

Workshop Report

10

CO-OPERATIVES IN
NATURAL RESOURCES MANAGEMENT

Katar Singh and Vishwa Ballabh



Institute of Rural Management Anand 388001 India

October 1993

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WORKSHOP IN POLITICAL THEORY

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U.S. DEPARTMENT OF AGRICULTURE

INSTITUTE OF RURAL MANAGEMENT

BLOOMINGTON, IN 47408-3895 U.S.A.

Workshop Report 10

Report Files

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ABBREVIATIONS AND ACRONYMS

AKRSP(I)	: Aga Khan Rural Support Programme (India)
CASAD	: Centre for Applied Systems and Development
CPR	: Common Pool Resource
GOI	: Government of India
IRMA	: Institute of Rural Management Anand
MATSYAFED	: Acronym for the Kerala State Co-operative Federation for Fisheries Development
MFP	: Minor Forest Produce
NDDB	: National Dairy Development Board
NGO	: Non-governmental Organisation
NRM	: Natural Resource Management
NRMCS	: Natural Resource Management Co-operative Societies
NTGCF	: National Tree Growers' Co-operative Federation
SIFFS	: South Indian Federation of Fishermen's Societies

CO-OPERATIVES IN NATURAL RESOURCES MANAGEMENT

Abstract

This report presents an analytical summary of the deliberations of the Workshop on Co-operatives in Natural Resources Management held at IRMA during 7-11 December, 1992. The report also draws upon the papers presented at the Workshop and other relevant literature. It is contended that as biological systems, the natural resources of land, water, forests, and fisheries are dynamic and amenable to management. Three alternative systems or regimes of managing natural resources are identified. They are privatisation, nationalisation, and collectivisation/co-operativisation. Experience with nationalisation of natural resources has not been good in most of the cases all over the world. Privatisation has yielded mixed results: it has been justified on efficiency grounds and condemned on equity and sustainability grounds. Co-operativisation or co-operative management is a relatively nascent regime although most natural resources in olden days were managed as common property by small and cohesive communities. The results of co-operative management of natural resources also have so far been mixed. But theoretically and ideologically, the co-operative mode of natural resources, management seems to be the best of all. This is so because with proper rules and regulations it can better meet the goals of efficiency, sustainability, equity and resource users' satisfaction and is politically and socially more acceptable in most societies and nations than any other alternatives.

The papers contributed to the Workshop covered the natural resources of land, water, forests and fisheries and their geographic coverage was nation-wide. Most of the papers were based on case-studies of both successes and failures in co-operative management of natural resources. It was revealed by the case-studies that most of the natural resources management co-operatives were parastatal organisations and not genuinely member-controlled co-operative societies. Another significant finding of the case-studies was that resource

management was not one of their goals. Besides member control, the other major determinants of success across all resources and geographic regions were identified to be: (1) high stakes of resource users in the resource as well as in the co-operatives managing the resource; (2) small and homogeneous or otherwise cohesive community of resource users; (3) education and awareness of resource users; (4) good local leadership; (5) professional management; (6) existence and strict enforcement of rules for regulating the use of the resource, preventing free riding, and sharing the costs and benefits of co-operative management equitably; (7) government support in the form of funds, technical information, legitimacy, and co-ordination; (8) involvement of an external agency as a catalyst; and (9) integration of production processing and marketing. Wherever and whenever a few or all of these factors are absent or are not available in needed quantity, co-operatives are prone to failure.

1. INTRODUCTION

Management of natural resources of land, water, forests, fish etc. of a nation is an important factor affecting the level and pace of its development. Many alternative systems of management of natural resources, especially common pool resources (CPRs), have been proposed by academics and practitioners. They include privatisation, nationalisation or centralised public management, and co-operative/ collective management by local people themselves. There is no single best system of management that could be commended for all situations and for all times to come. The choice of an appropriate system depends on several factors such as the characteristics of the resource, attributes of the resource users, the decision-making environment, and the goals of resource management. For improving the management of natural resources, it is necessary for the resource manager to understand the conditions under which each of the three alternative systems of resource management is likely to succeed as well as the conditions under which a system is likely to fail.

Late in 1991, the Institute of Rural Management, Anand (IRMA) launched an ambitious programme of collaborative research on the management of rural co-operatives. The programme culminated into a Symposium on Management of Rural Co-operatives' held at IRMA during 7-11 December 1992. The symposium comprised of 15 workshops; one each on 15 different themes all of which were related to management of rural co-operatives. The Workshop on Co-operatives in Natural Resources Management was one of the 15 workshops that comprised the symposium. The Programme Schedule of the Workshop is given in Annexure 1.

The Workshop aimed at exploring and critically analysing various factors affecting success and failure and identifying major issues and options in the co-operative management of natural resources of land, water, forests, and fisheries. More specifically, the Workshop had the following main objectives :

1. To examine the rationale of co-operative management of natural resources and review the current status of co-operatives engaged in the management of land, forests, water and fisheries resources;

2. To analyse cases of successes and failures in co-operative management of natural resources and identify the factors affecting both the successes and the failures;
3. To identify major issues and options to resolve them on the basis of analyses of the case-studies in the co-operative management of natural resources and a critical review of the literature available on the subject; and
4. To propose, discuss and finalise an agenda for future research in the area of co-operative management of natural resources.

The objectives of the Workshop were achieved mainly by analysing cases of both successes and failures in co-operative management of natural resources, and partly by a review of the literature available on the subject. Thirty-seven scholars including six IRMA faculty, policy-makers, administrators, managers, and practitioners attended the Workshop. A list of the participants is given in Annexure 2.

Workshop Papers

In all, 25 papers including the theme paper were contributed to the Workshop. The research reported in the papers covered the co-operatives engaged in the use and management of common pool natural resources of land, water, forests, and fisheries. The geographic coverage of the research was nation-wide: east, west, north and south India. Of the 25 papers, 21 were based on in-depth case-studies conducted by the research collaborators; the remaining four abstracted from a variety of sources including literature review and the researchers' own experiences. Of the 21 case-studies, nine were focussed on wastelands afforestation and forest management, six on water resources management, and the remaining six on fisheries (Table 1).

Table-1
Distribution of Case Studies by Category of Natural Resource
and Geographic Region of India

Natural resource category	Geographic region				All
	East	West	North	South	
1. Land	-	3	-	-	3
2. Tree plantations	2	1	-	1	4
3. Natural forest	-	1	1	-	2
4. Surface-water	-	4	-	-	4
5. Groundwater	-	1	-	1	2
6. Inland fisheries	1	-	1	-	2
7. Marine fisheries	1	-	-	3	4
All	4	10	2	5	21

2. RATIONALE FOR CO-OPERATIVE MANAGEMENT OF NATURAL RESOURCES

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.

Until recently the role of natural CPRs in the village economy was not understood properly. Therefore, privatisation or public ownership of CPRs 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 process of privatisation of CPRs as it affected the rural poor people involved three stages (Jodha, 1986): 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 disentitled them from the newly acquired land. 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 budget and staff. Budget, 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 is not an exception and 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.

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 of 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 organised into a formal association preferably a co-operative society. Co-operative management of natural CPRs is therefore the most appropriate of all forms of management in most situations.

3. EVOLUTION AND CURRENT STATUS OF NRM CO-OPERATIVES

The origin of the formal co-operative 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-operatives emerged primarily as people's response to exploitation of some kind or other. In most of the developing countries, however, co-operatives have been promoted by the governments as instruments of agricultural and rural development.

