

REPORT ON BAIF MITTRA'S EFFORTS FOR PROMOTING TRIBAL LIVELIHOODS IN JAWHAR TALUKA BY INTENSIFYING AGRICULTURE USING WATER

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1. Preamble:

Traditionally tribals are deemed distinct in their cultural ethos and life pattern from rest of the society. They are seen to be the natives of dense forests, ignorant about standard of living concept and lacking in sharply defined notion of private property. The forest catered their daily needs. When a particular patch of forest ran out of what they wanted, the tribals used to move to another patch. They never sought to produce more than what they immediately needed. The net annual income was derived from single rain-fed crop grown on land patch either traditionally tilled or specifically cleared for cultivation and some hunting or forest produce. They obtained the commodities that they did not produce by bartering what they had. These exchanges used to be grossly and exploitatively rapacious on the part of the traders from the point of view of those who knew the prices of things and also meant well by the tribals. Although the scenario is rapidly changing, it seems an almost ubiquitous ground reality that tribals do not practice intensive agriculture supported by irrigation. The recent attempts to induce irrigated agriculture among tribals are not wholly successful. There appears to be no inherent contradiction between tribal way of life and irrigated agriculture. Also, the tribals can be visualized as being the sufferer of geo-hydrology and gravitational force, as products of ossified production conditions, as hapless victims of political machinations of the wily mainland farmers and as purely rational economic actors although all these propositions can be endlessly debated. Broadly, in the context of this study, it is concluded that tribals truly lag behind the urban society in development of every sense.

The agriculture in tribal heartland of entire Central India is well below its optimum yield level mainly due to being rain-fed. This zone has the potential to become granary for the entire country. If this currently rain-fed agriculture is systematically transformed into a vibrant intensive agriculture, it will produce significantly to provide food security to the entire country. This process will also transform lives of millions of tribal people by enhancing the quality of life. The impact on contributing towards more sustainable and yet complete utilization of water and land resources will be an additional benefit. M/s. Maharashtra Institute of Technology Transfer for Rural Areas (MITTRA), Nasik, a development organization promoted by BAIF has been successful in achieving this in Jawhar Taluka of Thane district in Maharashtra. Their work over providing agro horticultural and irrigation infrastructure to native tribals is still in continuation with various other issues. Thus, this case aims to find out what works and what does not work in promoting tribal livelihoods based on intensification of agriculture using water.

2. Bharatiya Agro Industries Foundation (BAIF): Late Shri Mahatma Gandhi in 1946 had established a Nature Cure Centre at Urulikanchan, a backward village near Pune for promotion of community health through nature cure. Manager of that unit Late Shri Manibhai Desai promoted income generation activities as the main plank of development assuming unemployment, underemployment and erosion of natural resources being the root causes of poverty. Encouraged by great response from the rural community, Manibhai established BAIF at same place in 1967 and later renamed it as BAIF Development Research Foundation, to replicate his novel program in rural development.

MITTRA is a not-for-profit development organization promoted by BAIF for implementing multi pronged comprehensive rural development programs in Maharashtra. MITTRA is the ancient Sanskrit name of the rising sun, which brings new life to the world and also means Friend in Marathi language. Its mission has been spelt as under

“ Our mission is to create opportunities of gainful self-employment for rural families, especially disadvantaged sections, ensuring sustainable livelihood, enriched environment, improved quality of life and human values.

This will be achieved through development research, effective use of local resources, extension of appropriate technologies and upgrading of skills and capabilities with community participation.

MITTRA is a non-political, secular and professionally managed organization. ”

The approach of the organization is reflected as

1. Focus on Quality of Live.
2. Family as a Unit.
3. Assured Livelihood.
4. Women Empowerment.
5. Environmental Protection.
6. People's Organization.
7. Blending Development with Research and Training.

Due to plethora of problems especially malnutrition and lack of sanitation typical in any Indian tribal region in 1992, there were mortalities of about 45 children in Wawar- Wangani place of Jowhar Taluka sending wide ripples across the society and bureaucracy. Then Chief Minister Late Shri Sudhakar Rao Naik invited BAIF-MITTRA to extend their work in this region for social upliftment, which, was promptly obliged. It had been already successfully proved at Dharampur place in Gujarat State that the real answer over health issues and problems was holistic socio-economic development of society. The same hypothesis was extended to construct and implement development programmes for tribals in Jawhar Taluka.

3. Description of Jawhar Taluka:

3.1 Geography : Jawhar lies 479 m.above MSL in Sahyadri ranges in 10 43' to 20 North latitude and East 72 55' to 73 20' in Thane district. Traditionally ruled by tribal dynasty history of this place has been documented since 14th century. However, the place was deemed status of upper district comprising six talukas as late as in 1993. This comprises 185 villages with 103175 hectare geographic area mostly covered by undulating terrains. The area has four significant rivers viz. Surya, Pinjali, Wagh and Deharji. The place is depicted in Fig. No. 1.

3.2 Agro-climatic Conditions : State of Maharashtra has been subdivided into nine different agro-climatic zones due to regional variations in rainfall, soil, temperature, cropping pattern, natural flora etc. Jawhar is the component of North Konkan Coastal Agro Climatic Zone.

The salient features are presented in Table No. 1 and description of Agro eco-system in

Table No. 2.

Table No. 1: Salient Features of Agro Climatic Conditions at Jawhar

Sl.No.	Agro-Climatic Component	Description
1.	Average Rainfall and number of Rainy Days	2263 mm and 110-120 respectively
2.	Potential Cropping Period.	150-180 days.
3.	Kharif Temperature (Min and Max)	22.7 C & 32.8 C respectively.
4.	Rabi Temperature (Min and Max)	14.7 C & 33.0 C respectively.
5.	Summer Temperature (Min and Max)	23.9 C & 35.0 C respectively.
6.	Humidity % (Kharif, Rabi & Summer)	82.75, 61.75 & 42.25 respectively.
7.	Soil type with depth and slope.	Stony (3", 5%), Sandy Loam (6"-8", 5-10%), Clay Loam (12"-18", 0-1%)
8.	Electrical Conductivity of soil.	0.00365 mmhos, Acidic.
9.	P2O5/100 gm. Soil	6.7, Medium High.
10.	K2O/100 gm. Soil	23.30 Medium High.
11.	Soil Erodibility.	e & e due to high average slope and high rainfall.

e = 1/4th – 3/4th top soil lost - Rill erosion, e = 3/4th top soil & 1/4th sub-soil lost
Gullied Lands/Sand Dunes.

Table No. 2: Description of Agro-eco System in Jawhar Taluka

Sl.No.	Land Stretch	Kharif	Rabi
1.	Upland	Natural Grasses and Trees e.g. Ain, Teak, Sadada and Khair	NIL
2.	Slopy Land	Nagali, Varai, Blackgram, Tuar, Cowpea, Khurasani, Jowr, Ambadi as mixed cropping	NIL
3.	Low Land	Paddy & Very little Moranthus	NIL

Soil is reddish in colour, light, with very poor water retention capacity. Lands are mostly sloping

Comprising mostly boulders, gravel and stone. Even if rainfall is high due to undulating terrains and poor water retention capacity water scarcity is severe after December. Therefore, cultivation is limited to Kharif season only. Climate is hot and humid. Rainy season is between June and September months in which, maximum rainfall is between July and August. Due to heavy rainfall houses' roofs are sloping. The land use pattern in Jawhar block is presented in Table No. 3.

Table No. 3: Land Use Pattern in Jawhar Block

Sl.No.	Land Description	Area (ha)	% Total Land Area
1.	Forest	29979.39	35.89
2.	Irrigated by Source	19.41	0.02
3.	Unirrigated	45935.42	53.47
4.	Cultivable Waste Land	1359.42	1.58
5.	Area Not Available for Cultivation	6838.28	9.04

About 95% production in Jawhar block is agro based. However, crops are not sufficient to garner any notable monetary gains. The cultivation is undertaken with limited objectives of satisfying family needs of food. It is undertaken with wholly traditional means using wooden plough, Aathwal, Kudal etc. using artificial chemical based pesticides, seeds and fertilizers. Land parching to eradicate weeds in subsoil zone of farm is common practice by utilizing natural grasses, forest litter, paddy waste etc. in summer.

Jowhar taluka comprises about 6800 ha reserved forest area. Natural forest cover is fast dwindling and accordingly income from forest produce is also accordingly reducing. This has compelled the native tribal communities to contemplate over other sources of income. The natural forest comprise medicinal herbs and plants in addition to canopy commercial trees like Teak, Ain, Khair, Koshim, Hirda, Kahandol etc. However, this indigenous flora is utilized limitedly for supplementary income. Minor forest produce like gum, honey, lac, fruit etc. generate almost negligible income for natives.

To prevent and compensate for dwindling forest cover, Department of Social Forestry had initiated plantation programmes over village waste lands, Gram Panchayat, School areas. Trees like Acacia, Gulmohar, Glyricidia etc. suffice mere vegetation rather than any proposed commercial output.

4. Tribal Communities: Tribal communities in Maharashtra account for 73 lakh population comprising 47 tribes confined in 75 talukas of 15 districts. Out of this population, Thane district has 951000 tribal population. Jawhar taluka comprise 100% tribal population of 131346. Anthropological evidences suggest that many of these tribes are of Dravidian ancestry. Brief description of native tribal communities in Jawhar is as under

4.1 Qualitative Classification: 1. Mahadev Koli: Account for 2.3% tribal population. This is the most progressive tribe in the region and characterized by lesser addiction, maximum literacy, maximum % of land ownership and better financial resources. Construction of Morpakhi house is sharply distinct than other tribes' houses.

2. Konkana: About 50% individuals hold ownership land, literacy lesser than Mahadeo Kolis. This community comprises 25-30% total population in the region. House is mostly Chowpakhi.

3. Warli: This community is famous due to unique paintings. Literacy % is about 50, 40% of the population members hold land ownership and account for about 20% total population. This tribe can be distinguished from Konkana due to their style of wearing knee length clothes. Their house is either Chowpakhi or Dupakhi.

4. Thakar: Cover about 50% of total tribal population in Jowhar. Literacy % and land ownership % is about 25 and 40 respectively. This tribe has two sub-tribes viz. K & M due to difference in intra-tribe speech accent. This tribe has more domestic cattle than their counterparts.

5. Dhorkoli and Katkari: These primitive tribes account for about 46%, maximum individuals illiterate and landless of pastoral origin. These tribes are considered too backward since they do not have own source of permanent income, living in hutments, consuming rats, dead cattle etc. in routine diet.

