



**Wells for India**

Bringing water and dignity  
to the poorest people of rural Rajasthan



## **Community Based Water and Livelihood enhancement in Sawna Macro Watershed of Jaismand Catchment Area**

Sawna Macro Watershed (10 villages of Girwa, Vallabhnagar, Lasadiya blocks), Udaipur, Rajasthan  
1st April 2008 to 31<sup>st</sup> March 2013

## **Project Completion Report**

**April 2013**

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## 1.0 Abbreviations and Acronyms

Units:

Short form	Description
cum	cubic meter
ft	feet
ha	hectare
km	kilo meter
l	liter
m	meter
mm	milli meter

Terms:

Abbreviation/Acronym	Description
CCT	Continuous Contour Trench
CEE	Centre for Environment Education
CEO	Chief Executive Officer
E	East
FGD	Focused Group Discussion
FY	Financial Year
hhs	Households
KVK	Krishi Vigyan Kendra
LSCD	Loose Stone Check Dam
N	North
NGO	Non Government Organisation
NIH	National Institute of Hydrology
NREGS	National Rural Employment Guarantee Scheme
°C	Degree Celsius
PET	Potential Evatranspiration
PMF	Performance Measurement Framework
PRI	Panchayati Raj Institution
Ref.	Reference
RMoL	Rajasthan Mission on Skill and Livelihoods
RRWHS	Roof Rain Water Harvesting Structures
SCT	Scattered Contour Trench
SHG	Self Help Group
SLG	Sustainable Livelihood Group
ToRs	Term of Reference
WfI	Wells for India

## 2.0 Executive Summary

### 2.1 Project Area Profile

The Sawna watershed lies 62 km south east of Udaipur via Sakroda-Gudli-Bambora villages, which is part of Girwa, Vallabhnagar, Lasadiya blocks of Udaipur district of Rajasthan. This is 32 km<sup>2</sup> area consisting of 10 villages. The area lies on GT sheet no. 45L/3 by Survey of India. Sawna macro watershed is in longitude west of Morji ka Kheda E74° 05'28" to north of Kherakhet E74°08'44" and latitude N24°21'30" south of Morji ka Kheda to N24°26'36.4" north of Lakhmera/Tin Munda an also on sheet No 13 of of Geological & Mineral Atlas of India (by Geological survey of India).

The minimum and maximum temperatures are 03°C and 45°C, respectively while mean temperature is 22°C. The average annual rainfall received by the district is 652.6 mm. Annual potential evatranspiration/PET is 1380 mm. The area lies 30 km north east to the Jaismand lake, making it a part of one of the greatest catchments. The area south of the great watershed is drained by the tributaries which ultimately reach to Arabian Sea through the Gulf of Cambay.

### 2.2 Partners organization Profile

Established in 1989 Prayatna Samiti is a Non Government Organisation (NGO) functional in Udaipur district of Rajasthan. Registered in 1989 under Rajasthan State Societies Registration Act (1958) the NGO is functional to promote livelihood enhancement activities among the tribal community of the district. Under its programmes the blocks of Girwa and Salumber are being worked as major areas to raise family level income through agriculture and livestock promotion among rural community. Institution building approach of Prayatna Samiti has benefited men and women.

The organisation initiated its work in Gudli-Bambora region of Girwa Tehsil of Udaipur District. At present the NGO is working intensively in 12 panchayats of Girwa, Salubar and Bhinder Blocks of Udaipur.

Aims and objectives of Prayatna Samiti:

- Achieve hundred percent food security at village level.
- Cater and development the understanding of sustainable livelihoods among rural community dwelling in watersheds.
- Build the local capacities to seek the alternative rural livelihoods.
- Create self dependency among people to sustain their livelihoods.
- Develop the best local governance methodology.
- Build the productive agriculture methodology.
- Build the productive agricultural and livestock germplasm in water deficit area.
- Raise the water level through ground water recharge systems.

### 2.3 Project Period

1st April 2008 to 31<sup>st</sup> March 2013

## 2.4 Project activities, Number of villages and people benefited

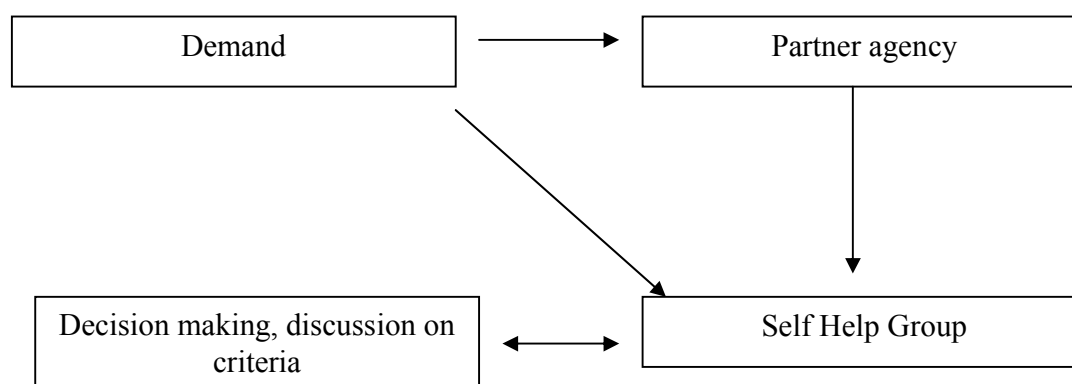
Project activities	Number of villages	People benefited
Water harvesting and conservation	10	719
Livestock and Agriculture development	10	967
Capacity building	10	2093
Skill development	4	109

## 2.5 Approach

The project follows the local institutional building approach to seek community participation and ensure sustainability. The institutions are SHGs. These comprises of 10 to 15 women, men or sometimes both. All the SHG members save their monthly savings from Rs 50 to Rs 100 in the group to the treasurer. The money as a common pool keeps on increasing and can help the needy when required. The money lend from the group is to be repaid back with interest in a limited period of time. The group also acts as the promoter of developmental activities as it hold the stakeholders who play an important role in decision making.

As the project demands development this cater the neediest person first. To implement the activity the partner organisation first discusses the activity with the SHG. After the selection of person his/her strength and capacity to handle the activity is judged by the group leader and secretary. If the loan repayment background (in case of loan based activity) is justifiable the activity is granted to the group members. The beneficiary can take the help of his/her family members and other community members to accomplish the work.

The activities always seek a 50% community contribution (in cash or in kind, as required). This ensures the sustainability and ownership. For pasture land treatment and roof rain water harvesting structure it is 25%.



## 2.6 Planned Budget and expenditures and contribution received

Total planned budget for five years (FY 2008-09 to 2012-13) was Rs 1,33,61,539 from which Rs 83,69,785 was spend in implementation. Community contribution to this expenditure was Rs 18,20,065.

Table showing the budget status for planned budget, expenditures, and community contribution in 5 FYs of project implementation:

FYs	FY 2008-09	FY 2009-10	FY 2010-11	FY 2011-12	FY 2012-13
Planned budget (Rs)	1837500	3901750	3085339	2877950	16,59,000
Expenditures	855065	1768585	2208277	2338077	11,99,781
Contributions	1,22,500	4492	8,47,343	538091	3,07,639

## 2.7 Major achievements / outcomes

- A total of 260 farmers benefitted by well lining are being able to irrigate 130 ha land for 75 days in comparison to 60 days, which was before well development.
- A 117 ha extra patch of non-irrigated land is being brought under cultivation addressing food security.
- More crops and other types are grown like moong, and mustard in the cultivated land of 100 ha.
- With 12 water tanks 7.25 ha of land has come under irrigation to produce vegetables, wheat and maize.
- A 44,000 l of water is being harvested in 1 year in the RRWHSs constructed in houses.
- An average of 3 m of water level rise reported in 330 wells due to the construction of LSCDs and gully plugs in farm lands and pasture land development.
- 80 ha of pasture land protected.
- A total of yearly production of 316 quintals of fodder generated from 60 ha of pasture land development, which was double than the previous years.
- A 40 kg of Lok 1 wheat provided to 100 farmers have enhanced the production from 500 kg to 800 kg per 0.9 ha.
- Due to vegetable demonstrations with 156 farmers a total income of Rs 75,816 is generated in 2 months.
- Provision of productive breed animals has enhanced the income. Annual animal milk production with 25 beneficiaries reached to 41,425 l. This was 17,500 l more than the previous years. 72.5 l of milk is also been sold to dairy per day. Improved practices like feed and disease management have been adapted.
- Community is adapting best practices in the form of practicing new varieties and searching forward market linkages. Moong, mustard and onion varieties are gaining popularity for their market demand. 50 farmers have started vegetable marketing. 135 ha of area have come under irrigation with major cash crops. Surplus wheat is sold to the market.
- 31 SHGs are functional in the area. Loans have been taken by the SHG members for initiating enterprises on grosser shop, cow and goat rearing, and land leveling.

## 2.8 Major lessons learned

- As the project considers community contribution in physical activities (well development, LSCDs, gully plugs, pasture land development, farm bunding, and RRWHSs) there is surety of sustainable linkages between the beneficiary and the structure. This addresses the long lasting impact. Repairing of damaged structures and collective protection in case of group activities have also been reported in Ramela pasture land development. Even the community is willing to put in contribution where the total cost is calculated more than the expected 50%. This highlights the dire need of water conservation and management from the community at collective level. There must be written agreements and by laws with community for their contribution.

- Big structures on water recharging needed to be built. These address a considerable amount of community contribution. Structures like RRWHS, wells and Water Tanks proved to be the good governance models as other people are also using the water and promoting the management.
- Alternative techniques to handle the enterprises by risk resolution are also been found by the entrepreneurs. After taking the loans people are finding the sustainable ways to carry on the enterprises. Castrating the indigenous bucks, and deworming of cows and goats shows their skills to promote the improved breed of animals. Enhancing the production of wheat even when the stone was surfaced after land levelling by putting the soil cover over it is also an example showing the entrepreneur skills developed. Community can be supported up to certain level to develop an enterprise as one of the qualities of the entrepreneur is to take risk and resolve the problems occurred.

## 2.9 Any other point

- Cumulative SHG progress report up to February 2013:

A total of 31 SHGs are functional in the area. In the monthly group meetings held women are encouraged to taken up innovative livelihoods in the form of value addition of existing exercises. Through land leveling, farm bunding, well lining and construction of low cost water harvesting structures they have benefitted themselves by achieving enhanced production. Men and women groups are addressed on the capacity building programmes like animal husbandry, agriculture, compost pits, water and sanitation, and village planning. Meanwhile, SHGs have also been linked with the loan based enterprising programme, Grammidhi, in 2009. Through this the members were linked with the corpus fund. The programme focused on innovative farm and non-farm enterprises, through which farmers took the loan on Gir cow, sirohi goat, kirana shop, poultry and well deepening machines. The loan was accessed through the SHGs on 12% simple interest rate.