In India, the modern co-operative 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-operatives confined their activities to providing cheap credit to farmers. The Co-operative Societies Act of 1912 enlarged the scope of co-operatives to include non-credit institutions and federal organisations. Gradually, and particularly after Independence, co-operative 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-operatives in

implementing various agricultural and rural development programmes. Unlike developed countries, co-operatives 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-operatives.

As of 1988-89, in India there were 3.38 lakh co-operatives of all types with a total membership of 15.6 lakh, paid-up capital of Rs.5,242.4 crores and working capital of Rs.62,144.5 crores (Sankaran, 1991). Besides, there were 20 national level co-operative Organisations and 260 state level co-operative organisations in the country.

Formal natural resources management co-operative societies (NRMCS), except perhaps the tank water management co-operatives of South India, are of a relatively recent origin in India. NRMCS include those of marine fisheries, inland fisheries, lift irrigation, canal irrigation, tube-well irrigation, tank management, tree growers, forest labour, salt producers, etc. Statistics about the number and membership of various types of NRMCS in India are not available except for fisheries co-operatives. These co-operatives have been initiated for a variety of reasons by voluntary associations, NGOs, and the governments.

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 such as VIKSAT, and the Aga Khan Rural Support Programme (India) (AKRSPI) are organising wasteland afforestation/tree growers' co-operatives, in the areas where they work. A bold initiative was taken by the National Dairy Development Board (NDDB) in 1986 to organise tree growers' co-operatives as a pilot project 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 at Anand. The NTGCF initially selected five states of Gujarat, Andhra Pradesh, Orissa, Karnataka and Rajasthan for organising TGCS under a pilot project under the auspices of the NDDB. 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.

The long-term goal of the NTGCF is to adapt the basic principles of the Anand Pattern dairy co-operatives for creating economically viable and self-sustaining co-operatives of tree growers. There is not much published literature available about the performance of TGCS.

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 in the order of Rs. 27,000 crore had been made in the major and medium sized irrigation projects in India. Most of these projects are deeply in the red. Besides, they have engendered many other problems such as improper use and/or wastage of water, waterlogging, salinity, alkalinity, inequitable distribution within the command areas, particularly between the head-reaches and tail-enders etc. Similarly, groundwater which is also a CPR is also over-exploited and misused in many areas. It is, therefore, important that such projects are well managed and colossal losses avoided.

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 of water tariff, change in the system of water pricing from area basis to volume basis, organising of water users into some form of association, conjunctive use of surface water and groundwater etc.

Participation of 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 irrigators' co-operative societies working in the Ukai-Kakrapar project command area in Gujarat and co-operative lift irrigation societies working in many states. There are many NGOs that are engaged in promoting such co-operatives. However, the water users associations and co-operatives are still nascent and their impact is not yet felt at the macro level. There is no national level information available about the number, membership,

paid-up share capital etc., about irrigation co-operatives in India. In Gujarat, the number of various types of irrigation co-operatives in 1989 was 830.

As of 1988-89, the number of primary fisheries co-operatives 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-operatives in India. We could locate only a few studies on the subject (Chatterjee and Bandyopadhyaya, 1990; Singh and Bhattacharya, 1991; Srivastava et al., 1985; Berkes, 1986). On the whole, most of the fishermen's co-operatives studied were successful and were able to retain the loyalty of their members.

After having reviewed the process of evolution and current status of various types of NRMCS, we now present an analytical summary of the workshop deliberations.

4. FOREST AND TREE GROWERS' CO-OPERATIVES

There were six case-studies on this subject presented at the Workshop (Table-2). The participants emphasised, *inter alia*, the importance of security of land tenure as an instrument of promoting afforestation of village common wastelands (Chambers et al., 1989). For the success of TGCS, two things are of paramount importance: (a) exclusive property right of TGCS to the land on a long-term lease of at least 30 years and its enforcement to restrain non-rights holders from using the resource; and (b) ability of the TGCS to coordinate and regulate the use of the resource by its members to avoid "free-riding" (Ballabh and Kramer, 1992). Most of the case-studies presented in the Workshop reported that the co-operatives were able to obtain long-term usufruct rights to the lands managed by them. However, the acquisition of such rights by co-operatives had not been easy. For example, Raju and Sarabhai (1992) identified the following difficulties in acquiring land for organising tree growers' co-operatives: (i) bureaucratic hassles in getting the lease of wastelands; (ii) poor co-ordination among government functionaries; and (iii) difficulties in obtaining

funds and technical guidance. This was further confirmed by the experience of the NTGCF. For example, in Rajasthan, an application for land lease by a TGCS has to pass through several officials starting from the lowest rank of the Revenue Department, the *Patwari/Talari*, to the Revenue Minister (Mishra, 1992). Rajasthan is not the only state where this kind of situation prevails; all the other states also suffer from similar problems (Mishra, 1992). Not only this, the terms and conditions of lease also vary significantly across the states. In some states, the co-operatives are asked to pay land revenue at rights significantly higher than those paid by individual private land-owners in that area for their better quality land. Further, since the land given to co-operatives are usually of poor quality, and do not produce even a blade of grass, it was observed that the co-operatives, in some cases, were asked to pay land revenue right from the beginning of the project when the land productivity was almost negligible. Several other important issues emerged in relation to land lease to the co-operatives. They include: (i) restrictions on membership (confined to particular group/community); (ii) restrictions on the use of land (only for tree plantation) (iii) uniform standard for allocation of land irrespective of differences in quality and productivity; and (iv) short period of lease (Mishra, 1992).

The participants were of the opinion that unless security of tenure and more autonomy at the grassroot level are provided, programmes of afforestation of common pool lands are unlikely to succeed. The Government of India (GOI) order of June 1, 1990 was considered inadequate to meet these requirements. However, the experience of village forest co-operative societies of Kangra district in Himachal Pradesh, reported by Agrawal and Singh (1992), was instructive. These village co-operatives, for long, performed admirably the function of protecting the forest assigned to them. First established in 1941, such co-operatives performed well, while they enjoyed legitimacy, autonomy and financial and technical assistance from the government. In recent years, these societies are on a decline because of the indifferent attitude of the forest department towards them (Agrawal and Singh, 1992).

Singh and Subramanian (1992) in their paper assert that for success of any co-operative venture in general and TGCS in particular, people's participation is a pre-requisite. Their paper was 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. They found people's participation to be relatively high in 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.

Despite innumerable problems in acquisition of land for TGCS, the experience of the NTGCF has been encouraging. According to Mishra (1992), the people have been more co-operative than anticipated in the beginning of the project. He further argues that such co-operatives can provide useful answers to the problems of private and revenue wastelands in the neighborhood of settlements in regions where large tracts of uncultivated wastelands are available, population pressure is comparatively low and fuel wood and fodder scarcity is high. More careful analysis of Vatra Tree Growers' Cooperative Society in Kheda by Saxena (1992) underpins the above optimism and suggests how much a well-run TGCS can achieve. While Saxena found the co-operative, which managed 38 ha plantation, to be economically viable, he notes a number of problems that the co-operatives is facing currently: frequent encroachments by members and non members particularly by the shepherd community, very modest plantation on members' private lands, inadequate processing and marketing facilities and absence of a clear mechanisms for equitable distribution of the surplus from common land plantation.

