

**Systematization Report  
2011-12**

***CCA RAI demonstration project***  
**How eco-restoration and institution strengthening improve communities to become  
more resilient to climate change**

**Submitted to: - GIZ (India) and EPCO (Madhya Pradesh)**

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## I. Abstract/ summary

The project “How eco-restoration and institution strengthening improve communities to become more resilient to climate change is functional from November, 2011. The project is located in a tribal district of Madhya Pradesh (MP). It is worth mentioning that Madhya Pradesh as such is away from various climate change hotspots of India for instance Himalayan glaciers, or Bay of Bengal or for that matter, western Rajasthan. However, MP is considered to be one of the most vulnerable states of India as far as climate change is concerned primarily due to very low adaptive capacities of people<sup>1</sup>. It has the highest rate of malnutrition, an extremely high incidence of poverty, all this despite its riches of natural resources.

The Niwas block in Mandla district in eastern Madhya Pradesh represents the ecological crisis which is getting aggravated due to climate change impacts like erratic rainfall. Low adaptive capacities of tribal population in Niwas block is largely attributed to weak institutions, heavy soil erosion, low asset base of farmers, and gradual degradation of natural resources. The project has intended to improve the adaptive capacities by strengthening village institutions especially for governing natural resources, demonstrating much needed soil and moisture conservation work and intervening in agriculture in order to improve the state of affairs in agriculture.

**Table 1: Summary of Achievements till Nov 2012**

Situation before	Climatic stress	Adaptation measure	Situation after (outcome)
Gradual degradation of forests owing to lack of community governance mechanisms over forests	Erratic rainfall furthering soil erosion in uplands, i.e. forests and private uplands	Strengthening institutions around forests and natural resources	Village institutions are taking charge of resource governance where few institutions have gained as much confidence that they would continue to conserve on their own whereas, some have just begun to protect.
30% of private land lying totally degraded, and a large chunk of private uplands largely lying fallow	Erratic rainfall furthering soil erosion in uplands	Bringing in soil and moisture conservation measures and agro-forestry to restore the degraded lands.	Impact visible in terms of improved soil moisture conditions as well as improvements in cropping intensity;
Low productivity of major crops (maize and paddy) and gradual decline of millets	Erratic rainfall	Improved package of practice in major crops; seed replacement in millets.	Major improvements in production of minor millets.

The systematization exercise conducted in November helped the team in looking back and ponder on the project experiences. We held focused group discussions in 6 villages, the state of village institutions, natural resources and effectiveness of project interventions. We interviewed about 60 individuals to understand their views on the project interventions. We have also collected testimonials of about 35 people on various experiences during the project.

<sup>1</sup> Madhya Pradesh State Action Plan for Climate Change

The exercise has helped in analyzing these experiences and draw learning for future. It has not only helped us in understanding what works, what does not work, the long term nature of our work, and improving our understanding of how village institutions can respond to challenges of climate change especially in the context of tribal areas in eastern Madhya Pradesh.

## **II. Introduction: project context and need for adaptation**

Mandla a south-eastern district of Madhya Pradesh, more known for the religious importance accorded to it due to presence of river Narmada and biodiversity rich Kanha Tiger Reserve is a part of Jabalpur Division. A major part of the district is occupied by the upper reaches of *Narmada* basin. The district spreads from 22 2'-23 22' N latitude and 80 18'-81 50' E longitudes.

The livelihoods of tribal communities in Mandla are dependent upon small-scale farming, fishing and forest produce as well as wage labor. Diversity of species and ecosystem services provides them various ecological services like fuel, food, fodder, housing material, medicine and spiritual sustenance. In the last years erratic rainfall has made crop planning go awry and decreasing agro-biodiversity leaves little alternatives for food security. Demographic pressure and low literacy levels combined with lower asset base further decreases adaptive capacities.

The project aims to restore the ecology of degraded forested landscapes, by improving the biodiversity of these landscapes and reducing soil erosion, as well as by strengthening collective efforts of village institutions. This will provide a greater variety of livelihood choices and thus sustained food security. Despite the challenge of erratic rainfall the project also aims at to improve the overall gains from agriculture.

The villages have weak village institutions which are making the government schemes as well as efforts of local NGOs less effective. This is further creating more risks for the tribal communities which are traditionally dependent on forest for their livelihood and other ecosystem services. Since this dependency is not sustainable and the poorest among the poor would be most vulnerable to economic shocks in case any shortage or ban is imposed on the collection and sale of NTFPs or any other ecosystem services.

Agriculture is also shifting towards high input-high output agriculture which is making the villages more sensitive towards erratic climatic events. The region also comes under the catchment area of Narmada basin which itself faces water stress situations as indicated in the State Action Plan of Climate Change. Not having enough storage capacity for water and not having systems which would ensure judicious use of water, topped up by rising trend of high input high output agriculture aggravate the existing crisis and increase the vulnerability of the poor.

From last few years, with the advent of high input high output agriculture, farmers have shifted to longer duration varieties of paddy, which would mean that they can sow rabi crops only in November. This makes rabi crops susceptible to frost and wilting, especially in pulses.

