Final Evaluation Report (Socio-economic impact)

Integrated Land and Ecosystem Management to Combat Land Degradation and Deforestation in Madhya Pradesh

(Atlas ID: 57324; UNDP PMIS ID: 3512; GEF ID: 3472)

GEF/UNDP/Government of India

Executing Agency/Implementing Partner:

Government of Madhya Pradesh

Other partner:

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Submitted by

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6 Acknowledgements

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25	Mr Mukesh Jindal	Forest Guard	Amla range, Betul
26	Mr Shivkumar Uike	Deputy Ranger	Sarni range, Betul
27	Mr Anand Kumar Parmar	Ranger	Gawasen range, Betul
28	Mr Umrao Parsi	Deputy Ranger	Gawasen range, Betul
29	Mr Hasne Alam	Forest Guard	Gawasen range, Betul
30	Mr Sarnam Singh	Forest Guard	Gawasen range, Betul
31	Ms Suneeta Uooke	Ranger	Sidhi range, Sidhi
32	Mr Devnath Potar	Forest Guard	Sidhi range, Sidhi
33	Mr Ramesh Gahlod	Ranger	Churhat range, Sidhi
34	Mr Vishnu Sharma	Forest Guard	Churhat range, Sidhi
35	Mr Ram Krishna Patkar	Ranger	Madwas range, Sidhi
36	Mr Krishna Kumar Kol	Forest Guard	Madwas range, Sidhi
37	Mr Sampat Kumar Dwivedi	Ranger	Mohan range, Sidhi
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Under this assignment, a team was put together by CMS to carry out the functions related to preparation and testing of study tools, field work, analysis of findings and report compilation. The details of the team members are shared below:

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7 Abbreviations

APL	Above Poverty Line
BPL	Below Poverty Line
CMS	Catalyst Management Services
GEF	Global Environment Facility
GIS	Geographic Information System
GP	Gram Panchayat
Ha	Hectares
JFMC	Joint Forest Management Committee
LPG	Liquefied Petroleum Gas
MFI	Micro Finance Institution
MGNREGA	Mahatma Gandhi National Rural Employment Guarantee Act
NGO	Non-Government Organization
NRM	Natural Resource Management
NTFP	Non-Timber Forest Produce
OBC	Other backward Castes
PDS	Public Distribution System
PPI	Progress out of Poverty Index
PRA	Participatory Rural Appraisal
SC	Scheduled Castes
SHG	Self Help Group
SME	Small and Medium Enterprise
ST	Scheduled Tribes
ToC	Theory of Change
UNDP	United Nations Development Programme

8 Programme overview

Background

Financed by the Global Environment Facility (GEF), United Nations Development Programme (UNDP) is implementing the project "Integrated Land & Eco-system Management to Combat Land Degradation and Deforestation in Madhya Pradesh" in partnership with the Forest Department of Madhya Pradesh under Community Forest Management. The programme duration was from Sept-2010 to Dec-2015. The programme area was spread over nine forest divisions of five project districts (Betul, Chhindwara, Sidhi, Singrauli and Umaria). The main objective of the programme was to address the problem of degraded bamboo forest land on micro-watershed basis, through local community participation through sustainable livelihood practices. The programme strategy was to provide an integrated approach of maintaining ecosystem services.

Objective of the programme

The larger goal of the programme was to promote sustainable land management while maintaining the capacity of ecosystems to deliver goods and services (benefitting local livelihoods), under climate change scenario. The specific objective was to promote community-driven sustainable land and ecosystem management at the landscape level through integration of watershed management, joint forest management, and sustainable livelihoods development, so as to balance ecological and livelihood needs.

The following were the activities that took place under the programme:

Rehabilitation of Degraded Bamboo Forests: Under this, in each district the rehabilitation of 3000 to 4000 Ha of degraded bamboo forest was to take place through villagers. For every beneficiary, each year 5 Ha of degraded bamboo forest had to be protected for 4 years leading to a total coverage of 20 Ha for each family/beneficiary. For this, each family was to get a monthly pay of Rs 2,500-Rs 3,500. In total, the target was to rehabilitate 14,500 Ha of degraded bamboo forest benefitting 725 families. After 4 years, these forest areas were to be handed over to the community who will be benefitted by selling the forest produce in a sustainable manner.

Energy Plantation: Under the programme, it was decided that each forest division is required to establish an energy plantation. This had to be done in an area of 220 Ha of which 40 villages were to get the benefit. In this energy plantation, fast growing fuel wood species were to be planted which were to be made available to the community, thereby decreasing the pressure of fuel wood on the forest areas.

Fodder Development: One of the programme activities also required to develop a fodder area in 190 Ha of land. This was to benefit 40 villages. In this, fast growing fodder species were to be planted which were to be made available to the community, thereby decreasing the pressure of fodder on the forest areas.

Development of Home Garden: Under this, it was required to distribute a total of 1,500 medicinal plants in each forest committee which were to be distributed among the villagers. For each family it was decided to give 5-10 plants. Also, training was to be provided to them for taking care of these

plants. Only those species were to be promoted which were locally acceptable. These plants could then be used by villagers to gain returns by selling the produce or used for household purposes.

Watershed Management: Under this, to stop the soil erosion in the forest and non-forest area, different watershed structures were to be built. These included contour trenches, gully plugging, stop dams, check dams, Nistar Tanks, etc. Also, bamboo plantation was to be done in the treatment area. This activity was to be done to treat 3000 Ha of forest and non-forest land.

Capacity Building of Joint Forest Management Committee (JFMC): One of the programme activities also required to build the capacity of 20 members from each forest committee of every forest division. A total of 2,000 members were to be trained to create Master Trainers who were to act as Resource Persons for each committee and give training to other members of the committee.

Establishment of Small and Medium Size Enterprises (SMEs): Under this project activity, small and medium size enterprises were to be developed. These were to be run by the community forest management committee. Exposure tours for training and capacity building of the committees also were to be done. The idea behind this was to generate an additional source of livelihood for the community.

Improving Agriculture and Animal Husbandry Practices: Under this, in each forest division, selected villages were to be developed as model villages in which different good agriculture and animal husbandry practices were to be promoted.

Table 1 - UNDP-GEF project physical target

Activities	**Physical target**
Rehabilitation of Degraded Bamboo Forests	14500 ha
Energy Plantation	220 ha.
Fodder Plantation	190 ha.
Watershed Management	3000 ha.
Development of Home Garden	6,00,000 Plants
Small & Medium sized Enterprise Business Plan Development	100
Capacity Building of JFMCs Members	2000
Agriculture & Animal husbandry in Villages	30

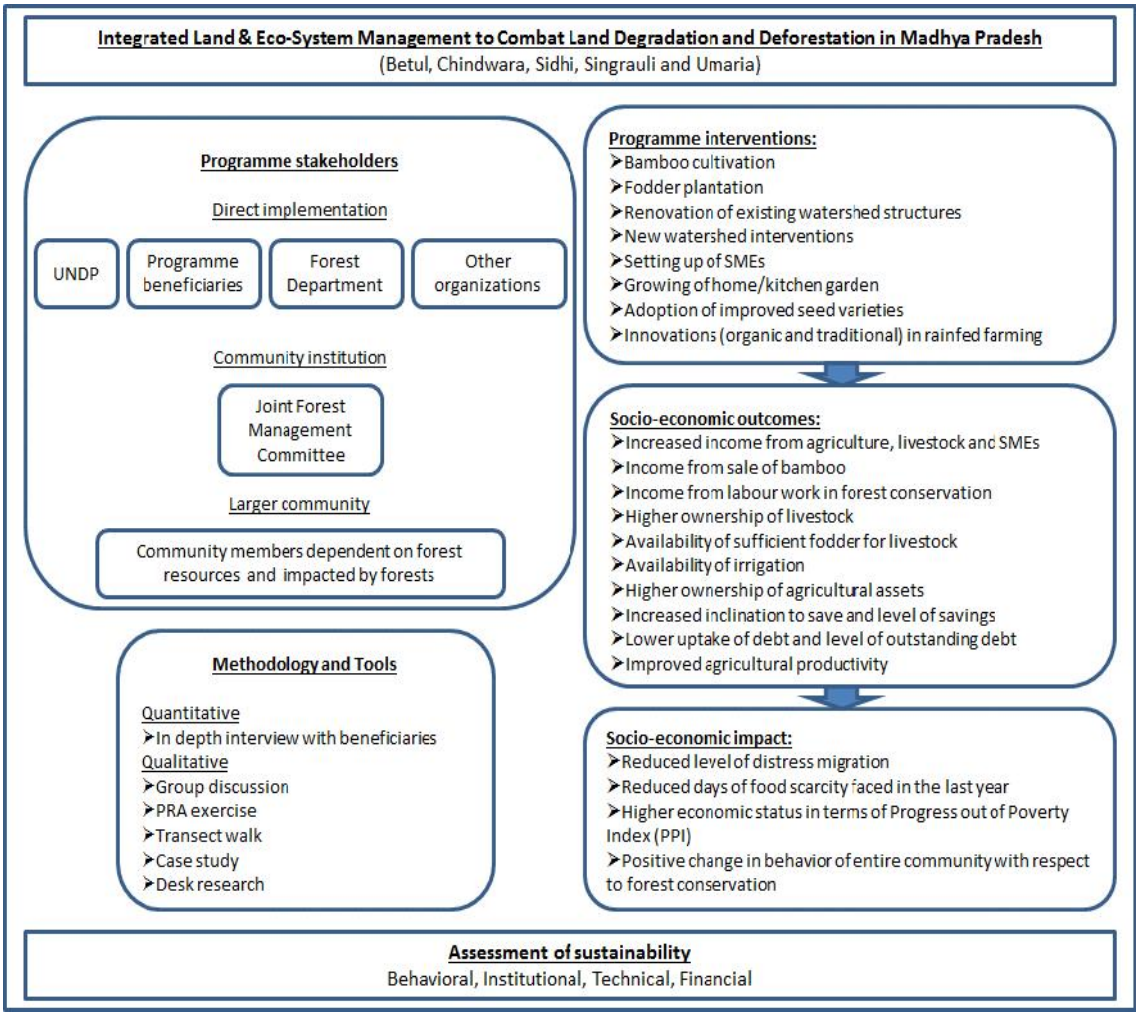
9 Objectives of the study

The objectives of the study include:

1. Conducting an assessment of the socio-economic impact of the programme with reference to the logical framework of the programme
2. Suggesting recommendations based on the study for a possible further scale up of the programme

10 Study framework

Figure 1 – Study framework



The key economic impact indicators assessed in this study are level of distress migration, days of food scarcity and the Progress out of Poverty Index. The key social impact indicator assessed is the behavioral change in the community with respect to forest conservation. The relevant interventions studied include bamboo rehabilitation, fodder plantation, renovation of existing watershed structures and new water shed interventions, setting up of SMEs, growing of home/kitchen garden and adoption of innovations like vermi-compost. The assessment of sustainability of impact has been done on four dimensions: Behavioral, Institutional, Technical and Financial.

The socio-economic study has been done at an overall programme level as well as at the district level for the three districts of study: Betul, Chhindwara and Sidhi. This has been done as the context is different across the three districts and accordingly, the impact of a particular intervention can also be varied. The Study Methodology section gives further details on the methodology used in the socio-economic study.

11 Study methodology

Based on the understanding of the programme, a mixed methods study that combines quantitative and qualitative methods was used. To measure the change in key indicators over the programme period, comparison with the information collected at baseline was planned. But since many of the key indicators were not captured in the baseline study, the endline study used recall to measure change. A separate standalone analysis of relevant indicators in the baseline study has been presented in the Annexure section of the report.

The **quantitative methods** in the study involved conducting an in depth interview with the beneficiaries of the programme. This interview was conducted by a qualified team of Field Investigators who conducted the interview through an Android Operating System based app on tablets. This ensured accuracy and reliability of data captured.

Picture 1 – In depth interview with beneficiary using mobile based apps

The **qualitative methods** included methods employed in the field as well as desk research. The field methods included a combination of Participatory Rural Appraisal (PRA) exercises with beneficiary groups, focused group discussions, transect walks to intervention sites and case studies. The main objective of the qualitative field methods was to map the perception of the beneficiaries regarding the change which occurred during the programme. An example of a PRA exercise being conducted can be seen in Picture 2.

Picture 2 – PRA exercise in Borapani village, Ambada range, Chhindwara district

Picture 3 was taken during a transect walk in the forest area near the Baghaun village in Sidhi range of Sidhi district. The primary purpose of the transect walks conducted during this study was to visit the sites of change with the beneficiaries and then capture their perception with respect to the change which has occurred due to the programme interventions. The discussions during these transect walks captured the entire journey of change along with the processes which contributed to the change. For example, the discussions included the processes adopted for beneficiary selection, the strength and inclusiveness of the institutions and the sustainability of the change. The perception of the beneficiaries regarding change served as a very reliable peer verified mechanism of capturing change due to the programme interventions.

Picture 3 - Transect walk in Baghaun village, Sidhi range, Sidhi district

The desk research involved compiling photographic evidence of key intervention sites and confirming the impact of the intervention at the site with the perception of the beneficiaries. During the field visit, detailed interactions were also held with the staff of the Forest Department to better understand their perception of the impact brought about by the programme.

12 Sampling

In depth interview with beneficiaries

For the sample selection, statistical significance at the programme level was assumed as that allowed for consolidation of results at the programme level. To get statistically significant results at the programme level, it was required to cover sufficient number of beneficiaries from within the project districts in the quantitative survey. Since assuming the level of significance at 95% would have significantly increased the minimum required sample size, the study assumed 90% significance and +/- 5% margin of error for the selection of beneficiaries.

Based on this, the minimum sample size required worked out to 267 respondents. This was rounded off to 270 respondents. Assuming a design effect of 2 as the sample selection was multi-stage and stratified, the desired sample size worked out to 540 respondents for the in depth interviews.

Based on interactions with the UNDP programme team, it was estimated that the total number of direct beneficiaries in the programme were approximately 700. Since there was a high probability of not being able to locate 540 direct beneficiaries to interview on account of migration, the field team consciously located indirect beneficiaries to make up for the shortfall. An indirect beneficiary, for example, would be benefitting from a watershed intervention through improved soil moisture retention which leads to higher agricultural productivity.

Based on this, the total sample covered was 552 beneficiaries. Picture 4 shows the district wise breakup of the sample size between the Betul (237 beneficiaries), Chhindwara (185 beneficiaries) and Sidhi (130 beneficiaries) districts. The sample size is relatively higher in Betul as there was a larger pool of direct beneficiaries present in Betul to proportionately select the sample from.

Picture 4 – District wise sample size in map of Madhya Pradesh

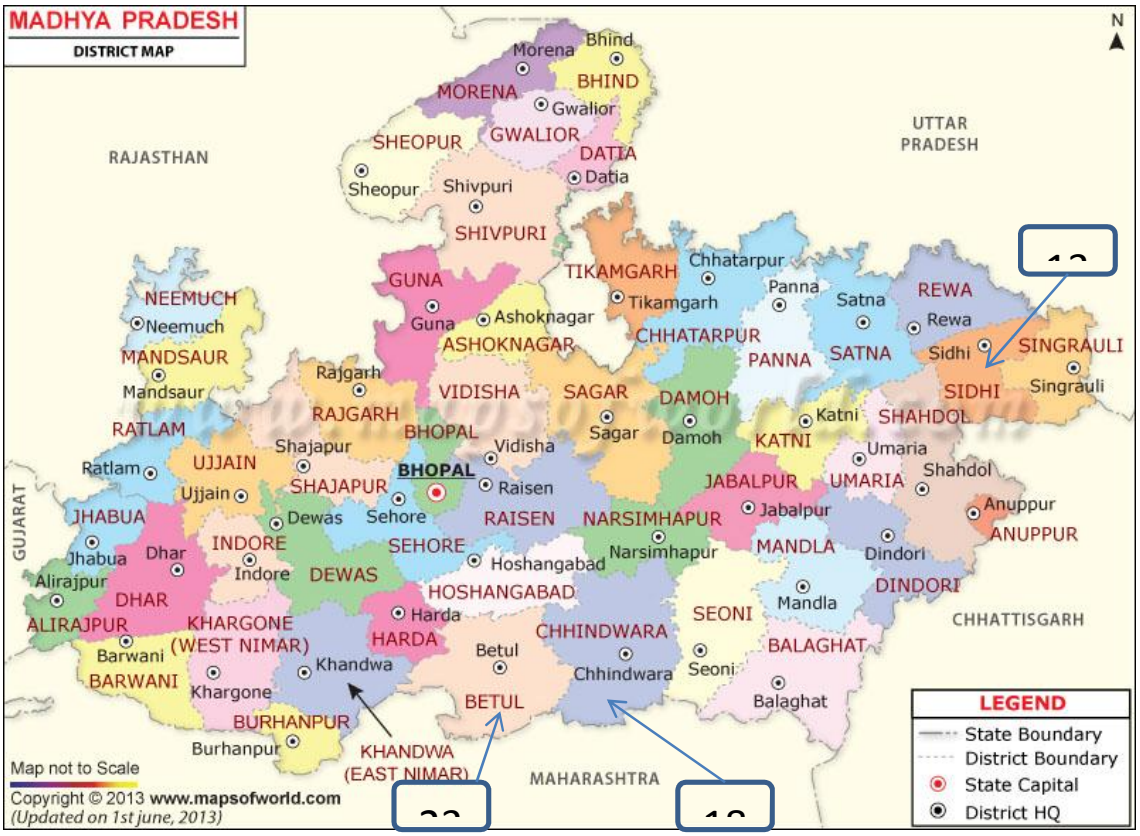


Figure 2 shows the breakup of the sample covered based on district as well as being direct/indirect. It can be seen that section of indirect beneficiaries covered in Chhindwara is high, primarily because of the different kind of watershed interventions carried out there.

Figure 2 – Sample size – Type of beneficiary wise

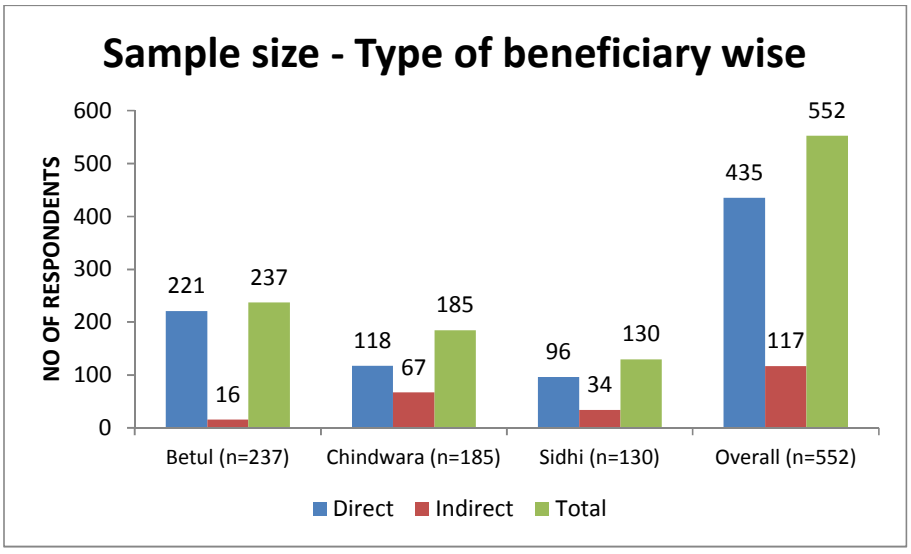
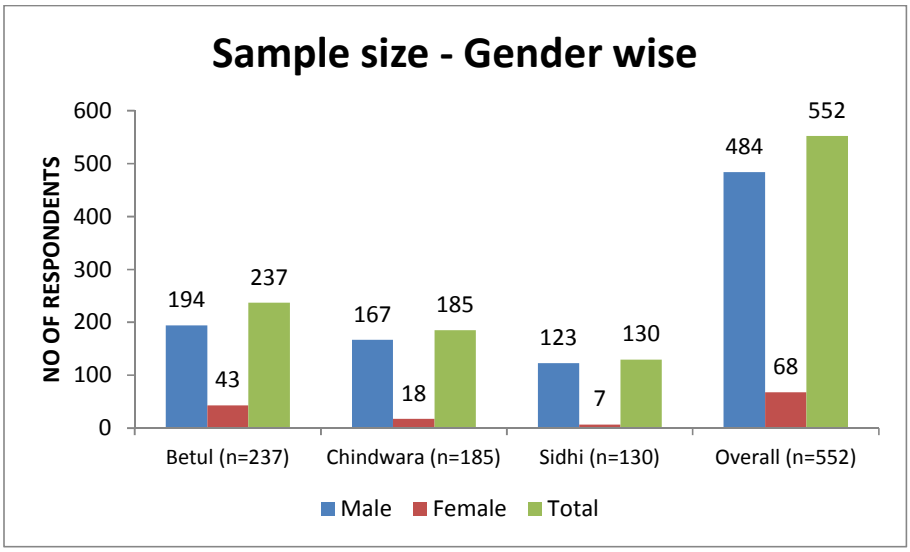


Figure 3 shows the breakup of the sample covered based on the gender of the respondents. It can be seen that the section of female respondents covered is the highest in Betul on account of the

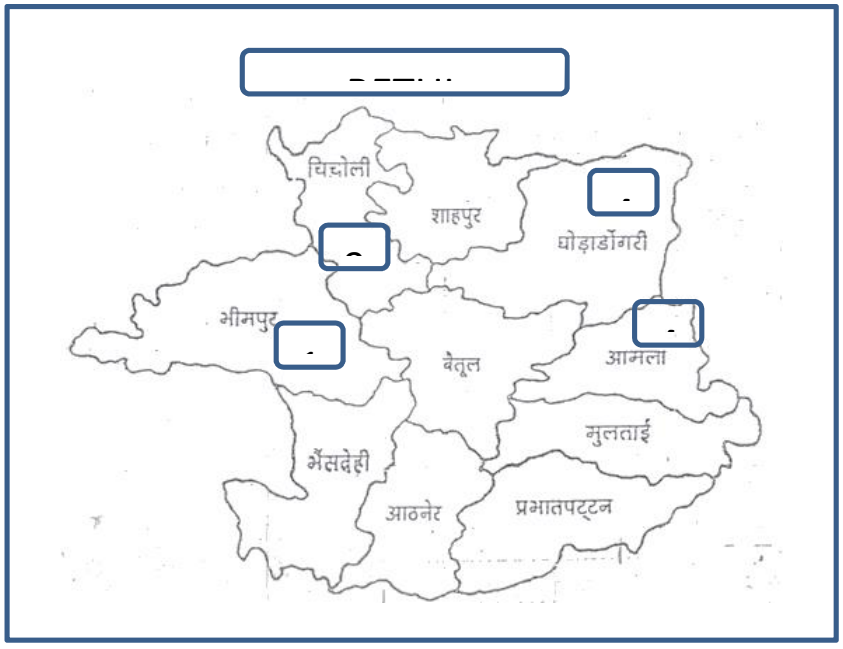
successful running of the silk thread production activity there which employs only women. On the other hand, the section of female respondents is the lowest in Sidhi on account of the limited success of the agarbatti activity there which employs women.