The experience with internal coordination and management of NRMCS has not been encouraging. For example, Singh and Mohanty (1992) report that the Sabaigrass Processing and Marketing Society was poorly managed and badly governed. It was be set by problems of infighting amongst the elected leaders, inflexible procedures, poor quality produce and low moral of its employees. Such conflicts are "rare where members' stakes and control are higher as in the case of village forest co-operatives of Himachal Pradesh (Agrawal and Singh, 1992).

Datta and Joshi (1992) explored the scope of using co-operatives for reclamation, management and use of water-logged and saline soils. They noted that although this task requires community approach and collective vigilance, co-operative can overcome these problems only if they can contain the problem

of free riding. Since at smaller scale (individual farm level) the technology of land reclamation becomes ineffective and unviable, participation of all farmers in the affected area is necessary for success of land reclamation projects (Datta and Joshi, 1992). On the basis of experience with a subsurface drainage project, Datta and Joshi contend that asset disparity, heterogeneity, conflicting needs and overall perception of people about the need for drainage etc. may limit the success of co-operatives in such an endeavor.

From the discussions held at the Workshop and a review of available literature, the following lessons can be drawn (Singh and Ballabh, 1989; Shankar Narayan, 1991; Saxena, 1987; Gupta, 1989; Shah and Ballabh, 1986):

- (i) Integration of savings, savings-linked loans, and afforestation/plantation activities: The AKRSP(I)'s experience in Gujarat shows that unless this is done, no programme of afforestation of common wastelands with people's participation can succeed in the long-run.
- (ii) 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 suitable tree species through joint consultation with the local people and Forest Department officials.
- (iii) Alternative sources of fodder and fuelwood: When the village commons are closed for grazing and 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.
- (iv) 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 community plantations. Such rules should be incorporated in the bye-laws of the co-operative and must be enforced and monitored by its members. Unauthorised usurpation of benefits by any member or other vested interests must be prevented and the culprits penalised heavily.

- (v) Financial: Conditions under which financial viability can be achieved and maintained should be specified right at the time of project formulation. Thereafter, a close monitoring should be done to make sure that they are all fulfilled. This is essential to sustain the project.
- (vi) Procurement, storage, processing, and marketing: A co-operative 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 economies of scale involved in these activities, only a vertically and horizontally integrated three-tier structure can successfully perform these functions.
- (vii) Quality-based pricing: Judging the quality of wood is a difficult task for the personnel of TGCS and it is in this respect that the private traders are superior to their 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. TGCS personnel will need to beg, borrow, and steal expertise in this area from private traders engaged in timber business.

5. OTHER LAND-BASED CO-OPERATIVES

Another set of co-operatives studied by collaborators were land-based commodity co-operatives such as minor forest produce (MFP) co-operatives in Raipur (M.P.) by Marothia (1992), a sheep breeders' co-operative in Rajasthan by Ray (1992) and salt miners' co-operatives in the Little Rann of Kutch by Singh and Bhattacharya (1992). The primary purpose of establishment of these co-operatives was to remove exploitation of members by the middlemen and contractors and provide an alternate channel for marketing. These case-studies focused on co-operatives of communities which depend for their livelihood on natural resources. In the first case, the resource was a natural reserved forest from which members gathered MFP. In the second one, the resource was a common pool range land; and in the third case, it was brine - a CPR. The MFP co-operatives studied by Marothia were more like government bodies than people's organisation. The members had little control on their management. According to Marothia, the co-operatives could not provide substantial benefits to members, except perhaps, to ensure proper wages. The primary co-operatives were poorly managed and their members did not have much

participation in their affairs except by way of collection of MFP and their disposal through them. In contrast, the overall control of the sheep breeders' co-operative was in the hands of its members. But a closer and more critical examination revealed that most of the members were either nominated or came from special caste groups. As a result, the sense of participation was lacking among members for whom certain number of seats were reserved. A sense of indifference was dominant among the members and it was the manager, a paid employee, who was running the entire show. Non-members were not interested in becoming members of the society (Ray, 1992). This shows that people did not think that the society would be able to meet their objectives.

Singh and Bhattacharya's (1992) case-study of *mandalis* (salt miners' co-operatives) in Kutch, describes the plight of poor *agarias* (salt miners), mostly landless poor, the process and economics of salt manufacture, and marketing of salt. The case-study suggests that the lot of *agarias* could be improved by increasing the efficiency of *mandalis* and enhancing their access to larger areas of brine. But amid a situation where already private salt traders having a strong hold on marketing and production operation (65 percent), how *mandalis* can be made effective is moot point. The authors, however, feel that since government owns the existing brine resource it has leverage to restructure the *mandalis* in favour of poor *agarias* by leasing out more areas of brine to *mandalis*. Restructuring *mandalis* on the line of Anand Pattern dairy co-operatives will not only save brine which is a CPR from uncontrolled exploitation by private traders but would also ensure social justice for which poor *agarias* are craving for years.

6. IRRIGATION CO-OPERATIVES

The absence of clearly defined property rights, coupled with the high investment required to lift groundwater, raises questions about the social, economic and ecological implications of institutional arrangements designed for the use and management of this CPR. Ensuring equitable access to groundwater is important because overpumping of water in a given watershed, usually by individual tube-well owners, has wider implications for the aquifer to which all those living in the area have a legitimate claim (Singh and Ballabh, 1992). The commercialisation of and rapid technological changes in agriculture such as increasing use of fertilisers and pesticides have affected both the quantity and

quality of groundwater and necessitated conjunctive use and management of surface and groundwater resources. The common pool nature of groundwater and the consequent interdependency among its users are strong rationale for regulating and co-ordinating its use by some form of community or village level organisation. Sustainability and equity should be guiding criteria for regulating water use.

There were seven papers on the subject presented at the Workshop. Two of the papers presented (Retnam and Nair, 1992 and Moench, 1992) suggest that co-operatives, existing or otherwise, are an appropriate institutional arrangement for sustainable and equitable use and management of groundwater. Shah and Bhattacharya (1992) compare the productivity and efficiency of tube-well co-operatives and irrigation companies in the Kheda and Mehsana districts respectively of Gujarat. They use the following three criteria for the purpose of comparison: (i) Do such organisations self-create or do they have to be created by outsiders?; (ii) Does the organisation adapt itself to changing markets and environmental conditions?; and (iii) Does the organisation resist, adapt or mutate when its basic principles are challenged? Using these criteria, they conclude that it is the irrigation companies, which stand out as "superior" organisations. Here, the locus of control is internal and is based on the proportionality principle in capital contribution, land holding within the command area, share in profits, risks and investments. Small in size, companies are autonomous and self-financed (surplus retained for future contingencies). In contrast, in Kheda, the Gujarat Groundwater Resources Development Corporation, is leasing out state tube-wells to farmers on the condition that they form co-operatives to manage them primarily to salvage its own investments. Not only are such co-operatives dominated by large farmers, they lack effective mechanisms for conflict resolution and remain weak and fragile organisations caught in the web of bureaucracy (externally imposed rules and regulations). Their main motive is to secure benefits for their members-low water prices, low energy costs, and subsidising of large farmers by small ones (Shah and Bhattacharaya, 1992). They conclude that the companies are better than the co-operatives as an organisation structure for groundwater management. However, author ignored several key issues: what happens to non-members in the watershed who may be making (illegitimate) claims on the same CPR, but not paying for it (i.e., free-riding)? How long can companies or co-operatives sustain themselves, given the significant over-use of groundwater? What are the implications, for agriculture - changes in crops and cropping

patterns? To what extent do small farmers benefit from companies as opposed to co-operatives?