Reduced crop yields, damages to crop and infrastructure due to water logging, nutrient loss and soil erosion due to intense rainfall, frost and water stress etc. increase the burden on subsistence farmers. These impacts especially on agriculture forces the communities to further exploit forest resources resulting in forest degradation. The region faces seasonal and regular water stress situations, increase in frequency and intensity of heavy precipitation events<sup>2</sup>. Intense rainfall with lesser number of rainy days leads to increased soil erosion. The erratic rainfall also affects the soil moisture and any intense spell in the last month can adversely affect winter crops such as maize which needs less soil moisture. The forests and the common lands are fast getting degraded owing to soil erosion, biotic pressure for fodder and fuel wood and gradual integration of governance of common properties.

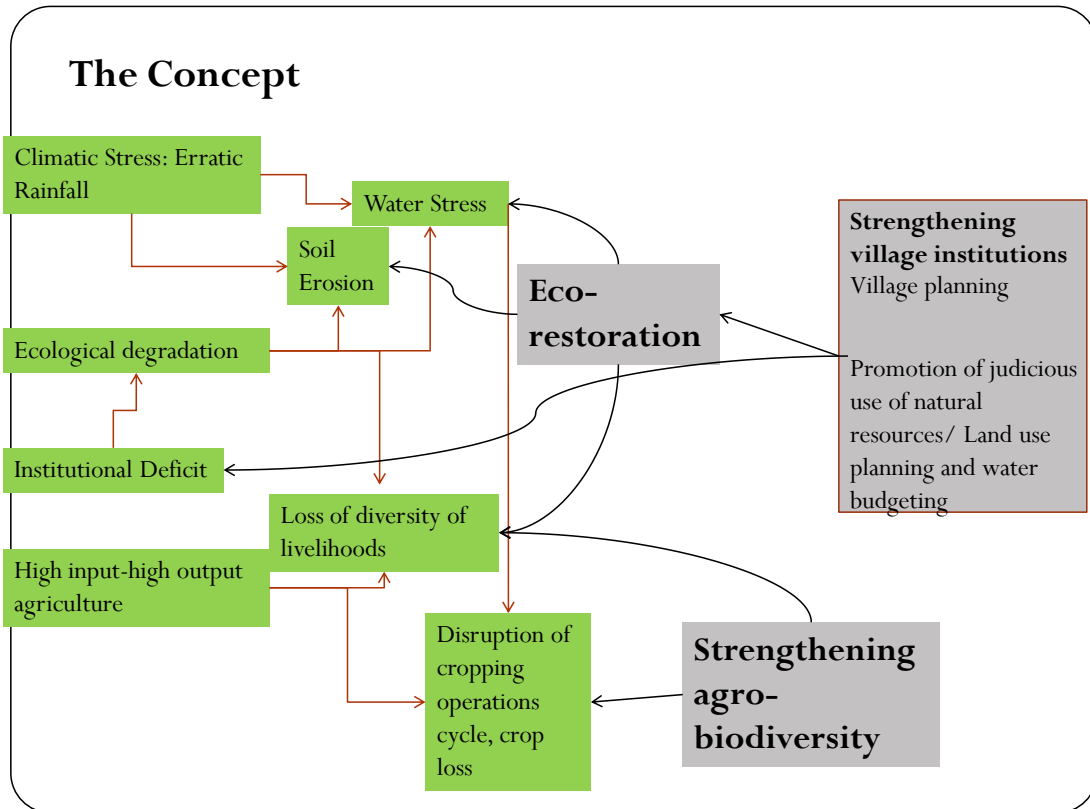
### III. Project

- The overall project objective is to achieve enhanced adaptive capacities of village communities of Mandla District by:
  1. improving the biodiversity of the forest landscapes,
  2. strengthening collective efforts of village institutions towards conservation
  3. and providing diversified basket of livelihood choices

Following conceptual diagram explains the existing situation and the project's theory of change or the adaptation hypothesis. While erratic rainfall is a major climatic stress, ecological degradation, institutional deficit as well as rising high input-high output agriculture are other major non-climatic stresses. *Forest degradation, loss of biodiversity and soil erosion exacerbated through climate variability and change are immediate threats to natural resource dependent communities in rain-fed areas like in the Mandla district of Madhya Pradesh. Addressing these issues and strengthening village institutions reduces the vulnerability of communities.*

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<sup>2</sup> Madhya Pradesh State Action Plan for Climate Change



- Components:

The major components of the project are:

1. Strengthening village institutions for village planning and judicious use of natural resources that would ultimately lead to eco-restoration.
2. Technical interventions for eco-restoration, which would primarily include measures to stem forest fragmentation, soil erosion and water harvesting
3. Supporting continuation of agro-biodiversity for reduction in risks.

- Coverage: the projects covers a total of 9 villages, where institutions are being strengthened to improve, conserve and manage natural resources, especially forests.

**IV. Objectives of the study (systematization exercise)**

The objective of the study was to understand whether the project interventions are in line with the vulnerabilities that people experience. Building towards the systematization exercise, a systematization question was formulated by the team which was to be tested and answered.

Systematization question: **Do the socio- technical interventions for agriculture and eco-restoration help enhancing the adaptive capacities of the tribal communities? To what extent strengthening of the village institutions contributes to the same?**

*Reference to the question*

**Eco-restoration** in the question refers to social and technical interventions undertaken in the project for holistic ecological security for the tribal community

**Social interventions** are mainly: strengthening of village institution by building capacities for village planning and framing rules and bylaws around natural resources; farmer’s field schools; awareness among communities on CC impacts and adaptive capacities

**Technical interventions** are mainly: agro-forestry, ridge to valley soil-moisture conservation; rain water harvesting

**Agriculture** refers to upland cultivation practices; revival of traditional resilient crops such as millets; improved cultivation practices for maize and paddy

**Village institution** refers to Gram Sabha having Prakirtik Sansadhan Prabandhan Samiti (PSPS, in English Natural Resource Management Committee) as designated committee of the Gram Sabha for NRM and is formed by Gram Sabha with facilitation of FES, the organisation implementing the CCA-RAI project.

