

Livelihoods and Landscapes Strategy Monitoring and Evaluation report: Haryana Landscape

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For more information

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Table of Contents

1. INTRODUCTION	1
Landscape Context	1
Overall Goal	4
Pilot Site Description.....	4
2. EVALUATION APPROACH AND METHODOLOGY.....	6
Interaction with Government Officials.....	7
Interaction with Project Beneficiaries	7
Participatory Field Observations.....	9
Data Analysis	10
Towards Sub-outcome 2:.....	10
Towards Sub-outcome 3.....	10
3. RESULTS	11
Outcome 2a: 30% increase in income through programme interventions recorded in 30% of the targeted households.....	11
Indicators	11
Baseline Scenario	11
Interventions and Impact	11
Distribution of Vegetable Seeds/Saplings.....	12
Horticulture	15
Medicinal Plants.....	15
Wealth Ranking	16
Outcome 2b: Increased water access for agriculture	17
Indicators	17
Baseline Scenario	17
Interventions	18
Impact	19
Outcome 2c: Income generation activities taken up by beneficiaries (vermi compost, mushroom cultivation, bee keeping, horticulture, vegetable cultivation, medicinal plants).....	20
Indicators	20
Baseline Scenario	20
Interventions	21
Impact	22
Vermicompost.....	22
Indicator.....	23
Outcome 3a: Existing benefit sharing and distribution mechanisms have greater transparency ...	24
Indicators	24
Baseline Scenario	24
Interventions	25
Impact	26
Specific case studies	28
Outcome 3b: Provision for equity in the current policy is implemented (Refers to intra-community benefit sharing).....	29
Indicators	29
Baseline Scenario	30
Interventions	30
Impact	31

Outcome 3c: Change in policy for greater share	32
Indicator	32
Baseline Scenario	32
Interventions	33
Impact	34
Outcome 3d: Participatory integrated village planning.....	35
Indicator.....	35
Baseline Scenario	35
Interventions	36
Impact	36
4. CONCLUSION.....	38

Annexures

Annexure 1 M&E table

Annexure 2 Wealth ranking

Annexure 3 Letter of Jhanda's Choe Society contribution for De-siltation of Shiv Mandir Dam

Annexure 4 Media coverage of training on vermi-compost, 2008

Annexure 5 Media coverage of training on vermi-compost and mushroom cultivation, 2009

Annexure 6 Letter of HRMS Thaska showing de-siltation work undertaken by them

Annexure 7 HRMS Thaska record showing share of landless in water from dams

Annexure 8 IGWR progress report showing forest works undertaken by FD in pilot villages

List of Tables

Table 1 Field interactions done with community at various levels for impact assessment.....	7
Table 2 Details of the number of seed packets distributed in the pilot villages.....	12
Table 3 Details of the number of vegetable saplings distributed in the pilot villages	13
Table 4 Average yield (kg/seed packet) for each vegetable seed packet (50 gm) distributed in the pilot villages	13
Table 5 Weighted average yield (kg) per sapling for each vegetables distributed in the pilot villages	13
Table 6 Average income per HH from distribution of vegetable seed packets (Indian Rupees)	14
Table 7 Average income per HH from distribution of vegetable saplings (Indian Rupees)	14
Table 8 Details of the number of horticulture saplings distributed and their survival percentage	15
Table 9 Details of beneficiaries of vermicompost.....	16
Table 10 Irrigation sources in the pilot	18
Table 11 Frequency and yield of paddy during the baseline and project end	19
Table 12 Frequency and yield of wheat during the baseline and project end	20
Table 13 Status of beneficiaries from IGAs	23
Table 14 Institutions engaged with in the four pilot villages	25
Table 15 Measuring transparency in the pilot villages.....	27
Table 16 Status of landless.....	31
Table 17 Status of Forest Department's commitment to changed policy	35
Table 18 Status of participatory integrated village planning.....	37

List of Figures

Figure 1 Map of Haryana landscape	3
Figure 2 GIS map of the pilot villages.....	5

List of Photos

Photo 1 FGD with the villagers of Pammuwala village	8
Photo 2 Interaction with SHG members	9
Photo 3 Horticulture plants distributed under LLS.....	9
Photo 4 Shiv Mandir dam at Jhanda during desiltation, and filled with water after desiltation	20
Photo 5 Vermicompost pit during construction.....	22
Photo 6 Records of SHG formed under LLS in Thaska	29
Photo 7 State level stakeholder workshop that brought together FD and community	35

1. Introduction

The present report shares the Monitoring and Evaluation findings of the Livelihoods and Landscapes Strategy (LLS) in the Haryana landscape of India. LLS has been demonstrated in a pilot site in this landscape by The Energy and Resources Institute (TERI), as partner to IUCN. The report captures results measured against identified indicators in the end of LLS scenario (2011), with the baseline (2007). A Monitoring and Evaluation (M&E) plan was prepared for the landscape, which forms the basis for capturing data reported here. The report is structured along the following lines. First, the landscape context is defined, followed by a description of the pilot. Thereafter, the approach and methodology of the evaluation are shared. Lastly, the results are reported as per the outcomes and respective indicators identified in the M & E plan.

Landscape Context

The Shivalik foothills belt in Yamunanagar District in the Indian state of Haryana was defined as the landscape for LLS, owing to similarity in ecological, social and economic conditions, which make it distinct from its neighbouring areas. The landscape covered three administrative Blocks, namely, Sadhaura, Bilaspur and Chachrauli and is marked by certain distinct characteristics. Bordered on the north by the Shivaliks, this entire area has a shared history of Joint Forest Management (JFM), and the local communities are dependent on two main forest resources, notably, water and NTFPs. The Hill Resource Management Societies (HRMSs), the local JFM Committees (JFMCs) are also distinct to this hilly forest area. Water is an important forest resource here, as this region is a rain fed area. Water from dams constructed in forest catchment areas, has provided irrigation to the local communities. To the south of the landscape lies the canal irrigated agriculture area. The agro-pastoral communities, *Gujjars*, living here have marginal landholdings. Agricultural is marginal in nature, production is low and most of the produce is consumed at the household level. The western boundary of the landscape is shared with another district in the state, and the eastern boundary with the state of Uttar Pradesh.

The LLS landscape is located in the northernmost part of Yamunanagar District in Haryana State. It contains a contiguous belt of deciduous forests on the Shivalik Hills and an adjacent belt of mostly rain-fed agricultural fields on the foothills and plains to the south. These adjacent belts of forests and farms run for about 100 km from west to east and together are less than 40 km wide, from the top of the Shivalik hills to the edge of the canal-irrigated plains in the south (see fig 1).

The forests of the Shivalik hills were once severely degraded from a long period of unregulated timber harvesting and over-grazing. Over the past more than 15 years (starting from early 1990s), these state owned forests have been dramatically restored through a programme of JFM and a concurrent change in livestock raising practices. Under the JFM programme, the benefits of forest management are shared between the local communities and the Forest Department (FD) and budgetary support has been made available through various schemes supported by the government and international donor agencies to pay for forest restoration costs. Income is generated from the sale of *bhabbar* grass, which is used in paper and rope production, and from the sale of fodder grasses for livestock. The incentive for protecting the upland forest watershed has also been enhanced through the construction of the dams in the forest that provide water for seasonal irrigation. Livestock are now mostly stall fed rather than grazed freely in the forest.

The dramatic restoration of the deciduous hill forests that was achieved during the first decade of the JFM programme (early 1990s to 2000s) is at risk of being reversed in the long-term unless benefits continue to flow from the forest under effective forest management by local institutions. The financial returns from selling *bhabbar* grass have been reduced by at least 50% following changes in local paper making technology that saw a switch to sawdust as a raw ingredient. Soil erosion in the forested catchment continues to reduce the storage capacity of the dams that are providing significant benefits to water users.

The *Gujjar* people that dominate the 31 villages in this narrow strip of land do not benefit from the canal-irrigation schemes further south because they occupy that part of the plains which is beyond the command area of the canal irrigation. In addition to sharing a common history of having been agro-pastoral nomads, the people share a dependency on the forests of the Shivalik hills. Their main economic activities are livestock raising and subsistence-oriented agriculture. In recent years, agricultural production has been boosted by new surface and ground water supplies created and re-charged respectively, by dams constructed to capture water from the forest catchments. Additional economic opportunities exist because of the proximity of the landscape to both to the District centre of Yamunanagar and the neighbouring State of Himachal Pradesh. Agricultural products such as milk and vegetables, wage labour and Eucalyptus and Poplar wood from agro-forestry initiatives on private lands are sold to these neighbouring markets. This has allowed for a shift from the domination of livestock rearing to more diversified livelihoods, based on a broader dependency on natural resources from within the landscape. Such a shift made the landscape approach of the LLS highly relevant to the existing situation and needs for rural development.

While the forests were generally in much better condition than they had been in the past, thanks to JFM, there was still more that needed to be done to harness the full potential of forests and the other natural resources in the landscape as a whole. After more than 15 years of operations, the local JFM related institutions were not functioning as well as they could; the benefit sharing arrangements between the local people and the FD, and within communities were not as attractive or effective as they are in other JFM States; and there were still some forces of degradation in the forests, such as soil erosion, the spread of invasive alien species, wild fires and un-regulated harvesting.

The desired long-term results for the landscape include ensuring the local forest management institutions work effectively and maintaining or increasing the incentives for and revenues from forest management. If this can be achieved then the standard of forest and watershed management will improve with consequent increases in the quantity of benefits and their equitable sharing within the community.

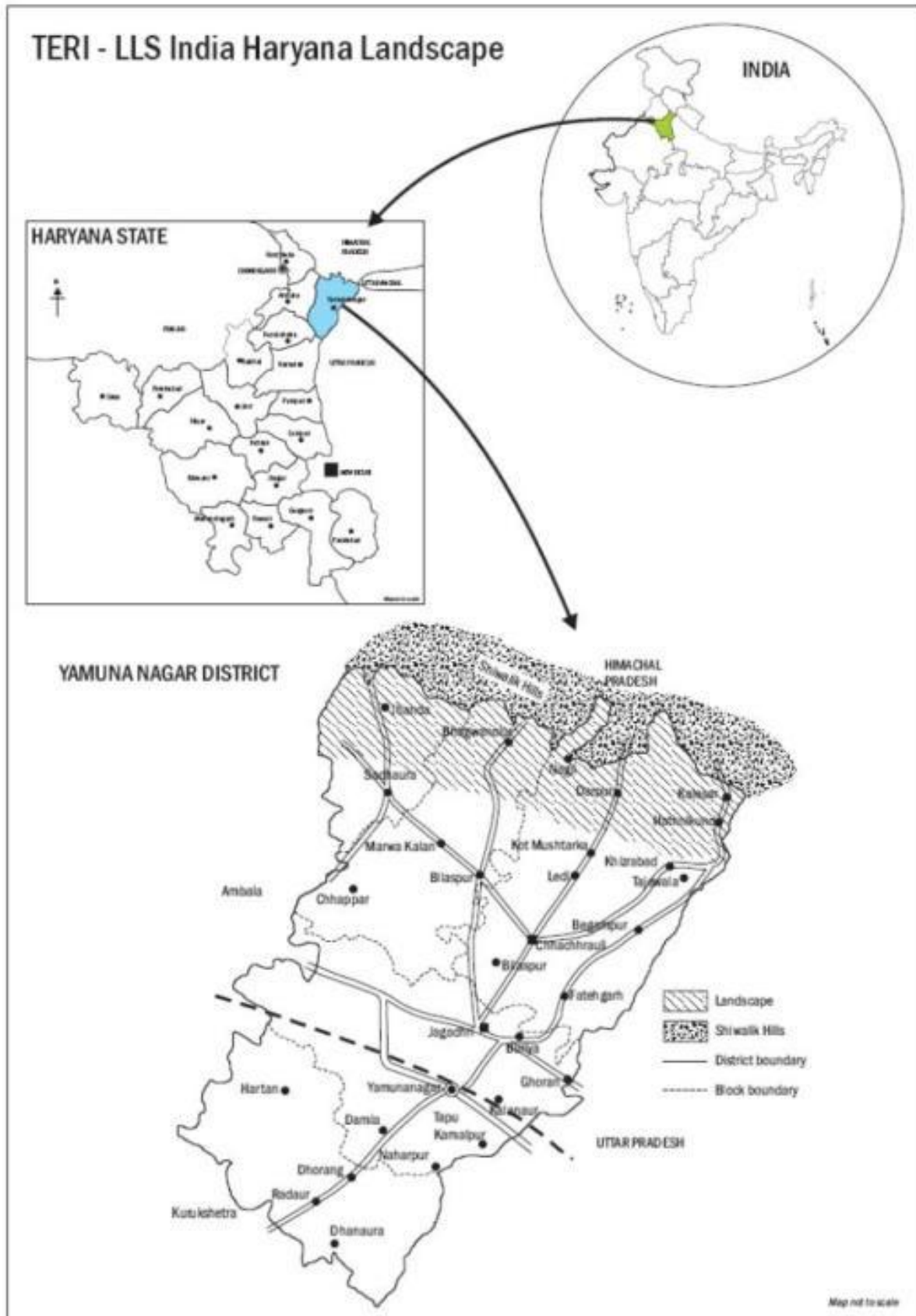


Figure 1 Map of Haryana landscape

Overall Goal

The overall goal that was defined for this landscape was as following:

“Effective, efficient and sustainable use of natural resources”

The specific objectives towards this were:

- To improve the functioning of HRMSs / JFMCs and Choe Societies, and local institutions like SHGs
- To increase incomes to the poor from sustainable natural resource management (NRM) and equitable benefit sharing
- To demonstrate successful approaches to others, which facilitate the achievement of sustainable livelihoods in the landscape, as a whole
- To promote participatory integrated village development planning and a landscape approach to NRM

In pursuing these aims, it was envisaged that a multitude of related issues that remained in the landscape would be addressed, such as:

- The low levels of effectiveness and efficiency of these local institutions in conserving natural resources and benefiting from their management. This includes problems with transparency and levels of participation in decision making and benefit sharing, as well as the failure to manage the remaining threats to forest values.
- The limited incentives for JFM, as compared to other States, as a result of the current policy in regard to sharing and controlling the benefits.
- The need to broaden the information base for planning to reflect the more diversified livelihoods now being pursued, and the need for a broader landscape approach to planning.
- Poverty and the need to diversify income generating activity options.
- Adequately recognizing and dealing with the different opportunities and interests of various sections of communities, especially the landless and other marginalized people.
- The proliferation of different local institutions for natural resource management created by various development programmes and projects.