The paper by Retnam and Nair (1992) looks at informal co-operation in the management of groundwater resources in Amabalavanapuram village, southern Tamil Nadu, a water scarce area. The authors argue that partnership wells owned by 6-25 members from the same caste or family, living in the same village, who came together because of the high investment costs associated with lifting groundwater, are more viable than wells whose partners are for the most part absentee cultivators and landowners. That is, farmers who are forced to migrate, either temporarily or permanently during periods of drought, are not expected to share in the costs of lifting water or maintenance of wells which take place in their absence. As a result, conflicts arise and are not usually resolved in the case of wells owned mostly by absentee partners.

While the authors have commented on the changes in crops and cropping patterns, as well as the availability of groundwater, many researchable issues are not touched by them. For example, if it is the women who do most of the agricultural work in the absence of their husbands, then what kinds of rights do women have to collective assets such as wells? Surely, if the men are unable to resolve the conflicts, then perhaps a tentative proposal could be to involve women in the management of wells, assuming they have the time and inclination to do so. It is also not clear, because of lack of household-based socio-economic data, as to why certain people are forced off their lands during periods of water scarcity and others are not. In conclusion, Retnam and Nair feel that people's participation through a co-operative organisation could lead to conservation, rational extraction and equitable utilisation of groundwater in the long-run. But there is no guarantee that such participation would ensure decision-making from bottom up. The nature and distribution of power at the micro and macro levels, and class, caste and gender differences need to be explored to get a better understanding of changes in the agrarian economy which, in turn, affect the sustainable use of groundwater.

The paper by Moench (1992) presents an overview of the situation engendered by overdevelopment of groundwater in Gujarat. He suggests that supply side (augmenting the availability of groundwater) and demand side (type of crop) solutions need to be looked at together following a holistic approach to resource management and agriculture. He reiterates the concept of interdependency,

based on a network of physical, social, economic and cultural ties which bind a group of people together, as a strong incentive for the co-operative management of CPRs.

Moench proposes that the existing rural (dairy) co-operatives could be used for management of groundwater as well, if they are equipped with required additional technical skills by apex organisations like the NDDB. However, this suggestion may not be applicable for a variety of reasons. There is no necessary locational correlation between the availability of groundwater and the existence of village dairy co-operatives. To assume that dairy co-operatives are highly successful and provide a variety of services to members is to overlook the range of critical literature on the Anand Pattern or the role of non-members (e.g., pastoralists) in the distribution of "benefits". Furthermore, the major strength of dairy co-operatives has been their singular focus on one product, namely, milk and its by-products. Thus the institutional structures and technical expertise required for transportation, processing and marketing of milk would be quite different from those needed for lifting of groundwater and maintenance of pumps. In sum, then, the advocacy of co-operatives as a means of sustainable use and management of groundwater cannot ignore the realities of local power structures and macro policy frameworks within which such organisations are embedded. Otherwise the principle of co-operation will remain simply a hollow rhetoric.

The paper by Thomas Palakudiyil (1992) addresses two distinct questions. First, he counters the "tragedy of commons" argument by indicating that concrete cases may be found which run contrary to the "tragedy" thesis. His own case-study was presented as an example of that. Second, he identifies four conditions that contributed to the emergence and survival of the organisation under study. They are (i) indivisibility of resource; (ii) high economic benefits; (iii) homogeneity of members; and (iv) supportive environment. In our opinion the case-study has several other interesting features which too demand attention. For example, he mentions that as many as 36 out of the 54 members of the associations have been elected to the managing committee for one or more terms during the fifteen years of its existence, a fact that contradicts the usual notion of leadership (Thomas, 1992).

In his study of Sahada Lift Irrigation Co-operative, Barik (1992) discusses (i) right ways of farmer mobilisation; (ii) features of the organisation of the

beneficiaries; and (iii) estimates of economic benefits, which incidentally, comes to be lower than the claims made by the sponsor of the co-operative - an NGO called Sadguru Water and Development Foundation. However, the paper deserves attention for two other features, rarely found in this group of studies. One, he indicates that apart from legal and financial supports, beneficiary (farmer) organisations also require technical support. In this case, such support was extended by the NGO in the forms of expert survey, providing good pumps and establishing a network for quick repair. Two, his discussion of sustainability deserves attention. Generally, sustainability is discussed with respect to resource availability or environmental viability. The present paper has addressed the question of sustainability from the perspective of management. The co-operative, which is a well-known success story, has been in existence for almost a decade. This provides a nice opportunity for evaluating the performance of its management structure. According to the author, the efficiency and sustainability of the scheme depends largely upon: (i) regular supply of electricity which is quite erratic; (ii) pricing method and structure; and (iii) provision of reserves for capital replacement (Barik, 1992).

Unlike other authors, Patil and Lele (1992) make a set of policy recommendations for extension officials based on several action research experiences of the CAS AD team. Since the recommendations are written in a precise way and each one is important it will be improper to single out anyone for highlighting. Instead, we feel that the aspect that needs special mention in this paper is the authors' quest for arriving at a distinct set of recommendations in such important areas as operational rules, water allocation, modernisation, and monitoring. The authors also assert that farmer involvement is justified only if it makes a positive contribution to development. This is radically different from the usual official approach where the task of organising farmers is undertaken "because it is a policy". In their opinion, the guidelines for extension work are more instructive than facilitating.

In his paper on analysis of *phad* system of irrigation Gulati (1992) first, highlights the need and benefits of farmers' participation in the management of large and medium irrigation projects; second, draws a number of implications from the *phad* system which could be replicated in large and medium irrigation projects for active involvement farmers. This *phad* system of irrigation is practised in Nasik.

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 c) non-interference of government.

The discussion on irrigation co-operatives mainly focussed on three aspects: (i) macro-environment; (ii) governance and control structures and practices; and (iii) pricing of water.

A summary of the discussion follows:

- (i) **Macro Environment:** Certain conditions need to be created by the State to facilitate the emergence of co-operatives. In the opinion of the workshop participants, the following are important:
 1. There should be institutional mechanisms for quick resolution of conflicts and establishment and enforcement of property rights. They should facilitate enforcement of contracts and resolve conflicts, both interstate and intrastate, over surface and groundwater rights. There also ought to be greater clarity in rights over water.
 2. There should be greater willingness on the part of government to hand over the management of water distribution to water users' co-operatives, wherever possible. Currently, attempts are made to involve the users, whether in surface irrigation systems or public tube-wells, only when the bureaucracy finds it difficult to manage by itself. Instead, systems should be planned to facilitate user involvement in management.
 3. Institutions for providing unbiased information on water resources to the users should be created. Although there are institutions which provide such information, they now have lost credibility because of the way they have operated in the past. Information in a form, meaningful to farmers, should be provided on the availability of

groundwater at a particular location or surface water in a surface irrigation system which services them.