**Tribal communities** refer to the tribal communities of Mandla district in Madhya Pradesh, which are largely Gonds and sparsely populated particularly vulnerable tribal group of Baigas. These tribes are mainly depended on forest resources and agriculture for their subsistence.

**V. Methodology, tools and research strategy**

- Study team: The members of Project implementation team primarily comprised of 6 members of which four have been part of direct field implementation.
- Study tools and strategy  
 In order to understand project’s impact on vulnerabilities of farmers, both qualitative and quantitative data has been collected. The qualitative data includes testimonials of about 30-35 individuals have been recorded on emerging issues, vulnerability of communities, impact as well as lessons learnt. Participatory impact assessment of improved natural resource governance in 6 villages has also been an important document. In order to quantify the impact, a questionnaire was also served to about 58 families of the project area. The team has also gathered quantitative data about soil and moisture conservation works, and impacts on crop yields as a result of intervention. Besides this, a photo documentation of project activities has also served as an important source of information.

While, the team conducted the PRAs, survey through questionnaire, collected testimonials, in the stipulated week after a year of intervention, many evidences and process documents like meeting registers, data collection on project impacts were being gathered since the intervention had begun.

Activities	Past Situation	What we do	Measure what/how	Monitor Changes
<b>Agriculture (Technical interventions)</b>				

Demonstrations for major crops (paddy and maize)	Broadcasting	SRI; Line sowing earthing up, conservation furrow or BBF	Yield, input, Photographs, case study, interaction with community, documentation, video	Less use of water, reduce the vulnerability for erratic rainfall, reduce the water logging condition; maintain the soil moisture
Demonstration in millets	Broadcasting	Line sowing with pigeon pea, Agro-forestry	Yield, case study, photographs, documentation	Utilization of unused land, cover forest fringes; Climate change impact resistant crop
Agro-forestry/Hort-forestry	More forest fringes, more unutilized land	Mixed Plantation on uplands on forest fringes;	Case study, photographs, interview of farmers	Bio-diversity would be increased, area under forest cover would be increased, reduce the vulnerability of chances of failure of agriculture crop due to erratic rainfall by plantation of forest and horticulture species.
Bund plantation	Less number of farmers under bund plantation	bund plantation to secure some of the livelihood demands and also diversify livelihood,	List out the number of farmer, interview of farmers, photographs, case study	pressure on forest would be reduced, farmers would adopt this activity for securing own diversified livelihood
Soil moisture conservation	Soil erosion high, runoff high, very little soil depth even inf arm lands	measure the runoff and soil erosion, steps to control soil erosion, measurement of soil moisture availability,	Data collection in every 15 days, photographs and village report	Soil erosion would be reduced, due to erratic rainfall vulnerability towards loss of nutrient would be reduced, storage of water would be stored for long time for different purpose
<b>Activities (Social interventions)</b>				
<b><i>Strengthening village institutions</i></b>				
Village level planning	Not existed	Support village for making village plan	Village register	Village institution would be strengthened and plan would be made by keeping the point climate change
Byelaws formation	Not existed	Support	Village record; PRA tools;	Natural resource would be conserved and protected and livelihood would ensure

Women participation	Not existed	Encouraging women for participation	Meeting records and through PRA tools	Women participation would be increased, decision making would be enhanced or strengthened
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- Study area: A total of six villages of Niwas block of Mandla district were studied during the exercise extensively. The following map provides the location of the villages studied.
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## VI. Findings

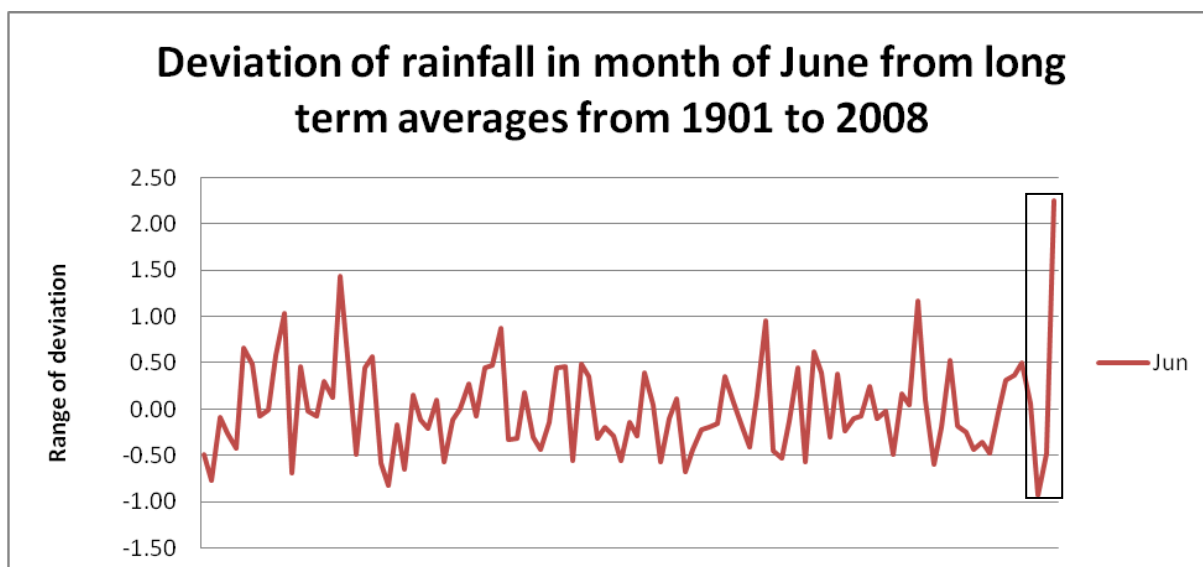
The interventions in the project primarily is eco-restoration and strengthening of institutions for eco-restoration or conservation of natural resources and also attempting to integrate biodiversity conservation with livelihoods in order to improve diversity in livelihoods as well as managing the risks. The intervention is guided by an institutional perspective to management of natural resources.

