to an irrigation source; profit share is an insignificant consideration. Most companies never distribute profits; instead, surpluses are retained for future contingencies.

Over years, as member-companies have become popular, even ordinary farmers are able to easily describe how to form and operate new companies. But when the first few such groupings had come up decades ago, there must have been experimentation with a variety of rules, norms, operating procedures; these must have over time stabilised in to a 'design-concept' that is known to work well and in consonance with the community's accepted notion of what is a just and proper way of arranging things. New companies continue to come up almost by the day; but these use the same standard 'design-concept' that has kept several thousand tubewell companies going for decades.

Management and Leadership

Do member-companies need and use exceptional talent and leadership resources to perform so well? No; will and active interest in managing the company well appears far more important than unusually strong 'extension motive' [5] or exceptional managerial and leadership capabilities. Companies seem to need and utilise ordinary capabilities of farmers who are interested; and people who end up doing the managing are interested because managing the company's affairs is nearly like managing their own business. The coalescence of incentives and motives that this brings about seems widely recognised as the prime reason for good management. It was therefore not surprising that there appeared no sign of tension about who should be the manager of the company's affairs; it seemed natural that only a sizeable stake holder should be the manager.

Interestingly, in case of Kheda's co-operatives, this scale bias in the choice of chairmen and secretaries was even stronger; as table IV.5 shows, the average land holding of the chairmen of the 26 co-operatives was very nearly the highest amongst their respective groups; in fact, barring few co-operatives, in the remainder the, chairmen were largest farmers in the command. In fact, the secretaries too were large farmers; and between the two, the chairmen and secretaries of most co-operatives accounted for over a third of the tubewells' command areas. These combined with the widespread evidence of hourly payments to tubewell operators and encouraging them to use the tubewell's services as members (on leased land if they did not have their own) suggest a deep understanding amongst farmer groups of complex 'agency-type' problems that the Corporation's design-concept singularly lacked.

Table: 5
Profile of Land Holdings in the Command

Land holdings in the command	Co-operatives (Kheda)	Companies (Mehsana)
smallest average	2.13	2.55
range	0.5-3.5	1.5- 6.0
largest average	9.13	9.85
range	4.0-16.0	6.0-18,5
Chairman/ manager average	7.49	8.23
range *	2.5-16.0	4.0-14.0
secretary average	6.37	
range	3.5-15.3	
operator average		3.25
range		1.5-4.5**

* In 18 out of the 26 co-operatives sampled, the chairman was the largest land holder in the command; in the rest, the chairman usually had a large landholding; in no more than three of the 26 co-operatives, for example, the chairman's land holding was less than twice the smallest holding in the command; and each of these three represented an exceptional situation.

** Co-operatives typically have an elected chairman, an honorary secretary and a paid operator. The secretary is effectively the executive officer and looks after the day-to-day operations. In companies, the elected 'manager' combines the role of both the chairman and secretary of a co-operative where as the operator in both cases operates the tubewell and distributes water.

This dominance of large farmers among the decision making bodies of co-operatives further elucidate why co-operatives set their water prices low. We examined earlier that the snapping of the proportionality principle accompanied by the hassles in getting the district registrar's approvals for even minor investment decisions and the myopia caused by short lease period account for the low propensity to save amongst co-operatives. Since setting prices low (rather than first making surpluses and then paying dividends and patronage bonus) is an easier, superior and hassle-free method of ensuring that the co-operative's benefits are distributed in proportion to use, co-operatives demonstrate a strong tendency to charge low prices. This is analogous to dairy co-operatives' propensity to pay high procurement prices for milk (except for a small tax dimension). Indeed, low water prices are widely regarded as the best indicator

of the tubewell co-operative's performance just as high milk procurement price is the most popular indicator of the performance of dairy co-operatives. The Narsanda co-operative, for instance, sells water at an unheard of rate of Rs 4/ hour; but because it has been managed well over decades, it does not face the kind of capital crunch many lesser co-operatives routinely face.

Conclusion

Member-companies of Mehsana which serve the same purpose as the tubewell co-operatives of Kheda are superior farmer organisations from the **viewpoint** of their farmer members. They are more efficient in operational and economic terms. They are more robust and vigorous as organisations because: a) they self create and self propagate; b) they actively guard their design sanctity; and c) they adapt and self correct.

The primary features of their design-concept that account for their superior performance include: a) complete autonomy and self-governance; b) acceptance of the proportionality principle in capital contribution, land holding within the command, patronage, share in profits and in risk; c) implicit recognition of the agency problem vis-a-vis honorary manager as well as paid operator; d) vesting of all powers of the general body in the manager and the managing committee; e) costly exit.

Aspects of design-concept that make tubewell co-operative fragile and inferior farmer organisations include: a) limited autonomy; b) compulsion to get approval from district registrar and/or corporation officials for most financial and administrative decisions; c) violation of the proportionality principle so that small land holders are required to subsidise large holders in capital supply; d) externally imposed rules of surplus application which strongly discourage capital accumulation and encourage unduly low water prices; e) myopia induced by the conditions of lease; f) low exit cost.

Will the turn-over scheme operate better if the Corporation agreed to consider companies with a design-concept similar to the Mehsana member-companies? In our judgment it will-- especially if it saves the members the hassles of getting the registrar's permission to do any thing. The companies will perform even better if the Corporation raises the lease rent to say Rs 10,000/month but in return provides the members complete autonomy and self governance. Better still, the companies will tend to invest more if the lease period were increased from 5 to 10 years.

Motes:

- [1] Companies show strikingly fine sense of pure economic rationality. The heavy investments made by companies in underground pipelines reflected not so much a desire to save water as the urge to cut electricity costs under the high pro-rata electricity tariff that the Gujarat Electricity Board charged until 1987. More importantly, heavy conveyance losses in open field channels raised dramatically the effective cost of irrigation to holdings away from the well-head. Further, with open field channels, water could not be reached to up-lying lands thus unduly restricting effective command. Underground pipelines made the location of tubewell irrelevant, equalised effective irrigation cost regardless of location and made topographical variations immaterial.
- [2] In 1987, when the Gujarat Electricity Board changed to flat tariff system from metered tariff system, the tariff slabs were more progressive than they are now. For 30+ hp tubewell, the original tariff was Rs 660/hp/year; a company at that time had to pay Rs 19800 per year for power alone. At the behest of some NGO leaders, special concessions were given to lift irrigation co-operatives which were made subject to lowest tariff slab applicable to tubewells with 7.5 hp motors.
- [3] Note that this 'set up' cost is very low compared to the expected future benefits from turn-over to the whole group; and private owners or tubewell companies will easily incur these costs; in tubewell co-operatives, these will get incurred either by a farmer who wants to effectively privatise the public tubewell or whose personal gains from turn-over are so large and certain that he is willing to incur them.
- [4] How exceedingly simple things get if the 'mother' is an educated and articulate person was suggested by the experience of Dr AS Patel who, as a 21 year old graduate 37 years ago pioneered the Narsanda lift irrigation co-operative. He applied to the District Registrar for assistance to set up the tubewell. Once it was sanctioned, young Ambubhai developed doubts and went to meet the DC with an application to cancel his earlier request*
"The DC, one Mr Dixit, an extremely noble man, read the application and looked straight in my eyes.
' Are you a graduate? '
'Yes'
'Which university?'

'Bombay', I said, proudly.

'It is a foolish university'

'How can you say such a thing about my alma mater??'

'What else am I to say about a university whose graduates do not want to benefit their own village even when they have all the assistance they need to do so?'

"I tore up my application and came back to Narsanda. And formed a co-operative which functions unto today" said Dr AS Patel to me. It is extremely unlikely that the DC, howsoever noble, would deal with an unlettered small farmer thus.

- [5] 'Extension motive' is loosely defined as the empathy for and motivation to help others.

References

- Abble, H, J Q Leslie and J W Wall (1982) Economic Return on Investment in Irrigation in India, World Bank Staff Working Paper #536, Washington, The World Bank.
- Ballabh, v (1989) The Decline of a Novel Experiment: Community Tubewells of Deoria. Anand: Institute of Rural Management (mimeo)
- Chambers, R, N C Saxena and Tushaar Shah (1989) To The Hands of the poor j. Water and Trees. New Delhi, Oxford -IBH.
- Shah, Tushaar (1991) Water Markets and Irrigation Development, India Journal of Agriculture Economics, December.
- Patel BS (1988), "Incidence of Water charges at Farm Level- A case study of Vijapur Taluka, Mehsana District," Unpublished N. Philo. Dissertations, submitted to Sardar Patel University, Vallabh Vidyanagar, Gujarat.
- Bhatia, Bela (1992), "Lush Fields and Parched Throats: The Political Economy of groundwater in Gujarat", Helsinki: The United Nations University.

**DETERIORATION IN GROUNDWATER RESOURCES:
COULD CO-OPERATION HELP CONSERVATION**

V.C.V. Retnam & K.N. Nair

Abstract. The study attempts to document the process of emergence of informal co-operation among the partners of wells and its deterioration consequent upon the introduction of modern water lifting technology in a hard rock area in south India. Although the operation of a number of factors like water shortage, hard rock, lack of finance, lack of interest in deepening of the wells and frequent incidence of drought keeps a significant number of wells out of use, a key factor that has contributed to this process appears to be absentee cultivation. Moreover, the spread of well irrigation has taken place in such a way that a few deep wells are surrounded by many shallow dry wells thereby aggravating the inequity in the extraction and utilisation of groundwater. Apart from the fiscal and legal measures that have to be designed and implemented by the state in order to conserve groundwater in situations of this kind, co-operative management appears to be a possible institutional mode of ensuring judicious use of scarce groundwater on a sustainable basis. However, the adoption of co-operative management of groundwater warrants the creation of adequate level of awareness among well owners regarding its advantages over the existing system and actual demonstration of its profitability. This can be better done by facilitating local level community action by a non-governmental organisation than by imposing a formal co-operative organisation patronised by the state.

Keywords. conservation, groundwater, hardrock, informal co-operation, modern water lifting technology, tanks, wells.

Introduction

The fact that agriculture in Tamil Nadu has been stagnating in recent years is evident from a number of studies [1]. A variety of factors have contributed to it. However, the most important factor cited is the rapid depletion of groundwater,, especially in the low rainfall regions. It is pointed out in this context that the rapid technological change in the exploitation and utilisation of groundwater through energisation of wells (including the spread of tube well irrigation) has contributed to this [2], Needless add, that increasing rate of commercialisation agriculture has been one of the motivating forces behind this technological change [3]. The rapid expansion of rural electrification and provision of power at cheap rates also

have further facilitated this process [4]. While in general we agree with this explanation, it should be pointed out that the decline in well irrigation is largely due to the break down of the informal co-operation in the organisation and management of groundwater. However, there has been no attempt, in the past to unravel the factors underlying the decline in the organisation and management of groundwater. But without a clear understanding of the factors underlying this process it may be difficult to design interventions appropriate for sustainable management of groundwater resource. The present study is a preliminary attempt in this direction. It is conducted in Ambalavanapuram village of Valliyoor block in Tirunelveli-Kattabomman District (TKD) of southern Tamil Nadu.

The study attempts to highlight the emergence of informal co-operation among the partners of wells and its deterioration in the context of organisation and management of modern water lifting technology. The organisation of this paper is as follows. In Section-2, we will provide a brief description of the objectives, scope and approach of the present study. In Section-3, we will examine the evolution of the physical organisational and institutional aspects of the irrigation system. In Section-4, an attempt is made to highlight the shift in technology of well irrigation and how it has contributed to the changes in cropping pattern. Following this in Section-5, we have made an attempt to bring out how conflicts arise and how they get resolved in well irrigation and the manner in which conflicts and resolutions results in non-use of wells. The last section brings together the main findings of the study and highlights their implications for the nature of interventions needed for the conservation of groundwater resource.

Objectives, Scope And Approach

Ambalavanapuram village falls in the low rainfall region of T.K. District. The normal rainfall in this region is around 800m.m. The bulk of the rainfall is received during the north-east monsoon period. The region is frequently visited by droughts. For instance the rainfall during the years 1977 and 1978 was 967.8 m.m and 1,109.8 m.m respectively. During the subsequent years 1979 and 1980 it was 742.6 m.m and 615.5 m.m respectively [5]. Given the vagaries of rainfall in this area without some type of irrigation it is difficult to grow crops. Recognising the need for irrigation, agriculturists in this region had developed tank-irrigation at least two centuries ago. This was followed by the growth of well irrigation in the last few decades of the present century. However, after a period of rapid expansion in recent years there has been a significant deterioration in the utilisation of well-irrigation. In this study we will examine the factors underlying this deterioration in the

irrigation system. More specifically the objectives of the study are the following:

- a. To examine the evolution of irrigation system in the study area in its physical, institutional and organisational aspects taken together and separately;
- b. To bring out the process of technological change in well-irrigation and its impact on cropping pattern;
- c. To examine how the growth of irrigated agriculture combined with a number of other factors operating in the agrarian economy has resulted in the deterioration in groundwater management, the nature of conflicts that has arisen due to this and the manner in which conflicts get resolved; and
- d. To suggest various strategies of intervention (including co-op management) for the conservation of the groundwater resource.

In order to meet the objectives of the study we have adopted the following approach. At the first stage we did a listing of all the tanks and wells in the village and collected information relating to the status of its ownership and whether it is used for irrigation or not. The listing revealed that the village has five tanks and 45 wells. Analysis of the data showed that three tanks are private and two of them are government and all of them are used for irrigation [6]. In case of wells our listing revealed that out of the total of 45 wells 10 of them have individual ownership and rest of the wells have partnerships. Out of the 35 partnership wells, 24 of them are in use and 11 not in use. The distribution of tanks and wells according to its location in the village is presented in the map. To study the physical, technological, institutional and organisational aspects of irrigation and to show how it has resulted in the deterioration of the irrigation system, we have examined all the five tanks, 10 ownership wells (IOW) and 10 partnership wells in use (PWU) and 10 partnership wells not in use (PWNU). Information relating to changes in ownership, techniques of irrigation, cropping pattern etc. are collected from respondents who act as leaders in the respective wells and tanks. To ensure more reliability of data and to keep in check the bias involved it was cross checked by interviewing a few other partners in each group.

The Irrigation System **and** its Evolution

In the present study, we will treat tanks and wells as an inter-linked system since water stored in tanks recharges the groundwater table. With the help of the survey data we shall attempt to map out the salient features of the physical, organisational and institutional aspects of this inter-linked irrigation system.

Coining to tanks it is seen that surface area of five tanks ranges from 10 to 33 acres and the depth 6 to 15 ft (See Table 1). The area irrigated varies from 10 to 30 acres. The area cultivated using this water is Jiiostly for growing paddy.

The number of partners among the tanks varies from a minimum of 6 to maximum 25. As regards the caste composition of the landowners of the command area of the tanks, two tanks are dominated by Yadavars and another two by Nadars and the remaining one is owned by multi-caste group.

Maintenance and repair of the government tanks are now carried out as a drought relief measure. From 1970 to 1992, silt was removed three times and the depth of these tanks was increased by 1/2 to 1 ft. In the case of private tanks the silt is removed depending on the need for it and the availability of finance. In other private tanks it is removed once in five years. Part of the amount needed for undertaking the repair and maintenance of the private tanks are realised by selling the firewood trees grown in the tank. The remaining expenses are shared by the landowners according to the extent of land they own in the command area of the tanks. However, with all these efforts, the impression we have gathered during the course of our field work is that there is partial deterioration in the storage capacity of the tanks due to inadequate removal of silt. Since part of the water stored in the tanks flows to the nearby wells in the form of underground seepage, the decline in the storage capacity of the tanks appears to have adversely affected the irrigation system in the village. However, it may be noted that the growth in well-irrigation in the village was not in response to the decline in tank-irrigation, since water from wells are not used to irrigate the land fed by tanks.

Analysis of the data on the growth of well-irrigation shows that a very high proportion of the wells in the area were constructed during the last 60 years. Twenty five percent of the wells are 90 years old and the remaining wells are between 40 and 60 years of age. In the initial stage five wells were under individual ownership in PWU and four in PWNU; subsequently there was a change in the type of ownership from individual to partnership. Around 50 percent of the wells coming under partnership at present were once individual ownership wells. It is equally applicable to both the groups PWU and PWNU. So the starting point was individual ownership for all the wells and the partnership evolved over time see Table 2.

Such shifts in the ownership of wells from individuals to partnership has been caused by partitioning sale and purchase of land. If the owner of a well has four sons, in the succeeding generation in the place of one well owner there will be four well owners and thus individual ownership changes and it becomes a partnership well. It does not,

however, alter the family and caste character of the owners of the wells. But when there is sale of the inherited land to persons belonging to other castes, the family and caste composition of the partners of well will undergo change.

At present the number of partners per well ranges from a minimum of two to a maximum of 10. Between the two categories viz., PWU and PWNU, the average number of partners is higher in the case of PWU compared to PWNU (see Table 3). Among the 20 partners wells five of them have partners from other castes.

The reason for the development of partnership or informal co-operation in the management of groundwater appears to be due to the indivisibility in the investment in well-irrigation. When land holdings become smaller and smaller, it will become difficult for the owners of such holdings to invest individually in the development of well-irrigation. The alternative open to them is to meet the investment cost required for the construction of the well by pooling their resources. This fact is evident from the data on the distribution of well owners according to the size of land holding (see Table 4). It is seen that the partnership holdings mostly belonged to the lower size group of land holdings. On the other hand most of the individual owners belonged to the larger size of holdings. This pattern seems to hold both in the case of PWU and PWNU (see Table 4).

When the well sites are owned by partners and if they belong to the same caste and family they have shown a tendency to come together and invest in the development of well-irrigation. Most of the owners of partners' well had private savings to dig wells. A few of them borrowed from private sources and government. But none of the individual owners have taken loan either from government or from others, they have used their own savings to construct wells. To install *Kamalai* [7] most of them used their savings, for electric motors, finance came from savings, private loans, government loans and sale of land. Among PWU, three of them raised resource by the sale of land, two from savings, others from different sources like private loans, government loans etc. In the case of PWNU, five of them financed it through their savings, two from private loans and five from government loans. While majority of the individual owners relied on their savings and private loans, a significant number of them (4 out of 10) raised resources by selling their lands (see Table 5). Sale of land is reported to be one of the important sources of finance in the case of PWU and IOW, not so with PWNU; in the last case loans from private and government appear as the main source of finance (50%).

Cost of construction and pumpset constitute the main elements of cost, apart from the maintenance cost. While construction cost is a dominating component in the traditional technology (lifting water with animal power), pumpset cost forms a significant portion of the cost of

wells under modern technology. The cost of digging coupled with the cost of removal of loose earth, rock etc., increases as the depth increases. The cost of well construction will further go up if the well has to be deepened again with the lowering of the water table. Since the depth of wells has significant bearing on the investment cost of well-irrigation we have made an analysis of this aspect over a period of time.

In the case of PWU the original depth ranged from 21 to 35 ft., average being 24.7 ft. The present depth of them varies from 51 to 87 ft., the average is 69.2 ft. Regarding PWNu the minimum depth was 21 and the maximum is 40 ft. and the average being 26.6 ft. The corresponding figures for the present period are 30, 85 and 57.5 ft. (see Table 6).

In sharp contrast to the figures given above in the case of IOW, the minimum original depth is 15 ft. the maximum was 49 ft. and the average was 29.7 ft. At present the minimum depth of a well belonging to this group is 63 ft. the maximum is 135 ft. and the average is 97.1 ft. It is important to note here that the depth of wells owned by all the three categories of respondents has increased sharply over a time (see Table 7).

In this context an important observation we have is that a few deep wells are surrounded by a number of shallow wells. The deep wells are usually owned by individual owners. Of the 10 IOW six of them have a depth of more than 100 ft (two of them more than 135 ft). This pattern of development has serious implications for the management of groundwater. In order to get more insights into this, it is important to examine the shift in technology of well-irrigation.

Changes in Technology and Cropping Pattern

The traditional technology used for lifting water in the village was *Kamalai*. But with the spread of mechanical technology over the last few decades Ambalavanapuram also witnessed rapid shift from animal power to electric motor for lifting water. Our sample respondents reported a variety of reasons for the shift in technology. Expansion of area under cultivation, stabilising irrigation in the land already under irrigated crops, the desire among partners to cultivate more area and sufficient money, got electric connection easily, difficulty in meeting the maintenance cost of bullocks, and the scope to cultivate more water absorbing crops are some of the important reasons for this change. Most of the wells got electric connection between 20 to 40 years ago. Across different categories of farmers, in the case of PWU, eight wells got it between 21 to 30 years. In the case of PWNu six wells got it in the same period (see Table 8).

The area irrigated by most of the wells was between two and four acres in all the three groups under *Kamalai*. All of them subsequently introduced electric motor. It led to the expansion of area under irrigation. After the introduction of electric engines the area irrigated by majority of the wells ranged between four and seven acres of land. Thus the shift in technology from traditional to modern has led to an increase in the area irrigated (see Table 9)

The investment cost involved in *Kamalai* and electric motor was shared among the partners on the basis of the extent of land they own in the command area of the well in question. The same principle was applied to share the maintenance cost as well. If a partner fails to pay his share of investment or maintenance cost he is not allowed to draw water till he pays his dues. This is true irrespective of the level of technology. However there are defaulters of this type. Even if one fails to make timely payment of his share he does so as early as possible. In exceptional cases when partners residing in far away places from the village and have non-agricultural activity as the major source of income, they may not care to make such payments. The share of water of the defaulting partners will be used by other partners till the defaulters clear their arrears of payment.

The crop that was most common among all the cultivators in the pre-well stage was grams, other crops like local maize, *cumbu* and *ragi* came next. When *Kamalai* was used the cropping pattern data collected from the command area of the wells showed the following order of importance-paddy local variety (long duration and high yielding) (30 wells), local maize (low yield) (27), chilly (25), plantains (23) and cucumber (9). Following the same method of the ranking of crops under mechanised technology are paddy high yielding variety (short duration) (26), chilly (24), local maize (21), plantain (20), flowering plants (16). Thus the development of well-irrigation has introduced significant change, in the cropping pattern in the study area. This is further evident from the profile of the cropping pattern changes in a typical partner holding given in Appendix A.

The significant change in the cropping pattern associated with changes in technology is the variety of paddy cultivated. Under *Kamalai* (long duration) paddy was the most popular crop (30 wells). But with the introduction of electric motor there was shift to high yielding short duration paddy. This trend was noted in 26 well commands. Among coarse grains the relative importance of maize remained more or less the same. Under *Kamalai* 27 well commands reported the cultivation of this crop; the corresponding figures under mechanical technology is 21. Commercial crops like chilly and plantain also do not show much change. But flowering plants, high breed cotton, and vegetable crops like tomato are receiving considerable importance under mechanical technology than that of *Kamalai* (see Table 10) .

Though more profitable crops could be raised in the place of paddy it is cultivated partly due to the strong preference of the people to rice (a staple food for human consumption and fodder for animals) and partly to the seasonal nature by the crop in the sense that during the north west Monsoon (October, November, December) no other short duration crop could be raised except paddy, because of the wet condition of the soil. Further, farmers believe that a landowner buying paddy from market for home consumption is doing something below his dignity; similar reasoning holds good for fodder for the animals too. It may be also noted that the shift from local variety of paddy to short duration high yielding variety is also due to the fact that cultivators consider paddy not only as a subsistence crop, but also a commodity that can be increasingly sold in the market.

We have also noted differences in the cropping pattern between individual well owners and partners well in use. As we noted elsewhere, the individual well owners belong to the larger holdings and therefore is likely to be cultivating higher extent of area under irrigated crops. The survey data reveal that they have a more diversified cropping pattern than the other groups. As we will show in the following section, the individual well owners have been able to achieve this because of their higher level of investment in well-irrigation arising out of the surpluses from the growth of irrigated agriculture. The manner in which the growth of irrigated agriculture has influenced the further development of well-irrigation and how it has resulted in conflicts over sharing of groundwater will be discussed in the following section.

Conflicts and Conflicts Resolutions

With the growth of irrigated agriculture, farmers started investing further in the development of well-irrigation. The prime factor behind this is the increased demand and stability for irrigation due to the cultivation of high value crops like banana, chilly and tobacco. This combined with the extension of irrigated area resulted in shortage of irrigation water which compelled the well owners to deepen their wells. Both individual owners and partners deepened their wells. However, there are notable differences in the number of times wells were deepened between the two groups (see Table 11).

The individual owners have deepened their wells more number of times than partners wells. This fact is consistent with the fact that the average depth of wells owned by individuals are much deeper than that of the partners'.

The investment cost made by most of the PWNUs in deepening the wells went upto Rs.20,000 whereas in the case of PWUs it Rs.60,000 and Rs.160,000. In the case of partners, they

shared the cost of deepening on the basis of the land they owned in the command area of the well.

It is evident from the above discussion that the cost of construction and deepening of wells, installation of traditional or modern technology are shared by the partners on the basis of the land they own and irrigate under the command area of their respective wells. They also share the water in proportion to the land they own and irrigate. To what extent well-irrigation protects crop production during periods of drought? Generally farmers adjust to drought situation by reducing the area under irrigated crops. For instance, a well which can irrigate five acres may irrigate only 50 cents. In this small area high valued, low water absorbing crops with high labour intensity (eg. Flower plants) are cultivated. During drought period labour cost is low. The net result is that a few well owners with water will be able to get the usual income with this adjustment mechanism. In that process, many partners may leave the well and land and migrate temporarily or permanently to distant or nearby areas [8].

When the normal rainfall resumes, the migrated well owners return and resume cultivation. They are not expected to share cost for the period when they did not draw water. If all have left the well during the drought all pay jointly for electricity and other costs to draw water.

In sharing the cost and water, conflicts arise due to the attempts made by each partner in promoting his interest undermining the interest of other partners. A detailed documentation of the nature of conflicts, the underlying causes and the manner in which it gets resolved is given in Appendix-B. The salient points emerging from this documentation is summarised below. Conflicts arise under certain conditions like power cut, failure to pay the deepening and maintenance cost of wells and energy charge. If there is power cut the partners cannot draw their share of water from the well as per schedule. It will affect their crop adversely particularly if the crop requires water at regular intervals of time or immediately after the application of chemical fertilizer when extra irrigation is needed without delay. Delay in watering and insufficient quantity of water rendered at such times will affect the crops adversely.

Immediately after transplanting commercial crops like chilly, they need frequent watering for a week or two. In such a situation there arises the problem of sharing water. Depending upon the degree of co-operation among the partners, these conflicts will get resolved or remain hidden. If the partners do not resolve the conflict either directly or through other partners it may go to the extent of keeping the well out of use. Thus the conflicts may occur frequently or occasionally; the partners belonging to the group PWU solve it but partners of PWNu are unable to solve

them. There are reasons for their inability to remove the constraints of co-operation.

The reasons reported for the wells not in use are water shortage, hard rock, lack of finance, theft of motor, lack of interest in deepening, land slide, moderate and short duration drought and severe long duration drought.

One wonders whether these are the apparent or real reasons for keeping the wells out of use. The very same constraints are removed by PWU and the wells are in use for a long period of time. One has to seek the real reasons for PWNU in terms of main source of income of the partners and their residence (inside or outside the village) etc.

Of the 10 wells of PWU, six wells have partners whose main occupation is cultivation whereas seven wells of PWNU have partners who are government employees and cultivators. Thus in the case of PWNU the major source of income of the partners is other than cultivation. In such a situation it is obvious that they take least interest in solving the problems arising among them either at the time of sharing the cost or sharing of water. Hence the absentee cultivation appears to be the most significant constraint to informal co-operation.

Conclusions

The purpose of this paper, as we stated at the outset was to examine the emergence of informal co-operation among the partners of wells and its deterioration over a period of time to time in the context of organisation and management of modern water lifting technology. The analysis has shown that the partnership in well irrigation has emerged largely in response to the indivisibility in the investment in well-irrigation.

The technology of well-irrigation has undergone significant changes over time, from the traditional *Kamalai* to electric engines. This shift has been accompanied by changes in cropping pattern to more diversified and high valued commercial crops, resulting in increased production and productivity of land. The increased prosperity from well-irrigation seems to have stimulated investment in the frequent deepening of wells and in the installation of more powerful engines. It is significant to note that the individual well owners with larger resource endowments have been more involved in this than the other two groups. Thus, the development of technology and growth of cash crop cultivation resulted in the widening of disparity in the harvesting and utilization of groundwater. There has been also substantial lowering of water table and drying of several wells belonging to partners. Since the lowering of the water table did not affect the individual owners adversely they have been able to deepen their wells more

8

frequently. Though conflicts arise in the management of partner wells, this did not contribute as a major factor for wells going out of use. The emergence of absentee land ownership and cultivation appears to be the most significant reason for the failure of informal co-operation among well partners thereby resulting in the non-use of wells.

Presently in the village of Ambalavanapuram there are three groups of cultivators: individual well owners who are able to take advantage of the irrigation technology from time to time; those partners of wells who are able to derive the benefits from well-irrigation through informal co-operation, and lastly those well partners who have to forego the benefits from well irrigation due to the failure of co-operation. Agriculture in the last category of cultivators in Ambalavanapuram has deteriorated, while the other two categories continue to show dynamism. However, since agriculture in one segment of the farming community has deteriorated, if we look at the village as a whole, we get a picture of stagnation or deceleration in agriculture. Though our study is confined to a small village it may be noted that in explaining the stagnation/deceleration of agriculture in semi-arid regions this study may provide some insight.

What is the lesson we learn from the study? Without formulating a comprehensive strategy of groundwater management, it will not be possible to conserve the groundwater resource and maintain efficiency in its utilization in the low rainfall regions. The elements of such a strategy have to be formulated at different levels: macro and micro, involving measures like fiscal, legal and providing incentives like helping the people to acquire loan to construct percolation tanks, employment during lean seasons under public work programmes etc., to construct and maintain water storing and recharging devices like percolation tanks with the participation of local beneficiaries. Since individual farmers may not be aware of the consequences of the over-extraction of groundwater on the underground Kāsin, even if fiscal and legal measures are introduced, they may continue to ruin the basin [9]. What is needed in such circumstances is to create awareness among farmers regarding the various dimensions of the underground water basin and the need to conserve this resource for sustainable development of irrigation. This kind of awareness among the farmers can be created only if people's participation is ensured at the micro level. Once the awareness is created among farmers, with the initiative of the local communities it may be possible to undertake the construction of various conservation measures like percolation ponds. This is a pre-condition for the organisation of co-ops which would lead to the conservation, extraction and equitable utilisation of groundwater.

38% of partners
outside

Table 1
Features of Tanks

Sl. No.	Area of Tanks (acres)	Depth of Tanks (feet)	Present Owner-ship	No. of land owners	Area irrigated (acres)
1.	10.8	8-11	Govt.	8	9.20
2.	12.96	7-8	Private	10	15.00
3.	32.84	12-15	"	5	30.00
4.	12.96	6-8	"	6	14.86
5.	13.25	8-10	Govt.	25	10.62

Table 2
Type of Ownership of Partner's Well at the Construction and at Present

Type of ownership	(PWU) Partners wells in use	(PWNU) Partners wells not in use
Individual ownership	5	4
Partnership	5	6
Total	10	10

Table 3
 Size of Partners' Wells
 (No. of Partners in Each Well Selected for Study)

Size (No. of Partners)	No. of Partners' wells	
	PWU	PWNU
2	2	1
3	2	-
4	-	2
5	-	2
6	3	3
7	-	-
8	1	1
9	1	-
10	-	-
>10	1	1
Total	10	10

Table 4
 Land Owned by Partners

Size Class (Area in cents)	No. of Partners		
	PWU	PWNU	IOW
0-50	31	17	-
51-100	12	16	1
100-150	5	8	1
151-200	4	6	-
201-250	8	2	-
251-300	3	3	1
300-350	-	-	1
(Above 350 upto 1500)	-	-	6

Table 5
 Source of Finance for Constructing Well and
 Installation of Electric Motor

Sl. No.	Source	(Constructing well) Kamalai		Installing Electric Motor		
		No. of wells		No. of wells		
				PWU	PWNU	LOW
1.	Saving	7		2	5	3
2.	Private loan	1		1	2	3
3.	Sale of land	-		3	-	4
4.	Bank loan	-		1	-	-
5.	Government loan	1		-	3	-
6.	Service	-		1	-	-
7.	Bank loan private loan	-		1	-	-

30% 70%
 30%

Table 6
 Depth of Wells (Ft)

SI. No.	Type of well	Initial			Present		
		Min.	Max.	Avg.	Min.	Max.	Avg.
1.	PWU	21	35	24.7	51	87	69.2
2.	PWNU	21	40	26.6	30	85	57.5
3.	IOW	15	49	29.7	63	135	97.1

most money diff
 BYP

Table 7
Average Depth of Wells Initial and Present

Average Depth	PWU (ft)	PWNU (ft)	IOW (ft)
Original	24.7	26.6	29.7
Present	69.2	57.5	97.1

Table 8
Distribution of Wells According to the Number of
Years Since Electricity was Introduced to Wells

Year	No. of Cases		
	PWU	PWNU	IOW
0-5	-	1	-
6-10	-	-	1
11-15	-	-	2
16-20	-	1	1
21-25	3	2	4
26-30	5	4	1
31-35	1	1	1
36-40	1	-	-
41 and above	-	1	-
	10	10	10

Table 9
Area Irrigated Through *Kamalais* and Electricity

Area Irrigation (cents)	No. of <i>Kamalais</i> and wells						No. of wells with elec- tric power		
	PWU		PWNU		IOW		PWU	PWNU	IOW
	No. Kama lais	No. of wells	No. Kama lais	NO. of wells	NO. Kama lais	No. of wells			
101-200	2	1	-	-	1	1	-	-	1
201-300	8	4	8	4	10	5	1	2	1
301-400	4	2	6	3	7	2	4	-	1
401-500	10	2	11	3	-	-	1	3	5
501-600	4	1	-	-	-	-	1	3	-
601-700	-	-	-	-	-	-	-	-	1
701-800	-	-	-	-	4	1	1	-	1
801-900	-	-	-	-	-	-	-	-	1
901-1000	-	-	-	-	-	-	-	-	1
1001 and above	-	-	-	-	-	-	-	-	3

Note: Columns 2 to 7 refer to pre-energisation period.
Columns 8 and 9 refer to the current period.
Column 9 refer to the period when it was in use.

← ~~4~~ → 2

Table 10
Changes in Technology and Cropping Pattern

Crops	Pre-well			Kamalai			Electric Motor		
	PWU	PWNU	IOW	PWU	PWNU	IOW	PWU	PWNU	IOW
1. Paddy local variety (long duration and high yielding)	-	-	-	10	11	9	-	-	2
2. Paddy HYV (Short duration)	-	-	-	-	-	1	8	9	9
3. Local cotton (long duration 15 to 20 years)	1	-	-	-	-	-	-	-	-
4. Hybrid cotton (Duration 6 to 7 months)	-	-	1	7	5	1	4	5	6
5. Local maize (yield low)	4	9	7	7	10	9	5	9	7
6. HYV maize (yield high)	-	-	-	-	-	-	-	-	-
7. Grams	8	10	10	-	-	-	-	-	-
8. Plantains	-	-	-	7	8	8	10	6	9
9. Groundnut	1	3	3	1	3	5	3	3	4
10. Onion	-	-	1	8	-	-	-	-	-
11. Chilly	-	-	1	8	9	8	6	8	10
12. Brinjal	-	-	-	1	-	-	3	-	1
13. Ladies Finger	-	-	-	-	-	-	4	2	6
14. Tomato	-	-	-	-	-	-	6	-	1 7
15. Cucumber	-	-	-	-	-	-	-	-	-
16. Vegetables	-	-	-	1	1	-	2	1	-

Table 10 (Cont'd).

Crops	Pre-well			Kamalai			Electric Motor		
	PWU	PWNU	IOW	PWU	PWNU	IOW	PWU	PWNU	IOW
17. Flowering plants	-	-	-	1	-	-	9	-	7
18. Coconut	-	-	-	1	2	-	-	1	7
19. Cumbu	3	8	2	-	-	-	-	-	-
20. Lime	-	-	-	1	-	-	-	-	2
21. Moringa	-	-	-	1	-	-	-	-	-
22. Tapioca	-	-	-	1	-	-	1	1	1
23. Sweet-Potato	-	-	-	1	-	-	-	1	-
24. Tobacco	-	-	-	-	-	1	1	-	2
25. Bitter (Gourd)	-	-	-	-	-	-	2	-	-
26. Sami (Traditional food crop)	-	-	-	-	-	-	-	-	-
27. Ragi	-	2	2	2	3	4	1	1	-
28. Country beans	-	-	-	-	-	-	2	-	-
29. Palmyrah	1	-	1	-	-	-	-	-	-
30. Kudirai Vaali (food crop cultivated long back)	-	-	-	-	-	-	-	-	-
31. Mango	-	-	-	-	-	-	-	-	-
32. Guava	-	-	-	-	-	-	-	-	1
33. Tamarind	-	-	1	-	-	-	-	-	-
34. Pamegranate	-	-	-	-	-	-	-	-	1

Table 11
 Distribution of Wells by Number of the Times Deepened

No. of times deepened	No. of Cases		
	PWU	PWNU	IOW
1-2		1	4
3-4	8	5	2
5-6	1	1	5
7-8	-	-	2
9-10	-	-	1
Total	10	10	10

Monsoon

Winter

Spring

Appendix - A

Changes in Cropping Pattern and Extent of Land

Sl.No. and Name of the well	I season				II season				III season			
	Area (cents)	Name of the crop	Source of irrigation	Season	Area (cents)	Crop	Source of irrigation	Season	Area (cents)	Crop	Source of water or irrigation	Season
A. BEFORE CONSTRUCTING WELL												
Muthuswamy	50	Maiz	Rain	June	125	Grams	Rain	Oct. Nov, Dec (North, East Monsoon)	125	Grazing land (barren land)	Rain	March, April, May
Konar well	75	Grams		July								
				Aug (south-west Monsoon)								
B. DURING KAMALAI SYSTEM												
Muthuswamy	75	Bananas	Kamalai	June,	125	Paddy	Kamalai well	Oct, Nov, Dec	75	Banana Chilly	Kamalai well	March, April, May
Konar well	25	Chilly	well	July,								
	25	Grams		Aug.								
C. DURING ELECTRIC MOTOR WELL (AT PRESENT)												
Muthuswamy	60	Banana	Electric	June,	125	Paddy	Electric motor well	Oct, Nov, Dec	75	Banana Vegetable	Electric Motor well	March, April, May
Konar well	30	Chilly	Motor	July,								
	15	Tobacco	well	Aug.								
	20	Vegetable										

Note: Cropping Pattern details are given for only one partner of a well with 125 cents of land.

Appendix B

Conflicts and Conflict Resolution

Sl. No.	Sharing cost and Benefit	Origin or formulation of rules	Rules	Violation	Conflict
1	A <u>In General</u>				
	1. Sharing Cost	The rules traditionally prevalent in the locality adopted	- The cost shared among the partners on the basis of the extent of land irrigated by each partner in the command area of the well.	Partner or partners violate the rule of meeting the cost (construction, deepening, cost etc)	Conflict arises while sharing cost.
	2. Sharing water	" "	- Water shared on the basis of the extent of land irrigated by each partner in the command area of the well.	If a partner is allowed to draw water from 6 A.M. to 6 P.M. on a particular day of the week, if he draws water for more time than allocated to him, he is considered to have violated the rule.	Conflict arises while sharing water.
2	B <u>Specific</u>				
	1. Wet season (Oct - Feb)	Surplus water - Hence no problem			
	2. Transplanting and chemical fertilizer applying times.	Rules framed according to the need. Immediately after transplanting and applying fertilizer frequent watering is required and so temporary rules are framed among the partners.	- Take water when needed consulting other partners.	No	No

Appendix B (Contd.)