4. Priority should be on local use of resources. The resource base of any region should be utilised to meet the needs of the people in that region before it is used for the benefit of others.
5. People should be given the right to design their own organisations. An appropriate organisational design is one which is uniquely suited to the environment. Mandating a uniform design will make organisations ineffective in several situations. In this context, greater attention should be paid to research on resource-specific issues. Water, forestry and fishery as resources differ from one another on certain critical parameters such as whether there is a symmetry in use, multiple uses of the resource and whether they can be used conjunctively. Organisational design should pay particular attention to the characteristics of the resource. A design suitable for an organisation engaged in exploiting a forest may not be suitable for sharing water from an irrigation system.

(ii) **Governance and Control Structures:** For the reasons cited above, internal structures may vary from one organisation to another and therefore they cannot be specifically stated for general application. The participants felt that governance and control structures should be designed so as to enhance openness, legitimacy, accountability and monitoring of member activities.

(iii) **Pricing of Water:** This is important as it has a strong bearing on long-term viability of co-operatives. Pricing relates to what the co-operative buys (canal water in bulk, for example) and what it provides to its members (irrigation from a deep tube-well or canal water purchased in bulk from the system). The group felt that the co-operatives may be subsidised by the State when they take up activities which were hitherto the responsibility of the State. The State could pass on funds that it was incurring on the scheme to the user groups. The group felt that this should be done only if necessary for the survival of the group.

The major criteria suggested for co-operatives to determine the prices they charge to their members are: (i) proportionality: and (ii) full cost recovery. Pricing formula should be designed such that members pay in relation to the benefits they receive. This is essential for both efficient resource-use and for maintaining group cohesiveness. Pricing should also seek to recover full costs as groups cannot sustain themselves without outside support if they do not do so. The group felt that, the benefits from irrigation are large enough to enable the users to pay the full costs of providing it. The group felt that in surface irrigation systems the user charges should, at least, cover operation and maintenance costs. The objective should be full cost recovery and the co-operatives should have the flexibility to decide how and when to collect the charges.

7. INLAND FISHERIES CO-OPERATIVES

There were two case-studies on inland fisheries presented at the Workshop. The study by Moorti and Chauhan (1992) reports the results of a study of 12 reservoir fisheries co-operatives in Himachal Pradesh. It was a successful attempt at co-operative management of a CPR. The success is attributed mainly to the following three factors: a) adequate infra-structural facilities; b) an efficient regulatory mechanism; and c) an efficient marketing mechanism. As the problem of judicious or controlled exploitation of a CPR is encountered most frequently in collective management, the evidence from the present study is of great relevance. The main elements of the mechanism devised consisted of: a) refusal to issue licenses over and above the saturation point even if the applicants are registered members of the society; b) a set of rules for protection and regulation of fisheries stipulating the fish size, mesh size, prohibition of wanton and wasteful methods of killing fish; and c) a complete ban on fishing during the rainy season (16 June to 15 August) so that breeding and spawning can take place unhampered.

A close linkage and collaboration between the State Fisheries Department and the co-operatives was another important feature of the management system. This again is an issue worth probing further in the context of the widespread alienation and mistrust that more commonly characterise the relationship between the state machinery and the co-operatives. Another issue that begs adequate explanation is marketing of fish through contractors as a result of which the

producers (fishermen) received only 52-57 per cent of the price paid by the consumer. What prevents the co-operatives from doing away with the middlemen remains a puzzle.

Singh and Dhar Choudhary (1992) presented a case-study of a sewage-fed fishery co-operative in West Bengal. The co-operative was unique in a number of ways: consistently efficient performance for over 65 years; very strict membership procedure; members being employees of the fisheries co-operative; and use of urban sewage as fish feed. The urban sewage is utilised not only in an economically profitable, but also environmentally sound manner - an issue of special relevance in the age of alarming rate of urban pollution. The co-operative had been functioning very successfully since its inception, be it in terms of the range of services rendered, benefits accrued to the members or creative and efficient management. The various factors responsible for this remarkable degree of efficiency include: long tradition, strict membership rules, membership handed down from one generation to the next, and a unique collaboration between co-operative personnel and government personnel in the day to day management of the co-operative. It is necessary to explore further the relative importance of the various factors, as replicability depends to a large extent on isolating the more crucial from the less crucial factors.

Though the Society has been running very efficiently (in terms of sound finances, able management etc.); to what extent it can be called a genuine co-operative society is a moot point. Given the fact that the Chief Executive Officer (CEO) is appointed by the government, what is the level of member control in the society? If there is a conflict between the Board of Directors and the CEO, what is the conflict resolution mechanism? Finally, marketing of fish in this otherwise well-managed society is done through middlemen. This results in diversion of some part of the revenue to the middlemen. What are the compulsions behind accepting this practice?

8. MARINE FISHERIES CO-OPERATIVES

There were four case-studies on marine fisheries co-operatives presented at the Workshop. Nair and Singh (1992) presented an overview of the organisation structure, management practices, business operations, performance and problems of two marine fisheries co-operatives in Kerala. The study shows that modernisation has led to over-capitalisation and over-exploitation of the marine resources. As a result, small-scale artisanal fishermen have become worse-off, a phenomenon similar to the depeasantisation and pauperisation observed in the wake of agricultural modernisation in the Green Revolution areas. Hence the study cautions against indiscriminate increase in the number of motorised fishing boats which is an important contributor to exploitation beyond a sustainable limit.

The study also calls for a re-examination of the social -desirability of new technology and the rationale of government subsidy to promote technology adoption. The modernisation programmes were introduced, in the first place, to improve the living standards of fishermen. The strategy adopted was to encourage fishermen to adopt better technology and thereby to improve their well-being. But the result, the study shows, has been counter-intentional: the lot of more of the fishermen has deteriorated. Hence the authors question the very strategy adopted, and make a strong plea for a more judicious exploitation and responsible management of the marine fisheries in the interest of millions of poor fishermen.

On the other hand, the study recommends stronger forward linkages in marketing, processing and even exporting. However, there is need to set export targets that are consistent with judicious exploitation of marine fisheries. This is so because once an expensive modern processing plant is set up or a valuable export contract is obtained the compulsion to ensure financial viability or to meet the export target will make restraining from over-exploitation much more difficult. Similar compulsions on the part of the sugar co-operatives in Maharashtra have led to serious depletion of groundwater resources as the demand made on the scarce resource -- water -- by increased cultivation of sugarcane is very high. The study also draws attention to another common problem encountered by development agencies: co-operation among co-operatives. In the present case the involvement of both MATSYAFED and

SIFFS in the same villages does not seem to have been beneficial to the population which both profess to promote.

The case-study of two fishermen's societies in south west Kerala by Balakrishnan, Singh and Das (1992) reaches an identical conclusion. Bhatt's (1992) study of fishery co-operatives in Dakshin Kannada district of Karnataka examines how fisheries co-operatives had grown more rapidly in the highly developed port fish market centres characterised by capital intensive fishing, centralised landings, oligopsonistic market structures and a high degree of market concentration. Here too, while co-operatives helped fishermen to raise their resources, they were unable to lead to better and more sustainable 'management' of the fisheries themselves. The case-study of marine fisheries co-operatives in West Bengal by Rahim and Singh (1992) describes the three-tier co-operative structure prevalent there. The study points out that while primary co-operatives made marginal profits, the central society lost heavily; that the elected boards have been marginalised and the co-operative has been bureaucratised. Once again, while these co-operatives have secured for their members fishing rights, they have done precious little to manage the fisheries resources.

