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TECHNOLOGICAL AND INSTITUTIONAL VARIABLES
IN THE EVOLUTION OF RULES FOR COMMUNITY
PLANTATIONS OF A SCHEDULED CASTE IN A
BACKWARD AREA OF GUJARAT

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ABSTRACT

Technological and Institutional Variables in the Evolution of Rules for Community Plantations of a Scheduled Caste in a Backward Area of Gujarat

This paper examines the nexus between new technology for an open access land resource and an institutional set-up for establishing and managing tree plantations as a common pool resource.] A

For the Vankars, a scheduled caste of a coastal saline region of Gujarat, this meant a struggle at several levels in society. This land is owned by the state government. It is open access land managed by the village panchayat.

The Vankars combined their knowledge of local resources with the techno-managerial inputs of an external non-government organisation* to evolve a new technology for making these lands productive. Some land was acquired from the Government on long lease on an individual basis and some on a group basis. In either case the Vankars soon realised that reclamation and management of such degraded "lands called for pooling of the land as well as other resources.

The setting up of a chain of cooperatives in different Villages in this region from 1979 onwards, and their subsequent federation into a cooperative union in 1989, is the realisation of a dream shared by the leaders of an oppressed community and their counterparts in the external agency.

The paper examines the evolution of rules for using usufruct, providing labour and protection, processing wood into charcoal and marketing, in three cooperatives. These have been selected on the basis of land productivity as criterion. The mechanisms for sharing the set-up and maintenance costs of the plantations, the problems of fostering unity and the perceived stream of benefits realised by the members vis-a-vis the NGO are summarised. Implications are then drawn for building institutions around common pool resources.] A

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This paper was prepared by Mr. A.R. Pastakia during his work at IIM-A as part time assistance to Prof. Anil K. Gupta in a project on Sustainable Development of High Risk Environment.

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Part 6 Implications for Institution Building

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INTRODUCTION

Genesis

Historical deprivation in socially and economically marginalised groups in degraded environments often leads to learned helplessness. This may have the following reasons:

- (i) The natural endowments of the are such that means of survival are fraught with natural hazards.
- (ii) The access to technology and other resources may be constrained because, firstly, market forces are weak and, secondly, social and political forces prevent easy access to the government delivery system. Hence while technology to upgrade local resources may be scale neutral, the efforts required to access other associated resources may not be so.
- (iii) the skills of the particular group are at a discount.

This paper presents the case of the Vankars (a scheduled
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caste) of a coastal saline backward region of Gujarat called the "Bhal", who, recognising the limits to economic emancipation through individual management of resources, decided to resort, to community action.

This resulted in the setting up of a string of scheduled caste cooperatives at the village level, which made possible the demarcation of open-access saline wasteland for the exclusive use of scheduled caste, as a common pool resource (refer Appendix 1.).

Pooling of resources such as land, labour, and knowledge pertaining to the use of such resources was a necessary condition for success. Experimentation to build upon local knowledge and adapt technology from outside was an integral part of the strategy.

The intervention was triggered off by the assurances provided by an city-based non-government agency called the Behavioural Science Center (BSC), active in the area since 1978.

The assurances from the BSC made it possible for the Vankars to set up their own institutions which would enable them to improve their access to resources and technology from outside as well as to augment\utilise their own skills (ability) and resources.

The effective negotiation of risks both horizontal (uncertainty in the behaviour of other members) and **vertical(uncertianity** of future returns on investment) was crucial to the process of setting up these institutions.

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Literature on institutional analysis in general fails to recognise the importance of developing all six elements for an effective intervention (but Gupta 1985):

	Access	Assurance	Ability
Ecological resources	XXX		
Institutions		XXX	
Technology			XXX

Hence, improving, access to resources, improving skills (ability) of people to convert these resources into assets and providing awareness to cope with the risks involved in setting up of a new enterprise (institution) are the three tasks that a developmental agency must address itself to.

Key Questions:

What made the movement of the Vankars from a state of learned helplessness to one of praxis possible?

To answer this question the answers to a few more questions must be sought :

- What kind of risks did the Vankara face as individual and as a group?
- Which were the risks inherent in the environment and which were those associated with the launching of a new enterprise?
- What were the requirements for community action? What kind of self-education process did the Vankars go through before entering into negotiations with various interest groups and arriving at the present form of institution? How did the perception of risks affect the shape and form of these institutions?
- How did the institutions deal with questions of leadership, evolution of rules\norms for legal and moral boundaries, sharing of benefits and conflict resolution?
- How did these norms\rules evolve over time and cross villages?
- In what way was the presence of the external facilitating agency a help or hindrance to the cooperative movement of the Vankars? What was the nature of relationship established between the CPR user institutions and the facilitating agency?
- What implications can be drawn from this case study for institution-building;
 - a) for CPR user organisations?
 - b) for facilitating agencies ?

Organisation of the paper :

The answers to these questions are attempted in five different parts of the paper.

Part 1 describes the risks the Vankars faced in the context of socio-ecological realities in general and resources, skills, and rules\norms in particular.

Part 2 focuses on the process before community action while Part 3 deals with institutional imperatives such as leadership, evolution of norms\rules and conflict resolution.

Part 4 highlights the role of the facilitating agency and Part 5 draws implications for institution-building separately for user organisations and facilitating agencies.

Part 1: FRAMEWORK FOR ANALYSIS

Gupta (1985) observed that the state had a duty towards the poor, whose skills were at a discount in the market. According to him, the resources for which technologies are not developed, the risks which were not insured by the state\market and skills which are made redundant or utilised sub-optimally by state, market and cooperatives, are the three main pillars on which a new paradigm has to evolve.

For the purpose of analysis we would like to adopt this frame work with the addition of one more parameter, viz., rules; which govern utilisation of resources in a given socio-ecological context.

A) Resources;

The "Bhal" region of Gujarat covers the low lying coastal area around the Gulf of Cambay (ref.map) . The region suffers from hostile geo-climatic environments comprising highly saline soils, erratic rains, monsoon inundation, temperature extremes, coastal cyclones etc. All these have rendered the life conditions of existence very difficult (refer Appendix 2).

Saline wastelands occupying more than 50% of the land represent the single largest under-utilised resource. The halophytic bio-mass produced on this land together with the agricultural waste, supports a fairly large animal population-mainly cows, buffalos, bullocks and a few goats.

The remaining land comprising alluvial soils is used for dry-land farming, the main crops being wheat and cotton. Yields are low and uncertain owing to the erratic pattern of rains.

In the last ten years, with the advent of the Mahi canal system, some villages have started cultivating paddy as a cash crop. However, the risk involved is quite high for many of the tail-end villages, since timely water-supply, is not guaranteed.

Most of the Bhal villages are multicaste in nature (see appendix). The dependence of different castes on the saline

wastelands for fodder and fuelwood requirements is not uniform.

Dependence for fodder is a direct consequence of the animal population maintained by different groups to support the mix of activities in their respective economic portfolios. The Bharwads, the Vankars and the Vaghris are the main users.

In the case of firewood there are a number of sources, viz., panchayat lands, road side plantations, open-access wastelands apart from private lands. Access to different sites is often affected by the status of the group concerned, in the caste hierarchy; the ones lowest in status being pushed to the saline wastes.