Sl. No.	Sharing cost and Benefit	Origin or formulation of rules	Rules	Violation	Conflict
3.	Power cut	Temporary rules are framed. During power cut the partner not getting water on the due date.	- After the resumption of the electric power connection, on the basis of days assigned partners draw water.	For instance if power conflict arises due to drawing extra water cut is for two days, and a partner draws water during his turn more than his share then conflict arises.	
4.	Summer (March-June)	In the light of the availability of water, crops to be raised, area to be cultivated, sharing of water etc. are decided.	- General rule is strictly followed in sharing cost and water.	Violation of the rule is severely warned. when conflict arises.	Time

Appendix B (Cont'd)

Sl. No.	Conflict Resolution	Penalty	Adjustment Mechanisms
1 A <u>In General</u>			
1. Sharing cost	They meet either near the well or in the village and take decisions.	Partner not paid the share of the cost is not allowed to draw water till the payment is made.	If all partners agree to write off the due from the defaulting partner, even without paying the amount the defaulter can draw water.
2. Sharing water	Partners meet and decide about the compensation to the loser. The loser is allowed to draw extra water when his turn comes next.	Partner who violates the rule is asked to compensate it in the sense of allowing the loser to draw more water when the next turn comes for his share of water.	1. It is an occasional event, the rule-breaker is warned not to repeat it again. 2. If a partner is frequently violating the rules no further adjustments is made particularly when he is urgently in need of water like transplanting time and fertilizer applications time.
2 B <u>Specific</u>			
1. Wet season (Octo-Feb)			
2. Transplanting and chemical fertilizer applying times.	No	No	If X needs more water on a particular day of the week to water the seedlings Y permits him to draw his share. When similar situations arise for Y, X allows him to do so.
3. Power cut	Partners meet and decide the basis of drawing the accumulated water.	Suitable action against the rule breaker.	If A's crop is affected due to current cut B helps him through mutual agreement.
4. Summer (March-June)	Accumulated water is shared among the partners equally -in the succeeding days. Rules are strictly enforced.	Heavy penalty	No adjustment.

Note: There is no notable difference in sharing cost and benefit and the consequent conflict among monocaste and multi-caste well owners. So what is given above is equally applicable to both. In this locality though multi-caste people are sharing cost and water, seldom one comes across cases of conflict on the basis of caste.

Notes

- [1] See for instance Bhalla And Alag (1979), Bhalla and Tyagi (1989) and Dev (1985) .
- [2] This line of argument may be found in Dhawan (1986) Nair and Das (1991) and Madhuma Bandara (1977).
- [3] The growth of well irrigation and its relationship with the commercialisation of Agriculture in the context of Tirunelveli was first pointed out by David Ludden (1979). According to him "The growth of well-irrigation is both historically and socially linked to the development of commercial agriculture. Example is Nadar's who were palmyra traders, later tobacco cultivators and traders. Wells became one of their basic tools. In southern Tirunelveli they grew plantains for sale. They became known as the supreme well diggers of the region, a renown supported by early census records that show them concentrated wherever there is a concentration of well-irrigation".
- [4] Among the different writers on this subject, for recent explanation see MIDS (1988).
- [5] For an analysis of the regional variation in the trends and patterns of rainfall in Tamil Nadu Udaya Kumar (1986).
- [6] The tanks in the villages were constructed about 200 years ago by individual farmers. The tanks were also owned and maintained by the private individuals. In the recent past, a few tank owners found it beneficial to surrender the ownership right to the government to get the silt removed through drought relief programme. Thus, of the five tanks, two tanks originally owned by the private and one is with the government. However, the management of two presently owned tanks is done by the landowners of the command area of these two tanks is as in the past.
- [7] *Kamalai* is a traditional method of water lifting with the help of bullocks like charasa in North India.
- [8] The data we have collected is not adequate to bring out the extent of migration under periods of drought since the last drought took place in the region about 3 years ago.
- [9] Partha basgupta is of the opinion that "In the absence of any intervention (eg. at the well head through co-operation) the doctrine (Reparian doctrine) will encourage an excessive rate of overall extraction leading possibly to and eventual ruin of the basin. This possibility is particularly telling, if it in fact

it is in the communities long term interest to keep the basin alive. But if the circumstances are such that this is a distinct possibility, the question can be asked why the farmers do not see the impending destruction of the basin. The answer is that the farmers may know nothing about the natural rate of replenishment of the water basin and therefore may not know that the total annual rate of extraction exceeds this rate. In fact they may not know what the threshold level of groundwater stock is. Moreover under the reparian doctrine no farmer on his own has much incentive to learn about the natural regeneration rate of the groundwater basin" (Partha Dasgupta, 1982).

References

- Bhalla, G.S., and D.S. Tyagi (1989). Indian Agricultural Development: A District level study. New Delhi: Institute For Studies in Industrial Development.
- Bhalla, G.S. and Alagh Y.K. (1979). Performance of Indian Agriculture: District-wise study. New Delhi: Sterling Publishers. Bandara, CM. Madhura (1977). Hydrological Consequences of Agrarian Change in B.H. Farmer (ed) Green Revolution of Technology and Change in Rice Growing Areas of Tamil Nadu and Sri Lanka. London: Cambridge University.
- David, Ludden (1979). Patronage and Irrigation in Tamil Nadu: A long term view. The Indian Economic and Social History Review Vol. XVI, No. 3.
- Dhavan, B.D. (1986). Economics of GroundWater Irrigation in Hard Rock , Regions With Special Reference to Maharashtra State. New Delhi : Agreole Publishing Company.
- Dev, S. Mahendra (1985). Direction of change in all crops in Indian Agriculture in late 1970's - A look at the level of District and Agro-climatic Regions. Economic and political weekly Review of Agriculture.
- Madras Institute of Development Studies. TamilNadu Economy: Performance and Issues. New Delh: Oxford & IBH Publishing Co. Pvt. Ltd.
- Nair K.N. & A.C. Das, (1990). Agricultural Change in Tamil Nadu: 1918-55 in S. Bhattacharya et.al, The South Indian Economy: Agrarian Change, Industrial Structure and State Policy, c 1914-47. New Delhi: Oxford University Press.
- Partha, Dasgupta (1992). The Control of Resources. Basil Blackwell. Oxford.
- UdayaKumar, M. Irrigation and Cropping Intensity in TamilNadu: A District-wise Analysis, M.phil thesis, Centre For Development Studies, Trivandrum.

NEW ROLES FOR EXISTING INSTITUTIONS
RURAL CO-OPERATIVES AND GROUNDWATER MANAGEMENT

Marcus Moench

Abstract. Groundwater depletion and pollution are emerging as major issues associated with overdevelopment of the resources in many parts of India. Most of the wells are owned and controlled by individuals or local communities. As a result, the central and state government institutions have little hope of effectively regulating their use in ways that address emerging problems. As with other natural resources, management of groundwater must have a high level of community involvement and support in order to be effective. Development of local institutions that can ensure this involvement and support is particularly difficult in the case of groundwater. For many of the factors thought to encourage effective management of the common resources by local groups are absent or difficult to create. As a result, identification of institutions that can effectively implement groundwater management actions is perhaps the most critical factor determining the societies' ability to address emerging problems. The existing rural co-operatives organised for purposes other than groundwater management may represent one such institutional possibility.

Keywords'. Groundwater management, Gujarat, Common property.

Introduction

The purpose of this paper is to discuss the emerging problems relating to overdevelopment of groundwater and potential roles for rural co-operatives in their management. The paper is essentially speculative, since the rough dimensions of groundwater overdevelopment in India are only now beginning to emerge. Comprehensive management systems have never been developed, much less implemented. Where management actions have occurred they have been focused on the *deus ex machina* of developing new supplies (if you have a water problem, pour water on it and it will go away). This paper focuses on issues involved in groundwater management under scarcity conditions where new supply options are limited such, as north Gujarat. The first section outlines the groundwater overdevelopment problems in north Gujarat. This is followed by a brief discussion on the management activities undertaken by the of existing government, Non-Government Organisations(NGOS), and local co-operative bodies. Management issues in groundwater are then analysed from the perspective of experiences in common property regimes involving other resources. The final

section examines how the involvement of the existing rural co-operatives could be utilised to address some of the common pool issues in the development of institutions for effective groundwater management.

overdevelopment

Groundwater mining is a growing problem in most parts of northern Gujarat. Water levels throughout much of Mehsana district are now dropping at the annual rate of 5 to 8 metres, a dramatic increase from the roughly 1 m/yr decline prevailing until 1970 (GOG 1992). According to recent estimates, groundwater resources in 36 taluks, mostly in the north, are approaching overdevelopment (See Figure 1) [1]. Extraction currently exceeds recharge in further 24 taluks (GOG 1992). Piezometric levels in deep tubewells are continuing to decline even in areas recently supplied with new sources of surface irrigation such as the Dharoi dam command area (GOG 1992).

Falling water tables and estimates of extraction in relation to total recharge are, at best, only partial indicators of the extent of groundwater development. Substantial questions exist concerning the accuracy of groundwater estimation methods (Moench 1991a; Dhawan 1990 a). Even the basic data on water table levels are often open to question. In addition, the water table levels and recharge/extraction estimates are poor indicators of actual water availability at the field level. In the hard rock areas porosity is often very low. As a result, groundwater tables often decline rapidly during periods of high pumping but then recover to the original levels once the monsoon set in. In this situation, farmers may not have sufficient water available in their wells to meet the irrigation needs over the full season even though the total extraction is less than the potential recharge. Overdevelopment, in this case, is manifest by the increasingly rapid rates of seasonal water level decline. As the number of wells increases, the rate of seasonal decline increases and the amount of time water is available in the existing wells decreases.

Beyond the water availability question, the emergence of groundwater quality problems is also often related to overdevelopment of the resource. Saline intrusion related to overpumping affects substantial coastal areas in Saurashtra and Kutch (See Figure 2). In addition, saline marine deposits are often interbedded with the sediments containing fresh water in the deep unconsolidated alluvial aquifers of central Gujarat. Fresh and saline aquifers are often found in close proximity. Most of these aquifers are leaky and pumping in fresh areas has caused the migration of saline water into fresh systems (High Level Committee 1991). The net result is that in many areas there has been a decline in the quality of groundwater.

The groundwater overdevelopment problems present in Gujarat are also emerging in other parts of India. Falling water tables are common in the hard rock sections of central and southern India. Well - known problem areas include Coimbatore district in Tamil Nadu and Kolar district in Karnataka. Long-term lowering of the water table may even occur in some sections of the water rich alluvial Gangetic aquifer (Bandara 1977; Pant 1987; Bandyopadhyay 1987,1989). According to Dr. A.S. Chawla of the Water Resource Technology Development Center, Roorkee: "Virtually all areas in western U.P. that aren't served by canals have declining water tables "[2]. Dhawan (1990b) suggests that declining water tables in Punjab constitute a factor in the disappearance of traditional wells and lift irrigation devices such as the Persian wheel. According to some reports, the water table in Punjab has dropped by as much as 60 feet in the districts which were recently subject to waterlogging (Sims 1988). Salinity problems associated with overdevelopment are also a major problem. Many coastal areas face saline intrusion. In addition, saline groundwater is common in Punjab, Haryana, and Rajasthan. Roughly 65% of Haryana is underlain by saline groundwater (Gangwar and Panghal 1989) . When the freshwater pockets become overdeveloped, water quality often declines as saline water is drawn into sweet aquifers or saline sources are tapped increasingly.

The extent of the emerging groundwater overdevelopment problems, their location, and (increasing agricultural demand experiences with farmer responses to supply availability) suggest that supply-side solutions will not be adequate. Groundwater extraction for agriculture is growing at a rapid rate. The number of pumpsets jumped from 87,000 in 1950 to over 12 million nationwide in 1990 (Dadlani 1990). Urban and industrial demands are also increasing. In many arid areas, surplus surface water is not available for diversion to locations where depletion is occurring. In Gujarat, significant portions of the areas experiencing overdevelopment problems fall outside the existing or planned canal commands. Most of the streams in north Gujarat are annual and relatively little water goes unutilised. Even in south Gujarat, where rainfall and stream flows are much higher, there is a major debate over the existence of "surplus" water for allocation to water short regions [3]. Furthermore, an increase in supply would often result in an increase in use - not reduction in groundwater extraction (Moench 1991b;1991c). As a result, large water transfer schemes will not solve groundwater depletion problems even if more sources of surplus water can be identified. Overall, it is clear that actions for increasing water availability will not be sufficient. Changes in end-use as well as increase in supply are essential.

Existing Management Activities

At present, attempts to manage the groundwater resources have focused almost exclusively on enhancing supply availability. This is true for the government, NGOs, and local co-operative efforts.

The government's efforts are typified by big interbasin transfer projects, development of local storage structures (tanks, check dams, etc.), and groundwater resource exploration in areas facing shortages. Minor, and generally ineffective, government attempts at limiting the demand have been made through restrictions on credit and electricity connections for new wells in areas facing depletion. Regulatory legislation has been passed in Gujarat and is proposed in other states. As Dhawan comments, however,

"This author does not entertain any great expectations from such a legislative measure even if enacted. For, there is little hope for effective implementation of such laws which are inherently difficult to enforce in the Indian conditions of small land holdings, inadequate administrative set-up in the countryside, and eroded state of ethics." (Dhawan 1989:9)

In addition to governmental efforts, at least two NGOs, the Aga Khan Rural Support Programme and the Shri Vivekanand Research and Training Institute, have been involved in groundwater management activities. These activities have generally involved the organisation of local water management societies, often, though not always, registered as co-operatives, for the construction and maintenance of small structures (check dams, recharge wells, etc.) to enhance groundwater availability. Funding for the construction is generally arranged through a combination of the government and NGO sources with 25% contribution from the local society. The maintenance of the structures is the societies' responsibility.

Outside the formal NGO and government spheres, co-operative action to develop groundwater resources and to manage water distribution is common throughout Gujarat. In Mehsana district, an area where falling water tables have greatly increased the cost of well construction, most tubewells are drilled by groups of farmers ranging up to 100 individuals. Individual contributions to tubewell construction costs, which often total Rs. 4 lakh to Rs. 5 lakh, range from 1 percent upwards. The tubewell organisations generally have an efficient mechanism for water allocation to farmers in their command. In this author's experience, they do not, however, attempt to influence individual farmer crop choices or water application methods. Other co-operative responses to water problems are also common. Arranging for the import of freshwater has, for example, been a typical farmer response to saline intrusion. Farmers in Husseinabad, a

town in Saurashtra, have purchased small plots of land 1-3 km inland, installed wells, and piped water out to their fields. One co-operative in Lohej imports water over a significant distance for its 150 members (Shah 1989).

A brief review of the recent literature brought to light only one case of demand management (Pani Panchayats of Maharashtra) by local organisations. In this case, under the influence of a far-sighted social worker, Shri Hazare, the farmer organisation decided to ban sugar-cane within the area served by community wells (Patil and Kulkarni 1989).

The focus on supply-side interventions and the almost complete absence of attempts to modify demand by organisations dealing with groundwater is indicative of a basic problem in managing the resource. To use Shah's term (1989), an appropriate "design concept" for user-group based organisations to manage depletion problems is difficult to identify. Co-operative organisations tend to form where individuals feel a strong immediate need and perceive a clear direct benefit from such organisation. Partnerships to construct wells in areas where groundwater depletion has made individuals construction unaffordable are common and serve as a prime example of such co-operation. Drilling a well has the concrete and immediately identifiable benefit of providing access to water. The benefits from actions to increase supply through recharge or watershed management activities are often difficult to identify, particularly at the individual level. Demand management benefits are even less visible. Groundwater is "invisible" and access is controlled by the ability of individuals to construct their own wells. An individual generally receives little direct benefit from reducing his own level of use -- particularly in situations where he cannot be assured that others are doing the same.

The physical dimensions of problems emerging from groundwater overdevelopment necessitate a combination of demand and supply-side actions. The governmental efforts to regulate resource use are unlikely to be effective. Management, if it is to occur, must be strongly rooted in the local community. A strong "design concept" for the development of community groundwater management organisations that can undertake demand as well as supply-side actions is, however, lacking. The insights from the literature on the co-operative resource management suggest that the involvement of the co-operative organisations developed for purposes other than water management may be one way out of this dilemma.

Management Issues from a Common Property. Perspective

Over the past few years, an extensive literature has grown documenting instances of co-operative resource management (CRM) at the village level [4]. Likewise, there are enough studies showing why CRM should not, and often does not, occur [5]. At present, while there is no cohesive theory that successfully predicts the presence or absence of the CRM, a variety of factors have often been noted in cases where it occurs. Among these factors some of the most important are:

- a) Small group size;
- b) Economic and/or cultural homogeneity among group members;
- c) Ability to control free - riders
- d) Access limitations for non-members;
- e) A clearly defined resource? and
- f) A high level of need [6].

The first five factors outline a set of internal group and boundary conditions which are generally associated with successful instances of CRM. Need provides the motivation. What is lacking in the set is a unifying reason why these factors should generally be associated with CRM. It is not possible to predict the occurrence of CRM systems on the basis of the list. Furthermore, not all factors listed are associated with every instance of CRM. The factors hint at an associated underlying reason which may be universal to instances of co-operation in cases where individual incentives would not always follow group objectives. The concept of interdependency may partially help to fill this gap. The hypothesis put forth here is that the tendency toward co-operative group action in any sphere of concern increases where physical, social or economic constraints limit the ability of the individual to act independently of the group. In other words, as interdependency increases so does the tendency towards co-operation. A corollary hypothesis is that as the inherent interdependency in any situation where co-operative action is required decreases and the management intensity increases, the necessity for formal bureaucratic structures and enforcement mechanisms also increase.

Interdependency would tend to be associated with many of the factors commonly observed in cases of CRM. In large groups the number of avenues for individual action with regard to the group tend to be large (compared) to the situation in small groups. An individual in a large group might have access to a number of different traders for the sale of products, a number of different stores for the purchase of basic supplies, different "labour banks" to undertake key

agricultural operations and a number of different churches or temples where religious needs could be met [7]. In a small, especially subsistence oriented, group there is often only one source for each of these necessities. Individuals would therefore be highly dependent on the goodwill of other members in a small group while this interdependency would tend to decrease in larger groups. A similar argument applies to the control of free-riders. When a group with a unified goal controls its members' access to the basic social and economic resources, then it is in a position to impose effective sanctions in response to free-riding. Cultural or economic heterogeneity would also tend to decrease interdependency. In situations of economic disparity, the wealthy tend to have access to necessities regardless of the co-operation or non-co-operation of their poorer counterparts. The poor may be dependent on the goodwill of the rich but the reverse is often not true. Where cultural heterogeneity is the case, an individual tends to be dependent on the goodwill of his own section of the community -- for example a specific ethnic or religious group -- and not necessarily on the goodwill of the community as a whole. Unless all sections share the wider community goals of co-operation, the presence of several sub-groups could substantially weaken the ability of the larger community to implement effective social sanctions against individuals.

It is important to note that what is being described here is association. Thus, interdependency is not equivalent to small group size, the ability to control free-riders or cultural/economic homogeneity. It may be commonly associated with these factors but it is not equivalent to them. This may help to explain why these factors are not present in all the cases where co-operative resource actions occur. The criterion of interdependency may have a wider relevance to the occurrence of co-operative resource action rather than the factors which are frequently, but not universally, associated with it.

On a practical level, the concept of interdependency needs further specification. At its weakest, interdependency is simply a joint goal which no member of the group can achieve without the co-operation of all other members. More commonly, interdependency would be present where a network of social, religious, economic or physical ties binds the individual to the group and where these ties can be influenced by the individual co-operation or non-co-operation. If non-co-operation can result, in all or some of these ties being threatened to the individual's detriment then interdependency is present [8]. The presence of interdependency implies that co-operation in one arena of life can be ensured by an implicit threat to other arenas.

Management through the Existing Co-operatives

If sound, the concept of interdependency suggests that the best way to manage the resources where the individual incentives for co-operation are diffuse may be through institutions where the incentives for individual co-operation are high. The network of rural co-operatives for agriculture and dairy marketing that exist throughout Gujarat may represent one such opportunity. Dairy co-operatives provide a variety of highly valuable services to their members. They have strong roots in the local communities and are relatively democratic structures. Overdevelopment of groundwater resources threatens the long-term viability of many co-operatives by undermining their production base. The need for their management should be relatively easy to identify.

Given their strong local roots, the existing co-operatives are in a good position to identify emerging problems and community perceptions regarding feasible actions. If the co-operatives decide to undertake water management activities, their structure could encourage a high degree of community participation in developing courses of action. Once actions have been identified, the existing co-operatives may be well placed to ensure their implementation. If the co-operatives link provision of marketing or other services with participation in management activities they could achieve a high degree of co-operation. This would be particularly important in the case of changes in end-use (such as limitations on crop choice) but could also be valuable for actions to enhance supply.

The involvement of the existing co-operatives has a number of other potential advantages. First, larger co-operatives such as the NDB have the ability to develop a strong technical capacity. They could provide advice to the local co-operatives regarding water problems and potential solutions. They could also become active in the development of new solutions. In the western Parts of the United States of America, rural organisations working with farmers have been influential in developing water application techniques that work under farm, rather than laboratory, conditions (Moench 1991b; 1991c).

Finally, the co-operatives are well placed to provide a range of extension services — from training in the use of water conservation technologies to credit — that could be essential to implementing demand-management approaches.

Conclusions

Overdevelopment of groundwater resources is emerging as a major issue in many arid sections of India. The existing responses are mostly on supply side and stand little chance of addressing sustainability issues. Governmental regulation is likely to be ineffective and the existing

community based co-operative approaches provide at best only limited solutions. A major dilemma exists in that the benefits from groundwater management are too diffuse to provide a strong incentive for the formation of co-operative management institutions. The involvement of existing the co-operative institutions developed for purposes other than water management may provide a partial solution to this dilemma.

Notes

- [1] More than 65% of available recharge in these taluks is extracted.
- [2] Discussion on 3/11/91.
- [3] Comments by Professor Y.K. Alagh at the Workshop on Water **Management**, Sardar Patel Institute, Aug 3-4, 1992.
- [4] One of the most important works being the Proceedings of the Conference on Common Property Resource Management (BOSTID 1986).
- [5] Two of the most important pieces being Hard (1968) and Runge (1981).
- [6] A more complete list is given in Moench (1987). The factors have been gleaned from the following sources: Nagabrahman (1989), Ciriacy-Wantrup and Bishop (1975); Stevenson (1984); Runge (1981); Gilles and Jamtgaard (1981); Chambers (1983); Popkin (1981); Oakerson (1985); Olson (1965); Wade (1985).
- [7] Although economic examples are given here, the resources could just as well be social. For example, the number of churches, temples or mosques an individual has access to may well be a basic factor in his dependency on a specific religious community.
- [8] The concept of interdependency could easily be expanded to include situations where co-operation is based on indirect or direct benefits to individuals (rather than threats).

Conceptually, a group could coerce an individual into co-operation just as easily by offering a position of prestige as by threatening social sanctions. The concept is not expanded in this paper because it adds an additional subjective dimension when attempting to apply the concept to actual field situations.

Reference

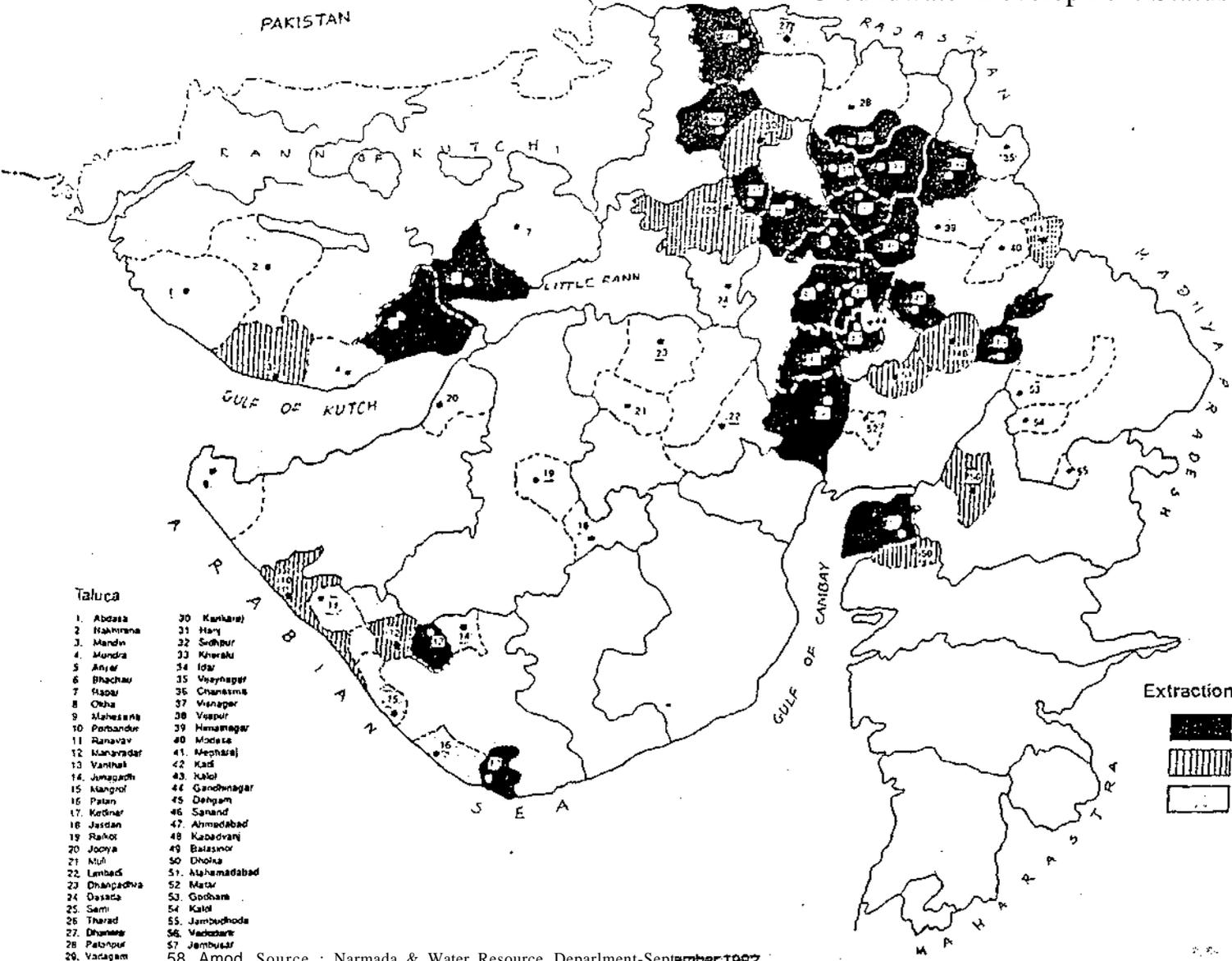
- Bandara, C.M.M. (1977). "Hydrological Consequences of Agrarian Change." in Green Revolution: Technology and Change in Rice-Growing Areas of Tamil Nadu and Sri Lanka., edited by B.H. Farmer, 323-339, Boulder : Westview Press.
- Bandyopadhyay, J. (1987). "Political Ecology of Drought and Water Scarcity." Economic and Political Weekly. xxii (50) 2159-2169.
- Bandyopadhyay, J. (1989). "Riskful Confusion of Drought and Man-Induced Water Scarcity." Ambio. 18(5).
- BOSTID (1986). Proceedings of the Conference on Common Property Resource Management. April 21-26, 1985. Board on Science and Technology for International Development. Office of International Affairs, National Research Council. Washington, D.C. : National Academy Press.
- Chambers, R. (1983). "Concept and Issues Paper: People and Common Property Resources in Land." Unpublished paper prepared for a staff meeting, Rural Poverty and Resources Program, May 19-13, Cairo, The Ford Foundation.
- Ciriacy-Wantrup, S.V. and R.C. Bishop (1975). "Common Property as a Concept in Natural Resources Policy." Natural Resources Journal. Vol. 15, 713-727.
- Dadlani, B.K. (1990). "Status of Energisation of Irrigation Pump Sets." Bhu-Jal News, 5(3), 12-22.
- Dhawan, B.D. (1989). "Preventing Groundwater Over-Exploitation." Paper presented at the Workshop on Efficiency and Equity in Groundwater Use and Management, 30, January to 1, February, Institute of Rural Management, Anand.
- Dhawan, B.D.(1990a). "How Reliable are Groundwater Estimates?." Economic and Political Weekly. May 19, 1073- 1076.
- Dhawan, B.D. (1990b). Studies in Minor Irrigation. Commonwealth, New Delhi, Publisher.
- Gangwar, A.C. and B.S. Panghal (1989). "Trends in Groundwater Development and Management in Haryana," Paper presented at the Workshop on Efficiency and Equity in Groundwater Use and Management, 30, January to 1, February, at the Institute of Rural Management, Anand.

- Gilles, J.L. and K. Jamtgaard (1981). "Overgrazing in Pastoral Areas." *Sociologia Ruralis*. 21(2)/ 129-141.
- GOG (1992). Report of the Committee on Estimation & Groundwater Recharge and Irrigation Potential in Gujarat State. Narmada and Water Resources Department, Government of Gujarat.
- High Level Committee (1991).
- Hardin, G. (1968). "The Tragedy of the Commons." *Science*, 162, 1243-1248.
- Moench, M. (1991a). "Drawing Down the Buffer: Upcoming Ground Water Management Issues in India." Monograph No. 18. Pacific Institute. 18.
- Moench, M. (1991b). Sustainability, Efficiency & Equity in Ground Water Development: Issues in the Western U.S. and India. Pacific Institute monograph, pp 45.
- Moench, M. (1991c). Sustainability, Efficiency & Equity in Ground Water Development: Issues in the Western U.S. and India. Pacific Institute monograph, pp 45.
- Nagabrahmam, D. (1989). "Small Groups and Groundwater Management." paper presented at the Workshop on Efficiency and Equity in Groundwater Use and Management, January 30 February 1, Institute of Rural Management, Anand, Gujarat.
- Oakerson, R. (1985). "Common Property Resources; An Analytic Framework," in (Feeney, Gilles, Oakerson and Thompson.) Workshop on Management of Common Natural Resources Held in December 5, Associates in Rural Development, USAID, Washington, D.C.
- Olson, M. (1965). *The Logic of Collective Action* Boston : (Harvard University Press).
- Pant, N. (1987). "Ground Water Depletion." Economic and Political Weekly, xxii(6), 219-220.
- Patil, R.K. and N.Y. Kulkarni (1989): "Experiences in Ground Water Management in Maharashtra", paper presented at the Workshop on Efficiency and Equity in Groundwater Use and Management, January 30-February 1, IRMA, Anand, Gujarat.
- Popkin, S.L. (1981): "Public Choice and Rural Development — Free Riders, Lemons, and Institutional Design." in Russell and Nicholson (eds.): Public Choice and Rural Development. Research Paper R-21, Resources for the Future, Washington, D.C., pp 43-80.

- Runge, C.F. (1981). "Common Property Externalities.* Isolation, Assurance, and Resource Depletion in a Traditional Grazing Context." American Journal of Agricultural Economics Vol. 63, 596-606.
- Shah, T. (1989). Sustainable Development of Groundwater Resource: Lessons from Amrapur and Husseinabad Villages in Junacradh District. unpublished mimeo, IRMA, Anand, Gujarat.
- Sims, H. (1988). Political Regimes. Public Policy and Economic Development , New Delhi, London, Sage Publication.
- Stevenson, G.G. (1984). The Swiss Grazing Commons: A Case Study in Common Property Resource Economics. Unpublished PhD dissertation, University of Wisconsin, Madison.
- Wade, R. (1985). "Common Property Resource Management in South Indian Villages." Prepared for the conference on the Management of Common Property Resources in the Third World, Washington, D.C. , National Research Council, National Academy Press.

Groundwater Development Status : Gujarat State

14



Taluca

- 1. Abdasa
- 2. Bhadrana
- 3. Mandvi
- 4. Mundra
- 5. Anjar
- 6. Bhachau
- 7. Rapar
- 8. Okha
- 9. Mahesana
- 10. Porbandar
- 11. Ranavav
- 12. Manavadar
- 13. Vantali
- 14. Junagadh
- 15. Kanganol
- 16. Patan
- 17. Keshav
- 18. Jaskan
- 19. Rajkot
- 20. Jooiya
- 21. Muli
- 22. Lambdi
- 23. Dhanpadiya
- 24. Dasa
- 25. Saml
- 26. Tharad
- 27. Dhanra
- 28. Patolpur
- 29. Vardagam
- 30. Kanhari
- 31. Hari
- 32. Sidpur
- 33. Kherali
- 34. Idar
- 35. Vesayager
- 36. Chanesma
- 37. Venapur
- 38. Vessur
- 39. Himmatnagar
- 40. Modasa
- 41. Megharaj
- 42. Kadl
- 43. Kaki
- 44. Gandhinagar
- 45. Dehgam
- 46. Sanand
- 47. Ahmedabad
- 48. Kabadvanj
- 49. Balarvor
- 50. Dhola
- 51. Alhamadabad
- 52. Matar
- 53. Godhara
- 54. Kati
- 55. Jambudhoda
- 56. Vadodra
- 57. Jambusar

Extraction

- Exceeds Recharge
- 85% to 100% of Recharge
- 65% to 84.99% of Recharge

Source : Narmada & Water Resource Department-September 1992

Figure-1

INDIA
MAP OF GUJARAT
FLUORIDES AND NITRATES IN
GROUND WATER FROM PHREATIC AQUIFER

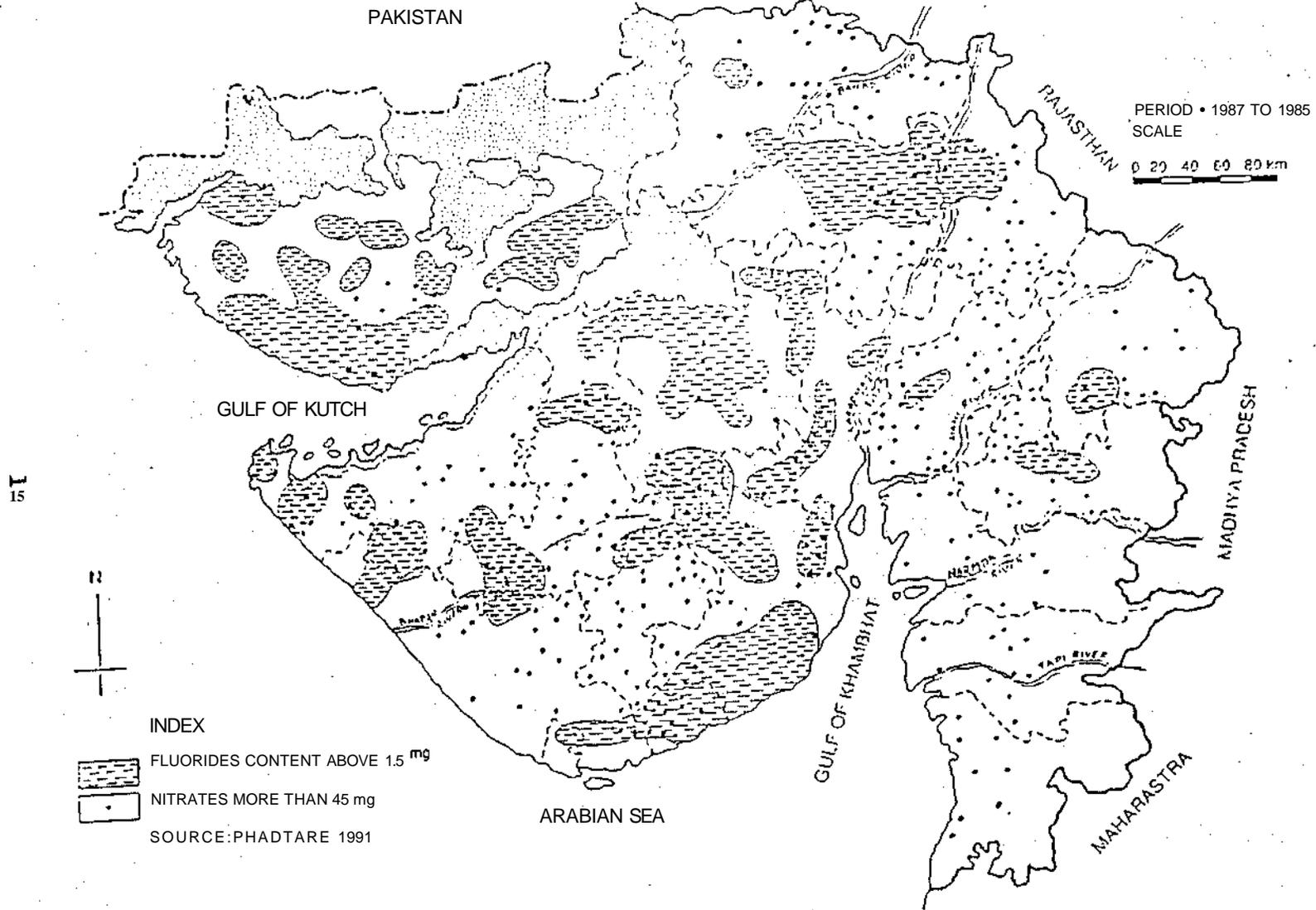


Figure-2

CO-OPERATIVE MANAGEMENT OF **RESERVOIR FISHERIES** :
A STUDY OF PONG DAM RESERVOIR IN KANGRA DISTRICT OF H.P.

T.V. Moorti **and** S.K. Chauhan

Abstract. The present study was carried out in a man-made Pong Dam reservoir of Himachal Pradesh with a view to study the organisation and working of the reservoir fish co-ops the pattern of fish arrival and revenue earned, to know the sale procedure and price-spread in the marketing of fish. The findings of the study reveal that a close relationships existed between the fish co-op societies and the state fisheries department which in turn led to the increase in the number of co-op societies and their membership by 500 and 66% respectively, over a period of decade i.e., 1980-81 to 1990-91. In the same period the revenue earned from the reservoir increased by 313%. The annual net profit at the co-op level was estimated to be Rs. 19,313. Similarly, net returns of fisherman per annum were worked out to be Rs. 7,539. The fish fauna of the reservoir showed that Rohu and Singhara constitute a major chunk of the fishery as their share was estimated to be about 47% during 1990-91. The study also shows that the co-ops in fish marketing are a success because these have been able to provide the necessary inputs to members and to regularise the collection and marketing of fish in the reservoir. The major share of the consumer's rupee goes to the fisherman (52.43%) followed by the contractor (12.00%) and the retailer (10.00%). A reasonably good share of the producer in the consumer's rupee is treated as an indicator of efficiency. So, it is confirmed that the existing marketing Channel I is reasonably efficient.