4.2 Demography: Comparison of population characteristics of Jawhar block are presented against comparison with Thane district in Table No. 4 & categorization of workers in Table No. 5.

Table No. 4: Comparison between Population Characteristics of Jawhar Block & Thane District

Sl.No.	Population Characterist.	Jawhar Block	Thane Rural	Thane Dist.	Jawhar's Share in Dist.
1.	Total Population	131346, All Rural	1855919	5249126, Rural 35%	2.5
2.	M:F	1000:1007	1000:954	1000:879	
3.	% Population of Children up to 6 years	20.89	18.31	16.86	3.1
4.	% SC Population	0.36	2.62	5.17	0.17
5.	% ST Population	93.52	45.69	18.12	12.91
6.	% Male Literacy	27.72	50.81	64.96	1
7.	% Female Literacy	11.24	30.71	49.68	0.61
8.	Number of Households	25049	353533	1096592	2.28
9.	Average Family Size	4.7	NA	NA	
10.	%Households with Female Head of Family	3.3	NA	NA	
11.	Avg % BPL Families	78.3	NA	NA	
12.	Average age of Bride & Groom	12 & 15 yrs respectively	NA	18 & 21 yrs respectively	
13.	Age at First Delivery	13-14 yrs	NA	Above 18 yrs	

NA = Not Available. Jawhar's share in District's respective category is expressed in % All figures except between SL. Nos. 8 & 13 are analysis of Census Report, 1991.

Table No. 5: Categorising Population in various workers' categories

Source - Census Report 1991

Sl. No.	Category	Jowhar Block (%)	Thane Rural	Thane Dist.	Jowhar's share in districts (%)
1.	Total Main Workers	51.74	43.88	37.37	3.46
2.	Marginal Workers	5.06	5.74	2.47	5.12
3.	Non Workers	43.19	50.37	60.15	1.79
4.	Cultivators	39.12	20.66	7.67	12.75
5.	Livestock, Forestry etc.	0.25	1.58	0.77	0.80
6.	Mining & Quarrying	Nil	0.19	0.15	Nil
7.	Manufacturing, Servicing, Repair in Household Industry	0.08	0.56	0.45	0.43
8.	Manufacturing, Servicing, Repair other than Household Industry	0.23	4.50	10.67	0.05
9.	Agricultural Labourers	10.03	10.06	3.85	6.51

Expressed % in columns 3,4 and 5 is of relevant Total Population.

Thus, on the basis of contents in Table No. 4 and 5, it is broadly concluded that

- Population in Jawhar comprise mostly ST people depending on agriculture as primary source of income either through own cultivation or farm labourers
- Most individuals are BPL and illiterate
- Females outnumber Males although their literacy is lesser than males
- Jawhar can be considered truly backward region of Thane district which is also reflected while comparing number of villages having access to different water sources in Jawhar with those in Thane district, which is presented in Table No. 6.

Table No. 6: Comparison of Access to Water Source in Jawhar block and Thane District

Sl. No.	Source	Jowhar Block	Thane District	% Contribution
1.	Tap	2	199	1
2.	Wells	126	1590	7.92
3.	Tank	---	42	Nil
4.	Hand Pump	---	430	Nil
5.	River	26	218	11.93
6.	Canal	---	5	Nil
7.	Others	73	78	93.59
8.	More than One Source	79	790	10
9.	Villages with no drinking water facility of any type	Nil	Nil	Nil

4.3 Social Customs and Rituals:

Most festivals in this part are not different from those celebrated in other urban parts of district. Makarsankranti, Ganeshpooja, Pola, Nagpanchami, Diwali etc are vehemently celebrated. Most significant festivals in these tribal communities are Holi and Dasara, the expenses on which are met by earning after migrating elsewhere as labourers. This migration is purely temporary and lasts for about 15 days. Aakhati and Khadicha Dev are festivals unique to these tribal communities, celebrated for healthy produce from farm. Nevertheless, traditional dance after liquor is inseparable part of any festival's celebration.

Marriages are characterized by dowry of Rs.500 and 2 Quintals grains from groom side to the bride. Food expenses during marriage are met by the bride groom. Divorce is accepted phenomenon and it can be due to causes like extra-marital affairs, impotency, infertility, addiction, physical torture etc. Men enjoy more liberties than women for marrying second time. Earlier grounds of seeking divorce from wife were very simple and with very nominal compensation payable to wife. Every village is ruled by Panchayat comprising Sarpanch, Bhagat, Police Patil for settling petty disputes over affairs, forgery, inflicting and recovering penalty, divorce etc. Significant personalities in a tribal village is presented in Table No. 7.

Table No.7: Significant Personalities and Their Traditional Roles in Tribal Villages of Jawhar Taluka

Sl.No.	Personality	Number/Village	Role
1.	Bhagat	Usually 1, May or may not exist in every village, Prescribed Status	Representative in Panchayat, Traditional village festivals, supposedly magic ian-cum-doctor
2.	Kamadi Bhagat	1, Present in every village	Communication agent, cannot prescribe medicines
3.	Kamdini	1, Prescribed Status	Among Warlis offers condolence rhymes
4.	Dhavalrin	1, Any woman can acquire status	Lady priest to conduct marriage in Warli Community
5.	Suin	Usually 1, Highly regarded, Special Status	Execute deliveries

4.4 Health Status: Most individuals in tribal communities belong to underweight category. Frail built, pale and yellowish eyes are common features of men, whereas most children are under the influence of some disease till they complete five years. Ladies are the worst sufferers in these tribal communities. They get motherhood before completing 18 years, suffer from malnutrition, lack hygiene, dumped by drudgery work etc. and are thus at the lowest level of social stratification. Typical daily routine of tribal women is pictorially depicted in Figure No. 2.

4.5 Availability of Financial Resources: Land and cattle are the only two commercial resources available to the tribals. These are evaluated currently as presented in Table No. 8.

Table No. 8: Evaluation of Tribals' Resources

Sl.No.	Resource	Cost per Unit (Rs.)
1.	Land suitable for cultivating Paddy	8000 / Acre
2.	Other cultivable land	3000 / Acre
3.	Bullock	3500-4000 / animal
4.	Ram	2000-2500 / animal
5.	Buffalo	6000-8000 / animal
6.	Goat	500-600 / animal
7.	Hen	100-200 / bird

Most practiced manner of saving and building finance is either store sum in indigenous grain pot or deposit with moneylender. Many individuals save by storing in the form of grains also. However, such savings are of too tiny amounts as most of them are BPL. In months between June and August, want of money is most severe as the individuals are engaged in respective farming operations and cannot earn wages by working elsewhere, own stock of grain is exhausted. Therefore, the community member has to seek loan mostly in the form of grain which is repaid with about 50% quantity as interest over the principally borrowed quantity of grains. Next preferred option is to borrow sum from private lender to whom it is returned @ 100% per annum or by offering free labour. The least preferred option for borrowing loan is by hypothecating land or gold with nearest Bank. Table No. 9 briefly describes existing pattern of savings and debt in Jawhar Region.

Table No.9: Debt and Saving Pattern in Jowhar Region

Sl.No.	Description	Source/ Reason	%	Remarks
1.	Manner of Saving	In House	20	Maximum in House
		SHG	0	
		Bank	0	
		Nil	80	
2.	Reason for Debt	Farming	15	Maximum for food, health and cultivation respectively
		Self-employment	5	
		Health & Hygiene	20	
		Education	0	
		Food	50	
		Clothing	0	
		Shelter	0	
		Socio-Cultural	10	
3.	Manner of Debt	Money Lender	20	Mostly borrowing grain
		Grain	70	
		Bank	10	
		SHG	0	

5.0 Sponsoring Organizations:

Jawhar is not an exception to other tribal areas of Maharashtra in remotelessness, poor livelihood opportunities, depleting soil cover, inadequate medical facilities, high morbidity and hopelessness. MITTRA is implementing a holistic tribal development programme in Jawhar, Akole, Mokhada & other talukas with the support of central & state Governments and other donors. A people centered approach, promptness and encourages the active participation of people in the planning & management of development activities. This is achieved through formation of people organizations, which provide platform for enabling people to undertake development related activities by mobilizing the community, with the sole purpose of efficiency executing them to benefit entire village community. Table No. provides thematic summary of Integrated Tribal Development Projects (ITDP) undertaken at Jawhar.

5.1 Tribal Development Department (TDD), Government of Maharashtra (GoM):

The Department sponsored ITDP was launched in 22 villages of Jawhar Taluka in 1993 for socio – economic rehabilitation of 1000 families in native communities by establishing mango orchards known as Wadis, soil conservation and introduction of improved agricultural techniques. In addition to providing improved seeds of Paddy, Redgram, Blackgram, vegetables etc. to farmers in Kharif season, this project addressed to the issue of water availability. After forming user group 12 mobile lift irrigation units were distributed to undertake vegetable cultivation over 62.5 acres. Three drinking water schemes were taken up & 14 schemes for irrigation were completed. The salient feature of ITDP supported by TDD, GoM are presented in Table No. 10 and description of activities in Table Nos. 11 & 12.

Table No. 10:
Salient features of ITDP supported by TDD, GoM.