Figure 3 – Sample size – Gender wise



Within Betul district (Picture 5), the sample size of 237 beneficiaries was distributed between Amla (43) Ghodadongri (43), Chicholi (99) and Bhimpur (12) blocks. All the forest divisions where the intervention took place (North Betul, West Betul and South Betul) were covered. The ranges covered included Sarni, Bhaura, Tavdi, Savligarh, Gawasen and Amla.

Picture 5 – Block wise sample breakup - Betul



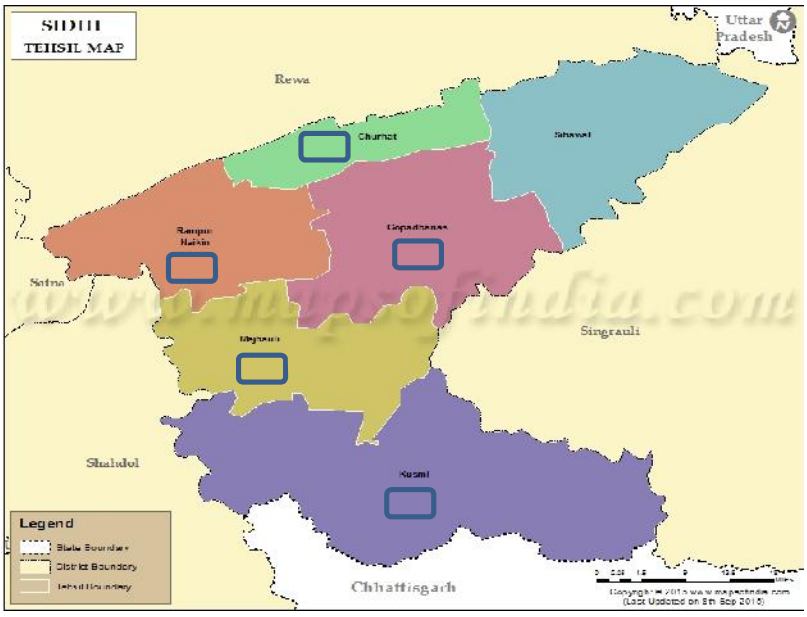
Within Chhindwara district (Picture 6), the sample size of 185 beneficiaries was distributed between Tamiya (86) Harrai (23) and Sausar (76) blocks. All the forest divisions where the intervention took

place (East Chhindwara, West Chhindwara and South Chhindwara) were covered. The ranges covered included Tamiya, Jhirpa, Pashchim Batkakhapa and Ambada.

Picture 6 – Block wise sample breakup - Chhindwara

Within Sidhi district (Picture 7), the sample size of 130 beneficiaries was distributed between Churhat (15) Gopadbanas (20), Rampur Naikin (20), Majhauli (35) and Kusumi (40) blocks. The only forest division where the intervention took place (Sidhi) was covered. The ranges covered included Churhat, Sidhi, Madwaas and Mohan.

Picture 7 – Block wise sample breakup - Sidhi



Qualitative study with beneficiary groups

For conducting the qualitative study with beneficiary groups, two teams of senior professionals from CMS attempted to visit one village in each range of the Betul, Chhindwara and Sidhi districts. In some cases, the interactions were held with groups of beneficiaries from multiple villages at a common point. The following are the details of the villages or sites visited for conducting the qualitative study:

S No	Name of village / site	Name of range	Name of district	Type of interaction
1	Borpani	Ambada	Chhindwara	PRA exercise, Transect walk, Focused group discussion, Case study, Stakeholder interview (local NGO Vrutti - on orange cultivation)
2	Agarbatti making unit, Tamiya	Tamiya	Chhindwara	Focused group discussion, Case study
3	Bamboo furniture making unit, Kunwabadla	Tamiya	Chhindwara	Transect walk, Focused group discussion, Case study
4	Dundhishikhar	Tamiya	Chhindwara	PRA exercise, Transect walk, Focused group discussion, Case study
5	Bodalkachar	Jhirpa	Chhindwara	Transect walk, Focused group discussion, Case study, Stakeholder interview (PRI representative)
6	Dukarjhela	Ambada	Chhindwara	Transect walk, Focused group discussion
7	Parasda	Bhaura	Betul	Transect walk, Focused group discussion, Case study, Stakeholder interview - PGVS, GVS (NGOs)
8	Tawadhana	Sarni	Betul	Focused group discussion, Case study
9	Silk thread production unit, Gawasen	Gawasen	Betul	Focused group discussion, Case study
10	Bamboo furniture making unit	Amla	Betul	Focused group discussion, Case study
11	Baghaun	Sidhi	Sidhi	Transect walk, Focused group discussion
12	Padkhuri	Churhat	Sidhi	Transect walk, Focused group discussion
13	Kusumi	Mohan	Sidhi	PRA exercise, Focused group discussion, Stakeholder interview
14	Piparaha	Mohan	Sidhi	Transect walk, Case study, Stakeholder interview

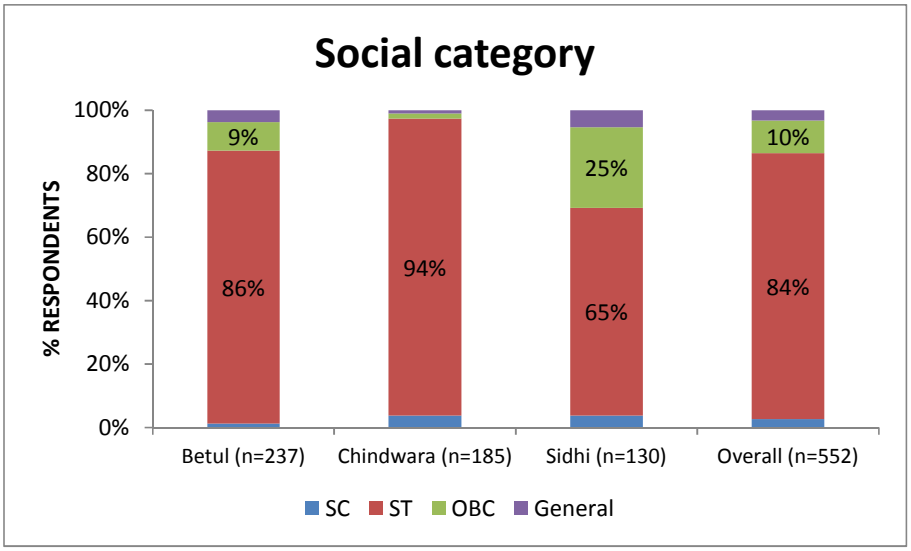
13 Detailed findings from the study

13.1 Basic profile of the sample

Social category

Based on the social category, it can be seen that the highest section of respondents was from the Scheduled Tribe (ST) category (84% overall) which is one of the most marginalized sections of the society. 10% of the overall respondents belonging to the Other Backward Castes (OBC) category. When seen district wise, it is seen that the proportion of ST respondents is the highest in Chhindwara (94%) and the lowest in Sidhi (65%).

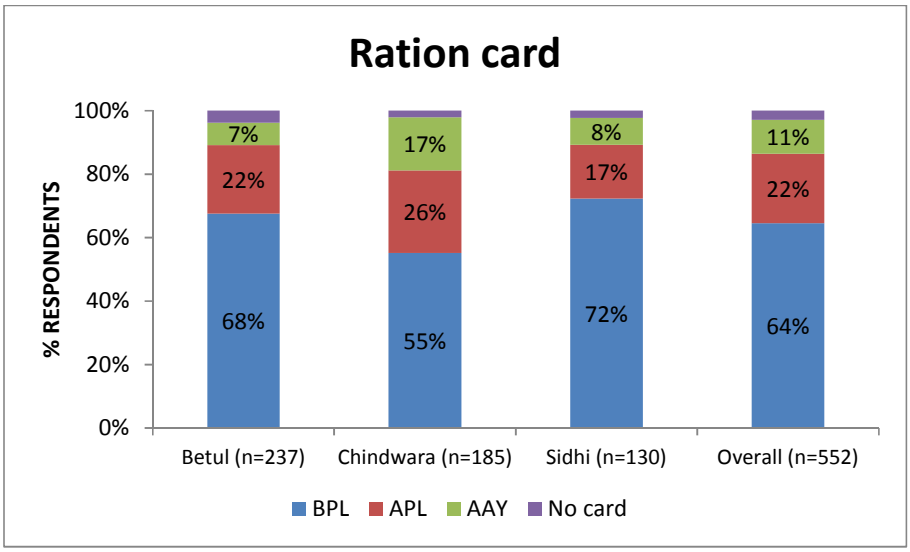
Figure 4 – Social category



Ration card

Based on the ownership of ration card, it is seen that 64% of the overall respondents are having Below Poverty Line (BPL) cards followed by 22% of the respondents having Above Poverty Line (APL) cards and 11% having Aantyoday Anna Yojana (AAY) cards. When seen district wise, it is seen that the proportion of APL respondents is the lowest in Sidhi (17%).

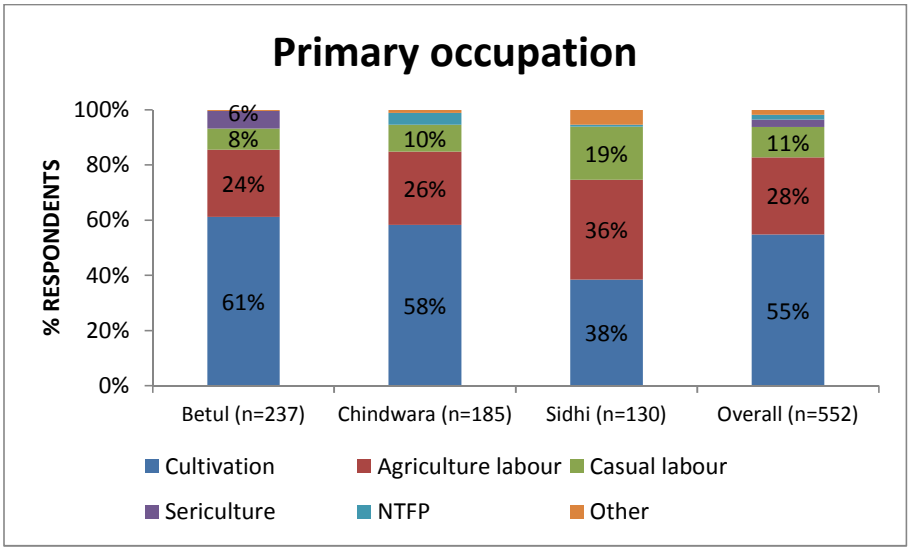
Figure 5 – Ration card



Primary occupation

Based on the primary occupation of the household, it is seen that overall, 55% of the respondents followed cultivation as the primary occupation followed by 28% of the respondents following agriculture labour and 11% of the respondents following casual labour as the primary occupation. The prevalence of labour as the primary occupation is the highest in Sidhi where 36% of the respondents followed agriculture labour and 19% of the respondents followed casual labour as the primary occupation. This was also confirmed based on feedback by the field team wherein many of the respondents were found to be landless. It can also be inferred from this that the selection of beneficiaries for bamboo rehabilitation, which was the primary activity promoted, was pertinent as bamboo rehabilitation can provide a much needed alternate source of income for landless families.

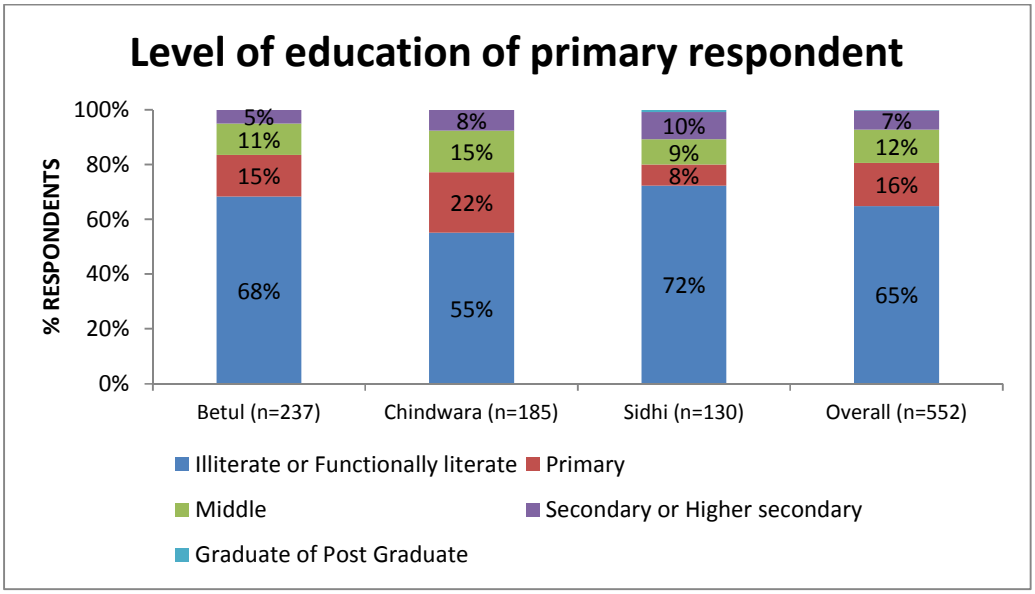
Figure 6 – Primary occupation



Level of education of primary respondent

Based on the education level of the primary respondent interviewed, it is seen that a large section of the overall respondents (65%) are either illiterate or only functionally literate with 7% of the respondents having studied upto secondary or higher secondary school. The level of education was found to be relatively the best in Chhindwara with 55% of the respondents being either illiterate or only functionally literate.

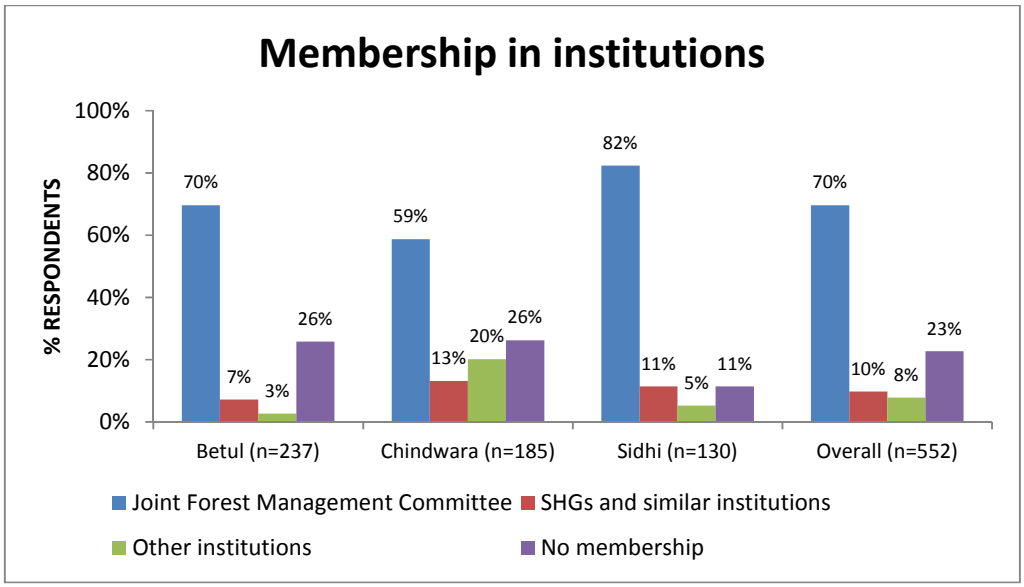
Figure 7 – Level of education of primary respondent



Membership in institutions

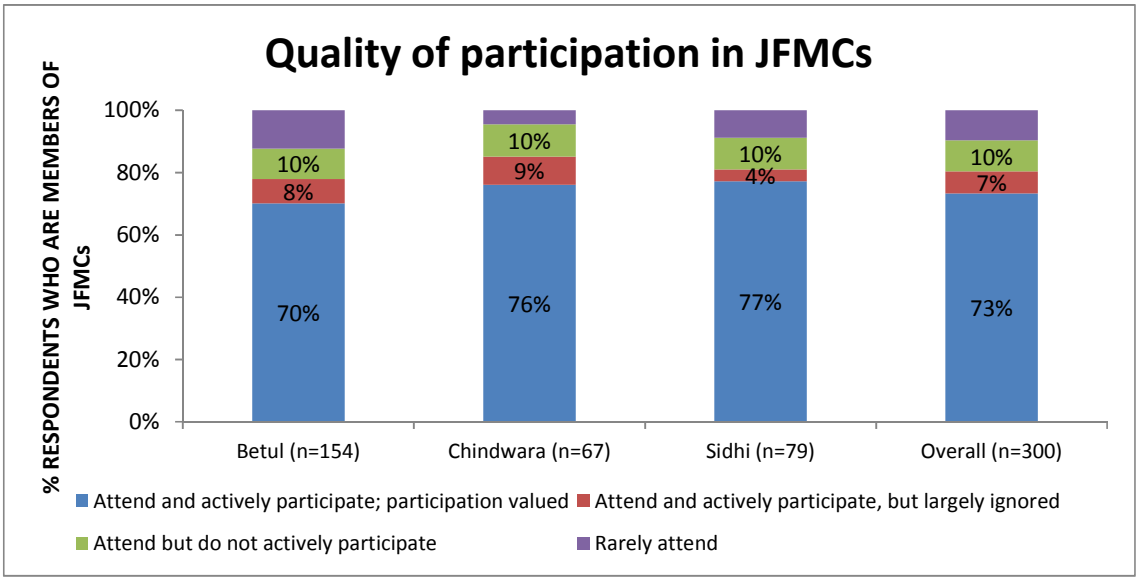
In terms of membership in institutions, it is seen that overall, 70% of the respondents had family members as part of Joint Forest Management Committees (JFMCs). 23% of the respondents overall had family members who were not part of any institution. This was also driven by the fact that a section of respondents interviewed were indirect beneficiaries.

Figure 8 – Membership in institutions



The quality of participation in JFMCs was found to be quite high with 73% of the overall respondents who have membership, attending and actively participating which is valued. This is important from the programme point of view as the JFMC was the key forum for ensuring effective community management of forest resources.

Figure 9 – Quality of participation in JFMCs



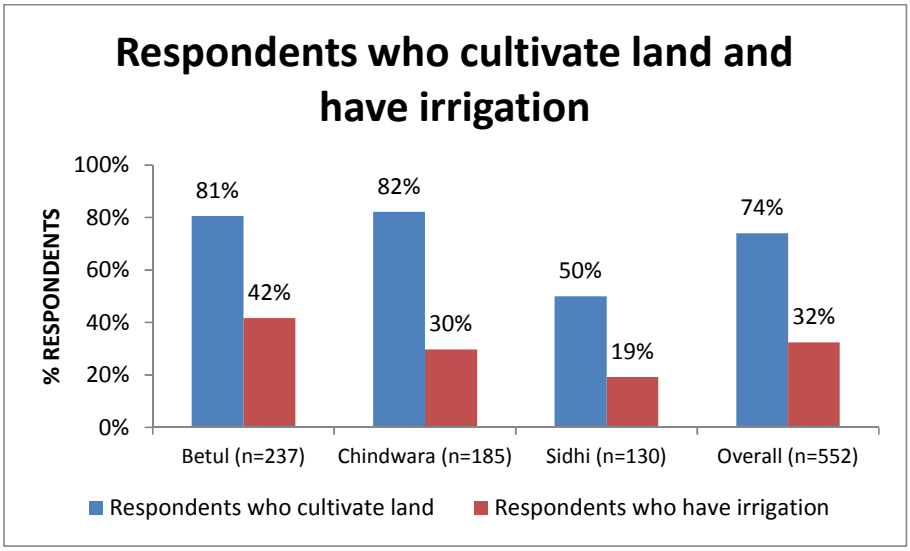
13.2 Change in key agricultural indicators

Engagement in agriculture

Based on the area cultivated, it was assessed whether a respondent engaged in any kind of crop cultivation. It is seen that overall, 74% of the respondents cultivated land. When viewed district wise, it is seen that 50% of the respondents in Sidhi cultivated land which corroborates the fact that a large section of the beneficiaries was landless. From the point of view of economic benefits, it can be inferred that the programme had very high relevance in Sidhi with bamboo rehabilitation serving as an alternate occupation for the large section of landless families.

Out of the overall respondents, 32% also had irrigation facilities available. This figure is the least for Sidhi with only 19% of the respondents having irrigation facilities available.

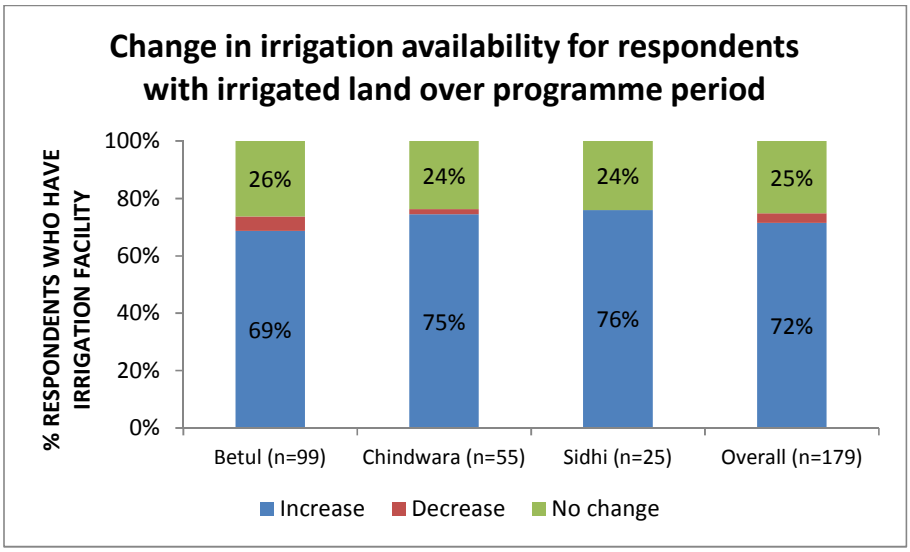
Figure 10 – Respondents who cultivate land and have irrigation



Change in irrigation availability

The respondents who had irrigation facility currently were further asked whether there was an increase or decrease in irrigation availability over the programme period. It is seen that overall, 72% of the respondents with irrigation facility had an increase in irrigation availability over the programme period with 25% seeing no change. This has helped these respondents in either taking a second crop in the Rabi season or getting increased productivity from the crops being taken earlier in both the Kharif and Rabi seasons.