B) Risks:

The risks inherent in the natural endowments of the region have a profound influence on the attitudes and psychological make-up of the people. Individual and group responses to such risks have varied from embracing Christianity (with the advent of missionaries in 1960s) or heavy drinking to technological innovations and risk-hedging mechanisms.

Some of the risk-adjusting\hedging mechanisms included migration, pledging labour for loans (including bonded labour) and interlocking labour-land markets.

When it came to starting a new enterprise the Vankars. found themselves faced with a whole range of social, political and economic risks both at the individual and at the group levels. The list provided in Table 1 identifies some of the major ones.

Table 1

Individual and Group Risks for Marginalised Producers in Establishing A Community Enterprise

Risk	Individual	Group
A <u>Economic (Vertical)</u>		
1) Technological viability	-	\$*
2) Future returns on Investment	-	*
3) Doubts about managerial skills	\$	• *
4) Doubts about adequacy of employment generation	\$	<
B <u>Environmental (Social\Political)</u>		
1) Threats from upper caste		
- withdrawal of employment and credit.	*	-
- blockage of government scheme benefits	*	-
- Denial of services in the village	"	\$
- Manipulation to divide Vankars	-	\$
- Harrassment (false implications, abuse, theft etc.)	*	*
- Physical assault on life\ property.	*	*
2) Sabotage by other stake-holders mainly Bharwads.	-	\$
3) Copperative legal system: fear of losing land to government on failure of enterprise	\$	\$
C <u>Social (Horizontal)</u>		
1) Uncertainty in behaviour of other members:		
- Factional fights	-	\$
- Dysfunctional leaders	-	\$
- Inequality in distribution of benefits and contributions		
(i) between individuals	\$	-
(ii) between factions	-	\$
- Unequal opportunities for growth; resultant jealousies and fights	\$	-
2) Sabotage by disgruntled elements	-	\$
3) Competition healthy or otherwise from parellel social organisations	-	\$

* \$ = presence of risk indicated

Not all risks are necessarily detrimental to the emergence and functioning of a new organisation. Indeed some risks may enable the institution to emerge stronger than would otherwise have been possible. The fear of losing land to the cooperative legal system, for instance, may be an effective check on diversive forces within the cooperative. Similarly, external threats from the upper caste may foster unity and increase the resolve to make the enterprise a success.

C) Skills:

Caste as an institution plays a dominant role in segregating people into different groups based on profession (skills) and ascribed status.

Traditionally, the Rajputs represent the erstwhile ruling class and continue to behave as such. The Brahmins are the priests while the Bharwads are the traditional shepherds. The Patels are agriculturists, the Vaghris are usually landless and have a diverse economic portfolio comprising hunting, fishing etc.

The most despised are the outcastes comprising the traditional weavers (Vankars),- sweepers (Bhangis) and flayers (Chamars).

The Vankars who have undergone an occupational change from weaving to farming in the past three decades have a good understanding of saline soils and their own nomenclature for differentiating alkaline patches. They believe that saline lands can be reclaimed through a process of bunding, ploughing and leaching of salts with rain-water. However, their experience limited only to agriculture and pastoralism, precluded other options.

Their organisational skills, on the other hand, were somewhat restricted owing to the adverse social conditions which had forced them to adopt a survival strategy which necessitated appeasement of powerful upper-caste people even at the cost of disunity among themselves.

"When the interests of the upper caste leaders conflict, their divisions are reflected in the lower castes - some Mahetars (traditional leaders of Vankars) take sides with one, and others with other high caste leaders. This is one cause of factionalism..." (Herdero 1989-pp 28)

Factionalism was the bone of the Veinkar community. "Factional fights among Vankars was a recurrent theme in their conversation and a critical element in their group image." (Herdero 1989-pp 29,30)

In the late seventies new forces came into play. The Vankars had begun to take advantage of improved access to education through the government reservation system and through the Catholic missionary activity. The resultant increase in awareness among the youth, and the arrival of BSC on the scene had set the stage for a process of social change.

D) Rules:

The pattern of control over different natural resources such as land, water, trees, bio-mass etc. reflects partly the mixed economy adopted by the nation since independence and partly the feudal system of farming inherited from the past (see Appendix 3).

Much of the agricultural land is privately owned by farmers, while most of the saline wastes are the property of the State. The low productivity and relative abundance of the latter are perhaps the main reasons for treating these lands as open-access

land in the village. In keeping with stated government policy, part of this land has been privatised by allotting small plots of 1-2 ha. each to individuals of the scheduled and backward castes. Such land has also been leased out to cooperatives of the same target groups. In most of these cases the state of the land has remained the same. Often the cooperatives are declared defunct and liquidated after a few years and the land is restored to the government, to complete the cycle.

The village panchayat (which is an elected body) also owns some land in the village, mainly the settlement land, and the village commons such as the village tank and gaucher (grazing land). The Panchayats exercise control over these lands.

The traditional dominance of the upper caste had given it a head start in the race for political power. The Sarpanch (head of the village panchayat) in most of the villages was either an upper caste person or its nominee. The local MLA (member of legislative assembly) was also a Rajput. Control over these channels made the government delivery system more accessible to the upper caste than to the backward or scheduled castes. For a diagrammatic representation of this relationship see Appendix 2.

Part 2: PRECURSORS OF COMMUNITY ACTION

A) Investment in Education

"Implanting of institutions" on an unwitting and unprepared group of beneficiaries is not uncommon among development agencies as well as aid agencies.

Most of these agencies in their urgency to reach out to the poor overlook the fact that education and institution-building are slow processes. The BSC as a rule spends at least one year "preparing the ground" for the acceptance of a cooperative in a given village—although after several years now, there is evidence of being able to telescope the phase to a considerable extent. The idea of the apex cooperative was talked of in the villages five to six years before it actually came into existence.

The preparatory phase was essentially used to raise awareness about social conditions, to bring to the surface the perceived risks, and to work out the necessary assurance mechanisms.

B) Assessment of Risk's

The perceived risks as indicated in Table 2 varied from village to village depending upon the nature of the resource at disposal, the nature of the leadership within the community and social, relations with other castes in the village.

Table 2
Assessment of Enterprise Risks in Three Villages

Particulars	Vadgam	Pandad	Golana
A <u>Economic (Vertical)</u>			
1) Technological viability	++	+++	+
2) Future returns on investment	++	+++	+
3) Doubts about managerial skills	+++	+	+++
4) Doubts about adequacy of employment generation	+	-	+
B <u>Environmental (Social \ Political)</u>			
1) Threats from upper caste			
- withdrawal of employment and credit.	+++	++	+++
- blockage of government scheme benefits	+	+	+
- Denial of services in the village	++	+	++
- Manipulation to divide Vankars	+++	++	+++
- Harrassment (false implications, abuse, theft etc.)	++	+	++
- Physical assault on life \ property.	-	-	+
2) Sabotage by other stake-holders mainly Bharwads.	+++	+	+
3) Cooperative legal system: fear of losing land to government on failure of enterprise	++	+++	+++
C <u>Social (Horizontal)</u>			
1) Uncertainty in behaviour of other members:			
- Factional fights	+++	++	+++
- Dysfunctional leaders	+++	+++	++
- Inequality in distribution of benefits and contributions			
(i) between individuals	+++	+++	+++
(ii) between factions	+++	++	+++
- Unequal opportunities for growth; resultant jealousies and fights	+++	+	+++
2) Sabotage by disgruntled elements	+++	+++	+
3) Competition, healthy or otherwise, from pallel social organisations	+++	+++	++

Pandad shows a significantly lower score on horizontal and environmental risks than Vadgam and Golana, both of which had a history of factionalism with strong traditional leadership. In Pandad the factions were more diffuse and unstable - realignments taking place from time to time. Pandad also had a strong youth leadership which could keep in check the traditional leaders whenever they tended to be dysfunctional.