To sum up, all the three case-studies presented revealed that all the members were all interested in developing and exploiting the natural CPR (fisheries) and not so much in sustainable management of the resources involved.

Many studies have been conducted on marine fisheries in both developing and developed countries of the world. For example, Berkes (1986 : 218-229) studied the focal 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-operative. It served 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-operative to be a successful one having no problems of over use or pollution. Similarly, in another study of a fishermen's co-operative in Ebibara community in Japan, Brameld (1968) found that the co-operative had proprietary rights on nearby fishing grounds granted by the Japanese government that also regulated the types of gear to be used. The co-operative 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-operatives 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-operatives have also been reported in the literature. For example, Sabella (1980) documents a case of failure of a fishing co-operative 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-operative 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-operatives; b) conditions under which fishing co-operatives can attain economic viability and become self-sustaining without any external support; c) how co-operatives 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 prices to members and retain their loyalty to the co-operatives.

9. DETERMINANTS OF PERFORMANCE OF NRM CO-OPERATIVES

Until now, we have not provided any clues to determinants of performance of NRMCS. In Tables 2 - 4, we present a summary appraisal of the sample NRMCS in terms of 11 chosen dimensions of governance structure and performance as perceived by their members. These 11 dimensions have been identified by several researchers as crucial determinants of success and failure of co-operatives (See, for example, Shah 1992 a,b; Attwood and Baviskar 1987, Baviskar and Attwood 1991).

Table 2
Salient Features of Governance and Performance of Land and Forest Resources based Co-operatives

Characteristics	TGCS Orissa	Vatra TGCS Kheda, Gujarat	Sabai-grass Processing, Orissa	Forest coop. Himachal Pradesh	Coop. on Degraded Land	Minor Forest Coop.	Sheep Breeders' Coop.	Salt Coop.
1. Members stake	Moderate	Moderate	Low to nil	Moderate to high	---	High	Very high	Very high
2. Members control	Moderate to low	High	Low (almost nil)	Moderate to high	---	Nil	Low (mostly nominated members on board)	Moderate
3. Quality of leadership	Poor	Moderate	---	differs across forest coops	---	---	Good	---
4. Size and composition	Large, heterogeneous	Large and heterogeneous	Large, heterogeneous	Large, homogeneous (some times heterogeneous)	Large and heterogeneous	Large, heterogeneous in class, homogeneous in caste & kinship	Large - homogeneous in caste, - heterogeneous in class	Medium homogeneous
5. Primary objective of coop.	Redeem health of waste land	Redeem health of wasteland	Improve econ. well being of members	- protection of forest - distribution of fodder, fuel, timber etc to members	Reclamation of soils	i) Provide better market opportunities ii) remove exploitation of people by contractors	- to develop pasture land - encourage scientific breeding programme - to provide market	Remove exploitation by private traders
6. Integration	Nil	Nil	Poor, Vertical Linkages	Nil	Nil	Vertical	Vertical	Vertical (not effective to combat private trade)

(contd..)

(Table 2 contd...)

Characteristics	TGCS Orissa	Vatra TGCS Kheda, Gujarat	Sabat-grass Processing, Orissa	Forest coop. Himachal Pradesh	Coop. on Degraded Land	Minor Forest Coop.	Sheep Breeders' Coop.	Salt Coop.
7. Enforcement of rules	Moderate	Moderate to high	Poor	High but deteriorating overtime	---	Poor (manipulated by enforcing authority)	---	---
8. Role of outside agency	Motivation financial technical institutional assistance	Motivation financial technical institutional assistance	Govt. regulatory	Providing legitimacy Financial assistance	Motivation Technical Financial assistance	Regulatory	Not clear (except provision of resource)	- motivation - financial - technical - institutional assistance
9. Property right	Long term Usufruct	Long term Usufruct	Usufruct (open access)	Exclusive usufruct	Private and/or CPR	Long term Usufruct	Long term Usufruct	Long term Usufruct
10. Performance in relation to members explicit goal	Reasonable	High	Very poor	Moderate to high	Not tested	Moderate to low	Poor	- moderate - could not achieve competitive advantage
11. Free riding	By non-members more. However, members also do it.	Few members and majority of non-members	- by both members - and by employees	not extensive, however both by members/non-members; but when are fined	---	---	By members and non-members and by employees	Limited (but by both members as well as non-members)

Table 3
Salient Features of Governance and Performance of Water Resource Co-operatives.

Characteristics	Lift irrigation Coop.	Sahada LI Coop.	Lift Irrigation Company/Coop.	Water Distribution Association
1. Members stake	Very high	Very high	High company poor in coop	Very high
2. Members control	Strong	Moderate	High in company Low in coop	Strong
3. Quality of leadership	Good	---	---	---
4. Size and composition	Medium homogeneous	Large homogeneous	Large and heterogeneous	Large and heterogeneous
5. Primary objective of coop.	Access to scarce water	Access to scarce water	Access to scarce water in company Reviability state tube-wells for coops	Access to scarce water with increased reliability
6. Integration	Strong vertical backward/forward linkages	Backward input linkages & support	Effective in company - moderate to poor in coop	Nil
7. Enforcement of rules	Very strong	Moderate	Strong in company, poor in coop.	Strong
8. Role of outside agency	- motivational - technical - financial	- motivational - technical - financial	Nil in company; Regulatory in coop	Motivation facilitator
9. Property right	Open access (capture first rule)	Open access	Open access	Contractual
10. Performance in relation to members explicit goal	Outstanding	Moderate	High & efficient in company moderate to poor in coop	Satisfactory
11. Free riding	Not observed	By those who are located at head reach (cross subsidization)	nil in company by larger partner in coop	Almost nil

Table 4
Salient Features of Governance and Performance Fishermen's Co-operatives

Characteristics	Captain Bhery Fish Coop.	Marine Fishermen Coop in Kerala	Marine Fish Coop. Karnataka	Marine Coop. WB	Marine Coop. Kerala	Pong Dam Fish Coop.
1. Members stake	High	High	High	High	High	High (livelihood)
2. Members control	Moderate Poor	Moderate Poor	Poor	Moderate at PFCS Very poor at CFCS	Moderate poor in MATSYAFED Coop; Somewhat better in SIFFS coop	Low moderate
3. Quality of leadership	---	Satisfactory	---	---	---	---
4. Size and composition	Medium homogeneous	Large homogeneous	Large homogeneous	Large homogeneous	Medium to Large homogeneous as well as heterogeneous	Large homogeneous caste but heterogeneous in class
5. Primary objective of coop.	Economic upliftment of members	Remove exploitation	Remove exploitation Provide improved technology	Remove exploitation equip fishermen to exploit resource	provide better technology and credit	Manage resource economic upliftment of member
6. Integration	Horizontal (poultry)	Horizontal and inputs credits	Input service	none	---	Poor vertical linkage

(contd..)

(Table 4 contd.)

