CONTENTS (IWMP I)

CHAPTER- 1

METHODOLOGY

INTRODUCTION

The Government of India (GOI) adopted watershed management as a strategy to address the sustainable agricultural productivity in the rainfed areas since the last three decades. Further, GOI has adopted watershed management as a national policy since 2003. Several studies have highlighted that appropriate natural resource management and its utilization results in enhancement agricultural productivity. In order to achieve food security, minimize the water conflicts and reduce poverty, it has become essential to increase productivity of rainfed / dry land farming by utilization of available natural resources.

In Haryana, watershed activities were undertaken by Department of Agriculture (Soil Conservation), Forest Department and Rural Development Department. The existing scheme of watershed, like DPAP, DDP, IWDP & Haryali were brought under one umbrella in the name of Integrated Watershed Management Programme in the year 2008. The scheme is basically for rainfed area, Common Guidelines were framed by National Rainfed Area Authority. Rural Development Department is the Nodal Department for implementation of IWMP through State Level Nodal Agency.

To implement watershed area (IWMP I) programme a systematic survey has been conducted to know the potentiality of the village. With this view, a baseline survey was conducted in nine micro- watersheds Jhal (2C5G2h2), Sudhrana (2C5G2m5), Juddi (2C5G2h9), Gujjarwas (2C5G2h3), Surheli (2C5G2h4), Shyam Nagar (2C5G2g2), Dahina A+B (2C5G2f5), Lisan (2C5G2h7), Dakhora (2C5G2g3) each village representing the micro- watershed. The base line survey conducted shall be considered as bench mark against which the results of project could be compared at the end of the implementation. It would also be helpful in guiding watershed programmes and to plan its goal in identifiable terms and be used as future reference. PRA techniques and transect walk were conducted with the Gram Sabha members and beneficiaries for building confidence in participation during project planning.

1.1 SCIENTIFIC PLANNING

1.1.1 Cluster Approach

This envisages a broader vision of Geo- hydrological unit which involves treating the cluster (IWMP I) of 9 micro watersheds namely Jhal (2C5G2h2), Sudhrana (2C5G2m5), Juddi (2C5G2h9), Gujjarwas (2C5G2h3), Surheli (2C5G2h4), Shyam Nagar (2C5G2g2), Dahina A+B (2C5G2f5), Lisan (2C5G2h7), Dakhora (2C5G2g3) with their respective codes.

1.1.2 Base Line Survey

Bench mark survey was conducted for collection of base line data on various bio-physical and socio-economic aspects. The methodology adopted was as follows:

1.1.3 Collection of Primary Data

Though the project was sanctioned in September, 2011 the preparatory phase started in 2012. Initially, a meeting was arranged with officials of concerned departments and technical experts located at Jhal, Sudhrana, Juddi, Gujjarwas, Surheli, Shyam Nagar, Dahina A+B, Lisan, Dakhora micro- watersheds. During this meeting, Preliminary Project Report (PPR) was discussed.

In order to have first hand information, a joint visit in the project area was made along with PRI members. In this survey, physical location of the watershed, drainage pattern, land use, employment scenario, agriculture produce and other problems related to the area were assessed. Sarpanches and local people were involved in the discussions and a note of the local needs and scope of watershed works was taken up.

The survey of India toposheets (Survey of India) of the area available on the 1:50000 scales were procured of the project area and all assigned villages were marked on the copies of the toposheets (Survey of India) as well as on the maps prepared by Soil and Land Use Survey of India (SLUSI).

The primary data related to land holding, crop area and production was collected from agriculture and revenue records of the village, the socio economic data of the target villages were collected from Anganwari workers and Panchayat Secretary in the village and district.

1.1.4 Collection of Secondary data

The data with regard to Demographic, socio-economic, infrastructure, land use, primary and secondary occupation, major crops grown and the yield level of fruits and vegetable crops, marketing facilities, fodder production, agro-forestry crops, live stock and milk production, status of self help groups, previous watershed schemes and works undertaken under MGNREGA etc. was gathered with the help of a designed Performa. Additional information was gathered by group and individual discussions with women groups, landless and other poor sections of the society. The issues concerning water availability, use of common property resources, fuel and fodder availability, wage employment opportunity and other major concerns were discussed, debated and recorded. Rainfall data was collected from the Deputy Director Agriculture (PPR).

1.2 PARTICIPATORY RURAL APPRAISAL

The due process of Participatory Rural Appraisal was followed in which village committees were sensitized about project activities. An appraisal of land resources, water resources, forest and pasture land resources, common property resources, production system and livestock resources was carried out by collecting data from primary and secondary sources. Group meetings were organized at common places and problems with possible solution were debated, discussed and efforts were made to reach an agreement on activities required under the projects. This was followed by transect walks across the entire area of the village and spots indicated by the community. The Technical possibilities were discussed and measurements were recorded for jointly agreed activities. Similarly, discussions were held about entry point activities and items of work were finalized keeping in view the availability of funds in the project. Through discussions were held on production activities and new innovative techniques of improving crop, fruit and milk production. The women groups were sensitized about income generating activities and skill improvement by various types of trainings. The department field staff facilitated the process of participation at the planning stage. The department officials simultaneously stated the process of forming watershed committees for each village. The roles and responsibilities of all stake holders as per guidelines, the

mechanism of fund flows, cost sharing arrangement in different components, and operational mechanism of the projects were thoroughly discussed with the community and to the Watershed Committees (WC) in detail.

1.2.1 Participatory Net Planning

The action plan was formulated based on the PRA, Geo-hydrological condition, Drainage pattern, Soil class, Soil erosion, forest and agriculture land. The project proposals were deliberated in the Gram Sabha meetings which were approved with required amendments.

Based on the experience of the experts working in the area and catchment area characteristics each structures like Water conveyance system, Strengthening of Water Conveyance Channel (Water Course in fields), Dug Out Pond (New/Renovation), Small Earthen Embankment with vegetative support, Earthen Embankment with pucca outlet, Ramp/Ghat Inlet and Outlet, Roof top rain water recharge structures, Community Water Storage Tanks etc. were recommended to conserve and store water used for life saving additional irrigation potential in the rainfed area and to avoid further degradation of the land.

1.2.2 Community Participants in Social Mapping

The village communities were apprised about project activities. Group meetings were organized at common places, problems and possible solutions were debated, discussed and efforts were made to reach agreement on activities required under the project. Social mapping involving local community was prepared. Infrastructure services and other village resources such as ponds, wells, agriculture land etc. were mapped.

1.2.3 Transect Walk

Reconnaissance survey was carried out through transect walk in order to identify the needs, treatments required and worksites. The sites were marked on the maps and different treatment measures required were recommended.

Transect walk

1.2.4 Focus Group Discussions

Focus Group Discussions (FGD) were conducted in order to obtain communities' approval on various identified needs. It was helpful in complementing the assessment emerged from PRA and to derive the opinion of the communities on various issues.

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Gram Sabha member's participation in group discussion

1.3 USE OF GIS TECHNOLOGY FOR PLANNING

Scientific tool has been promoted at various stages of watershed development planning.

Various maps were prepared such as Base map, Present Land Use, Drainage and Contours, Slope, Soil Classification, Land Capability Classification, Soil Fertility Status, Ground Water Depth and Quality, Proposed and existing activities of works. All Watershed maps (micro- watershed) have been prepared using Soil and Land use Survey of India (SLUSI) maps with coding.

1.3.1 Prioritization

With the assistance of Geographical Information System (GIS), various layers were created like Topography (slope), Drainage and contour, Groundwater conditions, Slope, soil and Land Capability classes. All these parameters were given weightage as per the guidelines issued by Govt. of India. The map prepared was used during the field visit for finalization of works and project objectives.

1.3.2 Planning

Based on the land use and Topographical maps in addition to social maps (PRA) prepared by the participants, analysis was carried out for the planning in micro- watersheds. The action plan was formulated using maps of Drainage pattern, Soil class, Soil erosion, forest, hydrology and present land use. The project proposals were deliberated in the Gram Sabha meetings which were approved with required amendments.

Based on the experience of the experts working in the area and catchment area characteristics each structure like Water conveyance system, Strengthening of Water Conveyance Channel (Water Course in fields), Dug Out Pond (New/Renovation), Small Earthen Embankment with vegetative support, Earthen Embankment with pucca outlet, Ramp/Ghat Inlet and Outlet, Roof top rain water recharge structures, Community Water Storage Tanks etc. were provided in consultation with the Gram Sabha Members. However finally only those activities are included which were suggested by the Gram Sabha according to their needs.

1.3.3 Hydrological modeling

The relevant hydrological parameters were used for delineation of micro- watersheds as per the existing drainage system. The works/ activities under drainage line treatment are proposed as per topography, present land use, site conditions and run- off in consultation with WC. These maps were generated as per SLUSI coding system. The maps are produced by developing different layers using GIS technology.

Table 1. Detail of scientific planning and inputs in IWMP projects

S.No.	Scientific Criteria/input used	Whether Scientific Criteria was used
A	**Planning**	

S.No.	Scientific Criteria/input used	Whether Scientific Criteria was used
	Cluster approach	Yes
	Hydro-geological survey	Yes
	Contour Mapping	Yes
	Participatory net planning (PNP)	Yes
	Remote sensing data-especially soil	Yes
	Ridge to valley treatment	Yes
	Online IT connectivity between	Yes
	1. Project and DRDA cell/ZP	Yes
	2. DRDA and SLNA	Yes
	3. SLNA and DoLR	Yes
	Availability of GIS layers	Yes
	1. Survey of India map/imagery /SLUSI map	Yes
	2. Micro- Watershed Boundary	Yes
	3. Drainage pattern	Yes
	4. Soil (soil fertility status)	Yes
	5. Land use	Yes

S.No.	Scientific Criteria/input used	Whether Scientific Criteria was used
	6. Ground water status	Yes
B	Inputs	-
	Bio pesticides	Yes
	Organic manure	Yes
	Vermin- compost	Yes
	Bio Fertilizer	Yes
	Water saving devices	Yes
	Mechanical tools	Yes
	Bio fencing	No
	Nutrient Budgeting	No
	Automatic water level recorder & sedimentation samplers	No

1.4 Preparation of Action Plan and Approval

Based on the need and problems in watershed area; a draft action plan was prepared and placed before the concerned watershed development committee as per schedule circulated by Additional Deputy Commissioner for approval of the Watershed Committees.

After detailed deliberation and incorporation of relevant recommendation/ suggestions into the plan, the action plan was approved in the meeting of Gram Sabha. The resolution of each village falling in the watershed has been received. The record is available with the PIA and WAPCOS.

CHAPTER – 2

PROJECT BACKGROUND

2.1 PROJECT BACKGROUND

Integrated Watershed Management Programme (IWMP-I) project is falls in Nahar and Jatusana block of Rewari district in Haryana state. The project is a cluster of nine micro- watersheds namely Jhal (2C5G2h2), Sudhrana (2C5G2m5), Juddi (2C5G2h9), Gujjarwas (2C5G2h3), Surheli (2C5G2h4), Shyam Nagar (2C5G2g2), Dahina A+B (2C5G2f5), Lisan (2C5G2h7), Dakhora (2C5G2g3). The total geographical area of the project is **5490 ha** out of which **5059 ha** has been undertaken to be treated under IWMP-I starting from year 2011-2012. The project is divided into ten micro watersheds. The Base map is shown in Annexure I.

Table 1: Basic Project Information

Sr. No	Name of the project	Name of the micro watersheds	Code No.	Name of the villages	Block	District	Area of the Project (ha)	Area proposed to be treated (ha)	Total Project cost (Rs lacs)	PIA
1	Jhal watershed	Jhal	2C5G2h2	Jhal	Nahar	Rewari	746	695	83.40	ASCO

Sr. No	Name of the project	Name of the micro watersheds	Code No.	Name of the villages	Block	District	Area of the Project (ha)	Area proposed to be treated (ha)	Total Project cost (Rs lacs)	PIA
	(IWMP I)									Rewari
2	Jhal watershed (IWMP I)	Sudhrana	2C5G2m5	Sudhrana	Nahar	Rewari	442	430	51.60	ASCO Rewari
3	Jhal watershed (IWMP I)	Juddi	2C5G2h9	Juddi	Nahar	Rewari	394	374	44.88	ASCO Rewari
4	Jhal watershed (IWMP I)	Gujjarwas	2C5G2h3	Gujjarwas	Nahar	Rewari	365	352	42.24	ASCO Rewari
5	Jhal watershed (IWMP I)	Surheli	2C5G2h4	Surheli	Nahar	Rewari	418	392	47.04	ASCO Rewari
6	Jhal watershed (IWMP I)	Shyam Nagar	2C5G2g2	Sham Nagar	Nahar	Rewari	384	370	44.40	ASCO Rewari
7	Jhal watershed (IWMP I)	Dahina A	2C5G2f5 (A)	Dahina A	Jatusana	Rewari	768	673	80.76	ASCO Rewari
8	Jhal watershed (IWMP I)	Dahina B	2C5G2f5 (B)	Dahina B	Jatusana	Rewari	768	673	80.76	ASCO Rewari
9	Jhal watershed (IWMP I)	Lisan	2C5G2h7	Lisan	Jatusana	Rewari	861	770	92.40	ASCO Rewari
10	Jhal watershed	Dakhora	2C5G2g2	Dakhora	Jatusana	Rewari	344	330	39.60	ASCO

Sr. No	Name of the project	Name of the micro watersheds	Code No.	Name of the villages	Block	District	Area of the Project (ha)	Area proposed to be treated (ha)	Total Project cost (Rs lacs)	PIA
	(IWMP I)									Rewari
					Grand Total		**5490**	**5059**	**607.08**	

2.2 NEED OF WATERSHED DEVELOPMENT PROGRAMME

Watershed development programme is prioritized on the basis of thirteen parameters namely;

i. poverty index,
ii. percentage of SC,
iii. actual wages,
iv. percentage of small and marginal farmers,
v. ground water status,
vi. moisture index,
vii. area under rain fed agriculture,
viii. drinking water situation in the area ,
ix. percentage of degraded land,
x. productivity potential of land,
xi. continuity of any other watershed already developed/treated,
xii. cluster approach for plain terrain,
xiii. cluster approach for hilly terrain,

The criteria and weightage of each of the parameters has been given in **Table 2**.

Table 2. Criteria and Weightage for Selection of Watershed

S. No.	Criteria	Maximum Score	Ranges and Scores			
i.	Poverty index (% of poor to population)	10	Above 80 % (10)	80 to 50 % (7.5)	50 to 20 % (5)	Below 20% (2.5)
ii.	% of SC/ST population	10	More than 40 % (10)	20 to 40 % (5)	Less than 20% (3)	
iii.	Actual wages	5	Actual wages are significantly lower than minimum wages (5)	Actual wages are equal to or higher than minimum wages (0)		
iv.	% of small and marginal farmers	10	More than 80 % (10)	50 to 80 % (5)	Less than 50% (3)	
v.	Ground water status	5	Over exploited (5)	Critical (3)	Sub Critical (2)	Safe (0)
vi.	Moisture index/ DPAP/DDP block	15	-66.7 & below (15) DDP block	-33.3 to -66.6 (10) DPAP Block	0 to -33.2 (0) Non DPAP/DDP Block	
Vii	Area under rain fed agriculture	15	More than 90 % (15)	80 to 90 % (10)	70 to 80 % (5)	Below 70 % (Reject)
Viii	Drinking water	10	No source (10)	Problematic village (7.5)	Partially covered (5)	Fully covered(0)
Ix	Degraded land	15	High-above 20 % (15)	Medium-10 to 20 % (10)	Low-less than 10 % of TGA (5)	
X	Productivity potential of the land	15	Lands with low production & where productivity can be significantly enhanced with reasonable efforts (15)	Lands with moderate production & where productivity can be enhanced with reasonable efforts (10)	Lands with high production & where productivity can be marginally enhanced with	

S. No.	Criteria	Maximum Score	Ranges and Scores			
					reasonable efforts (5)	
Xi	Contiguity to another watershed that has already been developed/treated	10	Contiguous to previously treated watershed & contiguity within the micro-watersheds in the project (10)	Contiguity within the micro-watersheds in the project but non contiguous to previously treated watershed (5)	Neither contiguous to previously treated watershed nor contiguity within the micro-watersheds in the project (0)	
xii	Cluster approach in the plains (More than one contiguous micro-watersheds in the project)	15	Above 6 micro-watersheds in cluster (15)	4 to 6 micro-watersheds in cluster (10)	2 to 4 micro-watersheds in cluster (5)	
xiii	Cluster approach in the hilly tract (More than one contiguous micro-watersheds in the project)	15	Above 5 micro-watersheds in cluster (15)	3 to 5 micro-watersheds in cluster (10)	2 to 3 micro-watersheds in cluster (5)	
	Total	**150**	**150**	**93**	**37**	**2.5**

Based on above criteria and weightage of 80 concerning these thirteen parameters, a composite ranking was given to Jhal Watershed (IWMP I) project as given in **Table- 3.**

The total numbers of families under BPL are less than the total number of households in the village. Hence a score of 5 was allotted. Rain fed agriculture is more and more than 80 percent and more than 50 % farmers are small and marginal. So the scoring is done 5. The project area comes under Arravalli range and Sahibi basin of Haryana, has no assured irrigation facility, erratic rainfall, deep quality of ground water is saline and the shallow are being exploited for development of irrigation, hence the block falls over exploited and score 5 is given. The percentage of schedule castes in this watershed is about 30 percent of the total population, hence 5 score was allotted. Due to high percentage of the poor population i.e. about 70 percent thus the scope of poverty index is 5. More than 60 percent of the farmers are small and marginal in nature. Hence a composite rank of 5 is allotted. With all the parameters taken together gives the watershed score to be 80.