It is significant that Pandad which has a lower score on environmental risks, past successfully negotiated in the past with the upper caste on issues of unjust treatment \ harrassment on the basis of caste. One example was the termination of the obnoxious practice of stealing bullock carts of Vankar families whom the Rajputs wanted to victimise.

C) Pre-cooperative negotiations

In 1979 when the idea of a cooperative was mooted in Vadgam, several types of negotiations preceded community action:

- a) Between factions within the Vankar community
- b) Between the Vankars and the upper castes of the village
- c) Between the Vankars and the cooperative legal system
- d) Between the Vankars and the facilitating agency(BSC).

Negotiations between Vadgam (the first cooperative) and the BSC led to the signing of a ten year contract :

(i) The BSC provided the following assurances :

- to play the role of facilitator and supporter for a minimum period of ten years and to provide the necessary training at various levels in the cooperative.
- to appoint from among its staff members a secretary to the cooperative who would ensure clean administration until such time as the Vankars developed sufficient faith in their own people to assume this responsibility.
- to ensure that information on the working of the cooperative was made available to all members.
- to provide the cooperative an interest-free loan which could be written off in the event of failure due to technical reasons or due to lack of proper management

(ii) The assurances sought in return were:

- to ensure that all Vankars were made members with equal share holding, and an equal say in the working of the cooperative.
- to repay the loan in the event of the project's becoming viable; in order to enable the BSC to set up a revolving capital to promote similar cooperatives in the area.

D) What did the cooperative offer the Vankars ?

The cooperative (registered either as a primary agricultural cooperative or as a tree growers' cooperative) promised to serve the following purposes:

- 1) To reduce the economic risk by diversification of portfolio.
- 2) To cut down on migration.
- 3) To enable individuals to create a new legal personality with credit-worthiness and to improve the access to government delivery systems (refer Appendix 2. diagram 2).
- 4) To enable individuals to extend their time-frame. (Most individual families would not be in a position to withstand a gestation period of 3-6 years for returns on investments.)
- 5) To redefine social relations both within the Vankar caste and between caste groups.
- 6) To move towards a life of self-reliance and self-respect.

Part 3: INSTITUTIONAL IMPERATIVES

A) Leadership :

The question of leadership becomes critical for institutions managing CPRs, mainly because of :

- (a) High set-up costs (see previous section)
- (b) High institution maintenance costs
- (c) High cost of failure of institutions, implying even higher set up costs for future cooperative ventures.

The set-up costs consisted of time, energy and resources required to mobilise community members. It is usually the leaders who bear these costs and also play an important role in resolving the assurance problem (Tushar Shah, 1989).

Traditional Leadership :

The traditional leaders, called mahetars jointly deal with matters affecting the whole community, including the relations of the Vankars with other castes within, and matters relating to other communities outside the village. The latter are often settled in meetings of the nat (assembly) of all the mahetars of the Bhal Bara villages. The assembly has both legislative and judicial powers over matters affecting two or more villages.

Each individual mahetar takes care of the welfare of the households under his jurisdiction. His duties may include finding suitable partners for boys and girls, arrangements for marriage, divorce, monetary loans etc. Not every mahetar holds the same degree of power within the village. Personal skills and economic preponderance do give, one or two of them political ascendancy in their village and in the whole region if the village is a big one. (Herdero 1989 - pp 25 - 27)

No cooperative endeavour in a village can hope to endure without the blessings of the mahetars. In addition, they make nominations to the executive committee of the cooperative.

From the viewpoint of the cooperative, most traditional leaders, would seem dysfunctional in view of two major weaknesses : (i) corruption in discharging duties towards individuals within their jurisdiction and (ii) inability to emerge from the patronising influence of the Rajput leaders.

Cooperative Leadership :

On the other hand, the leadership needs of the cooperative were rather different. A new functional leadership was required to run the new enterprise. The cooperative was generating new technical skills, new managerial and administrative skills, new mobilisation skills, new organisational skills, new public relations skills. This called for a new type of leadership - preferably a group leadership as opposed to the charismatic leadership of one or two individuals.

The executive committee usually consisted of the youth and they were eager to take on the challenge offered by the cooperative. However, their enthusiasm was not always appreciated by the traditional leaders who saw them as a potential threat to

their leadership.

This situation of dual leadership will be resolved when the educational process is completed, rendering traditional leaders either inconsequential or functional. Appendix 4 provides a brief account of the evolution of leadership in three cooperatives.

B) Evolution of Rules

1) Eligibility :

Although the by-laws of a scheduled caste cooperative the membership of permit other scheduled castes like the Harijans, the Vankars chose to limit membership within their own community. The stated reason was to keep the horizontal institutional risk within manageable limits. The unstated reason may have been a form of discrimination against the Harijans whom the Vankars looked down upon.

As the Vankars of Golana were to discover later, a heavy price had to be paid for this in 1986, when the Rajputs successfully used the Harijans against the Vankars in the worst carnage the region has seen against outcastes, in several years.

This incident caused a change among Vankars who resolved to help the Harijans set up their own cooperatives which would be provided membership in the Sangh.

Rules for membership of the village cooperative were also modified over time. At first, only the head of the family could become a member. Later amendments opened membership to :

- a) non-resident community persons
- b) married sons of undivided families married sons
- c) and women

The Sangh decided to restrict its area of operation and membership to the 28 villages inhabited by Vankars of Bhal Bara.

This was later extended to include another 22 villages in which the Harijans lived. And now, exclusive cooperatives for the Vankar women are also being supported by the Sangh. It is not clear whether these will become its members or belong to a separate structure, in future.

2) Electoral Arrangements:

According to cooperative law every cooperative had provision for an executive committee, the size of the committee depending on the strength of the membership.

In the Bhal cooperatives, candidates were chosen by consensus; the traditional leaders playing an important part in nominating them. The chairman was then elected by the committee. A system of rotation was followed in which a fixed number of committee members resigned each year to allow fresh blood to come in.

The rules for the Sangh are somewhat different. The committee has a term of three years before fresh elections can be held. This allows continuity of leadership, over a minimum period of time.

Norms to provide representation to new villages, to Harijan cooperatives and to women have not yet evolved.

3) Pooling of Resources

The three main resources pooled in the cooperatives were:

Land: In villages where individual Vankar households had received saline wasteland from the government - (small plots ranging from 1-7 hectares each) there was scope for pooling this resource, size.

Labour: This was perceived as both a benefit (right) and a resource to be contributed to the community enterprises.

Knowledge; This includes knowledge of local resources and techniques accumulated over time in the collective memory of the members and the knowledge relating to the working of the cooperatives.

- (a) Land - The need for pooling land and the type of pooling mechanisms used depended on the type and tenure of land available in the village (refer Appendix 5).