Introduction

A reservoir differs from a lake in that the former is artificially created. A reservoir can be defined as a large expanse of impounded water artificially created by putting across a stream an earthen or stone masonry or concrete bundh or dam. Reservoirs are formed mainly for irrigation, generation of power, flood control, recreation, fishery development, etc. Reservoirs in India are located in the hills as well as in the plains. Naturally formed lakes and man-made reservoirs constitute major potential fishery resources in India. The country's reservoir area is, therefore, rapidly changing. According to one estimate, there is at present a water spread of about 0.65 million ha in the country. Damming of streams has been in vogue since time immemorial.

Fish production in the Indian reservoirs varies depending upon the level of fishery development. It is estimated to be 6.2 kg and 39.0 kg per ha in Tungabhadra and Matture, respectively and 250 kg/ha in Keetham, an approximate estimate of the average fish production from the Indian reservoirs being only 6-7 kg/ha (Jhingran and Tripathi 1969). Various steps usually adopted in the development of fisheries in the Indian reservoirs are (i) survey of the fish fauna of the river before impounding of the reservoir, (ii) clearance of submerged obstructions like tree trunks, buildings, etc. (preferable at the pre-impoundment stage) and weeds to permit easy exploitation, (iii) establishment of a fish farm, (iv) stocking of the reservoir, (v) survey of fish seed resources to decide the necessity and the intensity of stocking from extraneous sources, (vi) rehabilitation of fishermen communities on the periphery of the reservoir, (vii) organisation of co-op societies for proper marketing, (viii) topographical survey of the reservoir substrata, (ix) experimental fishing before throwing open the reservoir for commercial exploitation, (x) transport and marketing, and (xi) conservation and management.

Fish is an important source of animal protein and as such has a vital role to play in the improvement of nutritional standard of the people. As a supplement diet to bridge the gap between the availability and requirement of food, which is further being accounted by the fast growing population, the development of fisheries assumes greater significance. A study conducted by the Indian Institute of Management, Ahmedabad predicted the domestic demand of fish between 12.5 to 2.00 lakh tones by 2,000 A.D. However, the present (1989-90) fish production in India is around 33 lakh tones. To meet this gap between demand and supply, the inland fisheries sector is to be exploited as the marine fisheries sector is expected to contribute not more than half of the requirement.

Now our country is on the threshold of attaining self-sufficiency in food production as a result of years of sustained agricultural research. In developing countries like India though the foodgrains production at present is marginally surplus, the problem of protein gap is still acute. The increase in population especially among the poorer classes causes rampant malnutrition necessitating increased production of protein-rich food. About 40% of the world population and 70% of the India's population is seriously suffering from malnutrition and protein starvation at present. So to overcome these difficulties, an efficient production, marketing and distribution system of the fisheries which has been a traditional enterprise for years together and one of the important sources of protein, must be evolved.

During recent years, fisheries development in the rural areas has assumed great importance. The technology deve-

loped during the last decade has brought in new dimensions for the fisheries development in the rural areas. The economic problem of fisheries development arises from various factors e.g., a high degree of uncertainty and risk involved in production, variation in fertility depending on the availability of food for fish and variety of fishes, fluctuations etc. In the existing production technology and marketing policy the fishermen are not quite sure of their rewards in terms of both, the yield and the price. Competition with other animal protein and the consumer's preference also play an important role. High perishability, seasonal variation in supply, inelastic nature of supply in the short period are the other factors contributing to the problem.

Fisheries co-ops

The organisational structure of the fishery co-ops normally consists of the primary fishery co-ops at the base level. A super-structure of federation of the primary fishery co-ops has been built up. It comprises district and central federations and state level organisations. All India Fishermen's Co-op Federation was set up in 1980. The number of the primary fisheries co-op in India during 1988-89 was 8,372 and their total membership stood at 11.30 lakh (Sankaran Committee Report 1991). The annual business turnover was estimated to be Rs. 43.94 crore. In 1988-89, at the national level, there was one National Federation of Fishermen's Co-ops; at the State level, there were 15 State Federations of Fishermen's Co-ops, and at the district level, there were 78 Central Fishermen's Co-op Societies.

Fisheries Resources in Himachal Pradesh

Himachal Pradesh is mountainous and is extensively criss-crossed by perennial rivers, streams and reservoirs which provide congenial conditions for the development of fisheries. The estimated length of riverine resources in the state is 3,000 Kms of which 600 Kms length lies in the trout zone and the remaining 2,400 Km length in the valley zone. In the valley zone also lies the main reservoir resources of the state. The Pong Dam and the Gobindsagar reservoir which respectively have come up as a result of high dams across the river Beas and the Satluj River have an aggregate area of 40,000 ha and are thus the main contributors to fish. The state is divided into two regions namely, the mountainous region and the sub-mountainous region. The elevation of the former ranges between 300 meters to 1,500 meters and for the latter above 1,500 meters. The Gobindsagar and the Pong Dam are located in the mountainous region.

Development of Fisheries in Himachal Pradesh

Prior to the formation of Himachal Pradesh in April, - 1948; none of the princely states except Mandi had fishery organisation. In Mandi too, the work was limited to running a small trout hatchery at Barot and management of river and streams with the employment of one sub-inspector and a few guards. Fishing was allowed under the licence system and the staff was engaged in the conservation of fish. In the erstwhile suket state, fishing was allowed under the contract system. With the formation of Himachal Pradesh in 1948, the fishing regulations and acts were applied to the entire state which made a remarkable progress in the field of fisheries came into existence in August, 1950; the first an foremost task for the department was to collect systematically, all relevant data with regards to the availability of resources, the production and the manpower engaged in fishing. Thereafter, conservation of fisheries so as to obtain optimum yield, from the riverine resources as taken up. In order to achieve this objective, the Indian Fisheries Act, 1897 and the Punjab Fisheries Act, 1914 were extended to the state and all available water reservoirs were opened to general fishing on a rational licensing system. A set of rules for protection and regulation of fisheries were also promulgated which among other things provided for fish size, mesh size regulations and prohibited want on and wasteful methods of killing the fish.

The number of registered fishermen in H.P. rose from 1,300 in 1951-52 to 11,021 in 1989-90. This has also resulted in the increased production of fish from 200 tones to 4,620 tones in the same period (Table 1). The fisheries sector accounted for 0.28% of the net state domestic product during 1989-90 at current prices.

There is not much published work available on the inland fisheries co-op as well as the reservoir fisheries co-op in India. We could locate only a few studies on the subject such as : Bhalerao and Kalicharan 1968; Saxens 1968; Chakravorty 1968; Dhondyal and Singh 1969; Prasad 1968; Jha 1968; Srinivasan 1968; Kawatra 1981; Mehta 1983; Rao 1984; Chatterjee and Bandyapadhyay 1990 and Sarada and Narender 1990.

In all the Five Year Plan, a number of scheme for the upliftment of fishermen and the development, of fisheries have been drawn and implemented. The development of fisheries and fishermen are interlinked. Himachal Pradesh has a great scope and potentiality for fish production. The Govindsagar on the Satluj River is the leading reservoir of the country with the production level of 75 kg per ha. Similarly, the Pong Dam on the Beas River is endowed with a huge fish production potential. Fishing in both the reservoirs has been brought completely under co-op fold since 1976. The co-op play an important role in the promotion of fisheries in the reservoirs. The fishermen's

co-op societies apart from providing for the development credit requirements to the needy **members**, are important for the marketing of fish which ensure on one hand remunerative prices to the fishermen and on the other hand, availability of fish at reasonable rates to the consumers by and large. In this study, an attempt has been made to study the management and the economic aspects of the co-ops.

Pong Dam Reservoir Fisheries Co-op : A Study

Objectives

The specific objective of the study were:

- a) To study the aims and objectives, organisational structure, functioning of the fish co-ops and to assess the intra and inter-relations of the state fisheries department and the fish co-ops.
- b) To study the pattern of fish production and revenue earned in the reservoir.
- c) To work out the variability in fish catch at the co-op level.
- d) To know the price-spread in the fish marketing and assess the marketing efficiency.

Methodology

The study was confined to the Pong Dam reservoir of Himachal Pradesh. Nine fish co-op societies out of twelve were selected at random for the study. In order to achieve the specific objectives stated above, detailed primary and secondary data were collected for the reference year **1990-91**. Conventional percentages and tabular analyses were used to interpret the results. Price-spread was estimated by concurrent margins method. Variability in fish catch and marketing efficiency was worked out using co-efficient of variation and Shepherds's formulae respectively as under:

$$\text{Co-efficient of variation} = \frac{\text{Standard Deviation}}{\text{Mean}} \times 100$$

$$\text{Marketing Efficiency} = \frac{\text{Value of the product}}{\text{Marketing cost}} \quad \mathbf{1}$$

The Background : About the Reservoir

The Pong Dam reservoir (Fig.1) came into being due to the construction of an earth-filled dam across the Beas River.

The construction of the dam was started in the year 1961 and was completed in 1974,

The same year, the reservoir was filled. By this inundation a reservoir measuring 42 km in length, 19 km in width and water spread area of 24,000 ha at 1,410 feet level was created. The uplevel and deadline of this reservoir is 1,430 feet and 1,260 feet respectively. It is surrounded by 250 km rail line and motor roads. In the west it is adjacent to the Punjab state. It provides a livelihood to about 2,000 fishermen families which had become jobless due to the creation of this dam.

The Fisheries Co-op Societies % Background Information

Aims and Objectives

The fish co-op societies have been organised with the following objectives:

- a) Make arrangement for raising funds for the members and its own business.
- b) Procure appliances and raw material to supply to members.
- c) Make arrangements for the marketing of fish of the members.
- d) To carry on production on co-op basis.
- e) To acquire and hold in common or on hire to members improved appliances connected with the industry.
- f) To do such other acts as may be conducive to the attainment of the general objectives of the society and creation of the spirit of thrift, mutual help and self-help amongst members.

Eligibility criteria for membership

According to the bye-laws of the society, any person is entitled to become a member, if he fulfills the following conditions. . . .

- a) Should be over 18 years and less than 60 years of age and of sound mind.
- b) Should be ordinarily, resident of the area of operation of the society.
- c) Should be of good character.
- d) Should be professional fisherman actually engaged in the fisheries production.

- e) Should have not declared as an insolvent/bankruptcy.
- f) Should have not been sentenced for any offense,

Membership fee

Each member of the fish co-op society has to pay Rs. 50 as membership fee once at the time of registration. Each member has equal share in the society.

Functioning of Co-op Societies

The members of the fish co-op societies are given fish licences by the state fisheries department, that is, by the Assistant Director of the Pong Dam reservoir fisheries. A member fisherman is issued one licence for maximum of two gillnets per year @ Rs. 50 per gillnet. A registered fisherman of the co-op society is issued a licence provided his application is duly recommended by the fisheries officer and the president of the concerned co-op society. The number of licences to be issued in each society is judged by the Assistant Director of the Pong Dam reservoir fisheries.

Over and above the saturation point no licence is issued to the additional members, though, they may be the registered members of the society. The old and the new fishermen members with good repute are given preferences while issuing licences; likewise a check is imposed on the accommodation of new entrants. The fish lift contracts from landing centres are allotted to contractors during February - March every year by the respective fish co-op societies in consultation with the Assistant Director of the reservoir fisheries. These contracts are given either through private negotiation or through open auction method. The contractors have to deposit a notified amount in the form of security with the respective society at the time of getting a contract for fish lift. The interest accrued from this amount goes to the society. The amount of security is released to the contractors in 3-4 installments over a period of time.

The contracts and rates of fish for summer (April-September) and winter (October-March) season vary depending on the location and distance of market place. However, keeping in view the rising trend of general price and to safeguard the interest of the fishermen, no fish lift contract is allotted at equal or lower price than the previous year. For example, in 1992-93 about 10% higher prices are being offered to the fishermen as compared to 1991-92. One more interesting feature of the pricing policy is that the fishermen are offered a price for fish irrespective of its varieties. Likewise, the chances of cheating the fishermen are minimised to the possible extent. Every year, 16th June to 15th August is strictly observed as the "closing period".

Governance System Governance System of Co-op Societies

The General Body (GB) of the society consisting of all the members has the supreme powers, A meeting of the GB of each society is held every year. The members elect four to five representatives from the GB to the management committee who, in turn, elect a Chairman, a Vice-chairman and a treasurer among themselves... The tenure of this management committee is of two years. The elected members should be the active members (i.e., fishermen actually engaged in fishing) of the fish co-op society. Those societies have one secretary (a paid servant of the Co-op Registrar's Office) who keeps the record of fish production and payments made to each member as well as of other financial matters. Normally, the secretary is paid Rs 500 per month by the concerned society and rest of his payments are made by the Co-op Registrar's Office. The co-op societies are governed under the co-op bye-laws. These societies receive the fish catch of the respective members at the respective landing centres and hand over the produce to the contractors. The fish catches are weighed memberwise in the presence of the secretary of the co-op society and other members of the executive body and field assistant of the reservoir fisheries department to cross-tally the figures as well as to put a check on malpractices. The fish contractors cannot lift the fish catch without receiving the *chalan* form from the fisheries department.

The fish co-op societies pay 15% royalty to the government i.e., to the fisheries department on the total sale proceeds and charge three to five per cent commission from the fishermen for the society. The fishermen are paid weekly for their catch, however, the 15% royalty to the government is paid in advance and the book adjustments for balance are made.

Progress of Co-op Societies and Fish Production

The commercial exploitation of fish from the reservoir was undertaken for the first time in 1976. In the beginning, only three fishermen co-op societies namely Dhameta, Dehra and Nagrota Surian (Table 2) with the total membership of 303 fishermen were registered who caught about 98 metric tones of fish valued at Rs. 5.18 lakh. In 1978-79, three more fishermen co-op societies at Haripur, Jawali and Dadasiba were added with the total membership of all the six societies going upto 616. These, fishermen caught about 5.37 metric tones of fish valued at Rs 15.12 lakhs. In 1979-80, two more societies at Barnali and Guglara were added thus raising the total membership to 805. They caught 596 metric tones of fish valued at Rs. 17.79 lakhs. In 1982-83, yet another society was formed at Khatyar raising the total membership of 9 societies to 893. During the year they could catch a total quantity of 499 metric tones of fish valued at Rs. 45.16 lakhs. One society at Jambal was added

during February, 1989 and the strength of all the societies has gone upto 1,392.

Two more societies at Harsar and Nandpur Bharoli have been registered last year (1990-91) and the total membership has now gone upto 1,414, out of which 1,096 (77.51%) are active members. It can be inferred from the table 2 that the number of the co-op societies, their membership as well as fish production has been increasing over the period. Total revenue earned by the government in the form of royalty, licence fee, compensation and auction of illegal fish increased from Rs. 3.42 lakh in 1980-81 to Rs. 14.12 lakh in 1990-91.

Commercial Fish Fauna of Reservoir

Tables 3 and 4 show the changes occurred in the commercial fish fauna. It can be seen from Table 3 that in the initial year Mahseer, Malli, Singhara, Gid, Kalbans and Carp, comprised the major fish catch out of which Gid (L. dero) comprised more than 60% and cat fishes 25% of the total catch. Mahseer formed about 10% of the catch. But this catch composition has changed with the passage of time.

The Gid which initially comprised about 62% has gone down to about 3% now (Table 4). Mahaseer has almost maintained its old composition all along, rather improved a bit. Common Carp which has all along been stocked extensively, has not shown any considerable improvement and forms, at present, only 4% of the catch. Cat fishes comprising of Singhara and Malli have shown slight improvement from 25% to 32%. Kalbans has also increased in the catch from 3.8% to 13.72%. Mrigal and Catla are also increasing in the catch but not much. Rohu which was previously almost nil now constitute a major chunk of the reservoir fishery and has constituted about 42.53% during 1987-88.

Variability in Fish Catch

Variability in fish catch at some selected collection centres is shown in Table 5. It can be noticed from the table that Barnali collection centre has shown the highest (76.921) variability in fish catch followed by Dehra collection centre (63.50%). The high variability at these two collection centres was because of high flow of water. Minimum variability was found in Guglara collection centre which is mainly because of its location.

The main reason for the high variability in fish catch is that during the rainy season (16 June to 15 August) the fish catch is banned for breeding purposes. Immediately after this, the fish catch shoots up. During winter, due to low levels of water and low water temperature, the fish do not come to the surface and hence fish catch is low. During the

summer season, the fish catch increases because of high levels of water and temperature.

As far as monthly average fish catch is concerned, it can be noticed from the table that Nagrota Surian collection centre gave an average yield of 13.52 tones which is followed by Khatyar (10.59 ton) and Dadasiba (9.24 ton) respectively. Jawali collection centre averaged minimum (2.81 ton) fish catch. At the overall level, it can be observed that the monthly average fish catch at the co-op level was estimated to be 63.23 tons. Variability at the overall level was worked out to be 30.93%.

Net returns of Fish Co-ops and Fishermen

The fixed cost comprising of payments made to the staff, expenses on rent and depreciation of assets alone accounted for 86.13% of the total cost (Table 6). The variable cost which included repairs and maintenance charges, accounted for only 13.87% of the total cost. The total cost of the co-op was worked out to be Rs 15,216 per annum. The income per co-op during 1990-91 was estimated to be Rs. 19,313. Similarly, the net returns per fisherman per annum varied from Rs. 2,942 in Jawali society to Rs. 11,089 in Khatyar society. However, the average annual net returns per fisherman in the reservoir were estimated to be Rs. 7,539 (Table 7).

Marketing Channels and Price-Spread of Fish Marketing;

The channels of distribution identified in the fish marketing are as follows:

- a) Fisherman/producer -> Contractor/wholesaler -> Retailer
Consumer
- b) Fisherman/producer -> Contractor/wholesaler -> Consumer

The price-spread of fish marketing is shown in Table 8. Figures clearly indicate that the fisherman's share in the consumer rupee came to 52.43% and 57.34% in Channel I and Channel II respectively. However, out of this 13.29% and 14.53% comes as the cost of production, and thus leaving 39.14% and 42.81% as his income respectively. The constructor (wholesaler) earn 12% and 22.19% net margin in Channel I and II respectively. Finally, the retailer's net margin in Channel I was worked out to be 10%.

Marketing Efficiency

The marketing efficiency is assessed by Shepherd's criterion. This measure is worked out to be 2.87 and 3.89

on Channel I and II respectively (Table 8). It implies that the value of goods sold is higher than the marketing costs and shows the extent of service rendered by the marketing agencies respectively at a cheaper cost.

Conclusion

The study confined to the Pong Dam reservoir of Himachal Pradesh where fish catch has been brought completely under the co-op fold shows that the number of co-op societies and their membership has increased by 50% and 66.55% over a period of decade i.e., from 1980-81 to 1990-91. In the same period, the revenue earned increased by 312.87%. The annual net profit at co-op level was estimated to be Rs. 19,313. The fish fauna showed that Rohu and Singhara constitute, a major chunk of the reservoir fishery as their share was estimated to be about 47% during 1990-91. The major share of the consumer's rupee goes to the producer/fisherman (52.43%) followed by wholesaler/contractor (12.00%) and the retailer (10.00%). A higher share of the producer in the consumer's rupee is treated as an indicator of efficiency. So, it is confirmed that the existing marketing Channel I is reasonably efficient.

It can be concluded from the study that the co-ops in fish marketing are a success because these have been able to regularise the collection and marketing of fish in the area. The factors for the success of fish co-ops can be listed as:

- a) Organisational efficiency of the fish co-ops reflected by a close linkage between the state fisheries department and the fish co-op societies.
- b) Provision of assured remunerative prices for fish by the societies.
- c) Safeguards against possible malpractices such as underweighing and undervaluation.
- d) Strict implementation of 'closing period' for breeding purpose from 16 June to 15 August every year.
- e) Proper spawning in the reservoir every year at the rate of 200 fingerlings per hectare.
- f) All the activities are done under the supervision of qualified and trained personnel.
- g) Exploration of efficient marketing channel by the co-op societies thus leading to higher share of the producer in the consumer's rupee.
- h) Use of recommended mesh size of 4" to 6" for gillnets.

- i) Division of reservoir into several beats: leads to efficient operation by different co-ops independently, which in turn helps them to avoid-any conflicts.
- j) Adequate arrangements for storing the catch.
- k) Establishment of fish seed farms near the reservoir which supplies quality seed and minimises the cost of spawning.

No doubt, the co-ops as well as individual fishermen are making profits but still there exist some problems in the fisheries development as follows;

- a) More geographical area (23,000 ha) and shallow nature of reservoir. This too is covered by 250 km railway line, motor roads and other means of communication. Thus there are chances of fish confiscation by poachers. The number of illegal fishing increased from 87 in 1980-81 to 314 in 1990-91.
- b) Existence of submerged obstructions like tree trunks, buildings, weeds etc., prevents the efficient use of fishing equipment.
- c) Inadequate infrastructure for looking after the fishing activities properly e.g. seven fisheries officers and 22 field assistants with one motor boat operate in the entire area of the reservoir.
- d) Non-existence of fish check posts at the main roads.
- e) Non-distribution of profits by the co-ops to the fish members.

Table 1
Production of Fish in India and Himachal Pradesh.

(in thousand tons)

Year	Himachal Pradesh	India
1950-51	0.200	752
1960-61	0.224	1,160
1970-71	0.660	1,756
1980-81	2.300	2,442
1981-82	2.523	2,367
1982-83	2.870	2,507
1983-84	2.630	2,862
1984-85	2.700	2,801
1985-86	2.950	2,876
1986-87	2.460	2,942
1987-88	4.095	2,959
1988-89	4.375	3,152
1989-90	4.620	3,250

Source : 1. Statistical outlines of H.P.
2. India - A reference annual (1990)

Table 2
Co-op Societies and Fish Catch at Pong Dam Reservoir of Himachal Pradesh.

Sr. No.	Year	No. of co-op societies	Name of co-op society added	Membership	Fish production (M/T)	Cost of fish (lakh Rs)	Total revenue (lakh Rs.)
1.	1976-77	3	Dhameta, Dehra and Nagrote Surian	303	98	5.18	1.00
2.	1977-78	3	Nil	343	266	7.50	1.43
3.	1978-79	6	Haripur, Jawali and Dadasiba	616	537	15.12	2.47
4.	1979-80	8	Barnali and Guglara	805	596	17.79	3.19
5.	1980-81	8	Nil	849	569	22.94	3.42
6.	1981-82	8	Nil	873	443	23.95	3.64
7.	1982-83	9	Khatyar	893	499	45.16	6.98
8.	1983-84	8	Nil	1009	470	36.62	5.63
9.	1984-85.	9	Nil	1009	479	42.62	6.56
10.	1985-86	9	-do-	1091	553	57.11	9.75
11.	1986-87	9	-do-	1113	519	61.81	10.49
12.	1987-88	9	-do-	1203	797	194.39	17.02
13.	1988-89	10	Jambal	1277	474	66.28	11.44
14.	1989-90	10	Nil	1392	489	82.98	13.84
15.	1990-91	12	Harsar and Nandpur Bhatoli	1414	442	82.87	14.12

Table 1
Production of Fish in India and Himachal Pradesh.

(in thousand tons)

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Table 3

Year-wise and Variety-wise Distribution of Fish Production
in Pong Dam Reservoir of Himachal Pradesh.

Sr.No.	Variety	1976-77	1977-78	1978-79	1979-80
1.	T or putitora (Mahseer)	10.0	7.0	5.0	10.0
2.	W. Attu (Malli)	5.0	5.0	6.0	9.0
3.	M. Seenghara (Singhara)	20.0	18.0	17.0	16.9
4.	L. dero (Gid)	61.9	62.1	58.5	34.5
5.	L. Calbasu (Kalbans)		3.8	8.1	24.2
6.	C. Carpio (Common Carp)	-	1.2	1.7	3.3
7.	C. Mrigala (mrigal)	-	-	-	0.1
8.	Miscellaneous	3.1	2.9	2.7	2.0
	Total	100	100	100	100

Table 4
Year-wise and Variety-wise Distribution of Fish Production
in Pong Dam reservoir of Himachal Pradesh.

Sr.No.	Variety	1986-87	1987-88	1988-89	1989-90
1.	T or putitora (Mahseer)	13.82	10.90	11.48	13.19
2.	C., Carpio (Common Carp)	4.59	3.91	6.75	4.11
3.	W.. Attu (Malli)	6.37	3.76	4.94	8.56
4.	M., Seenghara (Singhara)	24.99	16.12	20.42	23.33
5.	L.. Calbasu (Kalbans)	14.25	8.50	11.81	13.72
6.	L.dero/L. pata (Gid/Bata)	5.00	2.52	2.64	2.92
7.	C., Mrigala (mrigal)	9.52	9.66	8.90	4.91
8.	D., Punctatos (Sol)	0.05	0.09	0.07	0.21
9.	C.. Catla (Catla)	0.71	0.94	0.97	1.20
10.	L.. Rohita (Rohu)	18.61	42.53	30.52	23.54
11.	Miscellaneous	2.15	1.07	1.50	4.31
	Total	100	100	100	100

Table 5
 Month-wise Variability in Fish Catch at Different Co-op societies.

Sr. No.	Name of fish Co-op society	Mean value in tonnes (X)	Standard Deviation (S.E.)	Co-efficient of variation (c.y.)
1.	Barnali	5.30	40.81	76.92
2.	Dadasiba	9.24	32.77	35.47
3.	Dehra	5.85	37.12	63.50
4.	Dhameta	6.84	28.42	41.56
5.	Guglera	4.94	12.16	24.51
6.	Haripur	5.73	27.41	47.86
7.	Nagrota Surian	13.52	40.26	29.77
8.	Jawali	2.81	9.42	33.55
9.	Khatyar	10.59	28.22	26.66

Table 6
Annual Costs and Returns of Co-ops

Sr. No.	Particulars	Amount in (Rs.)	Per cent of total cost
A.	<u>Fixed Costs</u>		
1.	Payment to staff	12,500	82.15
2.	Rent and depreciation of assets	2,166	14.23
	Sub-total	14,666	96.38
B.	<u>Variable Costs</u>		
1.	Repair and maintenance of fixed assets	550	3.62
C.	Total Costs (A+B)	15,216	100
D.	<u>Returns</u>		
1.	Commission of the fish catch value and interest earned	34,52.9	-
E.	Net profit (D+C)	19,313	-

Table 7

Estimates of Net Returns from Fishing

Sr. No.	Name of fish co-op society	Average Annual net returns from fishing (Rs./member)
1.	Barnali	5,549
2.	Dadasiba	9,675
3.	Dehra	6,625
4.	Dhameta	9,250
5.	Guglara	9,150
6.	Haripur	5,998
7.	Nagrota Surian	11,000
8.	Jawali	2,942
9.	Khatyar	11,089
	All societies	7,539

Table 8

Price-spread for Fishes Through Different Channels, January 1992.

Sr. No.	Functionary/ items of cost	Channel I (Rs.Per kg)	Percentage	Channel II (Rs.Per kg)	percentage
1.	Net price to the fishermen	18.35	52.43	18.35	57.34
2.	Cost incurred by the fishermen				
	i) Handling and transportation charges upto lending centre	0.50	1.43	0.50	1.56
	ii) Commission charges to co-op society	0.70	2.00	0.70	2.19
	iii) Commission paid to Govt. in the form of royalty	3.45	9.86	3.45	10.78
3.	Fisherman or co-op society's sale/ wholesaler's purchase price	23.00	65.71	23.00	71.88
4.	Costs incurred by the wholesaler				
	i) Packing	1.20	3.43	0.80	2.50
	ii) Transportation &	1.10	3.14	0.70	2.19
	iii) Spoilage	0.40	1.14	0.30	0.94
	iv) Octroi	0.10	0.28	0.10	0.3
5.	Wholesaler's margin	4.20	12.00	7.10	22.19
6.	Wholesaler's sale/ relaiter's purchase price	30.00	85.71	-	-
7.	Costs incurred by the retailer				
	i) Transportation & labour	0.50	1.43	-	-
	ii) Spoilage	1.00	2.86	-	-
8.	Retailer's margin	3.50	10.00	-	-
9.	Retailer's sale/ consumer price	35.00	100	32.00	100
10.	Marketing efficiency	2.87	-	3.89	-

References

- Bhalerao, MM and Kalicharan (1968). "Fisheries co-ops in India." Indian Journal of Agricultural Economics. 23(4), 210-219.
- Chakravorty, S.K (1968). "Some problems of fish culture in West Bengal - a case study." Indian Journal of Agricultural Economics. 23(4), 228-235.
- Chatterjee, P.K and S. Bandyopadhyay (1990). "Performance and progress of primary co-op fisheries in West Bengal." Indian Journal of Agricultural Economics 45(3), 234.
- Galgotis, J.S (1968). "Role of co-ops in fisheries development in Maharashtra state." Indian Journal of Agricultural Economics. 23(4), 259-263.
- Jhinngam and Tripathi (1969).
- Kawatra, A.K. (1981). "Feasibility of fishermen co-ops in Punjab." Punjab Fisheries Bulletin. 53-56.
- Mehta, S.R. (1983). "Setting up fishermen's co-ops in Mauritius." Indian Co-op Review. 20(2), 201-214.
- Parsad, D (1968). "Economic aspects of fisheries development in Bihar." Indian Journal of Agricultural Economics. 23(4), 239-242.
- Sarada, R.V. and I. Narender (1990). "Rural development through co-ops: a case study of Mahatma Gandhi lift irrigation co-ops society in Gandipalli of Nalgonda district." Indian Journal of Agricultural Economics. 45(3), 236-237.
- Saxena, B.S (1968). "Indian fisheries in the national economy." Indian Journal of Agricultural Economics. 23(4), 219-223.
- Singh, GN and Dhondyal, S.P (1968). "Benefit cost ratio in fish culture." Indian Journal of Agricultural Economics. 23(4), 235-239.
- Singh, I. J. and Pandey, VK (1968). "Fish production function for west Godavari district, A.P." Indian Journal of Agricultural Economics. 23(4), 255-258.
- Sinha, S.P and Jha, MN (1968). "Development of fisheries - a study of the fishermen co-op societies in the district of Darbhanga, Bihar." Indian Journal of Agricultural Economics. 23(4), 243-247.

Srinivasan, M (1968). "Economic aspects of fisheries development in Madras state." Indian Journal of Agricultural Economics. 23(4), 243-247.

Subha Rao, N (1984). "Fishermen's co-ops federations in India: performance and problems". Indian CO-OP REVIEW. 21(4), 352-368.

THE CAPTAIN BHERY FISHERMIM'S CO-OPERATIVE SOCIETY IN WEST
BENGAL A CASE STUDY

Katar Singh and Sangeeta Dhar Choudhury

Abstract. This paper presents the results of a case study of a sewage-fed primary fishermen's co-operative (co-op) – the Captain Bhery Fishermen's Co-op Society -- located in Naobhanga area in the South 24-Parganas district of West Bengal. Having been registered in 1927, the society represents an ultra-stable successful institution actively supported and regulated by the Government of West Bengal. The society had 16 ha of sewage-fed water area that was used for pisciculture. The area was taken on lease from the government. The society had 29 members of whom 27 were fishermen by birth. It had been successful financially all through its existence and had bagged the National Productivity Award for three consecutive years from 1987-88. The average productivity in 1987-88 was 5.80 metric tonnes of fish per ha of the water area which is significantly higher than the average productivity in the state (2.45 mt/ha). The members of the society were, by and large, satisfied with the functioning and performance of the society. Neither the society nor the higher level Central Society and the apex level Federation did anything to ensure remunerative price for the fish caught by the members of the society. The authors highlight the need for intervention in the existing fish marketing system by extending the scope of the activities of the co-op structure to include fish processing and marketing also.

The co-op had two unique features. One, its members were paid monthly salary like any other government employees. Two, its Chief Executive Officer was a government employee who was nominated by the government to serve as a member of the Management Committee of the co-op. Despite the fact that it is closely regulated and administered by the government, the co-op has been successfully operating for over four decades. The authors commend the model for replication in similar environments within and outside the state.

Keywords: bhery, equity, Oakerson model, sewage-fed, sustainability, ultra-stable, fishling.

Introduction

At present, India with her second largest fresh water resources in Asia ranks third in fresh water fish production in the world (CICFRI 1988-89). Out of nearly 16 lakh ha of water area available in ponds and tanks in India, over 6 lakh ha is under fish production. Of the total fish production in India, 35% to 40% is normally contributed by inland fisheries, and about 10% of the total inland fishery production is accounted for by culture, fisheries.

The fisheries sector is now poised for creating a significant impact on the economy of the country as a whole. The sector is emerging as an important source of income, employment and foreign exchange. The amount of foreign exchange earned from the export of marine products has increased substantially (116%) from Rs.635 crore in 1989-90 to Rs.1,375 crore in 1991-92. Organisation of fishermen's co-operatives (co-ops) is now recognised as one of the major instruments for improving the economic condition of fishermen most of whom live below the poverty line. In India, in 1988-89, there were 8,372 primary fishermen's co-ops and their total membership stood at 11.30 lakh (Sankaran 1991). It is estimated that more than 50% of the fishermen in the country are in the fold of fishermen's co-ops. But, in spite of the financial, technical and infrastructural facilities provided by the government and other agencies like the National Co-operative Development Corporation (NCDC), the fishermen's co-ops have so far not been able to achieve their objectives. Most of them today suffer from various organisational, managerial, operational, and financial weaknesses which create obstacles in their task of uplifting the socio-economic condition of the fishermen community at large. The co-ops are afflicted by the lack of necessary horizontal and vertical linkages, financial discipline, proper marketing strategy, co-operative spirit among the fishermen, trained personnel for their management, etc.

The state of West Bengal has the highest production and productivity of inland, fish in the country (GOWB 1992 :32). It has bagged the National Productivity Award for the highest, fish production in the co-op sector for five consecutive years from 1985-86 through 1989-90 (ibid : 18}. The state has registered a steady growth rate of about 12% per annum in fish production from 1984-85 through 1990-

This case study was undertaken to explore into the governance structure, decision-making environment, operations, management, and performance of a primary fishermen's co-op, the Captain Bhery Fishermen's Co-operative Society hereafter referred to as co-op.

Research Methodology

The co-op was selected in view of its continued good performance over a period of some 65 years since its inception in 1927. In West Bengal, the experience with co-ops in general has not been encouraging (Baviskar and Attwood 1992). Therefore, the sample co-op represents a rare case of success in the state and hence deserves careful study and analysis. The case study method of research was used to fulfil the objectives of the study. The technique of Rapid Rural Appraisal was employed to collect the needed primary and secondary data from the co-op as well as its members and officials. The data collection work was done in the months of March and April 1992. The Oakerson model was used to analyse and evaluate the management of the fishery as well as the co-op. In a nutshell, the model consists of four components, namely, (1) technical and physical characteristics of the resource and/or the facility; (2) decision-making environment,* (3) patterns of interactions among the decision makers; and (4) outcomes and consequences (Oakerson 1986, 14-22).

Terminal and Physical Characteristics of **the Co-op**

The co-op is located in the Naobhanga area in the South 24-Parganas district of West Bengal. It is a city sewage-fed farm comprising quite a few *bheries* (small natural or man-made water bodies). The *bheries* allow the city's effluents and sewage to undergo a natural process of detoxification and bio-degradation, a process that takes a few days. Moreover, the alga that is visible in the lakes feed on the nutrients found in the sewage of the city. This algae serves as food for the fish. The *bheries* are very efficient in their cleansing function. Through the purely natural processes, they destroy 99.9% of the pathogenic coliform bacteria that comes from the sewage.

The co-op had 16 ha of productive water area under its command of which 13 ha was used for fish culture and the rest 3 ha for producing fish seeds/rearing fishlings. The water area is divided into two stocking *bheries* measuring together 13 ha and 10 fishling rearing/fish seed producing nurseries. The entire water area is exclusively used for pisciculture by the members of the co-op, i.e., exclusion of non-members is done effectively. The water area, before coming under the co-op fold, was under the possession of an army Captain and hence, the name Captain *Bhery*. Later on, some fishermen who built their huts along the bank of this *bhery* and started fishing in it for their livelihood made an appeal to the government that they be allowed to form a co-op and that the water area be vested in the co-op to be developed for fish culture.

In 1987-88, the Department of Fisheries undertook a project for reclamation of derelict water bodies under the Rural

Labour Employment Guarantee Programme. The project helped the co-op by providing additional water area for expansion of aquaculture with improved technology and also for fish seed production. Besides the expanded water area, this programme also provided the co-op with three sluice gates, two culverts and a 900 sq mt. long feeder road, The production of fish increased by about 50% after reclamation.

The Decision-Making Environment

In this section we briefly discuss the organisation structure and management system of the co-op and examine the role that the GOWB has played in nurturing the co-op over time.

Organisation Structure

At the state level, the Ministry of Fisheries is responsible for the overall development of both the fisherfolk and the fisheries in the state. Under the Ministry, there is a Department of Fisheries headed by a Secretary to the Government of West Bengal (GOWB) and a Directorate of Fisheries headed by the Director of Fisheries. To facilitate the work of registration and regulation of fishermen's co-ops in the state, the Director of Fisheries has been delegated the powers of Additional Registrar, Co-op Societies. At the district level, District Fisheries Officers and at the block level, Fishery Extension Officers look after the work of fisheries development and welfare of the fishermen, In matters relating to registration and regulation of fishermen's co-ops, the Assistant Registrars and Co-operative Inspectors are responsible to the Director of Fisheries.

The fishermen's co-ops have a three-tier structure of primary co-ops at the village level, central societies at the district/intermediate level and an ap-ex co-op federation at the state level. All necessary financial and technical assistance to both inland and marine fishermen's co-ops are provided by the qualified officials of the Directorate of Fisheries. Till 1988, there were 769 fishermen's co-ops in the inland sector and 18 co-ops in the marine sector, There has been a rapid growth in the number of fishermen's co-ops in the last few years. As a consequence, by November 30, 1991, the number of primary co-ops in the inland sector in the state had increased to 848 and their membership to 70,427. The primary co-ops are affiliated to 18 central societies. The number of registered co-ops in the marine sector had increased to 28 and their membership to 840. Some 73,100 acres of effective water area was held by the co-ops for aquaculture (Das 1992 : 14-15).

An apex body named the West Bengal State Fishermen's Co-operative Federation Ltd., or BENFISH in short, provides the needed financial and technical support to the fishermen's co-ops in the state and co-ordinates their activities. More specifically, its major activities include organising fishermen's co-ops; constructing boats and trawlers for them; supplying them with various other equipment and inputs such as fishing nets, high speed diesel, ice blocks, etc.; storing their fish stock in cold storages; and ensuring the speedy transportation of the fish through their insulated mobile vans.

Management of the Co-op

The business and other affairs of the co-op are managed by a Managing Committee consisting of six members who are all elected from amongst the members of the co-op for a period of three years. The maximum tenure of the Committee membership is two terms of three years each. The Committee includes a President, Vice President, Secretary and three members (Directors) all of whom are elected in a democratic manner by the members of the co-op in its Annual General Body Meeting. The members are given full opportunity to voice their opinions. The co-op had four staff members - manager, accountant, peon and driver. The Chief Executive Officer (CEO) of the co-op was a Grade II officer of the GOWB - a Fishery Extension Officer. This is a characteristic pattern of all the primary fishermen's co-ops in the state, each of which is headed ex officio by the Fishery Extension Officer posted in the Block in whose jurisdiction the co-op lies. The CEO has full administrative, financial and technical control over the employees of the co-op and handles all its financial transactions including the operation of bank accounts.