Sl. No.	Activity	Particulars	Amount (Rs)	Nature of Finance
1	Establishment of Wadis	1000 Families @ 1 Acre / Family	33000 / ha	100% Subsidy
2	Vegetable Cultivation	264, Families, Rabi Season	1600000 for material input inclusive of Wadi	
3	Mobile Irrigation Unit (MIU), 1999	12 groups of 5-13, individuals each, 62 Acres Vegetable Cultivation	977701 for 10 units	100% Subsidy
4	Lift Irrigation schemes (LIS)	14 Schemes for Groups, support crops over 150 acres in Rabi	2337630 inclusive of DWSS	100% Subsidy
5	Drinking water supply schemes (DWSS)	3 Villages		100 Subsidy

BAIF drew Labour Contribution in every activity from Villagers

Table No. 11: Socio Economic Development of Tribal Families

Sl. No.	Projects	Sponsor	Location	Yr Of Inception	Participant Families	Main Activities
1	Socio-economic development of 1000 Families	Tribal Dev. Dept. Maharashtra Govt.	Tal. Jawhar	1993	1000 Families in 22 Villages	Wadi (orchard) project is completed this year

2	Drinking water supply scheme and Mobile Irrigation Units	Tribal Dev. Dept. Maharashtra Govt.	Tal. Jawhar	1997	600 families 200 acres of Land	Drinking water supply and Irrigation scheme
3	Jan-Utthan Transfer of Technology for sustainable Development	Commission of European Community	Tal. Jawhar Dist. Thane & Tal. Akole Dist. A'nagar	1996	5064 BPL families in 39 villages	Wadi Livestock Development Improved agriculture, watershed Development. Other interventions for landless community health, women in development
4	Adivasi Development Programme	Govt. of Germany, through KfW, GOI & BABARD.	Tal. Peint & Tal. Surgana Dist. Nasik, Tal. Mokhanda Dist. Thane	2000	1822 families (1804 acres)	Wadi (orchard) forestry, soil conservation, WRD, Turmeric Cultivation, Vegetable Cultivation Community health

Table No. 12: Integrated Tribal Development, Supported by Tribal Development Department, Government of Maharashtra

Establishment of Wadis, Mango Orchards	Plantation of Rajapuri & Keshar variety with forestry spices planted on the periphery, on one acre of wasteland owned by Tribal family. 1000 families covered under the project
Vegetable Cultivation Tal. Jawhar	264 tribal families are cultivating vegetables as a second crop, helping them to earn an additional income of Rs.4000/- to 5000/- per annum.
Mobile irrigation Unit. Tal. Jawhar	Mobile irrigation unit with pipelines have been supplied to 12 groups, who took up vegetable cultivation on 62 acres
Lift Irrigation Scheme, Tal. Jawhar	14 lift irrigation schemes are in operation, and crops are being cultivated on 150 acres.
Drinking Water Supply Scheme Tal. Jawhar	The drinking water scheme implemented in three villages has helped in providing a safe & reliable source of drinking water the villagers.

5.2 Commission for European Communities (CEC):

A project of technology transfer for sustainable development under holistic rural development programmes has been sponsored by CEC through National Bank for agricultural & rural Development (NABARD) for implementation through BAIF. CEC had a proposal to invest Rs. 76 cores for 33000 families covering 30 districts of Karnataka, 2 Districts of Gujrat, 2 district viz Thane & Ahemadnagar of Maharashtra between December 1994 and December 2004, Budget for the following year is prepared in the preceding year & sent to NABARD, where it is discussed in the meeting of steering committee comprising a member of CEC. Funds are released after meeting for consumption during the following year. Provision in the project is Rs. 22000/ family inclusive of implementation, contingencies & demonstration charges. Net expenses per family is about Rs.16000. NABARD conducts quarterly monitoring to assess the progress, CEC holds six monthly monitoring & also holeded mid term evaluation in 2001-02. BAIF-MITTRA is paid 12% of the project cost as their supersivision & implementation charges. Main focus of this programme is raising 3000 rural families above poverty line through implementation of environmentally beneficial income generation activities, community health programmes & encouraging women's participation.

Thus, a novel JAN VTTHAN concept has been introduced for implementing various eco-friendly income generation activities, mainly land & livestock based, tailor made to the needs of each participating family. Main features of this approach are:

1. Reaching poorest of the poor families.
2. Flexible & participatory problem solving.
3. Assistance package focused on food security, livelihood & quality of life.
4. Building of family & community assets
5. Answering Community Concerns like health, gender, education, poverty & environment.

Family Coverage till 2000-01 under various aspects of JANUTTHAN is presented in Table no. 13.

Table No.13:

Family Coverage under Jan Utthan (Brought from Baif)

Progress of these development projects since inception is presented in the following table

Table No. 14: Progress in water Resources Development for Irrigation upto September 2001 in Jawhar Taluka

Sl.No.	Activity	No. of Sites/ villages	No. of Families Benifited	Area under Irrigation (Acre)
1	Lift Scheme	18	173	264
2	Mobile Lift Scheme	122	239	289
3	Permanent Check Dam	3	71	45
4	Composite Structures	6	78	52
5	Masonry Farm Tank	103	115	115
6	Well Deepening	60	110	110

6.0 Study Village :

Against this backdrop some mobile units (MU) and some Lift Irrigation Schemes (LIS) were studied to understand the impact of intensification of agriculture using ‘structured’ water over promoting tribal livelihoods in Jawhar Taluka. The emphasis was placed over sharing water for intensification of agriculture in groups. This was done to achieve better understanding of the phenomenon, understand benefits of more individuals, obtain innovative ideas of optimum resource utilization etc.

The study location viz. Raytale Pada in Vanvasi village, Kharonda Pimpalshet, Chambharshet & Aine are depicted over map of Jawhar taluka in Fig No.3. Land use pattern in these villages is presented in Table No. 15, infrastructure development & economic opportunities are presented in Table No. 16 & pertinent demographic details at these places are presented in Table No.17.

**Table No.15:
Description of Land in Study Villages**

Source 1991 Census

Sl.No.	Place	Area	Forest Area	Unirrigated area	Culturable Wasteland	Area not available for cultivation
1	Aine	874.70	673.27	168.96	32.47	80.0
2	Chambharshet	807.85	220.44	533.76	NA	53.65
3	Kharonda	1781.93	1717.76	64.17	NA	NA
4	Pimpalshet	543.42	368.72	167.27	NA	7.43
5	Raitale	847.09	NA	805.54	41.55	57.0
6	Average	971.0	596	347.94	17.80	39.62
7	Corresponding % in Taluka	-	35.89	53.47	1.58	9.04

Table No.16: Infra-structure Development & economic Opportunities within Study Village

Sl.No	Item	Aine	Chambharshet	Kharonda	Pimpalshet	Raitale
1	Road	KR	KR	KR	KR	KR
2	Electricity	DC	DC	DC & AC	DC & AC	DC & AC
3	Livelihood from Jungles	Forest Land Cultivation in Kharif	Negligible	Nil	Nil	Nil
4	Nearest Development Pole Jawhar	14Km	15 Km	28 Km	25 Km	5Km
5	Medical Facilities	>5km	>5km	>5km	>5km	>5km
6	Communication Means	Seasonal ST	Seasonal ST	St x 6	St x 6	Seasonal ST
7	Post Office & Telegraph	>5km	>5km	>5km	>5km	>5km

8	Educational Facilities	EE	EE	EE	EE	EE
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KR – Kuccha Road, DC – Domestic Consumption, AC – Agricultural Consumption, ST – State Transport, EE – Elementary Education.

Table No. 17:
Relevant Demographic Parameters in Study Villages

Source 1991 Census

Sl. No	Village	Population	Children upto 6 yrs	Literate		Main worker		Non Worker		Culti.		Agri. Labo.	
				M	F	M	F	M	F	M	F	M	F
1	Aine	407	98	24	16	NA	NA	34	33	107	98	21	21
2	Chambharshet	1166	246	27	4	5	187	201	324	323	153	34	22
3	Kharonda	1462	336	52	8	18	156	265	301	407	246	21	43
4	Pimpalshet	1014	234	33	6	8	151	184	206	261	127	24	39
5	Raitale	1039	215	84	36	NA	NA	61	50	282	150	46	54
6	Average	1018	226	44	14	46	99	149	183	276	155	29	36
7	% of Net Population	-	22.2	5.69		14.24		32.61		42.34		6.39	
8	Corresponding % in Taluka	-	20.89	19.48									

Inhabitants in the study villages have been classified according to annual income as follows

Table No.18:
Documentation of families in study villages

Source BAIF

Sl.No.	Village	BPL Families	BPL Individuals	Landless	Minor Farmer
1	Aine	62	288	45	8
2	Chambharshet	229	1230	253	76
3	Kharonda	307	1228	287	10
4	Pimpalshet	249	1260	242	7
5	Raitale	330	1375	278	52
6	Average	235	1080	221	31

Thus following conclusion are drawn about the study villages

- 1 Although average 61% (Higher than corresponding Taluka Average) village area is occupied by forest, the interviews revealed that forests had not made any significant contribution towards income. Thus efforts towards promoting irrigation vis-à-vis agriculture assume prominence.
- 2 Cultivators & agricultural laborers account for about average 50% population highlighting the importance of agriculture as occupation
- 3 Literacy % is very poor; much lower than the Taluka average. Among literates women are about 32%.
- 4 Women as a agricultural laborers & workers in some other categories are more than men illustrating drudgery,
- 5 Most prominent is complete absence of irrigation facilities within the study villages. Interviews of inhabitants during our exercise confirmed consistency with general agroclimatic conditions & cropping pattern within taluka.

Thus, the interventions (described in succeeding title) under study were

7.0 Interventions: Typically, the study intervention consist a water extraction mechanism (WEM) in the form of an electric motor pump or a diesel engine, rigid PVC pipes of suitable diameter for transporting water, relevant pipe fittings such as PVC bends, elbow, Tee, MTA, FTA etc., other kinds of accessories like foot valve, Air valves, NRV, gate valve etc. and civil structures like Pump house, engine foundation, water storage tank etc. wherever relevant. A list of hardware at Raitale and Aina is enclosed in Annexure for illustration. Table No. presents description of interventions studied during field visit. These interventions were installed to initiate cropping during Rabi season and support Wadi. These interventions are the output of strategic multipronged approach for holistic sustainable development. Hence, their objectives along with the roles played by them in the tribal societies should be viewed in wider perspective along with the impacts and outcomes of them. Table No. 19 presents description of studied interventions.

**Table No. 19:
Description of Study Interventions**

Sl. No.	Title	Aine	Tasu Pada, Chambharset	Hedicha Pada, Kharonda	Vanvasi Pada, Raitale
1	Nature of Intervantion	Lift Irrigation	Mobile Unit		Lift Irrigation
2	Year Of Inception	2002-03	2001-02	1997-98	2000-01
3	Sponsorer	ITDP	ITDP	ITDP	CEC
4	Description of water source	Pinjali River, Pereunial	Nag River & Back Water of Bhamni Dam, Seasonal	Nag River, Seasonal	Stream, Perennial with check dam
5	Command Area & Description	30ac, own land on contract	22 ac, land Contract	4 ac, On Contract	22.5 Acre, Own Land
6	Number of Beneficiaries	Group of 13	Group of 5	Group of 5	Group of 8

7	Description of Land Outside Command	Forest Land Cultivation, Avg. Land 3-5 Acre/ head	About 5 Ac/ head elsewhere, own	About 2.5 ac/ head elsewhere, Own	About 1-5 ac/ head own Land + about 10 as cumulative on contract
8	WEM & Complimentary Items	1No 16 HP DE @ Rs.69000 + 65 Nos 110mm PVC Pipes @ Rs.4200/ pc 60 mm 75 mm HDPE Pipe @ Rs.55 m & fittings of Rs.10220 + Rs. 18000 Civil Work	1 No 5HP DE @ Rs.18500, 50Nos 90mm PVC Pipes @ Rs.285/pc & fitting of Rs. 7500	1 No 3HP EP @ Rs.11500, 29Nos 90mm PVC Pipes @ Rs.285/pc & fitting of Rs. 1500	1 No 7.5HP EP @ Rs.10750, *Pipes of Rs. 48215 & fitting of Rs. 12977 +Rs. 81132 for Well Pump House + Rs 355448 on check Dam
9	Labour Cost (Rs.)	10950	5500	1810	64350 for WEM & Check Dam
10	Net Infrastructure Cost	149859	52834	23075	578882
11	Description	November to April	November to April	November to April	November to April
12	Crops Grown Last year	Wheat & Vegetables	Vegetables eg. Onion, Sweet Potato	Vegetables eg. Gowr, Cucurbits	Wheat & Vegetables, Banana, Sugarcane

**Labour Charges for Pipeline excavations @ Rs. 15/m*

BAIF-MITTRA have addressed at the following sub-system levels viz.