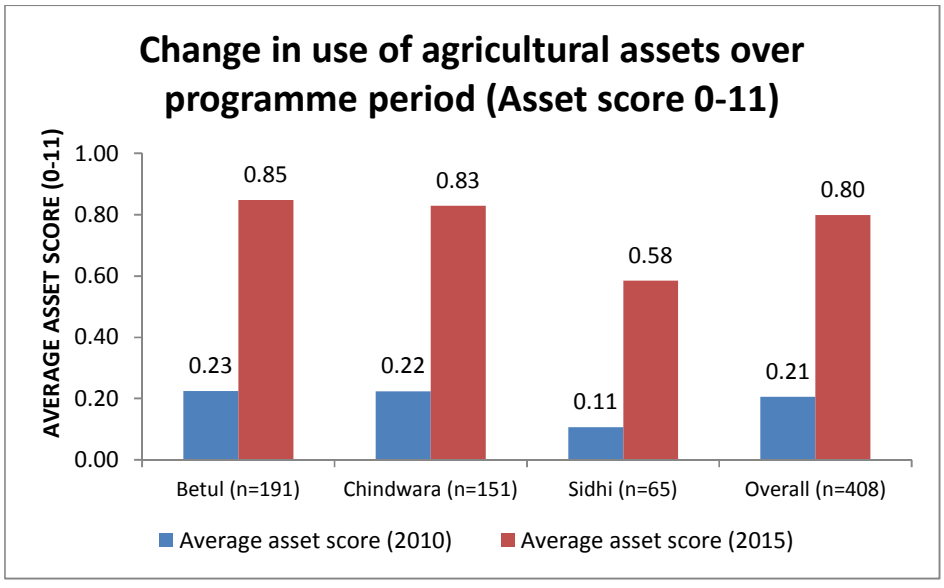
Figure 11 - Change in irrigation availability for respondents with irrigated land over programme period



Use of agricultural assets

The study checked the usage of assets like tube well, vermi-compost tank, well, drip irrigation, tractor, harvester, sprinkler, spray pump, diesel pump, electric pump, small inter culture equipment like cycle hoe and hand hoe and analyzed the change over the programme period. The usage of assets was measured by computing an asset score ranging from 0 to 11 which was a simple sum of the assets used. This score was computed only for those respondents who cultivate land. It is seen that average asset score for the overall respondents increased from 0.21 to 0.80 from the year 2010 to 2015. In absolute terms, the asset score is still very low, especially in Sidhi (0.58 currently). Based on interaction with beneficiary groups, it emerged that the component of the programme which facilitated the greater use of agricultural assets was the monthly income from labour in conserving forests which enabled either the purchase or renting of assets.

Figure 12 – Change in use of agricultural assets over programme period

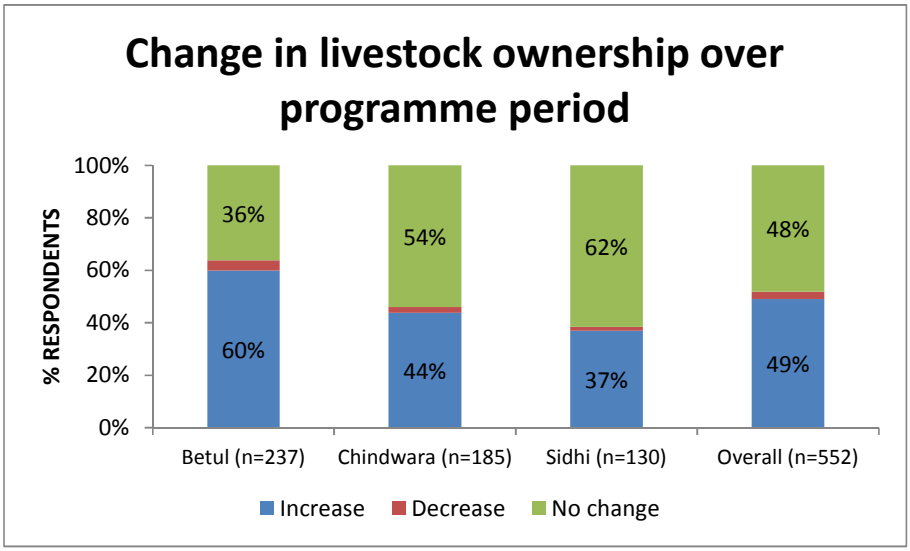


Livestock ownership

The ownership of livestock (cows, bullocks, buffaloes, goats, poultry, etc) was found to be high with 90% of the respondents overall owning some form of livestock. The figure was the highest in Betul (96% of respondents) and the lowest in Sidhi (78%). Please refer to Table 4 in the Annexure section for the breakup of key figures for direct and indirect beneficiaries.

All the respondents were probed on the kind of change in livestock over the programme period. It is seen that 49% of the overall respondents saw an increase in ownership of livestock over the programme period whereas 48% saw no change in ownership. The ownership of livestock and income derived from them is directly linked to the fodder cultivation component of the programme. Lack of availability of sufficient fodder for livestock was a problem already present in the context of the area chosen for the programme interventions. This also led to lower productivity of the livestock and hence, lower income from the livestock. Hence, cultivation of fodder in the common land was chosen as an intervention to ensure fodder sufficiency for the village and the region as a whole. During interactions with beneficiary groups, some cases emerged wherein because of better availability of fodder, livestock ownership had either increased or livestock productivity had improved.

Figure 13 - Change in livestock ownership over programme period



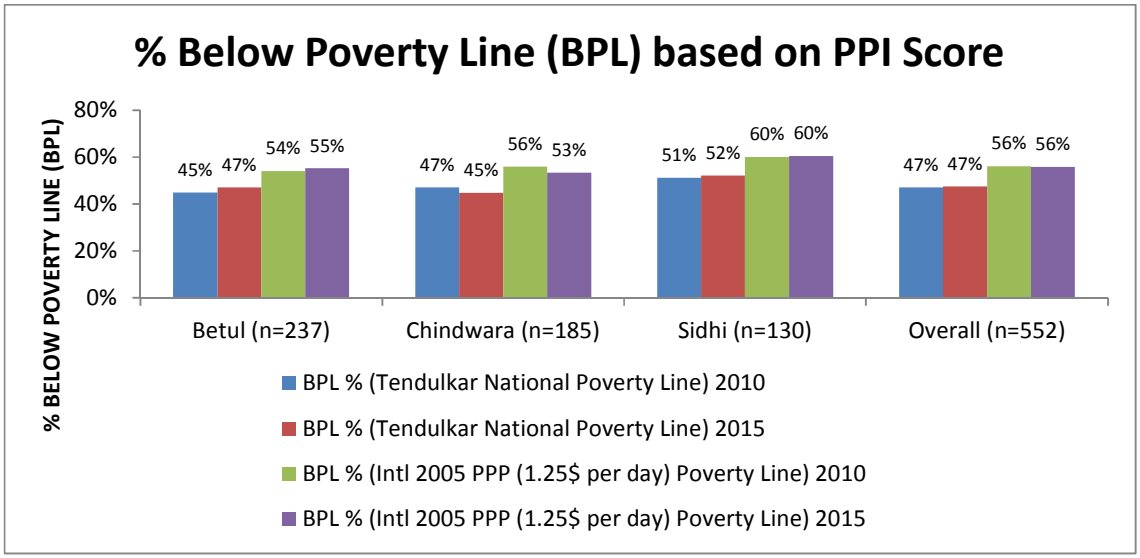
13.3 Change in key economic indicators

Below Poverty Line (BPL) based on Progress out of Poverty Index

Based on ten questions in the household questionnaire, a composite score, Progress out of Poverty Index (PPI) was computed. The PPI can be used as an indicator of the economic level a household occupies in the society. The PPI uses 10 key indicators to estimate the likelihood that a household has income below the National Poverty line, USAID "Extreme" Poverty Line, $0.75/Day/PPP (purchasing power parity), $1/Day/PPP, $1.25/Day/PPP, $1.50/Day/PPP, and $2/Day/PPP. These indicators are unique to each country and derived from standard national surveys. In addition, the indicators are selected on the basis of being easy and inexpensive to collect, being sensitive to changes in levels of poverty over time, and being strongly correlated with poverty. Driven by poverty data, each indicator is weighted towards a total PPI score, which is on a 0-100 scale. Higher scores indicate less likelihood of poverty.

The PPI Score was computed for 2010 which was at the start of the programme as well as for the present. Based on that, the percentage of households below the poverty line was calculated according to two systems, the Tendulkar national Poverty Line and the Intl 2005 PPP (1.25$ per day) Poverty Line. This enabled a comparison of the incidence of poverty at the beginning and the end of the programme. It is seen that for the overall respondents, the incidence of poverty has not changed according to both the systems of measurement. When seen district wise, it is seen that the section of BPL households has marginally gone up in Betul and Sidhi but has marginally come down in Chhindwara.

Figure 14 - % Below Poverty Line (BPL) based on PPI Score

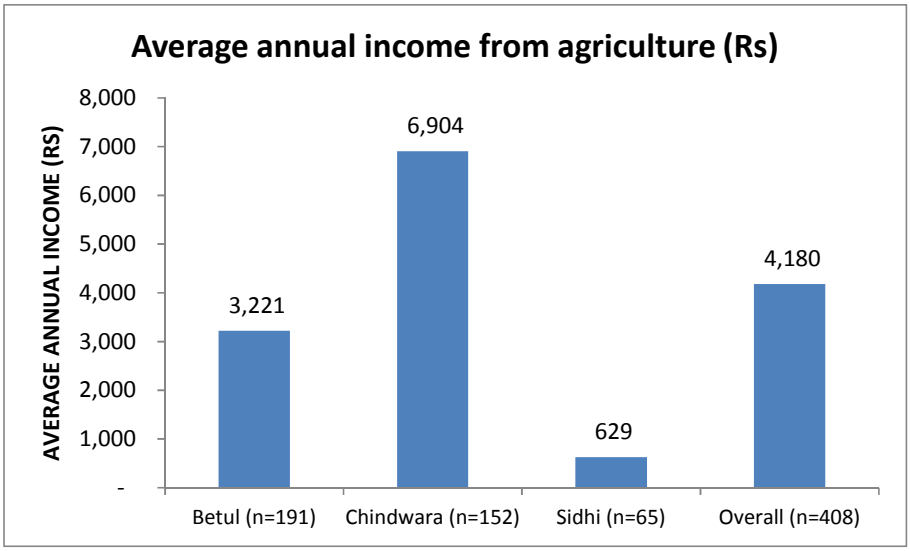


Annual income from agriculture

The annual income from agriculture was computed based on the farm produce sold. This was done for the respondents who cultivated land. Based on the average annual income, it is seen that the farmers of Chhindwara had the highest average annual income per farmer (Rs 6,904) and the farmers of Sidhi had the lowest average annual income per farmer (Rs 629). Overall, the average annual income from agriculture was computed as Rs 4,180 per farmer. On an absolute level, the average

annual income from agriculture is low and this was corroborated by the group interactions with farmers wherein the dependence on income from labour was found to be high.

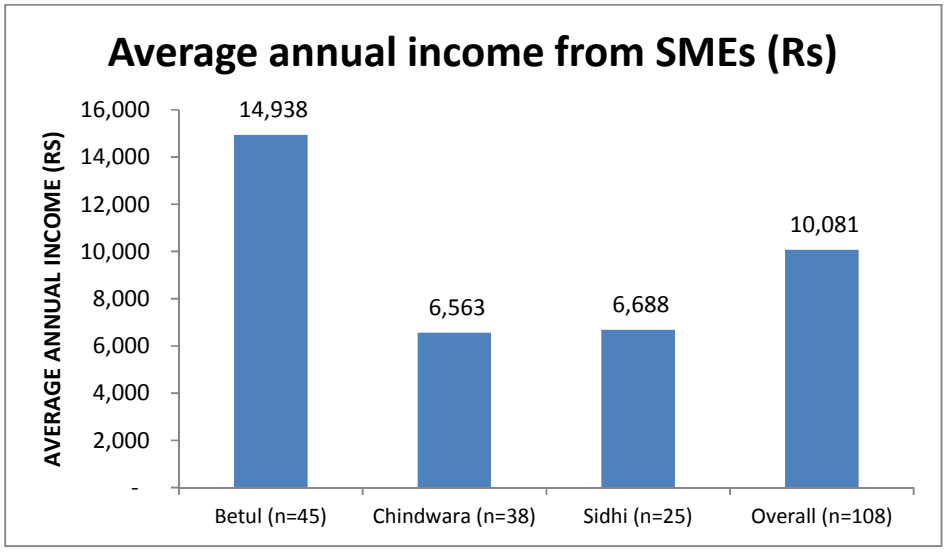
Figure 15 – Average annual income from agriculture (Rs)



Annual Income from Small and Medium Enterprises (SMEs)

Respondents who were engaged in SMEs at any point of time in the programme were probed on the income earned from it in the last year. The SMEs included activities like agarbatti making, silk thread production, lantana furniture making and bamboo furniture making. It is seen that overall, the average income earned last year by the SME linked respondents was Rs 10,081. The average annual income earned was found to be the highest in Betul (Rs 14,938). This was also corroborated by the interactions with beneficiary groups in Betul where the bamboo furniture making and silk thread production SMEs were found to be running successfully.

Figure 16 – Average annual income from SMEs (Rs)



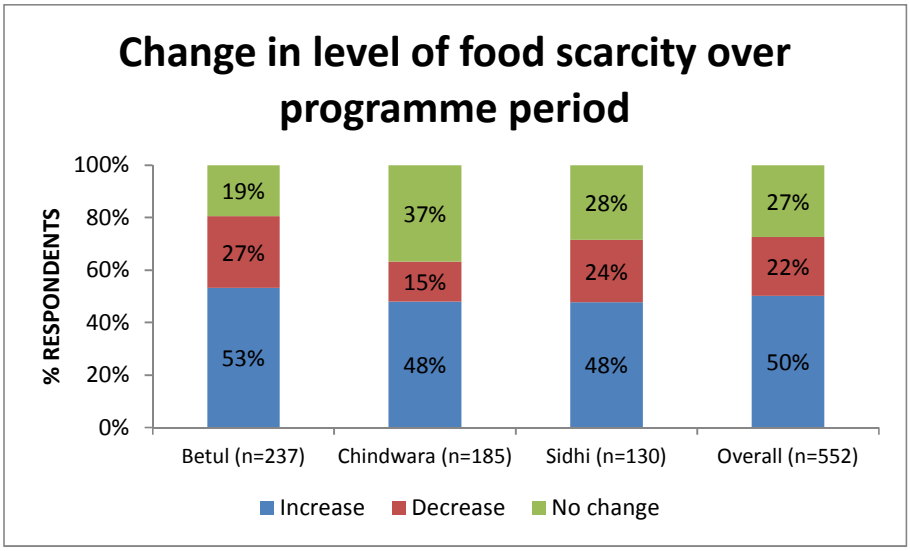
Level of food scarcity

The respondents were probed on the level of food scarcity faced by them in the last year which was defined as the number of days of not having sufficient food for the family without resorting to taking debt or migration. It is seen that overall, the average number of days of food scarcity faced last year was 19.4 days. This figure was marginally higher in Sidhi (21.9 days) and lower in Chhindwara (17.9 days).

Each respondent was also probed on what has been the kind of change in the level of food scarcity over the programme period. It is seen that overall, 50% of the respondents reported an increase in food scarcity over the programme period whereas 22% of the respondents reported a decrease in food scarcity. 27% respondents reported no change in food scarcity.

This finding is not exactly in line with the interactions with beneficiary groups where it was found that the income from conservation of forests was being used to meet the working capital needs of the family with good success. What does explain this finding is the fact that the income from conservation had stopped a year back and many respondents had not been able to use the income from conservation to increase their productive assets. This could possibly explain reverting to an earlier state of food scarcity with rising costs of inputs and other commodities.

Figure 17 – Change in level of food scarcity over programme period



Savings and Credit

To understand the management of the household economy, the respondents were probed on the tendency to save and the uptake of credit in the last year. It is seen that overall, only 27% of the respondents saved any money. The inclination to save was found to be the highest in Chhindwara (35% of respondents) and the lowest in Sidhi (20% of respondents). The inclination to save also derives from the availability of surplus cash.

The uptake of credit in the last year was found to be present in 43% of the overall respondents. It was found to be the highest in Sidhi (54% of respondents) and the lowest in Betul (32% of respondents). Taken together, it can be inferred that the tendency to save is least in respondents in Sidhi and the

tendency to take credit is the maximum in Sidhi. This indicates a relatively poorer state of working capital in Sidhi.

Figure 18 – Savings vs Credit

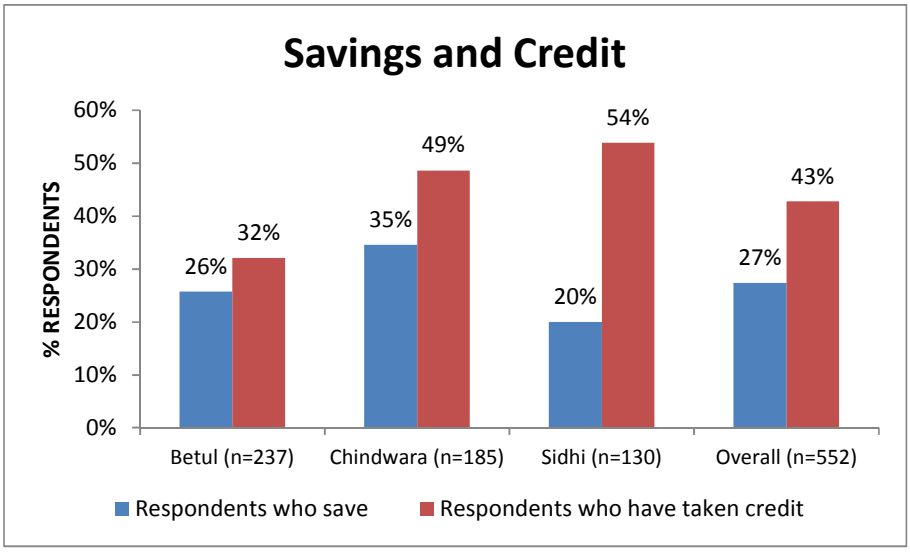
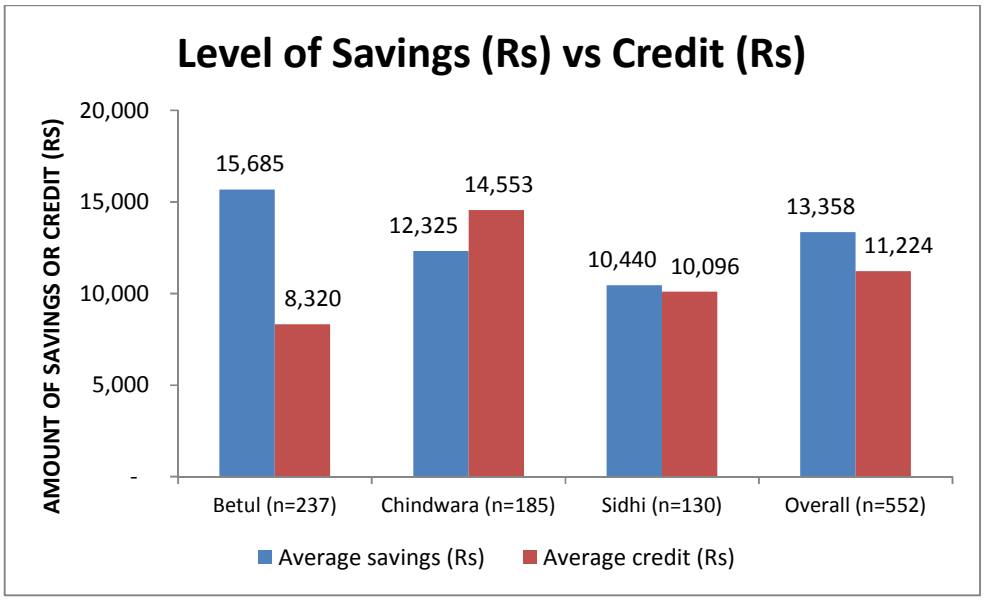


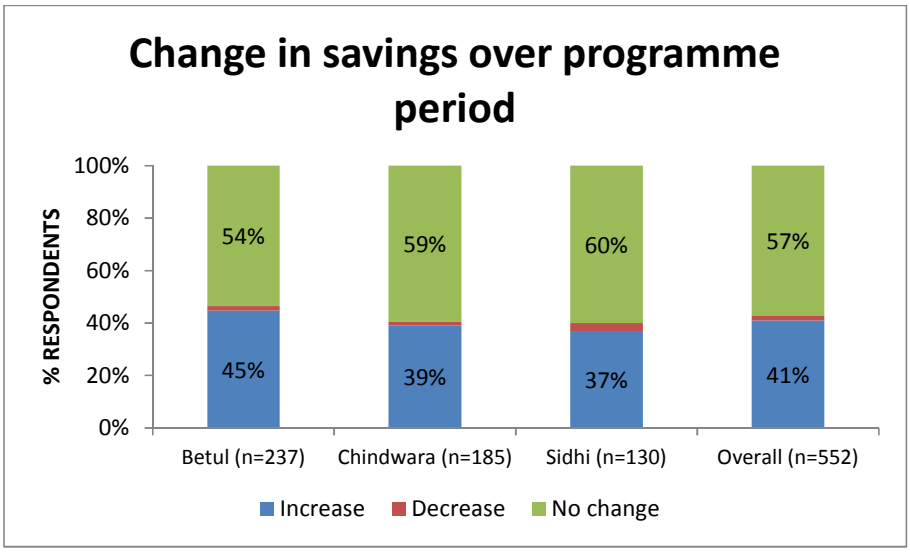
Figure 19 indicates the average savings and average credit per household for the respondents who save and take credit respectively. It is seen that the average savings per household overall is Rs 13,358 and the average credit per household is Rs 11,224.

Figure 19 – Level of Savings (Rs) vs Credit (Rs)



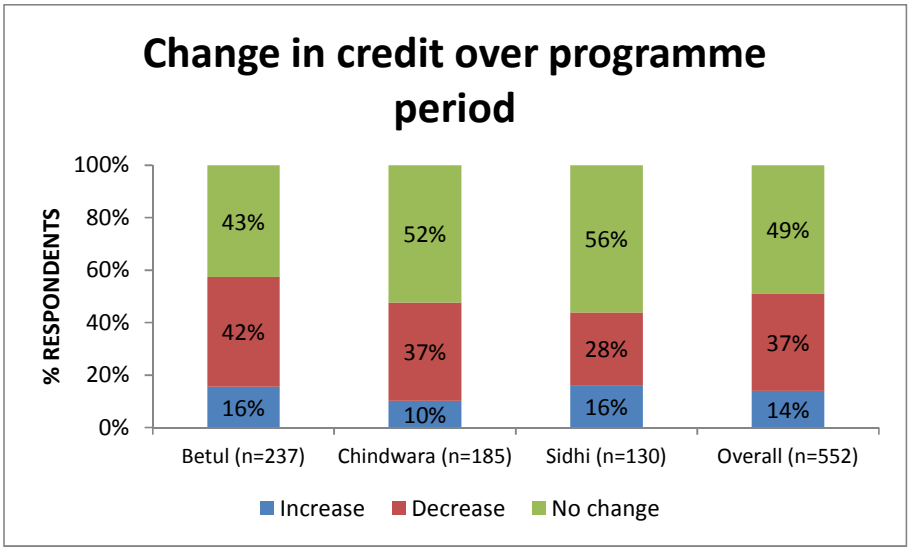
All the respondents were asked as to the nature of change of savings over the programme period. It is seen that overall, 41% of the respondents reported an increase in savings over the programme period whereas 57% reported no change.