The books of accounts and other records are maintained by the Manager and the Accountant. They are also responsible for receiving and making payments. The CEO and the Manager provide the technical guidance for fish culture. Though the account books and records are maintained by the staff, it is the duty of the Secretary to verify the accounts and records as it is he who is accountable to the members for the working of the co-op. There is also a Purchase Committee comprising four of the members who are responsible for the purchase of fish seed, fishlings, feed, etc.

Role of Government

The prospect of development of the fishery co-ops in the state has brightened in recent years due to certain positive steps taken by the GOWB. The Department of Fisheries has taken up a number of schemes for developing the economic condition of the fisherfolk. They include provision of extension education service, improved fishing technology, credit, subsidies, and additional water areas for

fish culture, etc. Till 1977, the traditional system was to auction the lease right of capture fishery or culture fishery on public water bodies to the highest bidders. In 1977, the government changed the policy and gave full legislative support to the fisherfolk, making provision for transferring all the vested water areas and other public water bodies to the local fisherfolk organised into fishermen's co-ops. Since then, the fishermen's co-ops have been holding legal rights over such vested water and public water bodies for capture as well as culture fishery at concessional lease rent with some exceptions due to administrative or legal problems (Das 1992: 14). At a joint state level fishery conference held on February 16, 1978, it was decided that the existing fishermen's co-ops should be reorganised into viable or potentially viable co-ops through merger, liquidation, and registration of new societies (Khulbe 1992: 7). Consequently, some 741 of the existing primary co-ops have been reorganised into 541 viable or potentially viable societies.

The Department of Fisheries has been instrumental in mobilising and channelising a lot of institutional finance through direct departmental investment, investment through schemes funded by the NCDC and governmental subsidies through various schemes for development of both inland and marine fisheries in the state. At present, around Rs. 7 crores are annually spent for providing productive assets to the fishermen's co-ops through the apex body.

The legal owner of the water area is the Director of Fisheries, GOWB. The society enjoys usufructuary rights on a lease basis for a maximum period of 10 years. The use of the water area is governed by the West Bengal Inland Fisheries Act of 1984 and the rules framed by the GOWB in 1985. A rent of Rs. 10,000/year is paid for the entire water area.

To conclude, we can say that GOWB has played an active role in establishing and managing the fish co-ops in the state. In an environment, like what prevails in West Bengal where the fishermen are all very poor and mostly illiterate and where they would not form co-ops on their own initiative even if they realise the need for them, the rationale for government initiative for organising co-ops and for assisting them technically, financially, and administratively is overwhelming.

Interactions among the Decision Makers

The co-op was registered on April 24, 1977 with an initial membership of only 11 people. However, as of April 1992, the number of members was 29 of whom 27 were fishermen by birth/occupation and one each was a Brahmin and a Kayasth. Besides, there was one member - a government employee - nominated by the GOWB. He was deputed to serve as the CEO of

the co-op. Membership is open to all the fishermen of villages Tapuriaghatta (east and west) and Chingrighatta under Tiljala Police station in the South 24-Parganas district. The society had a few non-members as employees too. They included seven labourers (for guarding and miscellaneous work) and six head loaders (for carrying fish from the catch centre to the selling spot, i.e., arat). For enrolling new members, the co-op follows a policy whereby a person desirous of becoming a member of the society is kept on probation as a non-member employee of the co-op for a period of 10 to 15 years. If the Managing Committee is satisfied with his work, he is enrolled as a member. There were no female members and all the members were Hindus. , Most of the members were educated upto the primary level. The members of the co-op are not educated enough to take financial decisions and are solely dependent on the CEO's initiative. The CEO being a government appointee has no personal stake in the society and did not take interest in all matters at all times.

We interviewed a few government officials associated with the fish co-ops in the state. According to the CEO of the Laketown Co-op, the members lacked initiative on their part. This lackadaisical attitude of the members has arisen, in his opinion, after the outbreak of a fish disease which caused severe losses to all the fishermen's co-operative societies in the state. With the fall in the output of fish as a result of the disease, the income of the member-fishermen from fish went down drastically and they are compelled to seek alternative sources of income and employment [1].

Outcomes and Consequences

The outcome of the management of the co-op can be evaluated in terms of yield of fish per ha of water area, financial viability (net profit earned by the co-op), and impact of the co-op on the economic well-being of its members and non-members. In the following paragraphs, we attempt to evaluate the performance of the co-op in terms of these criteria.

As per its bye-laws, the main objective of the co-op is to improve the condition of the fishermen who are its members. In furtherance of this objective, the co-op is at liberty to undertake a variety of activities including acquisition of fishery rights; arranging for the catching of fish in all the fisheries acquired by it; arranging for the disposal of the catches; raising funds; making advances and granting loans to its members; and so on.

Operations

Initially, the co-op started its operations by purchasing fishlings and then growing them in its own ponds. But now,

it undertakes the rearing fishlings too. The fish seeds purchased are placed in the nurseries for 15 days. After that they are taken to the rearing ponds where they are kept for one the one and a half months. Once these fishlings grow to the size of a finger, they are transferred to the main water bodies. The following species of fish are raised by the co-op :

1. Indian Major Carp *Labeo Rohita*
Catla Catla
Labeo Mrigela
2. Exotica Variety *Cyprinus Caspio*
Silver Carp *Telapia*
Mosambica Big head
Carp etc.

The fish seeds are supplied by the apex federation; from co-op's own production in its nursery/rearing tanks; and from other sources. The central society stopped supplying fish seed to the co-op three years ago as the latter* was unable to repay the amount outstanding against it. The co-op is now capable of meeting about 10% of its requirement of fish seed itself while the remaining is supplied by a few private firms. The co-op makes the purchase of fish seed on credit basis from M/s, B. Pandit & Eros,, Bijoy "Kr Dey and M/s. Ganesh Ch. Dey. It is alleged that the co-op does not follow the. specified norms and procedures while purchasing fish seeds from the private parties [2]. The purchase is normally done without floating tenders and hence this is a matter which needs to be looked into. According to the auditor of the society, the market rates could also not be verified.

Productivity and Net Income

The average yield of fish in the *bheries* owned by the co-ops was 5,80 mt per ha in 1987-88 which compared very favourably with the state average of 2.45 at over the three year period from 1986-87 to 1988-89 (Table 1 and Srivastava et al. 1990). The average yield of this magnitude has been sustained over a very long period of time. The net profit of the co-op from fish culture in 1989-90 was about Rs.5,600 per ha. The co-op incurred a loss of about Rs.41,0 00 in 1990-91 due to the out break of a fatal fish disease which reduced fish production drastically the following year also [3]. But, on the whole, the co-op has been financially viable over a very long period of time.

Economics of Fish Culture

Estimation of the benefits and costs of fish culture involves identification and quantification of both direct and indirect costs and benefits. The direct benefits accruing to the co-op include income from sale of the fish

catch. On the average, about 250-300 kg of fish are caught daily but sometimes, depending on the market demand, as much as 400 kg of fish are also caught daily. The members are given fish at concessional rates to the extent of 500 gm everyday. Some other income generating activities were started by the co-op for its members which, however, failed. A poultry farm involving an investment of Rs. 100,000 was started in 1980-81 which performed very well in the first 3 or 4 years. Later on, however, due to lack of initiative on the part of members, insufficient technical knowledge and adverse climatic factors, it had to be closed down in 1986. A consumers' stores for making available groceries, cereals, garments, etc. to the members and outsiders was being planned. Indirect benefits from fish culture include improvement in the environment as a result of treatment of the city sewage which cannot be measured in monetary terms.

The operating costs to the co-op include the expenditure on wages paid to the daily labourers hired for cleaning the ponds before stocking, raising and rearing the fishlings, feeding, transportation, marketing, rent, tax, etc. The fixed costs include the expenditure on salaries and other benefits paid to the members, depreciation, repair and maintenance, insurance premium, interest payments, festival bonus, etc. (Tables 3 and 4). The festival (*Puja*) bonus accounted for the highest share (27%) of the total expenditure. This was followed by expenditure on the improvement of the fishery (19%) and on the salary of the staff (13%). In our opinion there is a need for looking into the expenditure pattern of the co-op and reduce some of the unnecessary expenditures. For example, the festival bonus could be linked to the net profit earned by the co-op and the expenditure on the meetings which was over Rs. 23,000 could be reduced.

The co-op has received the National Productivity Council "Productivity Award" for three consecutive years, 1987-88, 1988-89 and 1989-90. However, the occurrence of a major fish disease--the Epezoitic Epidemic (Ulcerative Disease Syndrome)-- has resulted in severe financial losses to the co-op in the last two years, 1990-91 and 1991-92. The total turnover, working capital and realised net profit/loss for the years 1988-89, 1989-90 and 1990-91 for the co-op are presented in Table 2.

During 1991-92, a net loss of Rs. 41,000 was incurred by the co-op. However, efforts were being made by the CEO and members of the Managing Committee to come out of the situation and the members and staff of the co-op were quite optimistic about the outcome of the efforts.

Financial Management

The membership fee is Rs.5 per member. As of 1991, the authorised share capital of the co-op was Rs. 2 lakh of which Rs. 1.50 lakh was to be contributed by the members by

purchasing A class shares of Rs. 25 each and the remaining Rs. 0.50 lakh was to be subscribed by the GOWB by purchasing B class shares of Rs. 100 each.

As of 1991, the paid-up share capital was:

A class shares Rs. 17,350

B class shares Rs. 12,000

Every member has to purchase a minimum of 20 shares worth Rs. 500. It is clear from these figures that the co-op was able to raise only about 15% of the authorised share capital. The GOWB contributed about 41% of the co-op's paid-up share capital.

The major sources of funds for the co-op included the GOWB, banks and private traders. The co-op's bank deposits included fixed deposits and recurring deposits of Rs. 65,000 and Rs. 50,000 respectively both of which would mature by 1994. The working capital of the co-op included a government loan of Rs. 46,875 taken in 1982-83 to be repaid over 10 years, share capital and creditors. Besides, in 1987-88, the co-op got a loan of Rs. 80,000 and a subsidy of Rs. 21,810 under a scheme of the Fish Farmers' Development Agency (FFDA) to meet part of the cost of fish culture.

The GOWB provides grants and subsidies to the primary fishermen's co-ops as a measure of support for the co-operative movement. Besides the direct subsidy, other preferential treatments were also being given to co-ops. The government subsidy helped attract the fishermen to join the co-op as members and thereby increase the share capital which was necessary for increasing the borrowing capacity of the co-op, and hence its volume of business. The co-op had a provision for making advances or granting loans to its members upto a maximum limit of Rs. 3,000 per member. The loan is interest free and is sanctioned without any security. The loan could be used for non-productive purposes also like illness, marriage, death, house construction, etc. The loan amount is repayable by the borrower in 10 instalments with some leverage granted for times of dire need. The amount of instalment due is deducted from the loanee's monthly salary or the *Puja* bonus. The maximum amount of loan permissible to a non-member is Rs. 1,000 and the terms and conditions are the same as applicable to the members. Since the non-members' performance is watched carefully before they are granted membership of the co-op, they are generally loyal to the co-op and the loans are given on the basis of trust. Once a loan application has been made, the discretion to grant the loan to the applicant (member/non-member) lies with the Managing Committee. Since this procedure takes a few days time, a short-cut has been developed to deal with emergency cases; any member of the Managing Committee or the

Purchase Committee is empowered to take the decision which is ratified by the Management Committee later on.

As per the bye-laws of the co-op, the statutory fund includes bad debt fund (15% of the net profit), reserve fund (10% of the net profit) and co-op education funds (5% of the net profit).

Impact on the Members and Non-members

The members of the co-op are all fishermen by birth except two members. The average monthly income of an ordinary member of the co-op was Rs. 1,250 in 1991-92. A unique feature of this society is that the members are paid monthly salary and not daily wages. The other benefits enjoyed by the members include medical allowance of Rs. 360 per annum per member; festival bonus Rs. 3,000 per member; and an advance upto Rs. 3,000 per member for emergency needs (Table 4). Thus, the distribution of benefits from the common pool *bhery* was perfectly uniform among the members of the co-op and the income was assured irrespective of the amount of fish catch and the financial position of the co op.

The co-op not only looks after the interests of its members but also generates employment for the local people who are employed as daily wage labourers for cleaning the pond, transporting the fish from the pond site to the marketing point, guarding the fish pond, etc., throughout the year. In 1991-92, the co-op employed 42 men and paid them at an average rate of Rs. 1,025 per month. The benefits to the non-member workers include wages \$ Rs.3 0 per day, medical allowance @ Rs.240 per worker per annum, festival bonus of Rs.1,3 00 per worker and emergency advance upto Rs.500 per worker,

Marketing

The most commonly followed marketing channel was as follows: Producer-> Commission agent (*aratdars*)--> Retailer~~> consumer. The fish was sold through a commission agent at the nearby market at Tiljala, about 1 km away, for which the commission agent charged a 5% commission. The fish prices were fixed only by the commission agent.

Attitudes and Opinions of Fishermen and Government Officials

We interviewed quite a few member--fishermen to find out their attitudes and opinions towards the co-op. We found that all of them were aware of the benefits from joining the co-op and they all had high stakes in it. This realisation on their part made them take an active interest in the development of the co-op and its proper functioning. They told us that after their retirement, their sons or any other persons nominated by them can become members of the co-op. This made them take a long-term and sustainable interest in

the affairs of the co-op. In true sense, the member-fishermen were both the employers and the employees of the co-op. This is a unique feature of the co-op. In our opinion, the system of operation and management adopted by the co-op has been working fairly well. The management of the co-op has introduced many incentive schemes for the improvement of pisciculture which have improved the status of the pisciculture.

Some issues and Options

Based on our analysis of various aspects of the co-op, we have identified the following major issues in the operation and management of the co-op. Our suggestions as to how these issues can be resolved are also briefly stated in the following paragraphs.

1. The members of the co-op are not educated enough to take financial decisions. Consequently, the co-op is solely dependent on the CEO's initiative. The CEO being a government appointee has no personal stake in the society and need not take interest in all the matters at all times. In our opinion, the CEO has too many pre-occupations to be able to devote the necessary time to look after the management of the co-op.
2. No annual budgets are prepared by the co-op. It did not have adequate liquid cash to make payments to its fish seed suppliers. Moreover, the selection of the seed suppliers was also doubtful as no formal tenders were floated. We recommend that standard procedures and norms are laid down and followed for the purchase operations.
3. The legal rights of the co-op over the water bodies need to be looked into and the terms and conditions of the lease need to be rationalised. A system whereby a certain percentage of the profits is paid to the government as revenue should be implemented. This would take care of the revenue requirements of the state government and, at the same time, would be beneficial to the co-op as well which would be paying the rent as per its ability. The term of the lease should be at least 30 years. This would provide the co-op the needed incentive for making permanent improvements in the *bhery*.
4. The fish disease seems to have been the major cause of the losses suffered by many fish co-ops in the state in the last two years. For controlling the disease, the Department of Fisheries should provide adequate technical guidance at the right time. Regular checks by experts should be conducted to ensure proper and hygienic breeding grounds.

5. The co-op being a sewage-fed farm requires an outlet for the water. At present the outlet for filtered water is privately owned. For this, the co-op pays a rent of Rs. 2,000/year, This outlet is opened according to the whims and fancies of the private party which causes immense operational problems for the co-op. These needs to be looked into by the Department of Fisheries and alternative arrangement should be worked out.
6. The fish marketing system followed by the co-op does not ensure fair returns to it and at the same time forces the consumers to pay a higher price too. As the fish prices fluctuate everyday, the commission agents are in a favourable position to manipulate the prices the way they want. All the fish co-ops in the state sell fish to private traders and no marketing assistance is provided to them by either the apex federation or the central societies. To enhance the fisherman's share in the fish consumer's price, the apex federation and the central societies should help the co-op in marketing its produce in the terminal markets directly or through the retailers' co-ops that could be organised for the purpose. The retailers' co-ops should be provided adequate space and hygienic working conditions. These co-ops can assist the apex federation in planning out the infrastructure and management of the retail markets.

Conclusion and Implications

On the basis of the in-depth study and analysis of the Captain Bhery Fishermen's Co-op Society presented in this paper, we conclude that the society has been successful in terms of both the average yield of fish per ha of water area as well in terms of its impact on the economic well-being of its members and the non-members working for it. This has been possible due to the active financial, technical and administrative support extended to it by the Directorate of Fisheries, the GOWB and the loyalty of its members who are both the employers as well as the employees. In West Bengal, despite the pro-poor stance of the Left Front Government which has been in power now for more than two decades, co-ops do not have a good track record. The organisation structure of primary fishermen's co-ops in West Bengal wherein the members are both employers and employees could be considered ingenious in an environment in which neither purely government undertakings nor totally member-controlled co-ops have succeeded. The model is therefore worth pilot-testing in similar environments elsewhere in India. There are vast common pool ponds, tanks, reservoirs etc. in India lying unused due to lack of appropriate institutional arrangements for their restoration and management. Given the widespread failure of both government

undertakings and co-ops, the West Bengal model holds high promise as a middle path.

Table 1
Stocking and Production of Fish in the Co-op.

Particulars	1984-85	1985-86	1986-87	1987-88
1. Seed purchased:				
Spawn {no. in lakh}	3.50	4.00	2.16	2.64
Spawn (value in Rs.)	31,940	30,698	13,678	12,832
Quantity of fishlings (tonnes)	14.51	11.65	17.64	16.34
Value of fishlings (Rs.lakh)	2.18	1.75	2.64	2.45
2. Fish production (MT)	84.49	61.64	91.28	92.95
3. Value of fish production (Rs.lakh)	10.00	7.38	8.10	10.65
4. Average rate of produc tion (MT/ha)	5.28	3.85	5.70	5.80
5. Average value of produc tion (Rs./ha)	62,291	43,987	50,687	66,562

Table 2
 Some Indicators of Financial Performance of the Co-op
 (Rs.-lakh)

Indicators	1988-89	1989-90	1990-91
Working capital	NA	4.44	10.44
Total sales	17.55	11.64	12.54
Net profit/loss	(0.63)*	0.90	(0.41)
Value of closing fish stock	2.29	2.22	3.76

* The figures in brackets indicate losses.

Table 3
 Trading Account of the Co-op for the Period from 1-7-1990 to 30-6-1991

To Opening Stock	2,22,385.53	By sale of fish	12,53,662.60
To Purchasing Account		By Closing stock	
To Fish	6,92,338.45	By fish	3,75,564.62
To lime		767.50	6,93,105.95
To Commission on sale of fish	50,130.23	(60 days sale of the succeeding year)	
To carrying charges of fish	13,982.30		
To Bamboo Ropet Darma	5,174.45		
To Feed for Fisheries	5,902.00		
To Freight charges	823.00		
To Rent and taxes	12,902.03		
To Wages Account Members	3,89,766.68		
Daily labourers	48,554.35	4,38,321.03	
To Gross Profit transferred to profit and loss account	1,86,500.70		
Total	16,29,227.22		16,29,227.22

Table 4

Profit and Loss Account of the Co-op for the Year ended on 30th June, 1991

To entertainment	12,175.70	By gross profit transferred from Trading a/c	1,86,500.70
Kerosene, diesel and petrol	10,657.84	" Subsidy from OFO south 24-Parganas (for Duck cum fishery)	5,200.00
Contingent material	6,412.20	" Rent received from handing	1,10,750.00
Miscellaneous	1,606.60	" NCKI Fish Coped Project	2,000.00
Salary of staff	46,172.00	¹ interest received	357.50
Improvement of fishery	67,662.72	" Commission received	2,293.00
Medical aid for manager, staff, daily labourers	12,293.30	¹ Miscellaneous	63.00
Contingency	660.00	" Interest received from B.D.O. of B.O.I. (Salt Lake Branch)	10,026.41
Travelling expenses	1,562.70	¹¹ Interest received from F/D at W.8. State Coop. Bank (Beliraghata Branch)	6,050.00
Repair of nets	13,985.00	Net loss	41,043.09
Puja expenses	8,385.40		
Charity and advertisement	5,230.00		
Maintenance cost	1,754.52		
Printing and stationery	2,677.90		
Repair of car	2,492.50		
Repair of embankment	5,450.00		
Repair of boats	3,512.68		
Puja bonus	98,076.76		
NCKI Fish COPED Project	1,850.00		
insurance of car	315.00		
Meeting expenses	23,045.25		
Provision from yr. 1990-91	1,000.00		
Interest payable against government loan at 8%	1,125.00		
Depreciation of fixed assets	36,180.63		
Total	Rs. 3,64,283.70	Total	Rs. 3,64,283.70

Notes

- [1] Personal Communication with Shri Shyamal Kumar Dutta, Chief Executive Officer, Captain Bhery Fishermen's Co-op Society, dated July 14, 1992.
- [2] We got this impression during the course of our discussion with a few knowledgeable members of the co-op.
- [3] The disease was reported to have adversely affected fish production in many areas of the state.

References

- Baviskar, B.S. and D.W. Attwood (1992). The Political Economy of Co-operation in Rural India. Vol. II, Report for International Development Research Centre, Ottawa.
- CICFRI (1988-89). CIFRI Bulletin 1988-89 : Highlights. Barrackpore: Central Inland Capture Fisheries Research Institute,
- Das, Sukumar (1992). "Co-operative Movement of the Fishermen of West Bengal and its Impact on Productivity and Poverty Alleviation". In first issue January, Meenbarta. Calcutta; Department of Fisheries, Government of West Bengal.
- GOWB (1992). Meenbarta. First issue, January. Calcutta: Department of Fisheries, Government of West Bengal,
- GOWB (1992a), "Shrimp and Fish Culture Project with World Bank Assistance for West Bengal." Calcutta: Department of Fisheries, Government of West Bengal.
- Khulbe, Bhaskar (1992). "Sound Fishery Movement Depends on Effective Member Education Programmes". In Meenbarta, First issue, January. Calcutta: Department of Fisheries, Government of West Bengal.
- Oakerson, Ronald J. (1986). "A Model for the Analysis of Common Property Problems". In Proceedings of the Conference on Common Property Resource Management, prepared by the National Research Council, Washington, D.C.: National Academy Press.
- Sankaran, S.R. (1991). Report of the Committee Organisation of Co-operatives for Rural Poor. Delhi: Ministry of Agriculture, Department of Agriculture and Co-operation, Government of India.
- Singh, Katar, and S, Bhattacharjee (1991). "The Bergram Maihipara Common Pool Fish Pond: A Case Study". Case Study 8. Anand: Institute of Rural Management, Anand.
- Srivastava, U.K., et al. (1990). Evaluation Study of Fish Farmers,' Development Agency Programme for Fresh Water Aquaculture. Ahmedabads Centre for Management in Agriculture, Indian Institute of Management.

Workshop-9

THE MARINE FISHERMEN'S CO-OPERATIVE SOCIETIES IN KERALA
EXPLORATORY STUDY

Ram Mohan Nair and Katar Singh

Abstract. Kerala is an important maritime state in India known for its plentiful marine fish resources, especially prawns and oil sardines. The total fishermen population in the state is estimated around nine lakh of which nearly seven lakh are marine fishermen and the remaining two lakh inland fishermen. The level of living of most of the fishermen in the state is very low. Organisation of fishermen co-operative societies is one of the important measures that the Government of Kerala has taken to ameliorate the lot of the fishermen.

This paper presents an overview of the governance structure of the fisheries sector in Kerala and the main findings of an exploratory study of the organisation structure, management, business operations, and performance of a sample of two marine fishermen's co-operative societies in two purposively selected villages of the state. Both the co-ops studied were instrumental in helping their members with loans for acquisition of modern fishing craft and gear and with marketing of fish to some extent. However, they did not do anything to regulate the access of both member-fishermen as well as non-member fishermen to the fishing territories under their jurisdiction and thus failed to exclude the non-members from fishing. This in conjunction, with the introduction of motorised boats and modern gear has perhaps led to over-exploitation of fish stocks in the inshore waters and conflicts among artisanal and modern fishermen. The study also revealed that motorisation of fishing boats did not have a positive impact on the artisanal fishermen; it rather increased the disparities in fish catch and hence in income from the catch among those who had motorised boats and those who did not. The authors highlight the need for the co-op to play a more proactive role in marketing and processing of fish and in regulating the access to the common pool resource of marine fisheries.

Keywords. artisanal fishermen, fishing craft and gear, Kerala, marine fishermen's co-operative societies, marketing, motorised craft, open access resource.

Introduction

Kerala is an important maritime state of the Indian Union where over nine lakh people depend on fishing for their livelihood. It ranks second in terms of total inland and marine fish production and, first in terms of marine fish production in India. In 1990-91 its total fish production was estimated at 5.51 lakh iat of which 5.14 lakh nit (93%) was contributed by marine fisheries (GOWB 1992 : 35-36).

Since 1980, drastic changes have taken place in the structure of fisheries¹sector in Kerala .consequent upon the introduction of mechanised trawlers in the 1970s and the matorisation of indigenou s fishery craft in the 1980s [1], Whereas the impact. of the 'new fishing ' technology on total fish landings at the state level is controversial, it is commonly agreed that tile average catch per trip of motorised boats has increased and the drudgery involved declined (Anonymous 1991: 3) At the same time, the disparity in the distribution of total catch: among the fishermen-owning/using modern .fishing, craft and, gear and artisanal fishermen using traditional craft and gear has increased over time and so also the .level of indebtedness among the owners of motorised boats. On the whole, It is doubtful whether the economic condition of the average fishermen household has improved significantly after the introduction fishermen's co-operative societies were established in the state at the insistence of Government of Kerala (GOK) to improve the socio-economic condition of fishermen by unshackling them from the clutches of the money lenders and traders[2]. Although a lot of research work has recently been done to assess the impacts of new fishing technology and also the impacts of fishermen's co-ops, very little work has been done in the area of organization of management of the fishermen's co-ops and their role in managing the open access marine fisheries. This research was undertaken to study the organization structure, management, business operations, and performance of marine fishermen's co-ops in Kerala.

Research Procedure

Trivandrum district of Kerala was purposively selected for the study since it accounts, for the highest proportion (21%) of the total fisherfolk population in the state (MATSYAFED ud: 32). From Trivandrum district,, two villages, namely, Vizhinjam and Anjengo were chosen purposively for an in-depth study.¹ The selection of the villages' was done in consultation with the staff of the South, Indikn Federation of Fishermen Societies '(SXF'FS) . The sairtple: villages represented two contrasting conditions with respect to the nature of fishing technology in use and. the socio-economic conditions of the fisherfolk in the district.

Vizhinjam was chosen primarily because , it was the first fishing village in the district of Trivandrum where almost

all fishermen took to motorisation and there was not much difference between the rich and the poor among the fishing community. In Vizhinjam *panchayat* there were 17- primary fishermen's co-ops of which three were sponsored by the MATSYAFED and two were affiliated to the Trivandrum District Fishermen Federation (TDF) which in turn was affiliated to the SIFFS. The TDF co-ops were not functioning well and their very existence was being questioned at the local level.

Anjengo where motorisation has not been as common as in Vizhinjam has maintained its standing, as an important fish landing centre. In sharp contrast to Vizhinjam, it had six vibrant societies affiliated to the TDF and two primary fishermen co-operative societies affiliated to the MATSYAFED.

For an in-depth study of organisation, operations, management, we purposively chose one society each out of the two in Vizhinjam and the six in Anjengo affiliated to the TDF. Thus, Vizhinjam Fishermen Village Development Society hereafter referred to as Vizhinjam Society from Vizhinjam and Anjengo Fishermen Service Society hereafter referred to as Anjengo Society from Anjengo were selected for a detailed study. Finally, a sample 42 members from the Vizhinjam Society and 125 members from the six TDF societies in Anjengo was randomly drawn for studying the economics of fishing and assessing the impact of the sample societies on their members.

Both primary and secondary data required for fulfilling the objectives of the study were collected. The primary data were mostly collected through the personal interview method- using a pre-structured and pre-tested questionnaire. The interviews were conducted in the months of April and May 1992 by a trained person who was familiar with the local culture and conversant in the local language. Besides, unstructured discussions with knowledgeable fishermen, functionaries of the sample co-ops local leaders and officials of the SIFFS and the TDF were also held to gain deeper insights into the working and management of the sample co-ops.

Governance Structure of Fishermen's Co-ops

The GOK was perhaps the first state in India to have recognized the need for organizing fishermen's co-ops for improving the lot of fisherfolk and to enact a legislation, the Kerala Fishermen Welfare Societies Act 1980 that provides for constitution of fishermen welfare societies (GOK, 1983: 29). At the state level, a Cabinet Minister is in charge of development of fishermen and fisheries in the state. The Secretariat Department of Fisheries is headed by a Secretary to the GOK and the technical Department of Fisheries by a Director. In 1984, the GOK established the

Kerala State Co-operative Federation for Fisheries Development Ltd. popularly known as **MATSYAFED** with the clear mandate of co-operativisation of traditional fishermen and spearheading of development programmes, for fishermen. The main activities of the MATSYAFED include organisation of village level primary fishermen's co-operative societies (PFCS), implementation of fisheries' development programmes through them, and development of instrmetural facilities. The PFCS distribute to their members production inputs; and equipment such as kerosene, nets, outboard engines, and spare parts, and arrange for sale of fish catch of their members through auctions. The MATSYAFED provides managerial subsidy to. PFCS for the first five year on a tapering basis 100% in the first two years, 80% in the; third year, 70% in the fourth year, and 50% _in the fifth year.

The MATSYAFED is governed by a Board of Director comprising nine members. As of April 1992, all the nine members were -nominated by the GOK. The Secretary, Department of Fisheries, GOK is **ex-officio** .Chairman and Managing Director of the MATSYAFED. The Managing Director is assisted by a General Manager and a team of six Executives. two .Accounts Officers, one Assistant Manager, Personnel, one Assistant Executive Engineer and one Assistant. Engineer. The MATSYAFED owns and operates one net, complex, one nylon net factory, one; fish meal plant and one. fleet section.

At the district level, seven District Officers **look** after the fisheries development in the maritime districts work and at the village level Project Officers (PO) are responsible for implementation of fisheries development programmes. The POs are ex-officio Secretary of the PFCS. The Directorate of Fisheries implements programmes of fisheries development in non-maritime districts of the state. At the district level, **district** Fisheries Officers assisted with field staff are responsible for implementation of such programmes.

Besides the MATSYAFED, there exists a non-governmental organisation (NGO), SIFFS, that promotes organisation of fishermen co-op societies in Kerala and Tamil Nadu. The SIFFS serves 'as an apex organisation in the three-tier co-op structure having District Fisheries Federations at the middle level and primary fishermen's co-op societies at the. village level. Thus, at present, these exist two parallel **organisations-MATSYAFED** and SIFFS with almost a similar mandate. But the MATSYAFED functions more like a government organisation .and the .SIFFS is an NGQ. There is no co-ordination of their activities and consequently there is a lot of unnecessary duplication of services and facilities and hence wastage of resources.

A Profile Of the Sample Villages

In this section, we present some salient, features of the sample villages so that the reader can have an idea of

environment In which the sample fishermen¹s co-ops operated. Table 1 .presents some basic statistics about **both-the** sample villages.

Vizhinjam Village

Situated 16 **km** south of Trivandrum, **Vizhinjam** is an important fish landing centre among the twenty-seven fish landing villages in the fishery zone extending from Kollangode in the south to Valiaveli in the north, spanning a distance of about 50 km on the south-west coast of India. Vizhinjam is perhaps the largest **fishing villages** in the world. It has been a boon to the artisanai fishermen of both Trivandrum and **Kanyakumari** districts. During the monsoon months, fishermen from far and wide migrate with fishing equipment to operate from the safe heaven of the **vi-zhinjam** harbour. The possibility to operate round the year without any surf crossing problems has made Vizhinjass one of the most productive fishing villages. Merchants and middlemen, therefore, are present In large numbers giving the possibility of round-the-clock **marketing** and easy credit (of course at high cost). The net result is that Vizhinjam is the only centre in Trivandrum district which Is almost totally motorised. **Kattumaram** fishing is only marginal and used for inshore operations. Vizhinjam has a high concentration of plywood boats, most of them of the decked variety. Hook and line is the main operation, though in recent times, the fishermen have found that .It has to be supplemented with *echavala* gillnet (mackerel net) for economic operations.

It must be mentioned that Vizhinjam can be divided into two distinct parts, one a Christian hamlet and the other a Muslim -hamlet. The skills and fishing technology are distinctly different in the two hamlets. It is the Christian fishermen who represent the dynamic element in the village, while the Muslim fishermen depend more on the old-fashioned shore seines and boat seines (**thattumadi**) . .Thus, our remarks about plywood boats and motorisation are mainly relevant to the Christian hamlet.

Anjengo Village

Anjengo is a coastal village lying about 4 0 km north of Trivandrum. It is one of the biggest fishing areas north of Trivandrum and this is probably one reason why It Is so heavily populated (Table 1}. The coastal strip Is Inhabited by **Mukkuva** fisherfoik who have been Latin Catholic for the last four centuries but living In close harmony **with the** Hindu and Muslim non-fishing communities on the eastern side of the coastal road. The fishing population of this area lies locked in between the granite sea wall **that** was constructed some 20 years ago to prevent the sea **erosion**, and the road which separates them from other non-fishing communities. The entire .land area **is, thus,** a narrow strip between the coastal road and the sea. The mixed aromas that

fill the air speak both of an active fishery and the inability of the community to properly handle human excreta and household wastes that are dumped in open and scattered all around posing a threat to human health. The village is full of life and brimming with various types, of activities- business activities (fish sales, hotels, tea shops, grocery stores, etc.) social and cultural activities (youth clubs, reading rooms, music, etc.), and political activities of all hue and cry. The predominant landmarks of the village are the churches and schools and a primary health centre. As in all Christian fishing villages, the Church plays an important role in providing a sense of belonging and identity to the people. The schools are run by both the government and the Church but are wanting in basic facilities. Finally one cannot but be struck by the private and public vehicles that ply in the area giving the feeling that there is a great deal of contact with the rest of society.

Anjengo is situated 3 km away from the main railroad and 10 km away from an active fish market, which makes it possible for the **fisherfolk** to sell the bulk of their fish catch easily and that women vendors can use the train either to sell or to procure fish from other landing centres. A large **number of women are** engaged in fish vending and this could be one of the reasons for the disorganised and unhygienic surroundings.

As a predominantly *kattumaram* fishing area where changes in the type of fishing craft are on the increase? Anjengo seems to be an ideal area to study and understand. It is an area in which all the forces - technology, market, governments NGO, politics, religion, etc. - are at **play**.

Anjengo has possibly the second largest concentration of motorised units in Trivandrum district. Although 'the majority of the fishermen in the village still depends on the *kattumaria*? the hundred and, odd motorized units dominate the local fishing scene. Even though hook and line is an important gear for fishermen, in parts of Anjengo, drift netting with *echavala* (mackerel net) has emerged as the main operation after motorisation. Fishermen, therefore prefer the *vallam* model rather than the decked model- Due to the presence .of the SIFFS boatyard at Anjengo, the local fishermen have played a major role in the development of the plywood boat **technology**, it is the only village in the district that took whole-heartedly to plywood boats and did not even . consider the alternative of the plank transom boats. Monsoon conditions are extremely rough in Anjengo, making surf .crossing very hazardous. Earlier on, the fishermen used to migrate to Quilon with their *kattumarams* during the monsoon months {June - August). **Now**, equipped with the ply valiants and Yaiahas, the Anjengo fishermen' have mastered.-the. technique of surf crossing during the monsoon. As a result the monsoon migration to Quilon has totally stopped.

Within Anjengo which has a long stretch of coast, fishing practices vary a lot. Fishermen in the northern part are well-versed in hook and *line* fishing while those in the southern part depend almost exclusively on gillnetting. Our sample fishermen were chosen from the locality called Thonikkadavu where gillnetting is the main operation.

Profiles of the Sample Societies

In this section, we present brief profiles of two sample societies and highlight their strengths and weaknesses. Table 2 presents some salient features of both the sample societies.

The Vijiiinajm Society.

It is situated in the Kottukal village of Neyyattinkara Taluk of Trivandrum. The main objectives with which the society was formed was to eliminate the middlemen who played a significant role in the marketing of fish and exploited the fishermen through such practices as *udambadi* and *kurappu* [4]. It was proposed that by setting up this society they could lessen their dependence on fish traders and money-lenders. It was also proposed that the society could play a mediating role in the transactions between the fishermen and the merchants and could settle their disputes. So when the society was set up most of the members were freed from the clutches of the middlemen by the society by arranging short-term loans from banks. Once they were liberated from the clutches of the merchants, the fishermen were free to auction their catch at the best possible price available,

The society had also plans to procure new fish harvesting equipment and supply them to its members at a reasonable price. It was also thought that the innovations in fishing technology should be transferred to the fishing sector so that the fishermen are freed of the drudgery and rigors of fishing out in the seas, particularly during bad weather and at the same time they could earn a better living.

Occurrence of death of fishermen due to natural and other calamities encountered in fishing operations was common and it was realised that the family members of fishermen who were incapacitated should be compensated adequately by group insurance schemes or such schemes as deemed fit by the society.

The society also undertook to impart education to its member-fishermen who were not in a position to deal with the banks and other institutions which are mandated to help them. Free tuition was imparted to the school-going children of the fishermen and the society employed educated persons from the fishermen community for this purpose.

Another objective of the society was to secure from the government fish harvesting equipment at reasonable price for distribution to its members and to secure for the member-fishermen benefits from other government schemes. meant for them.

Membership

Persons above 18 years of age and living within the jurisdiction of the society are eligible to become its members; the only other qualification required is that they should be actively engaged in fishing to earn their livelihood.

The membership applications are considered by the MC and if they are satisfied, the applicant is granted the membership of the society. Once the membership is confirmed? the applicant is required to buy at least one share of Rs. 10 and pay the enrollment fee of one rupee to become a registered member of the society.

Members who are given loans through the society are required to deposit with the society 10 per cent of the value of their catch towards repayment of the loan.

When a member wants to be excluded from the membership roll, he is required to convince the MC about the reasons for doing so. When a member is to be removed from the roll, two-thirds of the members of the MC present and voting will have to support the proposal. When a member is removed from the membership roll it has. to be ensured that he clears all the society's dues outstanding against him. In cases when a member is not in a position to repay the loan or other dues, the society has to ensure that he repays the amount in easy installments.

The parameters for measuring co-operation of the members with the society are as follows:

1. The member should sell his catch only through the society;
2. The member should utilise the amount borrowed from the society only for the purpose for which it is sought.
3. He should repay the loan and interest without fail.
4. He should be honest and loyal to the society.
5. Members should attend the General Body meetings and should partake in the decision-making process.
6. Members should participate in the educational and cultural activities organised by the society.

Sources of Funds

The sources of funds of the society are membership fee, deposits, and compulsory savings of its members, loans, grants, and contributions. Every member of the society is required to save 3% of the value of his catch which is deposited with the society as compulsory saving. The procedure for* withdrawal of this amount is decided by the MC. When a member gets a loan in his name through the society, 10% of the loan amount is retained by the society for three years as a fixed deposit. Special saving deposit scheme is also available wherein a member has to have at least Rs. 10 in his account and the maximum amount permissible, is Rs. 5,000.

The society can receive contributions from individuals and organisations, and loans and grants from organisations registered under the Co-operative Societies Act, Companies Act or Charitable Societies³ Act, or government bodies. The total amount of loan should not be greater than ten times the value of the assets of the society as shown in the last accounting year.