### - **Situation before the project (pre-project)**

The exposure to erratic rainfall for the communities has been evident from the monthly rainfall data. We have tried to analyse the time series data of monthly rainfall for Mandla district. Analysing the data of the monthly rainfall from 1901 upto 2008 (provided by EPCO, Bhopal), it has been found that five year averages of the monthly rainfalls of Kharif season (June to September) deviate from long term averages by about 20 to 35%. However for the last three years (2006 to 2008, the deviation is as high as 54%. The data matched with the findings of the IMD data set for the years 2005 to 2010, where deviation of average monthly rainfall from the long term averages has been about 53%.

Of all the months the deviation from the long term average is highest in the months of June and September. Though deviations in months of June have been on a higher side, indicating the erratic nature of rainfall at the onset of the monsoon, the last five years have been exceptional where the difference has been as much as 100%. The following graph traces the impact of the erratic rainfall in June. The trend shows a rising positive deviation which sharpens in the later half of the century. However, the trend is deceptive as though deviation is less in terms of reduction in rainfall, the impact of negative rainfall is much more severe on crop planning. In addition to that, there is a negative correlation of 0.22 between monthly rainfall in June and September. This means that heavy rainfall in June may more often mean lower rainfall in September.





Following table analyses how crop planning is supposedly getting affected from rainfall.

Event	Primary Impact	Secondary Impact
<b>Early onset and heavy rainfall in June</b>	Heavy soil erosion, Maize washes away; difficult to adjust timing for sowing paddy but overall good for paddy;	Lesser rainfall in September, affecting production of millets, and seed setting in paddy
<b>Low rainfall in June</b>	Delay in paddy sowing as well as transplantation; maize survives with low rainfall	SRI becomes difficult as it requires sowing of young saplings.
<b>near average rainfall</b>	Good for both paddy and maize	

The team has **collected institutional history** in order to understand the existing strength of institutions especially for conservation of forests. The timelines of institutions around forest and the state of forests brings out following points which add to vulnerability affect adaptive capacities adversely:

1. Many villages have had a tradition for conserving the forests. It is these villages which have taken lead in initiating byelaws process for conservation. These villages include Kusumi, Payali Bahur and Patha Devgaon.
2. Most village communities acknowledge linkage of forests with livelihoods in diverse manners.
3. Apathy of forest department towards strengthening of the local Joint forest management committee, which today does not represent the people in the village but the forest department in the village.
4. Attempts to sabotage Gram Sabha decisions often triggered neglect of common properties, be it ponds or forests.
5. Degraded institutions led to loss of social control and erosion of collective wisdom of using what is needed (women have pointed this out especially).
6. External forces when pose a threat to forests, people feel helpless in protecting them.

**Panchayats** are also weak in terms of their ability to govern natural resources and plan for development of natural resources. Following table explains the status of Gram Sabhas and Panchayats:

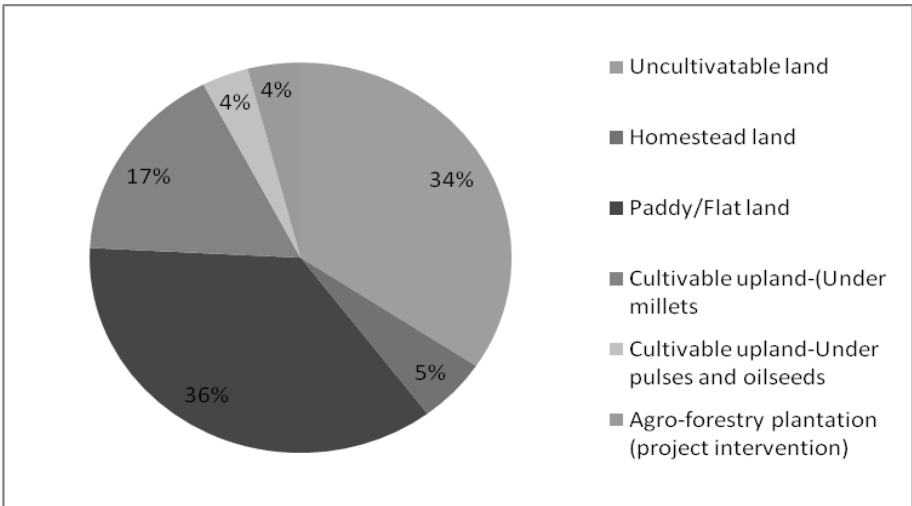
Indicators of strength of institutions	Baseline value
No of villages where Gram Sabhas are conducted monthly	None
No of villages with village perspective plans	None
Moderate regularity in conducting Gram Sabhas	Two (Thanamgaon and Harisingori)