Table- 3: Weightage of the Project

1	2	3	4	5	6	7	8	9													
Sr. No.	**District**	**Name of the project**	**No. of micro-water-sheds proposed to be covered**	**Geographical area (ha)**	**Proposed Area for Development**	**Type of project (Hilly/ Desert/ Others)**	**Proposed cost (Rs. In Lakh)**	**Weightage under the criteria**													
								i	**ii**	**iii**	**iv**	**v**	**vi**	**vii**	**viii**	**ix**	**x**	**xi**	**xii**	**xiii**	**Total**
1.	Rewari	Jhal watershed (IWMP I)	9	5490	5059	others	607.08	5	5	0	5	5	10	15	5	10	10	0	10	0	80

Table 4: Watershed Information

Name of the Project	No. of Micro-Watersheds to be Treated	Watershed codes	Watershed regime/type/order
Jhal Watershed (IWMP I)	9	2C5G2h2, 2C5G2m5, 2C5G2h9, 2C5G2h3, 2C5G2h4, 2C5G2g2, 2C5G2f5, 2C5G2h7, 2C5G2g3	Others

2.3 OTHER ONGOING DEVELOPMENT PROJECTS / SCHEMES IN THE PROJECT VILLAGES

These villages being backward have been on top priority in number of developmental projects. These programmes are Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS), Total Sanitation Campaign (TSC), Swarnajaynti Gram Swarojgar Yogna (SGSY) and Indira Awas Yojana (IAY), NWDPRA. The programmes that are active in this area are tabulated in **Table 5.**

Table 5. Ongoing Developmental Programs in the Project Area

S. No.	Name of the Program /Project	Name of Micro watersheds	Sponsoring agency	Objective	Estimated number of beneficiaries for year 2013-14 (Job card issued)
1	MGNREGA	Jhal	DRDA, Rewari	To provide assured employment of 100 days in a year to unskilled labour and development of village.	121
2	MGNREGA	Sudhrana	DRDA, Rewari	To provide assured employment of 100 days in a year to unskilled labour and development of village.	112
3	MGNREGA	Juddi	DRDA, Rewari	To provide assured employment of 100 days in a year to unskilled labour and development of village.	203
4	MGNREGA	Gujjarwas	DRDA, Rewari	To provide assured employment of 100 days in a	105

				year to unskilled labour and development of village.	
5	MGNREGA	Surheli	DRDA, Rewari	To provide assured employment of 100 days in a year to unskilled labour and development of village.	171
6	MGNREGA	Shyam Nagar	DRDA, Rewari	To provide assured employment of 100 days in a year to unskilled labour and development of village.	128
7	MGNREGA	Dahina A+B	DRDA, Rewari	To provide assured employment of 100 days in a year to unskilled labour and development of village.	385
8	MGNREGA	Lisan	DRDA, Rewari	To provide assured employment of 100 days in a year to unskilled labour and development of village.	155
9	MGNREGA	Dakhora	DRDA, Rewari	To provide assured employment of 100 days in a year to unskilled labour and development of village.	162

The District Rural Development Agency has undertaken various schemes under watershed development programme and the status is presented in **Table 6.**

Table 6: Previous Watershed Programme in the Project Area (if any)

Watershed Area Development Treated/Sanctioned											
1	2	3		4						5	
S. No	**Names of District**	**Total micro watersheds in the District**		**Micro- watersheds covered so far**						**Net watersheds to be covered**	
				Deptt. of Land Resources		**Other Ministries/ Deptt.**		**Total watersheds covered**			
				Pre- IWMP projects (DPAP+DDP+IWDP)		**Any other watershed project**					
		No.	**Area (ha)**	**No.**	**Area (ha)**	**No.**	**Area (ha)**	**No.**	**Area (ha)**	**No.**	**Area (ha)**
1	Rewari	402	150678	115	57500	15 (EAS)	7500	130 (221 villages)	65000	181	85678

CHAPTER – 3

BASIC INFORMATION OF THE PROJECT AREA

GEOGRAPHY AND GEOHYDROLOGY

The Jhal Watershed (IWMP I) falls in Nahar and Jatusana Block of District Rewari. The area is occupied by Indo- Gangetic alluvium plains and area is traversed and drained by seasonal streams of Sahibi river system. Physiographically, the area is divided Interdunal plains and Sahibi Basin. The area of watershed lies in between 28˚15'0''to 28˚30'58'' N Latitude & 76˚18'30'' to 76˚25'0'' east longitude with general elevation varies between 224-258 m MSL (google earth map) above mean sea level. The average rainfall of district is 702mm. About 80 percent of its annual rainfall is received in the month of July to September. Despite intensity of rainfall is scattered and erratic in this area, water retention capacity is very low, so area receive drought conditions in once in a four years. The Contour and Drainage map is presented in **Annexure II.**

3.1 LAND USE PATTERN

The village wise land use pattern is tabulated in **Table-1.** Land use map is shown in **Annexure-III.**

Table. 1 Land use pattern of Jhal Watershed (IWMP I)

Sr. No.	Name of Micro Watersheds With Code	Name of Villages	Geographical Area in (ha)	Treatable area of the village(ha)	Land under agriculture use (ha)	Rain fed area (ha)	Wasteland	
							Cultivable	Non-Cultivable
1	Jhal (2C5G2h2)	Jhal	746	695	667	616	0	79
2	Sudhrana (2C5G2m5)	Sudhrana	442	430	392	380	16	34
3	Juddi (2C5G2h9)	Juddi	394	374	325	305	0	69
4	Gujjarwas (2C5G2h3)	Gujjarwas	365	352	321	308	12	32
5	Surheli (2C5G2h4)	Surheli	418	392	365	339	18	35
6	Shyam Nagar (2C5G2g2)	Shyam Nagar	384	370	332	318	0	52
7	Dahina A (2C5G2f5)	Dahina A	768	673	724	629	0	44
8	Dahina B (2C5G2f5)	Dahina B	768	673	724	629	0	44
9	Lisan (2C5G2h7)	Lisan	861	770	774	683	15	72
10	Dakhora (2C5G2g2)	Dakhora	344	330	294	280	10	40
			5490	**5059**	**4918**	**4487**	**71**	**501**

(Source – District Census Handbook, 2001 Rewari)

3.2 SOIL AND TOPOGRAPHY

The soils of Jhal Watershed are very deep, loamy sand to clay loam, typic ustipssamant/ torripssammant, typic ustorthent/ torriorthent, typic haplustepts and typic haplocambids in the area. The topography of the area ranges from level to nearly level with depression in pockets. Soils are subject to susceptible to moderate to severe water and wind erosion. The slope ranges from <1 to >1%. Most of the area of micro watersheds falls under level to nearly level. In some low lying area small saline patches observed. Slope map is presented in Annexure IV.

Table 2. Soil type and Topography

Sr. No.	Name of Micro Watersheds	Code	Geographical area (ha)	Major Soil types	Topography
1.	Jhal	2C5G2h2	746	Loamy sand to sandy loam	Level to nearly level
2.	Sudhrana	2C5G2m5	442	Loamy sand to sandy loam	Level to nearly level
3.	Juddi	2C5G2h9	394	Loamy sand to sandy loam	Level to nearly level
4.	Gujjarwas	2C5G2h3	365	Sandy loam to clay loam	Level to nearly level
5	Surheli	2C5G2h4	418	Loamy sand to sandy loam	Level to nearly level
6.	Shyam Nagar	2C5G2g2	384	Loamy sand to sandy loam	Level to nearly level
7.	Dahina A	2C5G2f5 (A)	768	Sandy loam to clay loam	Level to nearly level
8.	Dahina B	2C5G2f5 (B)	768	Sandy loam to clay loam	Level to nearly level
9.	Lisan	2C5G2h7	861	Loamy sand to sandy loam	Level to nearly level
10.	Dakhora	2C5G2g2	344	Loamy sand to sandy loam	Level to nearly level
	Total		**5490**		

Source: - Department of Agriculture, Haryana

3.2.1 Flood and Drought Condition

There has been incidence of flood and drought in the watershed villages. The data collected from the revenue department reveals the instances of temporary flood on an average 1-2 time in 5 Years and drought once in a four Year. The absence of assured irrigation and drought resulted in low to very low yields of the crops.

Table 3. Flood and Drought condition

Sr. No.	Name of Micro- watersheds	Flood Incidence	Drought Incidence
1.	Jhal	1-2 time in 5 Years	Once in a four Year
2.	Sudhrana	1-2 time in 5 Years	Once in a four Year
3.	Juddi	1-2 time in 5 Years	Once in a four Year
4.	Gujjarwas	1-2 time in 5 Years	Once in a four Year
5	Surheli	1-2 time in 5 Years	Once in a four Year
6.	Shyam Nagar	1-2 time in 5 Years	Once in a four Year
7.	Dahina A+B	1-2 time in 5 Years	Once in a four Year
8.	Lisan	1-2 time in 5 Years	Once in a four Year
9.	Dakhora	1-2 time in 5 Years	Once in a four Year

3.3 SOILS

3.3.1 Soil Erosion

In the identified nine micro watersheds, it is observed that due to thin vegetative cover to increase the loss of surface soil in the watershed area. This results in degradation of agricultural land and low organic matter contents. The organic carbon content in areas comparatively low to restrict average in agriculture production and degradation of soil physical and chemical property. Average annual rainfall 702mm of the district falling under these watersheds, during heavy storms in rainy season the top soil washed away in the form of runoff which also carries valuable top soil (sheet). Majority of the watershed Community are dependent on rainfed agriculture due to lack of assured irrigation facilities and unsafe ground water conditions. Agriculture suffers due to area being rain fed and due to erratic rains in the region, resulting in further deterioration of socio economic conditions of community.

3.3.2 Soil Salinity/Alkalinity

There is low to moderate soil salinity in the Project and pH is normal and within the limits of 7.10 to 8.50.

Based on the soil samples analysis and reports the village wise distribution of pH is tabulated and shown in Table. 4.

Table 4. Soil pH and Salinity

Sr. No.	Name of Micro Watersheds	Soil pH	Type of salinity
1.	Jhal	7.15- 8.50	Low to Moderate
2.	Sudhrana	7.16- 8.35	Low to Moderate
3.	Juddi	7.15- 8.15	Low to Moderate
4.	Gujjarwas	7.17- 8.35	Low to Moderate
5	Surheli	7.15- 8.45	Low to Moderate
6.	Shyam Nagar	7.10- 8.15	Low to Moderate

7.	Dahina A+B	7.11- 8.15	Low to Moderate
8.	Lisan	7.15- 8.05	Low to Moderate
9.	Dakhora	7.20- 8.07	Low to Moderate

3.3.3 SOIL CLASSIFICATION

Major soils associations' fall in the watershed are seven soil associations unit. The detailed description of all soil associations are given below. The Soil map is presented in Annexure V. The fertility status of the project area, available nitrogen and available phosphorus are low. However, the available potash is medium. The fertility status map of the project area is exhibited in **Annexure-VI**.

Soil Mapping Unit- 5 (Berli- Bawal Soil Association)

The Berli soil series is dominated in this soil association and associated soil series is Bawal soil series. The dominant soil is well drained, Loamy sand to Sandy loam to Sandy clay loam, Coarse loamy Mixed hyperthermic Typic Haplustepts, 1st associate soil series is well drained, Loamy sand to Sandy loam, Sandy Mixed hyperthermic Typic Ustipsamments, Berli soil series is non calcareous, very deep, pH 8.40-9.20, dark brown to brown in colour (10YR 4/3-10YR 5/4) developed on Interdunal valley-dune complex/Very gentle sloping/Fine aeolian sand and Bawal soil series is non calcareous, very deep, pH 8.10-8.21, yellowish brown in colour (10YR 5/4-10YR 5/6) developed on Fluvio-aeolian plains/old dry riverbeds.

Soil Mapping Unit- 6 (Khol Soil Association)

The Khol soil series is only series in this soil association. The soil series is excessive to well drained, Sandy, Sandy Mixed hyperthermic Typic Torripsamments. The soil series is strongly calcareous, very deep, pH 8.00-8.70, pale brown to yellowish brown in colour (10YR 6/3-10YR 5/4) developed on Unstable sand dunes/Undulating terrain.

Soil Mapping Unit- 9 (Khol- Madola Soil Association)

The Khol soil series is dominated in this soil association and associated soil series is Madola soil series. The dominant soil is excessive to well drained, Sandy, Sandy Mixed hyperthermic Typic Torripsamments, 1st associate soil series is excessively drained, Loamy sand to Silt loam, Coarse loamy Mixed hyperthermic Typic Torriorthents, Khol soil series is strongly calcareous, very deep, pH 8.00-8.70, pale brown to yellowish brown in colour (10YR 6/3-10YR 5/4) developed on Unstable sand dunes/Undulating terrain and Madola soil series is Moderately strong calcareous, very deep, pH 8.40-8.80, brown to yellowish brown in colour (10YR 5/3-10YR 5/6) developed on Pediments formed by the accumulation of eroded particles from Aravali hills with Common medium and hard concretions of calcium carbonate in C- horizon.

Soil Mapping Unit- 11 (Sulkha Soil Association)

The Sulkha soil series is only series in this soil association. The soil series is excessively drained, loamy sand, Sandy Mixed hyperthermic Typic Torripsamments. The soil series is moderately strong calcareous, very deep, pH 8.40-8.60, yellowish brown in colour (10YR 5/4-10YR 5/8) developed on Gentle sloping Aeolian plains/Aeolian sand under arid climate with Common medium hard concretions of calcium carbonate in C- horizon.

Soil Mapping Unit- 12 (Jamalpur- Ahrod Soil Association)

The Jamalpur soil series is dominated in this soil association and associated soil series is Ahrod soil series. The dominant soil is excessively drained, sand, Sandy Mixed hyperthermic Typic Ustipsamments, 1st associate soil series is well drained, Loamy sand to Sandy loam to Loam, Coarse loamy Mixed hyperthermic Typic Torriorthents, Jamalpur soil series is non calcareous, very deep, pH 8.00-8.20, dark yellowish brown to yellowish brown in colour (10YR 4/4- 10YR 5/4) developed on Dunal complex/Aeolian over alluvium and Ahrod soil series is strongly calcareous, very deep, pH 7.90-8.50, dark yellowish brown to yellowish brown in colour (10YR 4/4-10YR 5/4) developed on Very gentle sloping/Undulating in Aeolian plain with Fine medium hard broken dark concretion of calcium carbonate in C horizon.

Soil Mapping Unit- 13 (Bharawas- Sulkha Soil Association)

The Bharawas soil series is dominated in this soil association and associated soil series is Sulkha soil series. The dominant soil is well drained, Sandy loam to Silty loam, Coarse loamy Mixed hyperthermic Typic Haplocambids, 1st associate soil series is excessively drained, loamy sand, Sandy Mixed hyperthermic Typic Torripsamments, Bharawas soil series is non calcareous, very deep, pH 8.50-8.70, dark brown to brown in colour (10YR 4/3-10YR 5/4) developed on Slope of undulating Aeolian plains/Aeolian sand under arid climate with Many calcium carbonate concretions in B and C horizon and Sulkha soil series is moderately strong calcareous, very deep, pH 8.40-8.60, yellowish brown in colour (10YR 5/4-10YR 5/8) developed on Gentle sloping Aeolian plains/Aeolian sand under arid climate with Common medium hard concretions of calcium carbonate in C- horizon.

Soil Mapping Unit- 16 (Mundsa- Dharuhera Soil Association)

The Mundsa soil series is dominated in this soil association and associated soil series is Dharuhera soil series. The dominant soil is well drained, Loamy sand to Sandy loam, Coarse loamy Mixed hyperthermic Typic Haplustepts, 1st associate soil series is well drained, Sandy clay loam to sandy Loam, Fine loamy Mixed hyperthermic Typic Haplustepts, Mundsa soil series is non calcareous, very deep, pH 8.40-9.20, dark yellowish brown in colour (10YR 4/4- 10YR 4/6) developed on Alluvium on very gently sloping Fluvio-Aeolian plain and Dharuhera soil series is non calcareous, very deep, pH 8.20-8.60, dark brown to yellowish brown in colour (10YR 4/3-10YR 5/6) developed on Very gently sloping topography/Fluvio-aeolian plains over alluvium.