There are three types of funds maintained by the society

1. The Revolving fund; This fund is kept for meeting the expenditure on the society's routine activities. **The** funds which do not fall in the social welfare/development category also qualify to come under this category.
2. The Fund from Mobilisation : Funds mobilised through special savings deposit schemes and compulsory thrift deposit schemes qualify to come under this category. These amounts are to be deposited with a nearest nationalised bank. The share capital of the society the compulsory fixed savings of the members are too deposited as fixed deposits with the bank.

Social Welfare Funds A certain percentage (2%) of value of fish catch of every member is retained as service charge by the society. The amount which is in excess of the administrative charges goes to the Social Welfare Fund. The authority to devise schemes to utilise money from this fund rests with the MC but it normally follows this pattern. Fifty per cent of this amount is used for welfare activities concerning the member; 25 per cent of the amount is utilised for the benefit of the society at large; 15 per cent of the amount is utilised for hosting cultural activities; and the remaining 10 per cent is utilised by the society to meet contingency demands.

Administration and Management

The General Body (GB) and a Management Committee (MC) are responsible for general administration and management of the society.

General Body. All members who have, been enrolled as members automatically become members of the GB. All members have a vote each. The GB has to meet at least twice a year. The calendar year is the financial year of the society. It should also approve the budget for the current financial year. At least half the members should be present and in cases where membership falls short of this, the GB cannot meet. The agenda for GB meeting should be released at least seven days in advance and in cases where an urgent meeting is called the agenda has to be released a day in advance.

The GB is the supreme decision-making body. But it delegates its authority to the MC and the paid, employees of the society. The office bearers of the society are President; Vice President, Secretary, Joint Secretary, and Treasurer.

The President chairs the GB meetings or in his absence a member has to be selected to chair the proceedings, The President has a casting vote and he can use this opportunity to side with a group when opposing groups have the same strength. All matters discussed in the GB have to be recorded in the minutes book. The President and the Secretary affix their signatures on the minutes book.

Management Committee (MC). The MC comprises seven members of whom five are elected from the GB and two are nominated. The two nominated members are selected from those persons who can contribute towards the growth of the society. They should not have any vested interest in the society. One of the nominees should be from the area falling within the jurisdiction of the society. The quorum for the meetings of the MC is four. But at least one of the nominated members should partake in the meetings. The tenure of the MC is for one year. A member cannot continue in the MC for more than three consecutive years. The outgoing MC continues to be in power till a new MC is elected. The newly elected members of the MC have to ensure that the results of the election are registered with the office of the District Registrar. A member who purposefully absents himself from the MC meetings can be removed. The President is authorised to nominate members to any vacancies in the MC. The Vice President deputises for the President in his absence or if the President resigns, the vice President continues to officiate as the President until the next MC confirms his presidency or elects a new president.

In special circumstances when the majority of the members of the MC resign, the Secretary has to call an emergency session of the GB and elect the new office bearers.

The MC normally meets once every month. The profit and loss statement of the society has to be passed by the GB and the MC has to submit the statement to the District Registrar within 21 days after the GB passes it. In cases where sub-committees have to be formed a member of the MC has to co-ordinate the activity of each sub-committee.

Records maintained by the Society

The following records are maintained by the society :

1. Bye-laws of the society and the registration certificate
2. Minutes book
3. Admission register
4. Receipt book
5. Income and expenditure statement
6. Stock register
- 7. Assets register
8. Pass books and cheque books
9. Deposit register
10. Asset/liabilities statement
11. Notice book
12. Correspondence file
13. Inward, register
14. Staff account book
15. Terms and conditions of service and compensation
16. other registers required for running the society

Anjengo Society:

The Anjengo FSS is the oldest of all the societies in the village. It was founded by an NGO, the Programme for Community Organisation (PCO), with the help of the local church and one Mr. Eugene Herbert was instrumental in organising the fishermen and registering the society. It is

registered: under **the Charitable Societies Apt.** of 1955. The society commenced its operation In 1980 though it got formally registered only in 1981. The *udampadi* system was a common practice during that time and the society was set up to free the fishermen from the clutches. of the money lenders and traders who practiced the system [3].

The membership, criteria, sources of funds, and management of the society are similar to those of Vizhinjam society. As of April 1992, the society had a Management **Committee** consisting of nine members. whom seven are elected from amongst the members of the society. It had five office bearers namely>. a President and **Vice** President, a Secretary, a Joint Secretary, and a Treasurer.

The society was formed with 40 members, As of: **April** 1992, the membership stood at around 125 of whom only 50 were active. Of the total members of the society, 26 members owned *valiants* and OEMs and 15 owned *kattamarams* and the rest were labourers. In 1981, 30 loans, amounting to Rs. 30,000 were secured from the Indian Overseas Bank to liberate the member fishermen from the *udampadi* system. In each of the years, 1984 and 1987, 15 loans each amounting to Rs. 5,000 were arranged by the society. , The recovery of the loans .has become a big headache for the Management Committee as many of the borrower-members have left the society once they got the loans.

As of April 1992, the society had four paid employees comprising one secretary and three salesmen. The clerk's salary was Rs.800 per month and the salesmen's Rs.600 per month. Thus, the total expenditure on salaries was Rs.2,600 per month. The clerk is responsible for maintaining all the required books of accounts and records and for making payments to member fishermen and receiving payments from salesmen.

The duties of the salesmen include arranging auctions for the catches of the members and collecting cash from the fish buyers/merchants. After the auction is over, the salesman issues a sales receipt to the member fishermen showing the amount of catch and its value. The fisherman can collect his payment from the society on production of the receipt. The salesmen complained of delays and lots of hassles in collecting the money from the fish buyers/ merchants.

The only source of revenue for the society was the three percent commission that it charges its members for auctioning their catches. The society **operates** a compulsory savings schemes for its members. Every member has to contribute two percent of the value of his catch, towards this scheme and the amount contributed is entered in the pass book of the contributing member. Once the amount contributed accumulates to Rs.500, the contributor can withdraw the amount in excess of Rs.500.

Economies of Fishing

The sample fishermen used a wide variety of fishing craft and gear for fishing. We estimated costs and returns for each of the major types of craft and gear used. But for sake of brevity, we present in Tables 3 and 4 estimates of operating costs and returns and other performance indicators for motorised plywood boats which is the most commonly used craft in both the sample villages. As shown in the tables, the sample fishermen in Anjengo village were doing better than their counterparts in Vizhinjam village in terms of all the parameters considered by us.

Our comprehensive study of the costs and earnings of motorised boats showed that wages formed the bulk of the variable cost (70%) in the case of the craft operating boat seines. Fuel formed the next important component. Annual fixed cost of a boat seine unit (12 HP engine) was about Es. 20,000 in 1982-83 which increased to Rs. 36,000 in 1991. The average net income of the motorised boats was found to be higher than that of the non-motorised craft,

Fuel efficiency, rate of return, labour productivity and net income were all found to be higher in the case of motorised craft with 7 HP engine operating boat seines as compared to those with 12 HP engines. Total revenue for the craft fitted with 12-HP engines and operating boat seine was higher than that of the craft fitted with 7-HP engines and the wage earners in the former got more income than the latter.

It may be stressed here that unlike crops, both quantity and quality of fish production are highly unpredictable and the risk involved is high. The prices vary drastically across various species and even day-to-day variations in the price of the same species are high. This is so not because of the changes in the market forces but because of the highly inelastic supply due to perishable nature of the commodity (fish)-. Because of the multi-species character of the marine fisheries, the revenue from each species depends not only on the price levels but also on the composition of the catch, Any study of costs and earnings of marine fisheries should therefore consider all these peculiar features and should be repeated at regular intervals to furnish up-to-date and reliable information for sound decision making.

There has been a decrease in the catch per trip of motorised boats in the recent years. This indicates the need for caution in advocating indiscriminate increase in the number of motorised boats. The redeeming feature today is that the revenue per boat trip is increasing, thanks to the spiraling price of fish and favourable change in the composition of catch observed during the last eight years. This has saved the sector till now. Motorisation could be a success in terms of quantity of catch if it is ensured that the boats extend their activities beyond the conventional range of 20 m to 50 m so that additional resources can be harvested.

While good resources are available in the comparatively deeper waters, whether an encircling pelagic gear like the existing type of boat seine and xing seine would be able to harvest them is questionable. Perhaps changes may be needed in the craft and gear designs for diversified fishing.

Our investigation shows that the fishermen often get into difficulty regarding availability of kerosene; especially in certain seasons. Even though the GQK supplies kerosene at a controlled price, the general complaint is about the quantity and the timeliness of the supplies. Sometimes, fishermen do not get sufficient quantity of kerosene and at times they are not able to purchase the full quota at one time due to lack of money and storage facilities.

The study revealed that motorisation has done but little for the artisanal fishermen. The cost of operation, the increasing cost of gears and crafts and cost of replacement have made the fishermen's life quite miserable. The fishermen are now caught in a wild cat chase. They have to procure modern equipment to survive but returns from these are not substantial as is revealed by our study. There is therefore a need for proper fisheries management.

Performance of the Sample Co-ops:

In Anjengo, there were six societies affiliated to TDFP, two of which had been recently formed. Though all the six societies were affected by local politics, they were doing reasonably well given the constraints under which they were operating. There were no hard and fast rules regarding membership, allocation, amongst the societies and a member residing in that village could become a member in any one society or all of the societies if he chooses to do so. During the course of our field work, we observed that there are significant overlaps in the membership of the SIFFS/TDFP co-ops and the MATSYAFED co-ops in both the sample villages. Recently the TDFP has framed some rules prohibiting a person to enroll as a member in more than one society. The members of the SIFFS/TDFP Co-ops secure the membership of the MATSYAFED co-ops primarily to avail of the benefits of the insurance scheme are eligible for compensation in case of death while they are out in the sea for fishing. The maximum limit of compensation is, however, only Rs. 6,000 which is ridiculously low but still better than nothing.

So far as the Vizhinjam society is concerned, since 1989, it has not been doing well financially. In 1990, it sold fish worth about Rs. 87 lakh and earned Rs. 1.7 lakh on account of commission. It made an operating surplus of Rs. 26, 512 (Table 2). Against this, it had a liability of over Rs. 71, 000 on account of loans outstanding against it. The society has now stopped advancing loans to its members. Besides, it had

to write off huge amounts on account of Its salesmen not remitting to it the sale proceeds that they collected from the fish buyers and leaving their jobs with it. According to some well wishers of the society, this deplorable state of affairs of the society has been caused by a Field Officer of the TDFP, his wife, and the Village Assistant. They are bent on ruining the society for their selfish interests. Elections to the MC are not free and .fair and the society staff are not allowed to work in the interest of the society. Out of its 125 members, only 50 are co-operating with it in the sense that they sell their catch through the society; the others have defaulted on repayment of their loans and have stopped selling their catch through the society. The society faces the danger of being defunct, if some drastic measures are not taken by the TDFP to improve its work environment and write off its losses.

Opinions of **the** Sample Fishermen

Most of our respondents told us that the gap between the poor and rich had increased over the past decade. There was nearly complete unanimity on this subject. Generally, the fishermen expressed the view that they were now worse off than they were in the past, despite motorization. Successive governments were not helpful and the politicians including local Members of Parliament (**MPs**) and the Members of the Legislative Assembly (MLAs) and *panchayat* officials were not sensitive to their needs. By and large they had to fend for themselves in their effort to ensure that they do not get crippled by poverty,

There are no frequent conflicts between fishermen and labourers and the clashes were more on communal basis than on economic issues. But more often than not, there were conflicts between the trawler owners/operators and artisanal fishermen.

There were charges against the TDFP, the SIFFS and the MATSYAFED that they have done enough to help them realise higher price for their catch and thereby liberate them from the clutches of the money lenders. The benefits of low interest loans, subsidies, and insurance scheme have also not reached the real needy. Generally, the complaints were genuine and had concrete basis to support them. The general feeling was that while some people have got out of the poverty trap, in general people were finding it difficult to survive with escalating prices of consumer durables and galloping operational costs of fishing.

Major Issues and Options

On the basis of the overview of governance, structure of fisheries development in Kerala and the findings of the in-depth study, many issues can be identified. In the

following paragraphs, we present some of the important issues and the issues and briefly spell out practicable strategies for their resolution.

The GOK has taken many pioneering steps including enactment, of rules providing for **establishment** of fishermen's welfare societies and regulation of fishing in the sea; it also has a Minister of Cabinet rank in charge of the Fisheries portfolio. An apex organisation, the MATSYAFED, has been established to Promote establishment of fishermen's co-operative societies and implementing various development programmes through them. Besides, an NGO, the SIFFS is also engaged in organising fishermen's co-operative societies and helping them with marketing and credit support. Whereas this kind of organisational structure at the state level seems **alright** there is a need to co-ordinate the activities of the MATSYAFED and the SIFFS and avoid unnecessary duplication of efforts. There are fishermen's co-ops sponsored by both MATSYAFED and SIFFS working in the same villages and creating confusion among the fishermen and unnecessarily competing between themselves.

In our opinion, SIFFS can perhaps do a better job than MATSYAFED of organising, conscientising, and educating the fishermen and should, therefore, confine its activities to those areas. The MATSYAFED needs to be given **autonomy** and allowed to work like a co-operative federation and not like a GOK department. It should vigorously pursue the task of reorganising the existing fishermen service societies into **genuinely member-controlled** fishermen's co-ops and eventually establish a three-tier structure like that of the **Anand** pattern dairy **co-ops**.

Marketing of Fish

Both the sample co-ops have done precious little to help their member fishermen to realise higher price for their catch like other private commission agents they help auction their members catch and charge a commission for that. Higher prices for fish can be assured only if forward linkages with retailers are established. This is possible only if the SIFFS and the MATSYAFED are mandated to intervene in processing, marketing, and export of fish in a big way. In our opinion, at this stage they are not equipped to do this successfully vis-a-vis the private entrepreneurs and firms that are engaged in these tasks and have developed strong economic and political clout. But there is no reason why the fishermen's co-ops cannot do all these things the way the Anand pattern dairy co-ops

have done in many states including Kerala, Here again, only a strong political will and full commitment to the co-op ideology at the state level can make a difference.

3. Management of New Fishing Technology

The GOK has facilitated and speeded up the introduction of mechanized trawlers, motorised boats and modern gear by granting low interest loans and subsidies to fishermen. In many areas this has led to over-capitalisation in the sector and over-exploitation of the marine fisheries beyond the level of maximum sustainable yield. Besides, many small scale artisanal fishermen have been left worse off; they cannot afford to invest so much money in modern fishing craft and gear. It seems that the sector is operating at the high input-high -- high-output level with no significant increase in net social welfare after introduction of new technology; as a matter of fact the net social welfare may have declined due to depletion of the stock of marine fish and pollution of sea water and air caused by mechanized fishing craft, There is therefore a need to examine carefully the social desirability of new technology and the rationale of government subsidies and grants to promote it.

4. Management of Fisheries Resources

Marine fisheries everywhere are an open access, i.e., nobody can be excluded from fishing and there are no rules and regulations governing the access to and exploitation of marine fisheries. Indigenous fishing techniques and practices were congenial to exploitation of marine fisheries on a sustainable yield basis, But introduction of mechanised trawlers and modern gear have led to over-exploitation of marine fisheries particularly in the inshore areas and disparities in the amount of fish caught by the artisanal fishermen and the trawler owners/operators. It is estimated that, in 1990, per capital catch of the traditional fishermen was 3.5 mt as compared to 7.9 mt for the mechanized sector (PC ud: 1). The rise in marine fish landings in the last Two to three years is due both to favourable climactic conditions and imposition of partial ban on trawlers in monsoon season. Neither the **MATSYAFED** nor the SIFFS has any mandate to **promote** the management of marine fishery resources on a sustainable yield basis. Similarly at the national level also, there is no awareness about the need to manage the marine fisheries on a sustainable basis. There is therefore a need for a national policy on fisheries that provide for, inter alia, judicious exploitation and management of marine fisheries in the interest of millions of poor fishermen who have

traditionally been dependent upon this natural renewable resource for their livelihood.

The GOK has already taken a pioneering step in the direction of regulation of exploitation of marine fisheries. The Kerala Marine Fishing Regulation Act 1980 provides for regulation and prohibition of use of fishing craft in contravention of any orders issued under Section 4 of the Act, and licensing and registration of fishing-vessels (*GOK 1983: 49*). The main objectives of the Act are to protect the interest of artisanal fishermen, to conserve fish and regulate fishing on scientific lines, and to maintain law and order in the sea. There is a need to enforce more effectively various provisions of the Act and this cannot be done unless there is a strong political will to do so at the national level.

5. Professional Management

There is a need for induction of professionally trained managers at the state level and district level and for training of the primary society level staff in the basics of accounting, record keeping and sales management. Although the SIFFS and the MATSYAFED have already started the process of inducting professionals, the mission and culture of both the organisations need to be re-oriented so that they CAN attract and retain good professionals and provide them productive and challenging work opportunities, which abound in the sector. Needless to emphasise, the professionals themselves should be thoroughly familiar with the fishermen community, marine fisheries and above all they should have a firm commitment to the co-op ideology and to the service of poor fishermen. Such professionals are a rare commodity indeed. but can be found if one is really interested in them. There are many organisations within and outside Kerala, where one can look for such professionals.

To conclude this paper we can say that ...the marine fishermen's co-op societies in the state have yet to prove their worth. They face a number of organisational and management problems which need to be resolved expeditiously. At the state level, there is a need for transforming the MATSYAFED into a truly co-op organisation and for coordination of its activities with those of the SIFFS. The fishermen have a high stake in the marine fisheries and they will co-operate with and support any programme that enhances their income from this natural resource. The co-op can win

their co-operation and loyalty if they intervene in a big way in fish processing and marketing and 'assure **the** fishermen a higher share in the consumer's price. If **the** co-ops cannot do this, they are doomed to failure and no amount of state patronage and subsidies can keep them alive for long.

Table 1
A Profile of the Sample Villages, 1991

Sl. No. Particular	Yizbinjam Anjengo	
1. Area (sq.km)	12.62	3.37
2. Distance from Trivandrum (km)	16	40
3. No. of residential houses	5,646	2,592
4. No. of resident households	6,837	2,882
5. Total population	37,293	15,632
6. Sex ratio (females/1000 males)	955	1,033
7. Density of population	2,955	4, 639
Scheduled Castes population	3,445 (9)*	937 (6)
9. Schedules Tribes population	21	
10. Literacy (%)		
- Total	55	55
- Male	59	56
-- Female	51	54

* Figures in brackets are percentage of total population,

Table 2

A Profile of the Sample Fishermen's Co-operative Societies

Sl No.	Particular	Vizhinjam Anjengo	
		FVDS	FSS
1.	Year of registration	1981	1981
2.	Affiliating organisation	TDFP	TDFP
3.	No. of active members as of April 1992	50	50
4.	Existence of elected Management Committee as of April 1992	Yes	Yes
5.	No. of members of the Management Committee	7	9
6.	No. of elected members of the Management Committee	5	7
7.	No. of office bearers as of April 1992	5	5
8.	No. of paid employees as of April 1992	5	4
9.	Annual turn over (lakh rupees) in 1990	36.89	NA
10.	Net operating surplus (rupees) in 1990	26,512	NA

Sources Office records of the societies and personal discussion with the Secretaries of the societies.

We have never regulated

In India
lots of indigenous
fishermen
that limited
access.

Table 3
Average Operating Costs and Gross Income per Trip of
notarised Plywood Boats (Rs.)

Sl.No.	Item	Vizhinj am	Anjengo
1.	Average value of sales	324 456	456
2.	Daily operating costs		
	a. Fuel and lubricants	117(36)*	71(16)
	b. Food	13(4)	18(4)
	c. Sales Commission	16(5)	21(5)
	d. Other expenses	20(6)	15(3)
	Subtotal (2)	166(51)	125(28)
3.	Gross income (1) - (2)	158(49)	331(72)
4.	Income to operating crew	104(32)	185(40)
5.	Share to equipment	54(17)	146(32)
6.	Repairs met by owner	21(7)	20(4)
7.	Income to owner group before depreciation	33(10)	128(28)

* Figures in brackets indicate percentage of the average value of sales.

Table 4
 Selected Indicators of Performance of the Sample
 Members

S1. No.	Item	Vizhingant	Anjengo
1.	Average investment in motorised plywood boats-medium (lakh Rs.)	133	4 6,2
2.	No. of trips made by plywood boat owners per annum	200	203
3.	Average trip time (hours)	9	12
4.	Average fishing time per trip (hours)	4.7	9
5.	Catch per trip (in kg)	59.58	81,24
6.	Catch per trip per crew (in kg) .	15,31	22.63
7.	Value of output per trip per fisherman (in Rs.)	92	133
8.	Annual value of output per craft (inRs.)	-68,480	96,900
9.	Annual value of output per fisherman (inRs.)	18,310	26,990
10.	Average price of fish (in Rs./kg)	5.75	5.87

Notes

- [1] For details of the history of introduction of mechanised trawlers and motorised boats see Anonymous (1991) and SIFFS (1991).
- [2] Initially, Fishermen Welfare Societies (FWS) were organised under the Kerala Fishermen Welfare Societies Act 1980 but afterwards the Kerala State Co-operative Federation for Fisheries Development popularly known as MATSYAFEB has started reorganising the FWS into Primary Fishermen's Co-operative Societies, Besides, SIFFS also started organising fishermen's co-op societies in the state.
- [3] *Udamhadi* in Malayalam means agreement. The system is prevalent in the coastal areas of the state and is highly exploitative of the poor fishermen. The main purpose of fishermen's societies was to eliminate the money lenders and other middlemen who operate through this system and appropriate most of the fruits of the poor fishermen's back-breaking labour. Under the system, money lenders advance money to the needy fishermen. The money advanced, irrespective of the amount, fetches the lender, five per cent of the value of the borrower's catch which is not counted towards repayment of the loan taken; it is outright extortion. Most of the poor borrowers are not in a position to repay the entire amount in lumpsum and unless all the the due amount is paid in lumpsum, the money is not taken back and the *udambadi* continues. A fisherman is typically given only a small amount of loan by a money lender which is not sufficient to meet his requirements. Thus, the poor fisherman is compelled to borrow from more than one money lender because the latter find it more profitable to advance money to more persons and corner five per cent of the value of every borrower's catch just for nothing.

In spite of the existence of the fishermen's societies, and the measures taken by them to do away with it, *udambadi* is still in full swing in Vizhinjam and to some extent in Anjengo.

- [4] *Kurapput* This word in Malayalam means reduction. On the surface, it looks like an exploitative system, particularly to an outsider, But, according to fishermen, this system promotes competition. A fish consignment traded without *kurappu* may not be effective. This system roughly speaking works as follows :

Suppose a fish basket is valued at Rs. 100. The commission agent declares the *kurappu* according to nature of the species caught and based on other market

conditions. Further suppose that the *kurappu* declared by the commission agent is 10% and the auction price is Rs. 120, then the *kurappu* will be Rs. 12 and the fisherman will receive Rs. 108 (120-12). Thus, the fisherman benefits from the system. The buyer also feels benefited as he pays Rs. 108 for the produce whose auction value was Rs. 120.

In Anjengo, the *kurappu* system works like this. For the fish basket valued at Rs. 100, the auction price is Rs. 110 and the *kurappu* Rs. 10. Of the *kurappu* of Rs. 10, Rs. 2 go to the society, Rs. 2 to the salesman, Re. one to the church, and the balance RS. 4 to the buyer,

References

- Anonymous (1991). Motorisation of Fishing Units : Benefits and Burdens, Trivandrum : Programme for Community Organisation and South Indian Federation of Fishermen Societies.
- GOK (1983). The Acts and Ordinances; of Kerala 1981, Trivandrum: The Law Department, Government of Kerala.
- GOWB (1992). MEENBARTA, First Issue, Calcutta: Department of Fisheries. Government of West Bengal.-
- MATSYAFED (ud) . Project Report for Matsyafed Net Complex. Trivandrum: Kerala State Co-operative Federation for Fisheries Development Limited.
- PCO (ud) . Programme for Community Organisation; Annual Report 1990-91. Trivandrum: PCO Centre.
- SIFFS (1991). A Census of the Artisanal Marine Fishing Fleet of Kerala 1991. Trivandrum: South Indian Federation of Fishermen Societies.

THE CO-OPERATIVE AS AN INSTITUTION FOR THE **MANAGEMENT**
OF MARINE FISHERY RESOURCES OF **KARNATAKA**

Ramachandra Bhatta

Abstract. Much of the relevant literature seems to suggest that co-operatives are best suited form of institutional set up for the management of fishery resources. This paper studying the role of co-op in the marine fisheries sector in the Dakshina Kannada District of Karnataka, has found co-op have grown more rapidly in developed port fish market centres, perhaps because the developed port fish markets are characterised by capital intensive fishing, centralisation of landings, an oligopsonistic market structure and a high degree of market concentration. However, as far as the management of fishery resources are concerned, this study found that neither this aspect the mandate of even the developed co-operative societies, nor did the fishermen interviewed repose much faith in the ability of the co-ops to effect the rational resource management. Based on the study, this paper suggests that such a resource management would be best effected by the community based fishermen's organisation.

Introduction

As in the case of any maritime country, in India too marine fishery resources constitute a significant component of the natural resources. For instance in 1987, fisheries sector contributed over Rs. 28,000 million to the national GDP at current prices, accounting for 0.95 percent of the total GDP Rs. 29,44,080 million. About 7.5 million people (i.e about 1.10 percent of the total population) are dependent primarily on marine fishing for their livelihood. Apart from these households, many other families are involved in fisheries related activities such as processing and distribution activities. The country exported 97,179 tons of marine products worth Rs.5,312 million during 1987, which constituted 15.52 percent of the total agricultural exports and 3.37 percent of the total exports,

Marine fishing is one of the major industries in the maritime state of Karnataka. The annual quantity of fish landed is around 200,000 tons giving an annual value of Rs.480,554,000, out of which nearly 35 percent is exported in value terms. The direct contribution of the marine fishing industry to the state GDP is around two percent at current prices. With 5.5 percent of the Indian coast line, the state contributes around 6 percent of the total marine fish production of the country.

The state's fishery resource potential is estimated at 425,000 tons from the Exclusive Economic Zone (EEZ) which has an area of 82,000 square kilometres (Baktha 1983). Similar to other maritime states of the country Karnataka effected a large scale mechanisation of fishing craft for increasing the marine fish production. It has been argued that such a **mechanisation** programme has led to a depletion of stocks due to over **fishing** (Douthwaite 1992). An undisputed consequence however has been the imbalance in **the** income distribution among the fishing families, consequent to **the introduction** of the mechanisation programme (Datta 1989). Thus the **outcome** of this technological advancement seems

perverse.

It is estimated that the annual average MSY of prawns for **Karnataka** as a whole is around 8,000 tons while the present catch has already reached this limit. It is also **estimated** that the **number** of **boats** required to harvest this limit is around 500 with 200 **days** of annual fishing days. However we have around 2,000 trawlers operating along the Karnataka coast. **Around** some of the major fishing ports the catch has exceeded **the MSY**. In Mangalore the average annual production of prawn is 1,860 tons as against the MSY of **1,715 tons**. Yet industry has not been able to exploit its annual potential from the **EEZ**. The average annual landings in Karnataka over the last 10 years **average** around 200,000 tons which is only 50 percent of the potential in **the** EEZ area. At the same time however there are ample signs of over-exploitation in the inshore waters..

The increase in population and the consequent increase in domestic and export demand for fish have resulted in a steady increase in price. The annual average price index of fish increased to 582.7 in 1987 while the index for all commodities stood at 395.7 with 1971 as base year (GOI 1988). As a result fishermen still find opportunities for realising a positive economic rent and the fishing industry as a whole holds potential for attracting capital and labour (**Kurien** 1989).

Another important result of the mechanisation process is the development of major and minor fishing harbours with physical and institutional infrastructure. The government initiated efforts to develop port fish markets with financial; facilities through government sponsored institutions and infrastructure facilities for landing of fish and its **marketing**. The process of mechanisation (production **oriented strategy**) to improve fishermen's income followed by market oriented strategies. Government sponsored agencies such as fishermen co-ops, statutory bodies and even public financed trading companies became a feature of **the** fisheries sector in addition to the private trade to ensure that fishermen receive fairer prices for their output; and also for the proper supply of fishing requisites. However, most of the benefits of these strategies have been cornered by the mechanised vessel

owners, because the government emphasised investment promotion in favour of economic efficiency rather than of equity and long-term sustainability of the industry.

From the very beginning of the industrial phase of fisheries development, the small - scale spatially scattered traditional fishermen with low borrowing capacity have been neglected. Over the years, indigenous, less efficient vessels were competed with the more efficient, cost efficient vessels, leaving a wide gap between the classes of rich and poor fishermen. Technological advancement, institutional changes and the free play of market forces seem to be the primary factors behind the decline of the traditional fisheries sector and the unequal distribution of income.

Objectives

The specific objectives of this study are;

1. To study the relevance of co-ops in the fisheries sector.
2. To study the historical development and progress of the co-ops, and evaluate their performance in the selected port fish markets.
3. To identify the factors responsible for the success or failure of the co-ops in the fisheries sector.
4. To suggest suitable policy changes in the institutional structure for the management of fisheries.

Review of Literature

Institutional Structure for Fisheries;

Fishery resource management is a widely discussed topic in natural resource studies (Charles-1988). Fish is a common property resource that can be used freely or at a minimum cost and consequently many fishery resources are frequently over exploited (Halfele 1974). In the context of their management some fisheries economists (eg. Berkes, 1985) frequently make a distinction between open access resources, a resource open to any user, and common property resources, owned collectively and managed by a well defined group of users and governed by a common property regime, i.e. systems of rights and duties which prevents over exploitation. Many traditional societies have institutional arrangements to manage common property resources in a sustainable manner, but in the face of rapid growth of population and shrinkage of physical area and resources available per household, management institutions have broken

down and there has been deterioration in the production potential of the common property resources (Lightfoot, et.al; 1991)

Social scientists define various forms of informal use rights such as territorial use rights and informal contracting. These use rights are best exercised through the formation of co-ops and fishermen's organisations, as they are cost effective and easier to enforce and or also superior from a socio-economic perspective. Lawson (1984) and McGoadwin (1983) note that fishery co-ops particularly suit developing countries. Jentoff (1985) argues that co-ops are well suited to the fishing industry in general since fisheries problems are collective in nature not only because they affect many actions simultaneously but also because they influence the pattern of social interaction themselves. The chief benefits of the co-op are self regulation and coordination, a method for dealing with distributional issues, and the encouragement of innovations. The members of the co-ops are provided with landing and marketing facilities and finance for meeting the working capital requirements and supply of fishery requisites. These co-ops are mainly aimed at increasing the fishermen's income through a reduction of the input costs. They also offer the better price to the fishermen, since they have better access to large urban markets (Amarasinghe 1989).

The above policy approach for the development of institutions and market structure is based on the premise that all resources are owned privately and the products have a downward sloping demand schedule. However, the development of an institutional structure based on the assumption of the existence of property rights over all the resources, may not produce optimal resource allocation. In an open access fisheries, all factor inputs are privately owned except the resource. • Such a combination would lead to excessive use of this free resource, and lead to over exploitation.

Role of Government in Fishery Resource Management

In any form of economic activity, the government can intervene both as a regulator of the activities of non-governmental agents as well as a direct operator. The extent of government involvement in each particular case be determined by policy objectives and practical considerations. In most cases the proper role of the government is guided by the motivation to maintain a market system that will maximise the social, economic and moral desires of the community,

The case for government involvement in preference to laissez faire in an economy is usually based on economic, social or political grounds. The objectives that are primarily of an economic nature fall into two classes depending on whether the emphasis is on economic efficiency or on the equity in

the distribution of economic benefits. Whether, the government's role in fishery management should be concerned with efficiency or equity of distribution of economic benefits has been vigorously debated in academic circles (Scot 1977, Bishop et al, 1981). Promotion of exports or value added activities of fishery produce, to improve the nations balance of payments in the fish trade are examples of arguments from the view point of economic efficiency. The social and equity objectives are often concerned with. the problems of inequitable distribution returns between fishermen and market intermediaries, provide employment and increasing the income of the fishermen. In some cases where rural votes wield considerable influence government efforts to improve the welfare of fishermen are also politically motivated.

An interesting discussion on the role of public fish marketing enterprises in fish marketing is given by Palfreman (1990). There are a number of ways in which a public marketing enterprises can make a positive contribution to fisheries management and development.

A public fish marketing enterprise might choose to intervene in one or more of these areas, because the government has taken the view that for one reason or the other the normal operation of the competitive free market cannot be relied upon to produce the desired results. The case for the establishment of a fish marketing enterprise to involve in the normal operations of the market depends on this and that for some reason or the other, there is market failure. However, involvement of government in fish trade should be considered keeping the costs and benefits of the proposed actions and alternative ways of achieving the aims. Another major task for the government is to ensure that public fish marketing enterprise is efficiently run. Efficiency in this context has a precise meaning, costs must be no greater than the next best alternative means of undertaking the same task. In other words, if a public sector fish marketing enterprise is engaged in fish trading it needs to be able to do this at a cost no higher than the corresponding cost in the private sector.

An interesting discussion on the need for government action in the fish marketing was given by Fredrick Nicholson as early as in 1917. Nicholson as Director of Fisheries in Madras commented upon the vulnerability of the fishermen. Blake (1969) quoting Nicholson states " I must always regret that socio-economic fishery questions - problems relating to the men rather than to material have not been dealt with as of secondary importance during the three years of enquiry". Imperfections in the fish marketing system and the need to eliminate middlemen exploitation have been considered as a sine qua non of the development of fisheries and of raising the income of the fishermen. After all it is the marketing institutions available to the fishermen besides their quality and quantity of catches, that is the most important

determinant of their income and hence their general welfare. A variety of policy instruments were embarked by central and state governments in the pre and post-eighties. These can be categorised as those that :

1. promote collective action of fishermen through the creation of fishermen's co-ops in view of influencing either the; marketing; of fish traders or by doing it on their own; and
2. initiate., direct participation in the. fish trade through the. government instituted; organisation so : .as to,provide competition to thefish traders, .

The **first** strategy involves projects that hope to organise fishermen in to cohesive groups to exert bargaining power over and competition to traders, However, bringing about real involvement of fishermen in marketing through an institutional means is complicated and a long-term, process especially when the target groups are generally illiterate and lack capital. Such a move is also based on the supposition that the coastal wholesalers were enjoying considerable monopsony gains from the industry and that the group action through the fishermen's¹ co operatives would force the traders to make concessions at least in the form of higher prices for the fishermen's output. However this strategy has grossly underestimated the strength of the opposition that takes the form of an institution, rather than individuals, which is **hot** only efficiently managed but it's also well endowed with capital.

The second strategy also attempts to overcome private monopsonies or oligopsonies with government administered marketing schemes. Superior management skills of the garastatals and possibly the ability¹ to rationalise and co-ordinate handling and distribution of fish at the macro-level were seen as factors that minimise costs of marketing and thereby improving the incomes of fishermen. However, civil servants and quasi-civil servants are transferable and their effectiveness on a job for a limited time span is often constrained by the heavy bureaucratic procedures in the operations and decision making of the projects. The direct market intervention by a government firm may be justified, only if the cost of marketing is reduced so as to benefit both fishermen and consumers.

Cooperatives and Fishery Resource Management

Co-ops are institutions comprising of groups of individuals intending to achieve certain general aims or more concerned with operational objectives through common economic action of the members (Omar 1988) . Theoretically co-ops are business organisations formed, financed and controlled by the members to provide goods and services to themselves at cost basis. The only real difference between a co-op and any other form of organisation is that the co-op are

designed to do business with its member patrons rather than with the public at large, and that the co-op earnings are distributed to the owners on the basis of stock ownership. The popularity of the co-op movements as a vehicle for development stems from its two attractive features; egalitarian aspects of the organisation that permits a greater dispersion of income through members and its ability to limit the economic power through collective action.

In India, a substantial amount of public funds have been poured into the development of co-ops by the government for organisation and development of the activities of the fishermen co-op societies, with the emphasis on only credit and marketing. In general, the market intervention via co-ops arose in response to low prices for fishermen attributable to excessive marketing margin, high prices of inputs, and low bargaining power of fishermen.

As evident from the above overview, development of an ideal institutional plan for the management of marine fishery resources requires a careful study of the present set up and its impact on economic efficiency and equity. The state requires a suitable management plan along with the development of market and institutional infrastructure, which will take the interest of various groups including large and small fishermen, fishery labourers and consumers.'

Methodology

The area of the study extended to nearly 200 kms on the south west coast covering Dakshina Kannada district which is one of the two coastal districts of Karnataka (the other being Uttar Kannada) .

The primary unit of sampling for the survey was fishermen household, defined as a family pursuing fishing as their full time (main) occupation. In some cases all the members of the family worked for the ' same unit (craft) while in others they did not. In the latter cases information on each unit of the family was collected, but considered as single households.

In the absence of the proper information on the fishermen households distribution, it was decided to select the primary households in two stages, the first stage being the fishing village,, which will be within the area of a fishermen co-ops and the second stage the fishermen households in the area. The selection of the first stage units was done purposively taking into consideration the representative nature of the village, the availability of samples, and the geographic spread. The first stage units constitute the centres from where data on co-op institutions were collected. The actual sample interviewed limited to 300 households and 19 was co-ops, since the geographic coverage was large and spatially scattered. The total

number of households and co-ops Interviewed is given in Table 1. The analysis of the data, was done by classifying the entire study area of three taluks into three distinct locations, based on the nature of market infrastructure development and concentration of fishing units. Based on the information available the port-fish markets of Dakshina Kannada District were 61 classified into 3 categories developed, less developed and underdeveloped markets. The salient features of these markets in terms of the infrastructure available is given in Table 2:

Developed Markets: These are the major port-fish markets the fishing households operate their crafts and sell their catch. There are 3 such markets in Dakshina Kannada District. They are Mangalore, Malpe and Gongoli. In the text they are referred to as Type A markets.

Less Developed Markets : This category includes the minor ports from where fishing households operate their vessels. They are Ullal, Kuiu, Mulki, Pollipu, Udyavar, Hangarkatta, Bejadi, Navunda, Tarapathi. These port-fish markets are listed as minor landing centres by the Department of Fisheries, Government of Karnataka. These port-markets are referred to as Type B market categories in the present study.

Underdeveloped Markets : These small landing centres lack basic infrastructure facilities. They include Baikampady, Haleyangadi, Uchila, Maravanthe, Shiroor etc. They are called Type C markets in the study.

The major port-fish market and the importance of these markets is shown in Table 3. It can be seen that more than 90 percent of the aggregate quantity is landed in these harbours and 90 percent of the mechanised boats are operating from these ports. The growth of the co-ops in the selected market categories over the period of 10 years was measured by using growth functions of the form

$$y = ABt \quad \text{where}$$

y = estimated value of the indicator

A = constant

B = regression coefficient

t = time period.

To test the goodness of fit R^2 values were estimated and their significance tested with F^1 ratios. The regression coefficients were tested for their significance with the help of t^1 values. Growth rates were computed by using the formula $\log B - 1$ (Ganesh Kumar et al 1989).