1. Community structure i.e. target of the program who are thrust upon by multiple interdisciplinary programs which have been already described in Table Nos 10,11 &12 of this report. These programs have been designed in order to

- Provide more autonomy and independency to the participant
- Render more choice and leisure to participant in work
- Enhance motivational content of job in terms of increased responsibility, recognition, decision making etc.
- Make work more meaningful and stimulating, thus providing for intrinsic rewards e.g. high moral in addition to adequate extrinsic rewards e.g. Better financial returns
- Make participants strive for realizing self-worth

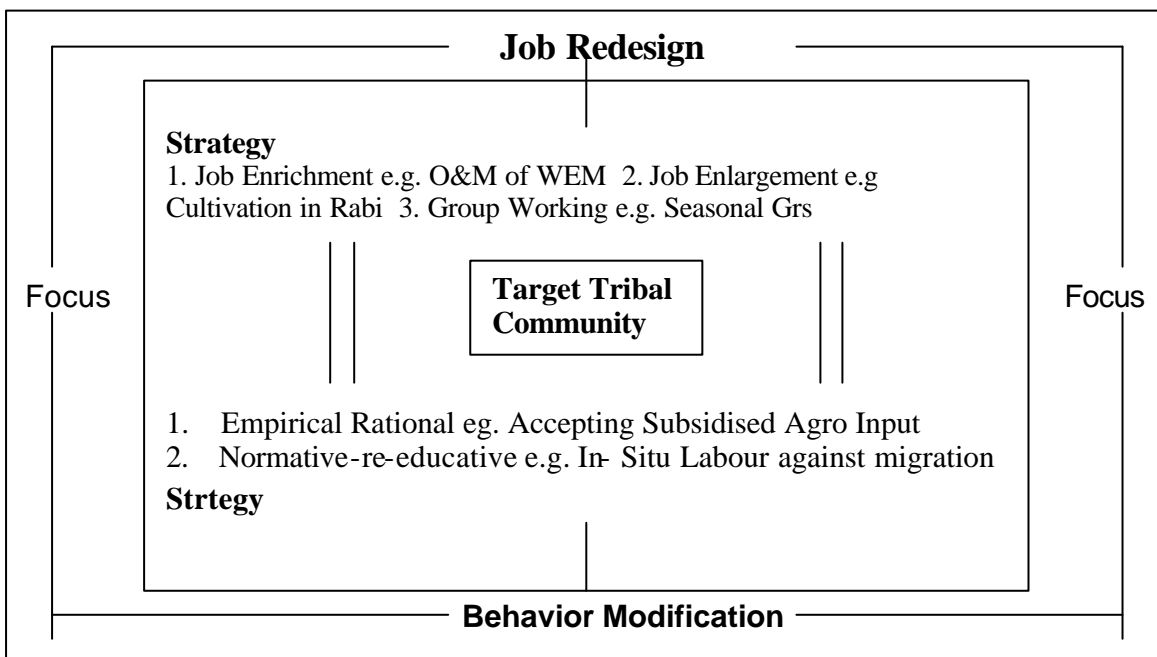
MITTRA has provided for problem solving and decision making and process consultation i.e. watching and aiding ongoing processes and improving them by establishing teams or groups to carry out the exercise.

2. Taste level in which emphasis is laid on job design parameters. Programs have been designed to furnish Job Restructuring viz. job enlargement i.e. extending the original scope of job along the same horizontal plane e.g. promoting inter-culture, nurturing Wadi, promoting vegetable cultivation etc., job enrichment i.e. imparting additional responsibility e.g. magnifying the original job wherein the participants were trusted for O & M of WEM in addition to cultivation, authority and responsibility considerations e.g. work as head of Gram Vikas Samiti (GVS) and group working i.e. undertaking and managing cultivation as member of a group. Thus the focus of the exercise is on job redesign and behavioural modifications.

3. People Level i.e. the target of intervention. Here again the emphasis is on fostering growth of participants by improving their problem solving capabilities.

After thorough deliberation over these three concerned sub-systems, group problem solving approach was propagated to implement the technology addition rather than thrusting the technology the community was made to feel the need for intervention. The combination of Empirical rational methods e.g. Providing better producing seed varieties and improved agronomic practices and Normative re-educative methods e.g. Discouraging day time liquor consumption, promotion of group buildings etc. constitute the strategy.

These efforts are depicted in following Fig.No. 4.



Certain operational methodologies adopted during the program are

1. Development of awareness about the potentialities of the proposed programmes to create Willingness and a sense of responsibility to adopt the intervention, thereby ensuring active Participation, raise community's aspirations to realistic level and to develop patience during execution. Cognitive dimension of change was brought about by rational presentation of the supposed benefits.
2. Positive reinforcement of activities in the direction of implemetation by postulating the outcomes. For this, certain monetary and non-monetary incentives out of programmes were hypothesized and promoted. Analytical conceptualization to determine possible units of change, consequence

of emphasis on one sub-system over other sub-systems, inter-relationships among various components boosted the efforts. Successful activities were brought to the focus to preserve zeal and enthusiasm during the entire period. In this regard, visits were arranged at Samsherpur place for exposure to success of the programs there.

3. Providing supportive leadership was another inducing force. Objective measure of change and its Benefits were effectively provided. The subjective barriers were overcome by training the participants, developing skilled personnel for identification and eradication of the machinery problems. The following table summarizes the issue.

Table No. 20: Progress in Training Activity till September 2001

Sl.No.	Repair Activity	Trained Personnel
1.	Diesel Engine	40
2.	Hand Pump	5
3.	Health and Sanitation	20
4.	Agriculture Field Guides	25
5.	Mango Grafting	10
6.	Nursery Raising	150

Other issues in supportive leadership are described in title 9.0 of this report.

4. Design of a sequential step-wise plan such that one leading to another than something sudden or Drastic was another factor for success. Promoting initially Wadi, WEM for individual and then promoting group irrigation activity served as good interpreter. Frequent feedback, interaction, regular monitoring served as good promotor. Thus, during implementation due emphasis over each stage i.e.
 1. Initial stage when intervention is considered desirable
 2. Reconsideration: Perception of real demand over the implementor and his work. Here the restraining forces needed attention. At Jawhar this has been achieved by
 - A. Forming Work Groups
 - B. Developing Skilled Manpower i.e. Imparting training to participants
 - C. Drawing Government Support
 - D. Delegating adequate men, material and infrastructural facilities i.e. Drawing grants from TOD, GOM, CEC, Diverting WEM from other projects. (In 1994-95, 17 Nos. of Diesel Engines were forwarded for utilization in Jawhar Block through grants from some other project)
 3. Persuasion: Focussing on attractive aspects such as huge output of bottle guard at Kharonda with others and then consolidation in terms of formalization and standardization, formalization of rules and procedures and standardization of work process and the individual. In standardization of the work process, the new work patterns were made part of the existing pattern while standardization of the individual for intervalising the new behaviour within him so that it can be subconsciously practiced.

Table No. 21 presents the diagnostic (independent) variables within the study area before intervention.

Table No.21: Diagnostic variables before intervention in the Study Area

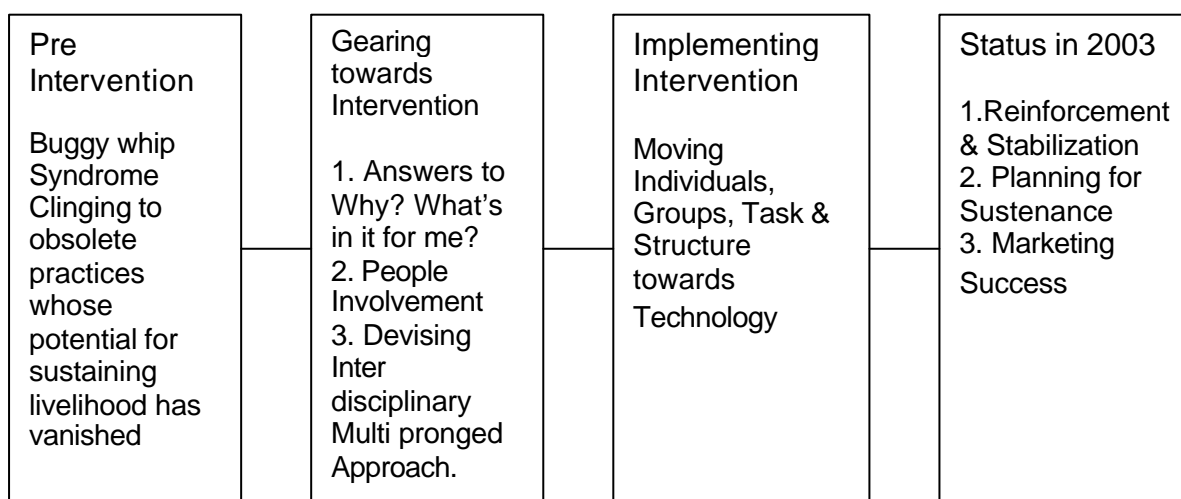
Sl.No.	Variable	Description
1.	Time Available	Long
2.	Need for change	Clear to bureaucracy
3.	Size of Community	Very Large
4.	Effects of existing controls and incentives	Encourage Focus
5.	Availability of Relevant Knowledge	Concentrated elsewhere
6.	Expectations of people about involvement in implementation	None
7.	Potential Resistance	Great
8.	Power Base of Implementor	Great

Based on these, the implementation strategy variables promised

1. Pace: Gradual, Follow Step-wise sequential plan
2. Use of Power: Bottoms-up strategy with the belief that people welcome change and the opportunity to contribute to their own productivity, especially if the change gives them more variety in their work and more autonomy. Groups were contacted after drawing references before approach solving 'whom to hit' question
3. Management Style: Directive + Participative

The process is depicted in Fig.No.5 as under

Fig. No.5: Approach of BAIF-MITTRA in study villages



For avoiding dependence over external factors and their vagaries, following practices have been undertaken :

1. Diversification : the degree of dependence over external factors such as brokers in Fruit Market and potential centers of wages was very high due to inherent poor infrastructure. Hence, incidences of exploitation were numerous, which used to further enhance the poverty. The intervention was able to reduce this state as the WEM allowed for garnering through diversified products, introduced new sources of supply and consumption e.g. constitution of co-operatives which also reduced infra-community competition.