(Source: Received from HARSAC on 1: 50000 scale)

3.3.4 Land Capability Classification

It is an interpretative grouping of soils based on inherent soil characteristics, external land features and environmental factors that limit the use of land. As per land capability classification, class 1 to class IV land is suited to agriculture. Classes V to VIII are not suitable for agriculture. These are used for pastures, forestry, and wildlife and recreation purposes and other industrial and township. Depending upon the degree of limitation and the kind of problems involved in management of soils, the land capability sub classes were indicated by adding the following limitation symbols to the capability classes:

1. Erosion and runoff (e) including risk of erosion and great erosion damage.
2. Excess of water (w) including wetness, high water table, and problem of drainage.

3. Root zone limitation (s) including shallow depth, low water holding capacity, salinity or alkalinity/rockiness.
4. Climate limitation (c).

The soils of the selected Watersheds have been grouped into two land capability classes. A brief description of each capability sub class is given as under and the **Land capability map is exhibited in Annexure-VII.**

Land capability subclass III e2s2

These soils are very deep, light to coarse loamy/ fine loamy texture located on level to nearly level slope. These soils are well drained, moderately permeable, moderate water holding capacity and moderate to severe erosion hazard.

Following recommendations are suggested for the economic use of this sub-class:

1. Land leveling should be done at 50% subsidy, because formers are not economically capable to bear the rate of land leveling.
2. Engineering measures like Percolation Embankments with other measures be under taken.
3. Agronomic measures like Dry farming, strip& Mixed cropping with other soil conservation measures like agro forestry and rainfed horticulture are recommended.
4. Green manuring should be promoted for increase physical and chemical properties of soil.
5. Masonry structure (outlet) should be constructed with field bandhs and percolation embankments for rills control and insitu moisture conservation.
6. Strengthening of old abandoned water courses.
7. Provide water storage tanks for storage of excess water for using supplementary irrigation during lean period.

Land capability subclass IV e3s3

These soils are very deep, light textured soils nearly level lands. The water holding capacity is poor to very poor and the water erosion hazard is moderate to severe. The wind erosion is also a main cause to create undulating topography.

Following recommendations are suggested for the economic use of this sub-class:

1. Special soil conservation measures should be adopted to check water erosion and increase ground water recharge; soils should be provided permanent vegetation (Agro-forestry) cover to check further deterioration of soils.
2. Soils would be cultivated in suitable crop rotation with adopting dry farming techniques.
3. Masonry structure should be constructed in field bunds and percolation embankment.
4. Land leveling should be done at 50% subsidy, because formers are not economically capable to bear the rate of land leveling.
5. Construction of percolation ponds and embankments for increasing ground water recharge.
6. Construction of small earthen embankments with vegetative support for Sand dunes stabilization.
7. Strengthening of old abandoned water courses.
8. Provide water storage tanks for storage of excess water for using supplementary irrigation during lean period.

3.3.5 Climatic Conditions

The average rainfall of the district is 702 mm (during the past 19 years data). The highest rainfall is 1138 mm during the year 2008. The uneven rainfall distribution is leading to run off soil every year to the depressions to create seasonal water logging conditions in the Watershed. The year wise rainfall from 1994 to 2012 is presented in **Table.5**

Table-5. Rainfall during the years 1994-12

Sr.No.	Year	Rainfall (in mm)
1	1994	791
2	1995	1087
3	1996	1064
4	1997	589
5	1998	953
6	1999	718
7	2000	479
8	2001	665
9	2002	408
10	2003	1024
11	2004	527
12	2005	889
13	2006	557
14	2007	575
15	2008	1138
16	2009	428
17	2010	625
18	2011	508
19	2012	323
	Average Rainfall	**702**

(Source: - Deputy Director Agriculture, Rewari)

The mean maximum temperature is 41.8˚ C (May and June) and mean minimum is 5.6˚ C (January) of the district.

3.3.6 Physiography and Reliefs

Physiographically, the area slope falls South- West to North- East. The general Elevation in the area belongs to new/ old alluvium plains with sand overburden in pockets to make small hummocks in the area. 224-258 m above mean sea level (google earth maps). The rain water is drained through field to field and ultimately create temporary water logging in low lying areas along canal network to create haphazard condition during rainy season if heavy rain received. The elevation range and percentage slope distribution has been presented in **Table 6.**

Table 6. Physiography and Relief

Project Name	Elevation (MSL)	Slope Range (%)	Major River Basin
Jhal Watershed (IWMP I)	224-258	<1 to >1	Sahibi

3.4 LAND AND AGRICULTURE

The land holding pattern of the villages under Jhal Watershed shows that the majority of the land holding is below 5.0 ha. The lack of assured irrigation source has forced the majority of the small farmers and landless labours of Watershed to migrate from village to ensure there, employment and livelihood to nearest Industrial towns is Delhi, Gurgaon, Dharuhera, Rewari and Bhiwadi (Rajasthan). This affects directly the demographic profile of the villages.

The major crops Bajra, Gawar, green fodder and pulses in Kharif under rain fed conditions. The major crops during Rabi wheat, mustard, gram, green fodder and seasonal vegetables in rain fed and irrigated conditions. The soil and water conservation measures such as Engineering like Water conveyance system, Strengthening of Water Conveyance Channel (Water Course in fields), Dug Out Pond (New/Renovation), Small Earthen Embankment with vegetative support, Earthen Embankment with pucca outlet, Ramp/Ghat Inlet and Outlet, Roof top rain water recharge structures, Community Water Storage Tanks etc. The project would help the farmers to take crop production which will enhance the net production value. The following plants are commonly observed in the Project Area. The natural vegetation in the project area is exhibited in **Table 7.**

Table 7. NATURAL VEGETATION

Sr. No.	Trees	Fruits	Grasses and Shurbs
1	Babool & Australian Babool	Pomegranate	Saccharum munja
2	Black Siris	Ber	Bhroot
3	Jal	Lemon	Jharberi
4	Shisham	Guava	Ker (Tint)
5	Neem	Jamun	
6	Khejri	Amla	
7	Pipal	Papaya	
8	Eucalyptus		

3.4.1 Land Ownership Details

The Caste wise land owned (in ha) is Tabulated in Table 8.

Table 8:- Land Ownership Details

GENERAL	OBC	SC	ST	Total owners
246	4577	-----	-----	4823

3.4.2 AGRICULTURE/PATTERN

Table 9. Agriculture/ Pattern

Sr. No.	Name of Micro Watersheds	Village	Land under agriculture use (ha)	Net Sown area (ha)	
				One time	Two times
1	Jhal	Jhal	667	475	425
2	Sudhrana	Sudhrana	392	315	305
3	Juddi	Juddi	325	264	249
4	Gujjarwas	Gujjarwas	321	265	239
5	Surheli	Surheli	365	295	260
6	Shyam Nagar	Shyam Nagar	332	265	242
7	Dahina A+B	Dahina A+B	1448	1186	975
8	Lisan	Lisan	774	622	575
9	Dakhora	Dakhora	294	235	215
		Total	**4918**	**3922**	**3485**

(Source: Department of Agriculture, Haryana)

3.4.3 IRRIGATION

Lack of Assured Irrigation Facilities

The present source of irrigation is ground water where the area is underlain by fresh to marginal and a few farmers are using brackish water in conjunction with fresh available water. 122 ha are irrigated with the existing canal network. The remaining cultivable area is under rainfed agriculture. The present source of irrigation in the watershed has been tabulated in **Table 10.**

Table 10. Irrigation Pattern.

Sr. No	Name of Micro Watersheds	Name of Villages	Source 1: Canal		Source 2: Groundwater (Tube wells)		Total
			Availability months	Net area (ha)	Availability months	Net area (ha)	
1	Jhal	Jhal	-	-	July to June	642	642
2	Sudhrana	Sudhrana	July to March	98	July to June	166	264
3	Juddi	Juddi	-	-	July to June	287	287
4	Gujjarwas	Gujjarwas	July to March	24	July to June	250	274
5	Surheli	Surheli	-	-	July to June	365	365
6	Shyam Nagar	Shyam Nagar	-	-	July to June	301	301
7	Dahina A	Dahina A	-	-	July to June	586	586
8	Dahina B	Dahina B	-	-	July to June	588	588
9	Lisan	Lisan	-	-	July to June	502	502
10	Dakhora	Dakhora	-	-	July to June	282	282
				122		**3969**	**4091**

(Source – District Census Handbook Rewari**)**

3.4.4 CROPPING PATTERN (crop details)

Cropping Pattern

The village wise area production and productivity of each crop is tabulated in **Table 11 A and 11 B** (Rabi and Kharif)**.**

Table 11 A. Crop Details (Rabi)

Sr. No	Name of Micro Watersheds	Village	Rabi crops(Wheat)				(Mustard)				(Barley)		
			Area (ha)	Prod. (kg)	Productivity (kg/ha) Avg.	Use of fertilizer	Area (ha)	Prod. (kg)	Productivity (kg/ha) Avg.	Use of fertilizer	Area (ha)	Prod. (kg)	Productivity (kg/ha) Avg.
1	Jhal	Jhal	156	718536	4606	Yes	232	411104	1772	Yes	1	2907	2907
2	Sudhrana	Sudhrana	104	479024	4606	Yes	161	285292	1772	Yes	2	5814	2907
3	Juddi	Juddi	98	451388	4606	Yes	125	221500	1772	-	1	2907	2907
4	Gujjarwas	Gujjarwas	50	230300	4606	Yes	166	294152	1772	Yes	1	2907	2907
5	Surheli	Surheli	44	202664	4606	Yes	174	308328	1772	Yes	2	5814	2907
6	Shyam Nagar	Shyam Nagar	107	492842	4606	Yes	114	202008	1772	Yes	3	8721	2907
7	Dahina A+B	Dahina A+B	309	1297491	4199	Yes	296	461760	1560	Yes	14	37828	2702
8	Lisan	Lisan	167	701233	4199	Yes	328	511680	1560	Yes	3	8106	2702
9	Dakhora	Dakhora	79	331721	4199	Yes	106	165360	1560	Yes	4	10808	2702
		Total	**1114**				**1702**				**31**		

Table 11 B. Crop Details (Kharif)

Sr. No	Name of Micro Watersheds	Village	(Bajra)				(Gwar)			(Arahar)		
			Area (ha)	Prod. (kg)	Productivity (kg/ha) Avg.	Use of fertilizer	Area (ha)	Prod. (kg)	Productivity (kg/ha) Avg.	Area (ha)	Prod. (kg)	Productivity (kg/ha) Avg.
1	Jhal	Jhal	315	588105	1867	Yes	4	7800	1950	11	20339	1849
2	Sudhrana	Sudhrana	174	324858	1867	Yes	2	3490	1745	10	17500	1750
3	Juddi	Juddi	178	332326	1867	Yes	3	5241	1747	12	24000	2000

Sr. No	Name of Micro Watersheds	Village	(Bajra)				(Gwar)			(Arahar)		
			Area (ha)	Prod. (kg)	Productivity (kg/ha) Avg.	Use of fertilizer	Area (ha)	Prod. (kg)	Productivity (kg/ha) Avg.	Area (ha)	Prod. (kg)	Productivity (kg/ha) Avg.
4	Gujjarwas	Gujjarwas	123	229641	1867	Yes	4	7800	1950	14	27286	1949
5	Surheli	Surheli	169	315523	1867	Yes	3	5856	1952	12.5	21875	1750
6	Shyam Nagar	Shyam Nagar	189	352863	1867	Yes	2	3502	1751	10	17500	1750
7	Dahina A+B	Dahina A+B	923	984841	1067	Yes	5	9745	1949	22	42900	1950
8	Lisan	Lisan	480	512160	1067	Yes	2	3500	1750	10	17450	1745
9	Dakhora	Dakhora	122	130174	1067	Yes	1	1750	1750	11	21725	1975
		Total	**2673**				**26**			**112.5**		

3.4.5 Livestock

Farmers in these villages have already been keeping the milch animals; mostly buffalos. The milk production of these animals (local breeds) is low (**Table 12)**. There is a need for the improvement of the local breed through artificial insemination, proper vaccination and nutritive feed. Introduction of cross breed cows and murrah buffalo with better milk production will popularize dairy farming in the area. Also, the farmyard manure procured from these animals will help improve the soil health.

Table 12. Village Wise Distribution of Milk Production in Jhal Watershed (IWMP I)

Sr. No	Name of Micro Watersheds	Villages	Buffalo(*Lit/per day/annum) for 6 months	Cow(*lit/per day/annum) for 6 months	Sheep	Goat	Camel
1	Jhal	Jhal	687/5496/989280 (Lit/annum)	111/610.5/109890 (Lit/annum)	-	208	12
2	Sudhrana	Sudhrana	635/5080/914400 (Lit/annum)	144/792/142560 (Lit/annum)	-	20	4
3	Juddi	Juddi	512/4096/737280 (Lit/annum)	94/517/93060 (Lit/annum)	64	155	8

Sr. No	Name of Micro Watersheds	Villages	Buffalo(*Lit/per day/annum) for 6 months	Cow(*lit/per day/annum) for 6 months	Sheep	Goat	Camel
4	Gujjarwas	Gujjarwas	365/2920/525600 (Lit/annum)	54/297/53460 (Lit/annum)	209	-	6
5	Surheli	Surheli	562/4496/809280 (Lit/annum)	137/753.5/135630 (Lit/annum)	59	13	14
6	Shyam Nagar	Shyam Nagar	512/4096/737280 (Lit/annum)	144/792/142560 (Lit/annum)	-	19	16
7	Dahina A+B	Dahina A+B	2103/16824/3028320 (Lit/annum)	506/2783/500940 (Lit/annum)	-	43	151
8	Lisan	Lisan	1268/10144/1825920 (Lit/annum)	216/1188/213840 (Lit/annum)	294	179	20
9	Dakhora	Dakhora	719/5752/1035360 (Lit/annum)	100/ 550/99000 (Lit/annum)	-	78	4

(Source: Animal Husbandry, Rewari)

***Average milk Yield of Buffalo 7.5 – 8.5 lit/ day and Cow Average milk Yield 3.5- 4.5 lit/ day**

3.4.6 Ground Water Concern

a) Depth to Water

The ground water hydrology focuses on occurrence and distribution of movement of water below the surface. Ground Water Cell of Haryana has fixed hydrograph station scattered in the district whose monitoring is undertaken during pre and post monsoon season. The water level data has been analyzed for the purpose of ground water studies in the watershed area. The ground water behavior in the watershed reveals the variation of depth to water level from 7.8 to 45.2 m below ground level. The area under Jhal, Juddi and partially in Sudhrana, the water table is between 10- 20m whereas in Sudhrana and about 50% of the area ranges is below 10m. The micro- watershed Gujjarwas, Surheli, Shyam nagar, Dakhora and Lisan, the water table varies between 20- 30 m below ground level (BGL). The deep water table from 30-60m is observed in Dahina micro- watershed. The village wise water level data has been tabulated in **Table 13.** Depth to water level map has been prepared and presented in the **Annexure VIII.**

Table 13. Village Wise Depth to Water Level of Jhal Watershed (IWMP I)

Sr. No.	Name of Micro Watersheds	Name of Villages	Source	Pre- Project level (m)
1	Jhal	Jhal	Open wells	15.4
2	Sudhrana	Sudhrana	Open wells	7.8
3	Juddi	Juddi	Open wells	19.3
4	Gujjarwas	Gujjarwas	Open wells	23.0
5	Surheli	Surheli	Open wells	22.5
6	Shyam Nagar	Shyam Nagar	Open wells	21.9
7	Dahina A	Dahina A	Open wells	45.2
8	Dahina B	Dahina B	Open wells	45.2
9	Lisan	Lisan	Open wells	29.0
10	Dakhora	Dakhora	Open wells	30.0

The source of drinking water supply is through the tube wells as well as canal network in the area. The micro watershed wise quality ranges from fresh to saline. The water quality distribution in Sudhrana, Jhal, Shyamnagar, Dakhora, Dahina and Lisan (partly) is fresh which is the exploited for irrigation purposes. The partial marginal quality of water is observed in Juddi, Gujjarwas, Surheli and Lisan. The marginal to saline quality of ground water is observed in parts of micro- watershed in villages Juddi, Gujjarwas, Surheli. The water quality map of the area is presented in **Annexure-IX**. The drinking water supply is available thought the year but shortage in villages during May and June where the supply is augmented by tankers. The department of Public Health Engineering is responsible for the water supply for drinking purpose.

b) Water table fluctuation

From the availability of the data from the period June 2007 to June 2012, it is observed that the water table is declining at the rate of 18cm per year.

The seasonal fluctuation i.e. Pre and Post monsoon period is 1- 2.4m. The pattern of ground water depletion is almost uniform in the project area.

c) Rain water harvesting and Recharging

The rapid growth of rural population leads to escalation of water demand. Conservation of ground water is important because it takes years to be replenished. In areas where ground water is used, care must be taken to replenish with rainwater.

It has been proposed to make rainwater-harvesting by construction of water harvesting structures in the areas where the water table is declining due to the exploitation of ground water in 90% of IWMP area.