Figure 20 – Change in savings over programme period



The respondents were also probed on the nature of change in credit taken over the programme period. It is seen that overall, 49% reported no change, 14% reported an increase and 37% reported a decrease in credit taken. This finding is also corroborated by the interactions with beneficiary groups wherein it emerged that the income from forest conservation was used for meeting working capital requirements as well as spend on purchasing assets (new vehicles) and performing marriages of children. In the absence of the income from conservation, the dependence on credit would have increased.

Figure 21 – Change in credit over programme period

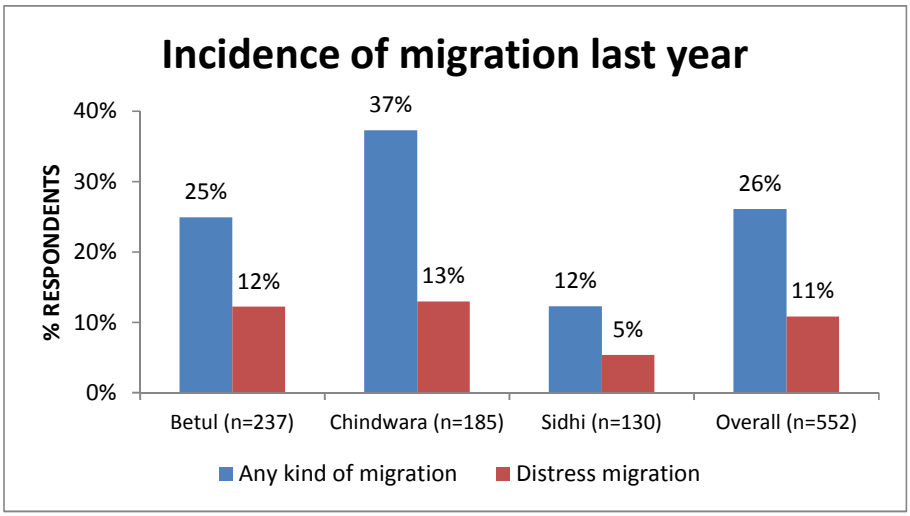


Migration

The incidence of migration was checked in the survey to understand if migration is taking place to augment income of the household. The level of distress migration was also probed specifically to understand if the migration is occurring by choice or through compulsion. It is seen that overall,

members of families of 26% of the respondents migrated last year. In terms of distress migration, 11% of the respondents reported that members of their families had migrated under distress last year. The incidence of migration was found to be the highest in Chhindwara (37% overall, 13% under distress) and the lowest in Sidhi (12% overall, 5% under distress).

Figure 22 – Incidence of migration last year



Migration was largely happening to nearby towns for casual labour work. For example, some of the migration from Chhindwara was happening to the nearby town of Pipariya. During the discussions with beneficiary groups, it was probed if the level of migration has come down over the programme period. The responses indicated that due to the assured nature of the monthly income from forest conservation, the incidence of migration had come down during the programme period.

Figure 23 – Change in level of distress migration (2010-2015)

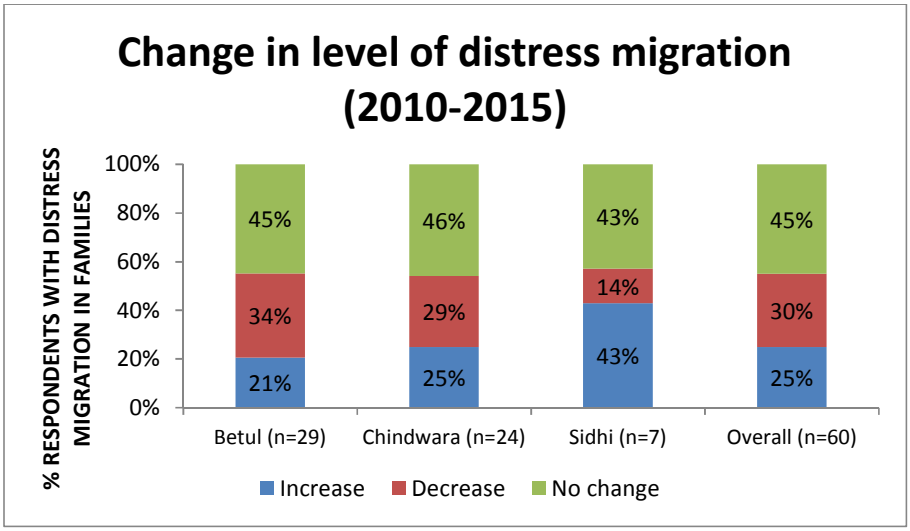


Figure 23 shows the change in levels of distress migration over the programme period (2010-2015), as reported by respondents whose families currently have distress migration. It is seen that overall, 30% of the respondents with distress migration in their families have seen reduced level of distress migration, 25% saw an increase and 45% saw no change over the programme period. The programme

period mentioned here also includes the year 2015 when the monthly income from conservation had been stopped. It needs to be noted here that these figures do not capture the respondents who had distress migration in their families earlier but now have none.

Case study 1 - Reduction in migration in Dundishikhar village, Tamiya range, Chhindwara

The beneficiaries in the Dundishikhar village of Tamiya range in Chhindwara district used to migrate to the district headquarters of the neighbouring district Pipariya before the start of the programme. Some people also used to travel for daily labour work. But now, with them being paid a monthly income of Rs 2,500 earlier which was incremented to Rs 3,500 per month later on, there are almost no instances of migration.

The below table shows the results of the PRA exercise conducted with the respondents of Dundishikhar wherein using a set of stones, the seven female and five male respondents were asked to state the change which has occurred over the programme on a scale of 0-10 for key change indicators. It can be seen that both sets of respondents reported substantial amounts of positive change in migration and other change indicators.

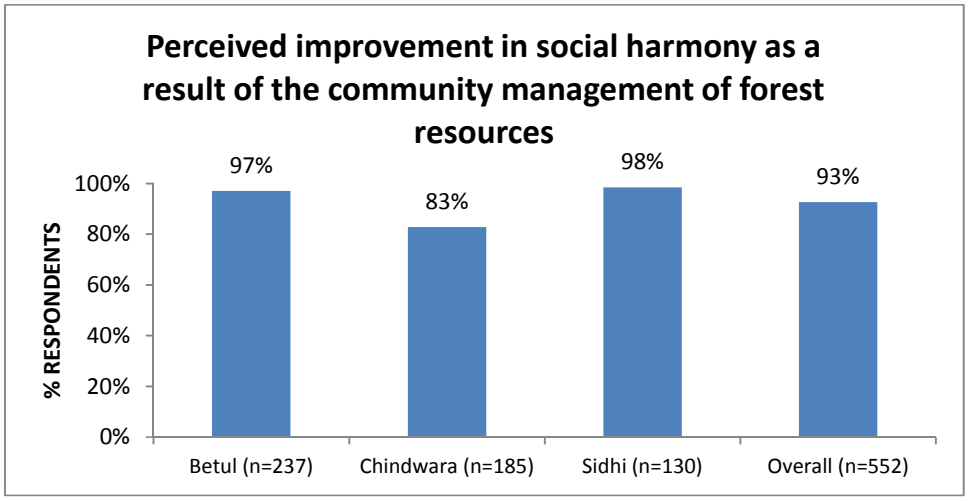
Area of change (From 2010 to 2015)	**Change reported by female respondents (On a scale of 0-10)**	**Change reported by male respondents (On a scale of 0-10)**
Availability of water	2 to 8	2 to 8
Ownership of livestock	4 to 6	2 to 8
Crop productivity	1 to 9	2 to 8
Fodder availability	1 to 9	1 to 9
Overall income	4 to 6	4 to 6
Migration	**8 to 2**	**8 to 2**

13.4 Change in key social indicators

Improvement in social harmony

A key mandate of the programme was management of forest resources by the community. This was to bring in greater ownership in protection of natural resources as well as avoid conflict and bring in sustained use of natural resources. As part of the study, the respondents were asked if they perceived an improvement in social harmony in their community as a result of the community management of forest resources as part of the programme. This is specifically related to a consensus between different members of the community with respect to conservation of common forest resources and consequently, reduced tensions between members of the community regarding sustainable use of forest resources. It is seen that overall, 93% of the respondents felt that they perceived an improvement in social harmony during the programme period. The section perceiving an improvement was higher in Sidhi (98% of respondents) and Betul (97% of respondents) than in Chhindwara (83% of respondents).

Figure 24 - Perceived improvement in social harmony as a result of the community management of forest resources



Change in behaviour of beneficiaries and community

As part of the qualitative study, it was assessed if there has been a change in behaviour with respect to forest protection in the beneficiaries as well as in the larger community. This was integral to the goal of forest protection in the programme. What was inferred was that the change in behaviour was clearly linked to the financial incentive. For four years, a regular monthly income from conservation for the beneficiaries was a very strong incentive for them to make frequent trips to the forest and protect them. It substituted for any loss being incurred by them in not possibly giving sufficient time to their other livelihood sources.

Over a period of time, the beneficiaries also began seeing the results of their conservation activities and this led to a strong belief in the benefits of forest conservation, at the behavioural level. Once the monthly income was stopped in the beginning of 2015, in many cases, the protection activities continued but the rigour of protection decreased over time. This was due to the fact that the financial incentive left was only the income from sale of bamboo but that has not happened uniformly across all the districts. In light of this, even though the belief of the beneficiaries in the protection of forests

was strong, the capacity to rigorously protect the forests from unsustainable use was reduced. Thus, it can be inferred that there was a strongly positive behavioural change in the beneficiaries with respect to forest conservation which was facilitated by the financial incentive linked to it. A case study to support this has been shared in Case study 2.

When the larger community is taken into account, it was inferred through interactions that they largely followed the norms of forest conservation for the forest land protected under the programme by the beneficiaries. After the protection period of four years ended (with a linked financial incentive of monthly income from conservation for beneficiaries), the behaviour of the community towards these protected areas has most probably not changed as they still believe the protection is taking place with the same rigour. A case study to support this has been shared in Case study 3.

Case study 2 - Ownership of forest resources by beneficiaries in Baghaun, Ghumma and Charhai villages, Sidhi range, Sidhi

The conservation and rejuvenation of forests in the Baghaun, Ghumma and Charhai villages of Sidhi range in Sidhi district was unique in terms of the sense of ownership of the beneficiaries with respect to forest conservation. A total of 28 beneficiaries from the three villages were involved in conserving 20 hectares of land each for four years. They were paid a monthly income of Rs 2,500 earlier which was incremented to Rs 3,500 per month later on. Their efforts led to the successful restoration of highly degraded forest land.

When the assessment team enquired if they would continue the conservation efforts beyond the programme period without any more income from conservation, they said that they will not stop conserving the forests. The key reason cited was that they had developed a deep attachment with the forests, one on the lines of “Mother nature” and hence they will not stop protecting it. They also said that all their prior efforts will go in vain if they stop protecting the forests. Hence, they still visit their respective areas of conservation and protect the area

Case study 3 - Change in behaviour of community towards forests in Parasda village, Bhaura range, Betul

The conservation and rejuvenation of forests in the Parasda village of Bhaura range in Betul district was a good case study in creation of awareness in the larger community with respect to forest conservation. A total of 40 beneficiaries from the village were involved in conserving 20 hectares of land each for four years. They were paid a monthly income of Rs 2,500 earlier which was incremented to Rs 3,500 per month later on. Their efforts led to the successful restoration of highly degraded forest land.

The assessment team enquired with the beneficiaries if post the programme completion, the conservation of forests would continue. The beneficiaries replied that now that there is no monthly income from conservation, they are visiting their respective patches of forest land less frequently. But this has not led to any reduction in the conservation of forests. The main reason was that the larger community, especially people from villages neighbouring the forests, have become habituated to the conservation of these particular forests. This kind of change in behaviour, especially in non-beneficiaries, bodes well for the future of conservation of forests in the area.

Impact on gender equity

The study also tried to capture the impact on gender through the programme components, both direct and indirect. As per the programme logframe, the only indicator which is directly connected to gender is the "Number of women participants in SMEs". Out of the SMEs which were promoted under the programme, it is seen that SMEs based on silk thread production and agarbatti making were carried out almost exclusively with women whereas SMEs like furniture making were carried out almost exclusively with men. SMEs based on poultry involved both women and men.

Out of these SMEs, the ones based on silk thread production was running successfully in Betul and actually had a tangible impact on the lives of the women involved in it. It led to increased mobility for them within the village. It led to a certain degree of financial independence as they were able to bring in a regular source of income into the family. It led to bonding between women which helped them to collectively address issues to some extent. Interactions with the women indicated a high level of ownership of the enterprise and an enhanced level of self-esteem in the women after engaging with the enterprise. Overall, it was a case of positive impact of a successfully run enterprise in the life of women.

On the other hand, the SMEs based on agarbatti making had shut down in Sidhi and some other places and was running only in the Tamiya range of Chhindwara. Even in this case, there was almost no ownership of the enterprise visible in the women. They were engaged purely as daily wage labourers from their point of view. Hence, any kind of a positive impact on their self-esteem was not visible. This was also contributed to by the lack of financial viability of agarbatti making as an enterprise.

Apart from engaging with women through SMEs, the interactions with women in the remaining components of the programme was found to be minimal. The prime activity of the programme was forest conservation by providing a regular source of income to the beneficiaries engaged in forest conservation. In this activity, it was found that the beneficiaries were exclusively male. The possible contributing factor behind this, based on interactions with the beneficiaries, was the perception that it was unsafe for women to venture deep into the forest areas to ensure protection.

Even in other components of the programme like construction of watershed structures like loose boulder check dams, the participation of women was limited to the labour work required to construct these structures. Based on interactions with the community and the forest department staff, the programme team also inferred that there is a very fundamental contradiction between two of the stated goals of the programme. On one hand, conservation of forests requires the forest department staff to ensure strict discipline in a strongly hierarchical way, to ensure that the use of forest areas is strictly regulated.

On the other hand, making the community members owners in forest management requires a very different set of community mobilization skills. This requires investing time in building strong community institutions and giving the space for community leaders to emerge in a very non-hierarchical manner. Hence, the programme team inferred that it would be unrealistic to the expect the same ground level forest department staff to have both the above types of engagement with the community. This is particularly so in the case of engagement with women with the aim of reducing gender inequity.

One of the common approaches towards mobilizing women is through strong institutions. In the context of this programme, the first opportunity lay with strengthening the JFMC in the village, especially by working with the women members of the JFMC. Based on the interactions in the field, strong evidence on this kind of engagement was not found. Beyond the JFMC, the approach could have involved mobilizing majority of the women in the village into Self Help Groups (SHGs) which would have not only aided in increasing savings and providing alternate sources of credit, but also served as a platform to mobilize women around other issues. The SHG platform would also have made possible a better spread of the economic benefits of the programme in the women members of the beneficiary families. There was no evidence found with respect to this kind of community engagement during the field visit.

13.5 Change linked to programme activities

Bamboo rehabilitation

A key intervention of the programme was to engage the community in protection of forests. This also included improving the health of existing bamboo clumps and planting new ones which came under the bamboo rehabilitation intervention. This intervention was carried out intensively for four years with each beneficiary being assigned 5 hectares of land to protect each year for four years, thus ensuring 20 hectares of conservation per beneficiary. As an incentive, the beneficiary was paid Rs 2,500 per month initially which was later increased to Rs 3,500 per month. Additionally, the stated goal with respect to bamboo rehabilitation was also the regular sale of bamboo, the income from which would go to the beneficiary (80%) and the JFMC (20%).

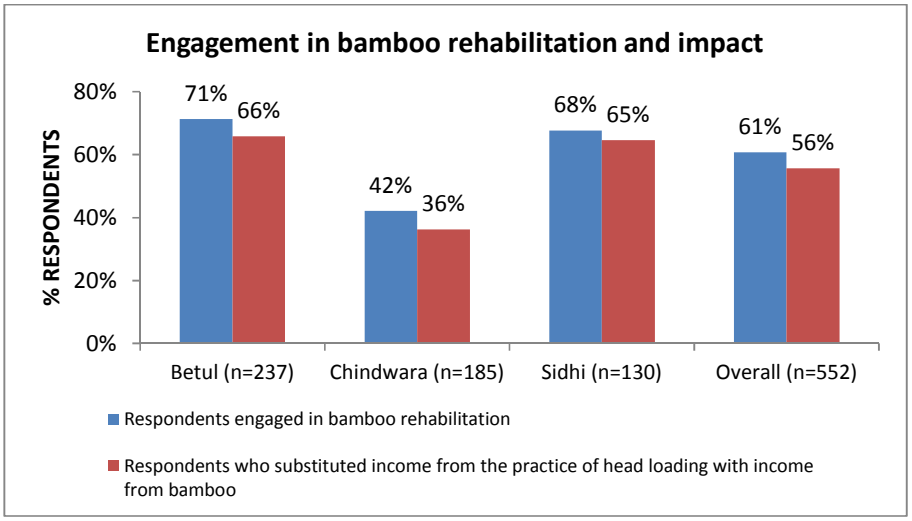
In the qualitative study, the assessment team found that the monthly income from forest conservation has been very beneficial to the beneficiary. This is especially true in areas like Sidhi where a large section of the beneficiaries was landless. If added up, the total income from conservation a beneficiary received over 4 years was Rs 1,44,000 which is a substantial amount. Having a regular monthly income for four years helped the families of beneficiaries overcome their vulnerabilities with respect to irregular income flow. It improved their working capital management and led to higher savings and lower uptake of credit. The monthly income from conservation was also used in some cases to purchase household assets like vehicles and agricultural assets like diesel pumps for better irrigation. In some cases, the income was used to finance social occasions like weddings of children.

With respect to the income from sale of bamboo, the assessment team found that the scenario was very different across the three districts. The best case was Chhindwara where one round of selling of bamboo had happened and the beneficiaries had been paid the money from the sale, some as high as Rs 17,200. In Sidhi, one round of sale of bamboo had happened last year but the proceeds from sale had yet to be given to the beneficiaries. There was a lot of resentment regarding this in beneficiaries of Sidhi and there was also a risk of their discontinuing protection of forests in some cases due to this. In the case of Betul, the sale of bamboo was yet to happen and there was a high level of anticipation in the beneficiaries regarding this. Thus, it can be concluded that there has been a much higher impact of income from forest protection than from income from the sale of bamboo.

In the quantitative study, the respondents were asked if they had directly engaged in bamboo rehabilitation as part of the programme. It is seen that overall, 61% of the respondents had engaged in bamboo rehabilitation. This figure is slightly on the lower side owing to the fact that the study also covered indirect beneficiaries.

A key change indicator for the programme was whether engaging in bamboo rehabilitation led to substitution of income from the practice of head loading with income from bamboo. It is seen that almost all the respondents engaged in bamboo rehabilitation reported substitution of income from the practice of head loading with income from bamboo. It is to be noted here that the income referred here is largely the income from forest conservation and not income from selling bamboo. This is evident from the fact that only beneficiaries of bamboo rehabilitation in Chhindwara have received income from selling bamboo.

Figure 25 – Engagement in bamboo rehabilitation and impact



Case study 4 - Beneficiary of income from bamboo rehabilitation in Surnadehi village, Amla range, Betul

Mr Lakshman Basore, 40 years old, of Surnadehi village in Amla range of Betul district is a beneficiary of the bamboo rehabilitation intervention. He lives in a joint family and has two elder brothers. He gained benefits from the programme through two activities, one through the income from forest conservation and the other through poultry farming.

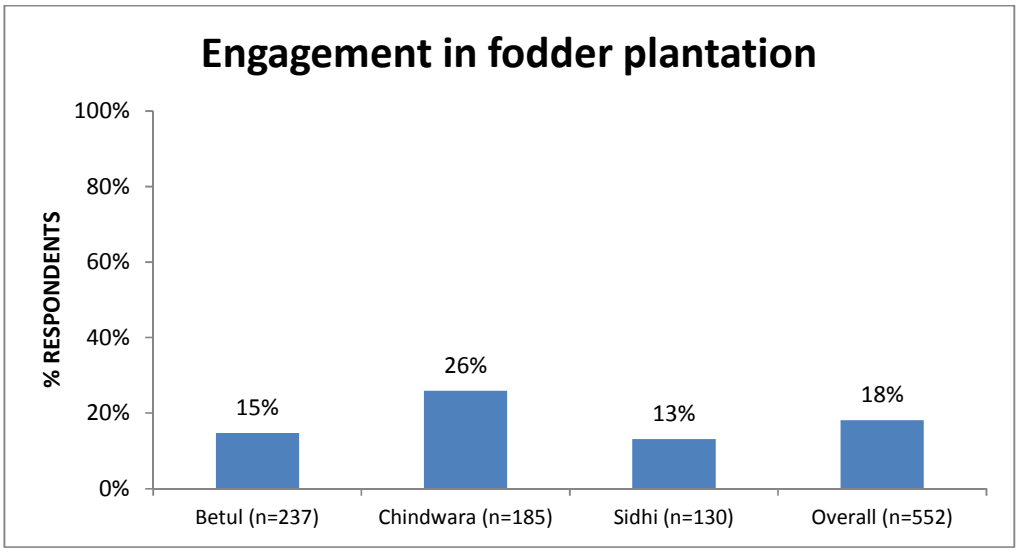
He used this income productively to purchase a diesel pump which enabled bringing water to his fields from a nearby well. With the availability of irrigation, he could get increased productivity from the Paddy, Wheat and Maize crops. This led to a further increase in income. He also started goat rearing as an income generating activity. He could purchase 3 acres of land during the programme. He also has a savings of Rs 40,000 in his bank account for meeting working capital requirements.

Case study 5 - Beneficiary of income from bamboo rehabilitation in Surnadehi village, Amla range, Betul

Fodder plantation

With respect to fodder plantation (Figure 26), respondents were probed on their engagement in fodder plantation as a programme activity as well as the impact of fodder plantation on them. It is seen that overall, 18% of the respondents reported being engaged in fodder plantation. The engagement in fodder plantation is the highest in Chhindwara (26% of respondents) and lowest in Sidhi (13% of respondents).