Pilot Site Description

The pilot site selected for demonstration of the LLS interventions in the landscape is a part of a sub watershed and covers four villages, namely Jhanda, Pammuwala, Salehpur and Thaska. It is a part of the Sadhoura Block (administrative division) and Yamunanagar District and Forest Division (see fig 2).

There are a total of 637 households with a mixed population of General Caste, Scheduled Caste (SC), Scheduled Tribe (ST), Other Backward Class (OBC) and Muslims. *Gujjars* from the OBC category constitute more than 60% of the population. Muslims constitute a significant proportion of the minority population in two of the selected villages, namely, Thaska and Pammuwala. Traditionally, *Gujjars* have been nomadic cattle graziers but now they are settled and make their living from agriculture and cattle rearing. Agriculture and animal husbandry are the predominant occupations. Most of the farmers in the pilot are

marginal with landholdings between 1-5 acres. More than 40% farmers are landless. Agriculture cultivation is largely for subsistence, but sometimes the surplus produce is sold and some cash crops are also grown. All four villages have three to four small dams constructed under various schemes of the Forest Department (FD), which are very important for cultivation of vegetables and crops like wheat and paddy, as water from these dams is used for irrigation. The baseline survey shows that the average monthly household income is approximately Rs.8000. Forests constitute an important source of economic dependence with the supply of NTFPs like *bhabbar* grass, fodder grass, fuel wood and other products. Social ethos especially in *Gujjar* and Muslim communities puts a lot of restrictions on women.

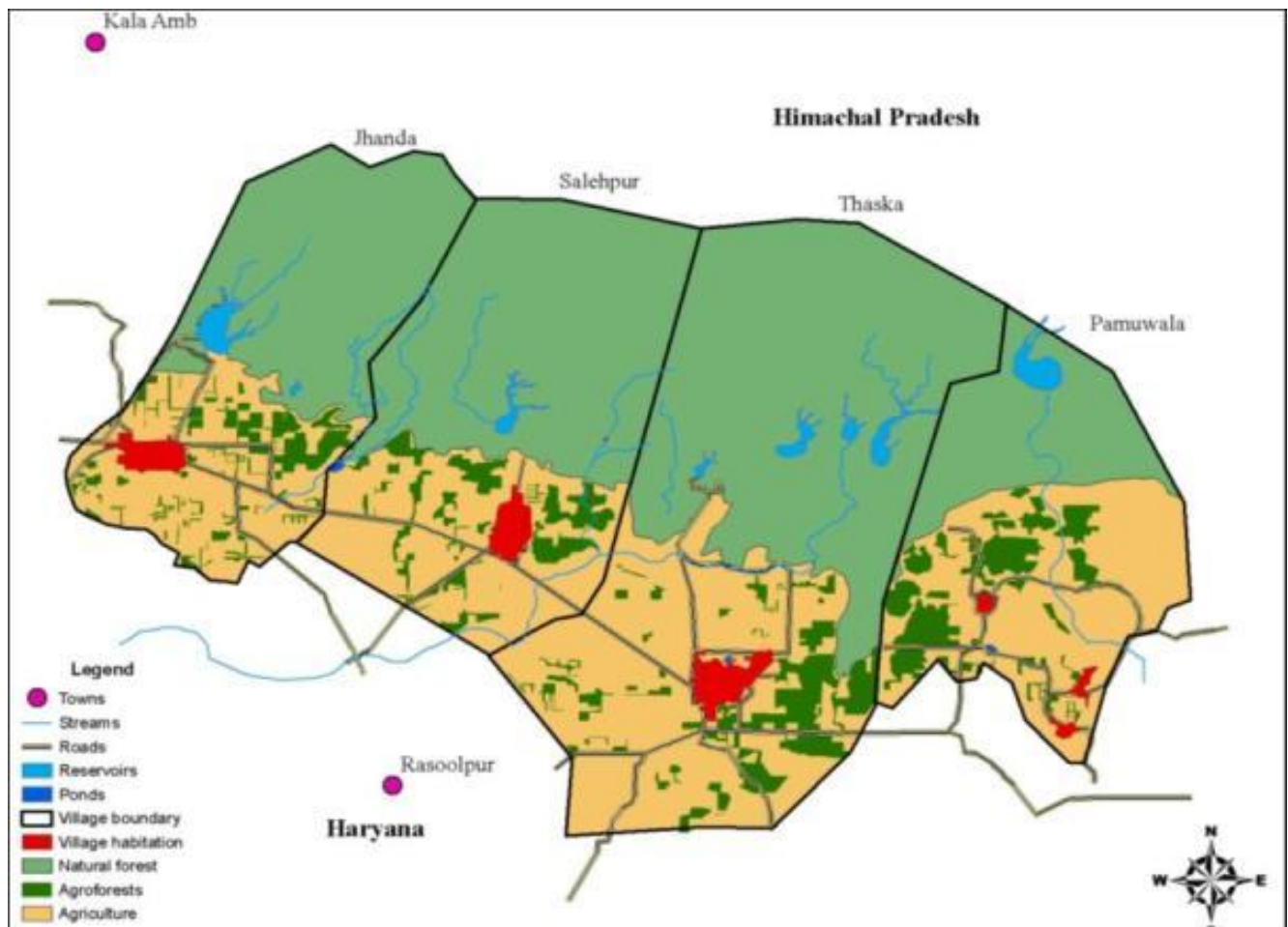


Figure 2 GIS map of the pilot villages

2. Evaluation Approach and Methodology

The impact evaluation survey was carried out at the end of LLS in 2011. The approach that was used was completely participatory. All the key stakeholders were involved and their feedback noted so as to make an assessment of the impact of the programme. This involved key person interviews with the key government officials, focus group discussions (FGDs) with different sections of the village community, community based organisations like the self-help groups (SHGs), HRMSs, and the Choe Society. Tools like checklists and semi-structured schedules were used to administer the interviews and FGDs. Besides interacting with the project beneficiaries, and government officials, biophysical interventions were also closely observed in the field to understand the status and impact of particular interventions.

The LLS site selected as a pilot in Haryana represents an action research site. A Theory of Change was developed for this site. The Theory of Change combined activities, outputs/deliverables and outcomes. The outcomes are reflective of performance, which is more immediate, and the longer-term changes. Each set of activities that would lead to an outcome was identified, as also the linkages between different activities, wherever applicable. The Theory of Change and the sub-outcomes formed the basis of developing the M&E plan (Annexure 1). A systematic and periodic method of data collection has been followed. The information provided also captures qualitative aspects and is supported with descriptive reports to capture the process.

To bring an increase in income by 30% among 30% of the targeted households / beneficiaries in the Haryana landscape, the focus was on increasing availability and accessibility of water from forested catchments; and supporting income generation activities (IGAs). Soil and water conservation works, plantation activities for forest catchment area treatment and increasing storage capacity of dams were aimed to increase water from forest catchments, which in turn result in increased agricultural production, thereby contributing to increased income of the communities in the landscape that are dependent on agriculture. The increased water availability is, however, dependent on external factors like rain, forest fires.

Towards IGAs training and capacity building support were provided to beneficiaries and by facilitating the taking up of IGAs. Women were especially encouraged through SHGs, which also empowered them and supported them in gaining collective voice that is important for them to contribute in community decision-making.

To establish more equitable benefit sharing arrangements, the aim was to work both at policy, as well as field level. At policy level, the aim was to initiate the process for bringing change by preparing a revised framework suggesting greater share of benefits and control of funds to the communities. This was done by undertaking intensive advocacy so that the key decision makers initiated the process for policy change. At field level LLS engaged with local institutions to strengthen their daily functioning in order to make the existing distribution mechanism (especially of water) effective and also improve transparency in the activities of FD and local institutions. The key external factor was the willingness and cooperation of the communities and FD.

Improved participatory integrated planning processes were advocated in order to have more synergies between developmental activities and ensure more efficient utilization of resources, as well as, so that communities had a greater say on the development activities undertaken in their villages.

Interaction with Government Officials

Discussions were held with the senior forest department officials, namely, Principal Chief Conservator of Forests (PCCF), Chief Conservators of Forests, Divisional Forest Officer (DFO), Yamunanagar, and also with Additional Deputy Commissioner (ADC), Yamunanagar and Commissioner, Shivalik Board. Feedback on the impact of the LLS was sought. Other than the qualitative feedback received, TERI team also tried to understand how effectively they had put to use the various reports (integrated village plans, for each pilot village) in their departmental schemes.

The main problem faced for gaining effective government support in LLS execution has been the frequent transfer of key government officials. During the entire LLS period the PCCF has changed five times, the DFO has changed three times, the Range Forest Officer (RFO) four times and the ADC, Yamunanagar has changed five times. This meant that each time there was a change in staffing; the initial momentum gained due to support and trust built with their predecessor had to be redone again. This involves time and resources.

Interaction with Project Beneficiaries

The impact visits to the LLS pilot villages were conducted with an objective of collecting primary data and observing the interventions directly. In order to achieve this objective, TERI team had intensive interactions with the communities at various levels using different methods. Village level meetings were organised to get a feedback on the overall impact of the interventions and support activities. The re-measuring of wealth ranking exercise was also conducted during the village meetings.

FGDs were conducted mainly with the SHG members, members of HRMS and Choe Society. Individual interactions with the beneficiaries of the different IGAs were also conducted. A sample of the beneficiaries of each of the interventions was randomly selected for detailed interview. The following table 1 gives the details of the interaction with the beneficiaries at various levels.

Table 1 Field interactions done with community at various levels for impact assessment

Type of interaction	Total No. of beneficiaries	No. of beneficiaries interviewed		
		Male	Females	Total
Focus Group Discussion				
• With the villagers		45	30	75
• With SHG Members		-	55	55
Participatory field observations		2	5	7
Individual interviews		-		0
• Distribution of horticulture plants	69	-	29	29
• Distribution of vegetable seeds/ saplings	117	-	24	24
• Medicinal and Aromatic Plants (<i>Aloe vera</i> and turmeric)	5	2	3	5
• Vermicompost	3	-	2	2

Type of interaction	Total No. of beneficiaries	No. of beneficiaries interviewed		
Beneficiaries of Shiv Mandir Dam, Jhanda	146	8	1	9
• Large land holders		3	-	
• Medium		3	-	
• Small-marginal land holders		2	1	
HRMS, Thaska				
• Landless households		1	-	1

Source: Primary Survey, TERI, 2011

The major objective of organising individual interactions and FGDs with the communities was to report the developmental activities conducted under LLS, awareness level of the communities towards LLS, assess their participation level, document perceptions on benefits accrued from various interventions and understand if there was any gap in implementation.



Photo 1 FGD with the villagers of Pammuwala village

Separate FGDs were conducted with all the SHG members. The FGDs were conducted to understand the functioning of SHGs, livelihood generation activities and other related issues.



Photo 2 Interaction with SHG members

Participatory Field Observations

In order to observe the success and impact of the different interventions conducted in arable and non-arable lands, the TERI team conducted on site visits. In addition, field discussions were held to understand the capacity of the community to continue with the particular interventions beyond the project period.



Photo 3 Horticulture plants distributed under LLS

Data Analysis

The field data thus collected was analysed to report the changes due to LLS. As far as possible, quantitative data was generated for all the interventions, however in most cases the qualitative assessments were also done to report the impact of the interventions, such as changes at institutional level, policy outcomes, awareness generation among the villagers, issues of various stakeholders such as landless and awareness on the post project scenario. Such an analysis helped in identifying the success, including gaps and weaknesses of the project.

The field data collected was analysed to comprehend the impact against each of the key sub-outcomes for the Haryana landscape, using the monitoring and evaluation framework designed to monitor it. These outcomes and the key indicators to measure them are as following:

Towards Sub-outcome 2:

- a. 30% increase in income through programme interventions recorded in 30% of the targeted households
- b. Increased water access for agriculture
- c. Income generation activities taken up by beneficiaries

Towards Sub-outcome 3

- a. Existing benefit sharing and distribution mechanisms have greater transparency
- b. Provision for equity in the current policy implemented (refers to intra community benefit sharing)
- c. Change in policy for greater share
- d. Participatory integrated village planning

3. Results

Outcome 2a: 30% increase in income through programme interventions recorded in 30% of the targeted households

Indicators

- Additional income (cash and non-cash) from LLS interventions amongst targeted households
- Changes recorded in wealth ranking

Baseline Scenario

The livelihood pattern in the villages at pilot site in Haryana is largely marked by subsistence farming. Wheat and rice are the main crops cultivated in the villages, and about 50% of the crop produced is sold. Cash crops like sugarcane and paddy are cultivated based on access to and availability of water for irrigation. Access to irrigation is either in the form of water drawn from forested catchments through water storage infrastructure (dams) or use of tube wells. Access to this water is an important concern for cropping and also reflects community's dependence on forest resource (water). Agricultural activities are also closely linked with dependence on livestock. Horticulture tree species like mango, guava and lemon are found in homestead gardens. Most households also collect fodder and grass from the forest, largely for subsistence. None of the community members were involved in alternate IGAs.

Interventions and Impact

Interventions for enhancing livelihood opportunities in the pilot villages were aimed at facilitating the communities to avail the different government schemes. Hence more focus was on building partnership with the concerned line departments and the communities, through continuous visits to the concerned departments, informing communities (especially panchayat members, other community based organizations like the HRMS/Choe Society, SHGs, and also individual community members etc.) by organizing a series of meetings and hence making them aware of different government schemes/ programmes, organizing capacity building programmes on identified income generation interventions, and facilitating exposure visits. Through LLS, TERI has made efforts to bridge the gap between the community and the government departments and as a liaison worked to bring them closer. The approach adopted for facilitating the different additional livelihood interventions in the pilot villages is discussed below.

IGAs identified based on local needs and suitability included vegetable cultivation, horticulture, mushroom cultivation, vermicompost and bee keeping. A preliminary need assessment on different income generation options was done by organizing village level meetings in all the pilot villages. This was matched with the different ongoing schemes of the government, so that those could be dovetailed into LLS. Based on these assessments, several interventions like distribution of improved variety vegetable seeds/ planting material, horticulture plants and alternate IGAs like vermicompost farming, cultivation of medicinal plants were taken up to facilitate communities in the pilot villages to increase their income. Most of the beneficiaries selected were affiliated SHGs. It was important to identify the right beneficiaries especially with respect to the IGA as its sustainability was

dependent on the interest shown by the beneficiary and resources (e.g. land) available with him/her. Hence, those that showed more eagerness to participate were selected. In this case the SHG provided a good platform to reach out to the community. Dovetailing with the ongoing government schemes was done for all livelihood enhancement interventions in the pilot villages.

Contribution of 40% (from the beneficiary) and 60% (from TERI) for various interventions was proposed and agreed upon by the community members. Beneficiary contribution is critical from the point of sustainability and to encourage ownership of work being done.