2. Developing Mutual Dependence through group working: This methodology also created structures with a large number of boundary spanners which allowed effective tackling with the troubleshooters.

Progress in water resources development activities for purposes other than irrigation till September 2001 is presented in Table No.22.

Table No.22: Progress in Water Resources Development for Purposes other than Irrigation

Sl.No.	Activity	No.of villages	Particulars (ha)	Success
1.	Area Treatment	2	370	-----
2.	Drainage Line Treatment	2	-----	1675 sites
3.	Plantation Forestry	--	50,000 saplings	70% survival
4.	Lift Schemes	11	2378 families	11890 individuals
5.	New well & Well Deepening	12	360 families	1800 individuals
6.	Spring Development	1	30 families	150 individuals
7.	Roof Top Water Harvesting	3	30 families	150 individuals

One of the interviewees mentioned that about then daily visits and efforts of BAIF-MITTRA staff to initiate cultivation during Rabi. “We did not know a plough then. Ploughing was manually demonstrated to us by BAIF-MITTRA. They fed us with seeds, fertilizers and pesticides, provided us with WEMs, demonstrated its operation and functioning, arranged for training. In short, they taught us A to Z in the subject”.

In 1997-98, MITTRA arranged for visits at Samsherpur to educate Jowhar’s tribals about success there, the scientific knowledge base was pardoned by arranging visits at Agricultural University Centres at Dapoli and Rahuri, Pragat Tantradyan Krishi Vidyan Kendra at Babhuleshwar, certain functioning co-operative societies in Nagar district and Gujarat State. Also, it was MITTRA’s effort to constitute consumer co-operative society for centralized collection of cashews and mangoes of Wadis.

The proposed grant per family was about Rs5000 from ITDP. They had advised for equity loan from NABARD. However, MITTRA strived for generation of these proposed loan from within the groups only in order to achieve self-sufficiency. Every year MITTRA sanctions revolving fund of Rs.50000 to selected GVS for procuring consumable agricultural commodities and is charged 12% per annum interest. Also, the agency successfully invites labour from villagers and instead of paying them in cash retains the funds with GVS for further utilization. Building Co-operative Society achieves prevention of stealth by private traders, uniformity in rates of produce and assured buy back arrangement. Estimate labour cost in Jawhar block is about Rs.3200000 so far.

As a result of promoting GVSS as centre for to and fro fund movement, MITTRA has attempted inculcating self-sufficiency, indoctrination in tricks of trade, leadership building etc.

To ensure adequacy in set of auxillary necessities, MITTRA have ensured for development of relevant infra-structure. Details about water resources development for irrigation, training for development of skilled man power and watershed development have been presented already in Table No. 20, 22 and 3 respectively in the earlier text of this report. Regarding availability of electricity for operating motor pump, MITTRA phys the role of guide and counselor. They help the interested customers in fulfillment of documents, interacting with MSEB, assistance in repairs etc.

MITTRA's cause in promoting utilization of indigenous natural water resources has been further strengthened by relaxation in relevant rules and regulations of Government. Previously obtaining water utilization licence from Government's Thane based office was mandatory. Illiteracy and ignorance about the pre-requisites for the same in addition to geographical remoteness and lack of transportation facilities had developed apathy among tribals regarding procurement of the licence, which put utilization of water resource beyond their contemplation. However, at present there is relaxation in this procedure prompting utilization of water resources possible.

8.0 Group & Group Dynamics:

The process of group formation is depicted in fig. No.6, which, also depicts the characteristics of the group.

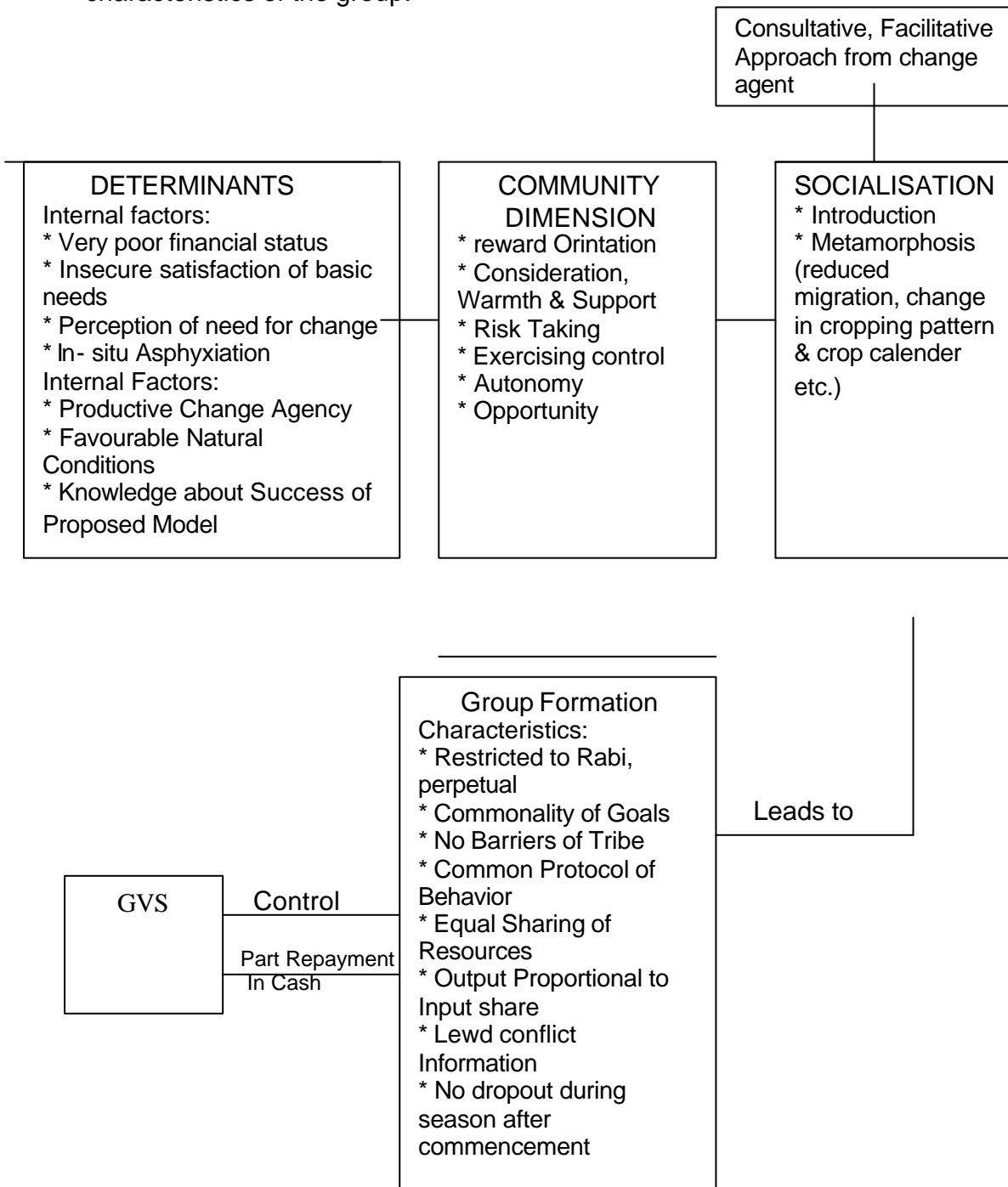


Fig. No.6: Process of Group Formation

Brief Description of Group Dynamics follows

8.1 Group Formation:

On the basis of attraction of persons towards each other as they hold similar attitude towards common objects or goal. Groups are constituted at the outset of Rabi season and continue till releasing the crop. Likely convenience after group formation in sharing resources, management i.e. homogeneity in objectives & goals is the sole stimulating force in group formation substance, without contemplating over differences in cast, community & tribes. However, natural settings in colonization of identical tribes immensely boot the cause. The number of group members is governed mostly by potential of resources in proposed service.

8.2 Nature of Group:

Mostly informal i.e absence of hierarchy, acquired status of group leader, membership voluntary, communication mostly grapevine form etc. within the group.

8.3 Group Cohesion:

Groups are mostly homogeneous in activity. Feeling of insecurity is the significant parameter in maintaining cohesivity. The working group at Medicha Pada, Kharonda is utilizing electric motor pump of one of the group member who is paying for the entire electricity consumption of the group. When questioned over that issue he replied that he could offer the money but not working individually. However, the other members have decided to share the expenses this year. Due to such high team spirits obviously the conflicts are restricted in being merely antecedent conditions, the stigma to erupt the conflicts has been perhaps reduced to vestigial stature.

8.4 Sharing Work Load:

This is practiced as per the group norms, which in turn are arrived at after mutual consensus before commencement of season. Turns for operating WEM, procuring proposed input, obtaining information about market, managing sales & subsequent realization etc follow pre-agreed protocol. Usually, the division of labour follows principle of equity. Funds for routine O & M are either contributed in advance or proportionately recovered after produces realization.

8.5 Sharing Benefits:

Mostly in proportion with land holding and contribution, but it can be shared equally if decided in advance

9.0 Governance Structure & Operating Procedures:

At every village one GVS governs the horti-agricultural issues, this GVS comprise President, Secretary & some members, whose number is not fixed. Such GVS hold bank account in Jawhar. The agro-input like fertilizers, seeds etc are supplied to GVS for distribution among the village, GVS makes assessment of the material for conversion in equivalent amount & makes it known to every recipient. GVS then arrives at suitable payback individual share in part & arranges recovery. This amount is part is retained in cash within the village & the remaining is deposited with the Bank. Following year the same amount is utilized for disbursement of loan to individuals. At Vanvasi Pada, Raitale the irrigation group has contributed about 20% to the saving of 62000/- of GVS there. Similarly GVS at Kharonda has delivered loan of Rs. 15000/- only during commencement of season in 2001-02. However, GVS intervenes only during conflicts if arise in routine. Otherwise, about O & M of WEM, formulation & enforcement etc groups enjoys complete autonomy. The issues in governance are presented below in table No.