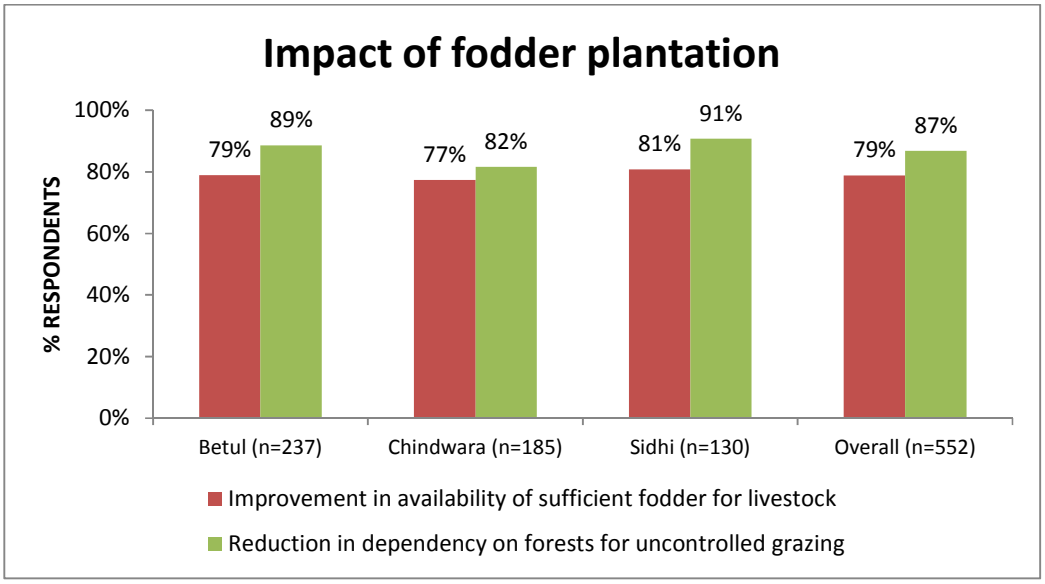
Figure 26 – Engagement in fodder plantation



In terms of impact of fodder plantation (Figure 27), it is seen that overall, 79% of the respondents reported an increase in availability of sufficient fodder for livestock during the programme period. Additionally, in terms of impact, 87% of the overall respondents reported a reduction in dependency on forests for uncontrolled grazing for their livestock.

These findings were also corroborated through the interactions with the beneficiary groups wherein engagement with a small number of beneficiaries in fodder cultivation on common land was leading to increase in availability of sufficient fodder for the livestock of the entire village. Since the plantation was happening on common land, the number of beneficiaries required for the upkeep of the fodder plantation was not high. But the common land under fodder cultivation being large in quantity was able to provide sufficient fodder for the entire village as well as neighbouring villages in some cases.

Figure 27 - Impact of fodder plantation



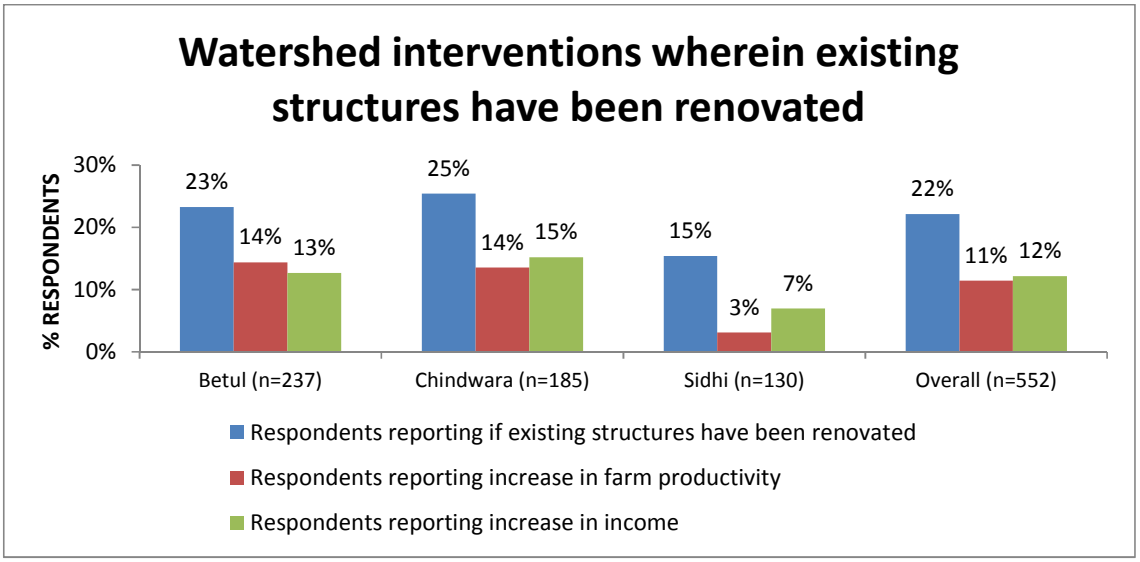
Case study 6 - Beneficiary of fodder plantation in Piparaha village, Kusumi range, Sidhi

Renovation in existing watershed interventions

A key activity in the programme was the renovation of watershed structures which were already present. It is seen in the study that overall, 22% of the respondents reported having been associated with watershed interventions wherein existing structures were renovated. An example wherein existing watershed structures have been renovated is from Borapani village of Sausar range of Chhindwara district. (Case study 7)

The respondents who were associated with the renovation of existing watershed interventions were also asked if there had been a corresponding increase in farm productivity and income due to the intervention. There is a positive correlation between increase in productivity and increase in income, with other factors like incidence of pest attacks and quality of agricultural inputs also affecting the income from agriculture. It is seen that overall, 11% of the respondents reported an increase in farm productivity and 12% of the respondents reported an increase in income due to the intervention. The section of respondents which mentioned increase in productivity was the highest in Chhindwara (14% mentioned increase in farm productivity, 15% mentioned increase in income) and the lowest in Sidhi (3% mentioned increase in farm productivity, 7% mentioned increase in income).

Figure 28 – Watershed interventions wherein existing structures have been renovated



Case study 7 – Deepening of community pond in Borapani village, Ambada range, Chhindwara

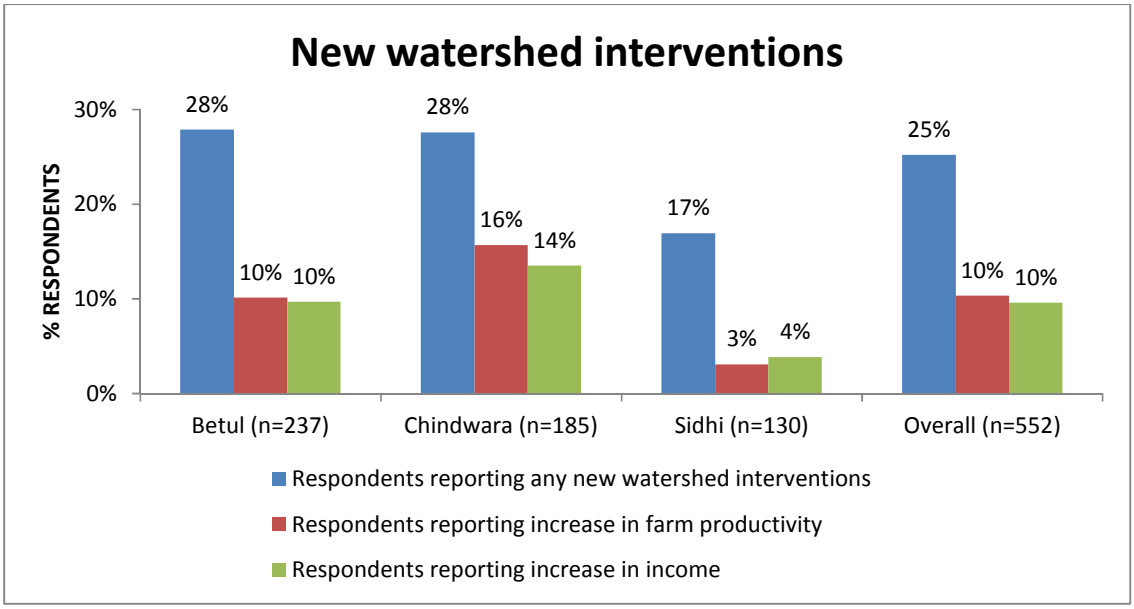
As part of the GEF-UNDP-Govt. of MP project, a community pond in the Borapani village of Ambada range in Chhindwara district was deepened. Before this intervention, the community pond used to get dry by the months of December or January. Deepening of the pond enabled the pond to hold water for the entire year which helped raise the water level in nearby wells as well as increased the moisture content in fields downstream. This enabled farmers to have increased productivity from the Rabi crops like Wheat and *Chana*.

An additional activity promoted by the Forest Department after the deepening of the pond was fishery. Under this activity, a group of 10 beneficiaries put seeds in the pond (sourced from self as well as the Forest Department) and harvest fish. Last year, the group earned a combined profit of

spondents reported having been associated with any new watershed interventions. The new interventions

included mostly loose boulder check structures constructed in streams running through the forest area. These loose boulder check structures serve the purpose of preventing soil erosion within the stream as well as increasing the level of water and moisture retention downstream. There was also an instance of fetching water from a hill nearby through underground pipes (Case study 8).

Figure 29 - New watershed interventions



The respondents who were associated with the new watershed interventions were also asked if there had been a corresponding increase in farm productivity and income due to the intervention. It is seen that overall, 10% of the respondents reported an increase in farm productivity and 10% of the respondents reported an increase in income due to the intervention. The section of respondents which mentioned increase in productivity was the highest in Chhindwara (16% mentioned increase in farm productivity, 14% mentioned increase in income) and the lowest in Sidhi (3% mentioned increase in farm productivity, 4% mentioned increase in income).

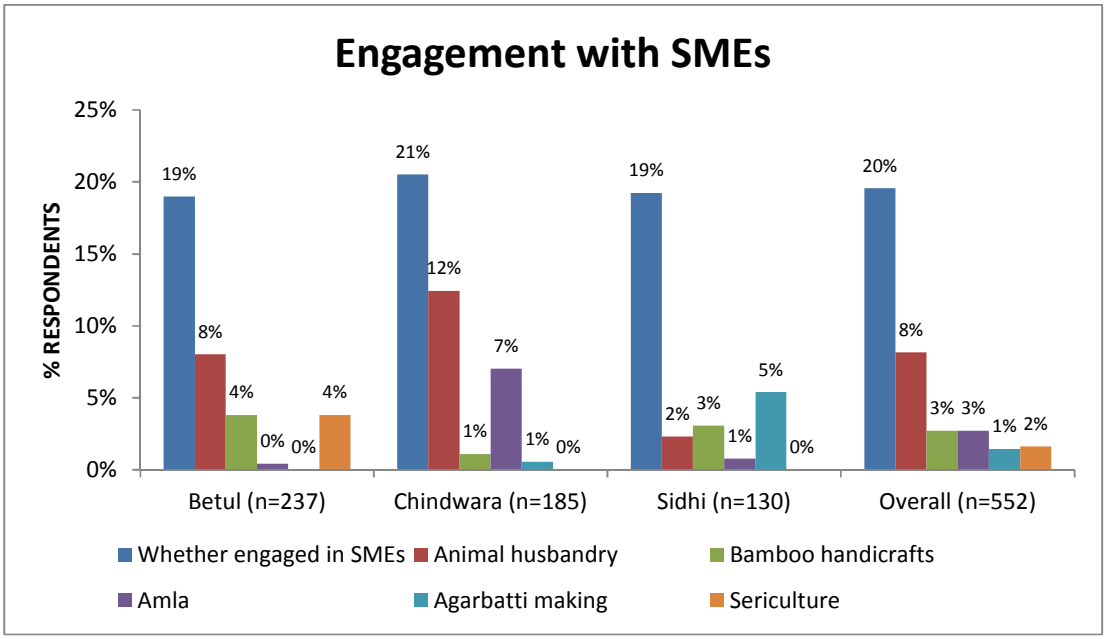
Case study 8 – Gravity based water supply in Dundishikhar village, Tamiya range, Chhindwara

A very unique intervention was carried out in the Dundishikhar village of Tamiya range in Chhindwara district wherein water from a source situated atop a neighbouring hill was brought to the village through underground pipes. Since the flow of water is based on gravity, the power consumption is nil and hence the running cost is very low. This water is used for both drinking purposes as well as for irrigation. Since the supply of water is throughout the year, it is possible for the people in the village to take a second crop with ease and get higher productivity. Land which used to lie barren earlier is now being cultivated. During the interaction, a farmer reported that he is able to get a yield of 10 boras per acre from his Wheat crop after the water has been supplied to the village. A total of 22 families are benefitting from this intervention.

Engagement with Small and Medium Enterprises (SMEs)

Small and Medium Enterprises (SMEs), largely linked to forest produce, were promoted as part of the programme to help increase income levels of the beneficiaries. It is seen that overall, 20% of the respondents were engaged with SMEs at any point of time in the programme. The highest engagement was seen with poultry as an activity, falling under animal husbandry. Apart from this, in Betul, bamboo handicrafts and silk thread production was promoted as an SME. In Chhindwara, Amla plantation and lantana furniture making were promoted as SMEs. Agarbatti making was promoted as an activity to a greater extent in Sidhi. A few case studies in SMEs promoted have been provided in Case studies 8, 9 and 10. During interactions with senior officials of the forest department, it emerged that business plans had been developed for a variety of SMEs but very few of them had actually been implemented on the ground. Thus, a clear gap emerged between conceptualization and implementation in the case of SMEs.

Figure 30 – Engagement with SMEs



Case study 9 – Agarbatti making unit in Tamiya range, Chhindwara

An agarbatti making SME had been set up in September, 2015 in Tamiya range in Chhindwara district with the Bhavani women's group. A total of 30 members are involved in agarbatti making in this unit and earn Rs 100 per day for their work. The unit functions 26 days in a month. The women were selected by the respective JFMCs of their villages. The members are still being trained in all the aspects of agarbatti making.

The assessment team observed that the members of the group still do not own the SME and see it more as a source of labour income. Currently, the unit is not making profits as it has not been able to link with adequate number of buyers. There is a high amount of inventory of agarbatti packets, with only 10-25% of the production being sold. The current monthly production is approximately 500 Kgs at full capacity but the break-even production for earning a minimum of Rs 100 per day per member is 1600 Kgs per month. When asked if they were confident of running the SME independently, the members expressed complete lack of knowledge of the basics of running an enterprise. They are totally dependent on the manager and Secretary (both men) who are running the enterprise with help from UNDP staff.

Overall, the key issue identified by the assessment team was one of sustainability of the enterprise. Even though the members were working as high quality skilled labourers, they need to start thinking as successful entrepreneurs.

Case study 10 – Lantana furniture making unit in Tamiya range, Chhindwara

A Lantana based furniture making SME has been set up in Tamiya range in Chhindwara district. A total of 10 people are involved in furniture making in this unit. This unit runs for 8 months in a year during the non-rainy season and the members work for 15 days in a month. Initially, 2 members received training in this activity and they shared their knowledge with the other members. The raw material for this (Lantana) is easily available in the forest area nearby. The unit is situated right next to the main road and the members are able to get buyers by displaying the furniture by the roadside. They also sell the furniture in an annual fair which is located nearby. On an average, when functional, the unit is able to earn Rs 3,000-4,000 per day for their work.

Case study 11 - Bamboo furniture making unit in Amla range, Betul

A Bamboo based furniture making SME has been set up in Amla range in Betul district. A total of 30 people are involved in furniture making in this unit. The members of this unit have been trained in bamboo based furniture making by a Non-Government Organization (NGO) named Jagruti Gramosthan Samiti.

The training of the beneficiaries was carried out from Oct 2015 to Jan 2016. Post the training, all the beneficiaries are able to earn a minimum of Rs 8,000 per month as labour income by working at the furniture making centre. Also, around 20 beneficiaries are earning additional income by making and selling furniture on their own.

Growing of home/kitchen garden

Eight percent of the respondents grew home/kitchen gardens as part of the project interventions. Under this intervention, the beneficiaries were encouraged to grow vegetables, fruits as well as some trees for providing minimal firewood.

Figure 31 – Growing of home/kitchen garden

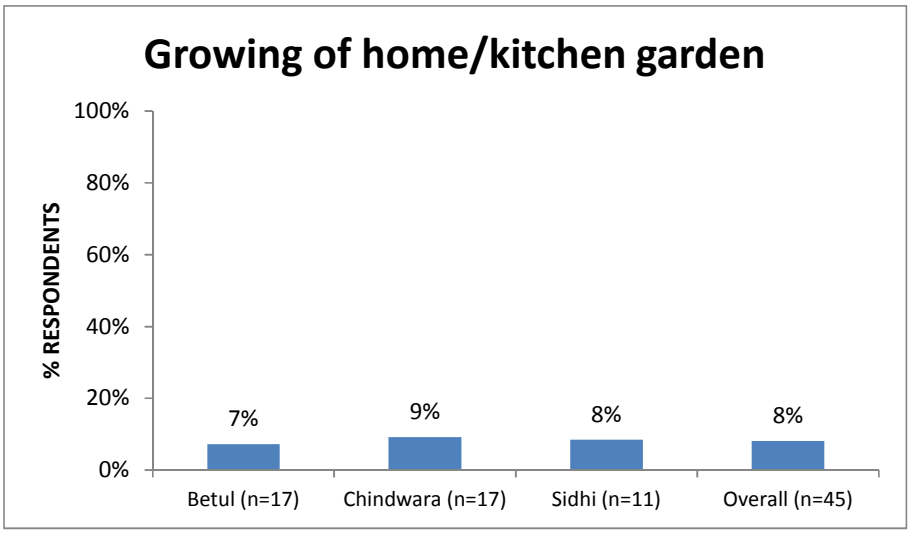


Table 2 mentions the key benefits reported by the beneficiaries who cultivate a home/kitchen garden. It is seen that the key benefits highlighted by beneficiaries include increased net income by not purchasing vegetables from the market, better nutritional intake and increased food security.

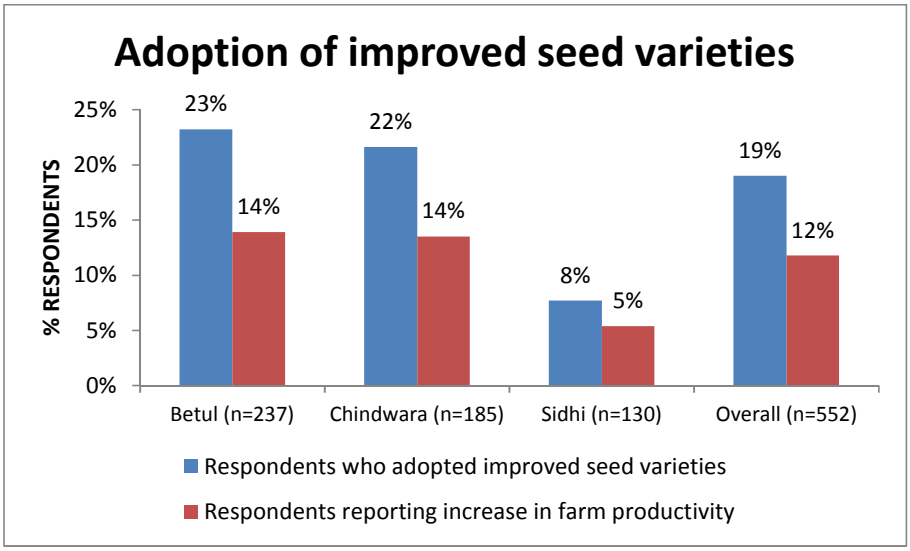
Table 2 – Benefits of home/kitchen garden

Benefits	Betul (n=17)	Chhindwara (n=17)	Sidhi (n=11)	Overall (n=45)
Increase in food security	3	3	9	15
Better nutritional intake	5	6	9	20
Increased net income by selling produce	0	7	0	7
Increased net income by not purchasing from market	10	9	3	22
Greater energy security	0	2	0	2
Medicinal use	0	1	0	1

Adoption of improved seed varieties

Under this intervention, improved varieties of seeds were meant to be promoted to increase the agricultural productivity of farmland. Overall, 19% of the beneficiaries reported that they had adopted improved varieties of seeds during the programme. Of these 12% also reported an improvement in agricultural productivity due to adopting new seed varieties. The adoption of new varieties was found to be higher in Betul (23% of respondents) and Chhindwara (22% of respondents) compared to Sidhi (8% of respondents). Though the programme focussed on awareness around improved seed varieties, the sources of the new seed varieties included the Government line departments and seed vendors in the local markets.

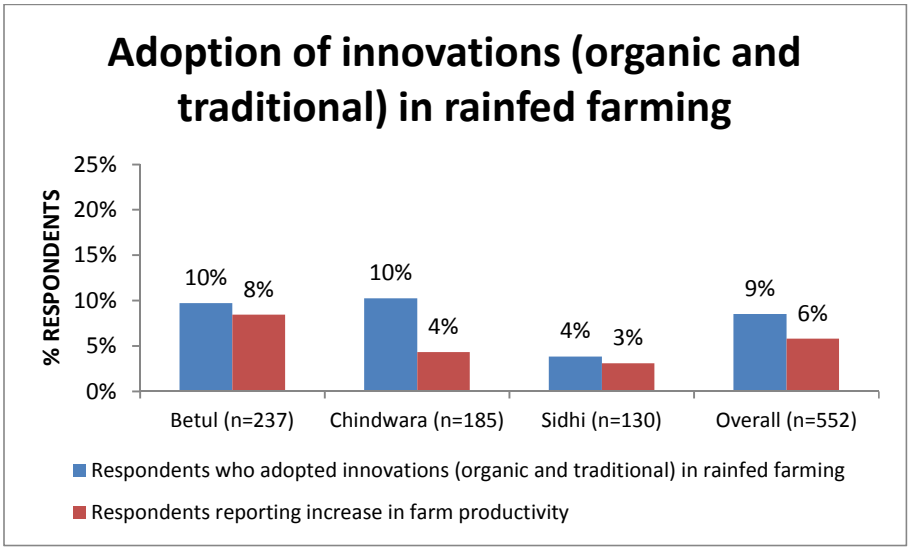
Figure 32 – Adoption of improved seed varieties



Innovations (organic and traditional) in rainfed farming

To improve farm productivity in rainfed farming, innovations like vermi-compost units were promoted with individual beneficiaries. It is seen that overall, 9% of the respondents reported participating in this intervention. A higher section of respondents in Betul and Chhindwara (10% of respondents) participated in this intervention than in Sidhi (4% of respondents). Overall, 6% of the beneficiaries also reported an increase in farm productivity due to interventions like vermi-compost units. In many cases, for example in Chhindwara, the vermi-compost units were only established in 2015 and hence, the outcomes in terms of improved farm productivity are yet to be seen.