The focus of the activities was on linking the beneficiaries with the existing programmes of the government departments. Farmers and members of SHGs have been directly linked with block level offices of the Horticulture Department, the State Seed Cooperative Society and Agriculture Department for obtaining quality seeds of vegetables, planting material for horticulture plants besides providing fertilizers free of cost or at a subsidized rate.

The different interventions adopted in the pilot villages to aid improvement in livelihood opportunities are discussed in detail below.

Distribution of Vegetable Seeds/Saplings

Preliminary survey was carried out to estimate the number of beneficiaries and the quantities of vegetable seeds/saplings required. Contacts with the block level offices of the Horticulture Department, the State Seed Cooperative Society and Agriculture Department were established for obtaining the required amount of improved variety seeds/planting materials of vegetables. Fertilizers were also obtained from those departments either for free or at a subsidized rate. Seeds/sapling of improved varieties of okra, radish, ridge gourd, tomato, bitter gourd, pumpkin and chillies were distributed. 119 Households (20 HH in Jhanda, 35 HH in Pammuwala, 25 HH in Salehpur and 39 HH in Thaska) benefitted from the distribution of vegetable seeds/ saplings. Tables 2 and 3 below give details of vegetable seed packets and saplings distributed.

Table 2 Details of the number of seed packets distributed in the pilot villages

	Onion	Okra	Radish	Ridge Gourd	Tomato	Bitter gourd	Pumpkin	Spinach	Coriander	Carrot	Turnip
Jhanda	0	5	14	5	1	7	1	6	8	2	3
Pammuwala	160	13	7	0	4	0	0	3	3	0	3
Salehpur	0	1	3	1	0	1	0	2	2	0	0
Thaska	20	16	7	2	0	16	0	6	7	6	6
Total	180	35	32	8	5	24	1	17	20	8	12

Source: Primary Survey, TERI

Table 3 Details of the number of vegetable saplings distributed in the pilot villages

	Green Chilli	Red Chilli	Capsicum	Tomato
Jhanda	290	580	370	244
Pammuwala	690	1600	670	370
Salehpur	100	25	25	25
Thaska	900	2930	950	85
Total	1980	5135	2015	724

Source: Primary Survey, TERI

21% of the beneficiaries were interviewed at the end of the project to review the impact of the activity. It was found that beneficiaries have become aware of the different government schemes and the departments that they could approach in future for support and supply of high yielding and improved varieties of vegetable seeds/ saplings. Table 4 shows the average yield of each vegetable seed pack in the pilot villages.

Table 4 Average yield (kg/seed packet) for each vegetable seed packet (50 gm) distributed in the pilot villages

	Okra	Radish	Tomato	Bitter gourd	Pumpkin	Spinach	Coriander	Turnip	Ridge guard
Jhanda	2.67	2.50	0.29	4.33	1.71	-	-	-	10.00
Pammuwala	3.20	1.70	-	-	-	2.00	1.00	1.50	-
Salehpur	0.00	3.00	0.00	3.00	0.00	1.25	0.50	-	0.00
Thaska	1.70	-	2.00	1.75	-	-	-	-	-
Average	1.89	2.40	0.76	3.03	0.86	1.63	0.75	1.50	5.00

Source: Primary Survey, TERI

The average yield per sapling of red chillies, capsicum, onion, and tomato across the pilot villages is 0.19, 0.22, 0.01 and 0.25 kg/sapling. The detailed information on yield per sapling of each of the vegetables distributed in the pilot villages is given in table 5.

Table 5 Weighted average yield (kg) per sapling for each vegetables distributed in the pilot villages

	Red Chillies	Capsicum	Onion	Tomato
Jhanda	0.21	0.23	0.03	0.38
Pammuwala	0.14	0.29	0.00	0.23
Salehpur	0.21	0.23	0.03	0.40
Thaska	0.20	0.13	0.00	0.00
Average	0.19	0.22	0.01	0.25

Source: Primary Survey, TERI

The additional income per household from distribution of vegetable seed packets and saplings based on the sample survey during the final impact evaluation is given in tables 6 & 7 respectively. Income from distribution of vegetable seed packets/saplings has been calculated by multiplying the yield of seed packet or saplings distributed by the present price of the vegetable at the time of the impact evaluation study.

The average total income per household from distribution of seed packets is Rs 1730.00, Rs585.00, Rs210.00 and Rs800.00 for Jhanda, Paummuwala, Salehpur and Thaska respectively. The detailed information on the average income per household for each of vegetable seed packets distributed in the pilot villages is given in table 6.

Table 6 Average income per HH from distribution of vegetable seed packets (Indian Rupees)

	Okra	Radish	Tomato	Bitter gourd	Pumpkin	Spinach	Coriander	Turnip	Ridge guard	Total
Jhanda	160	100	40	390	240	-	-	-	800	1730
Pammuwala	320	85	-	-	-	80	40	60	-	585
Salehpur	-	30	-	180	-	-	-	-	-	210
Thaska	340	-	40	420	-	-	-	-	-	800

Source: Primary Survey, TERI

The average total income per household from distribution of seed saplings is Rs 4900.00, Rs 700.00, Rs 885.10 and Rs 80.00 for Jhanda, Paummuwala, Salehpur and Thaska respectively. The detailed information on the average income per household for each of vegetable saplings distributed in the pilot villages is given in table 7.

Table 7 Average income per HH from distribution of vegetable saplings (Indian Rupees)

	Red Chillies	Capsicum	Onion	Tomato	Total
Jhanda	300	140	3820	640	4900
Pammuwala	1040	460	0	600	2100
Salehpur	0	0	0	0	0
Thaska	40	40	0	0	80

Source: Primary Survey, TERI

Households that have received seeds for vegetable crops and saplings record an increase in average agricultural income of Rs 831 and Rs 2601 per season respectively. The average net agricultural income for the four pilot villages is Rs 13839 per annum (as recorded in the baseline survey); thus agricultural incomes of beneficiary households for seeds and saplings increase by 6% and 19% respectively. With about 20% of households in the project villages benefitting from this intervention, this provides an early indication of direct project impact. We note that the impact is captured at this stage for one season and it is expected that when benefits are captured over several cropping seasons, they would be significantly higher. However, we do not consider here the alternative agricultural use of the land being used for the seeds and saplings and in this sense the income increases are not strictly incremental.

Horticulture

Distribution of improved varieties of horticulture plants like guava, lemon, sapodilla, mango and papaya was done with the help of the District Horticulture Department, Yamuna Nagar, Haryana. Approximately 350 plants (guava 45 saplings, lemon 60 saplings, sapodilla 56 saplings, mango 95 saplings and papaya 94 saplings) of horticulture saplings were distributed. The number of households that benefitted from distribution of horticulture plants was 69 (15 HH in Jhanda, 13 HH in Pammuwala, 20 HH in Salehpur and 21 HH in Thaska).

35% of the beneficiaries were interviewed at the end of the project to review the success of the horticulture plants distributed. Since it is too early to calculate the income derived, so the survival percentage was measured. The survival percentage of guava, lemon, sapodilla, mango and papaya at the time of the impact evaluation survey was 86%, 82%, 78%, 68% and 76% respectively. Table 8 details the number of each of the horticulture saplings distributed and their survival percentage during the impact evaluation survey.

Table 8 Details of the number of horticulture saplings distributed and their survival percentage

	Guava	Lemon	Sapodilla	Mango	Papaya
Jhanda	2	9	6	13	32
Pammuwala	9	25	28	29	32
Salehpur	14	7	6	34	11
Thaska	20	19	16	19	19
Total	45	60	56	95	94
Survival percentage (%)	86	82	78	68	76

Source: Primary Survey, TERI

Medicinal Plants

Distribution of medicinal plants like *Aloe vera* and turmeric was also taken in the pilot villages.

Aloe Vera

For the first time cultivation of *Aloe vera* was introduced in the pilot villages. Plants were provided by the Horticulture Department on subsidized rates. Approximately 1800 plants were distributed to three households (a total of 5400). The plants were growing very well but however during the heavy monsoon rains of 2010, most of these plants were damaged due to water logging. At the time of the impact evaluation survey most of the *Aloe vera* plants distributed were damaged.

Turmeric Cultivation

After intensive awareness generation followed by a market survey around one quintal planting material was provided by the Horticulture Department. Two farmer families in the pilot villages were provided with turmeric root suckers to multiply in their field.

During the final impact evaluation survey it was found that the turmeric plants were healthy and growing well.

Apiculture

Information and knowledge on bee keeping was shared with the community members. Linking with the District Horticulture Department to avail of schemes for apiculture was explored and worked out. However during the project nobody came forward to accept this as a potential alternate source of income hence, this activity was not implemented. Communities were informed on the schemes that they could avail if they were interested in this activity in future.

Vermicompost

A total of six SHG members were trained on vermicompost farming, out of which three adopted it as an alternate income generation activity. They had received five days training from three staff of *Krishi Vigyan Kendra* (local Agricultural Research Institute) at Jagadhri (Yamunanagar, District headquarter) for which they had received certificates. The percentage of beneficiary contribution at Jhanda, Pammuwala and Thaska were 52%, 73% and 47% respectively. The beneficiary contribution for the recipient at Pammuwala is the highest (73%) as compared to the other two beneficiaries as the size of the vermicompost pit for this beneficiary is larger as compared to the other two beneficiaries. Table 9 gives details of the beneficiaries of vermicompost.

Table 9 Details of beneficiaries of vermicompost

S. No.	Beneficiaries	Name of the pilot village	TERI contribution (Indian Rupees)	Beneficiary contribution- in kind (Indian Rupees)	Percentage of beneficiary contribution (%)
1	Ranjit	Jhanda	2620	1356	52
2	Raj kumar	Pammuwala	2620	1910	73
3	Banto Devi	Thaska	3096	1440	47

Source: Primary Survey, TERI

At the time of the impact evaluation survey it was found that all the three vermicompost pits were functioning. All the beneficiaries were using the vermicompost mainly in their own agriculture fields. They were also using vermicompost instead of DAP in their fields, which has resulted in a saving of Rs 540 per acre (that was earlier being spent on DAP).

Wealth Ranking

A detailed wealth ranking exercise was carried out in the early phase of the project (2009) through a participatory approach. The objective of the study was to know the status of wealth of all the households in the four pilot villages. It was found during the survey that the sources of livelihood were recognised by the village community as the main indicators and markers of wealth of a household. The primary sources of income of 70% of the households were agriculture and livestock. Each village was divided into four wealth categories viz. rich, average, poor and very poor on the basis of wealth indicators except for Pammuwala Upper village which is divided into three categories (rich, average and poor) (see Annexure 2).

Wealth ranking exercise was conducted again at the end of the project to see if there was any change in number of families grouped under different wealth categories due to the project impact as compared to the baseline survey. It is important to note here that the scale of LLS

project interventions has been mostly in the form of demonstration activity (being in the nature of action research), hence vast changes in the income of the households was not anticipated. Moreover the change in wealth of the household is largely dependent on other externalities which are outside the scope of the project. Also two years (since the baseline survey) is practically a very short duration to observe any discernable changes in wealth of a household.

During the final impact evaluation survey, a village meeting was called and communities were briefed and reminded on the criteria that they had used earlier to group each individual household into different wealth categories. The entire wealth ranking data was then presented to see if the wealth status of an individual household had changed since the baseline assessment was conducted. Suggested changes that emerged during the presentation were incorporated. It was found that there was an addition of one household in the rich household category at Jhanda, due to the migration of that household in the previous year. The wealth ranking for rest of the households in all the four villages remained the same.

Outcome 2b: Increased water access for agriculture

Indicators

- Irrigation:
 - Cultivated area under irrigation, or,
 - No. of rotations of irrigation received by beneficiary households for a crop
- Production of crops in irrigated area

Baseline Scenario

Agriculture is the primary source of income and, hence, irrigation is an important requirement for the communities. There have been several government programmes implemented in the pilot villages that aimed at providing improved irrigation facilities, yet the community continues to face irrigation problems. For better crop yields and hence in order to develop good agricultural practices, proper management of ongoing irrigation schemes needed to be adopted. According to the community members, a number of problems plagued the ongoing irrigation programmes. These related to lack of adequate pipelines from forest dams to the agricultural land, fixed norms for water distribution, irregular electricity supply to run the pump set, and so on.

The dams constructed in the forest catchment areas to store rain water and run off, to improve the ground water table as well as for irrigation of agricultural land, have been extremely useful in this landscape. Water from forest dams is the more significant source of irrigation. However, a large percentage of the agricultural land still remains rain fed. Even the farms that are irrigated do not necessarily receive the maximum irrigation that they should. The frequency and the intensity of irrigation are also low. This is due to a number of reasons. In the case of dams, catchment areas from where water gets harvested to be stored in the dams, need to be treated. The capacity of the dams needs to be increased. There is a huge amount of silt in the dams, thereby reducing the storage capacity. Lastly, the infrastructure available (pipelines) to draw water from the dams, to distribute water leaves potential for improvement.

There are two main sources of irrigation, namely, forest dams and private tubewells. Rice, wheat, and sugarcane are the main crops that require irrigation. The price of water from the dams is close to Rs 20/hr (as commonly decided by the village communities every year). The rates for using water from the private tube wells range between Rs 40– 50/hr, which is much higher than the rates of water from dams. Table 10 below gives the status of source of irrigation in the pilot villages.

Table 10 Irrigation sources in the pilot

Parameters	Forest dams	Private tubewells	Govt. tubewells	Total
Pammuwala	1	5 (4)	—	6
Thaska	3 (3)	20 (20)	—	22
Salehpur	2 (2)	5 (5)	—	7
Jhanda	2 (1)	12 (12)	1 (1)	15

Source: Primary survey, PSI and TERI, 2009 (The number in parenthesis indicates the functional water sources during survey conducted in 2009 to serve as a baseline)

Interventions

The different activities taken up under LLS towards better management and use of water from forested catchments are as following:

- A total of 1,85,000 (220x210x4 ft) cu. ft. area of desilting from the largest dam in village Jhanda, the Shiv Mandir dam, was undertaken. With this approximately 5, 96, 13,000 litre additional water has been made available in the dam. This intervention has been carried out with the collaboration of TERI and local village institution, the Choe Society (a local registered society which manages the natural resources of the village). Both these partners were involved in the decision making, planning, and implementation, with each having a share of contribution towards the activity. Levelling and plantation at the top of this dam was done for checking of soil erosion. 40% of the cost of the work was met partly by the community and 60% by TERI from project funds (see Annexure 3).
- De-siltation work for clearing the haudis (i.e. the outlet for water supply from the dam) of three dams in the pilot was done with the active involvement of local institutions (including in planning and implementation).
- Forest catchment area was treated. 900 contour trenches to improve yield of water were dug in the catchment areas of 5 dams in the pilot. About 12,360 multipurpose plant species such as Bamboo (9900), Kharik/Celtis australis (1000), Su-babool/Leuceana leucocephala (1000), Silver Oak/Grevillea robusta (100), Karanj/Pongamia pinnata (15), Arjuna/Terminalia arjuna (25), Bahera/Terminalia balerica (25), Harar/Terminalia chebula (25), Awanla/Emblica Officinalis (25), Kachnar/Bauhinia purpurea (15), Neem/Azadirachta indica (15), Teak/Tectona grandis (15) and Ghrit Kumari/Aloe vera (200) were planted in the forest catchment area. The species were identified based on local knowledge of the community members, local availability and suitability.
- LLS has made continuous efforts towards strengthening the local NRM institutions. These facilitation efforts have aided the functioning and strengthening of the HRMS, in the village Thaska, which has carried out de-siltation of one of its larger village dams with the support of the Forest Department.