In Pandad some Vankar families had small plots (more or less equal) of highly degraded saline wasteland which they were ready to contribute. Negotiations between land contributors and non-land contributors led to a formula of compensation. The non-land contributors were required to pay part of the share money on behalf of the land contributors.

In Vadgam the cooperative was able to acquire saline wasteland on lease from the government. Hence there was no need for pooling of land. At a later stage a few members owning thirty-six acres of land adjacent to the cooperative were interested in handing it over to the cooperative. Failure to work out a suitable mechanism of transfer pricing prevented the deal from going through.

Golana was different in two respects: (i) the quality of land was significantly better, some plots being suitable for marginal agriculture (ii) it had a history of cooperatives which had come up with multicaste alignments, one such cooperative consisting of half the Vankar population decided to offer membership to the rest of their community members, without any compensation.

After about one year forty-five individuals decided to withdraw about 100 acres of land from the cooperative which they had initially agreed to pool. This again was due to the failure to arrive at a suitable mechanism for compensation.

- (b) Labour : Since the members see the labour generated by the cooperative as a major benefit, pooling is never a problem, except in the peak agricultural season.

Limited pooling is enforced by the committee at that time depending on the following factors :

- i) Rainfall pattern of the year and resultant timing of peak season.
- ii) Planting targets for the year and cost of not meeting them,
- iii) Availability of outside labour.

Two mechanisms have been used in the past to meet the labour requirements for planting :

- (i) Raising the wage rate to offset partly the opportunity cost of working in the cooperative,
- (ii) Making it obligatory for each household (member) to offer one person for a stipulated - number of days, to the cooperative.

- (c) Knowledge :

Pooling of knowledge comes naturally to farmers of high risk environments. Farmers surviving under stress share a common bond which compels them to evolve norms for sharing all knowledge which forms part of the life-support system. It is, however, true that certain types of knowledge remained confined to certain castes on account of the role models they have accepted.

In this exercise the vadils or elders find an opportunity to make an important contribution - for their living memory represents, the only authentic source of information on the history of natural resources and their use, in the village.

Quite a different type of pooling can also take place in the day to day running of the cooperative. A few examples follow :

- i) Defence as a Common Good: In Pandad a single watchman has been deployed to look after 575 acres of land. This seemingly impossible task is performed quite effectively mainly because of support provided by the cooperative in passing on information to the watchman even on suspicion.

In Vadgam, a breach in the protective bunds means serious damage to the plantation due to tidal sea-water intrusion. Timely reporting by alert members has been instrumental in averting such losses.

Again in Vadgam, doors and windows stolen from the farmhouse of the cooperative were traced by an alert member despite the fact that the offender had fixed them onto his own house and applied a thick coat of fresh paint of a different colour.

Two cooperatives profitably used the principle of "making the naughty boy monitor" in approaching the protection problem. In Vadgam a Bharwad was appointed to keep the Bharwads in check, while in Golana a Rajput known for his honesty and poverty was identified to control the Rajputs.

ii) Technological Innovation : In Golana the cost of transporting saplings across the river to the planting site was causing concern to the manager. He then suggested direct sowing. One member suggested using excreta of donkeys fed on pods of Prosopis as ideal material for direct sowing. In this way not only did the seed treatment take place in the stomach of the animals, but the seed also got pelleted in organic manure. Three tractor-loads of such manure were collected and the idea put into practice.

In Pandad there were several plots of stunted plantation owing to adverse sub-soil conditions. When

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a row of such plants were cleared by the ONGC for the purpose of oil prospecting, everyone was concerned about compensation. A critical observation made by one member was that harvesting stunted plants was actually helpful since the vigorous coppicing power was used to overcome the adverse sub-soil conditions. This led to a practice of harvesting manure plants irrespective of their first growth.

Yet another technique was evolved when an observation was made that saplings in which only the bottom of the plastic covering was removed by some workers were in fact doing better than those planted after removing the entire covering. The covering on the sides help smoothen the shock experienced by the plant when planted in a highly saline environment.

4) Sharing uses/benefits

a) Labour as a benefit :

The employment generated by the cooperative resulted in immediate cash flows to members. It is not surprising, therefore, that much attention was given to evolving norms for equitable employment rights.

The principal norm was a system of rotation from household to household.

The variations were as follows :

- villager with factions or sub-settlements, such as Golana and Vadgam, preferred to have independent rotation within each faction.

- in the beginning, a member who did not use his right on a given day automatically forfeited it. A later modification was to make this right transferable. In this way, those who had less need of employment could still use their right to generate good will among friends and relatives.

The criterion for eligibility for employment was age. The upper limit was fixed at 70 while the lower limit was 15 years. Names of eligible members were entered in the muster-roll and updated every year. Was there any wage discrimination on the basis of age, sex or skill? Did the better worker get rewarded or penalised for his efforts?

The cooperative followed the minimum daily wage prescribed by the government which did not discriminate on grounds of age or sex. The system of payment and the level of supervision, however, depended on the type of work (see Appendix 6). All earthworks, which formed a major part of the expense, was paid on a piece-rate basis, which enabled the better worker to earn more. Similarly, harvesting and charcoal-making were also paid on piece-rate basis. Only the work of raising saplings and actual planting out was paid on the basis of a daily wage.

The intensity of supervision varied greatly and was a function of a) Task : delicate tasks requiring more supervision, b) Technology: e.g. the tractor putting a constraint on the number of workers per supervisor and c) Compensation: linking of compensation with productivity and quality stipulations.

b) Non - Marketable Bio-mass :

Thorny twigs left over after harvesting the wood constitute the non-marketable bio-mass produced on the plantation.

Members are allowed to collect these twigs and take home as much as they can carry on their heads on a given day.

The rest is dumped into pits for bio-degradation.

c) Marketable Bio-mass :

For the bulk of the marketable produce, norms are dictated almost entirely by the market requirements. Members have realised that failure to comply with the quality norms can give a bad name to the cooperative and even to the village - since in the charcoal market traders tend to identify (brand) the charcoal based on the point of supply. Direct marketing of firewood to boarding schools and factories was attempted, but given up in favour of conversion to charcoal which was easier to handle and made possible the conversion more wood into marketable form.

Small quantities of bio-mass which were not harvested under the normal cutting cycle were treated differently. Examples would include fire-wood confiscated from thieves, wood of natural strands of tamarix species, poles of

eucalyptus and leucaena grown in the nursery, fodder etc. Most of these are disposed of by auctioning, giving preference to members.

d) Surplus Management x

Two of the cooperatives are ready to generate surplus (Appendix 7). Norms for distribution of surplus, however, have not yet been evolved. Some of the community needs such as a common tractor to take care of peak ploughing requirements and to ensure timely sowing of agricultural land, and a community health care system seem to be on top of the priority list. Ploughing back into the plantations does not seem to be a major consideration, since grants for such activities continue to be available from government agencies and other sources.

C) Conflict Resolution

1) Internal:

Conflicts within cooperatives occur from time to time over issues pertaining to

- sharing of benefits (so far employment has been the major benefit):
- appointment of office-bearers
- appointment of employees and fixing remuneration
- termination/disciplinary action against office-bearers or employees.

Most conflicts may be traced back to internal jealousies, factional fights or power struggles between two or more traditional leaders.

Some of the measures adopted to preempt conflict were :-

(i) Maintaining family-wise and faction wise data on employment and feeding it back to members from time to time.