A cumulative report on the financial status is given below which indicates the monetary appraisal of the SHGs in the area:

SHGs formed	31
Membership	395
Total savings (Rs)	779307
Loan taken (Rs)	1292417
Interest penalty (Rs)	402869

(Ref.: Annexure v (for details))

- Works facilitate by government (through linkages) or other organisation in the project area:

Rajasthan Animal Husbandry was converged to provide 10 sirohi breed bucks at 50 per cent subsidy. A total of Rs 25,000 was leveraged to promote breed improvement. A tracking format on the buck performance – number of progenies, buck exchange – was also provided on this account.

50 farmers were provided with the PHEM-2 variety of maize from the Rajasthan Agriculture Department. This was made available on 100 per cent subsidy.

A total of 27 enterprises are functional with the linkage from Gramnidhi corpus fund operational in the area. Gramnidhi is a loan based rural enterprise programme, funded by RMoL (Jaipur) and facilitated by CEE, through which a farmer can access the demanded fund to carry on a desirable farm or non farmed based enterprise after being sanctioned by a institution Gramnidhi Committee. The loan is released to the farmer through his/her SHG which is repaid back at the rate of 12% interest in the specified period of time. With loan sanctioning Gramnidhi also supports free of cost capacity building of entrepreneurs.

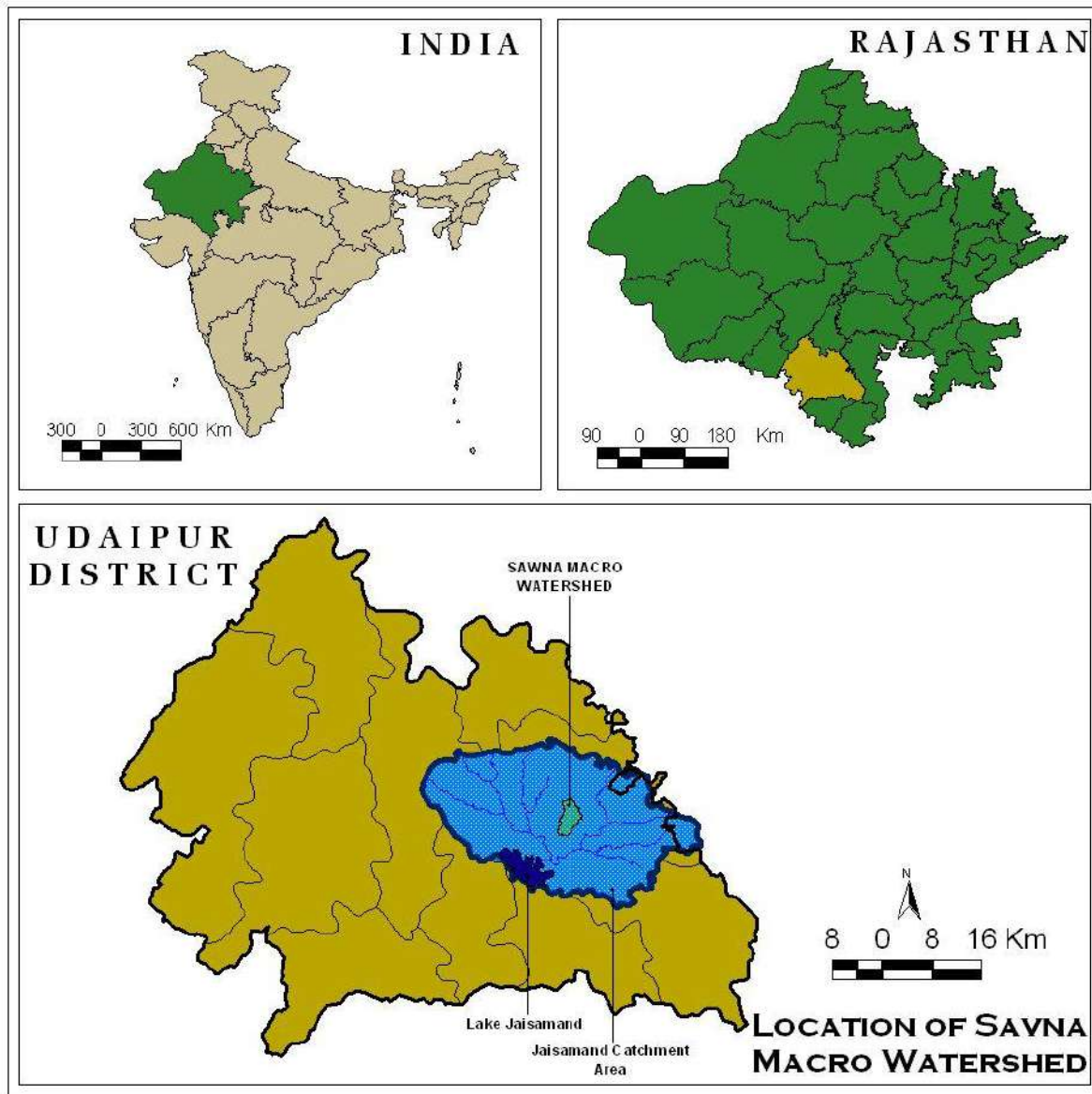
A loan of Rs 5,00,000 is being taken by the people to operate Gir breed of cow, sirohi breed of goat and kirana shop enterprises.

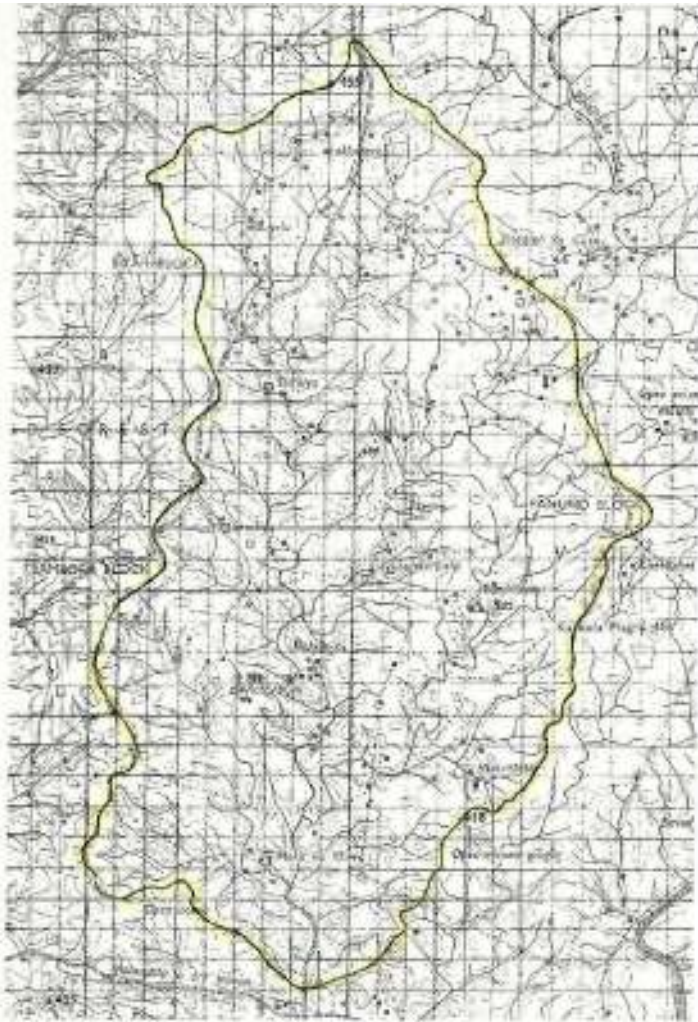


### 3.0 Project Summary

#### 3.1 Project Villages Location

Maps showing Sawna watershed location in Indian sub continent





**Map showing project villages location**



**Sawna watershed location  
map in GT sheet**

### 3.2 Brief description about project villages

- Project villages: Ramela- Lakhmela, Alukheda, Sawna, Nichli Semaliya, Upla Semaliya, Sundarpura, Ratanpura, Pemla kui, Hatida, and Mokla Talab.
- This area is predominantly inhabited by tribal (Rawat Meena). Based on the caste compositions we find that Lakhmela, Mokla Talab, Pemla Kui, Kherakhet, Ramela and Sunderpura are hundred percent tribal villages.
- Nichala Semliya, Ratanpura and Modji Ka khera are villages having Rajput, Dangi and Schedule Tribe as heterogeneous community.
- Consolidated community includes 80% schedule Tribes. Schedule Caste families are very limited in numbers in Alu Khera, Sawana and Upla Semliya only
- Sex Ratio among the children is 872 which is much lower than 934 among adults, indicating poor conditions women in the area.

- Sawna and Alukhera are larger villages while Sunderpura, Ramela, Mokla Talab, Nichla Semliya, Pemla Kui are small habitations with less than 30 households.
- 46% population in the project area belongs to children

### 3.3 Project Goal, Objectives, outputs, activities and budget

#### 3.3.1 Goal (Ref.: Annexure ix)

Enhanced Livelihood of poor community in 10 village of Sawna macro watersheds in Jaisamand catchment Area in Udaipur Rajasthan by 2013.

#### 3.3.2 Objectives (Ref.: Annexure iii (3.2))

- Provide safe drinking water to every human being and livestock.
- Optimising land and water productivity in the area.
- Apply and test ground water recharge situation in the project area.
- Evolve water and livelihood based institutional set up in the area.

#### 3.3.3 Outputs (Ref.: Annexure ix)

- Increased capacity of Water Harvesting by 50000 cum.
- Increased areas under irrigation up to 25 ha.
- Rabi crop area increase by 100 ha and Zayed crop area by 25 ha.
- Improve soil fertility in 200 ha. area of 500 farmers.
- Protect erosion in 300 ha land.
- 50 ha land increased under Kharif crop.
- 100 ha pasture land increased.
- Increase milk production in 300 families by 5 l/day.
- 50 SLG will start functioning in whole Sawna Macro Watershed.
- 200 families of 10 villages will start growing vegetables and horticulture.