Impact

For the impact evaluation of the status of water availability for irrigation a sample survey was conducted at the end of the project. Beneficiaries of the Shiv Mandir Dam at Jhanda were selected as this was the dam where TERI had assisted in desilting of the dam, hence the interventions carried under the LLS project interventions would have some bearing on the impact of water availability for irrigation from the dam. To compare the impact on water available for irrigation across different land holding categories a random of three farmers having large (> 4 acre), medium (1-4 acre) and small (<1 acre) land holdings were interviewed for detailed analysis.

The frequency and yield of paddy and wheat which are the major crops dependent on irrigation were recorded during the impact evaluation study. 2011 was considered as the project end year for evaluating the impact for paddy while 2010 was considered for wheat since it is a rabi crop and it was too early to determine the yield of wheat during the impact evaluation survey which was conducted in August 2011. 2008 was considered as the baseline year.

The de-siltation was carried out in 2009. However, during the impact evaluation survey at the end of the project the beneficiaries noted that the dam continued to provide increased water. The biggest benefit that was noted was increased water for the second / winter crop as compared with the baseline period. After de-siltation the farmers within the command area of the dam received 3 to 4 assured rounds of water for paddy and wheat respectively. For paddy the frequency of irrigation during the baseline and project end was 3 and 7 respectively. For the *rabi* crop, majority of the farmers across all categories were not receiving any water from the dam during the baseline, however due to de-siltation, farmers have received 3 irrigations for the second crop, i.e. wheat during the end of the project. The average yield (quintal/acre) of paddy during the baseline and project end was 12.11 and 22.51 respectively, while for wheat it was 6.07 and 12.20 quintal/acre respectively (see tables 11 and 12 for details).

Table 11 Frequency and yield of paddy during the baseline and project end

Categories of farmer	Baseline		Project end	
	Frequency of irrigation (Nos)	Yield (Qtl/ acre)	Frequency of irrigation (Nos)	Yield (Qtl/ acre)
Large land holding farmers (>4 acre)	3	10.60	7	17.00
Medium land holding farmers (2-4 acres)	3	12.40	7	17.20
Small land holding farmers (<1 acre)	3	13.33	7	33.33

Source: Primary Survey, TERI

Table 12 Frequency and yield of wheat during the baseline and project end

Categories of farmer	Baseline		Project end	
	Frequency of irrigation (Nos)	Yield (Qtl/ acre)	Frequency of irrigation (Nos)	Yield (Qtl/ acre)
Large land holding farmers (>4 acre)	0	7.00	3	12.33
Medium land holding farmers (2-4 acres)	0	5.87	3	12.27
Small land holding farmers (<1 acre)	0	5.33	3	12.00

Source: Primary Survey, TERI



Photo 4 Shiv Mandir dam at Jhanda during desiltation, and filled with water after desiltation

Outcome 2c: Income generation activities taken up by beneficiaries (vermi compost, mushroom cultivation, bee keeping, horticulture, vegetable cultivation, medicinal plants)

Indicators

- No. of beneficiaries taking up IGAs
- No. of beneficiaries continuing to engage with IGAs
- No. of people benefitting from training on IGAs

Baseline Scenario

The economy in the pilot villages is subsistence driven. Agriculture and livestock rearing are the main occupations. In recent times, dependence on wage labour has also increased. A lack of entrepreneurial skills in the local community can be seen as a contributing factor towards this. Even though there has been an improvement in the income and livelihoods of the local

community over the past 20 years, also leading to some amount of diversification (agro-forestry), the enhancement of livelihoods remained to be addressed adequately. There is a potential for enhancement within the existing livelihood options, as also to venture into additional or substitute activities.

Interventions

- Beneficiaries especially women (of SHGs) and marginalized were trained and their capacities built on various Income Generation Activities (IGAs).
- A combined introductory training was given to 40 community members by scientists from the local Agricultural Research Institute and line departments for the following income generation activities: mushroom cultivation, vermi-compost and dairy development (Animal Husbandry)
- Exposure visit was organized for women SHG members to demonstrate mushroom cultivation and vermi-compost making. About 10 members of different SHGs participated in the visit. The main objective of the visit was to introduce the members to other SHGs in the landscape (beyond the pilot) and their ongoing activities for self-dependence.
- Short duration (one to two day) and long duration (week long certificate courses) intensive trainings on vermi-composting, mushroom cultivation
- 5 day certificate course on “Vocational training on vermi-compost technology and production” conducted in association with local Agriculture Research Institute. The training also highlighted the different schemes of the Government departments, and provision of subsidy for IGAs like vermi-composting, bee keeping, mushroom cultivation, dairy development, cultivation of fruits, etc. (Annexures 4 and 5).
- Access to information facilitated for the community members. The knowledge and awareness of these, esp. among the poor and marginalized, has acted as an incentive for the communities to evince more interest in taking up IGAs
- Tie-ups were made with local Agricultural Research Institute. Agriculture and Horticulture Departments for imparting training courses and exposure visits in the form of certificate course for mushroom cultivation and vermi-compost etc.
- Tie-ups were made with government departments for subsidy provision and also with local Agricultural Research Institute for technical support for enterprise development around these activities.
- Other government schemes for tie up for promoting IGAs were identified.
- Training and capacity building on IGAs was undertaken in collaboration with Agriculture and Horticulture Department and local Agricultural Research Institute.
- Regular meetings and consultations with government departments to align with them for various activities.
- Knowledge sharing done with local communities of existing programmes to ensure maximum utilization, and using collaborative approach. Schemes availed by a few beneficiaries.

Impact

The benefits from IGAs have been captured in the section above (see Outcome 2a). Some of the additional and more perceptible changes are captured here.

Vermicompost

Two months after the start of a pit, vermicompost is ready. Beneficiaries cited that on an average, in a year they are able to get at least 6 rounds of compost, with 4/5 quintals of compost being generated in each round. The beneficiaries are using the compost at present for self-consumption, in their own fields, and noted perceptible changes in the crops grown using this compost. For example, vegetables (onion, raddish, chillies) were better in taste. Raddish grown with compost proved to be softer for as long as 6 months; whereas what was grown with the use of urea they reported used to go bitter very fast. The ease of maintenance of vermicompost was also highlighted. It only needs regular uptake of water.

Beneficiaries engaged in vermi-composting activity are making use of the knowledge received in the training course. Two of the beneficiaries cited for example, using vermicompost instead of DAP in their fields, as per the knowledge received in the training. This has also resulted in a saving of Rs 540 per acre. Cost saving, thus, is yet another benefit.

They are also using vermicompost for paddy after germination (and before sowing), to maintain the soil moisture content. This again, demonstrates their putting into practice the knowledge received at the training, which has made them see visible results – in terms of savings, better crop production (taste) etc.



Photo 5 Vermicompost pit during construction

Table 13 below shows the status of beneficiaries from IGAs. 119 beneficiaries (20 in Jhanda, 35 in Pammuwala, 25 in Salehpur and 39 in Thaska) benefitted from the distribution of vegetable seeds/saplings. All the beneficiaries were reported to have cultivated the received seeds/saplings. The number of beneficiaries from distribution of horticulture plants was 69 (15 in Jhanda, 13 in Pammuwala, 20 in Salehpur and 21 in Thaska). All the 69 beneficiaries were reported to have cultivated the received plants. Approximately 1800 Aloe Vera plants

were distributed to three beneficiaries (a total of 5400). The plants were growing very well but however during the heavy monsoon rains of 2010, most of these plants were damaged due to water logging. Two farmer families in the pilot villages were provided with turmeric root suckers to multiply in their field. During the final impact evaluation survey it was found that the turmeric plants were healthy and growing well.

Table 13 Status of beneficiaries from IGAs

Indicator	Vegetable cultivation	Horticulture	Vermi-compost	Medicinal Plants (Aloe Vera and turmeric)
No. of beneficiaries taking up IGAs	119 beneficiaries received support for vegetable cultivation (received seeds/saplings)	69 beneficiaries received support for horticulture (received plants)	3 beneficiaries received support for construction of vermi-compost pits	5 (total); 3 beneficiaries received support for Aloe Vera cultivation; 2 for turmeric cultivation
No. of beneficiaries continuing to engage with IGAs	119 beneficiaries engaged in cultivation of seeds / saplings received	69 beneficiaries engaged in planting these	3 beneficiaries continue to successfully engage with vermi-compost	3 beneficiaries of Aloe Vera cultivation continued to engage. However, success rate was low, due to external factors. 2 beneficiaries of turmeric cultivation continue to engage successfully.
No. of people benefitting from training on IGAs	40 beneficiaries received information about services offered by Agriculture and Horticulture Departments at an Introductory training	40 beneficiaries received information about services offered by Agriculture and Horticulture Departments at an Introductory training	6 (received 5 days certificate training course in vermin-compost))	3 (for Aloe Vera Exposure Visit)

Source: Primary Survey, TERI

Outcome 3a: Existing benefit sharing and distribution mechanisms have greater transparency

Indicators

- % of people who attend meetings
- % of women who attend meetings and % of women who attend feel that they have participated
- % of people who attend and know the revenue generated and how the funds have been allocated
- % of people who feel that the decisions were participatory

Baseline Scenario

The landscape and its institutions are facing problems for improvement of resource management. Much had already been achieved in forest restoration and management and livelihood diversification in the last decade, during the period of JFM. JFM has helped form institutions and also laid out rules for their functioning. At the baseline of LLS, it was realised that after nearly over a decade of their existence these institutions had weakened and were not functioning optimally. The resultant effects were seen on the status of the resources, as these institutions were primarily responsible for the management of the forest resources and also the services and benefits accessed. There were various issues related to functioning of institutions that needed attention like holding of regular meetings, participation in meetings, dissemination of information / communication about meetings, maintenance of records (minutes of meetings, accounts and transactions). Transparency was an issue.

LLS in this landscape was working on the more difficult issues of integration, coordination, transparency and equity. The task of deeply understanding the nature of institutions, developing indicators for institutional functioning, and understanding how to change entrenched behaviours and dealing with power dynamics is challenging. In other words, the changes sought by the LLS in this landscape are of a different and more complex nature than those that were facilitated over the last more than 15 years. It was unlikely to aim that all the objectives of LLS would have been achieved by 2011, but it was expected that some successful approaches and changes were achieved in the pilot within the life of the LLS. These are documented in the section below. The baseline figures for some of the indicators used to look at improved transparency are shown as following:

- 5% to 10% of people attended meetings
- Less than 1% of women attended meetings; and none of the women who attended felt that they had participated
- 30% to 40% of people who attended knew the revenue generated and how funds were allocated
- Less than 5% of people felt that the decisions were participatory

The role of women in decision-making in public fora has been limited by traditional social practices. The JFMCs (HRMSs) in the pilot had also acknowledged that they needed to address the issue of effective participation of women in decision-making. In recognition of

this, mechanisms had to be used to obtain and deliver the knowledge and preferences of women into formal decision-making process.

Interventions

LLS interventions in this direction have been focused on working alongside two sets of institutions. These include the JFMCs (the local NRM institutions) and Self Help Groups (SHGs).

In both cases the objective has been to act as a facilitator in promoting activities that improve the day to day running and functioning of these local institutions and groups. Hence, specific activities included facilitation for holding regular meetings, encouraging proper means for communication and information about meetings in advance, maintenance of records (including minutes of meetings, resolutions passed, accounts etc.)

LLS in the landscape also looked into the empowerment of women and to increase their participation in decision making, etc., due to constraints from traditional norms. Information about meetings was disseminated amongst women, efforts to mobilize their attendance and participation were made by LLS field staff, and separate sub-meetings for women were facilitated, through the medium of SHGs. These mechanisms were being used because changes in cultural practices are separate to and outside of the lifespan of the LLS. SHGs were supported for holding regular meetings, to note the proceedings of every meeting, to take the support of an educated young woman in the village to note the record (in case all women of the group were illiterate). Awareness was also created among the women members about the importance of their attendance and participation in village level meetings.

LLS worked with a total of 11 SHGs; 8 were in existence and had been formed under other projects. These were revived. Three new SHGs were formed in the pilot – constituting of women members belonging to marginalized groups. These women members reside in those areas of the pilot that have been out of reach in various development activities. Hence, to form these 3 new SHGs successfully was a significant move. LLS has supported them through mobilisation, motivation, and helping them through the process of getting organised (registration, opening a bank account, drawing up new bye-laws, etc.) and engaging in IGAs. Important equity issues regarding the benefits flowing through landless people and the participation of women were actively discussed within these institutions.

The table 14 below includes the list of institutions that TERI has been working closely with in the pilot:

Table 14 Institutions engaged with in the four pilot villages

Village	HRMS	Choe Society	SHGs
Jhanda	x	✓ (functioning)	✓ 2 (functioning, marked changes with LLS facilitation support)
Pammuwala	✓ (presently, non-functional – benefit from FD forest is very marginal)	X	✓ 3 (functioning, marked changes with LLS facilitation support)

Village	HRMS	Choe Society	SHGs
Salehpur	✓ (presently, non-functional – owing to intra village conflict)	X	✓ 2 (functioning, marked changes with LLS facilitation support)
Thaska	✓ (functioning, marked changes with LLS facilitation support)	X	✓ 4 (2 functioning very well, marked changes with LLS facilitation support)

Source: Primary Survey, TERI

Impact

There are indications that the local forest management institutions are holding more regular meetings, setting agendas and making records of decisions. 12 of the grassroots institutions (includes SHGs and JFMCs) that have been the partners in LLS are having regular meetings, following proper record maintenance and performing their regular functions consistently when compared to a pre-project scenario.