Table No.23: Governance of Intervention in Study village

Sl. No.	Items	Description
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1	Extent of user control	100%
2	Training of Users in Governance	Learnt during operations
3	Group of Building Process	For cultivating hitherto less productive land, Achieve Centripetal Irrigation & Operational Convenience, cultivate commercial crops.(impossible Individually) Based on proximity of command to water source, Mostly Seasonal, Investment & Profit according to individual land holding or mutual
4	Rule making process, clarity & transparency in rules and enforcement mechanisms	Rules mutually divided, group leader in formal, Implementation regular due to anticipated individual benefits, responsibility corroboration 100%, No provision of penalty.
5	Role of Traditional Leadership	Guidance in O & M of machinery, group formation & sustenance, auxiliary services.

10.0 Supplementary services & Auxiliary Conditions:

Since programs for tribal development are comprehensive with holistic objectives & focus on specific situation of tribal, the gamut of extended supplementary services is extensive. There services are classified as

1. Income Generation Group Activities eg. Operation of Consumer stores, production of pickles, Operation of Grain shop & small flourmills, distribution of fertilizers & improved varieties of seeds of Redgram, blackgram, paddy etc.
2. Services & training regarding grafting of Mangoes, WEM O & M, Potable water & General Health & Hygiene.
3. Income Generation Individual Activities eg. Backyard poultry & goat unit, Vermicomposting, Crossbreed Cues, Vegetable Cultivation.

Most significant achievement of their programmes is the farmers is the farmers breaking away from traditional annual single crop to current state of growing two crops.

Certain water-shed development activities have been undertaken for conservation & effective utilization of indigenous water resources, progress in which up to September 2001 are presented in Table No

11. Behaviour and Impact on individuals:

11.1 Participation: MITTRA has been able to constitute at least one group within every village of their programme's implementation. In 1994, MIU was introduced on experimental basis. Gradually, the success rubbed over non-participants and the concept got mobilized. Topographical and agro feasibilities now dictate group constitution. Drop-out is only on the grounds of non-contribution due to hampering of initial work load elsewhere.

11.2 Changes in Work Pattern: Dhavlu's story in the following block summarises the contents of this section.

Learning from Dhavlu Mahala's experience

Dhavlu Mahala, 7th passed, about 40 years old, resides at Hedicha Pada, Kharonda in his own pucca ghar with his wife. Their two sons are educating at Jowhar's Aashram Shala. He is leading a group of four residents of his village but belonging to different age groups as well as possessing varied family size and are different in literacy levels as well. They are cultivating about 4 acres land in partnership, since 2001-02. All of them hold individual land between 1 and 3 acres in addition to partnership land which is land on rent. They pump water from Nag river by utilizing Dhavlu's individual electric motor pump for cultivation of Bottle Guard, Pumpkin and Gowr. Dhavlu is bearing expenses of pumping from his own pocket for the entire group. "Sir, if I insist sharing of expenses, group might disintegrate and if I do not get yield in my ownership land I will struggle for livelihood as the activities we are undertaking as a group are not possible for me to practice individually". He had obtained that motor pump under ITDP's subsidies for individual seekers.

"Previously, we were migrating for about seven months at Dahanu with own ration to seek nominal wages of Rs.500 per month. We did not even know about Jowhar then and were at the lowest level of social hierarchy due to traditional poverty. All the agriculture was rain dependent, meagerly productive even if rains were normal, no access to other sources for income and hence were immensely exploited. In 1994-95 we attempted irrigation upon MITTRA's support. Then we cultivated watermelon fruits worth about Rs.99,000 which was purchased by a private broker who in turn behaved surreptitiously and did not pay us the amount equivalent to our produce. We prosecuted him after ITDP's support over the issue and recovered our amount. Gradually we got convinced about utility of WEM and the likely benefits arising out of it. Pest attack, vulnerability to seasonal and micro-climatic variations made us abandoned watermelons.

Meanwhile BAIF-MITTRA drove us towards cultivating one acre Mango orchards over our farm. I learnt the art of grafting also which is now yielding me additional income" reported Dhavlu and another member – Babu Waghera.

They continued, "In 2001-02 we planned for Cucurbits and Gowr upon guidance from MITTRA". Meanwhile in 1999-00 Dhavlu procured an electric motor pump from ITDP. To begin with, he drew interest free advance amount of Rs.20,000 from MITTRA upon promise of delivering mango saplings of equivalent amount. MITTRA supported with some input also in the form of supplying Bamboos, Wire, Rope, Seeds etc. Total fixed investment was of about Rs.60,000. "To sustain and nurture the group I decided to pardon individual pump set for utilization in group. I decided to meet the

recurring expenses over WEM through own pocket. I paid Rs.1600 as amount of annual electricity bill and additionally sustained Rs.200 over petty repair and maintenance. I am skilled enough to take care of petty and O & M requirements" Dhavlu informed.

The group met the operational expenses through rolling. Over and all they paid about Rs.15,000 as labour charge, Rs.35,000 as carting and freight and Rs.8,000 over fertilizer and other requirements and were able to produce about 50 tonnes of vegetable which was sold in Washi market. The group had learnt about trade practices there through references and actual exposure visit arranged by self. Dhavlu and Babu joyously communicated, "we are extremely happy now. We have got rid of commission agents who were previously cheating us. In 2001-02, our group has garnered a net profit of Rs.36000. We will continue as group and will share expenses over O & M of WEM. This year i.e. in 2003-04 we sought loan from SHG of Rs.15000 payable at interest rate of 2% per month. Additionally, each of us have contributed Rs.2000 towards group operations. Now we can spend more on educating proge wear better clothes, procure assets, enhance domestic standard, improve health and hygiene and avail better nutrition".

Annual income of Dhavlu now is about Rs.2,00,000. Dhavlu, once working as labour elsewhere, is now supporting about 100 labourers over his own farm on wages better than in outside his village. In addition to Rs.30 per day (outside rate Rs.25 per day), Dhavlu is able to provide noon meals also to his labourers. They informed further, “In post-intervention period we eat rice in both meals, eat chapattis of wheat four instead of Bhakari of Nagli Flour, consume ½ tin groundnut oil every month, consume Tadi instead of Mahua liquor. For packaging vegetables, we procure stationary waste from Government offices and private shop owners at Jawhar @ Rs.4 per kg. And Rs.7 per kg. respectively”

The changes in cropping pattern due to intervention is depicted in the following Figure No. 7.

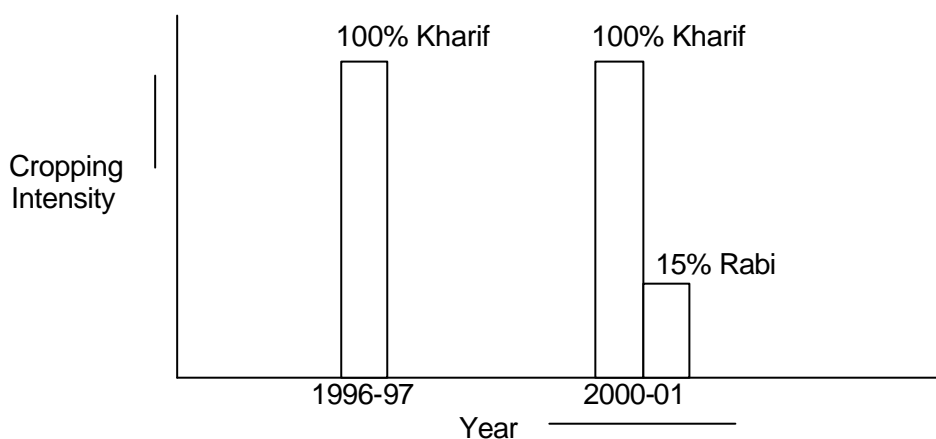


Table No. 24: Description of Investment & earning through agriculture in Kharif & Rabi seasons are presented below.

Sl. No.	Crop	Estimated Expenditure (Rs. Acre)				Cultivation Area (% of NCA)	Net output (Q+/ac)	Value (Rs)
		Seed Peste	Fertilizer	Labour & Machine	Transpo rtation			
1	Paddy	100	100	1050	Nil	30	10	5000
2	Nagli	150	150	1300	5	40	4	1800
3	Warai	150	150	1300	5	20	4	3400
4	Minor Crop eg. Udid, Kulith, Khurasani etc	100	100	250	.40	5	0.3	300
5	Wheat	200	Nil	60	450	12	13	10400
6	Brinjal	150	50	50	100	26	2/0.25 acre	800
7	Groundnut	100	150	150	150	26	12	9600
8	Sweet	200	200	200	200	26	0.5/0.25	500

	Potato						ac	
9	Other Vegetables	350	350	350	350	26	0.5/0.25 ac	500
10	Onion	1000	1000	1000	1000	26	2	10000

Sl. No. 5-10 represent crop in Rabi Season. Expenses indicate cultivator's own investment. NCA- Net Cultivated Area

Salient features of this cropping pattern are

1. Cultivation in Rabi Season is the result of MITTRA's efforts. WEM play key role in sustaining cultivation.
2. Vegetables are indicative of output at one instance within the study area. Since the vegetable cultivation is in adolescent stage, the trend cannot be described as a confirmed pattern. In the years to follow some permutation & combination are likely to obtain particular pattern to follow. Hence only the output & corresponding monetary value should be viewed in the perspective of successful pilot scale potential studies for additional income generation employing WEM. Variation in NCA %, output value & expenditure are likely.
3. Seeds of Kharif season's crop are mostly traditional. However, due to MITTRA's input cultivators are employing genetically superior high yielding, short duration varieties of Paddy. Cultivators are now prepared to spend over input commodities for better yield from nearby centers. Kharif season yield is consumed domestically.
4. Although the potential of wheat is great, availability of wheat from government on very nominal rates had discouraged wheat's cultivation this year. All the efforts were seen to be oriented towards vegetable cultivation.
5. It is firmly concluded that WEM have been ubiquitously accepted due to consensus over their potential for diversification in crops vis- a-vis income enhancement.

The effects of this intervention have been reflected in qualitative up gradation as presented in Table No. 25.