(ii) Maintaining factional parity in the appointment of office bearers and employees and determination of salaries to the extent possible; while emphasising the need for competent and trained people.

(iii) Keeping a constant, vigil and looking out for early warning signals.

(iv) Restoring to arbitration which has traditionally been the most popular way of resolving conflicts in the Bhal. This role was, earlier, the preserve of the upper caste leaders. With growing awareness among the Vankars and the coming of the cooperatives, this role was taken up by the facilitating agency, and at a much later date the Sangh and even the Vadils of neighbouring villages.

The first measure proved more effective in the early stages of the cooperative and was continued until the members developed faith in the system of sharing Labour.

The second and third and fourth may be seen as temporary measures against the more serious problem of factionalism.

In his comprehensive study of the Maharashtra Sugar Cooperatives, B.S. Baviskar(1980), discusses factionalism and its impact upon those cooperatives: "Although factionalism is (normatively) condemned as bad, it is accepted (pragmatically) as a reality of political life. In the given situation it is considered the most efficient way of organising and resolving political conflict - the organisation of two rival factions seems to be the obvious mechanism for efficient use of resources to achieve power in the absence of any division based on ideology" (Baviskar 1980, pp 780-783).

In the Bhal there is hardly any cooperative free of factionalism and yet most have them succeeded in creating new CPR assets and protecting them. Two cooperatives, viz., Vadgam and Mithli have, however, suffered severe setbacks on account of extended periods of breakdown in communication and resultant paralysis. A recent case study of Vadgam (which suffered two shut-downs of 15 months each) carried out by Bill Duggan (1980) concluded:

"In Vadgam, competition induced by factionalism has generally not acted as a safeguard against the abuse. To date Vadgam cooperative members have not been able to freely support the faction which best represents their immediate needs."

2) External

External conflicts have been of two types :

- (i) With other stake holders - mainly the Bharwad community.
- (ii) With the upper caste who were indirect stake holders - since the cooperative affected the labour market and threatened to end their dominance over the outcastes and the backward castes.

The first never assumed serious proportions in view of the relative abundance of the resource in question. Occasional tensions were dealt with by imposing fines on the offenders and through dialogue with community leaders. Transitory solutions such as making the naughty boy monitor (see section on defence as a common good) were attempted, but before long the Vankars realised that they would have to assert their collective might to protect their newly-created assets.

The second type of conflict was a serious matter. In Golana where the Vankar leadership was strong, things began to come to a head. Some Rajputs had already lost surplus land to the cooperative under the Land Ceiling Act. In 1985, government decided to transfer a common plot (traditionally being used as a threshing ground by the upper caste) to the Vankars who were in dire need of land

to build their houses on. This was more than the Rajputs could take. What followed was the worst carnage in the area on an unarmed and unprepared population. While four Vankar leaders lost their lives, several others sustained serious injuries. That the Vankars emerged from this ordeal with their unity and self-respect intact is a tribute to their courage and their desire to attain freedom, whatever the price.

Part 4 EMERGENCE OF THE SANGH

Cooperation among cooperatives is a basic principle of cooperativism. The Sangh which came into legal existence in 1989 is a manifestation of the principle in action.

The rationale for a federation of the scheduled caste cooperatives provided in the BSC's Annual Report (1988-89) is reproduced below:

- "1) Dealing with the market, the bureaucracy, financial organisations, institutions which can provide higher technology etc. demand a degree, of sophistication and socio-economic clout which no single village can easily possess.
- 2) If the management of the village cooperatives is left exclusively to the village it not only tends to be parochial, but what is worse, could easily fall prey to vested interests or succumb to factional pressures.
- 3) An individual cooperative can hardly make its voice heard by politicians who, ultimately, have a deciding voice in the district.
- 4) Heavy equipment, storage facilities cannot be had by small village cooperatives."

The Sangh today comprises two types of officers :

- a) Elected officials, viz., the executive committee and its President.
- b) Appointed officials - this team of "civil servants" is led by a General Manager and consists of a General Secretary, assisted by two clerks, five managers who help various villages in the planning and execution of work on the plantations and two educational officers whose task is to take care of social problems, conflict resolution, preparation of new villages, training of village committees etc.

All officials are local Vankars except for one who is a Vankar from an adjoining block. The BSC provides the financial support for the salaries of Sangh employees.

At the end of its first year of existence the Sangh appears to have achieved institutional equilibrium. It has successfully replaced the BSC in several functions and established a credibil-

-ity of its own. Particular mention should be made of its success in dealing with external threats and external agencies. Its efforts at mediating in the internal problems of the cooperatives have met with partial success. It has successfully initiated the move to integrate women into the cooperative movement through activities run exclusively by women, in order to give them the much required self-confidence. Sericulture has been one such activity.

It has not yet turned its attention to more long term issues such as mobilisation of funds and new technology.

Its immediate worries are :

- how to take the cooperative movement to the hinterland villages of Bhal Bara where waste land is a scarce resource.
- how to initiate work with the Harijans and give them representation in the Sangh.
- what kind of structures to adopt for the activities taken up by the women.

Part 5 ROLE PLAYED BY THE FACILITATING AGENCY

The BSC has played a "low profile" though critical role in bringing about the transformation in the Vankar community.

In playing the facilitator's role, the BSC staff has constantly had to fine-tune its response to match the changes taking place in the cooperative movement which it helped trigger off.

The relationship of the BSC with the Vankars changed, accordingly, over time. Broadly, four phases may be described.

- a) The contractual phase: This entry phase was characteristically brief but served the purpose of dealing with initial apprehensions (see section C and D of Part 2) and outlining the commitments of both partners to the contract. For the BSC, signing such a contract meant taking more than equal responsibility in locating appropriate technology to reclaim the saline wastelands and in setting up suitable management systems.
- b) The consultative phase: This phase took over from the second year when the BSC staff began making a conscious effort to involve the cooperative members in the day to day running of the cooperative. This phase continued for about two more years, i.e. until such time as both technical and institutional viability became clear for all to see.
- c) The collaborative phase; This phase covered the period from the point described above up to the formation of the Sangh in 1989. It was a period of growth and expansion. It was also a preparatory phase for the launching of the Sangh, for which a cadre of trained personnel was created. It also witnessed traumatic periods of hostility culminating in a major threat from the upper caste to wipe out the movement by exterminating its leaders. The BSC stood by its

partners through the crisis and played its role in enabling the Vankars to obtain justice.

It was, in short, a phase marked by irreversible changes in the social fabric, and threw up, in its wake, a new breed of leaders from among the Vankars.

- d) The disengagement phase; With the emergence of the Sangh the stage was set for the BSC to take the back seat, and eventually get off the bus. It would, from now onwards, play the role of friend, philosopher and guide. Its efforts are now concentrated on identification of technologies for diversification needs, continued training of federation officials, assistance in financial management and marketing at the corporate level, and the integration of the women into the cooperative movement.

Part 6 IMPLICATIONS FOR INSTITUTION-BUILDING

Gupta (1986) observed that if the development of common lands is intended to expand the decision-making horizon of the poor and to restrict or equalise the influence of the wealth then one cannot belittle the role of assurance mechanisms as argued by Runge (Runge 1985).