Activities for institutional strengthening led to institutions (SHGs, and NRM institutions) holding regular meetings (every 1-2 months), dates for monthly meetings being fixed by most groups and institutions. Proper record maintenance of minutes of meetings and activities undertaken by the groups and institutions is being done.

There were some stakeholders that the project was insufficiently aware of at the start of the project were marginalised communities in the villages. These have now been included and they have been organised into SHGs. They are invited to and provided information on all village level meetings so that they can participate; sometimes separate meetings held with these groups to encourage them and to get their feedback. An example of one such marginalised group is in Pammuwala village which had both Hindu and Muslim households. The Muslims were marginalised due to their houses being more to the southern part of the village away from the forest so less accessible. LLS was unaware of this community partly due to their inaccessibility, but also due to the fact that other projects that had worked in Pammuwala had also excluded them and they had thus not been included in development plans or in the forest management plan (meaning they were not included in water sharing so didn't get water to irrigate their agricultural land). LLS has now managed to get them into village planning and development so that now their voices are heard in village meetings and decisions.

To encourage women's participation, in Thaska village the HRMS has made a resolution, wherein every household that chose to be a member of the society had to be represented by two adults - a man and a woman and that this was mandatory. To protect the forest area from grazing, HRMS at Thaska village passed a resolution for the clear demarcation of forest land between Thaska and Pammuwala, as cattle of Pammuwala village were often encroaching upon their forest area for grazing. These are evidences of the improved functioning of the local institutions.

Changes in participation in meetings were also perceived. In Upper Pammuwala, village community members noted the difference in participation in meetings. An 80% to 90%

attendance of village community is marked in common meetings now. This was attributed to the efforts made for information and communication about the meetings in LLS. The tools used were cited like door-to-door information. A notable difference was cited especially owing to the communication tools. Furthermore, compared to a baseline scenario, there is an increase in the frequency of common village meetings, with the onset of LLS. LLS facilitated consistent and continuous meetings, which were very participatory. The meetings also see the participation of women; this being a result of the involvement of LLS with SHGs.

In village Salehpur also, it was noted that owing to LLS there has been a marked difference in the attendance and participation of women in common village meetings. Women are also vocal in these meetings and express their opinions.

Table 15 below shows the scenario of transparency against the indicators in the end of LLS. The figures are noted for the institutions and groups that LLS has been working with, or in other cases the level of meetings that have been influenced due to LLS. In the case of Thaska, the difference is recorded for the JFMC, while for the other villages the data was noted for common village meetings held, particularly as a part of LLS and that saw a marked difference, especially towards the end period in terms of people's participation.

Table 15 Measuring transparency in the pilot villages

Indicator	Thaska		Pammuwala				Jhanda		Salehpur	
	JFMC	SHG	Lower		Upper		Village meetings*	SHG	Village meetings*	SHG
			Village meetings*	SHG	Village meetings*	SHG				
Frequency of meetings	Once a month	Once a month	Once a month / once in 2 months	Once a month	Once a month	Once a month	Once a month	Once a month	Once a month / once in 2 months	Once a month
% of people who attend meeting	50% of General body members	70%	60%	80% to 90%	80% to 90%	60% to 70%	60%	70%	50% to 60%	60%
% of women who attend meeting and % of women who attend feel they have participated	Participation of women remains low due to highly entrenched social ethos; However, women are very active in separate meetings	70%**	50%; 30%	80%**	40%; 25%	60% to 70%**	40%; 40%	70%**	40%; 60%	60%**
% of people who attend and know the revenue generated and how the funds have been allocated	50%	70%	NA***	80%	NA***	60% to 70%	NA***	70%	NA***	60%

Indicator	Thaska			Pammuwala			Jhanda		Salehpur	
% of people who feel decisions were participatory	80% to 90%	90%	70%	90%	60% to 70%	70% to 80%	60% to 70%	80%	50% to 60%	70%

Source: Primary survey 2011

*Village meetings, specifically those undertaken under LLS

** In the case of SHGs all women who attend, felt that they had participated, Hence, the figure in both scenarios remains the same.

***These represent common village meetings under LLS for various purposes, like needs assessment, discussion of specific issues and the question of revenue may not be relevant here. However, in the case of Thaska, where it is relevant for awareness of the JFMC revenue use, the figures have been given.

Specific case studies

Thaska JFMC

The HRMS in Thaska is functioning much more actively. The HRMS general body meeting is being held once in every three months compared to a baseline of almost zero general body meetings. There is considerable improvement even in the way information is disseminated and communicated about the meetings. It is given through the village messenger (locally known as 'muniyari') and usually a day or 2 in advance. The meetings of the HRMS elected members are held at least once every month. However, often more than once, twice or thrice a month, if the need emerges. The HRMS is maintaining proper records and minutes of its meetings.

Regarding the participation of women, 50% of members constituting the general body are women. In Thaska village the HRMS has made a resolution, wherein every household that chose to be a member of the society has to be represented by two adults - a man and a woman, as a mandatory requirement.

The HRMS has also been proactive in performing its duties of forest protection and management. As an example, in the past 2 years the HRMS has been highly successful in controlling forest fires.

They have also carried out other activities of forest restoration like de-siltation of one of its village dams with the support of the Forest Department. De-siltation of Khol wala dam was taken up by the Thaska HRMS (local NRM institution) incurring an expenditure of Rs 1,90,000 from its joint account (see Annexure 6). The storage capacity of the dam has increased, as a result, supplying more water for irrigation. Furthermore, a proposal was submitted to the Commissioner, Shivalik Development Agency (SDA) by LLS team to undertake various works for improving dam/water storage infrastructure for all pilot villages. Meetings and facilitation efforts of TERI, and also pro-active follow up of strengthened HRMS of Thaska led to repair of the wall and spill way of Kholwala dam in Thaska by SDA in 2011, incurring a cost of Rs. 2,00,000 on it.

SHGs

11 SHGs in the pilot villages are functioning actively and conducting regular meetings, and also efficiently managing their monthly saving system. These include 3 new SHGs that were formed. Of the 3 new SHGs formed in the pilot, 2 constituted of women members belonging to marginalized groups. These women members reside in those areas of the pilot that have

been out of reach in various development activities. There is evidence of increased attendance and participation of women in village meetings when compared with a pre-LLS scenario.

The SHGs in Thaska (that were formed prior to LLS and got associated with LLS) reported a difference to its functioning since association with LLS. The groups had been formed prior to LLS but were not functioning properly at the time when LLS came to the pilot. Association with TERI has given them access to information and knowledge. Many of the members went for training and capacity building.

The new SHG formed at Thaska reported that they were regularly conducting meetings once every month. All members were regularly paying their monthly contributions. Inter-loaning between the members has started and repayments were being made in time.

In Lower Pammuwala, the new SHG that was formed, women noted meetings are being held regularly once a month. The women also noted that the SHG has become a medium of representation of women in common meetings.

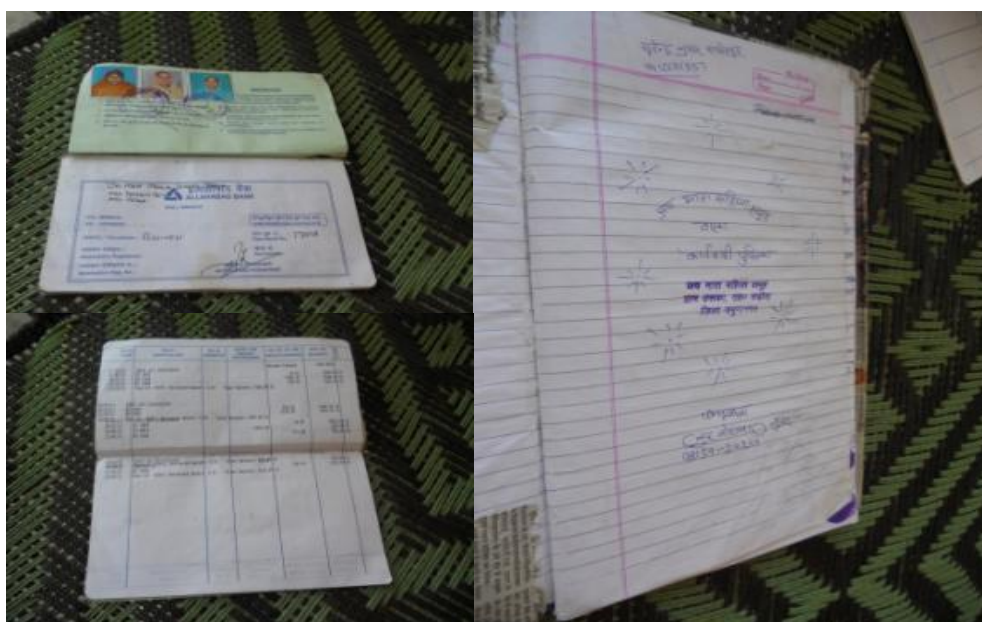


Photo 6 Records of SHG formed under LLS in Thaska

Outcome 3b: Provision for equity in the current policy is implemented (Refers to intra-community benefit sharing)

Indicators

- Share of the landless under current policy
- % of landless people able to access water rights

Baseline Scenario

One of the challenges that LLS sought to address in the landscape, was the existing JFM guidelines not being actively implemented or in a systematic manner, specifically the water share of the landless. Even if the water share was equitably distributed on paper, in practice it was not being implemented. This was also related to the lack of realising the full potential of water in forest catchments. Thus, in this case it has been an important issue for LLS to address how to maximise the water harvesting potential of the forest which would mean active management of the forest lands and therefore more water available to irrigate the full area of cultivable land and available to all who have a rightful share.

The construction of dams under various natural resource development projects in the state is the single most important activity which has resulted in huge economic gains through provision of irrigation water for agriculture crops. HRMSs have been given the responsibility of managing these structures and distributing the water on an equitable basis. Landless have also equal right to water as per the guidelines. Auction for water is only for distribution of water. The contractor is essentially the distributor of water to households for use for irrigation and in return collects a certain amount (as decided by the HRMS) from those who use it. The contractor has to be someone from the village.

As regards distribution of water, while the policies already provide for benefit sharing with landless people, the common situation has been that they do not actually receive or take a benefit for a range of reasons. While the potential benefit to a landless individual from selling a water share is relatively low compared to the transaction costs involved, it may be possible to pool the water shares and organise their sale on a group basis.

Interventions

The steps followed to promote more equitable benefit sharing within communities included:

- Raising awareness that there was a problem with the lack of benefit sharing with landless people from the sale of water from dams in JFM forests;
- Facilitating brainstorming within HRMSs to generate local solutions to handling this problem;
- Analysing the costs and benefits of forming a special interest group to pool and manage benefits for the landless;
- Supporting the implementation of the solutions adopted by the HRMSs.
- Specifically, village level meetings were organized to discuss benefit sharing arrangements, and review existing water distribution mechanism; intensive discussions and meetings were carried out regarding the application of existing benefit sharing arrangements of water for landless with the NRM institutions in each village. Each village NRM institution held special meetings to deliberate on issue of water sharing for landless, to devise local mechanisms for application.

The main selling points included both the equity argument and the fact that the landless have a potentially higher impact and direct dependence on forests due to their livestock rearing interests. The achievements of the past decade can only be maintained and built upon if the landless people actually benefit from the new forest management arrangements.

Impact

The JFMC in one pilot village, Thaska, has decided that only those households, including the landless who become members of the Society will get benefits from forest based resources (including dam water). This is a significant step to encourage the active involvement and participation of the village community, including the landless in the JFMC. Further, to ensure transparency of distribution system of water, HRMS members have been deputed for distribution of water as per rule. The amount of Rs 20/hr/member has been fixed, out of which Rs 3 is to be paid to the distributor and the net benefit of Rs 17/hr/member will go to the account of HRMS as revenue.

The JFMC has also passed a resolution saying the landless will have their rightful share in the water from the dams, and it is incumbent upon the contractor to distribute it to them (see Annexure 7). However, it is up to the landless to decide what to do with their share – whether to sell it to someone for cash or in exchange for a benefit in kind.

Even though in Thaska they have made a resolution, in effect, this is not working, as this is dependent on the availability of water in the dams. Since the time when this resolution has been passed, the 2 dams from which water is used for irrigation were in need of repair: in the case of one dam, the wall was broken and in the case of the other the *haudi* or channel/outlet was silted. The second dam was smaller. Thus, there was not enough water available for irrigation, and hence, the question may not have risen for the landless. Furthermore, the share of the landless is almost negligible, such that they do not feel the need for claiming the same. However, LLS has been successful in the acknowledgement and bringing to fore the issue that has not received its due attention hitherto. As per the HRMS records for membership for the year 2010-2011, of a total 145 members of the general body, 15 were landless. Among these, one household is benefitting from its water share and using it on land that has been leased-in for cultivation.

At the policy front, recommendations have also been made in the revised framework of benefit sharing arrangements to have a separate pool of funds from the village funds for the landless.

Table 16 Status of landless

Indicator	Baseline	End of LLS
Share of the landless under current policy	Policy provided for benefit sharing with landless people; but not practised	HRMS in one pilot village put arrangement for landless to avail their share
% of landless people able to access water rights	None	1 out of 15 landless members in the abovementioned pilot village. The mechanism is in place, to enable the landless to avail their share. However, as the monetary benefit is little, the number to claim is low, unless it is a scenario where the landless have direct benefit like use on leased land, as in the

Indicator	Baseline	End of LLS
		above case.

Source: Primary Survey, TERI

Outcome 3c: Change in policy for greater share

Indicator

- Demonstration of Forest Department's commitment to change policy

Baseline Scenario

There were a number of policy related problems encountered, which also defined some of the objectives of LLS. These included the lack of a review and revision of the JFM guidelines since its inception. LLS aimed to work towards the consideration of a review of these guidelines, and also suggest a revised framework in doing so. The basic premise of the revised provision was a greater share for the community in the existing benefit sharing arrangements.

The Haryana state JFM executive instructions of 1998 deal with sharing of forest produce between the community and the Forest Department and within the community, the constitution and eligibility of an HRMS/JFMC, responsibilities an HRMS/JFMC and the state Forest Department, annual purchase/auction of the forest produce, and management and utilisation of funds raised from purchase of forest produce

There is an annual auction for sale of grasses – *bhabbar* and fodder grass. The JFMC/HRMS of the village posts an advertisement notifying the date. Contractors willing to bid, Forest Department staff, HRMS and other village members are present when the auction happens on the decided date. The highest bidder gets the lease for the produce of grasses for that year. He pays the amount to the HRMS, which also lays down some rules (like one head load of *bhabbar* free to be given to every household and fodder grass to be given at a rate set by the HRMS per headload to every household without any discrimination). The auction usually is combined for both the grasses. But in some cases it could be separate as well. The contractors in this case could be from outside the village – but are usually from within the landscape. As per the executive instructions, fodder grass is to be given to the HRMS at the average price of auction in the last three years. HRMS fixes a price for each family. This price is based on components of the money paid to FD and management costs of HRMS. Widows and old women are given fodder grass free of any charge.