#### 3.3.4 Activities wise Budget

Budget Head	Key Activities	Nos.	Total Budget (for year 2008-13) (Rs)
Water Harvesting & Conservation	a. Well lining	50	7,50,000
	b. Pipe line/water course	80	4,00,000
	c. Storage tank	80	3,20,000
	d. Gully plugs	300	3,60,000
	e. LSCD	30	1,05,000
	f. Pasture land development	200 ha	20,00,000
Agriculture and Livestock	a. Vegetable gardening (back yard)	200 hhs	1,00,000
	b. Fruit orchard	50	4,00,000
	c. Agriculture demonstration	600	6,00,000
	d. Cattle vaccination camp	50	3,00,000
	e. Feed mangers	100	2,00,000

	f. Water trough	50	2,00,000
	h. Dairy development	200	44,00,000
Capacity Building	a. Improved agriculture training	5	60,000
	b. Scientific animal husbandry practices training	5	60,000
	c. Water saving trainings	5	60,000
	d. SLG organisation	28	28,000
Monitoring and Documentation	a. Wells for India monitoring visit	20	40,000
	b. Documentation	5	25,000
Project Personnel (Additional)	a. Project manager	60 months	7,95,690.9
	b. Technical specialist	60 months	6,63,075.75
	c. Accountant	60 months	5,30,460.60
	d. Field coordinator – 4	60 months	13,26,151.5
	e. CEO	60 months	6,63,0175.75
	f. Technical services	75 days	2,25,000
Non Recurring Items	a. Stationery & communication	60	1,80,000
	b. Office rent	60 months	2,10,000
	c. Office expenses	60 months	1,20,000
	d. Furniture & Equipments	1 (Once)	50,000
	e. Motor cycle	2	96,000
	f. Travel & DA	60 months	5,10,000
	g. Audit & Legal Expenses	5 years	50,000

### 3.4 Project Management and Administration

Administration allocates full time and part time project personnel to implement project in the 32 km<sup>2</sup> watershed. There are 3 staff deputed at field level who are field coordinators and women worker to execute the scheduled tasks with the community. These 3 are guided by and reports to a Project Manger who is responsible for the overall project execution. Part time bearers designates CEO, Accountant, Technical person and field worker. CEO directs the project, where as accountant is responsible for the financial transactions. Technical person is agricultural engineer and field worker is a community person who perform village related technical tasks.

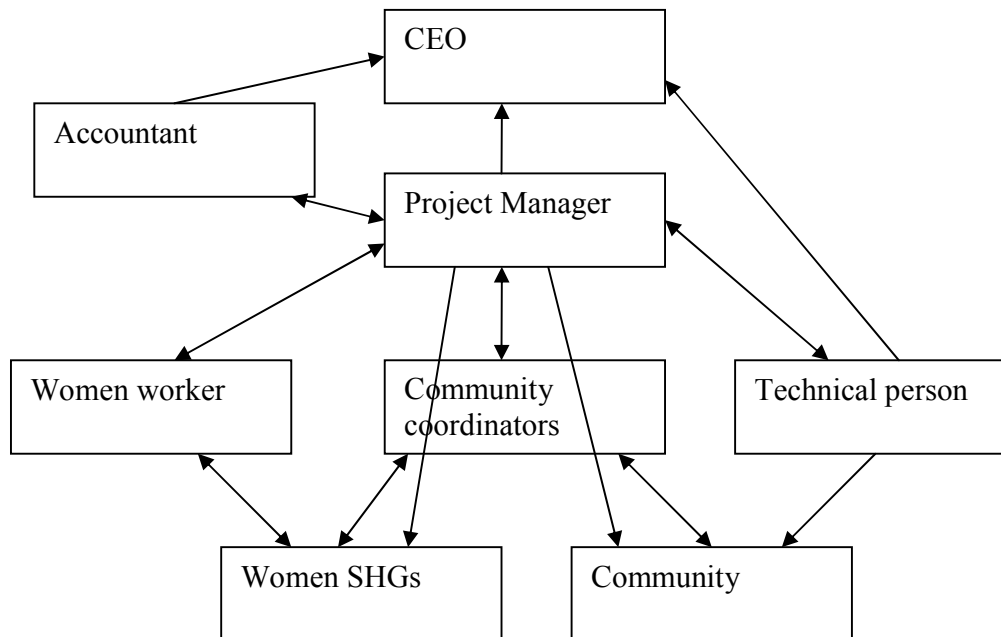
Expenses mentioned as travel, communication and other office expenses provided in the budget submitted to Wells for India are only used for coordinating WFI activities.

Roles and responsibilities in project management:

Staff's designation	<b>Project Manager</b>	<b>Field Coordinators</b>	<b>Women worker</b>
Roles & Responsibilities	Documentation of project activities	Organising community members	Coordinating SHG meetings
	Resource Mobilisation	Discussion of developmental works among community	Formation of new SHGs
	Knowledge Management	Coordinating local mobilisers	Coordinating local trainings

Optimisation of activities	Coordinating local trainings	Writing meeting minutes when present
Organising capacity building programmes	Search for developmental proposals from community	Follow up on development work
Planning	SHG coordination	Coordinating local mobilisers
Direction	Writing meeting minutes when present	Solution of problems effecting SHG meetings
Introducing innovations	Follow up on development work	
Search for developmental proposals from community	Taking cost estimates of construction	

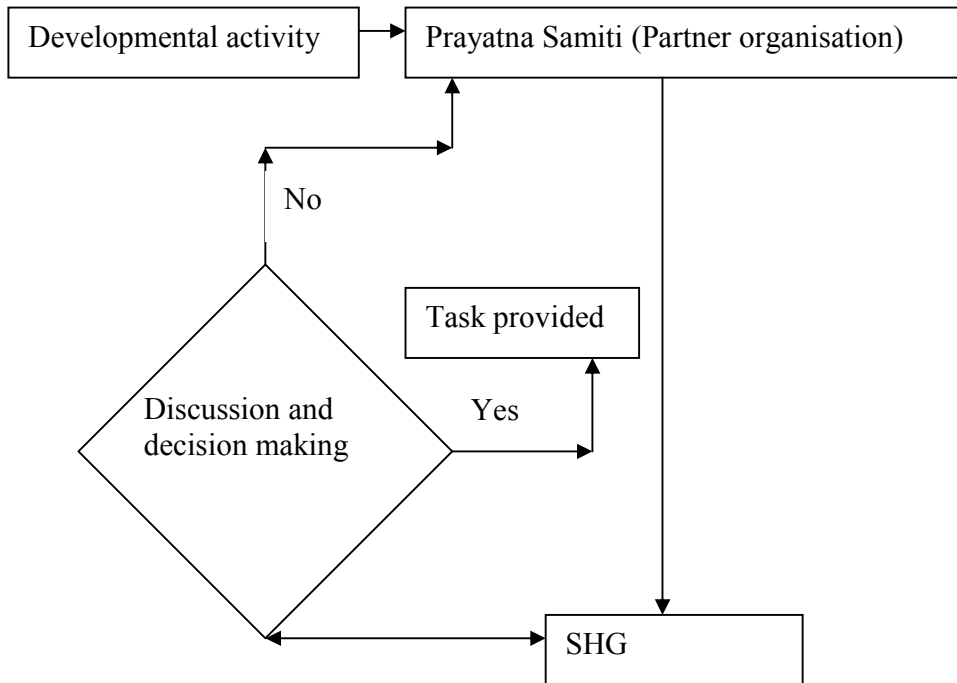
Diagram showing flow of reporting during project management:



### 3.5 Project Strategy and Approach

The local institutions – SHGs – are undertaken to implement the project activities. The strategy incorporates the decision making as its integral part. The women and men SHGs are self capable to position the development

and select the suitable person to accomplish the task. The people in the group self raises their concern to implement the activity at their household. Below is the flowchart depicting the strategy and approach to implement the project:



## 4.0 Project achievements against the set objectives / outcomes

**Brief description of the project objectives – (Ref.: Annexure iii)**

**Provide safe drinking water to every human being and livestock:** In the Sawna Macro watershed there are five community owned open wells which are designated as drinking water well and rest 232 wells are privately owned wells for irrigation purpose. There are 77 Hand pumps in the area with. Even after so many sources there are 20% families where women and children have to walk more than one kilometer to fetch water in normal conditions, more than two to three km during summer season while situation become worst during drought years. Therefore in-order to help community in achieving the target of assured drinking water for each and every human being and livestock of project villages' project has planned following major steps.

- Creation of source for deprived hamlets within the reach of five hundred meters.
- Drinking water source for each school
- Identification of traditional reliable sources (particularly those which works during drought years) and renovate them
- Creating institutional set-up such that drinking water is assured
- Linkage with government schemes and provisions to ease access to drinking water such as panghat scheme, hand pump, water trough and swajaldhara etc.
- Awareness and capacity building on water born diseases and Celebration of “World Water Day in schools

**Optimising land and water productivity in the area:** In the project most of the families relate each other with well as focus of socio-economic situation in the area. Effective relationship among the members, sharing such a source can really help each other in sustaining their livelihood. Mostly they form a peer group affecting each other positively and/or negatively. Some positive steps taken to improve situation of land and water management in such land can yield better results both in social and economical terms. Therefore project incorporated resource development planned around such sources. The focus of intervention would be water optimisation using approach of:

- **Enhancing water availability**
- **Optimising water productivity**
- **Reducing water wastage**

The interventions can be grouped into two categories group focused and community focused. Different techniques are planned to reduce slope and enhance moisture retention period and water harvesting. This will be done through following components.

Planned Interventions	Type of Proposed activities
Enhancing production in Beed	CCT, SCT, vegetative propagation and Plantation
Rain fed Agriculture	Land levelling, Field Bunds (FB) & Earthen Bunds (EB) Bund Plantation
Double Crop Cultivation	Earthen Bunds, (New & Repair) Vegetable Growing, Cultivation of Medicinal Crops,
Permanent crop	Agro-horticulture and agro-forestry

Well Recharge structures	LSCD, diversion channels
Reducing wastage	Lined channel, drip irrigation,
Improved animal husbandry	Water & feeding trough, chaff cutters and housing
	Vaccination, and treatment camps with government
	Information sharing on Improved breeds and their utilization
Organic Manuring	Vermicomposting, green manuring & liquid manuring
Cultivating sloping land	Sloping Agriculture Land Technology

#### -Capacity Building of community

**In order to improve knowledge level of community on modern developments in the field of land based livelihood project would organize training programs and interaction seminars** inviting outside experts. Some of the important themes that can be included are:

- **Agriculture-Animal husbandry concept in Resources management**
- **Conservation approach and cost economic approach in NRM**
- **Medicines & aromatic plantation and Vegetable gardening etc.**
- **Improved agriculture technologies (modern equipment, preparing organic manure, seed selection etc)**
- **Agro-forestry, Agro-horticulture, seed treatment, sowing, organic manure preparation, critical stages of irrigation, crop water relationship, mixed and inters cropping, appropriate land use system, value addition, post harvest technology.**

The project would also have regular theme based exposure visits so as to demonstrate different technologies problems faced their results, important stages of cultivation like sowing, irrigation, harvesting etc.