Characteristics	Captain Bhery Fish Coop.	Marine Fishermen Coop in Kerala	Marine Fish Coop. Karnataka	Marine Coop. WB	Marine Coop. Kerala	Pong Dam Fish Coop.
7. Enforcement of rules *	Strong	Strong for all the purpose except management of resource	Very poor in resource management	Very poor	Poor	Moderate
8. Role of outside agency	Regulatory and managerial subsidy	Promotional Financial assistance etc.	Regulatory Financial assistance	Regulatory	Regulatory Financial	Short term
9. Property right	Long term	Open access	Open access	Open access	Open access	Usufruct
10. Performance in relation to members explicit goal	Good	Satisfactory to Poor	Satisfactory to Poor	Satisfactory	Dissatisfied with both MATSYAFED and SIFFS	Satisfactory
11. Extent of free riding	not reported chances are very high	Extensive	Extensive	Extensive	Extensive	appears significant and increasing

It appears to us from the case-studies that those co-operatives are doing better where members have played important roles and have had a say in decision-making. In the government-promoted co-operatives, members' role was passive and they could hardly influence decision-making. Even in the commodity co-operatives, linkages with apex organisations were very poor; the main role of the latter was regulatory. These apex co-operatives did not try to explore better market avenues for their produce and instead depended upon the middlemen and local traders. In other words, they worked as commission agents. On the other hand, when members' influence on decision-making was more, the co-operatives seemed to work better and sought solutions to many of their problems. Although not all of them were able to achieve resounding success but they were able to retain their members' faith and loyalty.

Several other determinants of success emerged from the case-studies. For example, we found that the members stake in resources, around which coop is organised, is necessary but not sufficient conditions to become successful manager of the resource. There are several reasons for this. One, as we mentioned earlier, the members did not have any control over decision-making, and secondly, the co-operatives did not serve the interest of the members; the economic gain or services that the members received from the co-operatives were not significantly higher than those received by them, or the non-members, from alternative sources. In many cases, the incentives structures were such that they encouraged free-riding and the misuse of the co-operatives by a few members for their vested interests.

Most of the papers were based on case-studies of both successes and failures in co-operative management of natural resources. The results of the case-studies present a mixed scenario; some performed well while others did poorly. The case-studies revealed that not all the NRMCS studied were able to meet the goals of efficiency, sustainability, equity and resource users' satisfaction. Wherever they were successful, a variety of socio-cultural, technological, institutional, and economic factors contributed to the success. The major determinants of success across all resources and geographic regions were:

- (1) High stakes of resource users in the resource as well as in the co-operatives managing the resources. This was found to be an important factor in the forest co-operatives of Himachal Pradesh (Agrawal and Singh, 1992) minor forest co-operatives of Madhya Pradesh (Marothia,

1992) fisheries co-operatives of Karnataka (Bhatt, 1992); of Kerala (Nair and Singh, and Balakrishnan et al., 1992); and of West Bengal (Rahim and Singh), all water companies of Mehsana (Shah and Bhattacharya, 1992);»Amritwahani Lift Irrigation Co-operative (Thomas, 1992); and irrigation co-operatives in Maharashtra (Patil and Lele, 1992)).

- (2) Good local leadership and social and political entrepreneurship. This was found to be a significant determinant in the sheep breeders' co-operative in Rajasthan (Ray, 1992); Amritwahani Lift Irrigation Co-operative (Thomas, 1992); and Captain Bhery Fish Co-operative in West-Bengal (Singh and Dhar Chaudhary, 1992).
- (3) Existence and strict enforcement of rules for regulating the use of the resource, preventing free riding, and sharing the costs and benefits of co-operative management equitably (in proportion to the effort put in or contribution made. This was found to be a major factor in the TGCS (Mishra, 1992; Singh and Subramanian, 1992; Saxena, 1992); forest co-operatives of Himachal Pradesh (Agrawal and Singh, 1992) and irrigation co-operatives (Patil and Lele, 1992); and water companies of Mehsana (Shah and Bhattacharya).
- (4) Willingness of government departments and officials to share power with the co-operatives and to support them in the form of funds, technical information, legitimacy, and co-ordination. This was an important factor in the Pong Dam fish co-operatives, (Moorthi and Chauhan 1992).
- (5) Involvement of an external agency as a catalyst. This was found to be a significant factor in the TGCS (Mishra, 1992); irrigation-co-operatives (Patil and Lele, 1992); marine fish co-operatives of SIFFS (Nair and Singh, 1992); and Sahada Lift Irrigation Co-operative (Barik, 1992).
- (6) Integration of production, processing and marketing. Wherever and whenever integration of these functions was absent or was not available in needed quantity, co-operatives tended to fail or perform poorly. This was found to be a major factor in the minor forest produce co-operative (Marothia, 1992); all marine fish co-operatives (Nair and Singh, 1992; Rahim and Singh, 1992); salt miners' co-operatives (Singh and

Bhattacharya, 1992); and sabaigrass co-operative (Singh and Mohanthy, 1992).

- (7) Size and composition of membership of NRMCS did not have any significant effect on the performance of the co-operatives. The literature is replete with studies which suggest that small and cohesive groups have higher chances of success in management of CPRs than large and heterogeneous groups. But the case-studies presented at the Workshop did not support that view, and it is not necessary condition for a successful collective management of common pool resources. This indicates that large and heterogeneous groups could also be organised with proper institutional arrangements to manage CPRs successfully. This was evident in the cases of the TGCS (Mishra, 1992; Saxena, 1992; Singh and Subramanian, 1992); all water companies (Shah and Bhattacharya, 1992); irrigation co-operatives (Patil and Lele, 1992); and Pongdam Fish Co-operatives (Moorthi and Chauhan, 1992).

10. AGENDA FOR FUTURE RESEARCH

The participants identified many gray areas in the co-operative management of natural resources. Generally speaking, there was a consensus among the participants about the need for conducting research to evaluate alternative regimes systems of CPR management to find out what works and what does not and the design systems of collective/co-operative management that are likely to work successfully. Similarly, need was felt for research in technical sciences to develop scientific techniques and methods of locating natural resources like groundwater, brine, marine fisheries etc., and estimating their stocks, and direction of movement. A case was also made for applied research for designing new tools and equipment that can reduce the risks and the drudgery involved in exploitation of many natural resources like marine fisheries, brine, groundwater and so on.

More specifically, the participants identified the following major issues in the co-operative management of natural resources for future research :

- (i) Identification and description of those elements of macro environment that affect NRMCS and development of strategies for coping with them;

- (ii) Governance and control structures and mechanisms adopted by NRMCS and ways to enhance their effectiveness;
- (iii) Operating rules and procedures and their impact on the performance of NRMCS;
- (iv) Personnel policies and their impact on the performance of NRMCS;
- (v) Member participation in the activities and management of NRMCS;
- (vi) Resource-specific constraints on the performance of NRMCS and alternatives for their removal;
- (vii) Member-specific constraints on the performance of NRMCS and alternatives for their removal;
- (viii) Technology - specific constraints on the performance of NRMCS and alternatives for their removal;
- (ix) Issues relating to the quantum of benefits from NRMCS and their distribution among their members;
- (x) Issues relating to markets and marketing of natural resources and/or their products/commodities; and,
- (xi) Factors affecting financial and economic viability of NRMCS and issues relating to pricing and cost recovery.

11. CONCLUSIONS AND IMPLICATIONS

As biological systems, the natural resources of land, water, forests, and fisheries are dynamic and amenable to management. Three alternative systems or regimes under which natural resources can be managed are privatisation, nationalisation, and collectivisation/co-operativisation. Experience with nationalisation of natural resources has not been good in most of the cases all over the world. Privatisation has yielded mixed results: it has been justified on efficiency grounds and condemned on equity and sustainability grounds. Co-

operativisation or co-operative management is a relatively nascent regime. The results of co-operative management of natural resources also have, so far, been mixed. But the co-operative mode of natural resources management seems to hold the highest promise as an instrument of achieving the goals of efficiency, sustainability, equity and resource users' satisfaction. It is also politically and socially more acceptable in most societies and nations than any other alternatives.