As far as socio-economic vulnerability of the region is concerned, as is the case of other tribal communities, communities in the project area also rank low on various indices of food security, nutrition, education as well as income. Following table based on a household economic analysis conducted by FES provides the general wealth breakdown of households and the estimated average cash income of different wealth groups:

Wealth rank	% distribution in a village	Average annual income
Better off	13%	Rs. 17,530
Medium	43%	Rs. 16,468
Poor	44%	Rs. 12,162

The major criteria as per communities behind arriving on the wealth rank were the size of the land holding, vocations other than agriculture or wage labor etc. The income status presents a dismal picture and can play a proxy for low adaptive capacities of people.

**Graph 1: Percentage break up of land use obtained from 58 farmers during systematization exercise in project area**



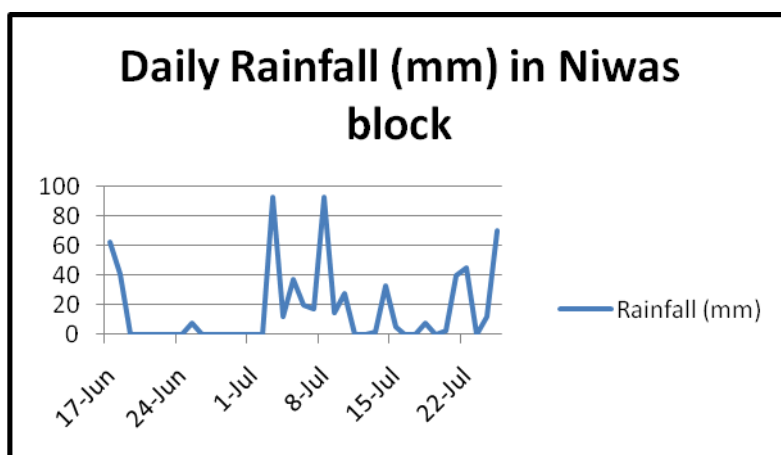
The above graph brings out that in last 10 years, about 34% of private cultivable lands have gone barren. The total land that was reported in the survey was about 308.5 acres. It is worrisome to see that even big farmers have been reduced to marginal farmers because of

growing problem of soil erosion. Notably, cultivable uplands which form about 22% of the area is witnessing severe erosion and might soon join the uncultivable land bracket.

#### - **Current Situation**

##### Understanding climatic stresses:

We are constantly adding to our knowledge of erratic rainfall in Mandla district. There has been a late onset of monsoon this year, Normal date of onset of monsoon is 15<sup>th</sup> June. Whereas, the monsoon arrived only in the week of 28<sup>th</sup> June-4<sup>th</sup> July, which accounted for 85% below normal rainfall by 4<sup>th</sup> July. The IMD data for the meteorological subdivision of Eastern Madhya Pradesh indicates the rainfall in June to be about 60% less than the normal rainfall.



By 26<sup>th</sup> July, the deficit has been met and has been reduced to just 8% below normal from the period of 1<sup>st</sup> June to 26<sup>th</sup> July. This indicates excessive rainfall above normal rainfall in the period. The actual rainfall between 4<sup>th</sup> July to 26<sup>th</sup> July seems to be 60% more than the normal rainfall. The negative correlation between June and September was also strengthened with reasonable rainfall in September (158 mm, about 26% deviation from long term average).

##### Strengthening institutions

Village institutions form the axis of conservation efforts for natural resources. Our engagement with village institutions began with organizing village institutions by electing an executive committee for natural resource management, called "Prakratik Sansadhan prabandhan Samiti (PSPS)". Advising the gram Sabha on natural resource management and spearheading the process of developing rules and regulations around commons is one of the duties of the committee along with planning for natural resources and land use. All the project villages are currently having the executive committees who are raising issues of natural resources conservation, especially of forests in Gram Sabhas. The issues of conservation and resource governance were discussed with men and women separately, building an understanding of degradation of natural resources within the groups and the committee and thereafter taking the issue to the forum of Gram Sabha.

The PSPS received a residential training on decentralized governance, perspective building on commons and planning. Village transects were conducted in each village for gaining a perspective on governance of natural resources. Village institutions arrived at a set of rules on using natural resources. Primarily, these rules included boundary rules, protection rules

for forests and usage rules to some extent. Basic focus has been on controlling lopping and logging of trees. At some places, they have also come up with rules regarding sharing of fish produced in vilage pond, etc.

#### Soil and moisture conservation

Heavy soil erosion have been a common occurrence in last few years. With the increase in heavy precipitation events and the degradation of forests there has been a very high increase in runoff and the resultant soil erosion causing rill formation in the farm lands and erodes productivity of lands over the years. With protection of ridges by promoting forest conservation, private lands are next that need to be treated in order to check soil erosion which has been amplified with erratic rainfall. The activities undertook here include modifying the outlets for draining water from farms from small outlets to stone outlets. Agro-forestry on private uplands of few patches has also been taken up to improve vegetative cover, arrest forest fragmentation and help in conserving soil and moisture. Following table summarises the actions taken:

Activities	Area under activities
Community Conservation of forests	500 hectares
Agro-forestry in private uplands	25 acres
Stone outlests in farm lands	15 acres

#### Agro-forestry in uplands

The private uplands are largely forests cleared up. At many places, they appear as a fragmented forest, whereas at many others they just indicate the boundary of forests. Introducing agro-forestry in these areas could help revive the gradually lost biodiversity of the forests, help bind the soil in the uplands, arrest forest fragmentation, improve canopy cover and diversify livelihoods of people.