Results and Discussion

The Historical Development of Co-operatives

The concern for the welfare of fishermen was initiated during 1940's when the Ministry of Food and Agriculture of the then government of India requested the FAO for the assignment of fish marketing specialist for advising the Government of India on plans for efficient distribution and marketing of fishery products (Report on Fish Marketing, Government of India 1955) . Accordingly FAO assigned three services expert during 1956 - 1959. The main recommendations of this committee have played a dominant role in subsequent government efforts and programmes for the development of the sector. The experts recommended for a detailed survey of marketing conditions and supervision of marketing practices in urban centres, establishment of separate fish markets, selling fish weights, introduction of metric system, provision of infrastructure etc. The main recommendations of these experts include organisation of co-ops and the other was the need for a scheme to subsidise fishermen for the purchase of fishing boats and equipment so as to modernise the fishing fleets. Both these recommendations were based on the premise that, the roots of poverty among fishermen were their shortages of capital, that led to their dependence on middlemen for the financing of their operation and the "tied" marketing arrangements for their catch. Accordingly right from the First Five Year Plan (1950 - 55) 100 percent loan cum subsidy scheme was initiated by the central government. The funds were channelled through the co operative credit structure. The loan scheme was intended to enable the fishermen to acquire more efficient gears and to undertake their own marketing of fish. The procedure of disbursing the loans through the fishermen co operatives was to induce fishermen to join their societies in order to nurture co operative ideology among members and hence pursue collective action when dealing with common problems including marketing. The State initiated a policy for the exploitation of marine resources in the early 1950's by emphasising the importance of artisanal - fishermen. However, after 1960's there was a radical change in the policy approach in favour of mechanisation. In 1966 a scheme for construction and distribution of trawlers was introduced by the Fishery Co-operative Federation on a pilot basis, a decade after Kerala started its attempt to "modernise" the fishery through a Indo-Norwegian Project. The increasing demand for prawn, lucrative international markets and the government's interest in the promotion of exports gave a further boost to trawling. Later when purse seines were introduced in 1976 there was an initial increase in total catch but the landings of prawns have started declining by 1980.

Table 4 shows the direct expenditure made by the government towards the fisheries sector during the decade 1981-1992, Table 4 illustrates that the total grants to fisheries

sector has doubled during the period specially, during 1991-92, mainly due to increased allocation of funds by the central government for the payment of fuel subsidy.,

In the early 1980's the government allocated more money for the mechanisation process which is reflected by nearly 50 percent of the grants given to crafts and gears. This resulted in the allocation of more than 40 percent of the total expenditure for the payment of fuel subsidy to the mechanised fishermen. This in turn resulted in the neglect of creating basic infrastructure and processing facilities. The co-ops received 30 percent of the total expenditure in the form of contribution to share capital managerial subsidy etc. throughout the period. Table illustrates that the policy of the government for mechanisation of the fishing units started in late 1970's has led to increased allocation of funds to meet the demands of the fishermen for subsidising their working capital requirements mainly fuel. The government could not concentrate on the development of infrastructure and processing facilities which would have been more helpful in the long run.

Income and Expenditure of the Selected Co-operatives

The income and expenditure pattern of the selected co-ops in different market centres for the year 1990-91 is presented in Table 5. The Table shows that the co-ops located in developed market centres (Type - A) generated more revenue from marketing activities. (36.30 percent) while the co-ops located in other two types of market categories (Types - B and C) generated more income from interest (87 and 85 percent respectively). In all the market categories the pattern of expenditure was relatively similar. The co-ops of the Type A market categories spent 75 times more money on administration compared to the co-ops located in Type C market categories. The, District Cooperative Fish Marketing

Federation also spent a larger share of their expenditure on

Table 6 shows the progress of the fishermen's co-op during the last decade. in terms of a few selected indicators. The Table illustrates the policy of the government in developing fishermen co-ops located in the developed port-fish market centres, by contributing more capital towards the share capital of these co-ops. The co-ops located in the developed port-fish markets were also able to mobilise more money through borrowed capital (Rs. 404,867) compared to co-ops located in less developed (Type - B Rs. 45,109) and the under developed (Type - C Rs. 43,069) market categories. The total capital base of the co-ops located in the developed market centres was 12 times greater than the co-ops located in Type - C market categories. Thus the policy

of the government in encouraging the mechanisation has also led to the **development** of co-op institutions in the port-fish markets.

These co-ops have distinctive organisational advantage over their counterparts in the private sector, The co-ops deal at "cost" **with** members whose equities are tied to their current transactions with the co-op. They have accessibility to the subsidised credit and other facilities provided by the government.

Table 7 explains the progress of the co-ops per member in different market centres. The Table shows that the contribution of share capital by the government and by the members is considerably greater in the port market centre compared to the co-ops located in the other market centres. The per - member borrowed capital of the co-ops located in the Type - A market centres was Rs. 141,00 while it was only Rs. 114 and Rs. 13 in the other two market categories (Type - B and Type - C respectively) , The profitability of the co-ops located in developed port fish market centres was only Rs. 29 per member which indicates that these co-ops inspite of higher magnitude of turnover could **not** generate enough cash surplus. However, this profit per - member retained by the co-op ignores the profits made by members in the production process. Since the fishermen set up the co-op to serve their interest as primary producers, it is more realistic for them to maximise profits on both the sides; the production process and marketing of output together. Further research on the joint profit maximisation objective which represents the sum of the profits from the two and the optimum output level would be useful.

Growth rate judged from all the selected indicators illustrate that (Table 8) the co-ops in Type - A **market** centres are progressing at a much faster rate **compared'** to the co-ops located in other market centres. The growth functions were found **to** be statistically significant as shown by 'F' ratios and regression co-efficients were also significant as shown by 't' values.

Table 9 illustrates the growth rates for **the** District Cooperative Fish Marketing Federation which is an apex organisation of the primary fishermen's co-op. The Federation functions independently and deals directly **with** primary producer members apart from playing the role as a federation of primary societies. The spectacular growth rate in the owned capital (20 percent) was mainly due to **heavy** investment in the equities by the **government**. The growth in the membership was seven percent which is higher compared to primary societies. All the regression co-efficients and R^2 were statistically significant.

Factors Responsible for the Success of the Co-operatives

Thus the success of the fishermen co-ops in the developed port-fish markets can be attributed to following factors;

1. The production of fish is concentrated and the fishermen are highly specialised.
2. The high localisation of market arrivals have favoured high market share and gave monopoly power to the co-ops.
3. The co-ops may hold an advantage in capital intensive activities although not complex. Since the mechanised fishing is more capital intensive, it has contributed to the success of the co-ops.

Thus two scenarios have emerged from the study of co-ops, the first scenario where the co-op is located in a developed port-fish market with a large number of mechanised boat owners as members with large scale production. Here the number of buyers (merchants) is far less than sellers (fishermen). In such a situation the co-ops basically doing the business of marketing could evolve greater linkages and interlocking of markets. In the second scenario larger number of, small fisherman following traditional fishing technology and small lots of fish to dispose are present. This pattern of trade and distribution with innumerable buyers (small fish distributors) whose demand capacity closely matches the supply potential of the sellers. This case would make a fairly close approximation of the pure competition, and the co-ops could not emerge as a strong institution.

The existence of imperfect markets where traders enjoy considerable monopsony profits, accounts for the popularity in the establishment of marketing co-ops to countervail the economic power of the traders and enhance producer prices. On the otherhand in under developed market centres where there is less scope for monopsony profits, co-ops could not succeed in generating enough surplus.

Fish Resource Management and Co-operatives

The approach of the governments both state and central has been to introduce programmes to promote collective action of fishermen through the creation of fishermen co-ops, initiate direct participation in fishery development through government sponsored agencies develop market infrastructure and fair trading practices through enactment of laws and enforcement of regulations. However, these institutions could not bring real involvement of fishermen for two reasons: The target groups were generally illiterate and lacked capital, Secondly, the approach of the government was partial in development of these institutions. They did not touch upon the various aspects of resource management,

either because the government did not think it necessary under the assumption that the complete property rights existed or because they did not have necessary **constitutional** support for introducing such measures.

Inter Market Variations in the involvement, of Households in the Co-operative

Table 10 shows the number of households having membership in co-ops and fishermen associations. It can be seen from the table the percentage and absolute number of households with the membership of only one co-op for each family increases as the level of market development decreases. There were only nine percent households with membership **of only** one co-op in the developed market categories (Type - A) while it was 42 percent in underdeveloped market categories (Type - C). On the other hand the number of households with the membership of more than one co-op was as high as 90 percent in the developed market categories. These households had membership in the local co-op as well as District Fish Marketing Federation. The memberships of fishermen association do not show a remarkable difference between the market categories. It indicates the uniformity in the existence and preference of these associations throughout the selected market centres.

Co-operatives as Source of Finance, for Fishing Business

Table '11 shows the sources of funds like banks, co-ops, merchants and others for the development of fishing business enterprises. Majority of the households in the developed market centres (Type - A) and less developed market centres (Type - B) borrowed from the banks. The preference for co-ops as a source of finance was least (ten percent) in all the market categories. It indicates the failure of co-ops as a major source of finance for meeting the capital needs of the fishing units. In most of the cases they only supplemented a small portion of the working capital requirement, of the business enterprise. The merchants in all the market categories played a very important and similar role in financing the fishing businesses.

Evaluation of the Fishermen's Co-operatives

Table 12 presents the evaluation of the co-ops by the fishermen families. The working of co-op institutions in the developed **port-market** categories was found to be better compared to the co-ops working from the other market categories. The co-ops were evaluated as **'satisfactory'** and **'very good'** by 45 percent of households living within the developed port market centres compared to only 33 percent and 38 percent in the other two market categories respectively.

The nature of complaints and the ranking of these complaints are presented in Table 13. A majority of the **households** felt that the officials of the **co-ops** were not accessible and not punctual in their work.

Measurement of Benefits from Co-operatives

An assessment of the benefits received by the member households from the co-ops is presented in Table-14. The scales were prepared by assigning scale values to the indicators of efficiency. These scale values were developed based on the expert opinion in the field (multiplying the actual values with the assigned values of **scale**). It can be seen from the Table 9.5 that the total scale was relatively more for the societies located within the market Type ~ A (1.02), compared to other two market categories which is only 0.92 (Type - B) and 0.94 (Type - C) respectively.

Opinion on Fish Resource Management

The opinion of the sample households about the size of the fish production is presented in Table 15. Most of the households throughout the different market centres experienced that the fish catch is declining. The proportion of households who opined that the size of the catch is increasing was relatively less. When the households were questioned about the reasons for declining catch **quantities**, most of them felt and still feel that this is mainly due to changes in the marine environment brought about **by** several factors. The mechanisation has made many adverse changes in the breeding growth of fish in the sea apart from pollution and **congestion of boats** in the inshore waters. The majority of the households attributed reasons for the **decline** in the catch to such changes and pollution instead of increase in the **number of** fishing vessels. Table 16 shows **that** 224 households **out of** 300 felt that environmental factors and pollution *are* major causes **of marine catch changes**.

Institutions for Fish Resource Management

The assignment of private property rights over sea fish resources can prevent the over exploitation of the resource. The economic over fishing OCCURS when the average cost of catching a standard unit of fish equals the market price and when the super normal profit **of the fishery** is dissipated. However, sole fishing rights have been historically rejected, by the governments as leading to monopoly control over the fishery (Johnson and Libcop 1992). On the other hand resources were converted into common property nature as against open access characteristics. Although under conditions of over exploitation the traditional management measures of fishing groups Bay have broken down there may remain certain important management skills within the group.

These may include individual knowledge of resource characteristics. In Dakshina Karmada District there has been institutional arrangement to manage fish resources like in many other parts of the country. The D.K. District Mogaveera Mahajana Sabha was established in 1924 by consolidating many Hoblis. This is a federation of fishermen association operating at the local level consisting more than 150 units, throughout the coast, initially the associations were actively involved in providing social, religious and financial link among members. They mainly concentrated on the settlement of disputes among traditional fishing households regarding the rights over the fish resources.

After the introduction of mechanisation in 1960's there were differences in the interest and it was difficult for the association to evolve a common strategy for the management of resources. The introduction of subsidy and subsidised financial assistance for mechanisation by the government in 1964, persuaded fishing households to adopt mechanised fishing methods inspite of the opposition from among the enlightened sections of group.

The government formed co-op institutions thinking that they have a built in mechanism for distributing the benefits in an egalitarian way, However, the co-ops and government sponsored institutions failed to generate enough profit for its own survival, though, they were able to act as an agency for the distribution of the subsidy and financial assistance.

Table 17 illustrates the opinion of the households regarding appropriate form of institutional framework for management of fish resources in the order of important reasons. It can be seen that the fishermen associations, were the preferred institutions. The maximum number of households found that fishermens' associations are much better than other forms of institutions. Thus 139 households out of 300, preferred fishermens' association as against only 38 households in the case of co-ops. The co-ops were the least preferred institution, after Fisheries Department and government authority. The major reasons for preferring fishermens' association were strong control over fishermen and local leadership. Whereas similar reasons were not found in the preference for co-ops though they were established with such objectives. Even now, the fishermen's associations are more effective in the settlement of disputes related with the fishing rights. On the other hand, co-ops were mainly canalising agents of government sponsored schemes providing financial assistance for fishing. The effectiveness of the fishermen's association can be measured by the fact that despite insurance facilities concerned made available for fishing from 16th August of every year, the fishermen go for fishing' from 25th August as per the association's directions.

The suggestions for fish resource management was assessed by asking specific questions on several alternative, measures, which is presented in Table 18. Though many of the households expressed the method of restricting the fishing season as one of the management methods clearly they were not available to for any opinion on these issues. Hence a majority of' the households have expressed their inability by answering "don't know" for the questions on suggestions for resource management.

The personal interview of a few leaders of fishermen's association showed that there is a need to have uniform law applicable for the entire coast of India, instead of a piecemeal approach of individual states. For instance, the restriction of fishing from May 30, to Sept 1 for Karnataka fishermen is not applicable to the fishermen of neighbouring states like Kerala, Goa and Maharastra who continue to go for fishing during the prohibited period in the waters of Karnataka. Secondly, the indigenous boats with outboard engines of higher capacity also were permitted to do fishing resulting in discrimination in the accessibility of fish resources. Though the Karnataka Marine Fishery Regulation Act of 1986 provides compulsory registration of vessels, no such system practically exists. The restriction on the introduction of new peruse seiners and trawler boats by stopping the issue of feasibility certificate (which is a prerequisite for bank finance) by the government have only resulted in the introduction of what is called mini-purse seiners. Thus completely overlooking the importance of local fishermen's association in the implementation of management method has resulted in the defective/delayed implementation of government policy to manage the resources.

Conclusions and Recommendations for Further Research

1. At the production level fishermen who were weak sellers had to dispose of their catch in oligopolistic markets which were characterised by high degree of market concentration. The attempts made by the government to correct the imbalance in the market power through the creation of co-ops have met with some success. Part of the success can be attributed to the centralisation of the catch and more capital intensive technologies followed. However, further research to measure the performance of the co-ops in comparison with private traders, using industrial organisation methodologies (market structure, conduct performance) would throw more light on the role of co-ops. The policy implications of the study shows that the strategies favouring the development of co-ops and market infrastructure at the producer level would improve the chances of success of co-op when there is greater imbalance in the market power between the traders. However the extent to which it will directly benefit the fishermen needs to be researched further.

2. The co-ops have developed into major institutions in the developed port fish market centres capable of influencing the credit and output markets, as shown by the indicators of development like, equities, total capital, membership etc. The estimated growth parameters also indicate the better growth of co-ops in developed fish markets compared to co ops located in less developed and under developed market centres. The differences in the profitability of the co-ops between the market categories was not considerable. However this study does not take into consideration the profit made by the member fishermen. Hence further research in estimating the total profit earned jointly by the members and co-ops would be more useful. Further, comparison of the performance of co-ops with the performance of private traders is also required to judge the proper role of co-ops.

3. The existing structure of fishermen co-ops which have the objective of increasing the members' income through supplying inputs, credit, and marketing services have not contributed anything in the field of resource management. The subsidised supply of fishing inputs through government sponsored programmes have only increased exploitation of free resource; fish. Hence an ideal institutional structure should also incorporate the resource management aspects through measures like restricting the entry of new fishing boats, restriction of total catch quantities etc. However, the results show that from the view point of resource management the traditional institutions are more suitable than co-ops as evaluated by the fishing households.

Table 1 *
 Number of Units Sampled In the Selected Taluks

Taluks	Households		Cooperatives	
	Popula TM tion	Sample	Popula- tion	sample
Mangalore	2366	120	14	5
Udupi	4133	110	20	9
Kundapur	2639	70	9	5
Total	9138	300	43	19

Table 2
 Infrastructure Available in different market centres

Facilities	Market Categories		
	Type A	Type B	Type C
1. Credit	Fully Available	Fully Available	Fully Available
2. Marketing	Fully Available	Partially Available	Not Available
3. Input Supply	Fully Available	Partially Available	Partially Available
4. Provision of Cold Storage Facilities	Fully Available	Not Available	Not Available
5. Berthing & Landing Facilities	Fully Available	Partially Available	Partially Available
6. Fuel Supply	Fully Available	Partially Available	Not Available

Table 3

Major Port Fish Markets of D.K. District (Figures in Percentage)

	Centres				Total
	Total	Mangalore	Maple-	Gangolli	
No. of centres	12				
Quantity of fish produced (M.tons)	85782,6	30.5	30.5	28	89
Fisherman Population	59934	9	15.76	15.83	40
Purse seiners	247	36.8	21.05	31.57	89.42
Trawlers	1259	28.75	38.52	12.23	79.5
Other mechanised	1330	12.11	20.9	12.78	45.8
Traditional	5454	15.44	34.84	2.8	53.1

Table 4

Government Assistants to Fisheries Sector (1981 - 92) in Oakshina Kannada District

Year	Total Grants (in Rs.)	Figures in Percentage						
		Crafts and Gears	Fuel Subsidy	Infra- structural Facilities	Fish Processing	Admini- stration	Coopera- tives	Welfare Schemes
80-81	6,018,729	49.76	11.11	7.38	10.22	21.39	1.22	8.11
81-82	5,975,927	48.65	9.88	8.59	2.01	27.14	0.29	3.44
82-83	9,363,404	32.19	11.81	4.11	12.48	21.96	13.6	3.72
83-84	4,974,622	15.45	9.84	11.78	15.19	33.68	0.95	13.1
84-85	6,733,894	16.02	7.36	12.81	9.52	36.89	8.59	8.87
85-86	5,930,799	16.71	23.63	5.31	4.51	37.02	10.03	2.78
86-87	7,003,355	15.69	23.12	8.32	2.61	30.01	17.78	2.52
87-88	6,778,768	9.97	46.31	5.06	4.38	29.76	2.93	1.59
88-89	6,525,082	14.26	3.56	6.72	5.71	32.96	7.81	1.98
89-90	5,520,967	16.55	40.45	8.74	9.22	35.48	1.69	4.42
90-91	7,234,231	12.05	<u>33.81</u>	10.37	7.57	32.21	0.67	3.34
91-92	12,489,378	8.38	<u>43.21</u>	10.16	3.92	24.52	7.12	2.72

Sources State Department of Fisheries, Mangalore.

table 5

Income and Expenditure Pattern of the Selected Fishermen's Co-operatives (1990-91)

	Market Categories				District			
	Type B	Percent	Type C	Percent	Type C	Percent	Federation	Percent
i) Incomes								
a) Interest	119,833	19.12	5,701	87.79	21,981	85.75	539,230	51.07
b) Marketing	226,808	36.25					959,656	19.30
c) Profit from the units	158,791	25.41	261	4.02	3,653	14.25	382,107	27.89
d) Others	119,543	19.13	532	8.19			90,592	1.82
- Total Income	624,975	100.00	6,494	100.00	25,634	100.00	4,971,585	100.00
II) Expenditures								
a) Administration,								
travel and others	385,865	68.68	7,918	56.52	5,179	100.00	1,656,381	45.44
b) Interest	56,594	10.07	4,387	31.32			1,454,723	39.91
c) Cost of goods sold and others	119,374	21.25	1,703	12.16			534,218	14.65
Total Expenditures	561,833	100.00	14,008	100.00	5,179	100.00	3,645,322	100.00
III) Profit or Loss	63,142		-7514		20,455		1,326,263	

Table 6
Progress of the Selected Fishermen's Co-operatives (1982 - 1991)

	Market Categories			District Marketing Federation
	Type A	Type B	Type C	
1. Membership	1,439	429	588	3,207
2. Member's Capital	102,649	19,403	28,90890S	525,196
3. Govt. Contribution	166,875	7,875	500	2,022,273
4. Reserves	724,826	26,493	40,130	77,863
5. Total Borrowed Capital	404,867	45,109	43,063	10,777,227
6. Total Deposits	362,020	13,400	1,685	280,254
7. Donations	15,333	726	—	—
8. Total Capital	1,778,009	113,435	114,874	13,686,020
9. Profit/Loss	80,092	-3,829.6	4,035	¹ -1,054,573.5

Notes The figures are average for the Period 1982-1991=

*Extent of infrastructure
highlight*

Table 7
Progress of the selected Fishermen's Co-operatives per member (1982 - 1991)

	Market Categories						District Marketing Federation	
	Type A	Percent	Type B	Percent	Type C	Percent	Federation	Percent
Member Capital	226.40	22.11	47.51	18.47	52.32	30.28	163.77	3.84
Govt Contribution	88.36	8.63	17.22	6.69	0.58	0.34	630.58	14.78
Reserves	345.48	33.75	47.54	18.48	100.72	58.30	24.28	0.59
Total Owned Funds	660.24	64.49	112.26	43.75	153.61	88.92	818.63	19.19
Total Borrowed Capital	141.22	13.79	114.57	44.52	13.76	7.96	3360.53	78.76
Total deposits	222.28	21.72	30.41	11.82	5.39	3.12	87.39	2.05
Total Capital	1023.74			100.00	172.76	100.00	4266.53	100.00
Profit or Loss per Member	28.96	100.00	257.24		25.44		-361.11	
			-2.04					

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Table 8
Growth Parameters of the Fishermen's Co-operatives (1982-91)

Variables	Market Categories	Constant	Regression coefficient	R ²	Growth rate (g)
1. Membership	Type A	1082	1.05** (2.7325)	0.4828** (7.47)	5.01
	Type a	416.87	1.0053* (2.166)	0.3565* (4.43)	0.53
	Type C	535	1.0181*** (5.2479)	0.7748*** (26.58)	1.81
2. Owned Capital	Type A	516416	1.139*** (9.844)	0.9237*** (96.85)	13.9
	Type B	36166	1.1015*** (4.593)	0.7250*** (21.09)	10.15
	Type C	39755.75	1.0959*** (9.503)	0.9186*** (90.28)	9.59
3. Borrowed Capital	Type A	168578	1.1517*** (9.4843)	0.9183*** (90.28)	15.17
	Type B	44023.74	1.00358 (0.5122)	0.03179C.262	0.358
	Type C	8140.85	0.7158*** (4.556)	0.7217*** (20.75)	-28.42
4. Total Capital	Type A	816958	1.1522*** (22.30)	0.9842*** (498.33)	15.22
	Type B	80408.14	1.0761*** (4.716)	0.7355*** (22.20)	7.61
	Type C	49396.9	1.069025*** (87.86)	0.9061*** (77.22)	6.902

Note; *** denotes significant at 1% level
 ** denotes significant at 5% level
 * denotes significant at 10% level

Figures in Paranthesis are 't' values for Regression coefficient and 'F' ratios for R.

Table 9
 Growth Parameters of the District Co-operative Pish Marketing
 Federation (1982-1991)

Variables	Constant	Regression coefficient	$\frac{I}{R}$	Growth rate (g)
1. Members	2191	1.0732*** (9.9323)	1.0732*** (98.67)	7.32
2. Owned Capital	107079	1.2097*** (5.379)	0.7834*** (28.93)	20.97
3. Borrowed Capital	9065672	1.0339*** (3.425)	0.5945*** (11.73)	3.39
4. Total Capital	9026409	1,0465*** (4.5576)	0.7220*** (14.24)	4.65

Notes *** denotes significant at 1% level.

Figures in Paranthesis are 't' values for Regression
 coefficient and 'F' ratios for R.

Table 10
Membership in Co-operative and Fishermens' Associations

Variables	Market categories					
	Type B		Type C		Type C	
	f B f	Per-cent	f	Per-cent	HH	Percent
1. Number of HH with membership of one Cooperative	18	9.57	11	28.2	31	42.47
2. Number of HH more than one Cooperative	170	90.43	28	71.8	42	57.53
— Total No. of HH 188 —	39				$\frac{HH}{18}$	
7. Number of HH with membership of Fishermen's Association	124	65.95	27	69.23	51	69.86

Note: The first two groups are mutually exclusive

Table 11
Sources of Funds for Fishing Businesses in Different Market Centres

Variables	Market categories					
	Type A		Type B		Type A	
	f No. of HH	No. Percent	f No. of HH	No. Percent	f No. of HH	No. Percent
1. own capital + owners	171	93.1	16	64.1	69	90.52
2. Banks + Others	155	82.45	25	10.26	21	28.77
3. Co-operatives + Others	18	9.57	4	84.62	8	10.96
4. Merchants + Others	131	69.68	33		45	61.44

Table 12
 Evaluation of Co-operatives by the Households in the
 Selected Markets

Criteria	Market Categories					
	Type A		Type B		Type C	
	No. of HH	Percent	(No. of HH	Percent	No. of HH	Percent
1. Poor	24	12.77	10	39	15	20.55
2. Average	74	39.36	11	28.21	29	39.73
3. Satisfactory	65	34.57	9	23.08	15	20.55
4. Very Good	21	11.17		10.26	13	17.81
9. Don't Know	4	2.13	5	12.82	1	1.37
Total	188	100	39	100	13	100

Table 13
 Nature of Complaints on Co-operatives
 by the Households

Complaints	Ranking (Priority wise)		
	1	2	3
0	68	0	0
1	108	30	4
2	42	42	9
3	25	22	8
S	27	2	0
9	30	1	0
Total	300	97	21

Note: Complaints:

0=No Complaints

1 = Not Accessible + Do not work+
 Not punctual + Delay in getting **the** service

2 = Rigid rules + Problems from the Apex/Govt
 + Delay in releasing the subsidy

3 = Corruption

9 = Don't know

8 = Others

Table 14

Assesment of the Benefits of Co-operatives by the Households

Variables	Market Categories					
	Type A		Type B		Type C	
	No. of HH		No- of HH		No of HH	
1. Value of Benefits Received	153	6609.78	32	3029,69	54	4765.02
2. Membership Scale	188	0.48	39	0.43	73	0.42
3. Benefits Scale	153	0.52	32	0.43	54	0.5
4. Opinion on Co-operative Scale	188	0.26	39	0.31	73	0.25
5. Complaints Scale	188	-0.24	39	-0.25	73	-0.22
6. Total Scale		1.02		0.92		0.94

Table 15
Opinion of the Households on the Size of Annual Landings

	Market Categories					
	Type A		Type B		Type C	
	No. of HH	Percent	No. of HH	Percent	No. of HH	Percent
1. Increasing	34	18	5	13	9	12.3
2. Constant	44	23.4	18	41	18	24.7
3. Declining	109	58	18	46	45	63
9. Don't Know	1	0.5	0	0	0	0
Total	188	100	39	100	73	100

Table 16
 Opinion of the Households on Reasons for Declining
 Annual Landings

Reasons	Ranking (Priority wise)			
	1	2	3	4
1. Increase in the No. of Mechanised boats	9	9	5	0
2. Fishing during monsoon by the smaller boats	18	33	7	1
3. Changes in the Marine Environment	125	72	6	0
4. Improvement in the Technology	20	13	2	0
5. Pollution	99	42	2	1
6. Don't Know	20	13	2	0
7. Others	9	0	0	0

Table 17
Opinion of the Households on Suitable Form of Institutions for
Resource Management

Institutions	No. of Households Reasons					Total
	1	2	3	8	9	
1. Directly by the Fisheries Department	33	14	4	3	0	54
2, Cooperative Societies	4	22	11	1	0	38
3. An Independent Government Authority	16	8	13	8	0	45
4. Fishermen's (Community based) Organisations	3	38	89	9	0	139
4. Others	2	2	3	15	2	24
Total	58	84	120	36	2	300

Note: Reasons:

1. Rigid Rules and Regulations
2. Strong Control Over Fishermen

Table 18
Opinion of the Households on Suggestions for Resource
Management

	Number of HH	Percentage
1. By imposing limits on the number of boats	3	1
2. Demarcation of fishing areas for mechanised boats	6	
3. By increasing the cost of fishing inputs & making fishing less attractive	14	4.87
4. By strictly restricting/ reducing fishing periods		20.33
5. Others	48	16
6. No Opinion	168	56
Total	300	100

References

- Amarsinghe, O. (1989). "Technological change, Transportation of Risks and Patronage Relations in a Fishing Community of South Srilanka". *Development and Change*. 20, 701-733.
- Baktha, N.P. (1983). "Development of Infrastructure Facilities for the Optimal Exploitation of the Exclusive Economic Zone". Fisheries Development in India. New Delhi: Concept Publishing Company.
- Berkes, F. (1985). "The Common Property Resource Problem and the Creation of Limited Property Rights". *Human Ecology*. 13, 187 - 208
- Bishop, R.C. , D.W.Bromley, and S.Langdon (1981). "Implementing Multiobjective Management of Commercial Fisheries: A Strategy for Policy Relevant Research". In *Economic Analysis For Fisheries Management Plans*, Ed. L.G. Anderson. Anon Arbor Science.
- Charles, A.T (1988), "Fishery Socioeconomics: A Survey". *Land Economics* 64 (3) 276-295.
- Datta, K.K, Dan, S.S and Datta, A.K. (1989). "Productivity, Profitability and Income Distribution in Capture Fishery; A study of the Orissa Coast". *Economic and Political Weekly XXV* (52), A-181-188,
- Douthwaite, R. (1992). *The Growth Illusion Bideford: Green books*.
- Ganesh Kumar N, Bhatta R, Kiresur, V.R, (1989). "Progress of Farmer's Service Societies in Dakshina Kannada - A Case Study. *Indian Co-operative Review*. XXVI (3). 339-346,
- Government of India (1988) . "Handbook of Fishery Statistics". New Delhi: Ministry of Agriculture, Fisheries Division.
- Government of India (1990). National Accounts Statistics. New Delhi: Central Statistical Organisation.
- Government of India (1961) . "Report on the Marketing of Fish in India Ed. 3", Nagpur: Directorate of Agricultural Marketing.
- Halfele E.T. (1974) . "The Governance of Common Property Resources", Baltimore: John Hopkins Univ Press.
- Jentoff S. (1985). "Models of Fisheries Development: Cooperative. Approach". *Marine Policy*, 322-31.

fishery

- Johnson R.N. and Libcap G.D. (1982), "**Contracting** Problems and Regulations The case of the Fishing". American Economic Review. 72 (5) 1005-1022.
- Kurien John (1991). "Running the Commons and Responses of the Commoners". Geneva: United Nations Research **Institute** for Social Development.
- Kurien John and Achari **T.R.T.** (1990). "Overfishing Along Kerala Coast; Causes and Consequences", Economic and Political Weekly XXV (36) 2011-2017.
- Lawson R. (1984). " **Economics of fisheries Development**". London: Frances Pinter Publishers.
- Lightfoot C.S. Feldman and Zabedin M (1991). "Households Agro-eco System and Rural Resource Management: A Guidebook". Manila: International Centre For Living Aquatic Resources Management.
- National Council (1986). "**Common** Property Resource Management". Washington, D.C. : National Academy Press.
- Omar I H (1988). Market Power, Vertical Linkages and Government Policy: The Malaysian Fish Industry Ph.D. Thesis, University of East Anglia.
- Palfreman AD (1990). "Fish Pricing Policies for Public Fish Marketing Enterprises". Hull: university of Hull unpublished.
- Scott A. (1979). "Development of Economic Theory of Fisheries Regulation". Journal of the Fisheries Research Board of Canada. 36: 725-41."

THE MARINE FISHERMEN'S CO-OPERATIVE SOCIETIES IN WEST BENGAL
AN EXPLORATORY STUDY

Kazi MB Rahim and Katar Singh

Abstract. The state of West Bengal has plentiful marine and inland fisheries resources and a sizeable population of fishermen. The state government has undertaken several programmes to improve the socio-economic condition of the fishermen and increase fish production. Development of a three-tier system of fishermen's co-operatives is one such programme. This paper presents an overview of the organisation and management of the Contai Central Fishermen's Co-operative Society in Midnapur district of the state and the main findings of a sample survey of three primary fishermen's co-operatives affiliated to the Central Society and an in-depth study of a sample of 60 member fishermen and 20 non-member fishermen.

The study revealed that the three-tier system appears, on the surface level, to have succeeded in achieving its goals. On the average, the sample fishermen families were all above the poverty line. But not all is well with the system. The Central Society has been running in loss year after year but the primary co-ops made marginal profits. The co-ops are all administered by the government officials although they have their own elected Boards/Managing Committees. The co-ops have failed to exclude the non-member fishermen from fishing in the waters leased in by them exclusively for their members; and they do not do anything to help their members in marketing of their fish nor do they undertake any human resource development activities for their members. The only good thing that the co-ops have done for their members is to secure for them fishing rights in the water bodies owned by the government and thereby have assured them regular employment and income. The authors highlight the need for professionalising the management of fishermen's co-ops in the state and reducing their dependence on the government.

Keywords. Financial viability, fishermen's co-op, lau National Productivity Award, pisciculture, socio-econ condition, water bodies.

Brakish

Tidal prawn

Introduction

The fisheries sector is now emerging as an important sector of India's economy. Millions of poor fishermen depend on it for their livelihood. But despite its important role in the country's economy, both productivity of fisheries and income of fishermen are very low compared to the potential that exists. Increasing the productivity of the fisheries resources and improving the socio-economic conditions of the fishermen are inextricably related and need to be done simultaneously. Organisation of fishermen's co-operatives (co-ops) has now been accepted as one of the important instruments of fulfilling both these goals (Singh and Bhattacharjee 1991 : 1-5).

In India, West Bengal is known for its plentiful inland and marine fisheries. The Government of West Bengal (GOWB) has established a three tier co-operative structure for development of its fisheries and improving the lot of its fishermen. As of November 1991, in the state, there were 848 Primary Fishermen's Co-op Societies (PFCS) at the village level, 18 Central Fishermen's Co-op Societies (CFCS) at the sub-division/district level and one State Federation of Fishermen's Co-op Societies (SFFCS) at the state level (Das 1992: 14-15). The federation is engaged, *inter alia*, in supplying fishing materials and equipment, and arranging for and disbursing loans to the PFCS through the CFCS. The performance of some of the co-ops has been good and they have bagged the National Productivity Award for their signal achievement in fish production (GOWB 1992 : 18).

This study was undertaken to study the organisation and management of the CFCS, Contai, examine the socio-economic conditions of a sample of members and non-members, and evaluate the socio-economic impact of PFCS on their members.

Research Methodology

Out of 19 CFCS in West Bengal, the CFCS, Contai was purposively selected for an in-depth study. The CFCS had 33 PFCS affiliated to it of which 22 were active. Three PFCS were selected randomly out of the active PFCS. Then, a sample of 60 members, 20 from each of the three selected PFCS, was selected randomly. For a comparison and contrast, a sample of 20 non-member fishermen in the area was also drawn randomly.

Both primary and secondary data were collected for fulfilling the objectives of the study. The primary data were collected by the personal interview method using a pre-structured questionnaire. The data collection work was done in the months of May and June 1992.

Management of the CFCS, Contai

The CFCS, Contai was established in 1964 with 29 PFCS affiliated with it. As of June 1992, 33 PFCS were members of the CFCS, Contai out of which only 22 PFCS were active. These are located in 13 blocks of the Contai subdivision, viz., Contai I, II & III, Ramnagar I & II, Egra I & II, Potashpur I&II, Bhagabanpur I & II, and Khajuri I & II. CFCS; contai, is managed by a Board of Directors. One representative from each of the 33 PFCSs is deputed to participate in the General Body Meeting of CFCS in which nine Directors are elected from amongst the members. The COWB nominates three Directors, one of whom is Sub-Divisional Officer who acts as the ex-officio Chairman of the Board.

Besides, for managing the day-to-day work, the CFCS, Contai has 11 regular employees and 11 casual workers. The Chief Executive Officer (CEO) of the CFCS who is an officer of the COWB is responsible for the overall administration and supervision of the CFCS and has full administrative and technical control over its staff.

For membership of the society, one is required to purchase at least 10 shares of Rs. 100 each. The working capital of the society in the year 1990-91 was Rs. 42 lakh.

Business Performance of the CFCS, Contai

The society's business interests cover a large number of activities such as supplying fishing equipment, nets, ropes, boats, fish feed and other inputs required for pisciculture, selling diesel and lubricating oil for motorised boats, and implementing the social fishery scheme of the Fish Farmer's Development Agency (FFDA). For implementing these activities, the society has established six different centres which are scattered all over its operational area.

The total fish caught by the society was 276.260 mt in 1989-90, 216.634 mt in 1990-91 and 148.216 mt in 1991-92 valued at Rs.10.75 lakh, Rs. 8.44 lakh and Rs.7.46 lakh respectively. The gross profit earned by the society was Rs.2.14 lakh in 1988-89, Rs.4.83 lakh in 1989-90 and Rs.5.15 lakh in 1990-91 (Table 1).

When the income from other sources, viz., rent from pisciculture, interests on bank deposits, income from the canteen, rent of trawler, government subsidy, etc., was added to the gross profit, the total income of the society went up to Rs. 5.00 lakh, Rs.6.57 lakh and Rs.5.94 lakh in 1988-89, 1989-90 and 1990-91 respectively. The total expenditure incurred by the co-op was Rs. 8.73 lakh, Rs.12.60 lakh and Rs.9.91 lakh in these three years respectively. Thus, the society incurred the loss of

Rs.3.73 lakh, Rs.6.03 lakh and Rs. 3.97 lakh in the years 1988-89, 1989-90 and 1990-91 respectively (Table 1). Since the losses are recouped through loans and grants by GOWB, the Society is a burden on the state exchequer.

A Profile of the Selected PFCS

As we stated earlier, out of the 22 active member PFCS of CFCS, Contai, three were selected randomly for an in-depth study. The selected societies were: a) Dohasonamoyee Fishermen's Co-operative Society; b) Ramnagar-Saptaqram Fishermen's Co-operative Society; and c) Majilapur-Punabalipara Fishermen's Co-operative Society. A brief profile of each of the three PFCS is presented in Table 2 and some salient features discussed in the following paragraphs.

Dohasonamoyee Society

The society was established in 1976 with its headquarters at Dohasonamoyee which is situated half a km away from the Bay of Bengal. It covered six villages having a total population of 12,000 people of which 4,000 were fishermen. Only 109 fishermen (2.7% of the total) have joined the co-op as members. The total paid-up share capital of the co-op was Rs. 15,460 of which the GOWB contributed Rs.10,000 (65%).

The amount of loan sanctioned by the GOWB was Rs. 55,000. The society had taken on lease from the GOWB one km long stretch of brackish water area for pisciculture. The rent of the water area was only Rs. 135 per annum. In 1990-92 the total revenue earned by the society was Rs. 6,000 from leasing out its water resources and the expenditure incurred was Rs. 3,635. Except leasing out its water resources to its members, the society performs no other functions. The society initially started with 63 members. By 1991-92, the number of members had increased to 109. All of them were male and belonged to the fishermen caste which is a Scheduled Caste. The society is run by a six-member Management Committee. The members of the Managing Committee are elected from amongst the members of the society in its annual General Body Meeting.