**Evolve water and livelihood based institutional set-up in the area:** In the approach of ridge to valley focusing on land and water management the effect of all the activity tends to result more remunerative as we walk down the stream. The interest of farmers varies from place to place therefore need is felt to build institutions around water sources, be it well, nadi, talai, anicut, small stream or a river basin. In this project Prayatna has visualize series of informal and formal institutes at different level reaching to a level of “Pani Chokhla” for whole of Sawna Macro watershed. Exact form of institutional set-up would evolve with time, but it would start from the informal traditional institution of “Well Sharer’s

PS planned to formalize institute of well users who sharers a source and have organic linkage in the form of kinship based on resource sharing. There will not be any formal electoral body in such institutions; rather their size would vary according to number of partner in a well. The second tier of institutions would be of members representing wells located in a stream. All the stream based institutions would form village or micro watershed (river based) group having representatives from stream based groups. Whole Sawna macro watershed would have institution called “**Sawna Pani Chokhla**” which Project would organise awareness campaign followed by exposure visit to places with successful democratic institutions around water and water sources.

In all there will be twenty five institutions of stream level with average membership of 10 benefiting 250 families. Besides resource development wells user groups community would also be organised into SLGs for evolving resource sharing mechanisms, saving habits and credit for better livelihood opportunity. If possible project would try to organize them around wells so as to avoid multiple institutions.



## Water Harvesting and Conservation

### 4.1 Objective 1

Objective	Outcome	Activities
Provide safe drinking water to every human being and livestock	<ul style="list-style-type: none"> <li>• A total of 260 farmers benefitted by well lining being able to irrigate 130 ha land for 75 days in comparison to 60 days, which was before well development.</li> <li>• Due to pipelines a 117 ha extra patch of non-irrigated land being brought under cultivation addressing food security. (Ref.: Case study 1 (as insight))</li> <li>• More crops and other types grown like moong, and mustard in the cultivated land of 100 ha.</li> <li>• With 12 water tanks 7.25 ha of land has come under irrigation to produce vegetables, wheat and maize. (Ref.: Case study 2 (as insight))</li> <li>• A 44,000 l of water is being harvested in 1 year in the RRWHSs constructed in houses. (Ref.: Case study 3 (as insight))</li> </ul>	<ul style="list-style-type: none"> <li>• 65 well linings done.</li> <li>• 12 water tanks constructed.</li> <li>• 106 farmers provided with pipelines.</li> <li>• 11 RRWHS constructed.</li> </ul>

The outcomes are based on field visits, monitoring, interviews and group discussions with community.

Achievements:

**65 well linings enhanced land productivity and restricted water pollution:** Stream water flowing down into the wells have been restricted to ground surface resulting in minimising flow of mud. Water pollution has also been checked which was caused by mixing of ground and surface water. Well partner families are reconstituted on the ground of common understanding for efficient utilization of water.

**117 ha extra patch of land generated due to pipelines:** Saving manpower and time farmers are able to cultivate non-irrigated land into cultivated land. Crops like wheat, maize and paddy and vegetables have been grown on fertile patches.

**0.45 ha fallow land per farmer converted to cultivable area:** Due to well lining and pipelines as from holistic development point of view farmers have cultivated sloppy pieces to generate the crops. Farm bunds and land leveling as the supplemented activities were been able to generate 70 quintals of extra wheat which was sold in the market. In this way, a major issue of food security been addressed.

**4,000 l of water harvested in Roof Rain Water Harvesting Structures during monsoon:** The RRWHs of capacity of 21,000 l each were able to collect average 4,000 l of water per beneficiary. The catchment roofs were designed to equip with smooth surface to ease the recharge through plastic pipes. Covered water was pure and able satisfy the needs like drinking, washing and bathing. This was the new source of water harvesting when the wells went dry.

### **Brief analysis of outcomes from water harvesting and conservation as per PMF:**

#### **Area increased under pipeline**

Pipelines are the watering devices which are frequently used by the community to irrigate the fields. Far located from the wells the fields are necessary to be irrigated on time. Due to lack of such resources farmers are unable to manage the water supply. Women have to travel long distance to transfer water. A huge amount of manpower is consumed while doing this. Water channels excavated on land also evaporates the water. FGD conducted with 18 farmers of Hathida and Moklatalab shows that the farmers benefited by the pipelines have been able to irrigate 0.8 ha of extra land per farmer. The irrigated land per farmer was 0.37 ha in 09-10. Saving in time and manpower has made farmers to enhance their land to 0.45 ha recorded during 2011-13 year. This is being utilized in wheat, maize and vegetables. (Ref.: point 1. in Annexure vii as interpretation data table of PMF)

#### **Case studies:**

##### Case study 1:

#### **Development around well – an emergence due to well lining**



Grandson of Radi bai checking pipelines in the newly lined well

Well of Radi bai/Chokha ji and Nand Lal/Navla ji was unable to irrigate their 2.3 ha of irrigated land in Ramela village of Vallabhnagar block. 30 years back, lying under the dilapidated condition the well was unable to harness pure water and provide retarded supply. This year (2013), the farmers have irrigated 0.25 ha land due to well lining happened on this well in 2012.

Radi bai and Nand Lal are the joint owners of their well. Residing since 20 years in the village, Radi Bai seen her well as a big resource but due to inflow of mud into the well the water went polluted providing an interrupted supply to the fields. Due to absence of boundary it was unsafe place for children and animals.

Her willingness to repair the well got a step up when she contacted Prayatna Samiti through her SHG Baderia Mata Mahila Mandal in 2012. She was



Chakni bai, a nearby farmer in seeing the results of well lining – the newly irrigated land in Ramela

considered as one of the marginalised farmers as her family income was Rs 1,500 per month. The total cost of construction was estimated as Rs 45,000 on which she agreed to contribute Rs 12,500 as the in-kind contribution.

Now, the well is irrigating 0.3 ha of land mass through an uninterrupted water supply. 0.25 ha land is utilised in sugar cane cultivation which is used to produce jaggery. 5 quintal sugarcane has now jumped up to produce 1 quintal jaggery which was 80 kg till last year. In this way, the well lining has contributed in raising family income. This year, an extra patch of 0.25 ha land is also been toiled to cultivate vegetables.

### Case study 2:

#### Water tank controls water flow

Controlling the flood irrigation to the regulated one is a challenging task. Many NGOs in Udaipur are working their own models to promote the effective water management technology. Drip irrigation, pipelines, water tanks and sprinklers are among them. Under the Sawna watershed development project Prayatna Samiti worked on the water tank model to manage the water supply. Tanks with an ample storage collect and send water to the desired locations and in regulated way.



Extra wheat cover due to controlled water flow

Pulki bai/Kishan ji is one of the leading owners of such water tank which was constructed by the Prayatna Samiti in Vasatalab village in year 2009. As the well was situated down the hill it was difficult to irrigate the land with controlled supply and lot of water was wasted. Also the farmers had to travel long distance to wash clothes, utensils and take bath. 2 other farmers contributed to the construction of tank.



Community filling the water from water tank in Vasatalab

Members of Idana Mata Mahila Mandal were met to address the need of water. Water usage and management are the two different components.

Water harvesting is the collection of water in the household and management refers to its efficient usage. It should be saved, but for long time. Its usage should address all people of the village. Irrigation, livestock and human beings are the addressable sections whose need to be managed. Trainings in Krishi Vigyan Kendra were also organised by the organisation.

The tank of 36,000 l was constructed on the uphill. The water was collected from the wells. To regulate the out flow of water a valve was provided at the bottom. The tank owners connect their pipelines in 2 consecutive days in a week. 0.9 ha of land per farmer is now extended to 1.1 ha which is used in production of wheat and maize. The motivated farmers have also started to sow vegetables. Compost pits is also been constructed as an improved farming measure.

The tank water is applied in the fields in diversified directions with the regulated flow. Farmers also say that the soil erosion is also been checked which was due to the flood irrigation. The collective pressure on the wells is reduced which has been indicated from the 1 day recharging time which earlier was 2 days.

## Case study 3:

**Roof Rain Water Harvesting Structures functions all year round**

Neighbours sharing the water of Champa bai's RRWHS in Sawna

Situated in the houses these 21,000 l tanks are the rain water reservoirs which are capable of serving daily family needs. Champa bai/Unkar ji, the RRWHS owner, of Sawna reiterates its significance. "24 hours availability of water is utilised in drinking, washing clothes, and bathing."

The need of such structures in the area is to harvest the water. As the village receives 550 mm of average rainfall and in undulating terrain this flows off rapidly down the stream, depriving the ground recharge. Collection of the water is of utmost importance. Many households has water tanks, but they still recharge from wells. RRWHS stands as water rechargers independent of any other resources. Water falling on the roof is collected in the big tank through gravitational flow. Plastic pipes connect the roof to the tank.

Champa bai is the members of Chamunda Mata Mahila Mandal SHG through which her house was selected to promote the technology. For the construction the roof should be cemented and have 100 m<sup>2</sup> area. After she agreed to the 25 per cent community contribution to the total cost of Rs 85,000 the work started with 8 labours and 2 technicians. It took 15 days to complete the work. Once the tank was constructed pipes were connected to the sieves of the roof. A single inlet was been provided on top side edge of the tank. A sand filter was fit in the pipe.

In its first rain of 550 mm the tanks was effective to harvest 4,000 l of water, which was devoid of fluorine contents. This pure water was utilised in drinking, bathing and washing utensils and clothes. She is using the tank as dual purpose model – it is also filled with the well water which collectively reduces the pressure on wells and save their manpower.

However, she says the tank is the better model to harvest the rain but the technology is to be more refined. Pipes are broken up easily by the goats and buffalos which contaminate the water. Pipes technology needs to be improved. They could be strong or concealed in the wall and ground.



RRWHS pipe network on the side of the terrace fencing

## Case study 4:

**Fallow land converts to cultivable due to pipeline**

Sloppy lands showing crop cultivation in Moklatalab

Experiences of farmers in Moklatalab region says agricultural pattern changes with the water transportation. Pipelines provided in the village enabled the farmers to cultivate barren masses to produce fodder and crops. Cultivation of nutritive fodder varieties which was once impossible in the slopes has found new space. The deficit of 60 quintals wheat was compensated with the surplus of 67 quintal during 2012.

15 pipelines of more than 5000 ft provided at 50% cash contribution by Prayatna Samiti during year 2010 have facilitated the farmers to transport water without much manpower, thus utilising the time in irrigating more field area without the water wastage. A single pipeline on average connects the wells to the fields separated with the distance of 0.5 km.