The indigenous knowledge of commercial horticulture or cultivation practices of popular horticulture crops are almost non-existent in tribal areas. The long gestation period of horticulture interventions further reduces the interest of people. However, their knowledge base on utility and usage of local trees is immense. Their knowledge has helped them manage their kitchen gardens or homesteads for self-consumption. Most common trees planted by people are bamboo, papaya, mango most of them in the homestead lands. However, trees which need more care like hybrid varieties of fruit trees or grafted varieties are difficult to be tended. Moreover, watering of plants is a major investment which is not so easy to make by poor farmers.

Moreover, it is important to note that Mandla is known for wild fruits and wild produce, commonly called non-timber forest produce. The domestication of these species especially in private uplands is supposed to be easier as compared to any exotic horticulture species. Species like *Buchania lanzan* (chironji), *Terminalia chebula* (Harra), *Embellica officnalis* (Aonla) etc. not only act as cash crops but also provide very important services like nutrition and medicine. Ultimately, entire process of agro forestry covering 25 acres of 8 villages could provide lessons for PSPS and farmers of the village. People knew that forest species do not require manure and fertiliser for growth and development. Selecting species based on the interest of the farmers would support for better survival and growth of the trees. Accepting

and promoting agro forestry as effective strategy to check soil erosion and increase soil moisture in the region ( upland ) would vitalise the agricultural diversity .

### Agriculture

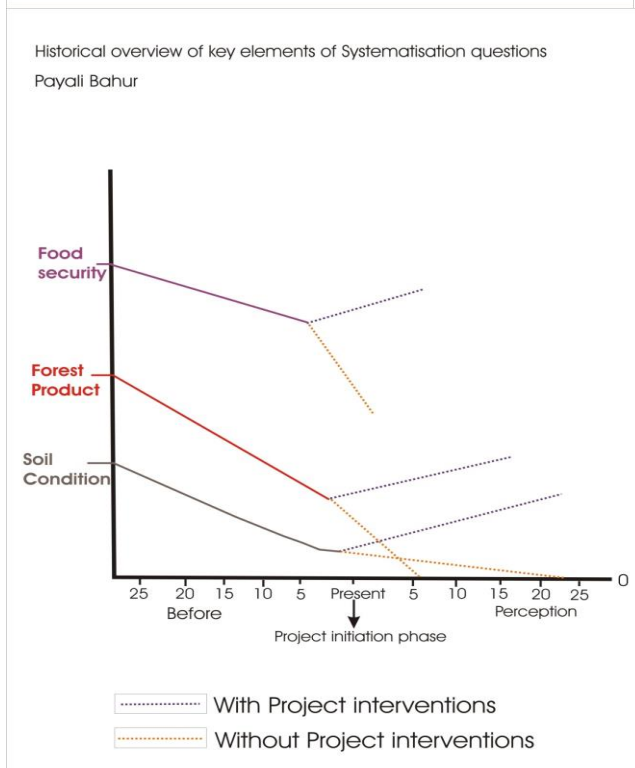
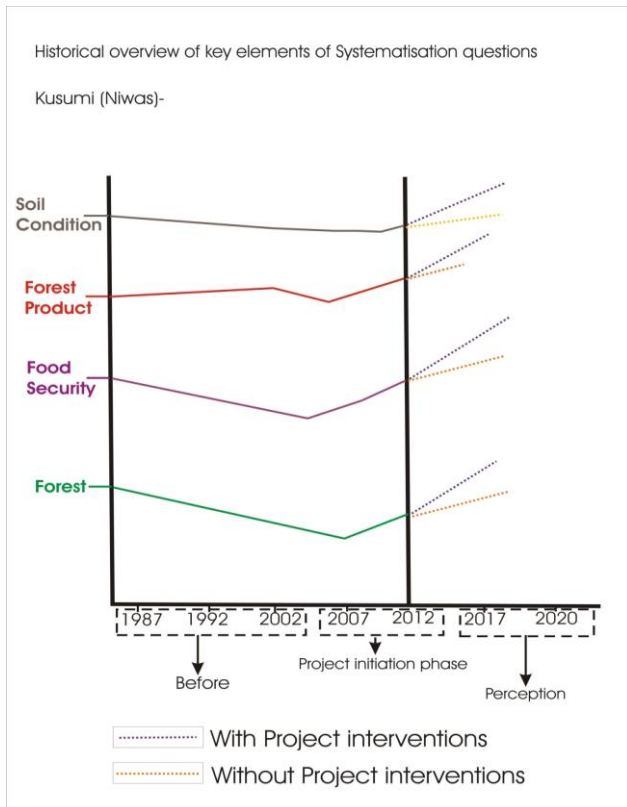
Team has tried to focus upon productivity side as the prices of millets have seen a marked rise in last couple of years. This is due to rising demand of millets in industry as well urban markets. Improved seeds of Kodo (JK 8) and Kutki (JK 48) were introduced this year along with re-introduction of Ragi (locally known as *Gurra Dhan*). The major points of interventions were therefore, seed replacement as well as introducing weeding to ensure good crop as well as maintain purity of seeds. Farmers already involved in this activity were prioritised assuming their engagement would hold better potentiality of being a model farmer in the region. They were provided support in terms of 100 KG of poultry manure/Acre to enhance the fertility of the soil which costed Rs.500.