Bhabbar grass (*Eulaliopsis binata*) is one of the main NTFPs in the Shivalik region of Haryana. It is used for various purposes viz. rope making, paper production and as fodder for cattle. It is harvested early in the months of June/July for fodder. However, it has to be harvested only after October for use as fibre. Hence, its harvest has to be regulated as per its utilization.

The benefit sharing regulations have not been modified since they were promulgated in 1998, and it is time to revise them to reflect the current challenges in JFM. Other states in India have undertaken such revisions that have led to enhanced benefits to communities. The main argument is that there is a need to balance a decrease in community interests in forests (due to livelihood diversification) with an increased share of and control over the cash benefits derived from forest management. There is also need to include extending the

tenure of the JFM committee beyond the current one year period which is too short a time to implement sustainable forest management operations in the long term.

Interventions

The steps followed to advocate for a greater share of benefits to communities included reviewing the existing benefit sharing mechanisms to reveal weaknesses and make comparisons with other states in India; consulting with stakeholders to identify options and preferences for changing the current mechanisms; and facilitating consideration of the options for change and their impacts within the Forest Department. The following specific activities were undertaken:

- Village level meetings were organized to discuss and review overall benefit sharing of forest resources
- Consultations held at village level to discuss /negotiate for suggestions/ revisions for improved benefit sharing, while reviewing the current issues.
- Report on suggested framework for revised benefit sharing arrangements was compiled based on stakeholder discussions and meetings.
- Report on improved and revised framework of benefit sharing and institutional mechanism was disseminated to policy makers and departments concerned including Forest Department (notably PCCF).
- A cross landscape HRMSs meeting was held that was attended by HRMSs and JFMCs from across the landscape and not just the 4 pilot villages. The meeting was also attended by the Divisional Forest Department staff. There was discussion on a number of issues, including benefit sharing needs.
- Towards improved sharing between Forest Department and local community, a policy brief was prepared and shared with Forest Department. The policy brief highlights key issues in the existing benefit sharing arrangements and offers suggestions for an improved framework. The policy brief was made into a communication product published under the auspices of TERI Press. This policy brief was circulated at the state level, and also at national and international fora. Some of the key suggestions here are:
 - JFM institutions should be given 100% share in NTFPs and at least 50% in net revenues from timber for their financial sustainability
 - Control of funds under JFM needs to be given to JFM committees
 - Policy approach to JFM needs to be de-linked with revenue criterion
 - Tenure of JFM committee needs to be increased to 3 years
 - Capacities of women and marginalised groups need to be strengthened by organising them into SHGs for effective participation in JFM
 - There should be a single institution at village level for management of natural resources
 - There should be a single institution at village level for management of natural resources

- JFM institutions should be linked with other development programmes through the Gram Panachayats for better development impacts and sustainable functioning
- The process for negotiation for improved benefit sharing was initiated. The strategy used for this was periodic one to one meetings with the PCCF, periodic presentations to senior state FD staff, and on one occasion included Additional Secretary, Forests & Finance, Govt of Haryana, and also identifying “champions” outside of the FD like the ex-PCCF (who was among the key players in drafting the guidelines), and representatives from the Central Ministry (MoEF).
- The result of all this process of negotiation was acknowledgement of FD of looking at the guidelines and holding a meeting to discuss the same.
- A state level stakeholder consultation on deliberating upon the existing the benefit sharing arrangements under JFM in the state, was held on 24th Jan 2011 at Pinjore Forest Complex, Haryana. The meeting was attended by all senior State Forest Department Officials, namely, Principal Secretary, PCCF (Principal Chief Conservator of Forests), Additional PCCF, CCFs (Chief Conservator of Forests), and DFOs (Divisional Forest Officers), RFOs (Range Forest Officers), and Forest Guards (all levels of State Forest Department). The workshop was also attended by community representatives from the pilot and also the Deputy Inspector General (DIG), Forests from the Central Ministry of Environment and Forests, who is in charge of the JFM cell of the Ministry. The objective behind involving representation of the Central Ministry was that the involvement of actors at the Centre would also play a role in influencing or putting pressure on the State Forest Department.

Impact

The holding of the state level consultation was a significant achievement, as it was a clear evidence of the recognition and acknowledgement by the FD to come together on board to discuss and re-look at the existing guidelines. The key points that came around in the discussions during the meeting are as following.

- The FD recognised the ills of the existence of multiple institutions at the ground level, that this was a problem created by them and that they need to take cognisance of it to address it in future development planning.
- Among the existing sharing of revenue, the non-use of Kalyan Kosh came out vehemently. The alternative use of Kalyan Kosh was suggested. For instance, use of the amount for incentivising good functioning of institutions, like giving awards to the best HRMS.
- Linkages with Gram Panchayat were considered very significant. The MoEF has recently issued a circular towards this. The FD said that very soon the state would be taking action on this.
- The issue of conflict resolution, with the example of Salehpur case was brought out. This was highlighted by women members from Salehpur who visited. FD acknowledged that they need to be more pro-active in conflict resolution. It was also suggested by community members that a possible way in the case of Salehpur was to increase the number of women members in the Management Committee of the HRMS.

Table 17 Status of Forest Department’s commitment to changed policy

Indicator	Baseline	End of LLS
Demonstration of Forest Department’s commitment to change policy	No commitment or interest	FD co-organised a stakeholder consultation under the aegis of LLS to discuss the existing benefit sharing arrangements. The meeting was attended by all ranks (including the senior most) of the State Forest Department staff, community representatives and representatives from the Central Government.



Photo 7 State level stakeholder workshop that brought together FD and community

Outcome 3d: Participatory integrated village planning

Indicator

- Improved participatory integrated village planning

Baseline Scenario

In the landscape there were also problems with “development governance” - multiple projects working in the landscape without adequate linkages between projects and departments and establishing new committees where other similar committees already existed. Not only was there a multiplicity of local institutions at the village level and lack of linkages of these with one another, even at the district level there was no integration between the various government departments and rural development programmes so as to channelise resources and make tie ups for the development of the same village. Thus,

promotion of a participatory integrated planning based on optimal use of various land uses and resources of the landscape by bringing together various actors and demonstrating linkages was a key activity for holistic village and landscape development.

Government Line Agencies, at the District level, such as the FD have a role in proposing and implementing rural development programmes and regulating natural resource management. The FD has a dominant role in the landscape because they are the owners of the natural forest, receive a share of the income from the sale of *bhabbar* and fodder grasses, and control the way revenue accruing to local communities is managed and used. They also oversee the work of the HRMSs that have been established under JFM. The FD has a Working Plan for the forest in the landscape – this is a 10-year Working Plan looking at forest restoration and plantations, catchment area treatments with contour trenches, check dams – much of which relate to water harvesting. Under different donor funded projects operating in the landscape, there have been plans which are wider than just technical forestry and include such things as livelihood interventions and institutional development. The District Administration makes decisions on rural development programmes, and channelizes resources through the Gram Panchayats, which are the main, local self-government bodies. The Gram Panchayats are responsible for deciding on the development programmes proposed by Government line agencies at a village cluster level, and on the use of rural development funds provided by the Government, such as those provided under the Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS), a Central Government scheme that represents a major source of funding, and guarantees 100 days of wage employment.

Interventions

Intensive consultations were held on the existing process of adaptive and participatory development planning. Participatory processes and scientific techniques were used for detailed and in-depth assessment of issues and needs of village development.

- Needs and issues around natural resources and livelihoods were identified; and interventions to address needs proposed based on technical analysis and local knowledge.
- A soil and water conservation assessment, and GIS mapping were done.
- Integrated village plans were prepared for each village, which were translated into local language, Hindi, and presented to the Gram Panchayats and local institutions in the pilot villages. The plans were also presented to the village community at village meetings.
- LLS worked through the Gram Panchayats, local NRM institutions and government by using the integrated planning approach to make the right connections for this to work.
- LLS looked at linking with MGNREGS in the pilot as a form of demonstration as NRM activities can be funded under the initiative. LLS did this by presenting the plans and influencing (through regular interactions and meetings) the Gram Panchayats and District administration that are the key players in the scheme.

Impact

LLS has been able to influence the Gram Panchayats in the pilot, who are now considering incorporating and undertaking some of the interventions proposed in the integrated village

plans under MGNREGS funds for their villages and propose those to the higher authorities. LLS has facilitated the GPs in the pilot villages, to incorporate and undertake the interventions proposed in the integrated village plans under MGNREGS funds for their villages. For example, the GP of Pammuwala has proposed undertaking di-siltation of a dam and construction of check dams in the forest area, from the integrated plans. The intensive participatory processes that were followed to prepare integrated village plans have influenced the participation and involvement of village community, especially of the marginalized sections including women, positively.

Based on the integrated plans submitted, the DFO (Divisional Forest Officer) has incorporated specific works (as suggested in the plans) in the Forest Department proposal to the District nodal officer for district MGNREGS activities for the 2011 plan.

In a meeting held with the DFO in August 2011, he shared that specific forest restoration works have been undertaken by the Forest Department under the new Integrated Ground Water Recharge (IGWR) Scheme, that started in late 2010 and being funded by the state Public Health Department, in the four pilot villages. These works are in alignment with the works suggested under the integrated plans. Under the IGWR, the Samalwala dam in Salehpur was repaired with an expenditure of Rs 2,50,000; an expenditure of Rs 4,00,000 was incurred on 2 percolation tanks in Thaska; cement structures costing Rs. 1,11,500 were made in Pammuwala (see Annexure 8).

The District nodal officer for development works, the ADC (Additional Deputy Commissioner), in a meeting held in August 2011, also agreed in principle to propose some of the activities in various other schemes for the next plan.

A significant achievement in the integrated planning has been involvement of marginalised groups. Some stakeholders that LLS was insufficiently aware of at the start have now been included. They were invited to and provided information on all village level meetings so that they could participate; sometimes separate meetings were held with these groups to encourage them and to get their feedback. An example of one such marginalised group was in Pammuwala village. The village Pammuwala, although comes as one Revenue village, it is clearly divided into two habitations - Hindu Pammuwala (also Upper Pammuwala) and Muslim Pammuwala (also Lower Pammuwala). The Muslims were marginalised due to their houses being more to the southern part of the village away from the forests, so less accessible. This group has remained excluded in most development planning that has hitherto been done for the village. Through the various participatory exercises and processes followed for integrated planning LLS has now managed to get them into village planning and development so that now their voices are heard in village meetings and decisions.

The participatory processes involved for integrated planning at the village level also have led to more visible participation of men and women in subsequent village meetings (refer to section on Outcome 3a).

Table 18 Status of participatory integrated village planning

Indicator	Baseline	End of LLS
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Improved participatory integrated village planning	No integrated village planning; effectiveness of 'participatory' planning marginal	<p>Participatory integrated village planning undertaken for all pilot villages</p> <p>Influenced the participation and involvement of village community, especially of the marginalized sections including women, positively</p> <p>Based on the integrated plans submitted, the DFO (Divisional Forest Officer) has incorporated specific works (as suggested in the plans) in the Forest Department proposal to the District nodal officer for district MGNREGS activities.</p> <p>Specific forest restoration works have been undertaken by the Forest Department under a new scheme.</p> <p>The District nodal officer for development works, the ADC (Additional Deputy Commissioner), has also agreed in principle to propose some of the activities in various other schemes for the next plan.</p>
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4. Conclusion

Overall, LLS has helped in the pilot to increase protection of the forests by keeping the people originally involved in forest landscape restoration, by focusing on strengthening forest management, while also advocating for increased incentives for the communities. At the policy level, new rules or regulations have not yet been sanctioned during the duration of LLS. However, LLS has brought to fore recognition within the Forest Department and the communities that there is a need to review the existing mechanisms. Even at the level of praxis, LLS has been able to demonstrate acknowledgement and recognition of the share of landless that as an issue, hitherto saw silence, in spite of regulation being in place. Issues have been effectively raised on things like inclusion and there is more openness to consider wider options than before. LLS has also been able to demonstrate diversification into additional income generation opportunities by making use of existing extension services of the various line departments. Annexure 1 gives the M&E table that captures an overview of the data against the identified outcomes and indicators.

Annexure 1 M & E Table

Annexure 1 : M & E Table

Outcome	M and E question	Indicator	Baseline	End of LLS
Towards Sub-outcome 2				
30% increase in income through programme interventions recorded in 30% of the targeted households	Has there been any increase in annual HH income of 30% of targeted households through programme interventions	Additional income (cash and non-cash) from LLS amongst targeted households	The average net agricultural income for the four pilot villages was Rs 13839 per annum, as recorded in the baseline survey.	Agricultural incomes of beneficiary households for seeds and saplings increased by 6% and 19% respectively. With about 20% of households in the project villages benefitting from this intervention, this provides an early indication of direct project impact. Impact is captured at this stage for one season and it is expected that when benefits are captured over several cropping seasons, they would be significantly higher. However, we do not consider here the alternative agricultural use of the land being used for the seeds and saplings and in this sense the income increases are not strictly incremental.
	Wealth ranking	Wealth ranking	Wealth ranking for pilot villages: No of rich HH – 104 (18%) No of average HH – 227 (39%) No of poor HH – 192 (33%) No of very poor HH - 65 (11%)	It was found that there was an addition of one household in the rich household category at Jhanda, due to the migration of that household in the previous year. The wealth ranking for rest of the households in all the four villages remained the same.
Increased water access for agriculture	Is there increased agricultural production due to	1. Irrigation: a. Cultivated area under irrigation , OR,	1b. is considered as an indicator. The impact is recorded from de-siltation	1b. is considered as an indicator. The impact is recorded from de-siltation od dam in Jhanda