A huge manpower to consumed in lifting water through buckets, boundary less wells, wastage of water during travel, evaporation though open drains, uncontrolled flow, misallocation were the problems faced by the villagers. The problem was heard in the regular meetings of the SHGs like Jogniya Mata Mahila Mandal where the proposals were presented to the SHG president and the NGO representatives. The needy and marginalised farmers were given the priority. The second condition was the 50% in cash contribution to be paid by the beneficiaries.



The farmers in the first irrigation used the pipes to irrigate the irrigated masses of land. As the NGO promoted their further use, some extra pieces of uncultivable lands adjoining the irrigated land were cultivated. In the fourth irrigation the farmers understood more importance of the devices and took it the slopes. The fallow land thus with further efforts like construction of soil and water conservation measures, the farm bunds, was cultivated with their efforts. From 8 ha land a 35 quintal Barley, and Pearl millet was harvested as fodder varieties and 55 quintals of wheat for market sale.

## Agriculture and Livestock

### 4.2 Objective 2

Objective	Outcome	Activities
Optimising land and water productivity in the area	<ul style="list-style-type: none"> <li>An average of 3 m of water level rise reported in 330 wells of the Sawna watershed due to the construction of LSCDs and gully plugs in farm lands and pasture land development (Ref.: quarterly well water level data recorded for 330 wells - Annexure vi.)</li> <li>80 ha of pasture land protected with security measures – stone walls and cactus plants – to regenerate the flora.</li> <li>A total of yearly production of 316 quintals of fodder generated from 60 ha of pasture land</li> </ul>	<ul style="list-style-type: none"> <li>99 ha of pasture land treated.</li> <li>60 LSCDs constructed.</li> <li>41 gully plugs constructed.</li> <li>40 farm bunds constructed.</li> <li>175 agriculture demonstrations done.</li> <li>20 buffalos, 6 cows, and 25 goat units provided.</li> <li>19 water troughs constructed for cattle.</li> <li>75 feed mangers constructed.</li> <li>6 deworming and vaccination camps conducted.</li> <li>1 castration camp for bucks and bulls</li> </ul>

	<p>development, which was double than the previous years.</p> <ul style="list-style-type: none"> <li>• Average of 11.25 mm soil depth increased per farmer due to LSCDs.</li> <li>• Average of 0.12 ha of land area cover irrigated due to the construction of farm bunds. (Ref.: Case study 5 (as insight))</li> <li>• A 40 kg of Lok 1 wheat provided per farmer have enhanced the production from 500 kg to 800 kg per 0.9 ha. (Ref.: Case study 7 (as insight))</li> <li>• Due to vegetable demonstrations with 156 farmers a total income of Rs 75,816 is generated in 2 months. (Ref.: Annexure x. for varieties of vegetables provided).</li> <li>• Provision of productive breed animals has enhanced the income. Annual animal milk production with 25 beneficiaries reached to 41,425 l. This was 17,500 l more than the previous years. 72.5 l of milk is also been sold to dairy per day. Improved practices like feed and disease management have been adapted.</li> <li>• 982 animals dewormed. 30 bucks castrated which are showing improvement in weight in comparison to non castrated bucks.</li> <li>• Community is becoming aware of the importance of castration in breed up</li> </ul>	<p>conducted.</p> <ul style="list-style-type: none"> <li>• 18 trainings on Improved Agricultural Practices.</li> <li>• 13 trainings on Improved Animal Husbandry Practices.</li> <li>• 4 trainings on Promotion of Drip Irrigation.</li> <li>• 3 training on Water and Sanitation for SHG members.</li> <li>• 16 Water and Sanitation Campaigns.</li> </ul>
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	<p>gradation.</p> <ul style="list-style-type: none"> <li>• Sirohi breed of goat is giving 2 l of milk per day which is 1.5 l more than indigenous breed.</li> <li>• With the construction of 75 feed mangers a total of 30 kg feed is saved from being wasted per day in 15 households.</li> <li>• Community is adapting best practices in the form of practicing new varieties and searching forward market linkages. Moong, mustard and onion varieties are gaining popularity for their market demand. 50 farmers have started vegetable marketing. 135 ha of area have come under irrigation with major cash crops. Surplus wheat is sold to the market.</li> <li>• Feed management and medication is also been provided to the animals. Productive breeds have improved the practices of animal rearing and linked people to the dairy.</li> <li>• 2 farmers have adapted the drip irrigation after knowing its importance in water conservation and saving manpower and time.</li> <li>• Hygienic practices like washing the hands before eating are being adapted. School programmes have motivated children to practice the best sanitation practices.</li> </ul>	
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	Toilet cleaning and water storage are some of the examples.	
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The outcomes are based on field visits, monitoring, interviews and group discussions with community.

Achievements:

**Sawna pasture land development resulted in production of 100 quintals of fodder which was double than previous harvests:** A total of 10 families of Sawna were benefitted through private pasture treatment where 100 quintals of fodder was generated. The work comprised of LSCD, gully plugs and trenches implementation.

**Average weight of wheat due to demonstration of Lok 1 variety of wheat has raise from 332.69 kg per farmer to 501.92 kg:** Lok 1 variety of wheat is known for the big sized, increase number of grains per twig and short height. In the same quantity sown as indigenous one the variety produces almost double or more production. A 0.25 ha of land produces 12 quintals of wheat which is double of 6 quintals of indigenous variety. 10 non-beneficiaries have also adapted the best practices.

**Indigenous buck castration:** Castration of indigenous breed of bucks has shown improvement in their body weight. The practice has also made people to understand he importance of castration for breed up gradation and enhancement in incomes.

**People motivated to adapt the Sirohi bucks from Government schemes:** With the 50 per cent community contribution from individuals 10 sirohi bucks were provided in Moklatalab, Ramela, and Nichla Semliya villages. This was done under the Rajasthan Animal Husbandry Department. A total of Rs 25,000 was subsidised for breed up-gradation.

**Brief analysis of outcomes of agriculture and livestock activities as per PMF:**

**Sand conservation due to LSCDs and Gully Plugs:**

A FGD was conducted with 18 farmers from Pemla Kui, , Alukheda, Ramela, Lakhmela. These farmers have 0.47 ha of land. It was recorded that average soil depth measured during year 12-13 was 23 mm which according to farmers was 11.67mm during year 09-10. Due to construction of LSCDs and Gully Plugs a 11.33mm depth of soil has deposited under the LSCDs. (Ref.: point 2. in Annexure vii as interpretation data table of PMF)

**Pasture land enhancement:**

During FGD conducted with 19 farmers of Ramela and Sawna villages it was found that a considerable amount of pasture land has been regenerated to produce fodder. SCTs and CCTs, Gully plugs and LSCDs constructed have checked the soil erosion on the slopes ranging from 25 to 50 degrees. The developed area of 40 ha has been able to produce 316 quintals fodder which was double than the previous years. The harvest count Heran, Rohida, Kongta, and Bhangta grasses which are known for their nutritive value. (Ref.: point 3. in Annexure vii as interpretation data table of PMF)

**Land area enhancement due to farm bunding and land leveling:**

Farm bunds are helpful in checking soil erosion. Land leveling has helped the farmers in cultivating the fallow slopes. Interviews and group discussions with 14 farmers of Pemla Kui, Ojala and Vasatalab villages show that average irrigated land hold per farmer was 0.34 ha in 09-10 year. Due to construction of farm bunds of up to 0.7



m height farmers are been able to irrigate 0.46 ha of land. Water scarcity and sheet erosion are been addressed to produce wheat, mustard and maize. New fodder varieties have also found a place on non-irrigated patches. . (Ref.: point 4 in Annexure vii as interpretation data table of PMF)

#### **Vegetable production:**

The major crops grown in Sawna region are wheat and maize. However, their production can't be neglected but more sources of income can be generated by utilizing the farmers' skills in vegetable cultivation. Vegetables supplement the crop varieties and are alternative source of income. The practice yields harvest in less time than the cash crops. 0.46 ha of land well cultivated with vegetables can provide income of Rs 50,000 in 2 months. Prayatna Samiti provided Spinach, Tomato, Cabbage, Caluliflower, Onion, and Radish seeds to the farmers. The improved varieties of seeds also replaced the indigenous varieties with low production. FGD with 10 farmers in Ramela, Lakhmela and Moklatalab villages show that a total of 200000 g of vegetables were produced in their fields in year 2011-13. An income of Rs 5000 was generated with Rs 25 per kg sold to nearby area. Some high yields with best practice like onion and peas were sold exclusively to the big markets at the appropriate rates. (Ref.: point 5. in Annexure vii as interpretation data table of PMF).

#### **Rabi and Kharif enhancement (also training components):**

An FGD with 14 farmers from Moklatalab and Sawna villages shows that the people have accepted the Lok 1 variety of wheat and PHEM 2 maize for higher yields. Total weight rabi crops during year 08-09 was 500 kg from 0.9 ha land which increased to 800 kg during 11-13; whereas total weight of maize from the same area of land in year 09-10 was 4300 kg, which remained 4300 during 11-13 due to monsoon calamities. The seeds of Lok 1 have also been sold to the non-beneficiaries. (Ref.: point 6. in Annexure vii as interpretation data table of PMF).

#### **Improved animal husbandry practices adapted (also training components):**

Animal husbandry is one of the traditional sources of livelihoods for the farmers. The income generated from this source is however not sustainable as low milk quantity and poor health conditions results in low milk quantity. Improper shelters and open grazing for big animals results in poor health and feeding practices lacking the quality feed results in less milk production. Analysing the situation Prayatna Samiti provided improved bred cows and buffalos to enhance the milk production. Sirohi goats were also provided to enhance milk and meat. Trainings were the interim part between demand supply of livestock.

FGD with 10 farmers in Vasatalab, Sawna, Lakhmela villages shows that Gir cows and buffalos were provided during year 08-11. This has increased the average animal animals per house hold. At present there are 3.75 animals per house hold. Discussions show that quantity of milk collected during 09-10 was 9570 l per year from these households. Quantity of milk collected during year 10-13 increased to 16570 l. Observations show that Improved practices adapted like feed management, timely medication, usage of feed mangers are been adapted. Average quantity of milk collected per day is 6.9 l. Average quantity of milk sold per day is 2.9 l. (Ref.: point 7. in Annexure vii as interpretation data table of PMF).

#### **Area increased under Drip irrigation:**

Drip irrigation is a water saving and high yielding method for crop cultivation. As the technology acceptance is a challenge only 2 people implemented drip in their field. Interviews with these farmers shows that the they have saved 800 l of water per day during vegetable cultivation. A 2 kg of extra vegetables of ladies finger and tomato was been reported from 0.56 ha of land. (Ref.: point 8. in Annexure vii as interpretation data table of PMF).