Table No.25:
Qualitative effects of intervention over tribal community in the study village

Sl. No	Parameter	Pre Intervention	Post Intervention
1	Daily Staple Diet	Paucity of rice for 3 months	Regular Rice Consumption during dinner, chapatis
2	Consumption of vegetable, oil & Fats	Irregular, Purchase of Inferior quality	Regular, Fresh vegetables indigenously available
3	Festivals	Limited Celebration	More Celebration, Increase in number of festivals
4	Addiction	70-80% Population, Raw Inferior Liquor	40-50% Population, more refined liquor like Tadi
5	Diseases & Illness	More, Treatment mostly non-conventional through superstitions	Reduced, Medical facilities indigenously available
6	Literacy	Less, Non-awareness among females	Improved, Awareness among females
7	Extra marital affairs & Bigamy	Resulted in social disharmony	Decreased, bigamy restricted to creamy layer
8	Marriage Age & custom	Tender, Tradition, Detrimental	Awareness about Abidance to statute, attempt to maintain conformity with social norms
9	Clothing	Traditional	Orientation towards urban

			area's pattern
10	Relative Valley with Urban	Very Deep	Moderate
11	Exploitation & Cheating	Very Common	Development of Resistance
12	Migration	Compulsory for daily livelihood, duration extensive	Optional, to mitigate Festival Expenditure, very short duration

This qualitative change can be further understood after comparison between annual pre-intervention income & post-intervention income, which is presented in Table No. 26

Another manner of developing understanding over expenditure habits i.e. indication of income in indirect fashion is to know Mean Per Capita Consumption Expenditure (MPCCE), which is presented in Table No. 27.

Table No. 26:
Comparison of Annual Income between Pre-intervention & Post-intervention Period

Sl. No.	Source	Pre-intervention (Rs./Yr)	Post-intervention (Rs./Yr)
1	Agriculture	4000-5000	10000-15000
2	Agricultural By-Product (Wadi, Social Forestry)	Nil	5000-10000
3	Live Stock Rearing	300-500	2000-4500
4	Local Farm Labour	500-1000	1000-1500
5	Migration	3500-4000	1500-2000
6	Other Services (e.g. Skilled Jobs)	500-1000	3000-5000
7	Forest Produce	500-1000	500-1000
8	Total	9300-12500	23000-39000

Table No. 27:
MPCCE within study Villages

Source Direct Interview

Sl. No.	Particulars	Pre-intervention (Rs./Yr)	Post-intervention (Rs./Yr)
1	Cereals & Grains	400-500	1200-2000
2	Fats & Oil	100-150	1000-2000
3	Milk & Milk Product	120-50	100-200
4	Fruit & Vegetables	40-50	200-300
5	Education	300-500	500-1000
6	Medical care	150-300	500-750
7	Clothes	300-500	500-750
8	Festivals & Celebrations	180-200	250-300
9	Daughter's marriage	4000-5000	12000-15000
10	Son's marriage	9000-10000	20000-25000
11	Alcohol	300-500	500-1000
12	Bidi & Tobacco	100-150	200-300
13	*Total	1890-2780	4950-8100

* Total Excludes items in serial No. 9 & 10

The above table highlights increase in consumption of cereal, fruit & vegetable and fats & oils in individuals diet within the study villages in post-intervention period. As a result of this, malnutrition has

receded. In 1996-97, 40% population in Grade II, while 17% comprised Grade III whereas the corresponding figures in 200-01 are 32% & 9.5% respectively.

As described in Table No.9, the earlier tendency towards obtaining debts was for livelihood. Since the income was insufficient to generate savings, the inhabitants had no knowledge about options of savings. “Sir, we were so poor that even private money lenders used to hesitate while sanctioning us debt due to non-conviction in our repayment abilities”, one of the interviewer had remarked. In the present scenario, options for securing debt have increased, reasons have shifted from sustaining livelihood to achieving crop diversity & profit generation etc. Table No. 28 indicates change of credit pattern in Thane Cluster.

Table No. 28: Change of Credit Pattern in Thane Cluster

Source : BAIF- MITTRA

Sl. No.	Item	Before SHG (%)	Within SHG(%)
1	Food	50	45
2	Clothes	2	5
3	Social Functions	10	5
4	Agriculture & allied	15	5
5	IGA	2	10
6	Health	20	5
7	Education	1	20
8	Housing	0	5

11.2 Impact over Women: Women in Development occupies special place in each program. Treating women as equity partners in the process of sustainable development, women are encouraged to participate in various activities under improved agriculture & other programs.

Learning from Mrs. Kusum Sathe

Between 2000 & 2002 she was leader of a group at Tasu Pada, Chambharshet for cultivation of vegetables employing a 5 HP diesel engine for pumping from Nag river & back waters of Dhamni dam. The initial investment of Rs 3000 and O & M expenses were borne by her, which were proportionally recovered from other members after realization of annual produce. She was the decision making authority within the group, who obtained rich harvest of Onion, Ground nut, Sweet Potato & other vegetables. Entire produce was easily sold in nearby colonies. The intervention influenced her about

1. Education over diesel engine repair
2. Knowledge about better agronomy
3. Access to direct sales
4. Availing disposable income
5. Improvement in social status
6. Reduction in manual labour
7. Reduction in addiction

“ I am very satisfied. Now I can act as consultant for vegetable cultivation. Also, I am held in higher esteem within my family” informed Mrs Kusum during interview.

The intervention helped women in several ways. As a cumulative effect of WEM & other programs more and more women began to join in main stream. Constitution of Self Help Groups (SHGs) were encouraged. They now lend money @ 24% for cultivation in Rabi. Table No. 29 informs about yearly progress in numbers of SHGs .

Table No. 29: Yearly Progress in SHGs in Jawhar region

Sl. No.	Year	No. of Female Grs/Participants	No. of Male Grs
1.	1995-96	6/72	0
2.	1996-97	17/187	0
3.	1997-98	31/356	0
4.	1998-99	34/408	0
5.	1999-00	70/840	0
6.	2000-01	174/1368	11
7.	2001-02	197/2364	20
8.	2002-03	212/2774	20

The observed impacts are as under

Table No. 30: Impacts of Intervention over Women in Study Villages

Sl. No.	Aspect	Positive Effect	Negative Effect
1.	Womens' Drudgery	Reduced manual labour, Better groom, reduced migration, Less harassment, Education in O & M of WEM	Increase in Supervisory Jobs
2.	Position within Family	Transition from emulator to advisor, More status due to earning, Better nutrition, Deputy Head of Family	Always at house farm interface
3.	Position in regard to Financial Transactions	Access to supplementary sources, Enjoy Role of Cashier, Direct contribution in sales, Voice in consumption pattern	Have to manage meticulously due to multiplicity of consumption options
4.	Empowerment	Selection of counterpart, Influence timings of irrigation	

12.0 Sustainability & Overall Success: Before pondering over likelihood of sustainability SWOT of the running intervention are presented in Table No. 31.

Table No. 31: Information about SWOT of the Intervention

Sl. No.	Parameter	Observations
1.	S: Strength	Demographic homogeneity, Availability of Electricity, Feasible Soil in Upland, Success in the Initial Phase, Adaptive Population, Sound Support from Sponsorers, Abundant Natural Water
2.	W: Weakness	Remoteness, Illiteracy, Less Infrastructure, Lack of Indigenous Leadership, Poor Water Retention Capacity of Soil
3.	O: Opportunities	Development of Horti- forestry, Strengthening Group Network, Effective Water & Soil Conservation
4.	T: Threats	High Soil Erosion, Laziness & Selfishness, Alcoholism,

Against this backdrop structuring of sustainability plan is under process. This is being done with an intention to pardon methodology for an interrupted O & M of WEM even after BAIF's withdrawal from the area. It was observed that Lift Irrigation Scheme at Kharonda has been fully handed over to the participants since last year. The beneficiaries have sustained it so far.

ANNEXURE

Table No.
Financing of schemes in study village

Sl.No	Item	Aine	Chambharshet	Kharanda	Raitale
1	Net Infrastructure Cost	149859	52834	23075	578882
2	Direct cash contribution by users	Nil	Nil	250	250
3	Price of Fuel	Diesel @ Rs.20/Ltr	Diesel @ Rs. 20/ltr	Flat Tariff @ Rs. 800/6 Month	Flat Tariff @ Rs. 1500/ 6 Months
4	Annual Fuel Expenditure (Rs)	3500	1200	1600	3000
5	Maintain ance Cost	250	250	200	950
6	Training Cost	100	100	100	100
7	Price of Water	Nil	Nil	Nil	Nil
8	MSEB Deposit & allied Paid by ITDP	Nil	Nil	6000	6000
9	Total Cost	180762	63956	36721	692643
10	Inicial cost of Irrigation (Rs./acre)	4204	2369	7344	23088
11	Expenses per head (Rs.)	323	474	1469	2886

Net Infrastructure cost:
Price of Fuel:
Initial Cost of Irrigation:

Drawn from Table No.
Inclusive of Procurement expenses
Total Cost/ command area + 1 acre / head wadi

Budget summary: Village- Ayne

Name of Scheme	Estimated cost, Rs.	Grant Amount, Rs.	Reference
Group - I	91789	75289	Annexure I
Group – II	105954	87379	Annexure II
Group – III	121248	100448	Annexure III
Group – IV	121248	100448	Annexure III
Group – v	151285	125635	Annexure IV
Total	591524	489199	

Lift Irrigation Scheme

Sr. No.	Particulars	Unit	Quantity	Rate Rs.	Amount, Rs		
					Grant	Contribution	Total
1	Pipeline	mtr	730	15		10950	10950

	excavation						
2	PVC pipe 110 mm (4kg/sq.cm)	mtr	730	70	51100		51100
3	HDPE Pipe 75 mm (4 kg/sq.cm)	mtr	60	55	3300		
4	Pipe Accessories				10220		10220
5	Engine Maintenance				3000		3000
6	Fuel	Lit	150	20	3000		3000
7	Distribution Chamber /Engine foundation	Nos.	3	6000	10800		10800
8	Improved Agriculture						
	Seed		Lumsum		10000	1000	11000
	Fertilizer		Lumsum			5000	5000
	Pesticides		Lumsum			1500	1500
9	Spray Pump (Knapsack)	Nos.	3	1000	3000		3000
10	Training	Nos.	3	2000	6000		6000
	Sub Total				100420	25650	126070
	Contingencies 5%				6304		6304
	Techno management Charges 15%				18911		18911
	Grand Total				125635	25650	151285