Outcome	M and E question	Indicator	Baseline	End of LLS
	increased availability of and access to water from the dams?	<p>b. No. of rotations of irrigation received by beneficiary HH for a crop</p> <p>2. Production of crops cultivated in irrigated area</p>	<p>of dam in Jhanda</p> <p>1b. Each beneficiary HH in Jhanda received water: Paddy – 3 times, Wheat - None</p> <p>2. The average production (quintal/acre) of paddy during the baseline was 12.11, while for wheat it was 6.07</p>	<p>1b. Each beneficiary HH receives water after de-siltation in Jhanda Paddy – 7 times, Wheat – 3 times</p> <p>2. The average production (quintal/acre) of paddy during the project end was 22.51, while for wheat it was 12.20</p>
Income generation activities taken up by beneficiaries (<i>vermi compost, mushroom cultivation, bee keeping, horticulture, vegetable cultivation, medicinal plants</i>)	Is there an increase in income of beneficiaries through revenue generated from continued involvement of IGAs?	<p>1. Number of beneficiaries taking up IGAs</p> <p>2. No. of beneficiaries continuing to engage with IGAs</p> <p>3. Number of people benefiting from training on IGAs</p>	<p>1. No HH was involved in any of these IGAs at baseline</p> <p>2. #The baseline is zero, as no HHs were involved in these IGAs</p> <p>3. The baseline is zero.</p>	<p>1. Number of beneficiaries taking up IGAs - 119</p> <p>2. No. of beneficiaries continuing to engage with IGAs: 119 beneficiaries engaged in cultivation of vegetable seeds/saplings received, 69 beneficiaries engaged in planting horticulture species received, 3 beneficiaries continue to successfully engage with vermi-compost, 3 beneficiaries of Aloe Vera cultivation continued to engage. However, success rate was low, due to external factors. 2 beneficiaries of turmeric cultivation continue to engage successfully.</p> <p>3. Number of people benefiting from training on IGAs: 40 beneficiaries received information about services offered by Agriculture and Horticulture Departments at an Introductory training, 6 (received 5</p>

Outcome	M and E question	Indicator	Baseline	End of LLS
				days certificate training course in vermicompost), 3 (for Aloe Vera Exposure Visit)
Towards Sub-outcome 3				
Existing benefit sharing and distribution mechanisms have greater transparency.	Do the village members, including women participate in decision making regarding management and use of forest resources?	<p>1. % of people who attend the meeting.</p> <p>2. % of women who attend the meeting and % of women who attend feel that they have participated.</p> <p>3. % of people who attend and know the revenue generated and how the funds have been allocated.</p> <p>4. % of people who feel that the decisions were participatory.</p>	<p>1. 5% to 10% attend meetings</p> <p>2. Less than 1% of women attend the meeting, and none of the women who attended felt that they had participated</p> <p>3. 30% to 40% of people who attend know the revenue generated and how the funds have been allocated.</p> <p>4. Less than 5% of people felt that the decisions were participatory</p>	Refer to table 15 in main report for details. The break up is given village-wise.
Provision for equity in the current policy is implemented (Note: this refers to intra-community benefit sharing)	What are the arrangements at policy and practice level regarding water share of the landless?	<p>1. Share of the landless under current policy</p> <p>2. % of the landless people able to access water rights.</p>	<p>1. Policy is in place, according to which landless have a share over water</p> <p>2. Negligible</p>	<p>1. HRMS in one pilot village put arrangement for landless to avail their share (see Annexure 7)</p> <p>2. 1 out of 15 landless members in the abovementioned pilot village. The mechanism is in place, to enable the landless to avail their share. However, as</p>

Outcome	M and E question	Indicator	Baseline	End of LLS
				the monetary benefit is little, the number to claim is low, unless it is a scenario where the landless have direct benefit like use on leased land, as in the above case.
Change in policy for greater share	How successful have been the efforts to bring change in policy for: a. Increased share benefits from forest resources to the community? b. Greater control of the community over the existing share of benefits?	Demonstration of Forest Department's commitment to change policy	There has been no review of policy guideline by the Forest Department since its inception in 1998	FD co-organised a stakeholder consultation under the aegis of LLS in January 2011, to discuss the existing benefit sharing arrangements. The meeting was attended by all ranks (including the senior most) of the State Forest Department staff, community representatives and representatives from the Central Government.
Cross cutting Theme				
Improved participatory integrated planning process accepted by FD& other Depts.	Is the government open and responsive to the revised micro planning process?	Improved participatory integrated village planning	Development planning process is not participatory/ integrated Government is not aware of the importance of integrated and participatory micro planning process	Participatory integrated village planning undertaken for all pilot villages. LLS influenced the participation and involvement of village community, especially of the marginalized sections including women, positively Based on the integrated plans submitted, the DFO (Divisional Forest Officer) has incorporated specific works (as suggested in the plans) in the Forest Department proposal to the District nodal officer for

Outcome	M and E question	Indicator	Baseline	End of LLS
				<p>district MGNREGS activities for 2011.</p> <p>Specific forest restoration works have been undertaken by the Forest Department under a new scheme, IGWR (see Annexure 8). In a meeting held with the DFO in August 2011, he shared that these works are in alignment with the works suggested under the integrated plans.</p> <p>The District nodal officer for development works, the ADC (Additional Deputy Commissioner), has also agreed in principle (in a meeting held in August 2011) to propose some of the activities in various other schemes for the next plan in 2011.</p>

Annexure 2 Wealth ranking

Annexure 2: Wealth ranking

A detailed wealth ranking exercise was carried out in the early phase of the project (2009) through a participatory approach. The objective of the study was to know the status of wealth of all the households in the four pilot villages. It was found during the survey that the sources of livelihood were recognised by the village community as the main indicators and markers of wealth of a household. The primary sources of income of 70% of the households were agriculture and livestock. Each village was divided into four wealth categories viz. rich, average, poor and very poor on the basis of wealth indicators except for Pammuwala Upper village which is divided into three categories (rich, average and poor). A total of 104 HH (18%) were categorized as rich, 227 HH as average (39%), 192 HH (33%) as poor and 65 HH (11%) very poor households across the four pilot villages as shown in table below.

Table 1 Number of households in each wealth category (baseline scenario)

Villages	Wealth Category			
	Rich	Average	Poor	Very Poor
Jhanda	24	50	29	0
Pammuwala Upper	8	15	22	0
Pammuwala Lower	4	14	24	16
Salehpur	26	74	43	0
Thaska	42	74	74	49
Total	104	227	192	65

Government service was the main indicator of more wealth. There are 45 households (7%) in government service, 331 (52%) are involved in planting trees in their farmlands, 455 (71%) are practicing agriculture, 275 (43%) are receiving pension under different categories, 49 (8%) are skilled labour while 387 (61%) are involved in daily wage labour. 96 households (15%) are doing business and 477 households (75%) are involved in livestock rearing (see table). Majority of government employees are from Thaska and Salehpur villages Pammuwala is the only village where none of the households is in government service. Almost each category is engaged in livestock rearing, rich class at large scale, having more than five cattle, while the other classes at small scale, having less than five cattle.

Table 2 Number of households in different wealth classes in the pilot LLS villages

Villages	Wealth Classes	Gov Job	Bus.	Skilled Labour	Tree	Agric	Daily Wage	Pension	Pvt. Service	Lvstk.
Pammuwala Upper	Poor	0	0	0	14	22	20	7	0	21
	Average	0	0	0	15	15	14	10	0	15
	Rich	0	0	1	8	8	8	6	0	8

Villages	Wealth Classes	Gov Job	Bus.	Skilled Labour	Tree	Agric	Daily Wage	Pension	Pvt. Service	Lvstk.
Pammuwala Lower	V.Poor	0	0	0	1	6	14	0	0	11
	Poor	0	0	1	13	22	21	11	0	20
	Average	0	0	3	14	14	8	11	14	14
	Rich	0	0	2	4	4	4	2	0	4
Thaska	V.Poor	0	0	3	2	3	38	9	11	11
	Poor	0	0	8	26	42	47	28	29	54
	Average	0	3	9	57	67	55	44	39	66
	Rich	16	6	10	31	34	21	27	19	35
Jhanda	V.Poor	0	0	0	2	3	25	6	0	7
	Poor	0	4	3	34	45	38	20	12	50
	Average	0	13	3	37	37	13	16	9	35
	Rich	14	10	5	20	22	2	8	2	22
Salehpur	V.Poor	0	0	0	0	22	25	4	13	16
	Poor	0	8	0	24	53	26	30	20	53
	Average	0	4	0	10	15	5	13	2	14
	Rich	15	48	1	19	21	3	23	9	21
TOTAL HOUSEHOLDS		45	96	49	331	455	387	275	179	477
PERCENTAGE		7%	15%	8%	52%	71%	61%	43%	28%	75%

(Gov. - Government, Bus.- Business, Agric- Agriculture, Pvt.-Private, Lvstk.- Livestock)

Wealth ranking

A detailed wealth ranking exercise was carried out in the early phase of the project (2009) through a participatory approach. The objective of the study was to know the status of wealth of all the households in the four pilot villages. It was found during the survey that the sources of livelihood were recognised by the village community as the main indicators and markers of wealth of a household. The primary sources of income of 70% of the households were agriculture and livestock. Each village was divided into four wealth categories viz. rich, average, poor and very poor on the basis of wealth indicators except for Pammuwala Upper village which is divided into three categories (rich, average and poor). A total of 104 HH (18%) were categorized as rich, 227 HH as average (39%), 192 HH (33%) as poor and 65 HH (11%) very poor households across the four pilot villages as shown in table below.

Table 3 Number of households in each wealth category (baseline scenario)

Villages	Wealth Category			
	Rich	Average	Poor	Very Poor
Jhanda	24	50	29	0
Pammuwala Upper	8	15	22	0
Pammuwala Lower	4	14	24	16
Salehpur	26	74	43	0
Thaska	42	74	74	49
Total	104	227	192	65

Government service was the main indicator of more wealth. There are 45 households (7%) in government service, 331 (52%) are involved in planting trees in their farmlands, 455 (71%) are practicing agriculture, 275 (43%) are receiving pension under different categories, 49 (8%) are skilled labour while 387 (61%) are involved in daily wage labour. 96 households (15%) are doing business and 477 households (75%) are involved in livestock rearing (see table). Majority of government employees are from Thaska and Salehpur villages Pammuwala is the only village where none of the households is in government service. Almost each category is engaged in livestock rearing, rich class at large scale, having more than five cattle, while the other classes at small scale, having less than five cattle.

Table 4 Number of households in different wealth classes in the pilot LLS villages

Villages	Wealth Classes	Gov Job	Bus.	Skilled Labour	Tree	Agric	Daily Wage	Pension	Pvt. Service	Lvstk.
Pammuwala Upper	Poor	0	0	0	14	22	20	7	0	21
	Average	0	0	0	15	15	14	10	0	15
	Rich	0	0	1	8	8	8	6	0	8
Pammuwala Lower	V.Poor	0	0	0	1	6	14	0	0	11
	Poor	0	0	1	13	22	21	11	0	20
	Average	0	0	3	14	14	8	11	14	14
	Rich	0	0	2	4	4	4	2	0	4
Thaska	V.Poor	0	0	3	2	3	38	9	11	11
	Poor	0	0	8	26	42	47	28	29	54
	Average	0	3	9	57	67	55	44	39	66
	Rich	16	6	10	31	34	21	27	19	35

Villages	Wealth Classes	Gov Job	Bus.	Skilled Labour	Tree	Agric	Daily Wage	Pension	Pvt. Service	Lvstk.
Jhanda	V.Poor	0	0	0	2	3	25	6	0	7
	Poor	0	4	3	34	45	38	20	12	50
	Average	0	13	3	37	37	13	16	9	35
	Rich	14	10	5	20	22	2	8	2	22
Salehpur	V.Poor	0	0	0	0	22	25	4	13	16
	Poor	0	8	0	24	53	26	30	20	53
	Average	0	4	0	10	15	5	13	2	14
	Rich	15	48	1	19	21	3	23	9	21
TOTAL HOUSEHOLDS		45	96	49	331	455	387	275	179	477
PERCENTAGE		7%	15%	8%	52%	71%	61%	43%	28%	75%

(Gov. - Government, Bus.- Business, Agric- Agriculture, Pvt.-Private, Lvstk.- Livestock)

**Annexure 3 Letter of Jhanda's
Choe Society contribution for De-
siltation of Shiv Mandir Dam**

दी झण्डा सहकारी भूमि संरक्षण समिति लि०

गांव झण्डा तह० जगाधरी जिला यमुनानगर (हरियाणा)

Attention - Sirincha Indukuri

क्रमांक न०

दिनांक... २५/२/२०१०.....

देरी (कि एनजी एंड रिसोर्सिंस इन्स्टीट्यूट) नई दिल्ली तथा चौ सोसाइटी ग्राम झण्डा द्वारा शिवमन्दिर डाम की डिसिलेसन हेतु एक बैठक आयुक्त की गयी थी, जिसमें सर्वसम्मति से निर्णय लिया गया था कि शिवमन्दिर डाम की डिसिलेसन करने में कुल लागत (उपभोग) का 60% देरी, नई दिल्ली तथा 40% चौ सोसाइटी, झण्डा द्वारा अंशदान किया जाएगा, तदुपरान्त डिसिलेसन कार्य में कुल लागत एवं अंशदान का विवरण इस प्रकार से है :-

प्रथम-चरण (60:40)	कुल लागत	देरी	चौ सोसाइटी
	Rs. 1,28,000 = ००	Rs. 76,800 = ००	Rs. 51,200 = ००
द्वितीय-चरण (80:20)			
	Rs. 90,000 = ००	Rs. 72,000 = ००	Rs. 18,000 = ००
कुल योग	Rs. 2,18,000 = ००	Rs. 1,48,800 = ००	Rs. 69,200 = ००

द्वारा चौ सोसाइटी सदस्य

Kehar Singh

प्रधान

संयोजक

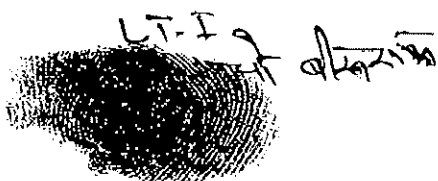
अमरसिंह

Spal

सदस्य

सचिव

Angry Singh



Annexure 4 Media coverage of training on vermi-compost, 2008

किसानों को कमाई के तरीके बताए

डेयरी, वर्मी खाद एवं मशरूम बारे करवाया अवगत

साढ़ौरा, 20 दिसम्बर (पंकेस) : कृषि विज्ञान केंद्र दामला के वैज्ञानिकों द्वारा गांव ठसका में किसानों को डेयरी प्रशिक्षण, वर्मी खाद की उपयोगिता एवं तैयार करने के तरीकों सहित मशरूम की खेती की जानकारी दी गई। नई दिल्ली स्थित टेरी संस्थान द्वारा आयोजित इस कार्यक्रम में इलाके के अनेकों किसानों सहित आम लोगों ने भाग लिया। कृषि विज्ञान केंद्र के समन्वयक डा. ओ.पी.मेहता ने लोगों को डेयरी के महत्व को बताते हुए इसकी ट्रेनिंग दी। वैज्ञानिक डा.बी.आर.कांबोज ने किसानों को वर्मी खाद की उपयोगिता के बारे में बोलते हुए कहा कि इस खाद के इस्तेमाल से खेतों में उर्वरकता बढ़ती है। उन्होंने किसानों को वर्मी की खाद करने की विधि भी बताई।