3.4.7 DETAILS OF COMMON PROPERTY RESOURCES: The department of panchayats has maintained the record of common property resources of area under various institutions. The data has been taken has been collected DDPO, Rewari. The details of common property resource in Jhal Watershed (IWMP I) are tabulated in **Table 14.**

Table 14. Detail of Common Property Resources

Name of the Project	CPR Particulars	Total Area, ha (Area owned / in possession of)				Area available for treatment (ha)			
Jhal Watershed (IWMP I)		Pvt. Person	Govt.	PRI	Any Other	Pvt. Person	Govt.	PRI	Any Other
	Waste land	---	---	503	---	---	---	71	---
	Pasture	---	---	30	---	---	---	30	---
	Orchards	11	---	---	---	11	---	---	---
	Village wood	---	---	32	---	---	---	32	---

	lot								
	Forest	---	---	39	---	---	---	39	---
	Village ponds, lake	---	---	24	---	---	---	24	---
	Community Buildings	---	25	---	---	---	---	25	---
	Weekly Mkts	---	---	---	---	---	---	---	---
	Permanent Mkts	---	---	---	---	---	---	---	---
	Temples/place of worship	---	---	17	---	---	---	17	---
	Others	---	---	---	---	---	---	---	---

3.5 SOCIO ECONOMIC AND LITERACY PROFILE

Land holdings: The area under the project is cultivated by small and marginal farmers. Almost 70 percent of the farmers fall under this category.

Poor economic conditions of farmers: The general socio economic condition of the farmers in this area is quite poor. They cannot use necessary agriculture inputs in a timely fashion due to financial constraints which adversely affects the crop yield.

Village wise household, total population and schedule caste population has been worked out from the census book and is tabulated in **table 15.** The literacy rate of micro watershed wise distribution is also exhibited in **Table 16**.

3.5.1 Demographic Status

Table 15. Demographic Status/ Population Pattern

Sr. No.	Name of the Micro watershed	Name of villages	Total no. of houses	Total Population			SC			
				Male	Female	Total	Male	Female	Total	%age
1	Jhal	Jhal	523	1367	1292	2659	329	313	642	24
2	Sudhrana	Sudhrana	424	1142	1011	2153	170	148	318	15
3	Juddi	Juddi	583	1458	1397	2855	355	327	682	24
4	Gujjarwas	Gujjarwas	241	673	590	1263	136	111	247	19
5	Surheli	Surheli	416	1008	970	1978	104	94	198	10
6	Shyam Nagar	Shyam Nagar	382	904	881	1785	191	190	381	21
7	Dahina A+B	Dahina A+B	1521	3741	3505	7246	520	471	991	13
8	Lisan	Lisan	786	1939	1757	3696	387	361	748	20
9	Dakhora	Dakhora	496	1350	1190	2540	203	167	370	14
		Total	**5372**	**13582**	**12593**	**26175**	**2395**	**2182**	**4577**	**17**

(Source- District Census 2011)

Table16. Village wise Literacy Rate in Jhal Watershed (IWMP I)

Sr.No.	Name of the Micro watershed	Name of villages	Total population	Literacy					
				Total Literates	% age	Male	% age	Female	% age
1	Jhal	Jhal	2659	1830	69	1047	57	783	43
2	Sudhrana	Sudhrana	2153	1455	67	886	61	569	39
3	Juddi	Juddi	2855	1957	68	1160	59	797	41
4	Gujjarwas	Gujjarwas	1263	862	68	534	62	328	38

5	Surheli	Surheli	1978	1383	69	793	57	590	43
6	Shyam Nagar	Shyam Nagar	1785	1305	73	754	58	551	42
7	Dahina A+B	Dahina A+B	7246	5233	72	3003	57	2230	43
8	Lisan	Lisan	3696	2587	70	1574	61	1013	39
9	Dakhora	Dakhora	2540	1813	71	1078	59	735	41
		Total	**26175**	**18425**	**70**	**10829**	**59**	**7596**	**41**

(Source- District Census- 2011)

Table 17. EMPLOYMENT STATUS

Sr.No.	Name of Micro Watersheds	Name of villages	Schedule caste		Cultivators		Agricultural labourers		Household industry workers		Other workers	
			Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
1	Jhal	Jhal	329	313	262	12	31	1	11	2	225	41
2	Sudhrana	Sudhrana	170	148	242	74	7	0	3	3	256	210
3	Juddi	Juddi	355	327	312	127	28	7	19	6	269	188
4	Gujjarwas	Gujjarwas	136	111	156	39	6	2	0	0	95	59
5	Surheli	Surheli	104	94	119	1	2	0	0	0	179	80
6	Shyam Nagar	Shyam Nagar	191	190	187	6	4	0	1	0	90	11
7	Dahina A+B	Dahina A+B	520	471	650	343	58	37	13	41	745	295
8	Lisan	Lisan	387	361	352	205	44	7	14	12	323	79
9	Dakhora	Dakhora	203	167	257	30	5	0	14	3	291	69
		Total	**2395**	**2182**	**2537**	**837**	**185**	**54**	**75**	**67**	**2473**	**1032**

Source: Census 2011

3.5.2 MIGRATION PATTERN

The major reason for migration is lack of employment opportunities, small uneconomical holding, and lack of fodder availability in summer etc. The village wise migration, period, reason for migration and probe able income generation has been compiled and shown in **Table 18.**

Table 18. Migration Pattern in Jhal Watershed (IWMP I)

Sr. No.	Name of Micro Watersheds	Name of villages	Total Population	No. of persons migrating	No. of days per year of migration	Main reason for migration	Income during migration/ month/person
1	Jhal	Jhal	2659	18	90	Lack of employment opportunity	6500- 10000
2	Sudhrana	Sudhrana	2153	38	120	Lack of employment opportunity	6500- 10000
3	Juddi	Juddi	2855	33	60	Lack of employment opportunity	6500- 10000
4	Gujjarwas	Gujjarwas	1263	32	60	Lack of employment opportunity	6500- 10000
5	Surheli	Surheli	1978	30	60	Lack of employment opportunity	6500- 10000
6	Shyam Nagar	Shyam Nagar	1785	18	60	Lack of employment opportunity	6500- 10000
7	Dahina A+B	Dahina A+B	7246	50	120	Lack of employment opportunity	6500- 10000
8	Lisan	Lisan	3696	23	90	Lack of employment opportunity	6500- 10000
9	Dakhora	Dakhora	2540	19	120	Lack of employment opportunity	6500- 10000

POVERTY: The distribution of the BPL and their percentage is presented in table 19.

Table 19. BPL Pattern

Sr. No.	Name of Micro watersheds	Name of villages	Total houses	Total Household-BPL	% of BPL HH
1	Jhal	Jhal	523	143	27
2	Sudhrana	Sudhrana	424	78	18
3	Juddi	Juddi	583	88	15
4	Gujjarwas	Gujjarwas	241	53	22
5	Surheli	Surheli	416	80	19
6	Shyam Nagar	Shyam Nagar	382	68	18
7	Dahina A+B	Dahina A+B	1521	265	17
8	Lisan	Lisan	786	139	17
9	Dakhora	Dakhora	496	92	18
		Total	**5372**	**1006**	**19**

(Source: District Administration Rewari, Haryana)

INFRASTRUCTURE DETAILS

All the villages are well connected by pucca road and primary or middle school exists in all villages. Health facility is available in villages or nearby Health Centers. The village wise details of infrastructure are shown in **Table 20** and the facilities/ household assets in the villages under watershed is shown in **Table 21**.

Table 20. Village Infrastructure

Sr. No.	Name of Micro watersheds	Name of villages	Bank Y/N	Post office Y/N	School Primary/ High/ Sr.Sec	Milk Collection Centre Y/N	Pucca Road to Village Y/N	Health Facility Govt/Private Y/N	Veterinary facility Y/N

Sr. No.	Name of Micro watersheds	Name of villages	Bank Y/N	Post office Y/N	School Primary/ High/ Sr.Sec	Milk Collection Centre Y/N	Pucca Road to Village Y/N	Health Facility Govt/Private Y/N	Veterinary facility Y/N
1	Jhal	Jhal	N	Y	Sr. Sec. School	Y	Y	N	N
2	Sudhrana	Sudhrana	N	N	High School	Y	Y	N	N
3	Juddi	Juddi	N	Y	Sr. Sec. School	Y	Y	Y	N
4	Gujjarwas	Gujjarwas	N	N	High School	Y	Y	Y	N
5	Surheli	Surheli	N	Y	High School	Y	Y	Y	N
6	Shyam Nagar	Shyam Nagar	N	Y	High School	Y	Y	N	N
7	Dahina A+B	Dahina A+B	Y	Y	Sr. Sec. School	Y	Y	Y	Y
8	Lisan	Lisan	N	Y	High School	Y	Y	N	Y
9	Dakhora	Dakhora	Y	Y	High School	Y	Y	Y	N

FACILITIES/ HOUSEHOLD ASSETS

Table 21. Facilities/ Household assets in Jhal Watershed (IWMP I)

Sr. No.	Name of micro water sheds	Name of villages	Total no. of Houses	HHs with Safe latrines	HHs with phones		HHs with vehicles		HHs with TV sets	HHs with cooking gas	HHs with drinking water	HHs with fridge
					Landline	Mobile	2 wheelers	4 wheelers				
1	Jhal	Jhal	523	130	31	261	78	20	83	41	523	28
2	Sudhrana	Sudhrana	424	106	25	212	63	16	67	33	424	23
3	Juddi	Juddi	583	145	34	291	87	23	93	46	583	32

Sr. No.	Name of micro water sheds	Name of villages	Total no. of Houses	HHs with Safe latrines	HHs with phones		HHs with vehicles		HHs with TV sets	HHs with cooking gas	HHs with drinking water	HHs with fridge
					Landline	Mobile	2 wheelers	4 wheelers				
4	Gujjarwas	Gujjarwas	241	60	14	120	36	9	38	19	241	13
5	Surheli	Surheli	416	104	24	208	62	16	66	33	416	22
6	Shyam Nagar	Shyam Nagar	382	95	22	191	57	15	61	30	382	21
7	Dahina A+B	Dahina A+B	1521	380	91	760	228	60	243	121	1521	83
8	Lisan	Lisan	786	196	47	393	117	31	125	62	786	43
9	Dakhora	Dakhora	496	124	29	248	74	19	79	39	496	27

3.5.3 LIVELIHOOD PATTERN: The livelihood from agriculture, animal husbandry, casual labour and others in the micro watershed (village wise) is shown in table 22.There is no major income from the common property resource to the individuals.

Table 22. Per capita (Household) income Jhal Watershed (IWMP I)

Sr. No.	Name of micro watersheds	Name of villages	Agriculture in Rs. P.A	Animal Husbandry in Rs. P.A	Casual labour in Rs. P.A	Others in Rs. P.A	Total in Rs.
1	Jhal	Jhal	22500	18600	5800	4400	51300
2	Sudhrana	Sudhrana	20500	17400	4900	5200	48000
3	Juddi	Juddi	18400	14400	4200	4900	41900
4	Gujjarwas	Gujjarwas	21600	18400	5400	4300	49700

Sr. No.	Name of micro watersheds	Name of villages	Agriculture in Rs. P.A	Animal Husbandry in Rs. P.A	Casual labour in Rs. P.A	Others in Rs. P.A	Total in Rs.
5	Surheli	Surheli	24500	20500	6500	5500	57000
6	Shyam Nagar	Shyam Nagar	23200	22000	6000	5200	56400
7	Dahina A+B	Dahina A+B	22300	20200	6500	4800	53800
8	Lisan	Lisan	21700	18400	5300	4200	49600
9	Dakhora	Dakhora	24600	22400	6000	5500	58500

3.5.4 Comparative Status of crop Productivity

Three major crops namely Wheat, Mustard, Bajra and Gwar are sown in Watershed villages. Though main crops grown in the area are Wheat, Mustard, Bajra and Gwar. Compared to rest of the district and the state, the average yield of these crops is quite low.

3.6 REASONS FOR LOW PRODUCTIVITY

- Lack of assured irrigation for agriculture.
- Poor availability and quality of ground water.
- Irregular and erratic rainfall: there is long span between two subsequent rainfalls in the area.
- Sudden change in climate of the area.
- Low organic carbon content.
- Poor physical and chemical properties of the soils are light in texture with boulders in pockets and poor fertility.
- Low water holding/ retention capacity.
- Moderate to rapid permeability.
- Poor phosphorous and medium potash nutrients availability.
- Acceptance of hybrid/ high yielding varieties are nil to negligible.

- Soil erosion.
- Essential micro- nutrient deficiency in the soil.
- Dependence of monsoon.
- Low fertilizer consumption per unit cropped area.
- Lack of economic condition of farmers.
- Lack of good quality of seeds and fertilizer.
- Lack of post harvesting facilities such as storage and marketing.

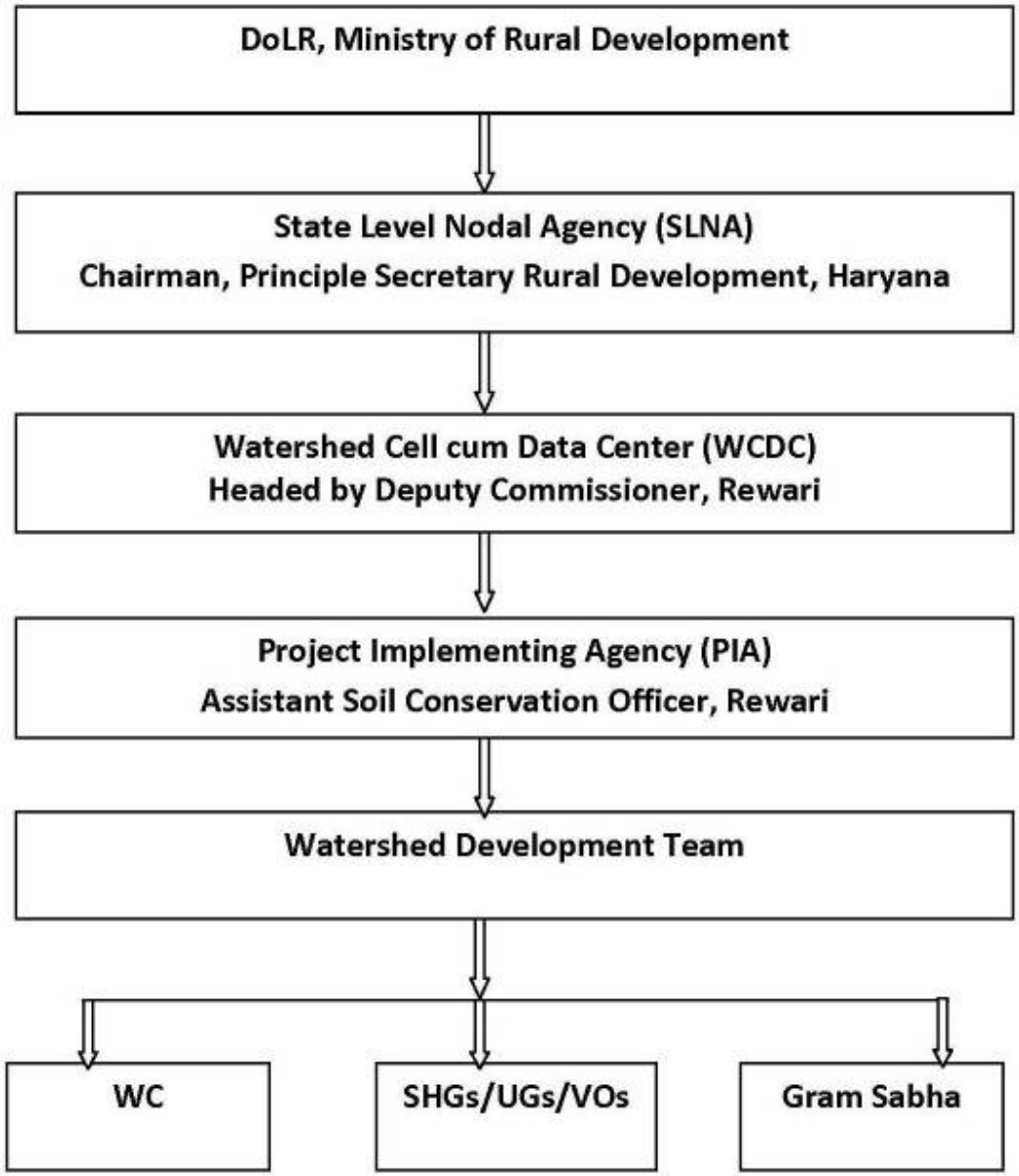
CHAPTER-4

PROJECT MANAGEMENT AGENCIES

4.1 INSTITUTIONAL ARRANGEMENT

Institutions play a major role in managing the projects. Realizing the importance of Community Participation, Decentralized Participatory Approach has been adopted for Watershed Management. Following decentralization and to achieve the objectives, there is a dire need for establishment of Institutional set up from National to Village Level (Micro Watershed Level), including cluster (Sub Watershed Level) and district level. These institutions need to be oriented from time to time and also empowered so that they take up the assigned tasks and work as per their responsibilities from the start of the program to effective management of Project. Considering the prevalent circumstances, these institutions should take decisions at their respective level. The involvement and participation of beneficiaries and other stakeholders is desired to be encouraged right from the planning stage.