The farmers have returned the 25% of the harvest in lieu of the inputs in order to improve the outreach of the seeds to more farmers next year. The seeds thus collected will form a part of the seed bank. The technical knowhow was shared among the farmers through trained master trainers.

The team has also intervened with maize and paddy. In maize especially, the yield has improved by 10 to 25% by doing simple cost-effective interventions like broad bed furrows, line sowing and earthing up of roots.

### Situation after the project (what really changed)

Basically the project has worked with the people-institution-resources complex in order to improve the natural resources and thereby livelihoods, enhancing the adaptive capacities of the poor. After a year of the project, when we discussed with people on issues of food security and state of forests and overall impact of project interventions on the same, we found that in general, there has been an improvement in the state of affairs in all villages. Places where institutions were better even before project intervention, people were confident of continuing the forest conservation even without our presence. Kususmi and pathdevgaon were two such villages. Whereas, villages like payali, Mohpani etc. indicated need for further strengthening of institutions around natural resources.



### Village institutions

During systematization exercise from 19<sup>th</sup> -21<sup>st</sup> nov.2012 the team interviewed 58 village households in order to understand general response to forest conservation. In order to further substantiate this, PRA exercises were also conducted to know the popular perceptions. The response to different questions were as follows

Question	Response		
	Total responses	Yes	No

<b>Are there any rules relating to jungle</b>	58	56	2
<b>Permission/ penalising outsiders on unauthorized entry to village forest</b>	58	53	5
<b>Collection of fire wood</b>	58	46	12
<b>Collection of NTFP</b>	58	24	34
<b>Protection of forest from fire</b>	58	20	38
<b>Grazing of cattle</b>	58	17	41

In most of the villages there was a common opinion that rules have been framed to penalise the people for logging and lopping. In village Kusmi, Rs-250 is the fine for the outsiders and Rs. 50 for the people who violates the rule from within the village. Besides the protection rules, other complex usage rules are either absent or at the stage of discussion. Every month the prakritik sansadhan prabandhan samiti is meeting once to discuss about different issues relating to natural resources. It tries to have a coordination among all the village institution to make the village united and to ensure the sustainability of the forest and other resources.

In the village Malheri, people also reflected in terms of increased say in governance of natural resources. Earlier the villagers had to approach the forester and beat guard for all issues related to forests. But now due to stronger village level institution, the reverse is happening.

#### Soil and moisture conservation

While conservation of forests and agro-forestry will show its impact later, the area treatment through treating the drainage outlets in farms has begun to show considerable impact. .

Following are the contributions of the initiatives

- The speed of the water flow checked for which soil erosion reduced on the concerned plot.
- The transplantation could happen in whole area because of the check in heavy flow of water .
- The increased moisture level supported for double cropping. A comparison between trial and control plots indicates improvement in moisture levels in trial plots of about 60% in November.
- It has made the plot suitable for cultivation of paddy.
- The paddy production increased 25% more than before .
- The pressure of water on the low lying plot came down resulting in the reduction of the soil erosion.
- The water level increased and could support for drinking water crisis .
- This initiatives also helped in spreading the technical know-how of the treatment in neighbouring villages.

#### Agro-forestry

Ultimately, entire process of agro forestry covering 25 acres of 8 villages could provide lessons for PSPS and farmers of the village. People knew that forest species do not require manure and fertiliser for growth and development .Selecting species based on the interest of the farmers would support for better survival and growth of the trees .Accepting and





of the village.

promoting agro forestry as effective strategy to check soil erosion and increase soil moisture in the region ( upland ) would vitalise the agricultural diversity.

Fodder production found increasing across households adopting the activity. All could take intercrop on the same patch for their involvement to protect the land from soil erosion. Plant growth and staggered trench were supportive for promoting millets. Overall, it added to the increase forest areas and tree populations

Besides agro-forestry on forest finrges, 300 farmers ahve undertaken plantations on bunds, with planting of 10 trees each.

#### Agriculture

All farmers who underook seed replacement in millets undertook a comparative demonstration was also ensured having promotion of both traditional and improved variety seeds in a single plot. Exact change in yield will be known once the harvesting of control plots is also complete. However, in people's perception, there has been an increase of 30 to 40% in the yield of Kodo and Kutki. In few plots, where we tried line sowing with Ragi, the impact has not been good and that has been learning for us. Notably, change in productivity upto 30% in an acre can bring a change in income of Rs. 7,500.

Besides the progress made in millets, the interventons in maize have also resulted in improving yields by 10 to 25%. However, in some villages, team has also witnessed reluctance to adopt new practices of maize cultivation.