The Assurance Mechanisms used by the BSC included :

- a) support in promoting technological innovation through on-farm trials aimed at (i) building upon local technical knowledge (ii) adapting new technology from outside.
- b) contractual arrangements to take care of vertical, horizontal and environmental risks.
- c) providing training at various levels in the cooperative to enable Vankars to acquire new skills - organisational, managerial and technical.

A) Implications for user organisations:

- 1) Under conditions of very low productivity, a relative abundance and fragmentation of land, pooling this resource becomes the only way to harness and develop it. Gupta (1985) noted that in case where commons have been degraded beyond a limit such that the cost of supervision and restricted access through privatisation is more than the value addition, privatisation does not offer much hope.

Soil and water conservation structures, protective bunds against tidal ingress etc. again require treatment of continuous stretches of land.

- 2) In a semi-feudal society, caste stereotypes linked to the role and status of a person in society serve as barriers to the organisation of the poor. Under such conditions multi-

- caste organisations may prove unviable unless individual caste groups are organised enough to allow inter-caste negotiations.

- 3) In the case of socially marginalised groups, the need for affiliation may override any economic considerations that a CPR may offer. The cooperative at Gudel which is at the bottom of the productivity list (see Appendix 8) is an excellent example. Despite eight continuous years of failure on the economic front, the Vankars of Gudel decided to keep the cooperative alive.
- 4) A cooperative managing a CPR is an enterprise with a social as well as economic dimension. Failure to respect autonomy of technology may have dire implications for the economic viability of the enterprise. On the other hand without the requisite investment in cooperative education and in the fostering of functional leadership, institutional sustainability would be in jeopardy.
- 5) In a community afflicted with factionalism, institutional stability is better ensured by externalising the role of the arbitrator. Such a role can be played by an apex body such as the Sangh or by any other accepted leaders/institution/well-wishers of the area.
- 6) Leadership in a cooperative managing a CPR can succeed when it makes functional leaders out of traditional ones and moves towards collective leadership. Sometimes, however, a good charismatic leader may be preferred to a weak collective leadership.

Collective action for managing CPRs needs both, mobilisation skills and institution-building skills. It requires educators as well as technical managers. More often than not, a leader may possess one skill but not the other. As a result, the cooperative produces multiple leadership. However, the integration of these leaders at the top and institutional mechanisms to achieve this, are of vital importance.

- 7) A two-tier model of cooperatives provides greater institutional stability on account of:
 - a) Better articulation of area/community needs
 - b) Ability to withstand threats from a hostile environment
 - c) Greater bargaining power in dealing with market forces
 - d) Mutual monitoring by the apex body and constituent cooperatives.

It provides multiple points for technological innovation, upgradation and validation, through a networking approach, enabling different members to learn from others' mistakes and discoveries.

Pooling of resources at the secondary level, helps reduce capital costs and overheads and brings into the realms of possibility future processing activities which may need larger doses of capital.

- B) Considerations of equity are somewhat surprisingly, closely related to efficiency concerns. Inefficiency and inequality are apt to go together in common property problems. Indeed the presence of inequality may lead to a collapse of collective efforts, resulting in inefficiency. (Oakerson, 1986)

In the Bhal cooperatives, considerable energy is spent on maintaining equity between individual households and, even more, so between factions. Often this has led to delays in arriving at simple decisions and in sub-optimising the decision itself, e.g. insistence on the frequent rotation of the supervisors and managers of the cooperatives preventing any one member from being adequately trained.

- 9) The case hints at the importance of transfer pricing for institutional stability - although in more than one cooperative this did not seem to be a necessary condition (See pooling of resources - land). This may be due to the homogeneity of the groups and the strong identification with super-ordinate goals. However, with the formation of new interest groups (Harijans, women) this is bound to prove indispensable for future negotiations between groups.

B) Implications for Facilitating Agencies

- 1) The institutional set-up of an external agency is often dictated by the type of institutions it helps promote in the field. It is likely, therefore, that some of the institutional problems with regard to the integration of different roles and leaderships will be mirrored in the promoting agency. Institutional innovations at either end can benefit the other.
- 2) In the initial stages the BSC played a critical role in providing institutional assurances to deal with the risks involved. The contractual arrangements arrived at with the people of Vadgam were guided by need to demonstrate the new technology and institutional arrangements in the area. At this stage the BSC, was forced to become a "door" rather than "enabler".

Bill Duggan (1990) in his case study observes "in their initial eagerness to get something going" the BSC perhaps did not pay enough attention to participatory process..." Facilitating agencies would do well to guard against this danger.

- 3) Yet another temptation to guard against could be the "first child syndrome". Duggan (1990) observed:

"Vadgam was the (first child), the village which would serve as the "rural university" in which the BSC staff would learn the basics of rural development. And it was perhaps for this reason that the BSC often tended to "spoil" the people of Vadgam, undermining effective participation.

- 4) The disengagement plan was built into the project from the beginning. The idea of the federation was mooted as early as 1983; it came into existence in its nascent form in 1984. Hence, at the point of registration the people were prepared to accept it. This greatly facilitated the process of disengagement which has now been initiated.
- 5) Collaboration with grass root organisations implies certain moral obligations. Of these, accountability is the most important. Openness to negative feedback from the people and owning up to one's mistakes is of paramount importance in establishing a relationship of mutual respect. Accountability also implies sharing information on project funding and utilisation of money channelled through the agency.
- 6) As preachers of cooperativism, facilitating agencies must nurture a culture of cooperativism and team building in their own organisation - since adults learn best by imitation. An informal, non-bureaucratic and relatively flat organisation may suit the purpose best. By implication, the state cannot be expected to play this role in the absence of suitable institutional innovation.

NOTES

1. The term "Scheduled Caste" was first adopted in 1935 when the lowest ranking Hindu castes were listed in a "Schedule" appended to the Government of India Act for purposes of statutory safeguards and other benefits. The Constitution of India followed a similar procedure.
2. Provision for registration as Tree Growers Cooperatives became available only after 1985 in the wake of a government initiative to address the problem of wasteland.
3. The Oil & Natural Gas Commission (ONGC) is a public sector undertaking active in the area for prospecting and tapping of oil and gas resources.

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APPENDIX - 1

GROWTH OF COOPERATIVE MOVEMENT IN BHAL (March 1990)

Year	Village	Members	Total Acentage
A. <u>FORESTRY ON WASTELANDS:</u>			
1979	Vadgam	67	232
1982	Pandad	90	578
1982	Golana	100	147
1982	Gudel	46	85
1984	Valli	17	34
1984	Vainej	42	83
1986	Rohini	40	100
1987	Tamsa	28	50*
1988	Mithli	66	140*
1989	Golana (Harijan)	22	44
Sub-Total		518	1493
B. <u>SWEET WATER FISHERIES:</u>			
1988	Varsada	112	1200
1988	Indranej	52	192
Sub-Total		164	1392
C. <u>SERICULTURE:</u>			
1990	Valli	52@	4
1990	Khaksar	52@	4
1990	Golana	116 &	4
		220	12

* The land has not yet been given officially by the Government
@ Valli it has a mixed cooperative, Khaksar has a men's cooperative and Golana has a women's cooperative.