Figure 33 – Adoption of innovations (organic and traditional) in rainfed farming



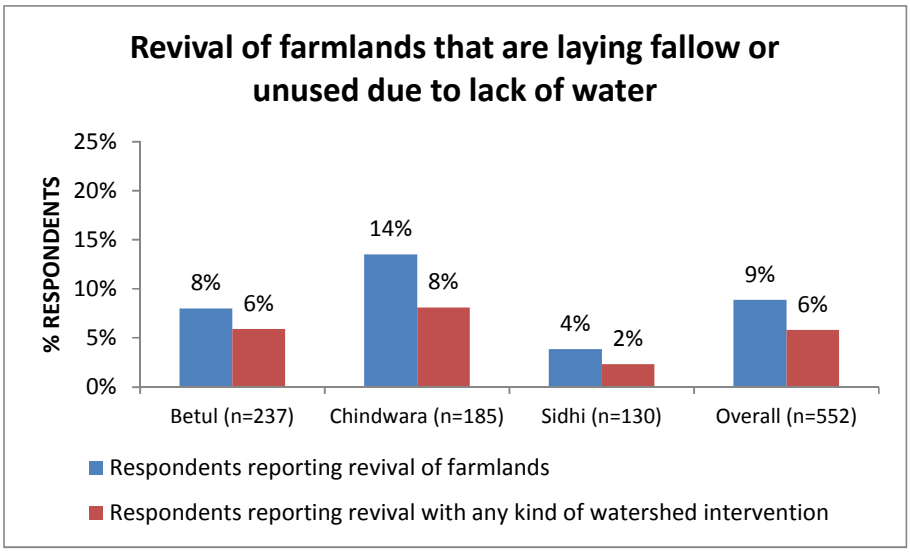
Case study 12 – Vermi-compost unit in Bodalkachar village, Jhirpa range, Chhindwara

Mr Ram Singh of Bodalkachar village of Jhirpa range in Chhindwara district is a beneficiary of the vermi-compost intervention. This unit was established in the Kharif season of 2015. Currently, he is yet to get the first round of compost manure from this unit. He plans to use the manure to increase the productivity of his farm land. He also plans to take multiple rounds of production from the unit in the future, thus ensuring a continuous supply of vermi-compost for his fields.

Revival of farmlands

The study probed respondents on whether there was any revival of farmlands that were lying fallow or unused due to lack of water. It is seen that overall, 9% of the respondents reported revival of farmlands of which 6% were respondents associated with a watershed intervention of the programme. The revival of farmlands is the highest in Chhindwara (14% of respondents) and lowest in Sidhi (4% of respondents).

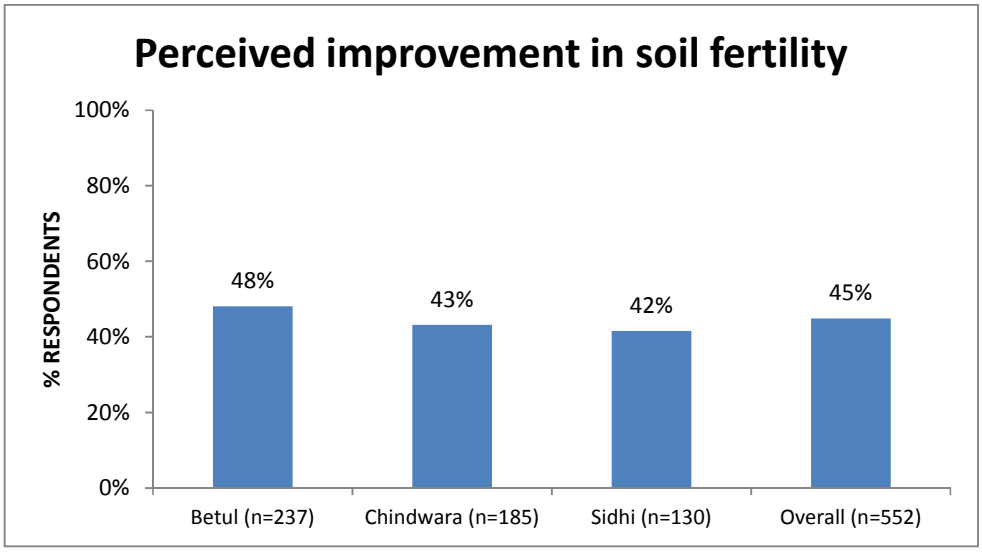
Figure 34 - Revival of farmlands that are lying fallow or unused due to lack of water



Improvement in soil fertility

The respondents were asked if in their perception, soil fertility had improved during the programme period as a result of the interventions. It is seen that overall, 45% of the respondents perceived an improvement in soil fertility during the programme period.

Figure 35 – Perceived improvement in soil fertility



13.6 Stories of transformation

Case study 13 - Spinning towards Empowerment

Munibhai, the master trainer and other women unanimously said, *"Now, we have a bank nearby and interactions with outsiders on and off have taken away our hesitation and shyness- we ourselves feel confident enough to open our bank account and start our savings group".* 31 women working in the UNDP-GEF supported centre where they make silk threads from Cocoons have come a long way to gather this kind of confidence and voice.

In August, 2012, 20 women from village Gawasen participated in a one month long technical training organized by the Silk Department, Hoshangabad supported by UNDP-GEF on making silk threads from cocoon. Other 20 women learnt the skill from the trained women and started earning. Presently 31 women and girls are working on about 30 manually operated machines placed in a well-ventilated shed at Gawasen village. On an average, about 25 women work in the centre on daily basis for 8 to 10 hours per day. The Cocoons are supplied by a centre from Hoshangabad and the team leader or the supervisor of the group distributes the cocoons as per the demand, need and efficiency and is responsible for disbursing the wages. On the basis of performance, two women from the group are master trainers who supervise and guide other women as and when required.

Picture 8 - Kosa Silk thread Production Centre in Gawasen range, Betul

The women aged 25 to 35 years and educated up to primary and middle school are from small farming families owning 1 to 2 acres of land totally dependent on rain-fed farming. The men from only few families are in small trades like carpentry, small shop keepers or school teachers, the majority work as labourers either in agriculture fields, on roads and nearby factories. These women too used to work in agriculture fields or on roads as weeders, harvesters, cleaners, head-loaders etc. They would find some work from 8 to 15 days a month earning about Rs. 150/- each day. The work was uncertain; some-times they would return empty-handed or would go to far-off places hunting for work spending whole day. Some families used to travel together to sugar-cane fields for days and months together

where the children would loiter around doing nothing. There have been instances of verbal and sexual abuse by the contractors/employers as well other men. Few women said that they sometimes were paid less but had no courage to argue or fight for their rights for correct and timely payments. They often felt lonely, aloof and under great stress for leaving their children alone or at the mercy of siblings and neighbours.

The work in the Centre too is laborious and monotonous since they work manually and almost non-stop for 8 to 10 hours per day. Depending on the amount of time that they put into and on efficiency, the women produce one to four kilos of thread and earn up to Rs. 4,000/- per month @ Rs. 1,000/Kilo. Sometimes, they earn lesser than Rs. 1,000/- per kilo depending on whether they have produced A or B grade of the thread. On an average, however women earn Rs. 2,500/month since they take off from the work because of additional household, social and community roles. The women have already communicated to the forest and silk department that they deserve more wages because their work is very laborious and the silk sari and materials are sold in the market at much higher rates.

The women find working in the shed much better than the labour work in the fields and on roads primarily because they are their own boss and enjoy this sort of freedom. They can decide when and how much they like to work. The working conditions are more or less good, though they would prefer electricity run machines which would reduce their drudgery and increase efficiency. Many women complain of knee, leg and hand pain as well headache from the heat from the tin sheds especially during summers, otherwise the shed is quite ventilated and airy. The plans have been made by the forest department and UNDP to open a much bigger and better equipped centre where 100 women can sit and work.

The proximity of the work-place to their home gives them as well their family members especially the children, *"a sense of peace and security"*. The children drop into the centre as and when they need their mothers and they know that their mother is safe. Most important for these women is the time that they save from travelling and hunting for labour work in the past and unnecessary arguments/harassment from the contractors, employers and other men. This has boosted their self-dignity and respect. Working in a group under the same shed has inculcated solidarity among them, for they share their sorrows and joys and help each other in resolving issues and exchanging ideas and experiences. At home and in the community, they are respected and often take decisions along with their family on how to spend the earnings. Over the years, they have learnt to reduce their drinking habits and thus, use their money judiciously. The women very clearly understand the usefulness of the savings and self-help groups. They took initiative to start a savings group but lost faith since they were duped by the person who was supposed to help them. They now feel confident of starting their savings group again, though with hand-holding support. This support would be for long term planning and for diversifying into other livelihood options, especially sericulture, animal husbandry and improved agriculture.

Case study 14 - Village Parasda

"Har Samasaya ka samadhan hota tha (All problems used to get solved)" - says the women and men from village Parasda about the Van Suraksha Samiti (Forest Management Committee) which was very active during the project period from 2010-2014. Of the 86 households, about 50% or 40 households

were the beneficiaries of the project. Though there was clear-cut criteria for selection of the beneficiaries- those who were BPL and holding the ration card were given priority, yet few households from APL category who were willing, could devote time and knew something about forest management also became the beneficiaries of the project in consensus with the forest department staff. Each beneficiary was given 20 hectares of land to look after during the project period starting with 5 hectares per year.

Life during the project period

Increased collective action and solidarity- The members of the van suraksha committee used to meet regularly and planned various activities such as capacity building and exposures to similar kinds of projects and institutions, rehabilitation of degraded bamboo forests, plantation of new bamboo, energy plantation, fodder development, watershed management, agriculture and animal husbandry, introduction of solar cookers and income generating activities such as poultry. The committee members would have regular interaction with the forest department, UNDP-GEF staff and other stakeholders. This helped them in overcoming their hesitation and gaining greater confidence. This confidence helped them in availing toilets under the Swachh Bharat Mission. So far, 20 toilets are constructed in the village with full subsidy from the Government and the beneficiary families contributed in terms of labour. The village has five hand pumps, of these 2 are fully functional and the remaining three need repairs. Some villagers are aware of this and intend to rectify them. The forest protection team was so regular that even after the project period, there has been no instance of tree felling by outsiders. The villagers from surrounding villages still have the impression that the forest is being protected rigorously.

Increased technical and general knowledge- The men with very few women went for trainings and exposures to learn about water and soil conservation, forestry related activities such as clumping and management of bamboo, and possible small scale enterprises as other livelihood options. The women mainly worked as labourers in construction of water harvesting structures such as dams, contours, pit digging etc and in cleaning, weeding, grass seed sowing, uprooting invasive species of trees, etc. They got 10 to 15 days of work for three months and were paid Rs. 100 to 120/day. This money was used largely for meeting working capital needs rather than for investment in capital assets. The men were more involved in forest rehabilitation, new plantation and protection and they all learnt various skills. Solar cookers were introduced for 27 beneficiaries, they learnt to cook food in it and saved fuel-wood. Similarly, poultry was introduced as a new activity, although it could not be continued as an enterprise. However, for some time, the beneficiaries benefitted from poultry by increased income through sale as well as improved nutrition condition by self-consumption.

Increased Bio-mass, soil moisture, water retention, fuel and fodder availability- Of the 968.45 hectares of total land in the village, 445.88 hectares have dense bamboo forest cover. The bamboo are of good quality, the trees are straight and they are ready to be harvested. The forest department has plans to harvest the bamboo; 80% of the benefits will go to the beneficiaries and 20% will go to the Van suraksha samiti for undertaking development work in the future. All 40 beneficiaries were involved in rehabilitation of degraded bamboo forests with 67,245 bamboo clumps over five years. Energy plantation was done in 15 hectares of land by growing 7,125 plants of bamboo, alona, sissoo, neem, karanj, Khamer, mahua, teak and subabul. The survival rate is about 80% even at present. The cutting of trees for fuel wood slowed down and only wood pruned from trees and wood fallen on the ground

was collected. The fodder availability increased due to plantation of 6,000 fodder trees including Cenchrus grass. From 2011 to 2013, the beneficiaries collected 135 quintals of fodder from 30 hectares of land. This helped in reduction of the practice of free grazing. At the same time, 350 kilos of Cenchrus grass was sown for extending the grass lands. Massive watershed related work was carried out in the village – 11,206 cubic meters of land was treated with boulder check dams, CPT, contour trench, and stop dam. 200 animals were vaccinated and sterilized during the project period.

Picture 9 – Loose boulder check dams in series in Parasda village, Bhaura range, Betul

Regular and decent income-The men received regular income throughout the project period which increased from Rs. 2,500 to Rs. 3,000 and lastly 3,500/- month. The Forest Department carried out a survey taking 2011 as base-line compared to 2013 which showed that the average annual income of beneficiaries jumped from Rs. 12,475/- to 50,025/- in two years. The beneficiaries credited regular flow of income which helped them having dug wells, buying electric pumps and diesel engines. Increased water availability resulted in productivity especially of wheat from 400 Quintal to 780 Quintals and the beneficiaries could grow 18 quintals more of the paddy in 2013.

Table 3 – Change in economic status in Parasda village

Assets created	**2011**	**2013**
TV	1	5
Cell phones	0	21
Motor cycle	6	11
Dug well	29	31
Electric pumps	14	21
Diesel engines	5	16
Wheat production in Quintals	400	780
Paddy production in Quintals	150	168
Annual income in Rs.	4,99,000	20,00,133
Annual average income in Rs.	12,475	50,025

Food security- The food availability and security increased primarily because of ability to buy food as well invest in agricultural equipment and aids. Timely availability of more water due to better water table owing to soil and water conservation, forest management, greenery for longer period of time, ability to buy bullocks, pipes, engines and better quality seeds, fertilizers, pesticides etc. increased the productivity of maize and wheat.

Changed food habits-The food habits changed from cooking maize in water and drinking at least one time in the past to eating wheat/maize bread with some vegetables both times of the day. This change in food habits was facilitated by the increased levels of income which made the purchase of costlier food items possible.

Hunting for labour work and migration stopped; increased enrolment in Aanganwadi Centres/schools- Before the project, the beneficiaries had to hunt for labour work which was always uncertain. A number of beneficiary families would travel to sugarcane fields for months together and the children would suffer. During the project period, the beneficiary families did not have to move out of the village for work and as Savita, the Aanganwadi worker pointed out that their children benefitted from the activities such as pre-school education, supplementary nutrition and health check-ups. Even the pregnant and lactating mothers benefitted.

Increased connectivity- One of the striking investment was done on cell phones by 21 beneficiaries and during the group discussions, they said that the mobile phones are very useful because they remain connected with their families as well with officials of forest department for guidance and discussions on various possible projects coming in the village. Increased number of motor cycles in the village has helped in increased mobility especially the sick and unhealthy people have the advantage of reaching the far off health centres with ease.

<u>Life after the project</u>

While the Van Suraksha Samiti still exists, the enthusiasm to protect the forest has reduced drastically. In the absence of regular income, the villagers have to hunt for labour work and by the time, they return, they are tired and cannot go in a group to the forest. About 15 to 20 families have already gone for sugarcane cutting and the women too have to go to the nearby villages for weeding and harvesting. The assets created during the project period especially the bamboo, when harvested, shall go a long way helping the beneficiaries with some income on an ongoing basis, similarly the fodder and fuel-wood shall reduce the drudgery and work-load on women, but the women sounded a bit worried. Even though, in the last one year, there has not been any incidence of tree cutting but now that the committee is not very active, it will be difficult for just one guard to keep vigil on the forest.

The investments by the beneficiaries on agriculture related equipment and aids will go a long way- at least 8 to 10 years of relatively better productivity than before and hence better food security. Yet convergence with related line departments such as agriculture, horticulture, animal husbandry etc for an integrated farming system would help. The institutional building mechanisms have helped building confidence and given exposures to the beneficiaries, yet hand holding for few more years emphasizing on further skills in convergence, partnerships and getting women on board as equal partners to development can go a long way benefitting the communities in sustainable way.

14 Conclusion and Recommendations

Basic profile of beneficiaries

The study found that the largest section of the respondents was from the Scheduled Tribes (ST) (84%) which is one of the most marginalized sections of the society. Additionally, 75% of the respondents either had a Below Poverty Line (BPL) or an Antyoday Anna Yojana (AAY) card which is a key measure of poverty defined by the Government. In terms of the primary occupation, 55% of the respondents reported cultivation whereas 39% of the respondents mentioned some form of labour (agricultural or casual) as the primary occupation. This trend was more pronounced in Sidhi district where the proportion of respondents with labour as the primary occupation was 55%. Many of these respondents were landless. This indicates that the selection of beneficiaries for the bamboo rehabilitation activity was very pertinent as it provided an alternate source of income for the beneficiaries, especially the landless ones.

The level of education of the primary respondents was found to be poor with 65% of the respondents being either illiterate or functionally literate. Of the overall respondents, 70% had family members who were part of the Joint Forest management Committees (JFMCs). The quality of participation in JFMCs was found to be quite high with 73% of the overall respondents who have membership, attending and putting forward their point which is valued. Quality participation in JFMCs was critical to ensure effective community management of forest resources.

Change in asset ownership and usage

An agricultural asset usage score was calculated based on usage of assets like tube well, vermi-compost tank, well, drip irrigation, tractor, harvester, sprinkler, spray pump, diesel pump, electric pump, small inter culture equipment like cycle hoe and hand hoe. It was seen that the average score had improved from 0.21 to 0.80 over the programme period. Thus, even though at an absolute level, the usage of agricultural assets was very low, there has been an improvement over the programme period.

However, in terms of ownership of household assets, there has not been a widespread increase which was reflected in the change in the level of Below Poverty Line (BPL) households based on the Progress out of Poverty Index (PPI). It was seen that the percentage of Below Poverty Line (BPL) households remained in the range of 47% (according to the Tendulkar national Poverty Line) to 56% (according to the Intl 2005 PPP (1.25$ per day) Poverty Line) over the programme period and there was almost no change. But there have been individual cases where beneficiaries have purchased household assets like vehicles or agricultural assets like diesel pumps. This finding flows from the field observation that the income from forest protection was sufficient in improving working capital management within the family but not sufficient enough to purchase new assets in most cases.

The ownership of livestock (cows, bullocks, buffaloes, goats, poultry, etc) was found to be high with 90% of the respondents overall owning some form of livestock. 49% of the respondents also mentioned that they had seen an increase in livestock over the programme period whereas 48% saw no change. The increase was highest in Betul with 60% of the respondents there reporting an increase in livestock ownership.

Change in indicators related to agricultural productivity

It was seen that 32% of the overall respondents had access to irrigation for their crops. When these respondents were asked on the nature of change in irrigation over the programme period, it was seen that 72% reported an increase in irrigation availability whereas 25% reported no change. The corresponding programmatic interventions with respect to increased irrigation availability were renovation of existing watershed structures and creation of new ones. Of the overall respondents, 22% reported being associated with renovation of existing watershed structures and 11% reported a corresponding increase in farm productivity attributed to the intervention. An example of this was the deepening of a community pond in Borpani village of Chhindwara which has led to increased water levels in wells and improved moisture retention in soil.

25% of the overall respondents also mentioned being associated with new watershed interventions like construction of loose boulder check dams to prevent soil erosion. A unique example of a new intervention was the supply of water for drinking and irrigation through a gravity based flow system in the Dundishikhar village of Chhindwara. 10% of the respondents also reported an increase in farm productivity due to these new watershed interventions. In terms of revival of farmlands that were lying fallow or unused due to lack of water, it was seen that overall, 9% of the respondents reported revival of farmlands of which 6% were respondents associated with a watershed intervention of the programme. Additionally, 45% of the overall respondents perceived an improvement in soil fertility during the programme due to the interventions carried out.

19% of the respondents also adopted improved seed varieties in their crops during the programme and 12% of the respondents saw an increase in farm productivity due to this. Innovations like vermi-compost units were adopted by 9% of the respondents and 6% of the respondents reported an increase in farm productivity due to this. It was observed that since some of the vermi- compost units were only established in the 2015 Kharif season, the corresponding increase in farm productivity will be witnessed in 2016.

Change in income from bamboo rehabilitation

A key intervention of the programme was to engage the community in protection of forests. This also included improving the health of existing bamboo clumps and planting new ones which came under the bamboo rehabilitation intervention. This intervention was carried out intensively for four years with each beneficiary being assigned 5 hectares of land to protect each year for four years, thus ensuring 20 hectares of conservation per beneficiary. As an incentive, the beneficiary was paid Rs 2,500 per month initially which was later increased to Rs 3,500 per month. Additionally, the stated goal with respect to bamboo rehabilitation was also the regular sale of bamboo, the income from which would go to the beneficiary (80%) and the JFMC (20%).

In the qualitative study, the assessment team found that the monthly income from forest conservation has been very beneficial to the beneficiary. This is especially true in areas like Sidhi where a large section of the beneficiaries was landless. If added up, the total income a beneficiary received over 4 years was Rs 1,44,000 which is a substantial amount. Having a regular monthly income for four years helped the families of beneficiaries overcome their vulnerabilities with respect to irregular income flow. It improved their working capital management and led to higher savings and lower uptake of credit. The monthly income was also used in some cases to purchase household assets like vehicles

and agricultural assets like diesel pumps for better irrigation. In some cases, the income was used to finance social occasions like weddings of children.

With respect to the income from sale of bamboo, the assessment team found that the scenario was very different across the three districts. The best case was Chhindwara where one round of selling of bamboo had happened and the beneficiaries had been paid the money from the sale, some as high as Rs 17,200. In Sidhi, one round of sale of bamboo had happened last year but the proceeds from sale had yet to be given to the beneficiaries. There was a lot of resentment regarding this in beneficiaries of Sidhi and there was also a risk of their discontinuing protection of forests in some cases due to this. In the case of Betul, the sale of bamboo was yet to happen and there was a high level of anticipation in the beneficiaries regarding this. Thus, it can be concluded that there has been a much higher impact of income from forest protection than from income from the sale of bamboo.

In the quantitative study, it was found that 61% of the respondents had directly engaged in bamboo rehabilitation as part of the programme. This figure is slightly on the lower side owing to the fact that the study also covered indirect beneficiaries. It was also seen that almost all the respondents engaged in bamboo rehabilitation reported substitution of income from the practice of head loading with income from bamboo.

Change in key household economy indicators

In the quantitative study, it was seen that the average annual agricultural income per household was Rs 4,180 for households involved in cultivation. The average annual income from SMEs per household was Rs 10,081 for households involved in SMEs. The SMEs included activities like agarbatti making, silk thread production and bamboo furniture making. The average annual income from SMEs was found to be the highest in Betul (Rs 14,938) which was also corroborated by the interactions with beneficiary groups in Betul where the bamboo furniture making and silk thread production SMEs were found to be running successfully.

In terms of working capital management, it was seen that only 27% of the overall respondents tended to save whereas the uptake of credit in the last year was found to be present in 43% of the overall respondents. In Sidhi in particular, it was seen that only 20% of the respondents save whereas 54% had taken credit. It was seen that the average savings per household overall was Rs 13,358 and the average credit per household was Rs 11,224.

When compared over the programme period, it was seen that 41% of the respondents reported an increase in savings whereas 57% reported no change. In the case of credit taken, it was seen that only 14% reported an increase whereas 37% reported a decrease and 49% reported no change in credit taken over the programme period. This finding was also corroborated by the interactions with beneficiary groups wherein it emerged that the income from forest conservation was used for meeting working capital requirements and reduce dependence on credit.