The institutional set up is given below:


DoLR, Ministry of Rural Development
State Level Nodal Agency (SLNA)
Chairman, Principle Secretary Rural Development, Haryana
Watershed Cell cum Data Center (WCDC)
Headed by Deputy Commissioner, Rewari
Project Implementing Agency (PIA)
Assistant Soil Conservation Officer, Rewari
Watershed Development Team
WC
SHGs/UGs/VOs
Gram Sabha

4.2 STATE LEVEL NODAL AGENCY, HARYANA

State Level Nodal Agency (SLNA) is headed by Chief Executive Officer and supported by Technical Experts is fully functional. The regular meetings with PIA and other stake holders are held to provide necessary guidance to them as per the revised, common guidelines, 2011. The main functions of SLNA are:

- To implement the approved perspective and strategy plan of watershed development for the state.
- Acts as Nodal Agency at State Level for appraisal and clearance.
- To establish and maintain a State Level data cell from the funds sanctioned to the State and connect it online with the National Level Data Centre.
- To provide technical support to Watershed Cell cum Data Centre throughout the state.
- To approve a list of independent institutions for capacity building of various stakeholders within the state and work out the overall capacity building strategy in consultation with NRAA/Nodal Ministry.
- To approve project implementing agencies identified/selected by WCDC/District Level Committee by adopting appropriate objective selection criteria and transparent systems.
- To establish monitoring, evaluation and learning systems at various levels (Internal and external/independent system).
- To ensure regular and quality online monitoring of watershed projects in the State in association with Nodal Agency at the Central Level and securing feedback by developing partnerships with independent and capable agencies.

4.3 WATERSHED CELL CUM DATA CENTRE, REWARI

WCDC has been notified by SLNA and the same has been constituted. The team comprises of 3 to 4 subject matter specialists on Agriculture, Water Management, Social Mobilization and Management & Accounts. WCDC is be headed by Deputy Commissioner and Additional Deputy Commissioner has been designated as Project Manager under IWMP. The WCDC members comprise of Technical Expert, Computer Operator and Accountant. As per guideline 3 to 6 full time staff (3 in district with less than 25000 ha project area and 6 in districts with more than 25000 ha project area) would assist the Project Manager. The Project Manager will prepare well defined

annual goals against which the performance will be monitored. The WCDC will be financially supported by the DoLR after review of available staff, infrastructure and actual requirement.

Organization of WCDC and its Objective

The primary objective is successful implementation of watershed programme. The organization bears the responsibility to assist and facilitate PIA from time to time. The broad functions of WCDC are as under:

- Providing technical support in planning and implementation of the project.
- Facilitation in preparation of Annual Action Plan.
- Monitoring and of project activities.
- Co-ordination with allied departments.
- Submission of various reports to SLNA.

4.4 Project Implementation Agency

The project Implementing Agencies (PIA), ASCO Rewari is selected by the State Level Nodal Agency (SLNA) for Integrated Watershed Management Programme (IWMP) in Haryana. In the district Rewari, where the area of development is 25100 ha, a separate dedicated unit, called the Watershed Cell cum Data Centre has been established which will oversee the implementation of watershed programme. The PIA is responsible for implementation of watershed project. Soils and Water Conservation Department, Rewari. He has a vast experience in implementing various watershed development Projects.

PIA will put dedicated watershed development team and will provide necessary technical guidance to the Gram Sabha /Watershed Committee for implementation of development plans for the watershed projects through Participatory Rural Appraisal Exercise.

PIA will also undertake:

a) Community Organization,
b) Trainings for the village communities,
c) Supervise Watershed Development Activities,
d) Inspect & authenticate project accounts,
e) Monitor & review the overall project implementation,
f) Set up institutional arrangements for post project operations and
g) Maintenance and further development of the assets created during the project period.

Table 1. PIA/ Project Implementing Agency

Sr.No.	Name of the Project	Details of PIA	
1	Jhal Watershed (IWMP-I)	i) Type of organization	District Level Nodal Agency
		ii) Name of organization	District Watershed Development Unit
		iii) Designation & Address	Assistant Soil Conservation Officer, Rewari
		iv) Telephone	094160- 69536
		v) Fax	01274- 225240
		vi) E-mail	drdarwr@hry.nic.in

The PIA is well competent to effectively manage this project and has a good rapport with the village community. The watershed committee members are giving them positive response in the preparatory phase. The overall responsibility of the PIA would be to oversee the project progresses well and to provide technical knowhow as when required. PIA has qualified and highly experienced staff to accomplish this task and take this project forward for its logical conclusion. PIA will be assisted by the Watershed Development Team.

4.4.1 Monitoring Level Staff at PIA Head Office

The highly experienced staff is engaged in the monitoring the project. The technical guidance to field staff from time to time is being provided. Meetings are being periodically held by head office with officials from the Rewari district to apprise themselves of the status of ongoing project.

4.5 Watershed Development Team

The watershed development team (WDT) is an integral part of the PIA. WDT would consist of subject specialists such as Agriculture, Animal Husbandry, Horticulture, Soil & Water Management and Forest. One woman member with experience in Social mobilization is also included in WDT. Assistant Soil Conservation Officer would be team leader of the WDTs. Team Leader will coordinate with other WDT members for smooth implementation of the project. One member of the WDT will be departmental official of the rank ADO (Soil Conservation)/ ADO (Agriculture) who will also be responsible for disbursement of funds along with Secretary Watershed Committee.

WDT will guide the watershed committee in the formulation of watershed action plan. An indicative list of the roles and responsibilities of the WDT would include among others, the following.

a) Constitution of Watershed Committee and its functioning,
b) Organizing and strengthening User groups, Self Help Groups,
c) Mobilizing women to ensure that the perspectives and interests of women are adequately reflected in the watershed action plan
d) Conducting Training and Capacity Building,
e) Common property resource management and equitable sharing
f) Preparing detailed resource development plan including Soil & Water Conservation,
g) Undertake engineering surveys,
h) Prepare engineering drawings and cost estimate for structures to be built.
i) Monitoring, checking, assessing, undertaking physical verification and measurements of the work done
j) Facilitating the development of livelihood opportunities for the landless
k) Maintaining project accounts
l) Arranging physical, financial and social audit of the work undertaken

m) Setting up suitable arrangements for post- project operation, maintenance and future development of the assets created during the project period.

4.6 WATERSHED COMMITTEE DETAILS

The process of formation of watershed committees of all villages has been completed and watershed committees have been formed in all villages. The representation on these committees consists of members from- SC, landless, women and members from self help groups and user groups. The committees would be imparted training for smooth management of the activities related to watershed.

Their representation of various groups is as under:

- Minimum of 50% members from SHGs and UGs, SCs, women and landless.
- One member from Watershed Development Team, especially women member (subject matter specialist in Social Science).

The Govt. of Haryana vide department memo No. PO (IWMP)-2012/1479 dated 05.03.2012 has decided to include the following members as members of the Watershed Committees.

- All alive ex-Sarpanches of concerned Gram Panchayats,
- Concerned member of Panchayat Samiti,
- Concerned member of Zila Parishad,

One of the members of Watershed Committees is nominated as Watershed Secretary to perform the following duties:

- Convening meetings of Watershed Committee, Gram Sabha,
- Maintaining all records and proceedings of the meetings.
- Follow up action on all decisions taken in the meetings.
- Ensuring people's participation.

4.6.1 Formation of Watershed Committees (WC)

The watershed committee has been constituted as per the guidelines para 6.3 (44) after convening a meeting of Gram Sabha. The schedule of the meeting was circulated by the Additional Deputy Commissioner well in advance. The watershed committees were constituted in each village as detailed in **Table 2.**

Table 2. Watershed Committees (WC) Details

Name of Micro Watersheds	Name of President	Name of Secretary	Name of Members
Jhal	Sh. Om Parkash	Sh. Dharam Singh	Smt. Sonia, Sh. Shyam Yadav, Sh. Vijay, Sh. Manpal, Sh. Shish Ram, Smt. Balwanti, Sh. Kundal Lal, Sh. Pappu / Satnarain, Sh. Naresh, Sh. Chirangi, Sh. Rohtash
Sudhrana	Ved Parkash	Dharambir	Sonia, Santra , Mani Ram, Saroj Devi, Kamla Devi, Hanuman, Ramesh, Sunil, Gordhan, Ram Niwas, Ramesh
Juddi	Bhateri Devi	Bhupesh	Sunil, Rameshwar, Balbir singh, Bimla Devi, Ragu Nath, Mahabir Singh, Rajender, Lal Singh, Rajender Ganpat, Sonia, Santra
Gujjarwas	Ram Kishan	Naresh Kumar	Dr. Bijender, Mukhtayar Singh, Ram Kumar, Santosh Devi, Mehar Singh, Dharambir, Rampal, Mahabir, Ramesh, Ram Kawar, Bhupender Singh
Surheli	Kahar Singh	Gaurav	Bijender Singh, Ram Singh, Bir Singh, Bawana Devi, Dhooni Ram, Budh Ram, Hari Kishan, Iswar, Ranjir, Mahabir, Nawal Singh
Shyam Nagar	Sudhir	Laxman	Bijender Singh, Shyam Yadav, Jai Parkash, Shri Ram, Shiv Kumar, Sheo Narain, Mahender,

Name of Micro Watersheds	Name of President	Name of Secretary	Name of Members
			Satpal, Anil Kumar, Anil Kumar, Roop Chand
Dahina	Satpal Yadav	Inderjeet	Bijender Singh, Ajay Kumar, Mahabir Singh, Kamlesh, Birender Singh, Lal Singh, Dev Singh, Attar Singh, Dhanpat, Surender
Lisan	Ajay Kumar	Under process	Bijender Singh, Pardeep Kumar, Rohtash Kumar, Phool Chand, Ram Bhagat, Shyam Singh, Kuldeep, Ishwar, Sube Singh, Shish Ram, Birmati
Dakhora	Surender Singh	Maya Devi	Bijender Singh, Pardeep Kumar, Ramhar, Abhay Singh, Lilawati, Madan Lal, Dharambir, Nirmala, Ramesh, Dalip, Nirmala

As per the Government decision, Sarpanch of the village is the chairman of the watershed committee. The Secretary of the Watershed Committee has been appointed by the Watershed Committee in the meeting of Gram Sabha. The Secretary will be paid honorarium and would be independent from the functioning of Panchayat Secretary. The secretary would be dedicated in the project activities and would take care of the watershed supervision and would be fully responsible for organizing the meeting and maintenance of records. The main responsibilities of secretary are as under:

- Convening the meeting and recording the minutes of WC meeting and will be responsible for follow up the decision taken by the WC Committee.
- The secretary will be responsible for financial transactions of the project and will sign the cheques with WDT nominee on the behalf of WC.
- He will motivate the villagers for voluntary contribution and ensure equitable distribution of resources.

4.7 INSTITUTIONAL SETUP AT WATERSHED LEVEL

4.7.1 Self Help Groups

The formation of the self help group in all the villages is underway. It is proposed to form at least 2 self help group in each village. In each village Self Help Groups consisting of 10 to 15 members having common goal are being formed. The members of SHGs would be drawn from very poor families, BPL families, SC families, Land less families, Small and Marginal farmers SHG would be homogeneous in nature and would work together for their socio-economic up-liftment. SHGs need to be imparted. Under the project, each SHGs would be given revolving fund Rs. 25000 each after 6 months of the date of formation. The income generating activities would be identified. For adopting economic activities would depend upon the decision of Self Help Group. Accordingly the Orientation and Trainings for their skill up gradation would be arranged in the project as activity. It is the responsibility of Watershed Committee to form SHGs in their respective villages under the guidance of Watershed Development Team and Project Implementing Agency.

4.7.2 User Groups

The Watershed Committee will constitute user group in the watershed area with the help of the WDT. In each Watershed village, user groups are also being formed. Members of these groups would be the beneficiaries of the Watershed project. User group are formed to manage the activities and also asset created under the programme on the long term basis. These groups would also be homogeneous in nature. User groups shall be given technical support as and when required by Watershed Committee and Watershed Development Team. During the preparatory stage while discussing with the Gram Sabha member it was decided that each group would formulate certain internal rules and have a feeling of ownership with community spirit. The members would be from various categories like landless, small farmer, marginal farmer and large farmer.

CHAPTER- 5

BUDGETING

MICRO WATERSHED WISE/COMPONENTS AND THEIR YEAR WISE PHASING BUDGET UNDER IWMP

IWMP- I JHAL WATERSHED

5.1 BUDGETING

The State Level Nodal Agency will distribute funds to WCDC keeping in view the detailed annual action plan of each micro- watershed. The expenditure under the various component of the project will be carried out as per the guidelines. The activity wise allocations of funds as per the provision of budget components have been work out and exhibited in table. 1. The first step in the budgeting is dividing the cost of project into various components as detailed in the revised common guidelines. It would help the PIA in further identifying activities under different components and allocate appropriate funds.

MICRO WATERSHED WISE / COMPONENT WISE PHASING

YEAR WISE BUDGET PHASING UNDER IWMP I

Area in Hectares and

Funds in Rs.

Table 1. Activity wise allocation of funds for Project Village

(BUDGET AT A GLANCE)

Name of the project	Project Area	Effective Area	Funds Available	Name of activity	1st Year	2nd Year	3rd Year	4th Year	5th Year	Total
Jhal Watershed (IWMP I)	5490	5059	60708000	Administrative costs	607080	607080	1821240	1821240	1214160	6070800
				Monitoring	0	0	0	607080	0	607080
				Evaluation	0	0	0	0	607080	607080
				Entry point activities	2428320	0	0	0	0	2428320
				Institution and capacity building	0	3035400	0	0	0	3035400
				Detailed project report	607080	0	0	0	0	607080
				Watershed development works	0	4856640	9713280	10320360	9106200	33996480
				Livelihood activities for the asset less persons	0	0	1821240	3035400	607080	5463720

				Production system and micro enterprises	0	0	1821240	2428320	1821240	6070800
				Consolidation phase	0	0	0	0	1821240	1821240
				Total	**3642480**	**8499120**	**15177000**	**18212400**	**15177000**	**60708000**
				Percentage of total cost	**6%**	**14%**	**25%**	**30%**	**25%**	**100%**

MICRO WATERSHED WISE/COMPONENT WISE PHASING

YEAR WISE BUDGET PHASING UNDER IWMP

Area in Hectares and

Funds in Rs.

Table 2. PHASING YEAR WISE (Name of the Micro Watershed: Jhal)

(BUDGET AT A GLANCE)

Effective Area	Funds Available	Name of activity	1st Year	2nd Year	3rd Year	4th Year	5th Year	Total
695	8340000	Administrative costs	83400	83400	250200	250200	166800	834000
		Monitoring	0	0	0	83400	0	83400

		Evaluation	0	0	0	0	83400	83400
		Entry point activities	333600	0	0	0	0	333600
		Institution and capacity building	0	417000	0	0	0	417000
		Detailed project report	83400	0	0	0	0	83400
		Watershed development works	0	667200	1334400	1417800	1251000	4670400
		Livelihood activities for the asset less persons	0	0	250200	417000	83400	750600
		Production system and micro enterprises	0	0	250200	333600	250200	834000
		Consolidation phase	0	0	0	0	250200	250200
		Total	**500400**	**1167600**	**2085000**	**2502000**	**2085000**	**8340000**
		Percentage of total cost	**6%**	**14%**	**25%**	**30%**	**25%**	**100%**

MICRO WATERSHED WISE/COMPONENT WISE PHASING

YEAR WISE BUDGET PHASING UNDER IWMP

Area in Hectares and

Funds in Rs.

Table 3. PHASING YEAR WISE (Name of the Micro Watershed: Sudhrana)

(**BUDGET AT A GLANCE)**

Effective Area	**Funds Available**	**Name of activity**	**1st Year**	**2nd Year**	**3rd Year**	**4th Year**	**5th Year**	**Total**
430	5160000	Administrative costs	51600	51600	154800	154800	103200	516000
		Monitoring	0	0	0	51600	0	51600
		Evaluation	0	0	0	0	51600	51600
		Entry point activities	206400	0	0	0	0	206400
		Institution and capacity building	0	258000	0	0	0	258000
		Detailed project report	51600	0	0	0	0	51600
		Watershed development works	0	412800	825600	877200	774000	2889600
		Livelihood activities for the asset less persons	0	0	154800	258000	51600	464400
		Production system and micro enterprises	0	0	154800	206400	154800	516000
		Consolidation phase	0	0	0	0	154800	154800
		Total	**309600**	**722400**	**1290000**	**1548000**	**1290000**	**5160000**
		Percentage of total cost	**6%**	**14%**	**25%**	**30%**	**25%**	**100%**

MICRO WATERSHED WISE/COMPONENT WISE PHASING

YEAR WISE BUDGET PHASING UNDER IWMP

Area in Hectares and

Funds in Rs.