APPENDIX - 2

Characteristics of natural hazards in Bhal area

Sr. No.	Geo-climatic environments	Characteristics and hazards
1.	Land salinity and ground water	Inherent salinity of sediments and ground water and surface ingress of tides and winds constantly degrade the land and water resources.
2.	Flooding	Lack of drainage and low permeability of soils cause longer flood coverage. During monsoon high sea tides and upland river discharge result in large scale inundation and water-logging.
3.	Land erosion and river migration	The habitation sites and agricultural lands are subject to erosion by river channel shifts, cyclonic winds and frequent high intensity rains.
4.	Sedimentation	The low-lying areas and stream channels getting silted by sediments making the threat of flooding more severe.
5.	Cyclones and storms	Extremes of coastal weather conditions very frequently hit the area resulting damage to property and life.
6.	Climate extremes	Temperature, wind, humidity etc. render living conditions very oppressive.
7.	Evaporation	High evaporation rate result in loss of sweet water and increase of airidity.
8.	Environmental Health	Poor quality of drinking water and agricultural soil affect the regional health adversely.

APPENDIX-3

Pattern of Ownership & Control of Natural Resources

<u>Party</u>	<u>Resource</u>	<u>Ownership</u>	<u>Control</u>
1. Individual farmers	Agricultural land Wasteland	Private Private; given to SC and BC under New Tenure, which disallows selling mortgaging or leasing out.	Private; land tax paid to govt. & village panchayat.
2. Farmer cooperatives	mostly wasteland by Revenue Dept.	state govt. cooperatives	cooperative; lease tax amount collected by revenue department (govt.)
3. Village Panchayat	Common grazing land village settlement land, village pond, temple etc.	state govt.	Panchayat, govt. may exercise control in exceptional cases.
4. State Govt.			
a) Revenue Dept.	wastelands (tidal and raised mud flats)	state govt.	Open access at village level.
b) Irrigation Dept.	Mahi canal system	state govt.	Department controls release and flow of water; nominal rent collected from farmers.
c) Forest Dept.	Road-side plantations All trees in the district	state govt. Private, govt. or panchayat	Harvesting of trees organised by dept. and wood auctioned. Harvesting of im-mature trees controlled by department. Also controls transit of wood/charcoal across districts through a system of transit pass

Relationship between the panchayats, government functionaries and villagers with respect to Control of Natural resources and Governemnt Delivery Systems.

Figure 1 (Pre-Intervention)

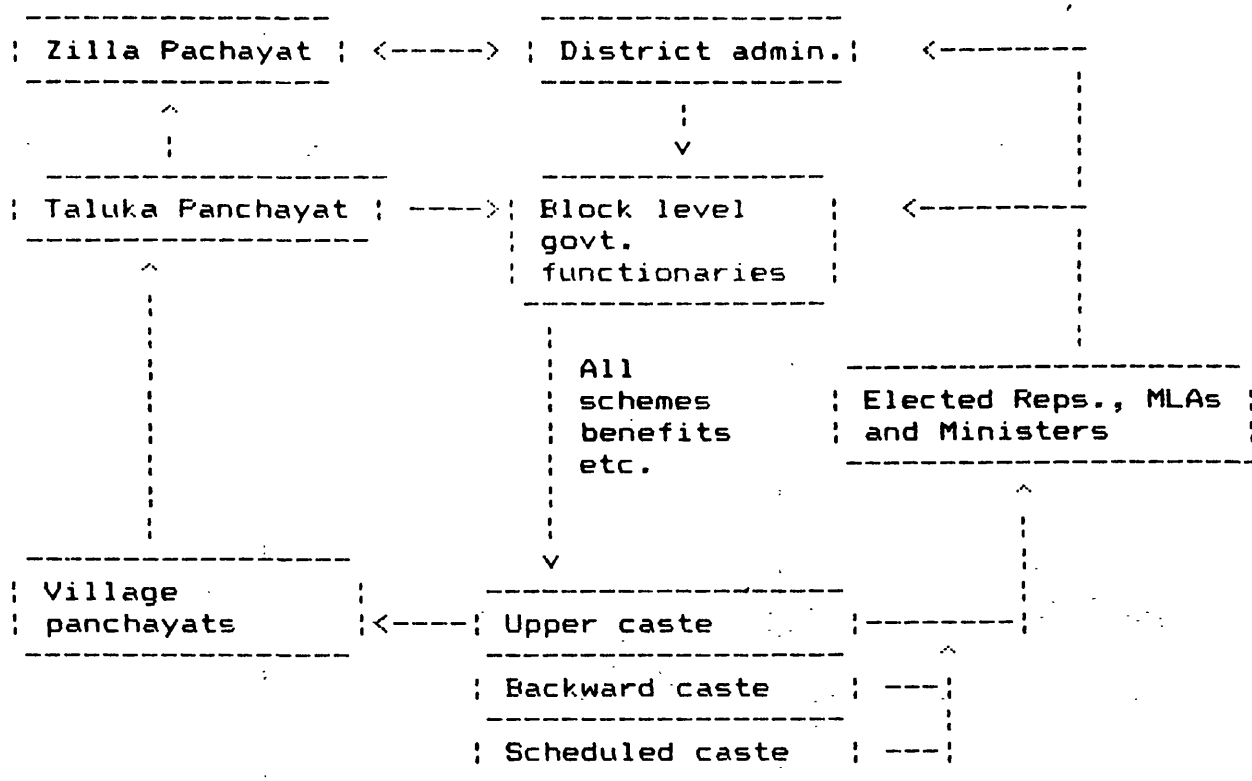
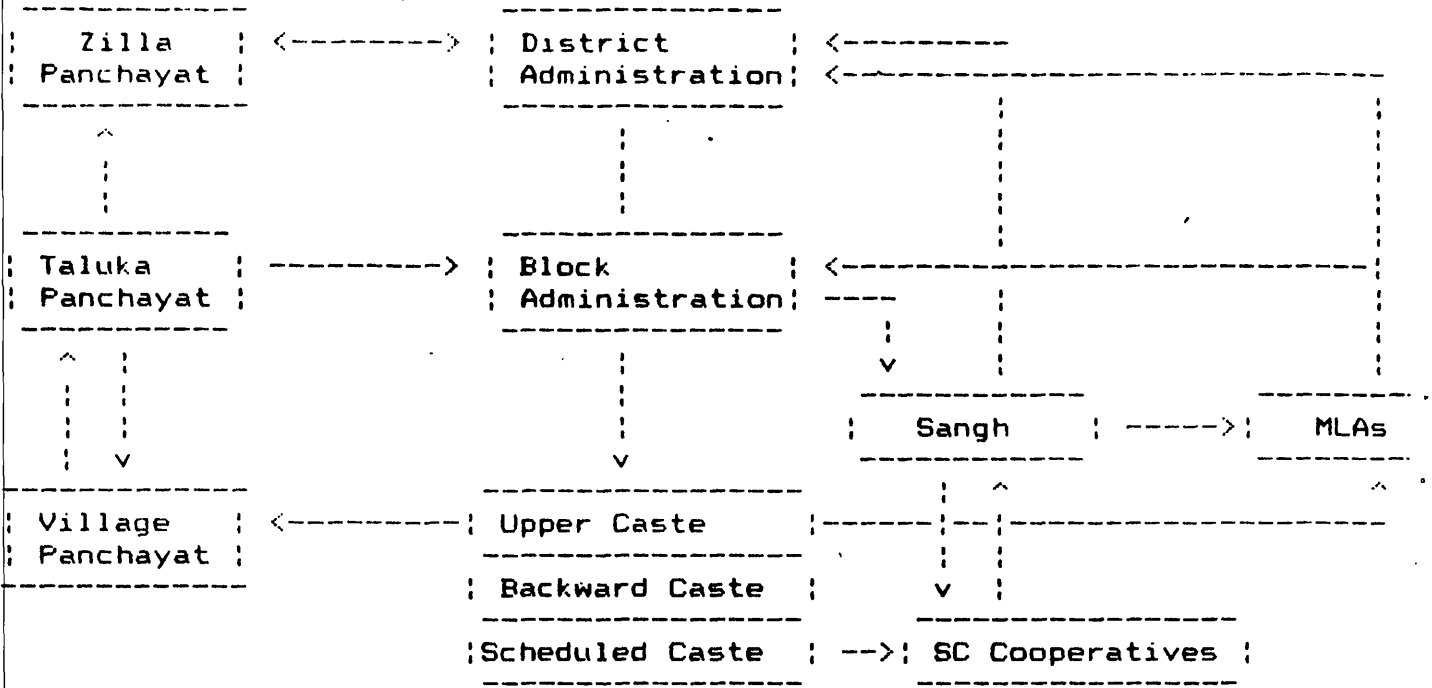