## Case studies:

### Case study 5:

#### Farm Bunds help in regenerating land

Kalki bai/Roda ji is marginalised farmers in Alukheda. With 5 family members she and her husband earn Rs 1,500 per month. With the limited irrigated land of 0.9 ha she has 0.4 ha non irrigated due the sloppy terrain. In year 2012 the slopes were restricted through farm bunds to produce crops. In October 2012 she harvested 1.5 quintal of Bhangta, a fodder type, out of the treated land.



In 2012 when Prayatna Samiti was doing the need identification the representatives selected the patch of land which should be treated with farm bunds. A collective patch of land was identified which belonged to the marginalised farmers. The land was sloppy with 20 percent slope running into the well. The soil was loose enough notwithstanding the crops. The issue was

discussed in the Kanna Mata Mhila Mandal SHG which was realised by the farmers.

The work started in March 2012 with the efforts farm owners. Farm Bunds were of 1 m height. The results were observed after monsoon. A thick layer of soil was deposited on to the inner sides of the bunds. NGO representatives also measured the fodder. 1.5 quintals of Bhangta was produced. This was the first time highest amount of collection Kalki bai got.

Other 11 farmers also got the productions which was the result of land treatment with the understanding of water harvesting.

### Case study 6:

#### Loose Stone Check Dam in the stream and farmers' motivation leads crop production



Field of Radi bai w/o Amba Lal in Lakhmela is a well irrigated patch yielding 6 quintal per bigha of crops round the year. With the irrigated land of 2 bigha the owner also holds *khatadari* (record) land of 1 bigha situated in the stream, making the total irrigated land to 3 bigha. The stream was a regular one before it was treated with the LSCDs (Loose Stone Check Dams).

It was in the year 2009 that the NGO Prayatna Samiti initiated to construct the soil and water conservation structures to harvest the ground water in the Sawna watershed region. Surveying the area the stream was selected as one of the major drainages to help the needy farmers. Through the SHG Amlia Mata Mahila Mandal the need was catered to the people and they felt the need of such structures. The structures like LSCDs, gully plugs, check dams; anikuts are known to retard the speed of water in the stream. These are constructed across the

streams to check the speed of water and percolate it through the surface to underground. The absorbed water serves to the area around.

Radi bai proposed to construct the LSCD in her stream with the 50 per cent contribution to the total of Rs 8,000. It appeared a big challenge when it was mandatory to lay down 3 more such structures since it was not logical to construct only one LSCD across 2 km long stream. She along with her husband motivated and convinced other owners of the stream. The stream is good source of water reservoir which will double the crop production, and the water absorbed will cater the area around too. Farmers got convinced, they also contributed in-kind while construction. The process took 4 months to get the things in place.

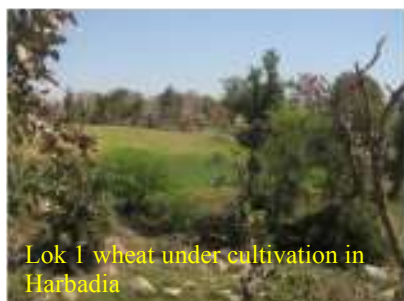


Wheat cultivated by Radi bai in the

The LSCDs are now well maintained. The silt deposited is used to pack the stones which make the structure sustainable. Also the production of wheat is doubled which is generally used for family consumption. A good governance model thus established feeds 4 farmers and no crop is taken during monsoon.

#### Case study 7:

#### Lok 1 wheat propagates



Lok 1 wheat under cultivation in Harbadia

Pushpa bai, daughter-in-law of Bhagga baa says, “she harvests 3 quintal of extra production of wheat since year 2010, and the grain size is bigger than indigenous variety.” Dwelling in Harbadia hamlet of Hathida village, 70 km away from Udaipur, Rajasthan she toils in undulating land. With limited irrigated land hold of 0.9 ha she gets 6 quintals of wheat earlier.

With the advent of Sawna Watershed development project Prayatna Samiti (local implementing NGO partner) provided improved variety of wheat to the marginalised section of farmers with the long term benefits of enhanced production and replication. This was in the year 2010 that 40 kg of what was provided to the 25 farmers on fifty per cent community contribution (in-cash) to test the productivity in comparison to the indigenous varieties.



Bhagga baa in his wheat field

Initially the experiment went in 1 bigha (0.46 ha) where the farmers succeeded in harvesting 2 quintal extra yield with low inputs which was 50 kg. The grains were bigger in size and consecutive propagation showed the collection of productive seeds which were also nutritious. The production reported per 0.9 ha of the land is now 18 quintals with the input of 80 kg bagging Rs 2,34,000 income with the cost price of Rs 1040 for seeds. The grain which was earlier purchased from market is presently enough for family consumption. During extreme money needs 2 to 3 quintals is sold in the market.

10 farmers of the nearby villages, Moklatalab, Hathida, have also adapted the seeds for more production. Pipelines provided to the same farmers have also helped them



Crop demonstration of Lok 1 wheat

to irrigate the uncultivable land for livelihood enhancement.

Lok 1 variety of wheat was developed by Lok Bharti, Gujarat, which has exceptionally Bold Grains. The weight of 1000 Grains is 55 grams while that of indigenous is 40 Grams. Other varieties of Wheat takes 110 to 115 days while "LOK-1" takes only 105 days to get maturity. Thus there is a saving of one irrigation. LOK-1 gives 6 to 8% more yield than other newly developed varieties in Central Zone. The average yield of wheat per hectare is 32 quintal in India. LOK-1 has given 34.5 quintal yield i.e.2.5 quintal more yields per hectare. It is escape to rust. Protein value remains 9 to 13% in general varieties while LOK-1 contains 13% proteins. The grain is large. LOK-1 stands second in the demand of breeder seeds in India.

Case study 8:

### Vegetables: the new crops to learn

Sita bai of Sawna village is the upcoming entrepreneur on vegetable farming. Although she had never practiced this livelihood before, the trainings and improved varieties of vegetable seeds provided by Prayatna Samiti have enabled her to utilise the cultivable land which was never used in agriculture. It is analysed by the NGO that vegetable farming has a potential to boost up the village income and provide skills to the farmers. On average 1 bigha produces 50 quintal vegetables which can earn the income of Rs 50,000 in two and a half months.



Sita bai in maintaining her vegetable farm land in Sawna

Farmers in Moklatalab, Vasatalab, Hathida are selling the vegetables in the nearby villages. The beneficiaries are thankful to Prayatna Samiti for providing capacity building and seeds. 15 trainings in agriculture have been provided in villages and agriculture institutes like Krishi Vigyan Kendra. Expert visits have also been conducted. Framers have learned to utilise the unused land to cultivate vegetables.

Improved varieties count AA (Ladies Finger), Kohinoor (Tomato), White Prince (Radish), Angoori (Pea), Nasik Red (Onion), Pusa Jwala (Green Chilli), etc. Wardi bai from Hathida in 2011 sold *Guwar* worth Rs 2,000;

Ram Lal from Ramela sold onion of Rs 14,400. World's food economy addresses grains and pulses. Vegetables which gives more incomes in short time are given too importance. If the sector is likely to be promoted then villages must get benefited.

However, Sita bai, Wardi bai and Ram Lal are struggling to sell their produce they are hopeful to get production in upcoming time. Multiple tested varieties that are cultivar to the area have shown good results so far. Morphology, taste and production have attracted farmers. Some capacity building is required on sowing pattern as various types are planted on limited area of 0.25 bigha. More land, up to 0.5 bigha, is required and farmers should cultivate 1 to 2 specific varieties which will make them vegetable entrepreneurs.



Sita bai demonstrating Angoori variety of pea

## Water and soil analysis

### 4.3 Objective 3

Objective	Outcome	Activities
<ul style="list-style-type: none"> <li>Apply and test ground water recharge situation in the project area</li> </ul>	<ul style="list-style-type: none"> <li>NIH is preparing a research document on Sawna watershed water analysis.</li> <li>Rock type, rock nature, and isotopic nature of rocks were been analysed through a geohydrological study of Sawna watershed area. Water recharging points and withering pattern were identified through the study carried out in 2010-11.</li> </ul>	<ul style="list-style-type: none"> <li>Soil samples from check dam catchments collected and send to NIH, Rorkee.</li> <li>Water samples from 15 wells collected and sent to NIH.</li> <li>Well water level of 330 wells from 13 villages of the watershed collected on quarterly basis and sent to Wfl.</li> <li>Fortnight collection of water level of 22 wells and 5 anikuts collected and sent to Wfl.</li> <li>Rainfall data from 10 villages collected and sent to Wfl.</li> <li>A Geohydrology study been conducted for Sawna watershed by a consultant (geohydrologist).</li> </ul>

## Capacity Building

### 4.4 Objective 4

Objective	Outcome	Activities
<ul style="list-style-type: none"> <li>Evolve water and livelihood based institutional set up in the area</li> </ul>	<ul style="list-style-type: none"> <li>People becoming aware on roles of Gram Panchayat. As the result of community mobilisation 3 proposals on land leveling and 1 earthen check dam (<i>nadi</i>) sanctioned for Alukheda village during 2011-12.</li> <li>31 SHGs are functional in the area. Loans have been taken by the SHG members for initiating enterprises on grosser shop, cow and goat</li> </ul>	<ul style="list-style-type: none"> <li>3 Joint workshops of PRI members for Micro Planning.</li> <li>21 SHG trainings.</li> <li>2 SLG trainings.</li> </ul>

	<p>rearing, and land leveling. As part of SHG strengthening people are becoming self capable of handling small enterprises and are earning profits. Profits of around Rs 1,000 per month from goaterly; Rs 2,000 per 3 months from wheat sale have been gained. (Ref.: Case study 9 (as insight))</p>	
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The outcomes are based on field visits, monitoring, interviews and group discussions with community.

Achievements:

**Community is adapting best practices in the form of practicing new varieties and searching forward market linkages:** Capacity building programmes have resulted in production of vegetables along with major crops during rabi and kharif. Organic medication has been provided to eradicate pests. Production is utilised in family consumption which has saved Rs 500 per month. People are demanding more varieties of vegetables along with capacity building programmes. The surplus production is planned to sold to market.

People are involved in animal management practices with the construction of sheds, provision of medicines. The indigenous buffalos purchased during project activities have benefited in milk production. Milk is also been sold to local dairy. Government linkages programme have been availed to promote Sirohi breed. 10 Sirohi bucks been purchased at 50 per cent subsidy from Animal Husbandry Department, Rajasthan. Awareness on Agriculture Department schemes on maize and manure procurement on 50 per cent subsidy resulted in maize seed purchase.