Table 4. PHASING YEAR WISE (Name of the Micro Watershed: Juddi)

(BUDGET AT A GLANCE)

Effective Area	Funds Available	Name of activity	1st Year	2nd Year	3rd Year	4th Year	5th Year	Total
374	4488000	Administrative costs	44880	44880	134640	134640	89760	448800
		Monitoring	0	0	0	44880	0	44880
		Evaluation	0	0	0	0	44880	44880
		Entry point activities	179520	0	0	0	0	179520
		Institution and capacity building	0	224400	0	0	0	224400
		Detailed project report	44880	0	0	0	0	44880
		Watershed development works	0	359040	718080	762960	673200	2513280
		Livelihood activities for the asset less persons	0	0	134640	224400	44880	403920
		Production system and micro enterprises	0	0	134640	179520	134640	448800

		Consolidation phase	0	0	0	0	134640	134640
		Total	**269280**	**628320**	**1122000**	**1346400**	**1122000**	**4488000**
		Percentage of total cost	**6%**	**14%**	**25%**	**30%**	**25%**	**100%**

MICRO WATERSHED WISE/COMPONENT WISE PHASING

YEAR WISE BUDGET PHASING UNDER IWMP

Area in Hectares and

Funds in Rs.

Table 5. PHASING YEAR WISE (Name of the Micro Watershed: Gujjarwas)

(**BUDGET AT A GLANCE)**

Effective Area	**Funds Available**	**Name of activity**	**1st Year**	**2nd Year**	**3rd Year**	**4th Year**	**5th Year**	**Total**
352	4224000	Administrative costs	42240	42240	126720	126720	84480	422400
		Monitoring	0	0	0	42240	0	42240
		Evaluation	0	0	0	0	42240	42240
		Entry point activities	168960	0	0	0	0	168960
		Institution and capacity	0	211200	0	0	0	211200

		building						
		Detailed project report	42240	0	0	0	0	42240
		Watershed development works	0	337920	675840	718080	633600	2365440
		Livelihood activities for the asset less persons	0	0	126720	211200	42240	380160
		Production system and micro enterprises	0	0	126720	168960	126720	422400
		Consolidation phase	0	0	0	0	126720	126720
		Total	**253440**	**591360**	**1056000**	**1267200**	**1056000**	**4224000**
		Percentage of total cost	**6%**	**14%**	**25%**	**30%**	**25%**	**100%**

MICRO WATERSHED WISE/COMPONENT WISE PHASING

YEAR WISE BUDGET PHASING UNDER IWMP

Area in Hectares and Funds in Rs.

Table 6. PHASING YEAR WISE (Name of the Micro Watershed: Surheli)

(**BUDGET AT A GLANCE)**

Effective Area	Funds Available	Name of activity	1st Year	2nd Year	3rd Year	4th Year	5th Year	Total
392	4704000	Administrative costs	47040	47040	141120	141120	94080	470400
		Monitoring	0	0	0	47040	0	47040
		Evaluation	0	0	0	0	47040	47040
		Entry point activities	188160	0	0	0	0	188160
		Institution and capacity building	0	235200	0	0	0	235200
		Detailed project report	47040	0	0	0	0	47040
		Watershed development works	0	376320	752640	799680	705600	2634240
		Livelihood activities for the asset less persons	0	0	141120	235200	47040	423360

		Production system and micro enterprises	0	0	141120	188160	141120	470400
		Consolidation phase	0	0	0	0	141120	141120
		Total	**282240**	**658560**	**1176000**	**1411200**	**1176000**	**4704000**
		Percentage of total cost	**6%**	**14%**	**25%**	**30%**	**25%**	**100%**

MICRO WATERSHED WISE/COMPONENT WISE PHASING

YEAR WISE BUDGET PHASING UNDER IWMP

Area in Hectares and Funds in Rs.

Table 7. PHASING YEAR WISE (Name of the Micro Watershed: Sham Nagar)

(BUDGET AT A GLANCE)

Effective Area	**Funds Available**	**Name of activity**	**1st Year**	**2nd Year**	**3rd Year**	**4th Year**	**5th Year**	**Total**
370	4440000	Administrative costs	44400	44400	133200	133200	88800	444000
		Monitoring	0	0	0	44400	0	44400
		Evaluation	0	0	0	0	44400	44400

		Entry point activities	177600	0	0	0	0	177600
		Institution and capacity building	0	222000	0	0	0	222000
		Detailed project report	44400	0	0	0	0	44400
		Watershed development works	0	355200	710400	754800	666000	2486400
		Livelihood activities for the asset less persons	0	0	133200	222000	44400	399600
		Production system and micro enterprises	0	0	133200	177600	133200	444000
		Consolidation phase	0	0	0	0	133200	133200
		Total	**266400**	**621600**	**1110000**	**1332000**	**1110000**	**4440000**
		Percentage of total cost	**6%**	**14%**	**25%**	**30%**	**25%**	**100%**

MICRO WATERSHED WISE/COMPONENT WISE PHASING

YEAR WISE BUDGET PHASING UNDER IWMP

Area in Hectares and Funds in Rs.

Table 8. PHASING YEAR WISE (Name of the Micro Watershed: Dahina A)

(BUDGET AT A GLANCE)

Effective Area	Funds Available	Name of activity	1st Year	2nd Year	3rd Year	4th Year	5th Year	Total
673	8076000	Administrative costs	80760	80760	242280	242280	161520	807600
		Monitoring	0	0	0	80760	0	80760
		Evaluation	0	0	0	0	80760	80760
		Entry point activities	323040	0	0	0	0	323040
		Institution and capacity building	0	403800	0	0	0	403800
		Detailed project report	80760	0	0	0	0	80760
		Watershed development works	0	646080	1292160	1372920	1211400	4522560
		Livelihood activities for the asset less persons	0	0	242280	403800	80760	726840
		Production system and micro enterprises	0	0	242280	323040	242280	807600
		Consolidation phase	0	0	0	0	242280	242280
		Total	**484560**	**1130640**	**2019000**	**2422800**	**2019000**	**8076000**
		Percentage of total	**6%**	**14%**	**25%**	**30%**	**25%**	**100%**

		cost						

MICRO WATERSHED WISE/COMPONENT WISE PHASING

YEAR WISE BUDGET PHASING UNDER IWMP

Area in Hectares and Funds in Rs.

Table 9. PHASING YEAR WISE (Name of the Micro Watershed: Dahina B)

(BUDGET AT A GLANCE)

Effective Area	Funds Available	Name of activity	1st Year	2nd Year	3rd Year	4th Year	5th Year	Total
673	8076000	Administrative costs	80760	80760	242280	242280	161520	807600
		Monitoring	0	0	0	80760	0	80760
		Evaluation	0	0	0	0	80760	80760
		Entry point activities	323040	0	0	0	0	323040
		Institution and capacity building	0	403800	0	0	0	403800

		Detailed project report	80760	0	0	0	0	80760
		Watershed development works	0	646080	1292160	1372920	1211400	4522560
		Livelihood activities for the asset less persons	0	0	242280	403800	80760	726840
		Production system and micro enterprises	0	0	242280	323040	242280	807600
		Consolidation phase	0	0	0	0	242280	242280
		Total	**484560**	**1130640**	**2019000**	**2422800**	**2019000**	**8076000**
		Percentage of total cost	**6%**	**14%**	**25%**	**30%**	**25%**	**100%**

MICRO WATERSHED WISE/COMPONENT WISE PHASING

YEAR WISE BUDGET PHASING UNDER IWMP

Area in Hectares and Funds in Rs.

Table 10. PHASING YEAR WISE (Name of the Micro Watershed: Lissan)

(BUDGET AT A GLANCE)

Effective Area	Funds Available	Name of activity	1st Year	2nd Year	3rd Year	4th Year	5th Year	Total
770	9240000	Administrative costs	92400	92400	277200	277200	184800	924000
		Monitoring	0	0	0	92400	0	92400
		Evaluation	0	0	0	0	92400	92400
		Entry point activities	369600	0	0	0	0	369600
		Institution and capacity building	0	462000	0	0	0	462000
		Detailed project report	92400	0	0	0	0	92400
		Watershed development works	0	739200	1478400	1570800	1386000	5174400
		Livelihood activities for the asset less persons	0	0	277200	462000	92400	831600
		Production system and micro enterprises	0	0	277200	369600	277200	924000
		Consolidation phase	0	0	0	0	277200	277200
		Total	**554400**	**1293600**	**2310000**	**2772000**	**2310000**	**9240000**
		Percentage of total cost	**6%**	**14%**	**25%**	**30%**	**25%**	**100%**

MICRO WATERSHED WISE/COMPONENT WISE PHASING

YEAR WISE BUDGET PHASING UNDER IWMP

Area in Hectares and Funds in Rs.

Table 11. PHASING YEAR WISE (Name of the Micro Watershed: Dakhora)

(BUDGET AT A GLANCE)

Effective Area	Funds Available	Name of activity	1st Year	2nd Year	3rd Year	4th Year	5th Year	Total
330	3960000	Administrative costs	39600	39600	118800	118800	79200	396000
		Monitoring	0	0	0	39600	0	39600
		Evaluation	0	0	0	0	39600	39600
		Entry point activities	158400	0	0	0	0	158400
		Institution and capacity building	0	198000	0	0	0	198000
		Detailed project report	39600	0	0	0	0	39600
		Watershed development works	0	316800	633600	673200	594000	2217600

		Livelihood activities for the asset less persons	0	0	118800	198000	39600	356400
		Production system and micro enterprises	0	0	118800	158400	118800	396000
		Consolidation phase	0	0	0	0	118800	118800
		Total	**237600**	**554400**	**990000**	**1188000**	**990000**	**3960000**
		Percentage of total cost	**6%**	**14%**	**25%**	**30%**	**25%**	**100%**

CHAPTER – 6

PREPARATORY PHASES

During the first year, all activities involved by adopting participatory approach and empowerment of local institutions (WC, SHG, and UG). WAPCOS team assumed the role of facilitator during this phase. In this phase, the main activities are as follows:

6.1 AWARENESS GENERATION AND MOTIVATION FOR PARTICIPATION

Fortunately, due to the implementation of earlier watershed management projects and operation of various ongoing soil and water conservation schemes, there has been regular interaction of the departmental staff with the community. Because of positive result of earlier projects, people are responsive and are looking forward for projects intervention. The need for the soil and water conservation works have emerged due to persistent draught, which the area is facing. However, production system need lot of improvement and hence the need of awareness generation and motivation for collective efforts to face the malady of recurrent floods and draught.

6.1.1 Collection of Base Line Data and Hydrological Data

As explained earlier, baseline data from all possible sources is collected for the purpose of not only future impact assessment but also to design project intervention. Most of this was done at the PPR and DPR stages, which forms integral part of the preparatory phase. In addition, data on rain fall amount and distribution, weather conditions and frequency of floods and drought was compiled at DPR stage.

6.1.2 Formation of Village Level Institutions

It has been decided by the state that project activities shall be implemented throughout the watershed committees (WCs). In collaboration with the department, the village level WCs were formed by holding well-attended meeting in which all settlement and section of the society were represented. Due representation was given to women, landless and BPL families as per norms issued by DoLR.

The self- Help Groups were formed during earlier projects but most of them are inactive and non – functional. Those groups will be revived and new ones were formed depending upon willingness of the interest groups. The type of activities these groups want pursue and their capacity building requirements were noted.

6.1.3 Preparation of DPR

PRA exercise and comprehensive data base have been carried out for DPR preparation. Meetings were held at district, micro-watershed wise and village wise with the lined departments and members of Gram Sabha on this aspect**.** The Draft Project Report was prepared on the basic information generated from primary and secondary sources. This also includes the outcome of participatory rural appraisal and outcome of transect walk and stakeholders' discussions. A list of scope of works that finally emerged was prepared. Based on the technical survey, detailed cost estimates were prepared for components including resource management, entry point activities and production system. A broad frame work for capacity building at all levels as per the guidelines of DoLR was prepared. The livelihood opportunities which emerged from local product and market facility were analyzed and outlines of the same were included. Since the financial provisions were decided according to the area proposed to be covered, these provisions were distributed across project activities. The project activities are sequenced into three phase's namely preparatory phase, work phase, consolidation and withdrawal phase. So, the activities were segregated in the sequence and explained in detail. Finally the details about budget and its spilt up into annual action plan were also attempted. Various maps using GIS were created likes Base map, Present Land Use, Geo-

hydrological, Micro Watershed, Drainage, Contours, Slope, Soil Classification, Soil fertility status, Land Capability Classification, Ground Water depth and Quality, Proposed and existing Activities of works. All the works proposed in the DPR are location specific and are as per the local demand and socio- economic conditions of the watersheds.

Strength, Weakness, Opportunities, Threat (SWOT) analysis of IWMP

A critical analysis of main strength of the proposed project, evident weaknesses, opportunities available for successful implementation and scope of achieving set objectives was made. Attention is also paid to possible threat against which sufficient inbuilt safeguards are provided. Such an analysis was done for the project in hand and summaries of observations were made and are mentioned below in all six watersheds in Rewari district.

Strengths

- Moderate rain fall
- Strong linkage with national and state level institutes and KGK for capacity building and technical guidance.
- Most families are engaged in animal husbandry activities.
- Availability of drinking water.
- Good response to earlier watershed management programmes.
- Local residents are active in micro enterprises.

Weaknesses

- Erratic rainfall
- Lack of good quality fodder.
- Lack of advanced cattle breed.

- Low level of milk production.
- Lack of knowledge base regarding scientific cattle management.
- Prevalence of soil erosion
- No organized micro enterprises activities.
- Lack of technical skills.

Opportunities

- Rain Water harvesting/recharging for production.
- Promotion of organic farming.
- Promotion of horticultural activities (dry land plants).
- Provide training on dairy farming and other income generating activities.
- Promotion of nursery raising and pasture development.
- There would be horizontal integration and convergence of development programmes being organized and run by govt.

Threats

There are few negative issues that may have adverse effect

- Unreliable rainfall.
- Absence of assured irrigation.
- Lack of cooperation and contribution from local residents.
- Low literacy rate in the project area.
- Rapid climate change affecting crops.
- Lack of awareness of Dairy farming as a commercial activity.
- The area is underlain by marginal to saline ground water.
- Frequent droughts.

CAPACITY BUILDING- 5%

Rs. 30, 35, 400/-

6.2 Capacity Building

1. Introduction

Watershed development is conceived as a strategy for protecting livelihoods of people inhabiting fragile ecosystems, which over period of time have become subject to multidimensional land degradation. Main stress has been to ensure availability of water for drinking and irrigation to support agro-horti-forestry operation vis-à-vis raise income level and provide adequate employment opportunities for communities living in such areas of concerns. As an intervention Integrated Wasteland Development is nearly 20 years old. The initiatives have been subject to periodic reviews by expert committees with a broader view to improve upon its strategy and components as well as match with the growing socio-ecological requirements

Para 9.VIII of common guidelines necessitate capacity building and training of all functionaries and stakeholders involved watershed programme on a war footing with definite action plan, requisite professionalism and all round competence.

2. Vision

A sincere effort to provide required professionalism and competence to the stakeholders associated with planning and implementation of IWMP in the state. This would include organisation development, human resource development, cooperation and network development and institutional development, all seen as a continuous process enabling functionaries to enhance their knowledge and skills and to develop the required orientation and perspectives thereby becoming more effective in discharging their roles and responsibilities.

3. Need

The term Capacity Development is understood as the development of peoples, organizations and societies' capability to manage resources effectively and efficiently in order to realize their own goals on a sustainable basis. In this context, four dimensions have to be distinguished:

- The development of the human resource or personnel development.
- The strengthening of the effectiveness and efficiency of organization or organizational development.
- The strengthening of cooperation between organizations and network development.
- The promotion of institutional frameworks for development.

Further, already 47 projects sanctioned in 2011-2012 in the state covering around 248 micro watersheds measuring 179531 hectares of area. The implementation of these new projects under the umbrella of common guidelines is reported to be in the initial stage under preparatory phase. The establishment of desired institutional setup at all levels, required level of awareness for ensuring effectiveness of all institutions and community participation is therefore necessitated for conclusive participation by all.

This also necessitates a comprehensive package to provide appropriate knowledge for speedy implementation of the projects in the state particularly in the districts.

4. Rationale

Para 81 of common guidelines for watershed development lays special emphasis on the following key elements of Capacity building strategy.

- Dedicated & decentralized institutional support & delivery mechanism
- Annual Action Plan for Capacity Building
- Pool of resource persons
- Well prepared training modules and reading materials
- Mechanism for effective monitoring and follow-up.

Keeping in firsthand experience of the state in launching 47 projects under IWMP and current state of planning and implementation under preparatory phase the current action plan is primarily prepared to build the capacity of different principal stakeholders of projects to speed up further implementation and also lay a strong foundation for subsequent phases.

5. Objectives

The main objectives of the current action plan for ongoing 47 projects are outlined as follows:-

- Create common understanding on different features and provisions of common guidelines as well as instructions directions issued from time to time by Central and State Governmental agencies.
- Develop proper conceptual understanding about integrated participatory watershed management including other issues such as equity, environmental and social sustainability among all implementing agencies at project and village levels, PRIs and local communities (**KNOWLEDGE**).
- Build necessary and required skills and managerial competence of all stakeholders about planning, implementation and management of various project activities using participatory approach (**SKILLS**).
- Help institutional growth of watershed committees at GP level.
- Strengthening community participation, ensuring positive involvement of communities and improvement of socio economic conditions in watershed areas (**ATTITUDES**).