Ramnagar-Saptaqram Society

This society was established in the year 1971. It covered seven villages having a total population of 14,000 of which 1,000 were fishermen. Only 252 (25.2% of the total) fishermen have joined the society as members. The total paid-up share capital of the society was Rs. 26,574 of which the GOWB contributed Rs. 11,000. The amount of loan sanctioned by the GOWB was Rs. 27,112.50. The society had six tidal canals for brackish water pisciculture. The total area of the canals was 250 acres. The society has to pay a rent of Rs. 2,500 per annum for the water area and a

tender money of Rs. 505 for *feri ghat* (landing site). The society has not been able to prevent non-members from fishing in its waters.

The total net income earned by the society from fish sale, rent received from *feri ghat* and boat was Rs. 4,747 in 1989-90, Rs. 1,016 in 1990-91 and Rs. 7,328 in 1991-92.

The number of members of the society has increased from 125 in 1971 to 251 in 1991. All the members were male and belonged to the fishermen caste. Membership fee of the society is Rs. 2 and value of each share Rs. 20. The society is run by a six-member Management Committee elected from amongst the members of the society in its General Body Meeting. In addition to the Management Committee, the society also has a six-member Advisory Committee. Both the Committees are constituted for a term of three years. The office bearers, viz., Director, Chairman, Secretary, Vice Chairman, Assistant Secretary and Treasurer are selected by the members of Management Committee themselves.

Majilapur and Punabalipara Society

This society was established in 1964. It covered only two villages having a total population of 1,750 of which 400 were fishermen. Some 141 (35.25%) fishermen have joined the society as members. The paid-up share capital of the co-op was Rs. 9,900 of which Rs. 5,000 was contributed by the GOWB.

The society had one tidal canal of 12 acres for brackish water fish culture. The society has not been able to prevent non-members from fishing in its waters. The society also provides canteen services. The total net income earned by the society in 1991-92 was Rs.11,000. The dividend amount is spent by the society in a collective social function instead of paying it to individual members. In 1991-92, a sum of Rs.2,000 was spent for this purpose. The total expenditure incurred by the co-op was Rs. 1,007 as rent for the tidal canal, Rs. 1,100 for office supplies and contingency and Rs. 2,000 for repair and maintenance of the tidal canal.

Out of 151 members of the society, 141 belonged to the fishermen caste and 10 to other Hindu caste groups. All the members were male. The membership fee is Rs. 2 and the value of each share is Rs. 20. The society is run by a nine-member Management Committee elected from amongst its members in its General Body Meeting for a term of three years. The office bearers, viz., Chairman, Vice Chairman, Secretary, Assistant Secretary, Treasurer and four Directors are selected by the elected members themselves.

Socio-Economic Impact of the Co-ops

As stated earlier, our sample size was 80 fishermen of which 60 were members and 20 were non-members. The main findings of the sample survey are summarised in Table 3 and briefly discussed in the following paragraphs.

The average family size of the Ramnagar-Saptagram PFCS was highest (12.7) followed by Dohasonamoyee (9.7) and Majilapur - Punabalipara (9.1). The overall average family size of all the members of CFCS was 10.6 which is higher than that of the sample non-member fisherman families (9.8). The male female-ratio for the members was 55 and 45 for the non-members.

Educational Status

On the average, 16.7% of the members and 20% of the non-members were illiterate. The literacy level of both the members and non-members compares very well with the average literacy rate of about 58% in the Midnapur district in 1991. About 20% of the members of Majilapur-Punabalipara and Dohasonamoyee PFCS were illiterate. The same level of illiteracy prevailed among the non-member families. The extent of illiteracy was lowest at 10% in the case of the members of Ramnagar-Saptagram PFCS. The highest level of education attained was found to be class IX among the member and non-member families. About 50% of the total members had education from class V to class IX in the case of Ramnagar-Saptagram CFCS whereas the corresponding figure for the non-members was only 20%. Some 60% of the non-members had education up to the primary level whereas the corresponding figure for the non-members was only about 47%.

Residential Buildings

The average number of residential buildings owned by the members of PFCS was 1.13 which is less than that owned by the non-member fishermen 1.20. The average investment in buildings was Rs. 29,469 for the members and Rs. 22,417 for the non-members.

Fishing Craft and Nets

Thirty per cent of the member-fishermen of Ramnagar-Saptagram PFCS and ten per cent of Majilapur-Punabalipara PFCS possessed one launch on an average. In the case of Dohasonamoyee PFCS, 20% of the members possessed 1.5 launches on an average. The average availability of launches for all the members was only 0.1 for Majilapur-Punabalipara PFCS, 0.3 each for the Ramnagar-Saptagram and Dohasonamoyee PFCS.

The fishermen of the non-member group had no launches at all. The average purchase value' of a launch was Rs.70,83 3 and its average expected life was 28 years. Not all the member-fishermen and non-members possessed a country boat individually. Some 10% to 4 0% of the members and 30 % of the non-members did not possess any boat at all. The average value of the boats possessed by the members was Rs. 9,595 and , Rs. 10,600 for the non-members. This shows that there was no significant difference in the average investment in boats between the members andnon-members. The average expected life of a boat was around 12 years.

The fishermen of the area use three types of fishing nets, viz., *Beundi*, *Bhasani* and *Khepla*. All of the members of Dohasonamoyee PFCS possessed 2.4 Beundis on an average, 90 % of the members of Majilapur-Punabalipara possessed 3.11 Beundis and only 30 % of the members of Ramnagar-Saptagram possessed three Beundis on an average. The average price paid for a Beundi net at the time of purchase was highest (Rs. 3,964) in the case of Majilapur-Punabalipara. Ninety per cent of non-member fishermen possessed 2.2 Beundis on an average for which the average purchase price was Rs.3,000. The rest of the fishermen did not possess any net of this type. Bhasani is a very large expensive net generally used for marine fishing. Its price varies with the variation in its quality and size. In the study area, the average purchase price of a Bhasani net varied from Rs. 23,000 in the case of Dohasonamoyee members to Rs. 50,000 in the case of Majilapur-Punabalipara members. Although the highest average purchase price was paid by the members of Majilapur-Punabalipara PFCS, only 10% of the members possessed this type of net. Some 50% of the members of Dohasonamoyee and 3 0% of the members of Ramnagar-Saptagram possessed Bhasani nets, only 2 0% of the non-members had Bhasani nets for which the average price was Rs . 35,000.

Khepla is a small type of net. Only 40 per cent of the members of Ramnagar-Saptagram possessed this type of net, the average purchase price of this was Rs . 165 only. Similarly, 30 % of the non-members also possessed the Khepla nets. The average purchased price was Rs. 200.

On the whole, the average investment in nets made by the members was about 41% higher than that made by the non-members .

Time Spent in Fishing and Fish Catch

On an average, 2.5 family members of the member-fishermen of PFCS were engaged in fishing. The highest number of family members (3) was engaged in this profession in Ramnagar-Saptagram and lowest number was 2.2 in Majilapur Punabalipara. In the case of non-member fishermen, only 2.3 family members were engaged in this profession.

Table 4 presents data about the time spent in fishing by the sample members and non-members; and the quantity of fish caught by them. Three months from mid-March to mid-June are considered as the non-fishing season due to the occurrence of frequent storms and cyclones. It was found that, on an average, the members of PFCS go for fishing for about 10.3 months in a year and non-members for 11 months. The members of Dohasonamoyee, PFCS, however, went out for fishing all the 12 months in a year.

In a year, 1,265 hrs. were spent on fishing on an average by the members of PFCS, whereas 1,487 hrs. were spent by the non-member fishermen. The maximum time (1,548 hrs.) were spent for fishing by the members of Dohasonamoyee PFCS and the minimum time (1,012 hrs.) by the Majilapur-Punabalipara members.

It is surprising that after spending the maximum time in fishing, the Dohasonamoyee members were able to catch only 137 qt. of fish per annum per family. The maximum quantity (255 qt.) of fish was caught by Majilapur-Punabalipara members who spent the minimum number of hours for fishing. This might be because they possessed big launches and expensive good quality nets. On an average, 195 qt. of fish was caught per annum per PFCS member family and 167 qt. by the non-member families.

On the whole, we can say that the members were better off than non-members in terms of both the average quantity of fish caught per family per annum and the average quantity caught per hour of fishing effort. This indicates that the members perhaps had access to better fishing spots than the non-members. This could be attributed to their membership of the co-ops.

Annual Income

Table 3 presents data on the annual average income from fishing as well as the total annual income from all sources for the sample members and non-members. The average annual income from fishing in 1990-91 was Rs. 34,200 for the members which is about 30% higher than the average income of Rs. 26,200 earned by the non-members. This indicates a positive impact of the co-ops on their members' income.

The main source of income of the members of PFCS was fish caught from the ocean and the brackish water. Agriculture was a secondary source of income of the members of PFCS. About 73% of the members earned a sizeable income (on an average, Rs. 9,318 per annum) from agriculture. Besides, 6.66% cent of the members also earned Rs. 11,000 on an average from other sources.

The highest amount of income earned from fish catch was Rs. 39,900 per annum per family for the members of Ramnagar-Saptagram PFCS. This was followed by Rs. 37,100 for the members of Dohasonamoyee and Rs. 25,600 for the members of Majilapur-Punabalipara PFCS.

The highest average annual income (Rs. 48,100) was earned by the members of Dohasonamoyee. The second position in this respect was occupied by the members of Ramnagar-Saptagram, their average annual income being Rs. 46,800. The average annual income of the members of Majilapur-Punabalipara PFCS was Rs. 30,400.

In comparison to these income figures, the average annual income for the non-members was very less being only Rs. 31,540. Although 90% of the non-members had agriculture as the second source of income, their average earning from agriculture was only Rs. 5,933 and Rs. 26,200 from fish catch. Unlike members of the PFCS, the non-member fishermen had no other sources of income except fish catch and agriculture.

Annual Expenditure

Table 3 also presents data on the annual average expenditure on food and clothing for the members and non-members. The members of the PFCS expended the highest amount of their income on food and other edible items. On an average, Rs. 15,400 per annum was spent by each family on those items, which was 55.06 % of their total expenditure. The wages paid had been excluded from the estimates of expenditure as they had already been deducted while working out the net income from different sources. The expenditure on clothing occupied the second highest position (Rs. 2,450). Education received less importance with an average amount of only Rs. 1,005 per family expended on it. Similarly, only Rs. 1,040 was spent per family per annum for health care.

In the case of non-members too, food and other edible items accounted for the highest amount of expenditure (Rs. 13,600) among all the items. This was about 57.89% of the total expenditure. As in the case of PFCS members clothing got the second highest position; on an average, Rs. 2,370 was spent under this head. Again, in this case too, health and education received the least importance. In both the cases of members and non-members, social ceremonies got more importance than education and health.

On the whole, there was no significant difference in the amount and pattern of household expenditure between the members and non-members.

Borrowings of Members and Non-members

On the average, the members borrowed Rs. 34,417 per family and the non-members, Rs. 15,300 from various sources (Table 3). This means that the members had borrowed significantly higher amount of money than the non-members. Some 40% of the members of PFCS had borrowed money from different sources such as the Central Co-operative Bank and a Primary Co-operative Society, namely, Satilapur Krishi Unnayan Samiti (SKUS). About 60% of the members of Dohasonamoyee CFCS had borrowed on an average, Rs.37,667 from the Central Co-operative Bank at different times during 1978-88. As of June 1992, 42.4% of the principal amount was outstanding. Similarly, 50% of the members of Majilapur-Punabalipara had borrowed, on an average, Rs.36,200 from the Central Cooperative Bank during 1985-86. In this case, about 47% of the principal amount was outstanding. The members of Ramnagar-Saptagram had just started borrowing from the institutional sources in 1992-93. Some 10% of the members had borrowed, on an average, Rs. 6,000 from SKUS.

In the case of non-members, the percentage of dues outstanding was very high, 73.6%. Some 50% of the non-members had borrowed money from the Central Co-operative Bank during the period, 1988-91. The average amount borrowed was Rs. 16,300 which was about 50% of the average amount borrowed by the members of PFCS.

On the whole, we could say that the co-ops had been instrumental in enhancing the incomes of their member fishermen by securing for them fishing rights in the water bodies owned publicly by GOWB. On the average, all of the sample fishermen families were above the national poverty line now set at an annual income of Rs. 11,000 for a family of five members.

Marketing Channels

It was found that no organised fish marketing system existed in the study area and that both the members and non-members used similar marketing channels. The major role is played by the middlemen comprising *aratdars* (commission agents), retailers and intermediaries between the retailers and fishermen. Sometimes, fishermen also bring their catch to

the whole-salers in Calcutta. The following six types of marketing channels were used by the sample fishermen to sell their fish. The PFCS and CFCS have done precious little to improve the marketing of fish.

1. Fishermen ——> Aratdar——> . Whole-saler in Calcutta
2. Fishermen-----> *Aratdar*-----> Retailer in local markets
3. Fishermen-----> Retailer in local markets

4. Fishermen—> Whole-saler in Calcutta
5. Fishermen—> Agent at the "landing sites
6. Fishermen—> Agent in villages

Conclusions and Implications

On the basis of the overview of the organisation and management of the CFCS, Contai and the findings of the in-depth study of a sample of both member and non-member fishermen presented in this paper, the following conclusions could be drawn:

Development of fishermen's co-ops has been recognised as one of the most important measures for improving the socio-economic condition of fishermen and boosting up fish production in the state. The three-tier system of fishermen's co-ops has taken firm roots in the state. Large amounts of money contributed by different sources is being pumped into the co-op system for implementing different projects and programmes for achieving the goals. The contribution of GOWB to the paid up share capital of the coops was very high ranging from to

The performance of some of the co-ops in the state has been praiseworthy. Many of them have bagged the National Productivity Award for their exemplary achievements in fish production in different years. The CFCS, Contai was, however, not financially viable in the last three years. — —

Although there were elected Boards of Directors and Management Committees at all the three levels, the co-op structure was closely regulated and administered by the GOWB Officers. There is a need for reducing the control of the government over the co-ops and for making them self-reliant. The members of different committees/bodies at all the levels were found lacking professionalism in their approach and actions. Also, they were not properly trained. The cooperative leaders did not have a clear idea of the mission of the fishermen's co-ops. There is therefore a need for professionalising the management of the co-ops and imparting training to their officials.

Establishment of healthy business linkages among the primary central and apex co-ops is essential for the financial viability of the PFCS. This, in reality, has not been achieved. There was lack of co-operation and communication among the societies in matters of common interest such as the marketing of fish.

The members of the PFCS do not get any extra benefits other than the right to catch fish in the brackish water which has been taken on lease from the GOWB by the societies. The non-members too are not excluded from catching fish in this area. Ineffective administrative machinery of the GOWB in conjunction with the vested interest have created several Z problems preventing the proper functioning of the co-operative societies.

By and large, the sample fish co-ops have been instrumental in enabling their members have access to the common pool (public) water bodies for fishing and fish culture. Consequently, the average annual income of the member-fishermen from fishing is higher than that of the non-members and, on the average, they were all above the poverty line. There is a need for the co-ops to restrict the access of non-members to the water bodies under their control so that the income of their members from fishing could go up further and non-members are brought under their fold.

The members do not get credit facilities from the fish co-ops. The programmes and projects implemented by the apex body and government agencies do not reach the grass-roots level. The poor image of the co-ops in the minds of the members formed due to their bad experience is distinctly conveyed in their talks about the co-ops.

Marketing of fish, the most critical factor affecting the income from fishing, is not undertaken by the co-ops. Moreover, human resources development through education, training, health and hygiene remains untouched and unthought of by the co-ops at the grass-roots level. A strong linkage between human resources development, provision of credit facilities, input supply, and marketing of fish products needs to be established through the co-ops.

Table 1 - Income and Expenditure of
CFCS, Contai (Rupees in lakhs)

Particulars	1988-89	1989-90	1990-91
Gross profit	2.14	4.83	5.1
Total income	5.00	6.57	5.9
Total expenditure	8.73	12.60	9.9⁴
Net income	(-) 3.73	(-) 6.03	(-) ³ . ⁹⁷

Source : Office records of the CFCS, Contai.

Table 2
A Profile of the Selected Primary Fishermen's Co-ops

Particulars	Dohasonamoyee society	Ramnagar-Saptagram society	Majilapur-Punabali-para society
1. Year of registration	1976	1971	1964
2. No. of villages covered	6	7	2
3. Total population	12,000	14,000	1,750
4. Total fishermen population	4,000	10,000	400
5. No. of members of the society (June 1992)	109	252	151
6. Total paid-up share capital (Rs)	15,460.00	26,574.00	9,900.00
7. GOWB's contribution to share capital (Rs.)	10,000.00	11,000.00	5,000.00
8. Loan sanctioned by the GOWB (Rs.)	<u>55,000.00</u>	<u>27,112.50</u>	NA
9. Water area under the society,	1 km (length)	250 acres	12 acres
10. Rent of water area (Rs./annum)	135.00	2,500.00	1,007.00
11. Income from fish sale in 1991-92 (Rs.)	Nil	6,253.50	12,000.00
12. Total expenditure in 1991-92 (Rs.)	3,635.00	6,574.95	4,107.00
13. Total net income in 1991-92 (Rs.)	4,000.00	7,328.00	11,000.00

Source : Office records of the co-ops.

None are actually paying

Always over payment

Table 3
Selected Indicators of Socio-Economic Conditions of Sample Members and Non-members.

Indicator	Members	Non-members
Average size of family	10.6	9.8
Per cent of illiterate fishermen	16.7	20.0
Average value of residential building (Rs.)	29,469	22,417
Average number of launches/ trawlers per family	0.23	0
Average purchase price of launches/trawlers (Rs.)	70,833	--
Average number of country boats	.8	0.08
Average purchase price of country boats (Rs.)	9,595	10,600
Average investment in nets (Rs.)		
-Beundi nets	10,114	6,667
-Bhasani nets	48,556	35,000 26,200
Average annual income in 199-91 from fish catch (Rs./family)	38,200	21,211
Average annual total income (Rs./family)		
Average annual expenditure on food (Rs./family)	15,400	13,600
Average annual expenditure on clothing (Rs./family)	2,450	2,370
Average amount of money borrowed (Rs./family)	34,417	15,300

Table 4
Time Spent on Fishing and Quantity of Fish Caught by Sample Member-Fishermen

PFCS	No. of family members engaged	No. of months in a year engaged	No. of hrs in a day engaged	Total hrs in a year engaged	Quantity of fish catch per family (Qt/year)	Quantity of fish catch per hr. (Kg)
Ramnagar-Saptagram	3	9.8	5.8	1,211	195	16
Hajilapur-Punabalipara	2.2	9.0	7.3	1,012	255	25
Dohasonamoyee	2.3	12.0	6.9	1,548	137	9
Overall	2.5	10.27	6.7	1,265	195	15
Non-members	2.3	11.0	6.5	1,487	167	11

References

- Das, Sukumar (1992). "Co-operative Movement of the Fishermen of West Bengal and its Impact on Productivity and Poverty Alleviation". Meenbarta. First issue, January. Calcutta: Department of Fisheries, Government of West Bengal.
- GOWB (1992). Meenbarta. First Issue, January. Calcutta: Department of Fisheries, Government of West Bengal.
- Singh, Katar and S. Bhattacharjee (1991). "The Beraram Maihipara Common Pool Fish Pond :_ A Case Study.." Case Study 8. Anand: Institute of Rural Management.

INTERVENTIONS IN COMMON POOL RESOURCE USE AND MANAGEMENT :
A CASE STUDY OF MARINE FISHERIES IN KERALA

Suresh Balakrishnan, Katar Singh and V, Mukunda Das

Abstract. This paper presents an overview of marine fisheries in south-west Kerala, and the findings of an in-depth study of two fishermen societies in the area. The study indicated that interventions by government organisations like the Kerala State Co-operative Federation for Fisheries Development popularly known as MAISYAFED and the non-governmental organisations like the South Indian Federation of Fishermen Societies (SIFFS) have focussed on improving the access of fishermen to marine resources through improvement of technology and financial support to acquire such technology. At the same time, the fishermen in the area perceived a gradual erosion of their incomes over time. This seems to emerge from a combination of over-exploitation of in-shore resources and unplanned fish harvests consequent upon the introduction of new technology.

The comparison of two societies, one sponsored by SIFFS at Vlz-injam and another sponsored by MAISYAFED at Pallihottam-Moothakkara, suggests that they have a similar impact on catches and income at the field level. Since the MAISYAFED society is a state-sponsored organisation with ample resources, its scale of operation is much higher in magnitude than that of the SIFFS-sponsored society. Although the SIFFS society indicates a much stronger fishermen organisation, it does not seem to have been able to do anything significant with regard to evolving a strategy for managing the common pool marine fisheries.

Perhaps the fishermen's societies must enlarge the scope of their activities and be able to take charge of the market system before any meaningful interventions in the common pool fisheries could be taken up. Such interventions need to be well planned because restrictions that threaten the survival of fishermen, who have no other alternative sources of livelihood, will certainly fail at the implementation stage.

Keywords. common pool resource, intervention, Kerala, marine fisheries, MAISYAFED, PCO, SIFFS, outboard motors.

introduction

Marine fisheries are one of the important common resources in India. Historically, the users of resource had been artisanal fishermen. Till the middle

S. Balakrishnan

the present century **traditional** methods based on human **effort and** skill were used to carry out fishing operations. Changes in fishing technology in the mid-fifties radically altered the scenario and led to systematic intensive exploitation of marine fisheries resources. The impact of this shift in technology is most pronounced in a small segment of the south Kerala coast which has the largest concentration of fishermen population in the country.

The major users of this resource today include modern fishermen using deep sea trawlers, mechanised boats, artisanal fishermen using OBM's and traditional fishermen relying on human power. The differences in technology across these groups have led to significant variations in access to marine resources and in turn given rise to significant variations in income. Conflicts have therefore emerged on this account, and gained momentum because of the perception that overfishing in the near shore areas is leading to a gradual decline in catch.

Developmental efforts in the marine fisheries sector have, by and large, focussed on improving the utilisation of resources through upgradation of technology. Although the initial efforts focussed on large commercial operations, it became evident that the pressure they put on the indigent artisanal fishermen population could not be over-looked. Therefore, subsequent efforts were directed towards improving the technology used by artisanal fishermen by upgrading their traditional operations with the help of out board motors (OBMs), more effective fishing gear and superior craft, building materials and designs. Traditional fishermen, at this stage, came to face financial constraints in acquiring modern fishing assets. Therefore, state-sponsored organisations like MAISYAHD and non-governmental organisations like SIFFS came forward with integrated fisheries development efforts which incorporated technology and finance. As a result, today, the state has a wide variety of grassroots level fishermen development organisations in the co-op and welfare sectors.

It is evident that the two main instruments used in the state for fisheries development, are introduction of motorised boats and organisation of fishermen's societies. Whereas fairly comprehensive and systematic techno-economic studies of artisanal and mechanised marine fisheries have been completed, there has been no in-depth study of the operations and management of the marine fishermen's societies. Hence it is appropriate to take a closer look at the role played by different fishermen's organisations at the grassroots level and the emerging changes in the artisanal fisheries sector of Kerala. It was therefore proposed **that** an exploratory case study be taken up to understand the dynamics of this process, and to document field level activities of two major organisations involved in this work, viz., MAISYAHD and SIFFS. This exploratory case study attempts to document and analyse the existing

procedures of operations and management of primary fishermen's organisations, identify their strengths and weaknesses, and explore the possibilities of enhancing their effectiveness as an instrument of development of both the fishermen and the fisheries.

Research Procedure

The case study method of research was followed to fulfill the objectives of this study. We purposefully selected two districts, viz., Trivandrum and Quilon for the purpose of this study. Then, one fishermen's co-op society was purposively selected from each of these two districts. The criterion for selection of the co-op was diversity of the fishing craft and gears used by fishermen. These two co-ops together represented the major types of fishing craft and gears that are presently used in the state. Finally, a sample of 20 fishermen was randomly selected from each of the two sample fishermen's societies for In-depth study of their income and consumption levels, catch per worker per day, expenditure incurred on fishing, and their attitudes and opinions about the operations and management of the co-ops.

Both primary and secondary data were collected to fulfil the objectives of the study. Primary data were collected from the samples of 40 fishermen and from various governmental and non-governmental agencies concerned with marine fisheries development. Besides, the techniques of direct observation, focus groups, discussion with key officials and non-officials, were also used to collect the needed primary data. Secondary data were collected from various governmental and non-governmental sources such as census documents, research reports, project reports, and so on.

The field work was conducted during the months of January - March, 1992. For the purpose of collection of data, a questionnaire was designed and pre-tested before use. The primary data from the sample fishermen were collected by personal interview methods by a trained investigator who had a fairly good knowledge of the fishermen community and various fishing craft and gears.

Organisational Interventions in Marine Fisheries Development

Kerala with a coastline of 590 Kms. and a continental shelf area of about 36,000 sq.kms. is well known for its rich marine fish resources, especially prawns and oil sardines. Over the period of last decade or so, Kerala's contribution to India's total marine fish landings has ranged between 20% to 24% although it accounts for only 10% of the state's coast line (GOK 1991 a). As of March 1991, the total fish production of the state was 6.99 lakh mt (GOK 1991 d). In 1988, Kerala contributed about 20% of the India's total

marine fish catch and accounted for nearly 35% of the country's total earnings from the export of marine products, Kerala thus occupies a place of prime importance in the marine fisheries sector of India's economy.

Marine fisheries constitute an important sector of Kerala's economy as well. Nearly 3% of the state's total population is engaged in this sector which contributes about 2.41 of the state's net domestic product (GOK 1991 d). As of March 1990, the total fishermen population in the state was estimated at about 9.54 lakh comprising 7.48 lakh of marine fishermen and 2.06 lakh of inland fishermen. Of the total fishermen, some 1.90 lakh were active sea going fishermen (GOK 1991 c). Marine fishermen in the state are concentrated in some 222 coastal villages. Of the 14 districts in the state, 9 districts, viz., Trivandrum, Quilon, Alleppey, Ernakulam, Trichur, Malappuram, Calicut, Kannur and Kasargod, are maritime districts.

Despite the significant role that the marine fishermen play in the economy of the state, their standard of living is not satisfactory. The fishermen lag behind the other sections of the population in terms of per capita income, literacy, access to public health care and other socio-economic indicators of development. Duly recognising the need for state intervention to ameliorate their socio-economic conditions, the government of Kerala (GOK) launched a number of welfare programmes for fishermen. The first major step that GOK took in this direction was the passing of an Act, the Kerala Fishermen Welfare Societies Act, 1980 providing for organisation of fishermen into 'Fishermen Welfare Societies' (FWS) and initiation of welfare and development programmes exclusively for fishermen. Consequently, some 222 FWS were organised rather hurriedly all along the coast covering the entire population of active marine fishermen. The societies so organised, however, remained more or less inactive until the Kerala State Co-operative Federation for Fisheries Development Limited popularly known as MATSYAFED was set up in late 1984.

MATSYAFED has a clear mandate of spearheading development programmes targeted at fishermen. Soon after its establishment, MATSYAFED launched an Integrated Fisheries Development Project (IFDP) in 1985 with financial support from the National Co-operative Development Corporation (NCDC). MATSYAFED now has reorganised all the erstwhile FWS into 81 Fishermen's Development and Welfare Co-operative Societies (FDWCS) spread over the state. It sought to integrate upgradation of artisanal fishing operations with financial aid, market linkages, input supply and welfare activities. The project was brought under the co-op sector so as to enable target beneficiaries assume control over developmental activities, with the aid of professionals (GOK 1985). The major activities of the primary level co-ops are, provision of new/replacement craft and gear on credit, conduct of fish auctions at beach landing sites,

collection of loan repayment instalments from auction proceeds, disbursement of loans and collection of repayment instalments for subsidised housing and sanitation schemes, and issue of certificates to facilitate insurance and similar schemes.

A fisheries development effort on similar lines was launched by a voluntary organisation, Programme for Community Organisation (PCO). Established in 1977, PCO has been involved among other things, in organising fishermen's co-ops and conducting training, research and extension programmes for them. After successfully establishing the Mariyanad Fishermen Cooperative Society, in an uninhabited stretch of land near Trivandrum, it promoted the establishment of the South Indian Federation of Fishermen Societies (SIFFS) in 1985 (Kumar, 1988).

The SIFFS was conceived as an apex body of fishermen societies in the districts of Trivandrum and Quilon in Kerala, and Kanyakumari in Tamil Nadu. As of today these societies cover 50 villages in these three districts with a primary membership of over 6,000 fishermen. These village level societies, mostly registered under the Charitable Societies Act, are members of district level federations. Each district federation is affiliated to SIFFS, and procures and markets Prawn and Cattle Fish for fish export; they also help market species like dried Anchovy, salted Ribbon Fish and Shark, thereby providing an alternative to a series of middlemen. The district federations also buy fishing equipment in bulk and sell it to fishermen at reasonable prices and provide training services to the village level societies. The societies usually have a limited area of operation, and work with small homogeneous groups of fishermen. Although most of the operations of these societies resemble that of MAISYAHED co-ops, there are some significant differences. Finance for purchase of fishing asset is either from banks or other funding agencies, and not from SIFFS' fund. Therefore, the society is very careful in recording landings; member groups tend to be closely involved, and actively monitor catches of other members at beach auctions to ensure loan repayments.

Profile of the Study Areas

Table 1 presents a profile of Trivandrum and Quilon districts and Table 2 presents some salient features of the sample fishermen's villages.

Trivandrum district

Trivandrum is the southern most district in the state of Kerala. The district with its long coastline of 78 Km and with an almost continuous stretch of lakes and backwaters makes it one of the most important centres for marine as well as backwater fisheries. Rainfall in the district is

from both south-west and north-east monsoons, and averages around 200 cms.

The district also accounts for very a high percentage (approx. 20%) of the state's fishermen population (GOK 1991 a). The district has 42 main fishing villages (GOK 1991 c). There are 22,070 active sea going fishermen in the district. The annual production of marine fish during 1987 and 1988 was estimated to be 39,174 and 34,887 mt respectively. There are 156 freezing plants and cold storages, in the district (GOK 1991 a).

Fishing gear available in the district includes cast nets, drag nets, gill nets, trawl nets, boat seines, shore seines, stake nets, Chinese dip nets, traps, hooks and other gear. In 1991, there were 1,654 motorised crafts of which 526 are plank boats and 128 are plywood boats. (SIFFS 1991 a). This census indicated that the district had 14,271 non-motorised craft of which 13,57. were *kattamarams*, 107 dugout canoes and 637 plank built boats. In the recent years, many of the *kattamaram* owners have found it difficult to operate on their own, and have therefore joined the ranks of labourers. Many of them migrate to, northern Kerala to work as labourers for the ring seine owners and gill net operators seasonally.

Trivandrum fisheries district exhibits wide inter-village and intra-village variations in the fishing skills and the types of crafts used. Fisheries operations are least mechanised in Trivandrum when compared to the levels achieved in other districts of the state' (SIFFS 1991 b). Furthermore, the adoption of motorised boats has been uneven in the district. For example, Vizhinjam is almost fully saturated with mechanised boats while nearby Valiathura remains, by and large, untouched by motorisation. The Christian fisherwomen play a major role in marketing fish, and handle over 75% of the total fish landings in the district.

Quilon district

Quilon district lies immediately north of Trivandrum. It has a coastline of 37.3 Km., which accounts for about 6% of the total coastline of the state. There are six taluks in the district and 100 villages, of which 92 are rural, five partly rural and three fully urban.

Fishing occupies an important place in the economy of the district. There are seven marine fishing villages and 26 inland fishing villages in the district. There are 23,372 sea going fishermen (Socio Economic Survey of Fishermen, Kerala 1985). The annual production of marine fish during 1987 and 1988 was 59,731 and 90,532 mt respectively. There are 95 frozen plants and cold storages in the district (Kerala Fisheries ; Facts & Figures 1990).

Fishermen in the district use a wide range of craft and gear. In 1981, there were 774 motorised crafts in the district represented by 150 out boards, four dugout canoes and 620 plywood boats (SIFFS 1991 a). The survey indicated that the district had 1,970 non-motorised crafts, of which 1,563 *katiamarams*, 238 dugout canoes 167 plank boats and two others.

The district has reasonably well developed shore-based facilities for developing the fishing industry. There is a modern fishing harbour in Neendakara village which is endowed with fairly well developed infrastructural facilities such as roads, power, potable water, transport and communication. This harbour is the major centre for mechanised boats and trawlers in South Kerala.

The district has two different fishing zones (SIFFS 1991 b). The northern part of the district is the **Thanguvallam** zone. The striking feature of this zone is the total absence of beach landings. The coastal villages in this zone are situated on a thin strip of land between the sea and an inland waterway (canal). Sea erosion being a severe problem, sea walls have been put up all along the coastal belt. As a result, fishermen have to anchor their crafts in the canal behind their villages and reach the sea by navigating through the canal and the lake up to the harbour. The fish are landed and sold at Neendakara which is the largest wholesale fish market in the region. Round trips through the canal take a considerable time and are hence very expensive on account of time and fuel required to navigate the distance. The zone lying south of Neendakara constitutes the **Quilon** town fisheries.

Vizhinjam

Vizhinjam Panchayat falls in Trivandrum taluk and is almost completely a low land area. It has five villages, with 11,495 households (Trivandrum District Handbook, 1991). The panchayat also has a fishing harbour, which is by and large used by artisanal fishermen only. The panchayat has 17 primary fishermen societies; of these three are sponsored by MATSYAFED, two by SIFFS, and others are sponsored by church related welfare societies. The panchayat has 75 fish merchants. During monsoon season, fishermen from the neighbouring Kanyakumari district as well as other fishing villages make use of this harbour for launching craft; over 1,000 motorised plywood boats and canoes lie anchored at **Vizhinjam**. Hence this village has a very important place in the fisheries operations of the district.

PallithottamrMoothakkara

The villages Pallithottam-Moothakkara form a contiguous unit and have been aggregated into a single society area by MATSYAFED. The area is part of the Quilon town, and therefore has a mixed population in terms of occupations. It

has some 300 motorised plywood boats and 2,000 fishermen operating from the densely populated town area. This zone has been badly affected by the operations of trawlers as well as ring seines. This area has eight primary fisheries societies of which one is sponsored by MATSYAFED, three by SIFFS and three by Quilon Service Society which is a local church related body. The area has 30 fish merchants, 25 auctioneers and five OBM service centres.

A Profile of the Fishermen Societies

Table 3 presents a profile of the sample fishermen's co-ops. The Vizhinjam Fishermen Village Development Society (VFVDS) was set up in 1983. It is affiliated to the Trivandrum District Fishermen Federation (TDDF) which is the apex body for fishermen village development societies in Trivandrum set up by the Programme for Community Organisation (PCO). The VFVDS has a membership of 50, of which 40 are active sea going fishermen. By religion, all the members are Christians. It has five employees who take care of routine operations including supervision of beach level auctions, disbursement of loans, maintenance of accounts and other organisational activities. The society earned Rs. 57,548 through commission from auctions during 1991-92, of which Rs. 44,501 has been utilised, to cover establishment expenses.

The Pallithottam-Moothakkara Fishermen Development Welfare Cooperative Society (PMFBWCS) was set up in 1987. It is affiliated to the MATSYAFED. This society was set up to facilitate the implementation of the Integrated Fisheries Project of MATSYAFED. The area of coverage of the PMFDWCS is much larger than that of other local fishermen societies. It has a membership of 542, of which 250 are active sea going fishermen. But for 16 members who are Hindus, all the others are Christians. This society employs four persons who oversee the auctions, disburse loans, carry out recovery activities and perform other organisational activities. On an annual income of Rs. 59,538 through commission from auctions, in 1991-92, the society has incurred establishment expenses amounting to Rs. 84,300.

Profile of Respondents

Table 4 presents a profile of the sample respondents. To get an in-depth view of the nature of marine fisheries operations, a small survey was carried out in each village covering 20 respondents. This survey attempted to collect some basic demographic details, some information on the financing pattern of their fishing assets, details regarding fishing operations and income, and their perceptions about the impact of current fishing operations on the sustainability of marine resources.

The respondents from Vizhinjam came from families with an average size of 5.5. The male female ratio observed in the sample of households was 56. Fifty percent of the heads of households covered in the survey were illiterate and only 25% had studied beyond primary level. Family income above Rs.12,000 per annum was reported by 75% of the respondents. Sixty five percent of the households resided in thatched houses; none of them possessed concrete accommodation. Respondents owning land formed 55% of the sample; 35% were landless.

The respondents from Moothakkara came from families with an average size of six. The male female ratio observed in the sample of households was approximately 1:1. Twenty percent of the heads of households covered in the survey were illiterate and only 35% had studied beyond primary level. Fifty percent of the respondents reported family income above Rs.12,000 per annum while 20% reported that their incomes were below Rs.8,000 per annum. About 45% of the households resided in thatched houses; only one household possessed concrete accommodation. Of the respondents, sixty percent owned land, while 15% were landless.

The high level of illiteracy observed corroborates the widely held belief that fishermen community have not benefited substantially from the literacy programmes in Kerala. This factor also has implications for the successful implementation of technology intervention process like motorisation.

Profile of Fishing Assets

Table 5 and 6 presents data about ownership of various types of craft and gears and average investment in them. The south Kerala coast presents great diversity in terms of sea conditions, fish species, fishing craft and gear. Differences also exist across locations in terms of dependence on marine resources, fishing skills and social processes. For example, the southern most area in which Vizhinjam falls has a very narrow continental shelf, dense population of fishermen and extensive motorisation. In contrast, the area near Quilon has a wider shelf, less dense population and fairly high level of motorisation. Differences in fishing assets have also emerged as a result of types of technology developed for specific types of fishing environment.

The survey revealed that group ownership of craft was quite low in Vizhinjam. Of the 15 ply vallams possessed by the respondents, 12 fell in the category of individual ownership. There were 20 OEMs under individual ownership and only seven in group ownership. Ply vallams accounted for approximately 75% of the crafts operated by respondents. The others were kattamarams and kettuvallams. High powered OBMs (9.9 hp and above) accounted for 41% of the power

devices used for propelling the craft. The major types of gear used in the area were gill nets (medium and large), boat seine, trammel net and hook and line, most of these gears were owned individually. In case of 20% of the respondents, medium gill nets, trammel net and hook and line were owned collectively. Boat seines were possessed by 45% of the respondents only.

The survey reveal that group ownership of craft OBMs and gear was sure popular in Moothakkara, About 80% of the respondents possessed ply-vallams and OBMs through group ownership. Similarly, 75% of the respondents had group ownership of medium gill nets and hook and line gear. The only type of craft used by respondents from Moothakkara was ply-vallam. Only one group covered in the survey had an OBM that fell in the high power category (9.9 hp and above) all the remaining were of 8 hp. or below. The more popular gear among respondent sat Moothakkara were medium gill nets, hook and line and large gill nets; more than 75% of the respondents had these gears. Only 25% of the respondents were using boat seine.

The sea conditions at Vizhinjairt and Moothakkara partly explain the differences in the crafts used. However, another important reason, as far as the sample is concerned, is the extent to which fishermen have come to appreciate the significance of ply-vallams as an alternative to *kattamarams* the intensity of extension through the non-MATSYAFED societies has made an important contribution in this regard.