### Case studies:

Case study 9:

#### Villagers keep Sirohi goat for good income



Bhamroo with his Sirohi bucks at Hathida village

Kalki bai, is an active member of SHG Joyti Mahila Mandal functional at Hathida. Her husband, Bhamroo, had a dream to start a Sirohi goat unit to sale them for meat. With the advent of Gramnidhi a loan of Rs 80,000 was granted to the SHG which helped him to make his dream true. All the 10 bucks are been sold in Rs 1,00,000.

Gramnidhi is a loan based enterprising programme of RMoL and CEE implemented by local NGOs Prayatna Samiti, Kotra Adivasi Sansthan, Sahyog

Gramnidhi committee is an institution of 5 NGO representatives whose SHGs are the part of Gramnidhi programme. This also comprises of active community members which take part in perceiving demand in local contexts. This is a 15 member board taking part in decision making while scrutinising the community demand on enterprises. The enterprises can be farm and non-farm based which needs to be approved by the president and secretary before getting loan.

Sansthan, Samarthak Samiti and Sangam Sansthan. A corpus money is maintained at the bank which is accessed by the SHGs to deal with the enterprises. An individual can propose for the release of money which is granted to him/her after a Gramnidhi agreement is signed between SHG and president of the Gramnidhi committee. The loan is given to the SHG at the rate of 12% simple interest. The repayment is done through SHG which is again transferred to the corpus money.



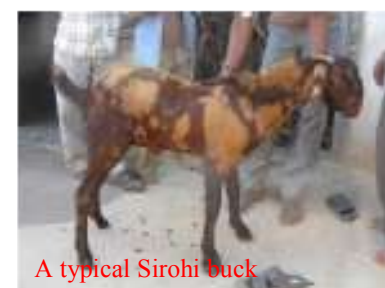
Kalki bai (standing aside), wife of Bhamroo, with bucks



Bucks feeding on maize in the house



Sirohi bucks drinking salted and floured water



A typical Sirohi buck

Once the need was identified in the village it took no time for Kalki bai and Bhamroo to take the decision. The proposal was scrutinised by the Gramnidhi committee members on the basis of the past repayments and livelihood handling capacity. The agreement was sanctioned on 2 years repayments. Though Bhamroo was traditionally trained to handle the business but training and skill building was the mandatory section of the programme. He got training in KVK and experts also provided on site trainings during year 2009. He came to know on medication, feed, and breed up-gradation programmes. “He was not aware of castrating local bucks and weighing the buck before sale” says Bhamroo, which can give him good prices. Sirohi goats yield more milk and meat than indigenous breeds. The bucks gain up to 35 kg of weight in 2 years and doe yield 2.5 l of milk after third kidding.

10 Sirohi bucks of 8 months were purchased from Devgarh Madaria, a village known for pure Sirohi breed, about 105 km from Udaipur. A local animal expert from CEE also facilitated the purchase and medication at initial phase. Bhamroo started with the enterprise. He took the bucks for grazing. Earlier he began with open grazing but as he remembered training he restricted the bucks to stall feeding. A drinking practice with salty and floured water was adapted. This gave bucks the extra nutritive value. The first buck was sold to a local from a nearby village at Rs 5,000. However, it was a bad price for the 9 months buck, but gradually he got prices for other bucks as he wait long for the good market value. He weighed all the bucks and sold them to market and *khatiks* (traditional market agents). The weighing machine was purchased by the SHG which was used in weighing other bucks too. The maximum cost of buck was Rs 12,000 for a 28 kg buck sold during July 2011. This was Rs 6,000 more than indigenous breed of same age. All the bucks were sold till December 2011. The business however, was not profitable but Bhamroo and Kalki got the

new market linkages and gained improved skills. Rs 150 per day cost of feed and medication of Rs 1,000 proved the deciding factors. Out of Rs 1,00,000 income a considerable amount of Rs 54,750 was calculated as the feed cost.

If it had been possible for Bhamroo to sell the bucks in 6 months the profits could had been a landmark. “A lot of time was been consumed to get the good market value”, says Kalki Bai. She is regular in making repayment. Her efforts as a good farmer can’t be neglected. Only 1 installment in 2 years is left to be paid. The story of Bhamroo has been replicated to set the examples. People in Ramela, Hathida, Moklatalab, Nichla Semliya, and Sawna are purchasing the Sirohi bucks. They have been sold from Rs 5,000 to Rs 10,000 however, some kept them for breed development. Bhamroo is now working as labour in Jodhpur district. When he comes home he advises other villagers to tame Sirohi breed.

## 5.0 Project Expenditures against the Plan Budget

Budget Line	Planned Budget	Expenditure as per Audited Statement of Accounts					
		2008-09	2009-10	2010-11	2011-12	2012-13	Total
House Hold survey	-	4400	-	-	-	-	4400
Wells Survey	-	4718	-	-	-	-	4718
Stream guaging & Data collection	-	6950	-	-	-	-	6950
Revenue maps	-	4270	-	-	-	-	4270
Resource mapping	-	1785	-	-	-	-	1785
Resource planning	-	13056	-	-	-	-	13056
Digital camera	-	15000	-	-	-	-	15000
Rain gauges	-	7200	-	-	-	-	7200
Data analysis	-	6798	-	-	-	-	6798
Well lining	750000	146622	290995	97040	69620	99912	704189
Pipe line / Water course	400000	15555	59125	89894	117929	-	282503
Beed Development	1080000	-	80194	126387	-	209060	415641
Cultivable land development	1120000	-	110872	-	-	-	110872
LSCD	84000	-	-	150608	57521	-	208129
Gully Plugging	288000	-	-	27536	8051	-	35587
Farm bunding	-	-	-	42789	40170	-	82959
Storage tank	256000	60007	-	-	-	-	60007
Roof Rain Water Harvesting Structures	-	-	-	-	220415	331185	551600
Cattle Purchase/Management (mentioned as 'Linkage for dairy development' in 2008-13 sanctioned budget)	2860000	-	-	-	-	-	0
Coordination with NREGS	42000	12000	-	-	-	-	12000
Vegetable gardening	80000	2245	-	-	-	-	2245
Feed Mangers	160000	-	-	-	17985	-	17985
Compost pit/ Vermi composting	360000	10150	14750	-	-	-	24900
Agricultural Demonstration	480000	-	11125	10177	4730	868	26900



Fruit orchard	320000	-	42630	-	-	-	42630
Vaccination camp	150000	1500	280	2000	1720	13587	19087
Water Trough	160000	14104	-	-	-	-	14104
Micro enterprises	-	-	122000	50000	-	-	172000
Patch work training	-	-	-	-	-	6845	6845
Skilled Training (follow-up)	-	-	-	-	2943	530	3473
Improved Agriculture Training & Ex. Visit	60000	1312	7015	3000	16114	21151	48592
Scientific animal husbandry training & EX. Visit	60000	-	3785	7760	14838	13562	
Water week celebration	200000	-	-	16122	-		
Water & Sanitation training for SHG Member	-	-	-	-	4242	-	16122
Water & Sanitation Campaign	-	-	-	-	7470	8333	12575
Water & Drip Irrigation training (mentioned as 'Water saving training' in 2008-13 sanctioned budget)	60000	-	1977	9517	7439	19526	26996
Joint Workshop of PRI's members, for Micro Planning	-	-	-	17531	24631	5062	22018
Village Committee Training	-	-	-	4864	11245	5438	47600
Staff Capacity Building	-	2014	32700	-	-	-	16109
Cluster & Federation Meeting	-	-	-	-	-	-	34714
SLG meeting	-	18427	60	536	-	-	0
SLG & SHG Capacity building	56000	-	19651	5389	3609	-	19023
Mahila sammelan	-	-	-	19606	-	-	28649
Exposure/Training/Awareness	134400	900	16682	-	-	-	19606
Wells for India Monitoring Visits	-	-	-	-	8716	-	17582
Project Evaluation	-	-	-	-	-	10617	19333
Documentation & Photos	30000	1467	-	-	-	74017	74017
CEOs Part Time Salary	663075.75	72000	-	-	60000	-	1467
Project Manager	795690.90	35715	88000	159516	165839	-	132000
Technical Person ( Part Time )	663075.75	69000	96000	23036	37000	198000	647070
Accountant (Part Time )	530460.6	32500	54000	72000	72000	-	225036

Field Worker -2 (mentioned as 'Field coordinator-4' in 2008-13 sanctioned budget)	1326151.50	89463	96000	114000	132000	72000	302500
Women Worker	-	-	-	70500	72000	137239	568702
Part Time Worker – 2	-	-	18000	11344	16918	78000	220500
Stationary/photocopy & Communication	180000	12190	23393	21708	17259	-	46262
Office Rent	210000	9000	22500	24000	24000	19338	93888
Office Expenses	120000	3222	10218	23002	20877	24000	103500
Audit Expenses	50000	5000	5000	7500	6000	21002	78321
Computer, Furniture & Equipments	50000	32990	-	-	-	6742	30242
Travel	510000	34051	40824	50674	74216	-	32990
Hydrogeological survey	-	-	-	-	287850	59839	259604
Review/Resource Planning	-	8000	1043	1010	-	-	287850
Motor cycle	96000	48821	-	-	-	-	10053
Miscellaneous expenses	-	2633	-	-	-	-	48821
<b>Grand Total</b>	14384855	805065	1268819	1259046	1790935.57	1435853	6559718
<b>Activities not taken up from the 5 years sanctioned budget plan</b>							
Well deepening	1200000						
Group LIS	600000						
Storage tank	400000						
LCWHS/Nadi/Pond	1800000						
Traditional source development for drinking in critical period	360000						
Anikuts	2160000						
Repair of existing breached structures	720000						
Ground water recharge measures	1500000						
Group pasture development	1600000						
Green manuring	64000						
Chaff cutter	100000						
Village meetings	-						
Mid term review	50000						

Technical services	225000						
Participatory planning around wells	150000						
Case study preparation	30000						
SLG organisation	28000						
<b>Total on activities accomplished and not taken up as per 5 year sanctioned budget</b>							
<b>Community contribution</b>	2646600	122500	4492	8,47,343	538091	3,07,639	18,20,065
<b>Total Grant Transfer</b>		Grant I audit: 202561 Grant during II audit: 1844250	1856528	900000	1791854	1371645	79,66,838
<b>Bank Interest</b>	-	8982	42926	30464	13528	18130	1,14,030
<b>Unspent carried forward</b>	-	1449978	1585339	207516	221962.43	175884.43	
<b>Partners Organization contribution</b>	-	-	-	-	-	-	-

(Ref.: Annexure iv.)