Table 1. Statement of Targets under Proposed Training Action Plan at Micro Watershed Level to be conducted by WDT members of Rewari District

Sl. No.	Title of Training Programme and Duration	Level of Participants	Total persons	Trainees Per Programme	Number of Programmes
01	District Level Sensitization Workshop for Watershed Committees. **One Day**				
	Rewari	Members of Watershed Committees @ 10 per committee would also include accompanying WDT Members.	770	300-350	2

02	Block Level Functional Programmes for Secretaries of Watershed Committees. **Two Days**				
	Rewari	Secretaries of Village Watershed Committees	77	35-40	2
03	Project Level Sensitization Camps for WC **One Days**				
	Rewari	Members of Watershed Committees @ 10 Persons (Tentative) per WC	770	50	15
04	Village Level Awareness Camps on IWMP at Micro Watershed Level for User Groups **One Day**				
	Rewari	Approximately 50 prospective user groups per micro watershed.	2150	50	43
05	Block Level Functional Programmes for SHGs [Leader, Secretary and Treasurer] under IWMP **One Day**				
	Rewari	Three persons (Leader, Secretary and Treasurer) per Self Help Group @ around one SHG per village.	231	50	5

Note: Training programmes under Sl. No. 01 are proposed to be conducted by HIRD in collaboration with SLNA and WCDCs.

6. Training Methods

A group of selected Watershed Development Team members would be trained on various methods to ensure that they are able to conduct the proposed interventions effectively with the help of some of the following methods.

- Interactive learning.
- Experience Sharing.
- Experimental Learning.
- Presentation of case studies.
- Classroom deliberations.
- Group [structured] exercises and discussions.

7. Tools

- Projectors
- Flip Charts
- Electronic films
- Print Material
- Other IEC material.

8. Resource Persons

8.1. Internal

Around two persons per WDT identified from the initial training activities by HIRD, Nilokheri would be trained on various aspects for designing and conducting the training programmes. It is expected that each WDT members would be required to function as a internal resource person for the proposed training programmes. Technical experts from each WCDC and PIA would also function as facilitators in the proposed training activities.

8.2. External

Further, in order to make the proposed interventions meaningful for achieving the broader objectives efforts would be made to liaison with various experts from district level line departments, agencies and state level institutions including HIRD as per the need of the programme.

9. Fund Requirement

The **approved revised norms for training for PRIs and RD functionaries" by MoRD, GoI in 2010** have been strictly used [for fixed and variable costs].

Table 2. Statement showing funds Requirement for training on IWMP in Haryana (Preparatory Phase – District Level)

Sr. No	Training Programmes for SLNA, WDT, PIA , Field Functionary , WDC member's , SHG & UG organize by HIRD	Total Funds
1	District Level Sensitization Workshop(s) for Watershed Committees	57473
2	Block Level Functional Programmes for Secretaries of Watershed Committees. Two Days	10662
3	Village Level Sensitization Camps for WC One Days	54571
4	Village Level Awareness Camps on IWMP at Micro Watershed Level for Prospective User Groups One Day	70201
5	Block Level Functional Programmes for SHGs [Leader, Secretary and Treasurer] under IWMP One Day	21848
	Total	**214755**

Table 3. Micro Watershed Wise Exposure cum training Visit for SLNA, WDT, PIA , Field Functionary , WDC, SHG & UG Members of IWMP I (Rewari)

S. No.	Target Group	Training Topics	No. of days	Budget per camp	No. of Camps	No. of Participants per camp	Cost for all participants per day	Cost per participant/ per day	Cost per person	Total Budget
1	Self Help Groups-2 SHGs- micro watershed level	Orientation on IWMP, SHGs cum Exposure Visit	2	14000	5	10	7000	700	2100	105000
2	User groups from each micro watershed	NRM, Post Project Management etc. –Exposure	2	14000	5	10	7000	700	2100	105000

S. No.	Target Group	Training Topics	No. of days	Budget per camp	No. of Camps	No. of Participants per camp	Cost for all participants per day	Cost per participant/ per day	Cost per person	Total Budget
		Visit								
3	Sub watershed Level- WDT Members	Part II-Module I to V-Exposure Visit Outside State- Conceptual, Technical, Social, Management of Finance, Monitoring and Evaluation.	4	60000	5	10	15000	1500	4500	225000
4	Sub watershed Level- PIA Members	Exposure Visit-Within Fundamentals of Watershed, Finance Management, Final Report on WDP etc	2	14000	5	10	7000	700	4500	225000
5	District Level-WDC	Exposure visit to successful watershed/ University.	2	14000	5	10	7000	700	1400	70000
6	District Level-Line Deptt., WDC	Exposure visit to successful watersheds	2	14000	5	10	7000	700	1400	70000

S. No.	Target Group	Training Topics	No. of days	Budget per camp	No. of Camps	No. of Participants per camp	Cost for all participants per day	Cost per participant/ per day	Cost per person	Total Budget
		within state.								
7	SLNA and District Level Controlling Officers	Exposure visit to successful watersheds outside state	4	60000	5	10	15000	1500	6000	300000
Total										**1100000**

Table 4. Farmer's / Beneficiaries training camps with Extension Programmes of IWMP I (Rewari)

S. No.	District	No. Micro watersheds	No. of Camps/ Year/ Micro watershed	Total No. of camps per Year	Total No. of camps for 5 Year's	Amount of per Camp	Amount per Micro watershed	Total Budget
1.	Farmer Training Camp in each season	10	2	20	100	12,000	2,40,000	12,00,000
2.	Propaganda & Documentation (Puppet show, documentary movies show, video-graphy, Photography, wall Painting, Display Board, pamphlets, leaf lets. Etc)	10	2	20	100	5000	1,00,000	5,00,000

3	Contingency charges							20645
	Total							**1720645**

i) **Training Programmes for SLNA, WDT, PIA , Field Functionary , WDC member's , SHG & UG organize by HIRD = Rs. 2,14,755/-**

ii) **Micro Watershed Wise Exposure cum training Visit For SLNA, WDT, PIA , Field Functionary , WDC, SHG & UG Members**
= Rs. 11, 00,000/-

iii) **Farmer's / Beneficiaries training camps with Extension Program's = Rs. 17,20,645/-**

Grand Total = Rs. 30, 35,400/-

6.2.1. EXPECTED OUTCOME OF CAPACITY BUILDING

- All principal stakeholders would be covered under proposed training interventions by March, 2013.
- The knowledge level of different stakeholders on various provisions of Common Guidelines will increase to a significant level.
- The skill level of the principal stakeholders will be improved in managing watershed projects in consonance with the provisions of common guidelines and state government instructions.
- The programmes will help in ensuring that all stakeholders/agencies/institutions work with positive attitudes in order to utilize the benefit of the projects in fulfilling the objectives set forth.
- Programmes will create a sense of responsible partnership amongst various stakeholders.
- The programmes will also help in further identifying areas for future interventions.
- Improved participation of different stakeholders leading to speedy implementation of watershed development work phase.
- Experiences would help in consolidating other gaps for better planning and management of Capacity Building and Training interventions under new projects in future.

6.3 Entry Point Activities 4%

EPA activities are taken up under the watershed to build rapport with village community at the beginning of the project, generally certain important works which are in urgent demand of the local community are taken up. A group discussion was conducted in the Gram Sabha meeting/watershed committee regarding EPA activities. It was conveyed to the Gram Sabha that an amount of **Rs. 24, 28,320/-** was provided for EPA. The provision of IEC material for community will be met under EPA. The stake holders discussed the various activities which they felt is important but after the discussion the following activities were finalized. The convergence with the other project can also be undertaken.

Table 5. Entry Point Activities in Jhal Watershed (IWMP I)

(Rs. In Lacs)

Sr.No.	Block	Name of Project	No. of EPAs Identified	No. of EPAs Completed	No. of EPAs in progress	Name/Nature of EPA	Location	Expenditure
1.	Nahar	IWMP-I (Jhal Watershed)	9	9	Nil	R/Wall	Jhal	4.30
						R/Wall	Sudhrana	1.90
						R/Wall	Juddi	1.75
						R/Wall	Gujjarwas	1.65
						Ramp/Inlet	Surheli	1.90
						R/Wall	Shyam Nagar	1.66
	Jatusana					R/Wall	Dahina	6.00
						R/Wall	Lisan	3.69

Sr.No.	Block	Name of Project	No. of EPAs Identified	No. of EPAs Completed	No. of EPAs in progress	Name/Nature of EPA	Location	Expenditure
						R/Wall	Dakhora	1.38
						Total		**24.23**

Total project Cost @ 4%= Rs. 24, 28,320/-

CHAPTER- 7

WORK PHASE

7.1 WATERSHED DEVELOPMENT WORKS - 56%

The Works under the project have been identified after the detailed survey of the Project Area and discussions held with watershed development team members along with officers from other field like Agriculture, Horticulture and Animal Husbandry. Participatory approach has been adopted to identify the activities under the project. The detailed discussions were held with watershed committees and works identified along with villagers after making visits to identified sites. The works mainly relate to soil and water conservation activities like Water conveyance system, Strengthening of Water Conveyance Channel (Water Course in fields) (Water Saving Technology), Dug Out Pond (New/Renovation), Small Earthen Embankment with vegetative support, Earthen Embankment with pucca outlet, Ramp/Ghat Inlet and Outlet, Roof top rain water recharge structures, Community Water Storage Tanks etc. The proposed project proposals were presented in the Gram Sabha meeting as per the schedule and were approved with certain changes. The works thus identified are given in the attached sheets along with estimates – micro watershed wise.

Natural Resource Management

There are no large/ deep gullies in the area because most of the area is nearly level, however at few places near sand dunes where slopes are nearly level, rills with complex slope have been formed which need specific treatment like construction of earthen embankments with pucca outlet.

The project area having small or large old ponds which have been silted up and needs strengthening. The land holding is small and any loss of land nearby area would be loss to the farmer. Under the IWDP/ Haryali some works like construction/renovation of farm ponds, small earthen embankment with vegetative support has been undertaken but still at few places inlet of the ponds and outlet needs to be constructed. So there repair and renovation is proposed. During the discussion it was felt to be genuine demand for repair, renovation and capacity enhancement of ponds in the area.

Proposed System: Run-off from upper area shall be reduced by a- forestation and other soil conservation measures which would also recharge the aquifer. As per need, retaining walls are proposed at strategic locations to protect the farm lands and bank of ponds. The diversion bund along state boundary in south to divert run-off to wasteland/ village pond which is almost dry in the non-monsoon period.

Proposed Activity: Renovation and, construction of new ponds. The provision for construction of Water Channel, inlet, outlet, ramp and retaining walls are the basic need by project stakeholders which has been provided. In some villages, the constructions of new ponds are proposed, subject to availability of funds. In summer months, it is widely held that buffaloes must spend 3 to 4 hours in pond for cooling which save the animal from heat stress. Hence, there was much demand of ponds renovation and repairs. Ponds as such are the best source of rainwater conservation and ground water recharge.

Gram Panchayats spend meger money on repair and renovation under different schemes but due to paucity of funds, works are taken up in piece meal and main work of retaining wall is ignored. The stakeholders gave high priority for the construction of retaining walls as lot of water was leaking from sides and cutting of banks by waves and animal intervention to reduce capacity of pond. In most villages, the first priority of the entire community is the construction of retaining walls of the ponds as these are considered sacred due to the presence of historic village temples nearby. Some of the works had been covered under entry point activities. It is also stressed to use the labor component from MGNREGA and material from provision from the IWMP so that maximum amount of rainwater is harvested.

7.2 Earthen Embankment

In order to conserve the rain water, the provisions of small earthen embankment have been provided along the field boundaries across the slope for in-situ moisture conservation. The diversion bund along state boundary in south to divert run-off to wasteland/ village pond which is almost dry in the non-monsoon period is proposed.

Suggested Interventions: In a number of villages, sites have been identified for in-situ moisture conservation and construction of embankments where village paths have got converted in to nalas due to severe erosion. The provision of earthen embankments besides being sustained source of water will help in checking further deterioration due to erosion in the project area.

This phase has been started after the completion of the preparatory phase is by and large complete. It is considered as the heart of the program in which the DPR proposals shall be implemented in participatory mode. In this watershed management program, it was planned to rehabilitate the degraded watersheds by the control of runoff and soil loss by biological and masonry works for conservation measures. In this water stressed project area, rainwater harvesting to reduce soil erosion, recharge ground water, improve moisture regime and use of harvesting water for human and livestock use. This was coupled with land development, production improvement, and promotion of subsidiary occupations for improved livelihoods. Many village ponds are silted, several are filled with filth and sewage water and giving foul smell. Repair renovation and retaining walls of village ponds has emerged as an important activity. The scope of integrated watershed regeneration/rehabilitation works which emerged from the PRA is now presented.

Sample estimates are as follows:

7.2.1 Activities under NRM (56%) Micro Watershed Wise (IWMP I Rewari) is given below and the proposed action plan/treatment plan map shown in **Annexure-X.**

Name of Project IWMP I Name of Watershed :Jhal Name of Village : Jhal							
Sr. No.	**Nature of Works**	**Location**	**Unit**	**No. of Works**		**Estimated Cost Rs. in Lacs.**	**Objective**
				Unit Cost (Rs. in Lacs)	**Phy.**		
1	Water conveyance system	From nearest minor to village pond	Mtr.	0.007	1000	7.00	To ensure availability of water in pond during lean period
2	Dug Out Pond (New/Renovation)	North side of village	No.	3	3	9.00	For ground water recharging & availability of water for village community animals.
3	Small Earthen Embankment with vegetative support	common Land and undulated Agriculture fields	100 Cum.	0.029	22449	6.51	For the control of soil erosion, in situ moisture conservation.
4	Earthen Embankment with pucca outlet	common Land and undulated Agriculture fields	No.	0.77+0.20=0.97	15	14.55	For the control of soil erosion, in situ moisture conservation.
5	Ramp/Ghat Inlet and Outlet	In village ponds	Cum	0.0326	145	4.73	For the control of soil erosion, in situ moisture conservation.
6	Roof top rain water recharge structure	Govt. School of village	No.	2	2	4.00	For the conservation of water and ground water recharging.
7	Agro Forestry/Afforestation	Boundary of Agriculture	Ha.	0.15	12	1.80	Increase biomass and additional income to the farmers

		fields					
8	Rainfed Horticulture	Boundary of Agriculture fields	Ha.	0.25	8	2.00	Proper utilization of uncultivated fields and additional income for farmers.
Total Cost						**49.59**	
Available Fund						**46.70**	
Convergence						**2.89**	

Name of Project IWMP I	**Name of Watershed :Jhal**		**Name of Village : Sudhrana**				
Sr. No.	**Nature of Works**	**Location**	**Unit**	**No. of Works**		**Estimated Cost Rs. in Lacs.**	**Objective**
				Phy.	**Unit Cost (Rs. in Lacs)**		
1	Dug Out Pond(New/Renovation)	North side of village	No.	3	3	9.00	For ground water recharging & availability of water for village community animals.
2	Ramp/Ghat Inlet and Outlet	In Village Pond	Cum	87	0.0326	2.84	For the control of soil erosion, in situ moisture conservation.
3	Roof top rain water recharge structure	Govt. School of village	No.	2	2	4.00	For the conservation of water and ground water recharging.