It was revealed by the case-studies that most of the natural resources management co-operatives (NRMCS) were parastatal organisations and not genuinely member-controlled co-operative societies. It was also found that none of the NRMCS studied had restoration, conservation and sustainable use of the natural resources as one of their objectives. The major determinants of success across all resources and geographic regions were identified to be: (1) high stakes of resource users in the resource as well as in the co-operatives managing the resources; (2) small and homogeneous or otherwise cohesive community of resource users; (3) education and awareness of resource users; (4) good local leadership; (5) professional management; (6) existence and strict enforcement of rules for regulating the use of the resource, preventing free riding, and sharing the costs and benefits of co-operative management equitably (in proportion to the effort put in or contribution made); (7) government support in the form of funds, technical information, legitimacy, and co-ordination; (8) involvement of an external agency as a catalyst; and (9) integration of production processing and marketing. Wherever and whenever a few or all of these factors are absent or are not available in needed quantity, co-operatives are prone to failure.

Most of natural CPRs could be put to more socially productive uses if they are given to co-operatives of local people, especially the rural poor on long-term (99 year) lease and the co-operatives are provided needed financial, technical, and legal support by the government. There is urgent need for a national policy for CPRs providing for their co-operativisation. Besides, the existing Co-operative Societies Act and the Companies Act will also need to be suitably amended to provide for establishment of NRMCS or NRM companies.

There is also a need to remove conflicts in the goals of various policies and programmes affecting natural resources and to simplify rules and procedures for assigning property rights in common property and government-owned resources to NRMCS. The government should allow the NRMCS full autonomy and not

use them as its instrument for promoting goals other than those of their members.

Non-governmental organisation having requisite technical expertise and financial resources could play an important role as a catalyst in organising and nurturing NRMCS and educating and training resource users. They should be encouraged and supported financially and technically by the government to play a complementary and supplementary roles and not treated as adversaries.

Once established, NRMCS will need to be managed professionally. The managers will need to develop innovative organisational designs and systems having flexibility to cope with unanticipated events, rational reward and punishment system, effective implementing and monitoring mechanisms, and accountability to their members and other clientele. For this, there will be need for establishing NRM institutes on the pattern of the Institute of Rural Management, Anand. State Agricultural Universities and Engineering Colleges and other Technical institutes can generate reliable information about the quantity and quality of natural resources available in the country.

Above all, there is need for a strong political will at the all levels to promote co-operativisation of CPRs in the country. The co-operative leadership will have to play a more vigorous role in lobbying for necessary changes in the existing laws, rules, and regulations affecting NRMCS, develop social and political entrepreneurship, and enhance the awareness of people about their rights and responsibilities in natural resources management. After all, it is the politicians who decide what will be done; the social scientists can only tell them what should be done and technocrats and bureaucrats can only advise them how it can be done.

ACKNOWLEDGEMENTS

We are thankful to all the Workshop participants for their valuable comments and observations made during the course of presentation and discussion of various papers. Our special gratitude is to the Workshop Chairmen, discussants, rapporteurs and speakers without whose benign co-operation it would have been difficult to conduct the workshop so smoothly and systematically. We have liberally drawn upon the discussants' remarks and notes and rapporteurs' reports in the preparation of this report but we alone are responsible for any errors of interpretation, omission and commission that still remain in the report.

For liberal financial support for conducting the case-studies presented at the Workshop as well as for organising the Workshop we are thankful to the Ford Foundation (India), New Delhi. Last but not the least, we are grateful to Prof. Tushaar Shah, Director, IRMA for the encouragement, advice, facilities and freedom provided to us in planning and conducting the Workshop.

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ANNEXURE 1

PROGRAMME SCHEDULE

WORKSHOP ON CO-OPERATIVES IN NATURAL RESOURCES MANAGEMENT

Workshop Directors : Drs. Katar Singh & Vishwa Ballabh

Venue : CONFERENCE HALL, ETDC, IRMA

Date	Time	Session topic, Chairperson, Discussant, Rapporteur, and Speakers
7/12/92	11.00 am - 01.00 pm	Inaugural session common for all the workshops
	01.00 pm - 02.00 pm	Lunch break
	02.00 pm - 03.50 pm	Chairperson: Elinor Ostrom Presentation of the theme paper and identification of issues for discussion Speaker: Katar Singh Property rights, Transaction costs, and & Co-ops in Natural Resources Management Speaker: Vishwa Ballabh Issues in Afforestation of Wastelands by NGOs Speaker: KV Sarabhai
8/12/92	09.00 am - 10.50 am	Presentation and discussion of papers on wastelands development and afforestation Chairperson: VK Mishra Discussant & Rapporteur: PK Joshi Speakers: VK Mishra S Subramanian DK Marothia RK Saxena DK Mohanty
	10.50 am - 11.10 am	Tea/coffee break

Date	Time	Session topic, Chairperson, Discussant, Rapporteur, and Speakers
8/12/92	11.10 am - 01.00 pm	<p>Presentation and discussion of papers on wastelands development and afforestation</p> <p>Chairperson: VK Mishra Discussant: Pk Joshi Rapporteur: HS Rawat Speakers: Chetan Agarwal PK Joshi S Bhattacharya Sunil Ray</p>
	01.00 pm - 01.50 pm	Lunch break
8/12/92	02.00 pm - 03.50 pm	<p>Presentation and discussion of papers on co-operative management of water resources</p> <p>Chairperson: Elinor Ostrom Discussant: Nirmal Sengupta Rapporteur: Marcus Moench Speakers: P Thomas BC Barik RK Patil</p>
9/12/92	09.00 am - 10.50 am	<p>Presentation and discussion of papers on co-operative management of water resources</p> <p>Chairperson: Nirmal Sengupta Discussant: Sara Ahmed Rapporteur: KV Raju Speakers: D Nagabrahnam for Tushaar Shah VCV Retnam Marcus Moench</p>
	10.50 am - 11.10 am	Tea/coffee break

Date	Time	Session topic, Chairperson, Discussant, Rapporteur, and Speakers
9/12/92	11.10 am - 01.00 pm	Presentation and discussion of papers on fisheries Chairperson: Takahisa Murakami Discussant: Thomas P Rapporteur: DK Marothia Speakers: SK Chauhan Sangeeta D Choudhary KMB Rahim Katar Singh R Bhatta
	01.00 pm - 1.50 pm	Lunch break
	02.00 pm - 03.00 pm	Presentation and discussion of papers on fisheries continued
	03.00 pm - 3.50 pm	Formation of three Groups and Group Discussion Group 1: Wastelands Afforestation and Forest Management Chairperson: VK Mishra Rapporteur: PK Joshi Group 2: Water Resources Management Chairperson: Shashi Kolavalli Rapporteur: KV Raju Group 3: Fisheries Management Chairperson: Thomas P Rapporteur: R Bhatta
	03.50 pm - 06.00 pm	Tea break and Distinguished Lecture
	06.00 pm - 07.00 pm	Group discussions continued
10/12/92	09.00 am - 10.50 am	Chairperson : Elinor Ostrom Presentation and discussion of the Group Reports

ANNEXURE - 2

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