## 6.0 Photographic presentations of the Project activities/ events



**Undulating terrain of Sawna watershed**



**A stream gauge placed in Sunderpura village to record water level**



**Kishan ji, a marginalised farmer of Ramela appreciating pipeline**



**Pipeline under use in Moklatalab. Extra land irrigated from pipeline**



**Boundaryless well in Alukheda – before well lining. Mud flows easily in the well.**



**Water pollution due to absence of boundary around the well in Ramela**



**Well owners standing aside to the newly developed well lining at Ramela**



**Water quality improved due to well lining at Alukheda**



**Community participation and gender equity maintained during well lining construction at Sawna**



**Newly developed well boundary/lining at Sawna village**



**Ram Chandra of Alukheda taking water out of RRWHS for drinking**



**A community women at Hathida watering the RRWHS surface for fixing cement**



**A 21,000 l water tank satisfying community need**



**Water tank under construction in Vasatalab**



**Soil cover increased due to the construction of farm bunds in Alukheda**



**Bhangta and Kongta fodder regenerated around trench excavated in Pasture land at Sawna**



**35 quintal of extra Bhangta fodder generated in the pasture land of Magan due to 20 ha pasture land treatment in Sawna**



**Gully plugs in the Ramela pasture**



**Barren condition of Sawna pasture before pasture land development**



**Rocky terrain of fallow land with no biomass in Alukheda before pasture development**



**10 ha of pasture land under treatment in Ramela**

**Women giving community contribution in their private pasture in Ramela**





**LSCD build across the stream in Alukheda**



**A series of farm bunds in the individual lands of Pemla Kui**



**LSCD under construction on individual farm**



**Cauliflower grown by Kanni bai in Hathida. A 1 quintal of harvest of vegetables in 3 months was reported from her field.**



**Improved variety of bottle guard with good morphology displayed by Sumitra in Hathida. The practices are also been replicated in the same village.**

**Fruit orchard showing the papaya cultivation in Moklatalab**



**Compost pit being filled up by a farmer in Ramela**

**Vegetable cultivation progressive in Lakhmela**



**Farmers oriented on improved varieties of vegetable seeds**



**Livestock feeding in feed mangers in Lakhmela**



**A veterinarian (Dr. Vijay Mane) imparting animal husbandry techniques to the community**



**Improved Agriculture Training being provided to the farmers**



**People start using feed mangers as an important practice to avoid fodder wastage and improve animal health**



**Community bring their goats for medication at deworming camp at Lakhmela**



**A kirana shop under operation as small and micro enterprise at Sawna**



**Animal Husbandry Training conducted at Village Resource Centre, Bambora**



**SHG group discussion conducted at Village Resource Centre, Bambora**



**Community worker orienting women on SHG roles**



**Prayatna Samiti's staff forming SHG at Lakhmela**



**Ward panch, community mobilisers, and panchayat representatives attending Joint workshop on PRIs at Sawna**



**Boys clean their school toilet during Sanitation Campaign in Sawna Secondary School**



**A hand wash exercise practiced with SHGs at Sawna**



**School children educated by Prayatna Samiti on microbe infection cycle as awareness towards safe drinking water**

## 7.0 Critical Assessment of the project performance

- Sustainability of the project is one of the major critical factors that is to be adjudged through the strategic promotion. Although the replicable needs have emerged as the solutions to the water scarcity but these need to be linked with the financial and manpower resources. It is been discussed in the SHG meetings and PRI workshops that SHGs are to be linked to the Panchayat programmes. Through NRERGS and other panchayat schemes prevalent in the villages people can be benefited. Ward panch at this step can lead the SHGs to present their proposals and ensure the implementation. Panchayat on the other hand can be made aware of the new components added to the schemes.
- A continuous monitoring is also required to ensure the water quality status. A regular check on the water pollution is to be made. Well mouths can be covered with the nets in this case.
- LSCDs and gully plugs' construction needed to be monitored. Visits to the area show that some of them are deformed. Community and NGO both are required to think for reducing manpower and management cost while constructing RRWHSs as flexible pipe tubes could have been placed instead of pipe pieces.
- After water harvesting the water management should be taken under consideration. A good governance should apply less expenditure and more benefits. Common water reservoirs and big check dams need to be constructed at Panchayat level.
- RRWHS are to be designed as the source of pure water. Lids and pipes should be cleaned with disinfectants; sand filters should be covered from unbreakable material as at some places they are reported to be little damaged. Advance lifting facilities need to be provided to minimise the contamination. The technology is well adapted as people are using it efficiently to minimise the pressure on wells during the monsoon.
- Water tank technology needs improvement on water purity point of view. If the water is used for drinking purpose it needs to be covered from the top. The tanks are designed to remain open.
- From enterprising point of view the fruit orchards needs to be cultivated at large land area. The cultivar varieties can be propagated in the fallow lands as the pipelines, water tanks and well lining facilities been provided to the community. The general observation shows that they are maintained in very few households only for family consumption.
- Pasture land development involved good community participation and build the understanding on water harvesting measures. Such activities should also involve more labours even from other villages which can build more understanding and systems in the form of ToRs on pasture land management.
- Small scale enterprises find more scope than the large scale ones. Non familiar activities in this case are not required to be promoted as they put extra burden on the farmer. Delay in loan repayment and alienation of farmers in case of gir breed of cow indicate such examples. SHGs are also needed to think deeply before taking up such large scale enterprises and specially when are tried at experimental level. Sirohi goatery, plant nursery, mustard oil sale, moong and vegetable are the familiar livelihoods which can

be promoted well as small scale enterprises. These are low cost input based activities, easily manageable and profitable. For tribal scenario, enterprises are gradual shift of livelihoods to profitable practices which involves change in mind set.

- It will be better to monitor the existing SHGs rather than developing new ones. A lot of SHG strengthening is required so that men and women can be involved in addressing developmental activities. People's interest should be brought to achieve overall SHG objectives. NGO should critically monitor the responsibility of group bearers in developing women strength and decision making capacities. A federation needs to be established in which unanimous decisions for the watershed development can be taken at holistic level. Money can be used more judiciously by refining needs and decisions on them.
- People are becoming aware of the best agricultural and animal husbandry practices. Sowing vegetable, composting, shed and feed management, and involvement in dairy activities indicates adaptation of some good practices. A strict selection criterion of participants is to be maintained as they can be treated as good mobilisers and can impart trainings at local level. Pasture land development can to be taken as one of the major activities as this reflects the ownerships to be addressed at effective level where the people from many families can be aggregated to prosper common understanding. On the other hand it should be taken at large level since the treatment will affect the fodder generation which is a vital source of feed for the livestock. The ground water level will also be increased which will improve the fodder type and growth as a long term benefit.
- Self Help Groups (SHGs) can be federated as the harmony is to be reflected if the project is implemented in the very large part of the catchment area. A monitoring body can be deputed to take decisions and linking the SHGs with gram panchayat. The demands can be made refined and logical to be placed in this way.
- Common resources of water harvesting like tanks and Roof Rain Water Harvesting Structures proved to be one of the efficient sources of water pooling. These reduced pressure on wells. Such structures need to be replicated at large scale.
- From project management perspective lack of technical persons (like agriculture engineers) on full time basis was one of the drawbacks of the project. As the project demanded lot of water harvesting mechanisms and land treatment work there could have one technical staff to implement, monitor and evaluate these. Although the activities were well implemented by the community workers but a proper direction with technical supervision could have supplemented the results.



## 8.0 Lesson Learnt

- As the project considers community contribution in physical activities (well development, LSCDs, gully plugs, pasture land development, farm bunding, and RRWHSs) there is surety of sustainable linkages between the beneficiary and the structure. This addresses the long lasting impact. Repairing of damaged structures and collective protection in case of group activities have also been reported in Ramela pasture land development. Even the community is willing to put in contribution where the total cost is calculated more than the expected 50%. This highlights the dire need of water conservation and management from the community at collective level. There must be written agreements and by laws with community for their contribution.
- Big structures on water recharging needed to be built. These address a considerable amount of community contribution. Structures like RRWHS, wells and Water Tanks proved to be the good governance models as other people are also using the water and promoting the management.
- Construction of check dams, wells, artificial ponds and water tanks, RRWHS and pipelines in the last 5 years or before have shown considerable amount of change in the land use pattern with respect to the ground water and rain fall. The quarterly well water level data of 330 wells of the watershed in last 3 years shows that the average irrigated land area per farmer has been increased by 0.35 ha which is utilized for production of wheat, maize and mustard. Water management is applicable in systematic approach in a specified area to bring change in livelihood pattern. Recharging synchronized with optimized supply is a complete system.
- It is sometimes difficult to tap in beneficiaries/labours when they are engaged in sowing or harvesting activities in their field. Even the people are not available at the time of capacity building activities. Amidst the busy schedule it is difficult to harness the manpower. The problem was solved by scheduling the project work during early morning hours. This can be made more realistic when the NGO can plot the availability of beneficiaries for the whole financial year.
- Community is appreciating the improved variety of seeds of vegetables, maize and wheat provided by the partner organisation as they are getting the higher yields than the indigenous varieties they were practices earlier. They have got the good products and new vegetables which they had never practiced with. Capacity building programmes provided to them have improved their skills in handling vegetable and cropping practices. Innovative concepts to enhance income levels are well accepted. People can utilise their traditional knowledge with new inputs.
- Alternative techniques to handle the enterprises by risk resolution are also been found by the entrepreneurs. After taking the loans people are finding the sustainable ways to carry on the enterprises. Castrating the indigenous bucks, and deworming of cows and goats shows their skills to promote the improved breed of animals. Enhancing the production of wheat even when the stone was surfaced after land levelling by putting the soil cover over it is also an example showing the entrepreneur skills developed. Community can be supported up to certain level to develop an enterprise as one of the qualities of the entrepreneur is to take risk and resolve the problems occurred.
- Prayatna Samiti has also to think to discover enterprises rather than developing them. Villagers are more familiar and easy with some of the activities which are huge profit making ones and sustaining their

households. Mustard oil sale, pulse moong production, Lok 1wheat sale, and maize sale are such livelihoods. Business plans and inputs can be provided to such small scale activities which are rarely noticed. These unaddressed enterprises can be proliferated well as they are more familiar to the people.

## 9.0 Annexure

- i. IPP
- ii. Base Line Survey Report
- iii. Full Project Proposal and Budget
- iv. Scanned copy of All 5 years Audited Accounts statement
- v. Cumulative SHG progress report up to February 2013
- vi. Quarterly well water level data recorded for 330 wells
- vii. PMF data interpretations
- viii. Data Compilation Sheet PMF
- ix. Water & Livelihood Enhancement-Sawna Macro Watershed (PS -WFI) - Logical Framework Matrix
- x. Vegetable varieties