Income from SMEs

Of the overall respondents, 20% were engaged with SMEs at any point of time in the programme. The highest engagement was seen with poultry as an activity, falling under animal husbandry. Apart from this, in Betul, bamboo handicrafts and silk thread production was promoted as an SME. In Chhindwara, Amla plantation and lantana furniture making were promoted as SMEs. Agarbatti making was

promoted as an activity to a greater extent in Sidhi. Based on the qualitative study, bamboo furniture making and silk thread production emerged as the successfully functioning SMEs. Agarbatti making as an SME was not found to be running successfully across the districts. The basic gaps were found to be in the selection of the type of SME, establishing market linkages and strengthening the internal processes of the SME.

Change in availability of fodder and dependence on forests for grazing

Overall, 18% of the respondents had been engaged in fodder plantation as an activity. But the impact of this intervention was found to be widespread with 79% of the respondents reporting an increase in availability of sufficient fodder for livestock during the programme period and 87% of the respondents reported a reduction in dependency on forests for uncontrolled grazing for their livestock. These findings were also corroborated through the interactions with the beneficiary groups wherein engagement with a small number of beneficiaries in fodder cultivation on common land was leading to increase in availability of sufficient fodder for the livestock of the entire village. In some cases, availability of sufficient fodder also led to increased livestock productivity which in turn led to higher income from livestock.

Change in migration

The incidence of migration last year was found to be present in 26% of the households overall with it being the highest in Chhindwara (37% of households) and the lowest in Sidhi (12%). The migration was found to be occurring to the neighboring districts, mainly for casual labour work. Over the programme period, there has been a decrease in levels of migration, especially distress migration. This has been primarily on account of the assured monthly income received by the beneficiaries. The main reason for migrating earlier was not having sufficient working capital round the year and the regular income from forest protection filled this gap effectively in many cases.

Change in food security

The number of days of food scarcity in the last year (defined as the number of days of not having sufficient food for the family without resorting to taking debt or migration) was found to be 19.4 days, with it being the highest in Sidhi (21.9 days) and the lowest in Chhindwara (17.9 days). In terms of change over the programme period, it was seen that 50% of the respondents reported an increase in food scarcity over the programme period, 22% reported a decrease and 27% reported no change. This finding is not exactly in line with the interactions with beneficiary groups where it was found that the income from conservation of forests was being used to meet the working capital needs of the family with good success. What does explain this finding is the fact that the income from conservation had stopped a year back and many respondents had not been able to use the income to increase their productive assets. This could possibly explain reverting to an earlier state of food scarcity with rising costs of inputs and other commodities.

This also flows from the low uptake of the home/kitchen garden activity (8% of the respondents) which was also intended to increase the food security of the family. The key benefits mentioned by these respondents included increased net income by not purchasing vegetables from the market, better nutritional intake and increased food security.

Change in behavior in beneficiaries and the community

A key mandate of the programme was management of forest resources by the community. This was to bring in greater ownership in protection of natural resources as well as avoid conflict and bring in sustained use of natural resources. It is seen that overall, 93% of the respondents felt that they perceived an improvement in social harmony as a result of the community management of forest resources as part of the programme.

In terms of behaviour change in the beneficiaries with respect to forest conservation, it was inferred that the change in behaviour was clearly linked to the financial incentive. For four years, a regular monthly income from conservation for the beneficiaries was a very strong incentive for them to make frequent trips to the forest and protect them. It substituted for any loss being incurred by them in not possibly giving sufficient time to their other livelihood sources. Over a period of time, the beneficiaries also began seeing the results of their conservation activities and this led to a strong belief in the benefits of forest conservation, at the behavioural level. Once the monthly income was stopped in the beginning of 2015, in many cases, the protection activities continued but the rigour of protection decreased over time. This was due to the fact that the financial incentive left was only the income from sale of bamboo but that has not happened uniformly across all the districts. In light of this, even though the belief of the beneficiaries in the protection of forests was strong, the capacity to rigorously protect the forests from unsustainable use was reduced. Thus, it can be inferred that there was a strongly positive behavioural change in the beneficiaries with respect to forest conservation which was facilitated by the financial incentive linked to it.

When the larger community is taken into account, it was inferred through interactions that they largely followed the norms of forest conservation for the forest land protected under the programme by the beneficiaries. After the protection period of four years ended (with a linked financial incentive of monthly income from conservation for beneficiaries), the behaviour of the community towards these protected areas has most probably not changed as they still believe the protection is taking place with the same rigour.

Impact on gender equity

The programme interventions with greater involvement of women included SMEs based on silk thread production and agarbatti making. Out of these, the silk thread production based SME was found to functioning well and contributing to increased mobility of women, improved self-esteem, high bonding between the women and a regular source of income. But the agarbatti making based SMEs were not found to be functioning well and many of them had shut down. The participation in the agarbatti making bases SMEs was in any case found to involve women more as labourers rather than as the owners of the enterprise.

The women were left out of the key intervention of forest protection under the programme, primarily on account of safety concerns for women in venturing into the deep sections of the forest, as inferred from interactions with women. There was also no visible impact in terms of greater participation of women in the JFMCs which would have served as an effective governance platform. The assessment team inferred that this could flow from the apparent contradiction between the skills required in forest department staff in ensuring effective protection of forests and mobilizing the community, especially women, towards reducing gender inequity.

Sustainability of impact:

Behavioral sustainability

The assessment team found that by being part of a four years long conservation effort in the programme, the beneficiaries have begun to appreciate the increase in density of forest cover. What made it work effectively was the financial incentive linked to inculcating this behavior. Now that the programme period is complete, there is a high probability of this behavior continuing in terms of the beneficiaries understanding the value of forest conservation. But this may not necessarily translate into effective forest conservation in the future as the financial incentive, in terms of a regular monthly income, is no longer present. If a beneficiary has to secure the livelihood for his family, he may not have the leeway in terms of time and energy to make frequent visits to the forest area and protect it with the same rigor as earlier. Hence, in the case of the beneficiary, behavioral sustainability may not necessarily translate into environmental sustainability.

This is where the sustainability of behavioral change in the larger community would come into the picture. The assessment team could deduce that the larger community had a positive behavior towards the protected areas, mainly because of the highly effective protection by the beneficiaries. Once the rigor of protection comes down with time, there is a high likelihood of the larger community members using the resources of the protected forests in an unsustainable manner again. Hence, the change in behavior in the larger community will most probably not sustain.

Institutional sustainability

The assessment team found that the key interaction which facilitated the implementation of the programme on the ground was the interaction between the beneficiaries and the staff of the Forest Department. The selection of beneficiaries was also largely driven by the Forest Department staff with certain criteria being followed like the inclination of the beneficiary to participate, level of land holding and ease of access to forest area. The institution which should have had a central role in the implementation of the entire programme was the JFMC. The JFMC was the representative group from the community whose role also involved getting the larger community on board the programme objectives.

But the assessment team found the role of the JFMC to be limited in areas like beneficiary selection. The entire programme still seemed more like an employment opportunity for the beneficiaries with the Forest Department rather than a community institution led initiative with wholehearted participation of the entire community. In terms of institutional sustainability, this could be an issue as the role of the Forest Department remains central to achievement of the programme goals. If the protection of forests needs to be continued beyond the programme period, it would have to be through a consensus achieved in the entire community which needs to be led by a strong community institution. This would require a lot of investment in the capacity building of the JFMC members on the processes to be followed in strengthening the institution and building consensus in the larger community.

Technical sustainability

The assessment team looked at technical sustainability in terms of the sustainability of adoption of practices like improving the health of bamboo clumps and the functioning of assets like loose boulder

check dams since these were two of the most widespread interventions across all the ranges. It was found that activities like raising soil at the roots of the bamboo clumps and making stone bunds at the bamboo roots had been carried out by paying the beneficiaries daily wages. Even the construction of the loose boulder check dams had been carried out by paying daily wages to the beneficiaries and also some other members of the community.

Since the programme period is over, the question to be answered is whether these practices will continue in the absences of wages. The assessment team felt that the probability of beneficiaries carrying out these activities in the absence of a financial incentive is low. This would also be because of the fact that the outcomes of these practices would benefit not just that individual but the entire community and the environment. That may not be a strong enough incentive for a beneficiary to carry out these practices on a voluntary basis.

Financial sustainability

The assessment team found that the protection of forests as a goal has been achieved almost uniformly across all the ranges. The key contributing factor has been the rigorous involvement of the beneficiaries who were employed for four years continuously on a regular monthly income. The beneficiaries achieved this goal by making frequent visits to the protected forest area and guarding the forests. Over a period of four years, this has led to a clear increase in plant and tree density and rise in the undergrowth.

If this outcome has to be sustained, the financial sustainability of the entire intervention comes into question. Based on interactions with beneficiary groups, it was inferred that the incentive to continue protecting forests in the absence of the monthly income from conservation was not uniform across the ranges. It was not even uniform in the beneficiaries within a range. Even though protection of forests has become habituated to a certain extent in the beneficiaries and the larger community as well, it is not widespread. Additionally, the income from selling bamboo has not been realized by all the beneficiaries. Even in cases where the income has been realized, the income received per beneficiary is not uniform and varies widely. Hence, there is a high risk of the outcome of forest protection being reversed in the absence of a continuous and substantial financial incentive.

Key recommendations

1. The primary reason for effective forest conservation taking place was the strong financial incentive given to the beneficiaries in terms of a regular monthly income. Since this mechanism has worked so well, it could be explored if sufficient resources could be mobilized to make the wage payment mechanism a permanent one to ensure conservation in the future too and on a much larger scale.
2. The primary role of the Forest Department staff is the conservation of forests which requires a particular kind of approach towards the community. But a programme which seeks to make the community a key stakeholder in forest conservation requires the staff to be more sensitive towards the needs of the community. Hence, it is recommended to have capacity building of the Forest Department staff to sensitize them on community mobilization, specifically oriented towards making the community take more ownership of the conservation of forests.

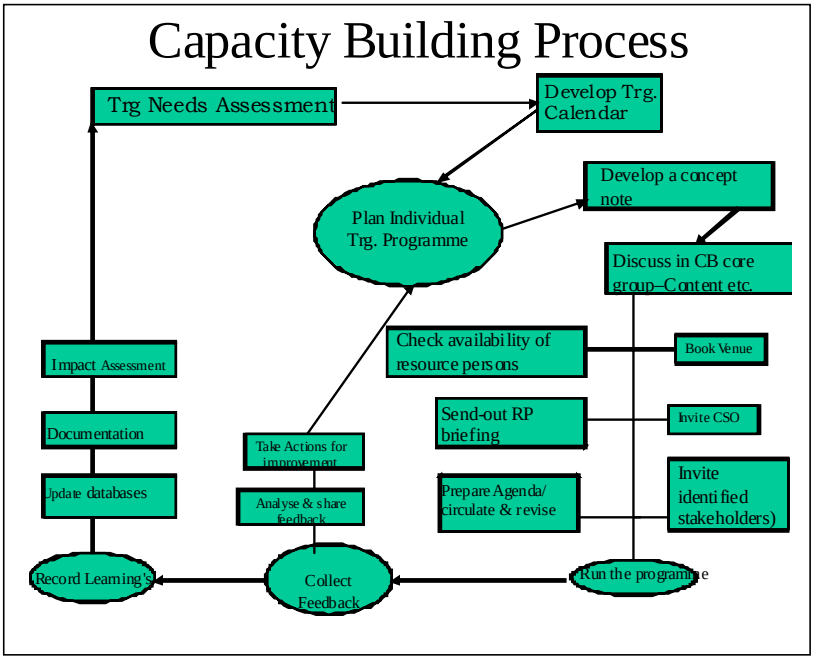
3. Since most of the respondents mentioned agriculture or agriculture labour as their primary occupation, the pace of socio-economic change can be increased through convergence with other Government departments and schemes like the Department of Agriculture, Department of Horticulture and MGNREGA. This would bring in additional capital which could facilitate interventions like adoption of better seeds and practices, renovation and construction of watershed structures and knowledge building.
4. Two key areas of improvement to achieve the programme's objectives would be improving the capacities of the community and institution building in the community. It would be advisable to involve reputed NGOs on a long term basis who would be ready to invest time and resources with members of the community and work on these areas. This is very important from the point of view of bringing in sustainable behavioural change in the larger community towards forest conservation. It would also be imperative to build the strength of the JFMC as an institution and strengthen its internal processes.
5. To ensure the distribution of economic benefits of the programme in a more gender equitable manner, it would be recommended to mobilize women around Self Help Groups (SHGs) which would allow them to better voice their opinion and benefit more from the programme interventions.
6. The programme has succeeded in the conservation of forests to a much larger extent than in creating sustainable income generating activities. Thus, income generation should also be given high priority in the future as it is the key incentive to a beneficiary for sustained protection of forests.
7. The SMEs promoted under the programme have largely not succeeded to sustain themselves. One contributing factor in this is the lack of expertise within the Forest Department to run SMEs. Thus, it is recommended to get other organizations involved in promoting and running the SMEs who have the necessary expertise in aspects like establishing market linkages and making the SMEs financially self-sustainable.
8. It is also recommended that the selection of SMEs to promote should be done more judiciously. For example, an SME like agarbatti making would find it much harder to locate sufficient markets. It would be more appropriate to promote SMEs based on commonly harnessed NTFP products.
9. In addition to group initiatives like SMEs, it is also recommended to promote individual based enterprises which have a higher probability of succeeding and becoming financially self-sustainable.
10. It is recommended that a strong interface with the National Bamboo Mission is established which will ensure better skill development of the bamboo furniture making SME members and also better market linkages.
11. It is necessary to not carry out interventions in isolation but rather look at a model for integrated development. Thus, for example, a very successful intervention in new watershed development was in the Dundishikhar village of Chhindwara wherein round the water availability has been ensured for irrigation. But due to lack of knowledge of better agricultural practices, the farmers were not able to make adequate use of this facility to its fullest extent. In an integrated model, the awareness on better agricultural practices should have been carried out in conjunction with the improvement in availability of irrigation.

15 Manual of Practice for Capacity Building of Stakeholders

Capacity building shall be treated as process – a means to an end – by which an individual, group of individuals or communities/organizations can find their own solutions, usually by building competence in terms of knowledge, skills, and experience; strengthening commitment, developing team work and team culture, and ensuring consistency. This includes repeating good work every day, to undertake actions leading to sustainable NRM and livelihood. Capacity building should not be considered in isolation of on-ground actions. Rather, it should specifically support effective on-ground implementation and uptake of NRM and livelihood practices.

Given that strategic NRM & livelihood related outcomes of the project are achieved in the longer term after withdrawal, capacity building provides important intermediate results related to attitude, behaviour and practice change, and increased engagement in sustainable NRM. In the proposed project, monitoring, evaluation and learning framework could be developed so that these intermediate results are measured as management action targets. Capacity building of core group will be planned to take up all the capacity building issues to plan, design, implement and follow up. Below are some standard questions for designing capacity building interventions –

- **What** – specific behaviour and practice changes (intermediate results) are required to achieve in the proposed project? What are the specific, critical capacity building activities that will most effectively support the achievement of these changes, and what is the justification for their choice? What pre-requisite and co-requisite activities are required in order to successfully undertake these capacity building activities? What has already been done and is the proposed activity building on this?



- **Where** – geographically within the project should capacity building activities be targeted, in order to best achieve key expected result areas of project? This necessitates an understanding of socio-economic demographics, in addition to the sustainable livelihood and NRM issues of the districts separately.

- **Who** – within these areas should be specifically targeted for involvement in capacity building?

- **When** – should specific capacity building activities be undertaken and in what order?

- Which are time critical and which cannot be undertaken until others have been completed?

- **Which** – are the most appropriate delivery mechanisms in terms of level (local, district, State), delivery party (forest department, line department, PRI, community institutions, core groups, community support networks, industry etc.) and approach?

- **How much** - information is it necessary to include in the capacity building plan in order to substantiate the capacity building decisions, assumptions and proposed actions? Evidence is required that a strategic and systematic process has been followed in determining capacity building needs.

Topic of the training based on the Subject	:	Name for the programme
Proposed Date	:	Tentative dates (Duration)
Venue	:	If known
Target Group Coordinators/ ORW etc.	:	For whom? Eg: Project
Background	:	Underlying reasons/ Need for the programme
Purpose	:	What does the programme aim at
Programme Structure	:	How will the subject be delivered? Methods to be applied for achieving the purpose.

Depending on context and situation, Stakeholders can adopt below suggested capacity building models, at single or multiple levels:

- The **Programmed Learning model**, where courses/workshops will be developed (in-house) and are being run to improve specific skills and understanding. This could be further done through cost-sharing model (more than two interested project/agencies/departments will work out strategies to share their capacity building resources with each other) or cost-effective model – in-house resource person shall be identified and asked to impart trainings to identified person for building existing/new capacities.

- **Village study/learning group model**, where representatives from community institutions will identify key issues of learning; debate thoroughly/in-depth. Field coordinator will be responsible to handhold community to strengthen the community level learning/study forum.

- **E-learning model**, where Capacity building core will initiate to identify CB issues, seeking for interested parties to build their capacities through the principles of distance education programme. Handholding will also be provided.

- The **Group Empowerment/Facilitation Model**, where groups will be provided with assistance to prioritize and seek their own learning and information needs. 'Training of trainers' (ToT) concept could be promoted where potential trainers are groomed.

- **Outreach services model** encompasses all the efforts of proposed project, other than direct implementation that helps in replication and influence other stakeholder(s) to enhance rural livelihoods in a sustainable manner. Building capacity of a larger number of NGO and Govt. staff and work towards changing polices through applied research, networking and policy dialogue and documentation and dissemination of best practices.

- The **Technological Development Model**, where a combination of methods is used (including exposures) to help stakeholder(s) to improve specific management practices and technologies (for example organic farming, NTFP processing, value addition, sustainable bamboo harvesting, irrigation efficiency etc.).

Looking at diversity of interventions and stakeholder(s), regular and periodic capacity building approaches shall be applied –

1. Class room based training – in-house /overseas
2. Field level training
3. Job swap
4. Peer learning reviews: Internal (staff) and external (organizational)
5. Cross learning visits: project staff will visit external organizations of same nature of interventions.
6. Peer learning workshops
7. Exposure visits (within and outside state)
8. On job training
9. Mentoring support
10. Sponsor - link for outside trainings & Workshops, exposures

Table 4 mentions the key areas of capacity building relevant to this programme -

Table 4 - Key Areas of Capacity Building covered under the manual

S. No.	Key capacity building areas	Description on sub-areas of capacity building	Stakeholder(s)
1	Technical competencies	Rules and regulations, structure of the Forest Department Communication protocols in Forest department Innovative approaches of forest protection and wild animals Bio-diversity conservation laws and regulations NTFP, Bamboo – regeneration and best practices of harvesting etc. Approach and areas where convergence is possible with other line department	Field staff of forest department, partner NGOs team, Line department, PRI members
1.1	Forestry sector		

S. No.	Key capacity building areas	Description on sub-areas of capacity building	Stakeholder(s)
1.2	Monitoring and evaluation	Concepts of monitoring and evaluation Principles, and approaches of monitoring and evaluation How to carry out monitoring and evaluation in field? Periodic data collection and report writing Uses of IT based solutions and monitoring systems	Middle and field staff of forest department, line dept., partner NGOs team, PRI members
1.3	Community mobilization and formation of institutions	PRA methods, micro plan development methods Gender equity – concepts, principles, best practices etc. Basic models and principles of community mobilization, best practices of community mobilization Principles, methods, models, basic rules and regulations of mobilization, formation of committees – JFM, SHGs JFM – policies, models, best practices, profit sharing mechanisms etc. Roles and responsibilities of stakeholders in JFM Principles of institutions management – linkages, organization and functioning of institutions, management of institutions etc.	Middle and field staff of forest department, line dept., NGOs, PRI members, JFM and SHG members
1.4	NTFP management and micro enterprise development and management	Identification, processing technologies, value addition techniques, market linkages etc. Setting up micro enterprise related to NTFP or other income generation activities; Functioning and working systems of Community institutions – SHG, JFM etc., traders, retailers	Middle and field staff of forest department, line dept., partner NGOs team, PRI members
1.5	Bio-diversity conservation and Livelihood development activities	Bio-diversity conservation – concepts, types, implementation Organic farming - concepts, types, implementation of NADAP, Vermi compost, biogas etc.) Alternative energy - concepts, types, implementation –biogas, smokeless Chulha, solar appliances Fodder and livestock management – area, best practices, models, approaches best suited in their area Agriculture input supply and marketing – concepts, best practices, models etc. Agriculture productivity enhancing methods, best practices Promotion of water use efficient devices – strategies, methods, principles, best practices etc. Horticulture/floriculture- strategies, methods, principles, best practices etc. Common land development and management - strategies, methods, principles, best practices etc.	Middle and field staff of forest department, line dept., partner NGOs team, PRI members All target villages Households/families

S. No.	Key capacity building areas	Description on sub-areas of capacity building	Stakeholder(s)
2.0 2.1	Behavioural/Social/ Management: Skills required to improve working with stakeholder(s)	How to communicate clearly in writing; Use effective verbal communication skills? Best practices on work with others in teams; build and maintain networks and work relationships? How to develop appropriate level of rapport with stakeholder(s); negotiate with others to achieve tasks and goals? What are the effective ways of dealing with conflict situations? How do we perform, entertain, occupy or inspire others?	Forest dept., Line dept., NGOs project staff, PRI members
2.2	Skills required to improve Stakeholder(s) management	Ways to adapt to changing circumstances; identify and articulate long term vision for future How to conduct stakeholder wise power analysis; business/enterprise development and management; deep understanding of markets, stakeholders and competitors? How to do correct assessment of risk and return of decisions? Global perspectives, and political processes on sustainable livelihood and Natural resource management	Selected staff from field, middle and top management separately Forest dept. and partner NGOs team, PRI and line-dept. - Low
2.3	Improving Personal characteristics	How to improve and demonstrate a passion to succeed? Best way to accept responsibility for success and failures; openness to adopt new ideas; challenge the status quo; display confidence How to balance and maintain commitment to continual personal development Best practices to think analytically and be sensitive to the needs of others	FD, NGOs, Line depts., PRI members
2.4	Skills required to improve Strategic management	Adapt to changing circumstances Identify and articulate long term vision for future Deep understanding of markets, customers and competitors Correctly assess the risk and return of decisions; global perspective.	Selected staff from field, middle and top management from Forest dept. and NGOs partner
2.5	Skills required to improve management of results	How to organize own work to achieve goals; use latest technologies of information management? Stress management to manage work priorities; produce quality results; produce complex documents? How to plan and implement planned interventions at activities? What would be the standards of delivering quality community based services? How to manage resources smartly; manage operations to achieve planned consequences? Ways to implement new strategies in response to changing needs?	Selected staff from field, middle and top management separately Forest dept. and NGOs – High PRI and line-dept. – Low

S. No.	Key capacity building areas	Description on sub-areas of capacity building	Stakeholder(s)
		Skills to Implement and monitor continuous improvements to systems and processes How to facilitate and capitalize on change; encourage and manage innovation; translate long term vision into a step by step plan Practical ways to work appropriately on handle crises; manage budgets and timelines	

16 Tools/techniques to Track and Measure Project Impacts on Biodiversity / Ecological Assessment

16.1 Tracking and Measuring of Impact on biodiversity

Why is tracking and measuring impact so important? [1]

Cost-effective monitoring is essential to justify investment from biodiversity beneficiaries, be they public or private. Government, Investors and beneficiaries need to know their funds are effectively assisting forest developers and farmers to shift to biodiversity conservation, ecological agriculture and generate the ecosystem service expected.