Fig. No.: Implementing Intervention

Table No.: Description of Intervention at Vanvasi Pada , Raitale

Sl. No.	Particulars	Size	Unit	Rate	Valuation Vanvasi		Akhar Check Dam	
					Quantity	Amount Rs.	Quantity	Amount Rs.
1	Bricks		Nos. Nos. Nos	1.34 1.25 1.33	1800	2412 0 0		
2	Sand		Brass	1300	10	13000	41	53300
3	Metal		Brass	1300	2	2600	8	10400
4	Cement	53 grade 43 grade	Bags Bags	146 137	120	17520 0	379 80	55334 10960
5	Rubble		Brass Nos.	1	12	7800 0	17 3565	11050 3565
6	M.S. Angles	Feet	35	15	525			
7	G.I. Sheets	10x2.5'	Nos	280	4	1120		
8	PVC Pipe 4kg	90mm	Nos	285	169	48215.7		
9	G.I. Pipes	80mm	Meter	223.33	18	4020		
10	Engines / pumps		Nos.			10750		
11	Foot Valve	65mm	Nos	280	1	280		
12	G.I. Bend	65mm	Nos	150	2	300		
13	G.I. Socket	65mm	Nos	55	5	165		
14	Barrel Nipple	65mm 80mm	Nos Nos	54 66	1 1	54 66		
15	G.I. Reducer Socket	80x65	Nos	90	1	90		
16	R.T. Flange	80x65	Nos	60	1	60		
17	Non Return Valve	80mm	Nos	1300	1	1300		
18	M.S. Tail Flange	80x80	Nos	45	1	45		
19	PVC Tail pc	90mm	Nos	20	1	20		
20	PVC Solution		Litr	110	3	330		
21	PVC Ball Valve	90 mm	Nos	400	8	3200		
22	C.I. Valve	90 mm	Nos	325	3	975		
23	PVC M.T.A.	90 mm	Nos	40	20	800		
24	Air Valve with Service	90 mm	Nos	250	14	3500		

25	PVC Elbow	90 mm	Nos	70	14	980		
26	PVC Tee	90 mm	Nos	78	9	702		
27	PVC Bend	90mm	Nos	50	9	450		
28	Hack saw blade		Nos	4	1	4		
29	Foundation bolt		Nos	50	4	200		
30	Wooden Door		Nos	1100	1	1100		
31	Plastic Cloth		Kg	60			2	120
32	PVC End cap		Nos	25	9	225		
33	'J' hook, wiser & nuts					30		
34	Transportation Charges					2600		800
35	Blasting Charges		Nos	50			117	5850
36	Labour Charges					38000		26350
						163526.7		177729
						341255.7		

DESIRED INFORMATION TO BE OBTAINED FROM BAIF

1. Destination: Vanvasi Pada / Madvira / Aina / Pimpalshet.

2. Geographic Location:

3. Locale:

3.1 Soil type:

3.2 Rainfall (Specify total rainy days, avg.rainfall):

3.3 Topography:

3.4 Forest Cover (If possible, specify major tree species) :

3.5 Total cultivable Area:

3.6 Net cultivable Area:

3.7 Major crops Grown and Cropping Pattern:

- 3.8 Total Average temperature with seasonal variations:
- 3.9 Number and Nature of natural water resources accessed by tribals:
- 3.10 Number of dugwells and Borewells (if any):
- 3.11 Position of Destination relative to water source:
- 3.12 Land holding (classified as say 10% below 5 Acres and so on):

4. About Community:

- 4.1 Religion and Caste (If more than one, please indicate %):
- 4.2 Family Size:
- 4.3 Male to Female ratio:
- 4.4 Average Life of an individual:
- 4.5 Native of the area since:
- 4.6 Relative % population with respect to taluka and district:
- 4.7 Average age at marriage: Bride Vs. Groom
- 4.8 Age at first child.
- 4.9 Fecundity and fertility in women:
- 4.10 Inter-personal relations within community – Nature and Scope:
- 4.11 Migration Pattern (if relevant) with % migration and reasons:
- 4.12 Social Tensions (If relevant), Causes, Method of Resolution etc.
- 4.13 Knowledge of Agriculture and Agronomy.

5. Finance and Occupation of tribals:

- 5.1 Occupation:
- 5.2 Land holding (Avg. and Min-Max) (acres):
- 5.3 Annual Income (Rs.) (Min-Max and Avg.) (Please specify % eg. 80% tribals below Rs. 5000/- & so on.)

- 5.4 Sources of Income other than chief occupation e.g. Fishing, Poultry, Dairy, Minor forest produce etc.
- 5.5 Net Income drawn from such supplementary sources (Please specify % as in 5.3)
- 5.6 Any special skill e.g. Paintings, Carpentry, Craft work etc. (Specify % and skill)
- 5.7 Annual Income (Rs.) out of 5.6 (if any):
- 5.8 Property Rights on Land:
- 5.9 Family and Community norms on division of labour:
- 5.10 MPCCE:

6. Access to Market:

- 6.1 Where?
- 6.2 How?

- 6.3 Provided by whom?
- 6.4 % Tribals exploring at outside market:
- 6.5 If no tribal accesses outside market, please specify reasons:
- 6.6 Assimilation in main stream i.e. Extent of homogeneity with non-tribal life.
If yes, give reasons and how. If no, indicate reasons:
Note : While indicating level of assimilation, please specify as poor to good and % if possible :
- 6.7 About BAIF's efforts towards access to market or any supplementary

7. About Intervention:

- 7.1. Which type (Lift Irrigation, Mobile Irrigation etc.)(Specify make of Water Extraction Mechanism & associated accessories – List can be enclosed).
- 7.2. Installed when?
- 7.3. Installed by whom?
- 7.4. Source of Finance? (Specify if sponsored partly or wholly, sanctioned amount, interest amount –if any, terms of grant, subsidy if any with conditions)
- 7.5. Water Source? Seasonal or Perennial? (Well, River, Stream) (Give details):
- 7.6. Command Area (ha)?
- 7.7. How it is designed?
- 7.8. Other water sources in command? (River, Stream, wells etc.)
- 7.9. Intervention used when? For how many days?
- 7.10. Operational Cost (Rs./Unit)?
- 7.11. Maintenance of installation?
- 7.12. Improvement in output after installation of Water Extraction Mechanism?

- 7.13. Government orders (if any) on use of stream water, electricity supply, tariff, water levy etc.(Please indicate whichever is relevant).
- 7.14. Service back-up for smooth operation of Water Extraction Mechanism (Specify nature, personnel involved and annual cost).
- 7.15. Means of Resource protection (If any):
- 7.16. Prop out rates, if any and Causes:

8. Status of women in Tribal Community:

- 8.1 Literacy level and %:
- 8.2 Traditional Role in Division of work:
- 8.3 Nutritional status:
- 8.4 % of Abortion :
- 8.5 Social Exposure:
- 8.6 Any special skill:

- 8.7 Impact of Dowry, Bigamy, Liquor and Other illicit practices (State in brief, indicate%):
- 8.8 Average age at death:
- 8.9 Amount of say in household matters, Means of Income, Expenditure, Social Exposure etc.

9. Impact of Intervention Over:

- 9.1 Income (Elaborate quantitatively):
- 9.2 Life Style:
- 9.3 Changes in cropping practices (Specify whether the intervention has led to introduction of new crop and/or multiplication of traditional produce):
- 9.4 Orientation towards market and non-tribal life:
- 9.5 Impact over physical input in cultivation practices:
- 9.6 Whether the intervention has led to increase in free time for tribals? Whether they are devoting this free time (If relevant) in any other constructive practices (e.g. commencing any new occupation, improving education etc.)
- 9.7 What is the direct impact of intervention over women? (Specify as reduction in traditional work load, women's role in O & M of intervention, opportunities for social upliftment, improve standard of living, better financial security, any change in role played by them in traditional household and agronomic practices etc.) :
- 9.8 Impact of intervention over other tribals, other organizations and Government around the area:
- 9.9 Remarks of tribals over intervention:
- 9.10 Suggestions for better performance, more installations etc.:
- 9.11 Contribution of Intervention towards Intensification of Agriculture:

QUESTIONNAIRE FOR TRIBALS

1. Name and Address of the Group :
2. Description of Intervention : (State Water Extraction Mechanism, Other Hardware, Water Source etc.)
3. Situation of Group with respect to water source, wherein intervention is placed:
4. Participants' Details:

Sl. Name	Caste/Community/Land Holding (Acres).	*Owner-ship.	Crops Grown (Indicate	Output (Tonnes/ Acres)	Investment (Rs.)	Output (Rs.)
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name &
(%)

- 1.
 - 2.
 - 3.
-

*Indicate whether own land or land on contract.

5. Whether the participants hold any land outside the influence of intervention ? If yes – indicate area, location, crops grown, period of cultivation, investment, access to any other water source, financial returns, availability of Water Extraction Mechanism etc.

6. Other Sources of Income (Indicate Source and Revenue Generated).

7. Personal Details of the Group:

Sr. No.	Name	Age	Literacy Level	Family Size	Any special skill	Delet (Rs.) Purpose
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8. Intervention Installed When?

9. Did you have knowledge about the installed WEM?

10. In pre-intervention period, what was the irrigation mechanism available to you?

11. Details about Group Dynamics:

11.1 Group formation – when, why and how?

11.2 What are the cohesive forces within the group?

11.3 Is the Group Formation – Seasonal or Annual? (If seasonal, indicate period)

11.4 Group Norm and Behaviour (Identify hierarchy, behavioural ethics, how rules are made and enforced, Provision for penalty, nature and reasons of conflict and its resolution, work

sharing patterns.

11.5 Details about any drop outs with reasons, instances of premature group disintegration with reasons, non-formation of groups in any particular year with reasons.

11.6 Weaknesses and Threats to the group as perceived by the tribals.

11.7 Fund flow channels within the group (Indicate how funds are generated – if whether monthly basis, quarterly basis, yearly basis or so, how much amount is generated, how it is expedited, who maintains the accounts, any bank balance etc.)

12. Intervention and Group:

(Primary or Supplementary Irrigation etc.)

12.1 Purpose and Duration of WEM Utilisation.

12.2 Net Area under irrigation.

12.3 Irrigated area as % of Net cultivation.

12.4 Fuel supply and consumption to run WEM (Indicate rate of diesel as Rs./L or tariff if electric motor pump, cost of procuring diesel, whether supply is timely, quantity of fuel, Net seasonal expenditure on fuel, net quantity of fuel consumed).