Figure 2 (Post Intervention)



APPENDIX - 4

Evolution of Leadership in the Bhal Cooperatives

1) Vadgam (1979-1990)

Vadgam had two factions consisting of 33 families each - the Jadvas and the Mokhras. The charismatic leaders of the two factions had a long-standing fight which kept the vas divided for most of the time. The two leaders' influence on the cooperative is very strong and on a number of occasions, has interfered with the smooth working of the cooperative, which suffered severe setbacks on account of closure of work for more than 15 months, on two occasions.

The committee comprising young members has taken a long time finding its voice, and still continues to be under the influence of the Vadils.

2) Pandad: (1981-1990)

In Pandad factionalism was a part of life, but the factions were not clearly defined and realignments took place from time to time. Pandad also had a good supply of young leaders who had a countervailing influence on the vadils. On more than one occasion the committee which consisted of young members, prevented the vadils from bringing factional fights into the working of the cooperative.

3) Golana; (1982-1990)

Golana had three clearly defined factions based on kinship patterns. The traditional leadership was charismatic and strong. There were also two outstanding young leaders who were next in line for the traditional leadership. As the cooperative began to assert itself the Rajputs perceived these young leaders as the biggest threat to their political preponderance and sought to liquidate them. They succeeded only partially since one of them escaped to remain alive and keep the struggle going. The "Golana incident" and subsequent struggle for redress saw the traditional leaders coming together and operating in a highly functional manner in the activities of the cooperative. There is, however, a near absence of young leaders in the cooperative since the traditional leaders have not allowed the second line to develop.

APPENDIX - 5

Tenure of Land and Pooling Mechanisms

Village	Land type	Acerage	Ownership	Pooling/Transfer mechanism	Outcome
Vadgam	Saline waste - en bloc	183	Revenue Dept.	one year lease - renewable every year.	Stable Individuals but not transferred to co-op.
	-do-	36	Few individuals		
Pandad	Saline waste - en bloc	575	Few individual Vankars	Non-land contributors paid the share capital of land contributors.	Stable
Golana	Sandy river- side waste and some marginal agri- cultural land.	180	Existing cooperative of 45 Vankars and a few Rajputs	Rajputs asked to withdraw. Remaining Vankars made members. No transfer pricing done.	Stable
	-do-	100	56 Vankar individuals	Suitable formula for transfer pricing not worked out.	

Note; The above is not an exhaustive list of cooperatives or their land holdings, and is meant only to illustrate a point.

APPENDIX-6

Organisation of Labour end Level of Supervision

<u>Activity</u>	<u>Mode of Payment</u>	<u>Norms for Participation</u>	<u>Supervision level</u>
1. All earth work, bunding, water harvesting system, drainage system, tanks, land levelling	Piece rate basis, Formula for incremental wages depending on lift and lead of earth work.	Usually work-pairs of one male and one female. During drought labour shared with other backward communities.	One per 50 workers
2. Nursery Raising	Daily wages	System of rotation from house to house. Women's participation high.	1:25
3. Transport of saplings earth or FYM, by tractor	daily wages or fixed rate per trip.	Rotation not always possible	1:7
4. All planting, digging pits, spot watering, mulching, etc.	daily wages	participation of women, aged and adolocent youth high.	1:15
5. Harvesting wood and billeting	piece-rate basis	predetermined gangs who agree to meet marketing schedule - men only.	1:30
6. Charcoal-making	piece-rate basis	on contract, mostly to outsiders. Differential rate used to encourage members.	1:30
7. Loading & unloading of wood charcoal, grain	fixed rate per truck for wood. Piece-rate in case of bags.	men only. No system of Rotation	one per truck

APPENDIX - 7

Balance Sheet of Vadgam, Golana and Pandad Cooperatives as on 30/6/69

Particulars	Vadgam Rs.	Golana Rs.	Pandad Rs.
A. <u>LONG TERM LIABILITIES</u>			
1. Share Capital	25460.00	21840.00	38500.00
2. BSC loan outstanding for			
a) Plantation	47289.85	35220.03	126870.03
b) Tractor		105000.00	
3. Funds created from savings of members	17109.00	32509.60	-
B. <u>SUBSIDIES</u>			
1. Grant (DRDA)	173985.00	209382.80	244458.38
2. CRS-Food For Work Grant*	270500.00	216600.00	451800.00
C. <u>FIXED ASSETS</u>			
1. Book Value* of Community Plantation	202489.00	206186.10	345893.60
2. Other assets (tractor, machinery)	-	112377.00	-
3. Investments	1010.00	2325.00	1000.00

* As of 1988 only; assuming an average value of Rs.8/manday.

* Book Value does not include the value of investment through Food for Work (CRS grant).

APPENDIX - 8

Table 1.

Summary of the plantations established and status with regard to current and projected productivity.
(March 1990)

Coop. Name	Total acreage	Planted acreage	Established acreage	Productive* acreage
Vadgam	232	200	125	75 productive 50 after 2 years 25 after 4 years
Pandad	578	210	175	10 productive 50 after 2 years 40 after 6 years
Golana	147	120	75	50 productive 25 after 2 years 25 after 2 years
Valli	34	26	25	25 productive
Vainej	83	83	80	30 after 2 years 50 after 4 years
Rohini	100	25	25	25 after 6 years
Mithli	140	100	100	50 productive 50 after 2 years
Gudel	85	25	-	-
Total	1399	769	630	210 productive 205 after 2 years 100 after 4 years 65 after 6 years

* Table 2 & 3 provide an idea of the average productivity based on past production.

Table - 2
Charcoal Manufacture and Sale, Golana and Vadgam

Coop. Name	Year	Charcoal (Tons)	Gross Income (Rs.)	Price/ton (Rs.)	Net Income (Rs.)
Golana	1984	26.84	37873.38	1411.08	10,462.69
	1986	56.68	84932.40	1494.23	40,520.45
Vadgam	1986	64.29	96161.30	1495.74	46,892.42

Table - 3
Average Productivity of Plantation

Wood /acre	12 tons
Charcoal/acre	3 tons
Gross Income/acre/cutting	Rs.4,485/-