What do you monitor?

The performance of the biodiversity interventions process and assessment of outputs to understand the change of social and economic behaviours can be measured by its environmental and social impacts. Environmental impacts can affect species diversity, habitat connectivity and ecosystem processes. Social impacts can be diverse, affecting livelihoods, income, food security, gender and well-being. Tracking these impacts is key as its socio-economic outcomes determine the long-term environmental performance of the initiative.

How do you measure impact?

Not all ecosystem services have equal monitoring requirements. For example, while rates of carbon sequestration in young fast-growing trees can be easily estimated with allometric equations, changes in water quality and quantity can take several decades to be realized. Relationships between land management and hydrology in particular are complex, site-specific and prone to misunderstandings; more detailed and site specific measurements may need to be kept for long periods of time to yield reliable data.

A monitoring framework needs to be set in place from the very beginning, to allow for comparison with the results achieved along the way. Indicators can then be used to measure both environmental and socio-economic impacts. These can be identified through participatory research methods, such as household surveys, focus groups, mapping, and ranking methods etc. for socio-economic impacts, and remote sensing and ground-based surveys, etc. for environmental impacts.

[1] http://www.fao.org/ecosystem-services-biodiversity/incentives/ies-step-by-step/tracking-impact/en/

16.2 Types of monitoring

Different biodiversity conservation and livelihood development work requires different types of monitoring. This is dependent on the context, the ecosystem service, agricultural production and impacts considered, and the rigor required by the investors. Developing a very detailed and cost intensive methodology that cannot be sustained by the initiative in the long run, either due to lack of funds or insufficient equipment and skills, will not adequately track impact. Levels of precision can range from broad estimations based on global coefficients to site-specific sampling.

Measuring Tools and Indicators

Below are some examples of these methodologies. Some are specialized in gathering environmental data, others focus on social impacts. Some are simpler than others, but if used more often, they can increase the level of rigor of the methodology. By combining several of these methods, the level of rigor can also increase.

Environmental Impact

Social and biodiversity Impact assessment (SBIA) Manual for REDD+ Projects provides tools to guide practitioners to monitor environmental and social impacts relating to specific CCB Standard Certification criteria.

IIED - Poverty and Conservation Learning Group

Guides for practitioners on Environmental Impact Assessment (EIA) and Strategic Environmental Assessment (SEA) methods for biodiversity in relation to CBD requirements.

Social Impact

IIED - Poverty and Conservation Learning Group

Multiple tools and methodologies to assess the impact of initiatives on socio-economics and biodiversity. These also include valuation methodologies and frameworks to guide decision-making.

Information to design livelihood surveys that document the impact of co-benefit conservation interventions on local welfare.

ProFor's Poverty-Forest Linkages Toolkit

Wide set of rapid participatory assessment methods on economic and non-economic contributions from forests to households. A guide to support capacity building and training of these tools is also included.

Assessing the Impact of Development Programmes on Food Security

E-learning course from FAO providing guidelines on:
(1) Methods to assess the impact of programmes on food security
(2) How to plan for monitoring end evaluation (M&E) activities
(3) Commonly used indicators for impact assessment and M&E

Additional resources

The following online links give more information on conducting social and biodiversity impact assessment:

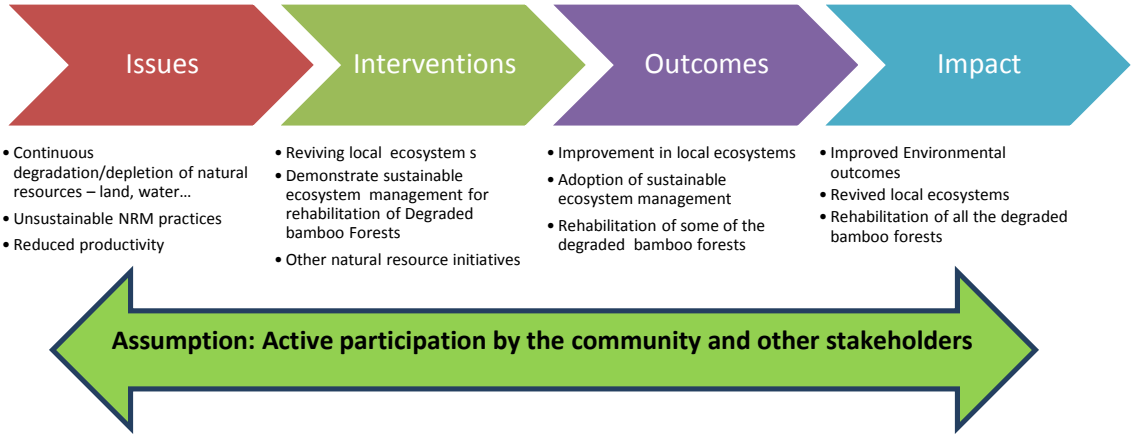
https://s3.amazonaws.com/CCBA/SBIA_Manual/SBIA_Part_3.pdf

http://unpan1.un.org/intradoc/groups/public/documents/cgg/unpan026197.pdf

Theory of Change

The development of Theory of change for any project is most important to monitor the program interventions on periodic basis. This will bring together the context, programme level interventions, the intended changes and impact. The effort shall include listing of all assumptions being made in the process. The diagram below captures a suggested Theory of Change for the programme developed for assessment of UNDP-GEF Integrated Land and Ecosystem Management to Combat Land Degradation and Deforestation in Madhya Pradesh.

Figure 36 – Suggested Theory of Change (ToC)



The main impact indicators include:

1. Improved Environmental Outcomes: This would be measured through improvement in water quality, salinity, biodiversity, soils and invasive native scrub
2. Revived local ecosystems: Change in behaviour of the local community towards better livelihood and natural resource management practices
3. Rehabilitated degraded bamboo forests: Increased bamboo production

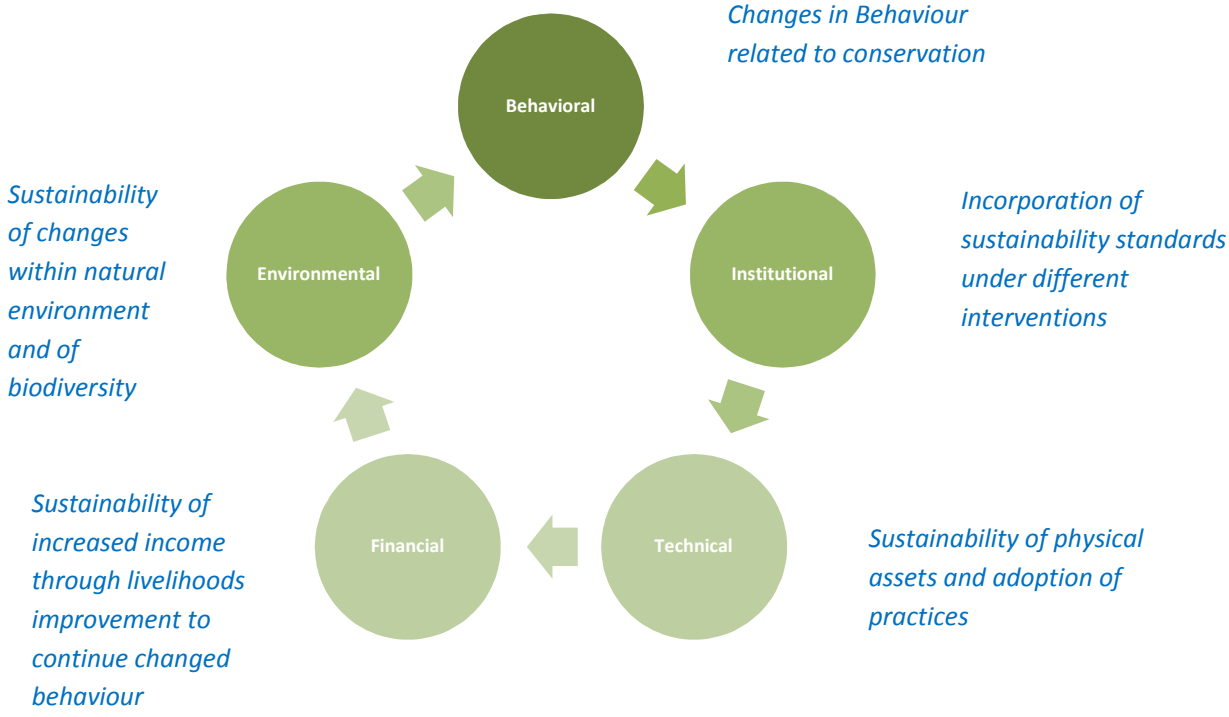
Measuring Sustainability

One of the key indicators for measuring impact is sustainability. The diagram below depicts the manner in which we propose to measure sustainability. This model is based on the sustainable livelihoods framework. Sustainability in this framework is measured as per 5 parameters:

1. Behavioural sustainability
2. Institutional sustainability
3. Technical sustainability
4. Financial sustainability
5. Environmental sustainability

The achievements and changes in all 5 of these parameters is consolidated together to measure the programme sustainability.

Figure 37 – Measuring sustainability



17 Key inputs on the way forward emerging from stakeholders' workshop

A one day workshop was held on 26th April 2016 in Chhindwara with important stakeholders of the programme. The main purpose of this workshop was to disseminate the findings from the study to the participants, gain their insights on these findings and seek their inputs on what is the way forward for key components of the programme.

The workshop was organized with the support of Mr K C Tyagi, CCF, Chhindwara. The workshop had close to 70 participants and had a mix of Forest Department staff and beneficiaries of the programme. The divisions represented in the workshop included East Chhindwara, West Chhindwara, South Chhindwara, North Betul, West Betul and South Betul. The workshop was divided into three sessions as explained below:

1. In the first session, CMS shared the findings and recommendations from the socio-economic and the biodiversity assessment study with the workshop participants.
2. In the second session, an open discussion was held on the findings from the study which was facilitated by Mr K C Tyagi. The discussion helped in refining the interpretation of the findings from the study and added to the recommendations proposed.
3. In the third and final session, the participants were divided into sub-groups and were asked to give inputs on the following questions:
    a. What were the main learnings from the UNDP-GEF programme?
    b. What were the activities which were successful and should be taken forward in the future?
    c. How can these activities be taken forward in the future?
    d. What are the possible challenges in this process?

    After the relevant points were shared by the sub-groups in the plenary, the workshop was concluded.

Key insights on the study findings shared in the open discussion session

1. The impact of the programme has a link to the ratio of beneficiaries to total population of the village. In villages with a high ratio of beneficiaries to total population, the programme has been more effective in achieving its goals.
2. The formation of the first stage of growth of a bamboo shoot happens during the 2-3 months of the monsoon rainfall season. Hence, the protection of bamboo forests from grazing in the future has to be carried out intensively only in the peak rainfall months of the monsoon season. The protection for remainder of the year can be less intensive. This kind of planning can help in better utilization of the time of a person involved in forest protection.
3. Making of agarbattis and kaadis should be two separate enterprises as the market for the two varies. The making of kaadis can be a more successful enterprise as there is a lot of unutilized waste left over after cutting bamboo which can be used in making kaadis cost effectively.

4. Rather than focus on SMEs, the focus in the future should be on micro-enterprises, either individual based or Self Help Group based.
5. Systematic felling in a forest in a sustainable manner should be promoted for multiple species of flora. This would ensure the twin benefits of profit as well as conservation. Hence, in the future, beneficiaries could be given rights to conserve and sell not just bamboo but other species of flora too.
6. The approach should not be to lock people out of the forest area in order to conserve it but rather to manage the demand of the population from the forest area in a way that ensures sustained growth within the forest area.
7. A highly decentralized approach to forest conservation is needed to effectively achieve the goals outlined in the programme. This would also require changes in the policy environment.

Key points shared in session on the way forward

<u>Learning from UNDP-GEF Project</u>

- Co-management practices had regenerated the local bamboo forest as a resource, creating opportunities for the families to access the resource for commercial benefits, leading to improvement in their socio-economic condition.
- The income from the above improved the agriculture and education status of the beneficiaries.
- The water table increased through water and soil conservation works.
- The establishment of fodder plantation has led to the availability of fodder for domestic animals.
- Beneficiaries learned the importance of community participation and management.
- Funds should be utilized for community (not for individuals) and in right direction.
- Linkages with other line departments had proven to be very useful.
- Skill development in fishery as an activity was very useful.
- Fire, illegal felling and open grazing has been controlled to a large extent.
- The forest density has improved as a result of the programme.

<u>Activities which were successful and should be considered in future</u>

- Protection of forests.
- Soil and water conservation works.
- Plantation of fodder, fast growing and fruit bearing trees.
- Training on various activities such as poultry, vermi compost, bio fertilizer, fishery etc, with exposure visits.
- Improved agriculture practices.

<u>How to take forward these activities in future</u>

- The UNDP-GEF project should be continued in the future in a scaled up form.
- Joint Forest Management Committees and Forest Department should work together effectively.
- Local people living in the vicinity of the forest area should be motivated strongly to conserve forests.
- Plantation of new trees should happen.
- Financial help should be provided to ensure regular protection of forests.
- A change in attitude has to be brought about in people regarding forests protection and use.
- There should be continuous focus on trainings and education.
- Convergence with other line departments should be pursued.

Picture 10 – Workshop participants presenting key points from sub-group discussion on way forward

Possible challenges in fulfilling these activities

- Lack of availability of markets for products would reduce the profits made.
- Exploitation by middle men and agents may be a big disincentive.
- The required financial resources may not be available.
- There may be resistance from the community in carrying out some of these activities.
- People living in villages may not have sufficient time and resources to take these activities forward.
- Lack of awareness and direction may hinder progress.

18 Gender based approach towards addressing poverty, livelihoods and NRM

Natural resources such as land, water and forests are a direct source of food, cash income and a range of subsistence benefits for millions of people in India, but there are major differences in the benefits that accrue to men and women. Women are frequently disadvantaged, for a range of interrelated cultural, socio-economic and institutional reasons, in their access to and control over natural resources including the forest resources and in the availability of economic opportunities. While men are usually interested in trees for commercial purposes, women are concerned with biodiversity conservation and multiple products based management which ensures fuel-wood, fodder, water and other Non-timber forest products (NTFPs). They spend major part of their time and walk long distances daily to collect fuel-wood, fodder and NTFPs from forests, therefore, they remained at forefront in conservation movements like chipko and khejri in India. The gendered division of agricultural labour and food production, combined with the fact that women often have fewer alternative income-earning opportunities than men, means that women tend to collect forest produce to supplement the nutrition of their households and income generated from these activities adds to the purchasing power of households and therefore food security. (For example, in Uttar Pradesh, about 33% to 45% of women's income was generated from forests and common land, compared with only 13% for men).

Evidence shows that the women, as compared to men, often have highly specialized knowledge of trees and forests in terms of species diversity, their uses for various purposes, conservation practices and management. Their knowledge tends to be linked more directly to household food consumption and health, which is particularly important during food crises. They often make significant labour contributions to agro-forestry, for example, by planting, weeding and watering trees; their opportunities in the sector are often limited to low-return activities that are of little or no interest to men, while men tend to control the production and marketing of higher- value products as well as the use of the income so generated. Again, their roles in forestry value chains are generally poorly supported by policy-makers and service providers. The persistent lack of gender-disaggregated data further compounds this problem.

The women, as principal collectors of forest produce, suffer the most as a result of forest degradation which results in short supply of fuel-wood and fodder, consequently in increased hardship in meeting their subsistence needs. Again, the production of NTFPs is adversely affected by forest degradation, resulting in corresponding reduction of income of women from this source, loss of job opportunities and out-migration of male members in search of employment. This necessitates women to shoulder the responsibilities of agricultural operations normally handled by men that further increase the workload and drudgery affecting their health and well-being. [2]

Despite improvements in the policy environment, women often have less secure land rights and access to forests, and participate less in decision-making and forest management. Decisions made without considering women's forestry roles tend to have a ripple effect, negatively impacting women, their households and consequently the livelihoods.

Forests and gender research has shown that negative environmental impacts happen if Gender issues are not considered - for example, women are forced to collect fuel-wood and forest products from

[2] http://www.fao.org/forestry/gender/en/

other forest areas and they are viewed as someone stealing resources; if only men are consulted, the choice of species and forest management techniques may not be appropriate for all forest users; when training and information is not provided to both women and men, conservation issues are not fully understood by them as forest users which has a detrimental impact on both the project and the forests. Paying attention to gender differences benefits efforts, strengthen the contribution from the forest to biodiversity conservation, sustainable development and poverty reduction. Involving women in decision-making at all levels has positive effects on many forest management issues including resource sustainability, forest regeneration and conflict management.

The true conservation and management of forests require a paradigm shift where all forest work incorporates gender considerations throughout the project cycle- planning, designing, implementation, monitoring and evaluation. The following elements are fundamental.

- Recognize women as forest stakeholders.
- Undertake Gender analysis of roles and responsibilities of men and women, use, access and control of natural resources.
- Collect Gender disaggregated data throughout the project cycle.
- Mobilize and build capacity of women and women's organizations.
- Ensure that potential conflicts among competing uses of forests and their by-products are avoided.
- Ensure that women and men's traditional and indigenous rights to forest use are not diminished when new projects are implemented.
- Promote equal access of women to land ownership and other resources necessary for effective socio-economic participation (e.g. capital, technical assistance, technology, tools, equipment, markets and time).
- Train both men and women in methods to increase productivity through new technologies – including nursery techniques, site selection, and selection of species, land preparation, planting, weeding and maintenance.
- Recruit and train women forestry extension agents so women can play a more active role in forest management and training of other women while increasing awareness of women's roles in the use of forest resources, including their particular needs and constraints.
- Build capacities of men and women on the value of forests and sustainable forestry management including gender sensitive approaches and strategies.
- Enhance women's participation and cooperation in community groups or forest resource management committees created for project management.
- Build strategic alliances between forest resource management committees and women's organizations/women-administered micro-finance groups to undertake small and medium enterprises, manage conservation, environmental restoration and development contracts from the Government and donor agencies etc.
- Build capacities of the forest department staff and other Stakeholders on gender sensitive strategies to sustainable forest management
- Encourage multi-stakeholders' cooperation and alliance for convergence and integrated approach
- Encourage mechanisms and systems for knowledge management and sharing and outreach.

19 Annexure

19.1 Disaggregation of key indicators based on type of beneficiary

Table 5 gives the disaggregation of all the indicators based on a beneficiary being direct or indirect.

Table 5 – Listing of key indicators for direct and indirect beneficiaries

Area	Indicator	Direct beneficiaries (n=435)	Indirect beneficiaries (n=117)	Overall beneficiaries (n=552)
Food scarcity	Number of days of food scarcity faced by the household in the last year	20.1	15.6	19.4
	Respondents reporting decrease in food scarcity over programme period	26%	9%	22%
Below Poverty Line (BPL) based on Progress out of Poverty Index (PPI)	BPL % (Tendulkar National Poverty Line) 2010	47%	45%	47%
	BPL % (Tendulkar National Poverty Line) 2015	48%	45%	47%
	BPL % (Intl 2005 PPP (1.25$ per day) Poverty Line) 2010	56%	55%	56%
	BPL % (Intl 2005 PPP (1.25$ per day) Poverty Line) 2015	56%	54%	56%
Irrigation availability	Respondents reporting increase in irrigation availability over programme period	75%	58%	72%
Livestock availability	Respondents reporting increase in livestock over programme period	53%	35%	49%
Use of agricultural assets	Average agricultural assets score (2010)	0.18	0.30	0.21
	Average agricultural assets score (2015)	0.83	0.70	0.80
Savings and Credit	Respondents reporting increase in savings over programme period	47%	17%	41%
	Respondents reporting decrease in credit over programme period	42%	17%	37%
Migration	Respondents reporting any kind of migration in the last year	25%	31%	26%
	Respondents reporting distress migration in the last year	10%	13%	11%
	Respondents reporting decrease in migration over programme period	38%	7%	30%
Bamboo rehabilitation	Respondents engaged in bamboo rehabilitation	75%	8%	61%
	Respondents reporting substitution of income from the practice of head loading with income from bamboo	69%	6%	56%
Fodder plantation	Respondents engaged in fodder plantation	21%	9%	18%
	Respondents reporting improvement in availability of sufficient fodder for livestock	81%	71%	79%
	Respondents reporting reduction in dependency on forests for uncontrolled grazing	89%	79%	87%
Home garden	Respondents growing home/kitchen garden	10%	3%	8%

Renovation of existing watershed structures	Respondents reporting existing watershed structures have been renovated	25%	11%	22%
	Respondents reporting increase in farm productivity	13%	4%	11%
	Respondents reporting increase in income	14%	3%	12%
New watershed interventions	Respondents reporting any new watershed interventions	28%	14%	25%
	Respondents reporting increase in farm productivity	11%	8%	10%
	Respondents reporting increase in income	11%	5%	10%
SMEs	Respondents engaged in SMEs	21%	14%	20%
Improved seed varieties	Respondents who adopted improved seed varieties	19%	19%	19%
	Respondents reporting increase in farm productivity	12%	10%	12%
Innovations in rainfed farming	Respondents who adopted innovations (organic and traditional) in rainfed farming	8%	3%	7%
	Respondents reporting increase in farm productivity	6%	0%	5%
Revival of farmlands	Respondents reporting revival of farmlands that are laying fallow or unused due to lack of water	10%	3%	9%
Soil fertility	Respondents who perceived improvement in soil fertility	47%	36%	45%

19.2 Standalone baseline analysis

The baseline study attempted to cover all the beneficiaries and captured information at the household level as well as at the village level. The information with respect to key socio-economic indicators is mentioned in Table 6. The corresponding values for the year 2015 are also mentioned. A comparison between the values should be carried out with caution as the methodology and accuracy of the two surveys may be very different.

Table 6 – Standalone baseline analysis (Year 2010)

Indicator	Value in 2010 (n=429)	Value in 2015 (n=552)
Households having a *pucca* house	0%	1.3%
Households owning a motorcycle	5%	13.4%
Households using LPG as an energy source	0%	0.2%
Average total annual income of a household (Rs)	38,120	25,302
Percentage of land which is irrigated	12%	34%

It can be seen that none of the beneficiary households had a *pucca* house in 2010. In terms of ownership of assets, none of the beneficiary households owned a motorcycle in 2010. Additionally, all the households used firewood itself and none of them used LPG as an energy source for cooking in 2010.

The income of each beneficiary household was computed based on the income from agriculture, labour and other sources. It was seen that the average total annual income of a beneficiary household in 2010 was Rs 38,120. Additionally, of the total land cultivated by the beneficiary households, 12% was irrigated in 2010.