वैज्ञानिक डा.आर.एस.ताया ने मशरूम की फसल के महत्व बताते हुए इसके तैयार करने के तरीकों से अवगत करवाया। एच.आर.एम.एस. सचिव लाल सिंह ठसका ने वैज्ञानिकों का गांव में पहुंचने पर स्वागत किया गया तथा उनके द्वारा दी गई जानकारी पर उनका आभार व्यक्त किया गया। मौके पर बलदेव भारतीय, राकेश कुमार, ललित कुमार, संदीप कुमार सहित अनेकों ग्रामीण उपस्थित थे।

पंजाब केशरी - 21/12/2008

Annexure 5 Media coverage of training on vermi-compost and mushroom cultivation, 2009

केंचुआ खाद के फायदे बताए

यमुनानगर 10 मार्च (ब्यूरो) :
कृषि विज्ञान केन्द्र दामला द्वारा टेरी
(टी एनजी एण्ड रिसोर्सिंस इंस्टीच्यूट)
नई दिल्ली के सहयोग से जगाधरी में
कृषि उपनिदेशक कार्यालय के सभागार
में वर्मी कम्पोस्ट (केंचुआ खाद) बनाने
की वैज्ञानिक विधि पर पांच दिवसीय
व्यवसायिक प्रशिक्षण कार्यक्रम का
आयोजन किया गया। कार्यक्रम के
समापन समारोह की अध्यक्षता करते
हुए कृषि उपनिदेशक डा. जे.आर. बराड़
ने प्रशिक्षणार्थियों को केंचुओं पालन
एवं केंचुआ खाद बनाने के लिये प्रेरित
करते हुए कहा कि इस प्रयोग से जहां
ग्रामीण व शहरी कूड़े-कचरे का
सदुपयोग करने में मदद मिलेगी, वहीं
भूमि की उर्वरा शक्ति को बरकरार
रखने में सहायता मिलेगी। उन्होंने
किसानों को वर्मीकम्पोस्ट बनाकर अपने
खेतों में डालने की सलाह दी तथा
भूमिहीन बेरोजगार नवयुवकों को इसे
व्यवसाय के रूप में अपनाकर अपनी
आजीविका में सुधार लाने की कहा।

इस प्रशिक्षण कार्यक्रम के संयोजक
डा. वी.आर. काम्बोज कृषि वैज्ञानिक
कृषि विज्ञान केन्द्र दामला यमुनानगर
ने केंचुआ खाद बनाने की विस्तृत
जानकारी प्रशिक्षणार्थियों को दी।
उन्होंने बताया कि वर्मी कम्पोस्ट को
बनाने के लिए केवल एक तिहाई
गोबर की आवश्यकता होती है तथा
दो-तिहाई शहरी व ग्रामीण कूड़े-
कचरे को इस गोबर के साथ मिलाकर
आईसीनया फाइटिडा नामक केंचुएं
की प्रजाति की मदद से अच्छी
गुणवत्ता वाली खाद तैयार की जा सकती
है। उन्होंने बताया कि इस विधि द्वारा
60-70 दिनों में खाद तैयार हो जाती
है, जबकि गोबर के खाद तैयार करने
में 5-6 महीने का समय लगता है।

केन्द्र के मुदा वैज्ञानिक ने भू-
केंचुआ खाद का भूमि की उर्वरा शक्ति
पर होने वाले फायदों बारे जानकारी
दी तथा उन्होंने कहा कि इसके प्रयोग
जमीन में लाभदायक जीवाणुओं की
संख्या में वृद्धि होगी व भूमि की
भौतिक व रासायनिक दशा में भी
सुधार होगा। कृषि विज्ञान केन्द्र के
वैज्ञानिक डॉ. राजवीर गर्ग ने वर्मी
कम्पोस्ट का जैविक कृषि में महत्व
पर जानकारी दी व हर किसान द्वारा
अपनाने की सलाह दी।

पंजाब केजरी - दिनांक 11-03-2009

**Annexure 6 Letter of HRMS
Thaska showing de-siltation work
undertaken by them**

ॐ

पहाड़ी संसाधन प्रबन्धक सोसायटी

गांव ठसका, डाकखाना महमदपुर, तहसील जगाधरी, जिला यमुनानगर

(H. R. M. S.)

पंजीकृत संख्या 1219 दिनांक 16-2-90

अधीनियम XXI-1850

क्रमांक.....

दिनांक.....

हम, ऐसी, नई दिल्ली द्वारा H.R.M.S ठसका के खोल नदी वाले बांध कि डिशिनिंग करवाने हेतु मांगी दर्शन करने के लिये आगार प्रकट करते हैं। जिसने कि H.R.M.S ठसका व वन विभाग यमुनानगर के बिच में इस पुनित कार्य करवाने हेतु एक माध्यम कि मुगिका निमाई। बांध कि डिशिनिंग हेतु H.R.M.S ठसका तथा वन विभाग के संयुक्त खात में से (एक लाख नब्बे हजार) 1,90,000/- खर्च किये गये

खजानची

प्रधान Maulraj
H.R.M.S. ठसका,
जगाधरी (यमुनानगर)

सोचव
सोमा

खजानची
हरपाल सिंह

कोटी प्रदीप
ल. न. दाताराम



**Annexure 7 HRMS Thaska record
showing share of landless in water
from dams**

Date

कार्यवाही पुस्तक ५२०११ नं० २

Proceedings Book

१०/१०/०९

आज दिनांक १० अक्टूबर २००९ को श्री मारुज जी, अध्यक्ष HRMS ठसका की चौपाल पर HRMS की कार्यकारिणी की बैठक हुई। इस बैठक का मुख्य उद्देश्य वर्तमान HRMS को मिले रिकार्ड पर चर्चा व HRMS की गतिविधियों पर सहमति बनाने का था। इस बैठक में चर्चा के बाद निम्न निर्णय लिए गए।

- ① रिकार्ड में कमी बाबत जानकारी का प्रस्ताव देरी एवं वनविभाग के अधिकारियों को दिया जाएगा।
- ② HRMS की कमेटी की मीटिंग हर महीने की १० तारीख को की जाएगी।
- ③ HRMS की आम सभा की मीटिंग हर ३ महीने की जाएगी।
- ④ डेम से पानी वितरण की व्यवस्था में सुधार किया जाएगा। भूमिहीन को भी पानी में बराबर हक दिया जाएगा।
- ⑤ घास व मगर घास के Auction की व्यवस्था पर नीतिबद्ध नियम बनाए जायेंगे।
- ⑥ HRMS की कार्य व्यवस्था पर ११/११ को ~~कार्य~~ प्रबंधन संबंधी कार्य में पारदर्शिता लेकर हरे एक अध्यक्ष HRMS के रूप में स्थापित करने के उपालंभ किए जाएंगे।

[P.T.O.]

Date	कार्यवाही पुस्तक	Proceedings Book
	<p><i>Mamaji</i></p> <p>महाराष्ट्र राज्य सरकार (M.R.M.S.)</p> <p>L.T. 1</p> <p>गस्ताक 1/18</p> <p>L.T. 1</p> <p>गस्ताक 2/17</p> <p>Namm</p>	<p>सायक</p> <p>सामा</p> <p>ल. ज. 12/14</p> <p><i>Sajalans</i></p> <p>राजानची</p> <p>हरपालसिंह</p>

**Annexure 8 IGWR progress report
showing forest works undertaken
by FD in pilot villages**

Progress Report of IGWR for year 2010-11

S. No.	Range	Name of Work	Choe/Nallah/Year of Construction	Qty.	Previous Expenditure upto 31-3-2011	Current during 5/2011	Total Expenditure upto 31-5-2011
1. Water Harvesting Dams							
1	Kalesar	Bagpat	Padlia Khala	1	3681000	819000	4500000
2	--do--	Khillanwala	Khalwala Khala	1	5500000	0	5500000
		Total		2	9181000	819000	10000000
1	Kalsia	Chikan	Baba Ka Khala	1	3466238	1033762	4500000
2	--do--	Darpur/Jattanwala	Ougiwala Khala	1	4980832	1219168	6200000
		Total		2	8447070	2252930	10700000
		G. Total		9	17628070	3071930	20700000
2. RESTORATION OF DAM							
1	Kalesar	Banaki Dam	1987-88	1	350000	0	350000
2	--do--	Ambwali	1987-88	1	400000	0	400000
		Total		2	750000.00	0	750000
1	Sadhaura	Samlawala Dam	1988-89	1	250000	0	250000
2	--do--	Mehrawala Dam	2006-07	1	300000	0	300000
3	--do--	Shivjiwala Dam	2003-04	1	300000	0	300000
4	--do--	Patharwala Dam	2005-06	1	250000	0	250000
5	--do--	Sir Bhangiwala Dam	1990-191	1	500000	0	500000
6	--do--	Kholwala Dam	2004-05	1	977540	722460	1700000
8	--do--	Kheriwala Dam	1997-98	1	300000	0	300000
9	--do--	Mahiyawala Dam	1995-96	1	305500	44500	350000
10	--do--	Dungewala Dam	2006-07	1	238700	61300	300000
11	--do--	Khara Dam	1997-98	1	228500	71500	300000
		Total		10	3650240	899760	4550000
1	Kalsia	Kuewala Khala	1987-88	1	0.00	650000.00	650000.00
		G. Total		13	4400240	1549760	5950000
3. Percolation tanks in Shivaliks							
1	Kalesar	Bagpat	Peerwala	1	200000	0	200000
	do		do	1	200000	0	200000
2	do	Khizri	Nukad	1	200000	0	200000
	do		do	1	200000	0	200000
3	do	Khillanwala	Khalwala	1	200000	0	200000
	do		do	1	200000	0	200000
4	do	Ambwali	Nalawala Khala	1	200000	0	200000
	do		do	1	200000	0	200000
5	do	Ambwali	Brotiwala Khala	1	200000	0	200000
	do		do	1	200000	0	200000
		Total		10	2000000	0	2000000
1	Sadhaura	Thaska	Thaska	2	400000	0	400000
2	do	Pammuwala	Pammuwala	2	400000	0	400000
3	do	Sangoli	Sandoli	1	200000	0	200000
4	do	Salehpur	Salehpur	2	400000	0	400000
5	do	Kathgarh	Kathgarh	1	200000	0	200000
6	do	Rampur Gainda	Rampur Gainda	1	200000	0	200000
		Total		9	1800000	0	1800000
1	Kalsia	Chikan	Baba Ka Khala	1	100000	0	100000
	do		do	1	100000	0	100000
2	do	Darpur	Ogalwala Khala	1	100000	0	100000
	do		do	1	100000	0	100000
3	do	Bansantaur	Saponwala Khala	1	200000	0	200000
		Total		5	600000	0	600000
		G. Total		24	4400000	0	4400000
4. Crate Wire Structures in Shivaliks							
1	Kalesar	Bagpat	Bagpat wala Khala No. 1	18.00	19200	0	19200

S. No.	Range	Name of Work	Choe/Nallah/Year of Construction	Qty.	Previous Expenditure upto 31-3-2011	Current during 5/2011	Total Expenditure upto 31-5-2011
8	do	Kansli	Dungewala Khala No1	141.5	241000	0	241000
	do		Dungewala Khala No 2	141.5	241000	0	241000
9	do		Dungewala Khala No 3	44.82	76000	0	76000
	do		Gugge wala No 1	44.82	0	74000	74000
	do		Gugge wala No 2	95.13	168000	0	168000
10	do		Gugge wala No 3	95.13	168000	0	168000
	do		That wali khali No 1	95.13	168000	0	168000
11	do		That wali khali No 2	70.29	33000	87000	120000
	do		Sadwala No 1	95.13	168000	0	168000
	do		Sadwala No 2	95.13	0	168000	168000
12	do		Sainwali No 1	96.28	0	167500	167500
	do		Sainwali No 2	95.13	0	168000	168000
13	do		Chikan Khala	95.13	0	168000	168000
14	do		Kansli Sout	95.13	0	168000	168000
15	do		Banzara wala No 1	96.32	0	167500	167500
	do		Banzara wala No 2	74.88	0	129800	129800
	do		Banzara wala No 3	96.54	0	167500	167500
	do		Banzara wala No 4	14.08	0	17200	17200
16	do		Matoliya	96.31	0	167500	167500
17	do		Bichwali Khali	95.13	0	168000	168000
18	do		Khundal	95.13	0	168000	168000
19	do		Punyali	128.98	0	337000	337000
20	do		Ambwali	51.72	0	92000	92000
	do			43.41	0	76000	76000
		Total		3198.21	3059000	2491000	5550000
1	Sadhaura	Pammuwala	Khargwala Khala-I	47.5	111500	0	111500
	do		Khargwala Khala-II	90.28	111500	0	111500
2	do	Thaska	Raniwala	107.18	167400	0	167400
	do		Sudjha Sahib wala -I	105.48	167400	0	167400
	do		Sudjha Sahib wala -II	160.88	167400	0	167400
	do		Barwala Khala	23.2	167400	0	167400
	do		Ambwala Khala	160.88	167400	0	167400
3	do	Salehpur	Meharwala Khala-I	97.84	167400	0	167400
	do		Meharwala Khala-II	97.75	167400	0	167400
	do		Sambalwey wala Khala-I	106.7	167400	0	167400
	do		Sambalwey wala Khala-II	106.7	167400	0	167400
	do		Sambalwey wala Khala-III	93.1	167400	0	167400
4	do	Sangouli	Chokiwala Khala-i	107.9	186000	0	186000
	do		Chokiwala Khala-ii	70.96	186000	0	186000
	do		Chokiwala Khala-iii	12.71	186000	0	186000
		Total		1390.06	2455000	0	2455000
1	Kalsia	Chikan	Jaguwala Khala	76.63	106557	33043	139600
	do		do	62.7	91189	28511	119700
2	do	Chikan	Baba Ka Khala	68.33	124800	0	124800
	do		do	61.95	113300	0	113300
3	do	Darpur	Ogliwala Khala	64.33	116300	0	116300
	do		do	73.78	134100	0	134100
4	do	Darpur	Bhata Ka Khala	61.96	112900	0	112900
	do		do	62.95	113300	0	113300
5	do	Bansantaur	Saponwala	70.17	116500	0	116500
		Total		602.8	1028946	61554	1090500
		G. Total		5191.07	6542946	2552554	9095500
6 Check Dams in Shivaliks				Or Say	6541046		
1	Sadhaura	Sadhaura	Sadhaura Range	6522.00	3000120	0	3000120
2	Kalesar	Kalesar	Kalesar Range	16832.24	7726000	0	7726000
			Total	23354.24	10726120	0	10726120
Grand Total					51629476	7174244	58805499

1900