Financing of Fishing Assets

The survey revealed that the order of investments required to possess a complete complement of fishing equipment was quite high. Even traditional crafts like kettuvallam cost over Rs.15,000. The survey recorded the average investments required for acquisition of different types of craft, OBMs and gear for the two sample villages; the details are presented in Table 6.

The survey also examined the sources of finance used by the sample fishermen to purchase craft, OBMs and gear. It was observed that the fishermen tended to seek loans from different institutions, and sometimes borrowed from many sources at the same time. The financing strategy used also varied from asset to asset. The alternate profiles that were examined were combinations of loans from different sources, namely, MATSYAFED, SIFFS, and money lenders; the details are presented in Table 7.

Finance for fishing craft acquired by the , respondents of Vizhinjam primarily came from SIFFS and money lenders, according to the survey. It was observed that 45% of the sample fishermen had borrowed only from SIFFS for this purpose, while 40% had used money lenders exclusively for

financing the purchase of fishing crafts. About 15% had made use of a combination of SIFFS loans, and borrowings from money lenders to purchase the craft, However, when it came to OBM, some respondents had already repaid loans taken for purchasing this equipment or had purchased the same through own funds, About 40% of the respondents used a combination of loans from SIFFS and money lenders to purchase OEMs. The pattern was completely different when it came to nets and gear. About 65% of the respondents relied exclusively on money lenders to finance these purchases while the remaining 35% used the combination of SIFFS loans and money lenders.

The pattern of finances used by the respondents in Moothakkara for purchase of the craft followed a trend similar to that observed in Vizhinjam. About 50% of the respondents borrowed from MATSYAFED only to finance purchase of the craft, while five percent relied on SIFFS only. About 10% used both MATSYAFED and money-lenders while 15% relied on money-lenders only. A more interesting combination of financing was observed in case of two of the respondents who borrowed from both MATSYAFED and SIFFS for their OBMs, which was possible due to group operations. However, when it came to OBMs, all the respondents are reported to have used MATSYAFED finance only, for the purchase of equipment. In the context of nets and gear, 5.0% used a combination of MATSYAFED finance and money lenders, 45% exclusively money lenders and one respondent a combination of MATSYAFED, SIFFS and money-lenders.

The profile of asset acquisition patterns in Vizhinjam and Moothakkara was examined through this survey. The results are presented in Table 8. Most of the respondents (87%) from Vizhinjam had acquired plywood boats more than five years prior to the survey. In contrast, 70% of the respondents from Moothakkara had acquired plywood boats only during the last five years. With regard to nylon nets the pattern is less skewed in that 60% of the respondents from Vizhinjam and 80% from "Moothakkara acquired this gear during the last five years. The difference is marginal in the case of OBMs, where 90 to 95% of the respondents at both the locations acquired this equipment only during the last five years.

The major thrust of these interventionist strategies has been on providing craft and gear on credit, so as to give more fishermen access to these modern : inputs. This approach was expected to insulate the beneficiary fishermen from usurious private money-lenders. However, acquisition of modern craft and gear does not guarantee regular income, because the size of fish catch showed wide variation and seasonality (Tables 9 and 10) . Hence many beneficiaries resort to private money-lenders to take care of their short term subsistence requirements during the lean season. These short term loans are repaid to money-lenders by diverting their produce away from society's primary auctions. As a result, these organisations feel that a

significant presence in the retail market needs to be built before a commanding position can be established in the primary auction market.

Profile of Fishing Operations and Practices

Table 11 and 12 presents a profile each of important fishing operations and fishing practices respectively for the sample villages. Fishing operations take place all along the south Kerala coast on a regular basis except during the monsoons. In such periods of bad weather, launching and landing of craft can be carried out at protected harbours like Vizhinjam and Neendakara. This factor plays the key role in determining the number of fishing days during which operations are carried out in the monsoon months between June and August. However the factors that affect the intensity of fishing operations in the other months are movement of shoals, cost of fuel in operating the craft and the like, which determine for a group to venture out on a particular day for fishing. This dimension has assumed greater importance in recent years with the increase in power of the OBM's used for propelling the craft. As a result, fishermen, particularly those operating in groups with largercraft, prefer to venture out only after smaller craft or more enterprising fishermen reportsighting of--

The main factor that affects the economics of fishing operations is the Likelihood of having to return without a catch. This uncertainty plays a key role in determining the decision to proceed to sea for fishing on a particular day. It was observed in the survey that approximately 30% of the fishing days result in 'nil' or 'negligible return' to the respondents. These zero return days vary in intensity across seasons.

Respondents from Vizhinjam reported that they carried out the fishing operations on approximately 236 days every year. In the monsoon season, between June and August they were able to carry out normal fishing activities because the harbour makes it possible to launch and land boats. Major variations can be observed with regard to the amount of time that is spent by the respondents across seasons. In contrast to the seven hours that they spend on an average in the monsoon season, they spend 11 to 12 hours on each trip during the rest of the year. However, the expenses they incur on fuel do not proportionately go up during the rest of the year because the distance travelled does not vary substantially; the difference in time is actually spent in waiting for the catch to emerge in good weather. The sample respondents from Moothakkara indicated that fishing operations were carried out on approximately 235 days every year. The lowest intensity of activity was during the monsoon months when fishing is possible only in about 50% of the days. The time spent on fishing operations tends to be

similar to that in the subsequent season from September to December. The intensity of fishing activity tends to come down marginally between January and May in terms of time spent on fishing.

The monsoon is also the period when catches are most abundant., Therefore, the highest earnings are reported in the monsoon season when the respondents from Vizhinjam had reported catches by groups to be as high as Rs.4,100 per day. The respondents from this area reported fairly high levels of maintenance expenditure amounting to approximately Rs.15,000 per annum. Net per household income based on income and operating expense data was estimated to be Rs.14,392 in Vizhinjam. The resulting per capita income of Rs.2,398. is lower than the average for the district of Rs.3,799 (GOK 1991 d) .

Although the respondents from Moothakkara indicated lower average returns during the season from January to May in comparison with respondents from Vizhinjam, they seem to be able to avoid 'nil' return days better than their counterparts from Vizhinjam. High value catches worth Rs.3,474 on an average was reported at Moothakkara. The respondents reported comparatively lower levels of maintenance expenditure of approximately Rs.7,000 per annum.' Net per household income based on income and operating expense data was estimated to be Rs.27,312 at Pallithottam-MGothakkara. The resulting per capita income of Rs. 4,582 is higher than the average for the district of Rs.3,756 (GOK 1991d) .

Impact of Intervention

Mechanisation of artisanal fisheries has taken place through the adoption of OBMs for propelling traditional craft. The first key area in which widespread impact has been recognised is the reduction of physical effort and drudgery in day-to-day fishing operations. Although this has not been explicitly stated by many as a major benefit, it has been stated in reactions to suggestions that fuel energy is becoming extremely expensive and could be substituted with more labour. The reduction in strain is expected to have a positive impact on the health and quality of life of fishermen.

Technology has provided artisanal fishermen access to the outer seas. Although they do not travel great distances on a regular basis, it has made possible for them to move rapidly and harvest shoals at greater distances and with greater speed. If one does not take into account the cost involved in mechanised fishing, it would appear that the impact on production and earnings should be immense.

Technology upgradation was expected to give rise to substantial additional employment for artisanal fishermen,

by increasing the ability of fishermen to seek out good catches during lean seasons, and by enabling them to spend longer hours at sea. The survey revealed that 95% of the respondents perceived an increase in number of fishing days after the introduction of mechanisation, at both Vizhinjam and Moothakkara (Table 13).

The survey examined the perceptions of the sample fishermen regarding the impact of technology on a variety of areas. With regard to the change in volume of catch all the respondents from Vizhinjam felt that instead of the expected increase, there had been a decline in catch. At Moothakkara, the pattern was a little different, in the sense that only 75% felt that it was decreasing; 20% of the respondents felt that their catches had increased. About 85% of the respondents at Vizhinjam and 100% from Moothakkara observed that fish availability in the inshore areas had substantially reduced in recent times leading to decreases in both individual and total catch. In other words, the perception of respondents with regard to changes or increases in catch have by and large been negative, although studies at the state level have suggested to the contrary (Das et al. 1992). Perhaps, local factors like over-fishing areas close to urban areas, viz., Trivandrum and Quilon cities, would explain this negative perception.

The perceived about decrease in catch does not suggest that incomes have not gone up. About 95% of the respondents both at Moothakkara and Vizhinjam felt that the number of days that they could carry out fishing operations had substantially improved after motorisation. This perception is reinforced through improved income, as reported by 90% of the respondents from Moothakkara. However, this perception is not completely shared by the respondents from Vizhinjam, of whom only 35% feel that incomes have been improving (Table 13). A partial explanation for the improvement in incomes

reported in the artisanal fisheries sector can be found in the inflationary push to fish prices. The more important explanation can be seen in the development of market channels and beach level auctions through which fishermen are able to realise a better proportion of the final consumer price. This factor assumes significance with regard to areas like Vizhinjam and Moothakkara which are located close to major towns like Trivandruia and Quilon. All respondents, both at Vizhinjam and Moothakkara, reported that price of fish had gone up after formation of the fishermen societies in their areas.

The consumption pattern of respondents did not vary sharply across the two areas covered in the survey. Although food grains form the major part of the consumption expenditure, expenses at tea shops accounted for nearly 18% of the total annual expenditure. Another important element in the consumption expenditure reported is liquor; 5% to 10% of the

expenditure was reported by the respondents to be on purchase of liquor (Table 14). It reinforces the perception that in the life of a sea going fisherman, a fair amount of expense on liquor takes place on a regular basis.

There seems to be a high level of dissatisfaction among the respondents with regard to the quality of technical resources available for OBM maintenance. Around 95% to 100% of the respondents felt that the quality of service available was poor, and that repairs were extremely costly.

The impact of the interventions by these fishermen's organization have gone well beyond incremental income and employment. In the first place, these interventions have focussed on a community which had no asset base worth mention, and which had been treated as unbankable from commercial financing view point. This class of households today are owners of assets which would be valued at current prices between Rs.50,000 to Rs.100,000. This remarkable change has had a deep impact on the status of artisanal fishermen in the local community, and also on their perceptions regarding the future.

A remarkable side-effect of the improvement in the asset-ownership is the increased credit-worthiness of fishermen in the larger community. Families who used to find it difficult to purchase rice on credit for a square meal in the past, now easily get credit from local shops to cover the requirements of a week or a fortnight. Similarly, it has also now become much easier for fishermen to get working capital to cover operating expenses and gear repair through private loans. This has made life much easier for them than before. However, increased credit-worthiness seems to have also increased the scale of indebtedness among fishermen, but alongside made life much easier than before.

In spite of the improvements that have taken place in the quality of life in the fishermen community, there is also an undercurrent of frustration and despair. When they compare their life-styles and working environment with individuals in the organised sector, particularly in urban sectors in Trivandrum and Quilon, many react that at least their children must be helped to escape from the artisanal fisheries sector. Meanwhile, a large number of youth from the community have completed secondary education. Since the unemployment situation in the state is very acute, it has made opportunities more difficult to come by for these first generation job seekers. Their plight becomes more poignant because lack of experience in fishing activities during adolescent years spent at school has made it very difficult for them to be efficient fishermen.

These socio-economic issues have made the fishermen community an ideal setting for regular political activity. Since fishing villages are fairly densely populated and the resident communities have fairly similar problems, it also

Conclusions and Implications

The case analysis of marine fisheries at Vizhinjam and Pallithottam-Moothakkara presented in this paper reveal the nature and extent of changes taking place in the artisanal marine fisheries sector in Kerala. It was evident that the major source of change could be traced to the improvement in technology through motorisation. This process was facilitated and speeded up by institutional interventions which have attempted to quickly disseminate new technology and also provide financial and infrastructural support in order to provide access to technology among large numbers of artisanal fishermen. Along side, it was observed that traditional artisanal fishermen who used to limit their catch to the requirements of the local market and family consumption have now shifted to a much larger market-oriented operation with the support of motorised craft. This shift in market has also been facilitated by the growth of private business through development of preservation facilities like cold storages and ice plants, as well as wider distribution facilities including exports. As a result, there are a number of external variables which today determine the extent of returns to artisanal fishermen.

In the process, there is a growing perception that the returns to artisanal fishermen today are below expectations of the community, and are also below the potential of the sector. This has led to a debate among the artisanal fishermen community about whether the cause lies in the nature of current fishing operations or in the environment of marine fisheries. From the point of view of fishing operations, the factors that *may* have played a critical role are rapid growth in number of craft in the sector, and technology which is oriented towards intensive fishing in potential areas. From the point of view of bio-technical environment, the factors are growth in population being supported by marine fisheries, high cost of production due to cost of craft and fuel, poor use of available technology which makes operational costs high, and the general non-sustainability of marine resources.

This problem has helped to evolve very slowly a common pool perspective of marine fisheries among artisanal fishermen. These perspectives are based on two frames - nature of assets held, and geographical boundaries. In the first grouping, classes with shared interest and problems have emerged, like OBM users, mechanised boat owners, primitive craft owners and the like. In the second, communities have tried to come together to restrict access to inshore waters and local markets. However, these groupings have tended to be transient and shifting in nature and unless institutional forms evolve around them, a common pool perspective is unlikely to emerge. The societies on their part certainly do not facilitate this process.

The design of a common pool resource management framework for marine fisheries becomes much more complex when one considers the potential implications of any restriction on fishing by artisanal fishermen. This community has no alternative source of employment or income, and depends on this resource alone for survival. Any restriction on fishing could therefore threaten the very survival of the fishermen, unless it forms part of a package which would take care of the needs of the indigent population adequately. The absence of such a comprehensive intervention, common pool resource frameworks would neither be feasible nor implementable.

The complexity of the artisanal marine fisheries system has been partially captured in this case study. The dynamics of the system varies a good deal within the districts and to a much greater extent across the districts. It would therefore be difficult to suggest an approach that takes into account such variations without extensive study of all the areas to be covered. It is likely that the emerging the areas to be covered. It's likely that the emerging forces within the fishermen community will develop a greater regional/local focus when it comes to managing common pool resources and resolving the related problems in the near future.

Table 1
A Profile of Trivandrum and Quilon Districts

Sl. No.	Particular	Trivandrum	Quilon
1.	Population : Total	2,596,112	2,813,650
	Male	1,279,150	1,388,678
	Female	1,316,962	1,424,972
2.	Area Sq. Km.	2,192	4,620
3.	Literacy (%)	70.50	74.11
4.	No. of households	491,081	514,669
5.	No. of fishing villages	47	46
7.	Fishing craft		
	(a) Kattamarara	13,527	1,563
	(b) Dugout/Plank	1,274	559
	(c) Plywood	128	620
	(d) Other	—	2
8.	No. of fishing gear		
	(a) Gill net	10,872	3,411
	(b) Shore seine	610	136
	(c) Boat seine	1,298	61
	(d) Trammel net	2,858	721
	(e) Hook & line	5,200	679
	(f) Ring seine	—	166

Source : Census of Artisanal Fishing Fleet in Kerala, 1991, and District Handbook, 1991.

Table 2
A Profile of the Sample Fishermen's Villages

S1. Particulars ' Vizhinjam Pallithottam-No. Panchayat Moothakkara:

1. Active fishermen	5,550	3,000
2. Fishermen households	2,820	1,300
	Hindu 350 -	
	Muslim	410
	Christian	2,070
		70
		1,230
3. Literacy (%)	58	41
4. Fishing craft		
(a) Kattamaram	647	57
(b) Dugout/plank	138	139
(c) Plywood	380	96
(d) Other	83	70
5. Fishing gear		
(a) Gill net	679	500
(b) Shore seine	37	18
(c) Boat seine	328	20
(d) Ring seine	--	93
(e) Hook & line	(not estimated)	127
(f) Trammel net	344	20
6. No. of societies	11	8
7. No. of merchants	75	30
8. No. of auctioneers	60	25
9. Money lenders	120	75
10. OBM repair centres	6	5
11. Plywood craft repair centres	1	--
12. Village amenities		
(a) Schools	3	2
(b) Colleges	--	--
(c) Primary health centres	5	2
(d) Banks	3	--
(f) Ice plants	2	2
(g) Cinemas	3	--
(h) Boat building yards	2	1
(j) Arrack shops	4	3

Source: Office records of the Sample Fishermen's Co-operative Societies.

Table 3
A Profile of the Sample Fishermen's Co-operative Societies

Sl. No.	Particulars	Vizhinjam	Pallithottam- Moothakkara
1.	Name	VFVDS	PMFDWCS
2.	Year of origin	1983	1987
3.	Membership	50	542
	Hindus	—	16
	Muslims	—	—
	Christians	50	526
4.	Active members	40	250
5.	Annual fish catch (Kg)	27,62,439	2,87,291
6.	Loan disbursed (Nos)	1	61
7.	Loan value (in Rupees)	1,916	21,87,291
8.	Loan recovery (in Rupees)	15,594	2,31,573
9.	No. of employees	5	4
10.	Annual establishment expn. (in Rupees)	44,501	64,300
11.	Annual commission income (in Rupees)	57,548	59,538
12.	Annual surplus (in Rupees)	+13,047	-4,764

Table 4
A Profile of the Respondents

S1.	Particulars	Vizhinjam	Pallithottam- Moothakkara
1.	Family size	5.6	5.9
	Male	50	61
	Female	62	57
2.	Education of head of households		
	Illiterate	10	4
	Upto primary	5	9
	Above primary	5	7
3.	Family income (annual)		
	Rs. 8,000 and below	2	4
	Rs. 8,001 - 12,000	3	6
	Above 12,000	15	10
4.	Type of house		
	Thatched	13	9
	Tiled	7	10
	Concrete	-	1
5.	Land ownership		
	Landless	7	3
	Puraxnpokku	2	5
	Landed	11	12

Source : Sample survey.

Table 5
Ownership of Fishing Assets in Sample Villages

Sl. No.	Particulars	Vizhinjam		Pallithottam-Moethakkara	
		Individual ownership	Group ownership	Individual ownership	Group ownership
1.	Type of craft				
	Kattamaraxn	3	0	--	--
	Kettuvallam	2	1	--	--
	Ply vallain	12	3	4	16
2.	Type of OBM				
	8 HP	11	5	5	15
	9.9 and above	9	2	--	--
3.	Type of Gear				
	Gill nets (Med)	16	4	5	15
	Boat seine	8	1	1	4
	Gill nets (Large)	14	3	5	11
	Trammel net	16	4	2	5
	Hooks and line	16	4	5	15

Table 6

Average Investment in Fishing Craft in the Sample Villages

Sl. No.	Particulars	Vizhinjam (Rs.)	Pallithottam- Moothakkara (Rs.)
1.	Average price of craft		
	Kattamaram (set)	8,200	---
	Kettuvallam	15,066	---
	Plywood	18,230	17,925
2.	Average price of OBM		
	8 HP	18,000	23,000
	9.9 and above	21,000	---
3.	Average investment in Net	48,700	43,075

Table 7
 Source and Amount of Loans Taken by Sample Respondents for
 Various Fishing Craft and Gear

Particulars	CRAFT		OBM		NET	
	Vzhm	Palltm- Mooth	Vzhm	Palltm- Mooth	Vzhm	Palltm- Mooth
MATSYAFED only	—	10	2	20	—	—
SIFFS only	9	1	—	—	—	—
MATSYAFED & SIFFS	—	2	—	—	—	—
MATSYAFED & Money lenders	—	2	—	—	—	10
SIFFS & Money lenders	3	—	—	—	7	—
MATSYAFED, SIFFS & Money lenders	—	—	—	—	—	1
Money lenders only	8	3	4	—	13	9

Table 8
 Asset Acquisition by the Sample Respondents

Sl. No.	Particulars	During last 5 yrs		More than 5 yrs	
		Vzhm	Palltm-Mooth	Vzhm	Palltm-Mooth
1.	Craft				
	Plywood	2	14	13	6
	Kettuvallolia	1	-	2	--
2.	OBM	18	19	1	1
3.	Nylon net	12	16	8	4

Table 9
Species-wise and Month-wise Marine Fish Landings in Kerala
During 1987

	Species			
	Oil Sardine	Lesser Sardine	Mackerel	Prawns
January	24,752	5,938	1,890	1,387
February	13,641	3,680	2,638	1,456
March	3,574	1,686	1,801	1,939
April	4,761	3,393	1,397	570
May	6,339	192	991	1,832
June	12,961	183	1,901	2,770
July	4,236	304	186	7,341
August	5,200	316	623	5,929
September	15,537	3,345	2,616	3,289
October	22,586	2,098	1,004	619
November	14,547	1,519	803	1,567
December	17,125	1,591	1,444	1,118

Source : Kerala Fisheries at a Glance, 1990

Table 10
District-wise Marine Fish Landings in Kerala During 1987

Species	Trivandrum				Quilon			
	1985	1986	1987	1988	1985	1986	1987	1988
Oil Sardine	364	1,176	6,379	79	7,983	19,107	7,311	4,612
Lesser Sardine	2,997	1,672	4,816	3,958	3,174	3,373	2,699	2,911
Mackerel	2,483	910	3,772	3,860	1,554	118	1,370	8,552
Prawn	42	133	460	227	23,157	16,995	12,616	9,128

Source s Kerala Fisheries at a Glance, 1990

Table 11
A Profile of Fishing Operations in the Sample Villages

Particulars	Vzhm	Mooth	Vzhm	Mooth	Vzhm	Mooth
	Jan -	May	June -	Aug	Sept -	Oct
Fishing days	98	100	60	47	78	88
Time spent (in hours/ day)	12	5.5	7	8	11	8
Fuel per trip (in litres)	188	94	139	88	169	107
Gross group earnings						
(a) Average number of days with no catch	42	36	26	10	33	28
(b) Average value of large catch (in Rupees)	3,350	879	4,100	3,474	2,575	1,595
(c) Average number of days with large catch	8	13	5	8	6	12
(d) Average value of catch (in Rupees)	482	353	540	550	311	350
(e) Average number of days per catch	48	57	29	24	39	38
Average net group earnings (in Rupees)	31,512	29,148	27,820	36,866	19,039	22,964

Table 12

A Profile of Fishing Practices in the Sample Villages

Particulars	vizhinjam	Pallithottam- Moothakkara
Mode of sale	Auction	Auction
Maintenancs expenditure (in Rupees)	--	--
Net/annum	4,030	1,765
OBM/annum	7,526	3,197
Craft/annum	3,525	2,180
Average group size	4	3
Net income per household (in Rupees)	14,572	27,312

Table 13
 Perceptions on Fisheries : Impact of Motorisation

Particulars	% of sample fishermen	
	Vizhinjam	Pallithottam- Moothakkara
Improvement in catch size	Nil	20
Improvement in daily income	35	90
Improvement in fishing days	95	95

Table 14
 Pattern of Annual Consumption Expenditure

	Vizhinjam (Rs.)	Pallithottam MoothaKkara (Rs.)
Foodgrains	11,050	13,741
Teashops	3,575	4,134
Housing	639	810
Liquor	1,605	1,470
Others	2,788	2,775

References

- Das, V.M., Balakrishnan, Suresh, and Padmakumar, K. (1992) . Impact of Integrated Fisheries Development Project Phase I: An Evaluation. Trivandrum: Centre for Management Development.
- ☞ (1985) . An Integrated Fisheries Project : Appraisal Report. Kerala State Co-operative Federation for Fisheries Development Ltd. (MATSYAFED), Trivandrum: Government of Kerala.
- ☞ (1991 a) . Kerala Fisheries : Facts and Figures, 1990. Trivandrum: The Department of Fisheries, Government of Kerala.
- ☞ (1991 b) . Inland Fisheries of Kerala at a Glance. Trivandrum: The Planning and Statistical Cell, Directorate of Fisheries, Government of Kerala.
- ☞ (1991 c) , Marine Fisheries of Kerala at a Glance. Trivandrum: The Planning and Statistical Cell, Directorate of Fisheries,. Government of Kerala.
- ☞ (1991 d) . Economic Review. Trivandrum: Kerala State-Planning Board, Government of Kerala.
- Kumar, K.G, (1988) . 'Organising Fisherfolk Co-operatives in Kerala. Economic and Political Weekly.
- Kurien, J. and T.R.T. Achari (1989) . On Ruining the Commons and the Commoner - The Political Economy of our Fishing, Working paper No.232, Trivandrum: Centre for Development Studies.
- SIFFS (1991 a) . A Census of Artisanal Fishing Fleet of Kerala (1991) . Trivandrum: South Indian Federation of Fishermen Societies.
- SIFFS (1991 b) . Motorisation of Fishing Units : Benefits and Burdens. Trivandrum: South Indian Federation of Fishermen's Societies.

Workshop-9

CO-OPERATIVE MARKETING SOCIETIES IN RUBBER PLANTATIONS :
A STUDY IN KERALA

V . Haridasan

Abstract. The paper examines the evolution of co-operative rubber marketing in India and assesses its progress. At the end of 1991-92, there were 36 rubber marketing societies in India. Data from 33 societies operating in Kerala were collected. The data related to the period 1991. The total membership of the societies was 86,181. This formed around 20 per cent of the registered small growers in Kerala, The rubber area owned by the members was 1.83 lakh hectares. This formed around 50 per cent of the total rubber area of the small growers in the state. The average membership of the societies increased from 706 in 1965-66 to 2,612 in 1990-91. The average rubber sold by the societies increased from 190 mt in 1965-66 to 1,302 mt by 1991-92. The number of societies increased from 12 in 1965-66 to 36 in 1991-92. There was allround progress in the activities of the societies during the last 25 years.

Keywords: Kerala, marketing, natural rubber, rubber plantation, Rubber Board.

Introduction

Rubber is a perennial tropical crop grown mainly in the southern states of India. Rubber has been cultivated in Kerala (85%), Tamil Nadu (4%), Tripura (4%), Karnataka (3%) and Assam (2%). The total rubber area was 4.7 lakh hectares at the end of 1991-92. Some north eastern states (in addition to Assam and Tripura) with a reasonable climatic conditions, have also started cultivating rubber.

There are two distinct groups producing rubber viz., the estates and the small holdings. At the time of Independence the estates (more than 20 hectares) dominated the production scene. But later the small holdings began to take up rubber cultivation and at the end of 1990-91 they contributed around eighty per cent of the crop. It was only around twenty percent in 1950-51.

The total world production of natural rubber has been placed at 5.3 million mt in 1991. India's share was about seven percent in the same period, and India stood fourth among the rubber producing countries of the world.

Features of Rubber Marketing

The crop of the rubber tree is collected by a method of "controlled wounding" called tapping. Tapping is made usually every second or third day during which a thin portion of the bark is removed by the tapping knife which allows the milk of the rubber tree (latex) to ooze out and the same is collected in a coconut shell or plastic cup.

Latex is coagulated by adding formic or acetic acid and the coagulum is transformed into sheets. The sheets are dried, smoked and marketed. The scrap rubber which forms about 15 to 20 per cent of the total production is sold to dealers or millers and is converted by them into estate brown crepe rubber. Certain growers also sell latex after preservation for concretion, That part of the processing is carried out in the factories. It may be stated that the quality of rubber produced is not uniform. Depending upon the colour, dirt, bubbles, blisters etc. sheet rubber and crepe rubber are classified under 22 grades, Latex concentrates are classified under three groups based on the degree of concentration. Small growers generally produce sheet rubber, the quality of which is generally lower than that of estates. Since 1974, small quantities of technically specified crumb rubber are also produced in India,

In rubber marketing there are certain distinct stages. In the first stage the country dealers purchase rubber from small growers. These dealers eventually sell rubber to the big dealers in places like Palai, Kottayam, Cochin etc, The big dealers generally have contact with manufacturers. A large number of marketing societies fall under the category of big dealers.

Difficulties in disposing stock during peak production months (October to December), occasional downgrading by buyers and non-realisation of notified prices are the major marketing problems encountered by the small growers. About 50 per cent of the rubber produced in the country is consumed by the automobile tyre manufacturers. Their purchase policy affects the fortunes of the small growers. Since grading is done visually and there is a marked difference in the price of different grades, during periods of excess supply, the buyers are able to downgrade rubber and give the growers a lower price, whereas in periods of shortage the opposite also takes place.

The total production of rubber in 1991-92 was placed at 3.7 lakh ait. Sheet rubber formed about 70%, concentrated latex about 12%, estate brown crepe about 10% and technically specified crumb rubber formed about 5 per cent in 1991-92. Pale latex crepe and preserved latex claimed the remaining 3 per cent. However, the percentage can vary slightly from year to year.

Rubber is an industrial raw material used in thousands of goods, However., the major consumption of natural rubber is in the sphere of automobile industry particularly the tyres and tubes. Other areas of use are cycle tyres, moulded articles, foot-wear, belts, hoses etc.

In India rubber has been a controlled commodity. There has been an uninterrupted support price for rubber. Sometimes both maximum and minimum prices were fixed for rubber. Now only minimum prices are fixed by the government. In addition to the minimum support price, the State Trading Corporation (STC) has been active in procuring rubber from the market as a buffer stock whenever prices fell below the support price.

Evolution of **co-operative** rubber marketing in India

Since 1960 the Rubber Board has been actively engaged in promoting co-op marketing among small rubber growers to solve their marketing problems. A number of schemes have been launched by the Board for financing and giving technical assistance to marketing societies.

The Tariff Board which examined the cost of production for fixing fair prices for rubber observed in 1951 that the Rubber Board should take suitable steps for improving marketing. In 1954 the Rubber Board appointed a committee to examine the scope for introducing co-op marketing societies. The plantation Enquiry Commission (1956) examined the scope for organising co-ops and came to the conclusion that the co-op marketing societies should be formed with co-op supply and banking societies. The Commission wanted the marketing societies to purchase rubber outright and collect a charge for meeting administrative expenses and losses in marketing. In 1958 the government of India adopted the recommendation of the Commission. This was followed up by the Rubber Board by obtaining the services of a Dy. Registrar of co-op societies in 1960 for the purpose of organising co-ops. Since then the Board has organised a number of co-op marketing societies.

In 1963-64 the Board formulated a scheme for granting working capital loan to the co-op marketing societies. A scheme for granting share capital loan was launched in 1965-66. In addition all types of eligible co-op societies were given subsidy for constructing smoke houses for producing good quality sheet rubber.

In addition to the Board's efforts, the state government of Kerala also encourages rubber marketing societies by participating in the share capital and granting loans and subsidies.

The number of co-op rubber marketing societies at the end of 1965-66, 1971-72 and 1990-91 is given in Table 1. •

A study was undertaken in May^mJune 1992 to find out the current position, the coverage and activities of the rubber marketing societies in India. At the end of June 1992, there were 36 co-op rubber marketing societies with rubber dealers licence granted by the Rubber Board. Data could be collected from 33 societies by visiting them. The data related to the period 1990-91 (unless specified otherwise). In addition to the data collected from the societies data available from the Rubber Board were also utilised. Out of the 33 societies six societies were in existence before 1960 and only five societies came into being after 1980. The details are shown Table-2. The geographical distribution of the societies studies is shown in Table-3.

The membership of the societies consisted of individual rubber growers, other individuals, other societies, the state government and the Rubber Board. The total membership of the 33 societies was 86,181 at the end of 1990-91. The details are shown in Table-4. The rubber grower members are further classified into a frequency table and the same is shown in Table-5.

It will be seen that 21 societies (64%) have membership below 2,000 per society. There was one society with membership exceeding 10,000 and two societies exceeding 5,000. It will be interesting to relate the membership of rubber growers to the total registered small rubber growers in India.

The percentage of rubber growers in the societies will be around 20 out of the total registered small growers in India. However, if the area of rubber grower members is related to the total rubber area of small growers in the state, the percentage of coverage would be about 50.

All the societies were engaged in marketing. In addition eight societies had agricultural activities, mainly running rubber nurseries; four had banking and four had small-scale rubber manufacturing units. In addition, four fairly big societies had factories producing technically specified rubber (crumb rubber). The details are shown in Table-6. It may be mentioned that some societies have more than one activity.

Capital structure

All the societies have the usual three forms of capital viz., authorised capital, subscribed capital and the working capital. The authorised capital of the 33 societies was Rs. 15.38 crores. The distribution of the authorised capital is shown in Table-7.

Subscribed capital is lower than that of the authorised capital, while working capital is generally higher than the subscribed capital. This is due to the fact that the

societies also avail deposits from members and loans from district co-op banks. Subscribed capital formed Rs. 4.69 crores and working capital Rs. 9,06 crores. The details are shown in Table-8.

Rubber area

The total rubber area owned by the rubber grower members was 1,83,380 hectares. The average rubber area per member, therefore, worked out at 2.33 ha. Four societies out of 33 had over 10,000 ha. of rubber area among the members. The details are shown in Table-9. Twenty-seven societies out of thirty-three, operated through branches. There were a total of 165 branches. The details are shown in Table-ID,

Apart from purchasing and selling rubber, most of the societies were engaged in the sale of inputs required by the rubber growers. These consisted of chemical fertilisers, copper sulphate for plant protection, acid required for coagulating rubber, plastic cup for collecting rubber latex, spray oil for plant protection, pesticides and insecticides, rain guarding materials (for enabling tapping during rainy days) yield stimulants and agricultural implements including tapping knives, aluminium dishes for coagulating rubber latex etc. Thirty societies dealt with fertilizers, 27 societies sold copper sulphate and acid and 15 societies sold other inputs. The total sales of input during 1990-91 amounted to Rs. 6.93 crores of rupees. For a comparative analysis, the sales of input by the societies in 1965-66, 1971-72 and 1990-91 are presented in Table-11.

Some societies also under took plant protection activities. The number of such societies was 24. Of the 24 societies 18 lent out micron sprayers to growers. These societies owned a total of 41 micron sprayers.

The societies were handling substantial quantities of rubber. The average quantity of rubber sold per society was 1,302 rat in 1991-92. The details are shown in Table-12. The table also shows the comparative figures for some previous years.

Sources of Funds

The societies mobilised the funds from various sources. The most important one was the share capital. The most important source of loan was from the District Co-operative Bank (25 societies) followed by government including the Rubber Board (20 societies). Only 13 societies had outstanding amount as loan to the Rubber Board. Rubber Board's assistance consisted of share capital contribution and working capital loan and subsidy. The other societies had repaid them. Deposit from members also formed a substantial part, of the working capital. Twelve societies

had availed of subsidy from the government (including the Rubber Board). But this was a small part, of the working capital.

Five societies have advanced loans to rubber grower members. Some of the societies were also engaged in extension activities, The activities consisted of organising rubber growers' seminars, training programmes for rubber growers, training programmes for tappers, visits to the Rubber Research Institute of India, availing of the mobile soil and leaf testing facility of the Rubber Research Institute and the advice of technical officers of the Rubber Board. The details are shown in Table-13.

In addition to the marketing societies, the Rubber Board was instrumental in establishing a Marketing Federation for the purpose of centralised marketing to get a better average price to the grower. The Rubber Marketing Federation, Cochin sells rubber directly to the manufacturers. It also works as the agent of the STC during periods of low prices, thereby enabling the rubber growers to realise a higher price.

The Marketing Federation procures rubbex* mainly from the marketing societies. The Federation also undertakes the wholesale supply of inputs to them. It also arranges helicopter spraying in the small holdings against abnormal leaf fall disease which is widespread.

Conclusions

The study shows that co-op rubber marketing societies have been fairly successful in rubber plantation industry. There has been a steady increase in the rubber marketed by the societies.

Thus the average quantity sold by the society increased from 190 mt in 1965-66 to 1,302 mt by 1991-92, The average membership of the societies also increased from 706 to 2,612 during the period 1965-66 to 1990-91. These are some of the indicators to show the progress of the societies during the last twenty five years.

Table 1
Number of Societies

Year	No. of Societies	Membership	Average membership
1965-66#	12	8,475	706
1971-72#	23	32,099	1,396
1990-91	33*	86,181	2,612

R.G Unni and V. Haridasan, 'A study of co-operative Rubber Marketing Societies, Rubber Board, Kottayan. 1974. P.11.

* A total of 36 Marketing societies are operating in Rubber. The data of the remaining three could not be collected within the time limit.

Table 2
Data of Registration of Societies

	No. of societies	% to total
Before 1960	6	18
1961 to 1970	18	55
1971 to 1980	4	12
After 1980	5	15
Total	33	100

Table 3
Geographical Distribution of Societies (1990-91)

District	No. of societies	% of total
Trivandrum	13	3
Quilon		9
Alleppey	1	3
Pathanamthitta	4	12
Kottayam	8	25
Idukki	4	12
Ernakulam	4	12
Trichur	1	3
Palghat	1	3
Malappuram	1	3
Wynadu	1	3
Kozhikode	1	3
Cannanore	2	6
Kasargode	1	3
Total	33	100

Table 4
Members of Societies

Membership	No.	% of total
Individuals		
Rubber growers	78,756	91.38
Others	6,807	7.90
Institutions		
Societies	570	0.66
Govt. and the Rubber Board	48	0.06
Total	86,181	100

Table 5
Classification of Societies by Number of Members

Number of members	No. of societies	% to total
Less than 1,000	11	34
1,000 to 2,000	10	30
2,001 to 3,000	5	15
3,001 to 4,000	3	9
Above 4,000	4	12
Total	33	100

Table 6
Activities Other Than Marketing

Activities	No. of societies
Rubber nursery	5
Smoke house for rubber sheets	3
Rubber sheeting batteries	2
Crumb rubber factory	4
Rubber goods manufacturing units	4

Table 7
Authorised Capital

	No. of societies	% to total
Below Rs. 10 lakhs	2	6
Rs. 10 to 20 lakhs	11	34
Rs. 21 to 30 lakhs	3	9
Rs. 31 to 40 lakhs	1	3
Rs. 41 to 50 lakhs	10	30
Above 50 lakhs	6	18
Total	33	100

Table 8
Subscribed and Working Capital (1990-91)

	Subscribed capital		Working capital	
	No. of societies	% to total	No. of societies	% to total
Below Rs. 5 lakhs	9	27	5	15
Rs. 5 to 10 lakhs	7	21	5	15
Rs. 11 to 20 lakhs	9	27	9	27
Above Rs. 20 lakhs	8	25	14	43
Total	33	100	33	100

Table 9
Rubber Area of Societies

	No. of societies	% to total
Below 2000 hectares	10	30
2000 to 4000 "	12	37
4001 to 6000 "	2	6
6001 to 8000 "	3	9
8001 to 10000 "	2	6
Above 10000 "	4	12
Total	33	100

Table 10
Branches of Societies (1990-91)

	No. of societies	% to total
Below 5 branches	16	49
5 to 10 "	9	27
Above 10 "	2	6
Without "	6	18
Total	33	100

Table 11
Quantity of Inputs Sold by Societies

	No. of societies selling	Amount (Rs. in lakhs)
1965-66#	12	12.8
1971-72#	22	33.3
1990-91	33	693.00

Unni. R.G and Haridasan.V. opp.cit.p.

Table 12
Quantity of Rubber Marketed

Year	No. of societies	Quantity of rubber sold	Average per society (mt)
1965-66#	12	2,285	190
1971-72#	23	10,295	448
1981-92*	33	42,951	1,302

Unni* R.G. and Haridasan. V. opp. cit. P.16.

* The data collected from the office of the Rubber Board.

Table 13
Extension Activities of the Societies (1990-91)

Activity	No. of societies	No. of times
Seminars	10	26
Training programme	3	4
Training to tappers	2	2
Visits to RRII	4	12
Soil and leaf analysis	-	6
Classes taken by Rubber Board Officials	6	19

Workshop-9