### **VII. Process of change**

- Project perspective: Mainstreaming of adaptation to climate change and approaching natural resource management from the perspective of adaptation has been the prime focus of the project. Strengthening of village institutions leads to articulation of village's priorities and ensures mainstreaming of agenda of resource management and conservation for betterment of all. Adaptive capacities of poor improve as the community as a whole focuses upon improvement in the state of commons which are spaces for the poor. Strong village institutions are able to plan for the landscape, addressing issues like forest fragmentation and treat entire forest fringes as one unit, irrespective of the pattern of ownership. An institution therefore is a better unit in order to improve adaptive capacities of the communities, as it can address the 'issue' for the entire community and not only for single families.
- Community perspective: Improved state of natural resources is only possible with the coordinated of effort of communities towards that end. Bringing communities to talk on these issues has helped communities come together so many times, unfolding the possibilities of both-collective action as well as surfacing of hidden conflicts. For instance,



the meetings have brought to fore role of women in forest conservation. Many people who would think that the current practices of women are damaging to forests, do not realize the hardships of women. However, the meetings have given vent to the hidden conflict. It should lead to a more cohesive, vibrant and inclusive village institution. Collective action around natural resources has also put various government services also under scrutiny. Three out of 6 villages surveyed had a confidence of continuing the management of resources even without the project team's help. Project team will only help improve the governance further.

Secondly, from community's perspective, investment in natural resources and biodiversity will help strengthen natural resource based livelihoods and also bring diversity to livelihood system.

### VIII. Lessons learned around adaptation

- Does this project support adaptation on the ground and if so how?  
The project helps in improving moisture and helps diversify livelihoods, thereby improving the adaptive capacities of people.  
Interventions in the project have supported adaptation in the following manner, wherein a distinction has been made between generic and specific adaptation practices. Generic adaptation practices are those which have to be there in any developmental input irrespective of the favorable or harmful climate scenario. Generic adaptation practices are all the more important and a 'must do' even in a business as usual scenario. Therefore their importance in any adaptation project for a crisis more severe is all the more required.

Thematic areas of intervention	Generic adaptation practices in the project	Specific adaptation practices
<b>Institutions and adaptation</b>	Village planning and Natural resource management through village institutions	Institutional response to erratic rainfall <sup>3</sup> : Adjusting crop calendar, crop planning and land use as per the challenges of erratic rainfall
<b>Diversity of livelihoods</b>	Agro-forestry-especially in forest fringes	Priority to local species found in a great range of latitudes to take care of erratic weather
	Yield enhancement through intervening with improved package of practices	Seed replacement in millets and improved package of practices in millets
<b>Eco-restoration</b>	Additional water storage capacity	Gully plugs in the catchment of pond in order to arrest deposition of silt due to heavy soil erosion.

<sup>3</sup> Has not been attempted till November, 2012. This is a learning from the discussions held at various levels in the project team and also within organization during the systematization exercise.

	Soil moisture conservation	Changing the traditional outlets from farm bunds to stone outlets.
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- Demonstration effect: Besides our failure in introducing line sowing in millets, all the interventions have had a demonstrative effect. In the testimonials, we have obtained evidence of people who have begun to adopt various activities. However, the activities need to be scaled up a little more in order to prove their relevance in the project area.
- Potential for scaling up:

<b>Village level planning</b>	Village micro-plans for Climate change adaptation for MGNREGA, watershed programmes
<b>Rules and byelaws</b>	JFM programme and Grazing lands management, biodiversity management committees and governance of Commons gained under community forest rights
<b>Technical interventions on soil and moisture conservation</b>	Designing of SMC works in IWMP and MGNREGA
<b>Agro-forestry</b>	Nandan Falodhyan scheme of MGNREGA national horticulture Mission, Lok Vaniki, State Biodiversity Board, NABARD's tribal development fund scheme
<b>Agriculture</b>	Lessons for Mahila Kisan Sashaktikaran pariyojana

## IX. Communication of findings

The communication of findings will be made within the organization, village communities and with the Government and other development agencies. This will be done through specific workshops on adaptation to climate change, brochures on the project as well as screening of a film on project interventions at various occasions.

Communication products

Sl	Particular
1.	Power point presentation of Systematization document
2	Policy and programmatic briefs (upto 4 numbers)
3.	Case studies compendium
4.	Systematization report
5.	Brochure on Improving adaptive capacities of tribal communities through Eco restoration and institutional building in Madhya Pradesh

6.	A short film of 8-10 minutes on Community adaptive capacities through ecological conservation
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## X. Recommendations

- For year 2 of implementation and systematization:
  1. Soil erosion emerges as a major problem of the area, which is getting amplified by intense rainfall for small durations. We find more than 30% of land turning barren in last 5 to 10 years in the project villages owing to soil erosion. Our major focus in next year should therefore be to work upon soil erosion.
  2. Keeping in mind the success of agro-forestry activity, the funds for the same may be increased in order to reach out to more farmers.
  3. Changes in crop calendar in order to bring more focus to millets.
  4. Focus of implementation should be institutional responses to climate change. What collective action can people take up to combat impacts of climate change is what should be the focus of year 2.
  5. Farm system level approach which addresses the entire landscape put together for agriculture is required to bring a desirable change.
  6. Systematization exercise should be 10 days long instead of being a week long exercise as it requires a lot of time to compile the report afterwards.
- Sustainability
 

Eco-restoration is a long term agenda and requires a lot of collective energies to make it happen. However, within the given time period, the Prakratik Sansadhan Prabandhan Samitis have attained strength by participating in trainings and planning and have developed a perspective on development.
- Risks
 

Rising soil erosion is turning even the landed farmers poor. A long term and sustained effort is required for checking the trend. Rampant migration is there because agriculture is not generating enough employment opportunities any more. Gains in agricultural productivity that have been found recently have largely been because of jumping from local seeds to hybrid seeds promoted Government policies, which is pushing farmers to high input-high output agriculture, another reason adding to their vulnerability.