4	Earthen Embankment with pucca outlet	common Land and undulated Agriculture fields	No.	5	0.77+0.20=0.97	4.85	For the control of soil erosion, in situ moisture conservation.
5	Small Earthen Embankment with vegetative support	common Land and undulated Agriculture fields	100 Cum.	8656	0.029	2.51	For the control of soil erosion, in situ moisture conservation.
6	Strengthening of Water Conveyance Channel (Water Course in fields) (Water Saving Technology)	Agriculture Fields	Rmt.	0.013	500	6.50	Reduce loss of canal water during irrigation
7	Agro Forestry/Afforestation	Boundary of Agriculture fields	Ha.	5	0.15	0.75	Increase biomass and additional income to the farmers
8	Rainfed Horticulture	Boundary of Agriculture fields	Ha.	3	0.25	0.75	Proper utilization of uncultivated fields and additional income for farmers.
Total Cost						**31.20**	
Available Fund						**28.90**	
Convergence						**2.30**	

Name of Project IWMP I	**Name of Watershed : Jhal**		**Name of Village : Juddi**			
Sr. No.	**Nature of Works**	**Location**	**Unit**	**No. of Works**	**Estimated**	**Objective**

				Phy.	Unit Cost (Rs. in Lacs)	Cost Rs. in Lacs.	
1	Dug Out Pond(New/Renovation)	West side of village	No.	2	3	6.00	For ground water recharging & availability of water for village community animals.
2	Ramp/Ghat Inlet and Outlet	North to South West to East	Cum.	68	0.0326	2.22	For the control of soil erosion, in situ moisture conservation.
3	Water Conveyance System	Nahar minor to johri of the village	Meter	1500	0.007	10.50	To insured availability of water during lien period in ponds
4	Roof top rain water recharge structure	Govt. School of village	No.	2	2	4.00	For the conservation of water and ground water recharging.
5	Small Earthen Embankment with vegetative support	common Land and undulated Agriculture fields	100 Cum.	12742	0.029	3.69	For the control of soil erosion, in situ moisture conservation.
6	Agro Forestry	Boundary of Agriculture fields	Ha.	5	0.15	0.75	Increase biomass and additional income to the farmers
7	Rainfed Horticulture	Boundary of Agriculture fields	Ha.	3	0.25	0.75	Proper utilization of uncultivated fields and additional income for farmers.
Total Cost						**27.91**	
Available Fund						**25.13**	
Convergence						**2.78**	

Name of Project IWMP I	**Name of Watershed :Jhal**		**Name of Village : Gujjarwas**				
Sr. No.	**Nature of Works**	**Location**	**Unit**	**No. of Works**		**Estimated Cost Rs. in Lacs.**	**Objective**
				Phy.	**Unit Cost (Rs. in Lacs)**		
1	Dug Out Pond(New/Renovation)	North side of village	No.	1	3	3.00	For ground water recharging & availability of water for village community animals.
2	Ramp/Ghat Inlet and Outlet	In village pond	Cum	214	0.0326	6.98	For the control of soil erosion, in situ moisture conservation.
3	Water Conveyance System	Nahar minor to forest pond near shiv mandir	Meter	1200	0.007	8.40	To insured availability of water during lien period in ponds
4	Roof top rain water recharge structure	Govt. School of village	No.	2	2	4.00	For the conservation of water and ground water recharging.
5	Small Earthen Embankment with vegetative support	common Land and undulated Agriculture fields	100 Cum.	8545	0.029	2.48	For the control of soil erosion, in situ moisture conservation.
6	Agro Forestry/Afforestation	Boundary of Agriculture fields	Ha.	5	0.15	0.75	Increase biomass and additional income to the farmers
7	Rainfed Horticulture	Boundary of Agriculture fields	Ha.	2	0.25	0.50	Proper utilization of uncultivated fields and additional income for farmers.

Total Cost	**26.11**	
Available Fund	**23.65**	
Convergence	**2.46**	

Name of Project IWMP I Name of Watershed :Jhal Name of Village : Surheli

Sr. No.	Nature of Works	Location	Unit	No. of Works		Estimated Cost Rs. in Lacs.	Objective
				Phy.	Unit Cost (Rs. in Lacs)		
1	Dug Out Pond(New/Renovation)	North side of village	No.	2	3	6.00	For ground water recharging & availability of water for village community animals.
2	Water Conveyance System	Surheli minor to village pond	Meter	1000	0.007	7.00	To insured availability of water during lien period in ponds
3	Roof top rain water recharge structure	Govt. School of village	No.	2	2	4.00	For the conservation of water and ground water recharging.
4	Ramp/Ghat Inlet and Outlet	SC colony	Cum.	85	0.0326	2.77	For the control of soil erosion, in situ moisture conservation.
5	Small Earthen Embankment with vegetative support	common Land and undulated Agriculture fields	100 Cum.	7759	0.029	2.25	For the control of soil erosion, in situ moisture conservation.
6	Earthen Embankment with pucca outlet	common Land and undulated Agriculture	No.	5	0.77+0.20=0.97	4.85	For the control of soil erosion, in situ moisture conservation.

		fields					
7	Agro Forestry/Afforestation	Boundary of Agriculture fields	Ha.	10	0.15	1.50	Increase biomass and additional income to the farmers
8	Rainfed Horticulture	Boundary of Agriculture fields	Ha.	2	0.25	0.50	Proper utilization of uncultivated fields and additional income for farmers.
Total Cost						**28.87**	
Available Fund						**26.34**	
Convergence						**2.53**	

Name of Project IWMP I	**Name of Watershed :Jhal**		**Name of Village : Shyam Nagar**				
Sr. No.	**Nature of Works**	**Location**	**Unit**	**No. of Works**		**Estimated Cost Rs. in Lacs.**	**Objective**
				Phy.	**Unit Cost (Rs. in Lacs)**		
1	Dug Out Pond(New/Renovation)	North side of village	No.	2	3	6.00	For ground water recharging & availability of water for village community animals.
2	Ramp/Ghat Inlet and Outlet	North side of village	Cum.	86	0.0326	2.80	For the control of soil erosion, in situ moisture conservation.

3	Water Conveyance System	Surheli minor to village pond	Meter	1000	0.007	7.00	To insured availability of water during lien period in ponds
4	Roof top rain water recharge structure	Govt. School of village	No.	1	2	2.00	For the conservation of water and ground water recharging.
5	Small Earthen Embankment with vegetative support	common Land and undulated Agriculture fields	100 Cum.	7845	0.029	2.27	For the control of soil erosion, in situ moisture conservation.
6	Earthen Embankment with pucca outlet	common Land and undulated Agriculture fields	No.	5	0.77+0.20 =0.97	4.85	For the control of soil erosion, in situ moisture conservation.
7	Agro Forestry/Afforestation	Boundary of Agriculture fields	Ha.	4	0.15	0.60	Increase biomass and additional income to the farmers
8	Rainfed Horticulture	Boundary of Agriculture fields	Ha.	2	0.25	0.50	Proper utilization of uncultivated fields and additional income for farmers.
Total Cost						**26.02**	
Available Fund						**24.86**	
Convergence						**1.16**	

Name of Project IWMP I	**Name of Watershed :Jhal**		**Name of Village : Dahina**			
Sr. No.	**Nature of Works**	**Location**	**Unit**	**No. of Works**	**Estimated Cost**	**Objective**

				Phy.	Unit Cost (Rs. in Lacs)	Rs. in Lacs.	
2	Dug Out Pond/Renovation	North side of village	No.	4	3	12.00	For ground water recharging & availability of water for village community animals.
3	Roof top rain water recharge structure	Govt. School of village	No.	4	2	8.00	For the conservation of water and ground water recharging.
4	Small Earthen Embankment with vegetative support	common Land and undulated Agriculture fields	100 Cum.	23104	0.029	6.70	For the control of soil erosion, in situ moisture conservation.
5	Earthen Embankment with pucca outlet	common Land and undulated Agriculture fields	No.	15	0.77+0.20= 0.97	14.55	For the control of soil erosion, in situ moisture conservation.
6	Ramp/Ghat Inlet and Outlet	SC colony	Cum.	105	0.0326	3.42	For the control of soil erosion, in situ moisture conservation.
7	Community Water Storage Tank	In Agriculture Fields	No.	8	3	24.00	For Storage of surplus canal water for use during lean period
8	Strengthening of Water Conveyance Channel (Water Course in fields) (Water Saving Technology)	Agriculture Fields	Rmt.	0.013	1200	15.60	Reduce loss of canal water during irrigation
9	Agro Forestry/Afforestation	Boundary of Agriculture fields	Ha.	45	0.15	6.75	Increase biomass and additional income to the farmers

9	Rainfed Horticulture	Boundary of Agriculture fields	Ha.	10	0.25	2.50	Proper utilization of uncultivated fields and additional income for farmers.
Total Cost						**93.52**	
Available Fund						**90.45**	
Convergence						**3.07**	

Name of Project IWMP I	**Name of Watershed :Jhal**		**Name of Village : Lisan**				
Sr. No.	**Nature of Works**	**Location**	**Unit**	**No. of Works**		**Estimated Cost**	**Objective**
				Phy.	**Unit Cost (Rs. in Lacs)**	**Rs. in Lacs.**	
1	RCC pipe line	Replaced on amended old water channel	Meter	800	0.013	10.40	To avoid water losses during irrigation
2	Dug Out Pond (New/Renovation)	North side of village	No.	3	3	9.00	For ground water recharging & availability of water for village community animals.
3	Ramp/Ghat Inlet and Outlet	Near Panchayat Ghar	Cum.	151	0.0326	4.92	For the control of soil erosion, in situ moisture conservation.
4	Roof top rain water recharge structure	Govt. School of village	No.	2	2	4.00	For the conservation of water and ground water recharging.
5	Small Earthen Embankment with	common Land and undulated	100 Cum.	8104	0.029	2.35	For the control of soil erosion, in situ moisture conservation.

	vegetative support	Agriculture fields					
6	Earthen Embankment with pucca outlet	common Land and undulated Agriculture fields	No.	5	0.77+0.20=0.97	4.85	For the control of soil erosion, in situ moisture conservation.
7	Water Conveyance System	Minor to village pond	Mtr.	700	0.007	4.90	To insured availability of water during lien period in ponds
8	Community Water Storage Tank	In Agriculture Fields	No.	4	3	12.00	For Storage of surplus canal water for use during lean period
9	Rainfed/Horticulture	Boundary of Agriculture fields	Ha.	4	0.25	1.00	Proper utilization of uncultivated fields and additional income for farmers.
10	Agro Forestry/Afforestation	Boundary of Agriculture fields	Ha.	10	0.15	1.50	Increase biomass and additional income to the farmers
Total Cost						**54.92**	
Available Fund						**51.74**	
Convergence						**3.18**	

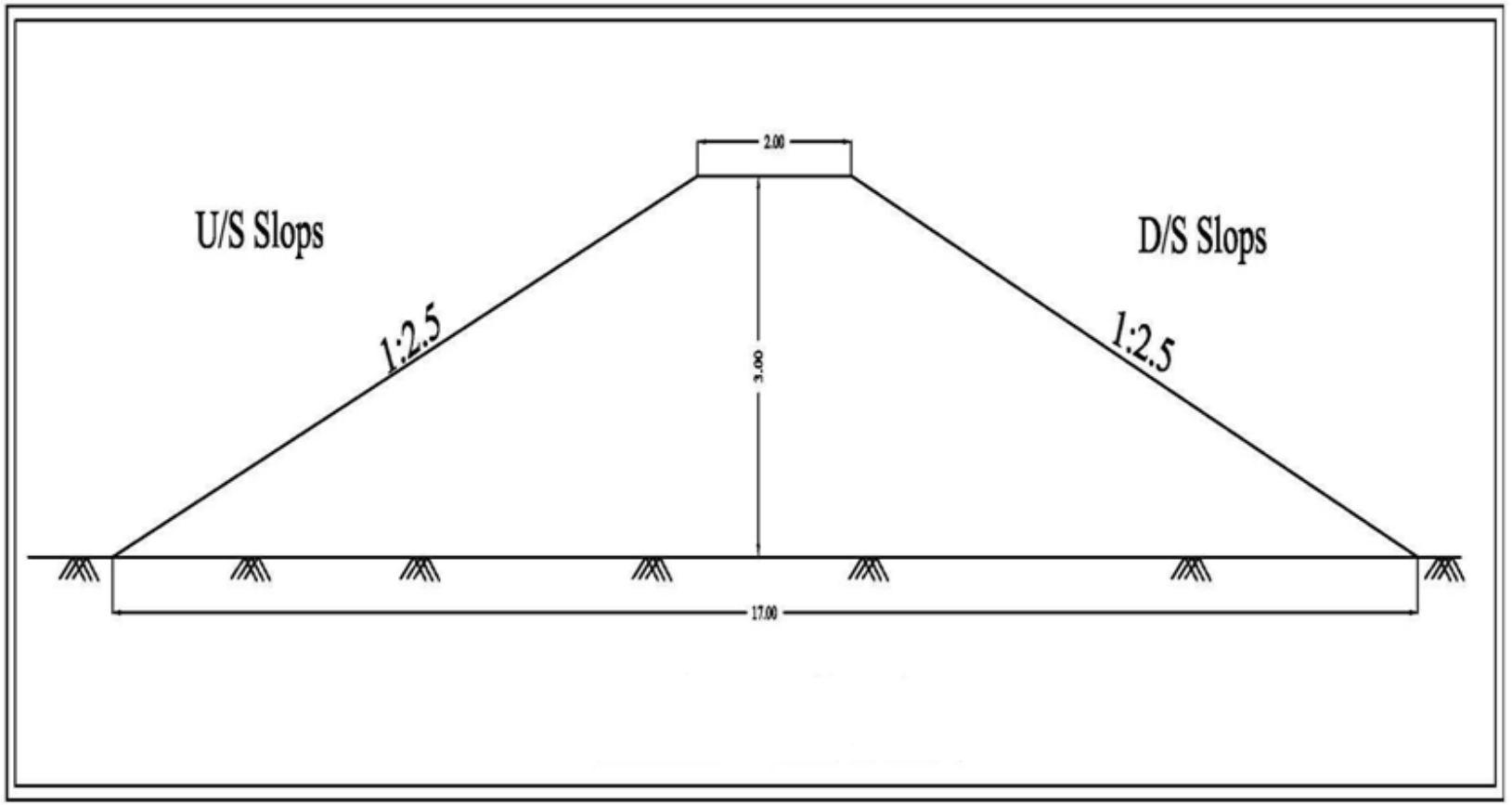
Name of Project IWMP I	**Name of Watershed :Jhal**		**Name of Village : Dakhora**				
Sr. No.	**Nature of Works**	**Location**	**Unit**	**No. of Works**		**Estimated Cost Rs. in Lacs.**	**Objective**
				Unit Cost (Rs. in Lacs)	**Phy.**		

1	Dug Out Pond (New/Renovation)	Near Panchayat Ghar	No.	3	2	6.00	For ground water recharging & availability of water for village community animals.
2	Ramp/Ghat Inlet and Outlet	Near Panchayat Ghar	Cum.	0.0326	64	2.09	For the control of soil erosion, in situ moisture conservation.
3	Roof top rain water recharge structure	Govt. School of village	No.	2	1	2.00	For the conservation of water and ground water recharging.
4	Earthen Embankment with pucca outlet	common Land and undulated Agriculture fields	No.	0.77+0.20=0.97	3	2.91	For the control of soil erosion, in situ moisture conservation.
5	Water Conveyance System	Oant minor to village pond	Mtr.	0.007	120	0.84	To insured availability of water during lien period in ponds
6	Small Earthen Embankment with vegetative support	common Land and undulated Agriculture fields	100 Cum	0.029	6345	1.84	For the control of soil erosion, in situ moisture conservation.
7	Strengthening of Water Conveyance Channel (Water Course in fields) (Water Saving Technology)	Agriculture Fields	Rmt.	0.013	500	6.50	Reduce loss of canal water during irrigation
8	Rainfed/Horticulture	Boundary of Agriculture fields	Ha.	0.25	4	1.00	Proper utilization of uncultivated fields and additional income for farmers.
9	Agro Forestry/Afforestation	Boundary of Agriculture fields	Ha.	0.15	10	1.50	Increase biomass and additional income to the farmers
Total Cost						**24.68**	

Available Fund	**22.18**	
Convergence	**2.50**	

Table 1. DETAILED ESTIMATE OF EARTHEN EMBANKMENT

	Let the Average length =	40 meters			
	Let the Average Height =	3.0 meters			
	Up Stream Slope =	1 : 2.5			
	Down Stream Slope =	1 : 2.5			



Earthen Embankment

Leads Statement :-					
Cross Section Area = (Base + Top) ÷ 2 x Height i.e {(17.00 +2.00) ÷ 2} x 3.00 = 28.50 Square meters					
Horizontal leads = (Base/2) + (Cross section area/ 2 x 0.6) i.e. (17.00/2) + [{28.50}/(2 x 0.6)] =32.25 meters					
Vertical leads = (Height +0.60) x 0.4 x 10 i.e. (3.00 +0.60) x 0.4 x 10 = 14.40 meters					
Total leads = 32.25 meters + 14.40 meters = 46.65 meters					
Number of leads = (46.65 - 15.00) / 7.5 = 4.22 leads Or Say 5 No. of Leads					
Area of Jungle Clearance :-					
Area to be covered by the body of Dam = Length x Average base i.e. 40.00 x 17.00 = 680.00 Sq. meters					
Area from where E/W is to be excavated = Av. Length x leads i.e. 40.00 x 46.65 = 1866.00 Sq. meters					
Total Area = 680.00 + 1866.00 =	2546.00	Sq. meters.			
Volume of Loose soil to be removed :-					
Area to be covered by the body of Dam X Depth of loose soil i.e (680.00 x 0.30) =				204.00	cum
Volume of Earthwork in bund filling :-					
(Cross Section Area X Length) + Loose soil to be removed i.e.(28.50 x 40.00)+ 204.00 =				1344.00	cum
ABSTRACT OF COST					
S.No.	**Item of Work**	**Quantity**	**Rate**	**Unit**	**Amount**

1	Jungle clearance including uprooting of rank vegetarian, grass, bush woods etc H.S.R.6.26	2546.00 sq.m	Rs.66.80 + 300% C. Prem. =267.20	100 sq.m	6802.91
2	Removal of loose soil up to 0.3 m below Natural surface level H.S.R. 6.2 (b)	204.00 cum	Rs.586.60 + 350% C. Prem.= 2639.70	100 cum	5384.99
3	E/work excavation for making embank-ment undressed including breaking of Clods. H.S.R. 6.2 (b)	1344.00 cum	Rs.586.60 + 350% C. Prem.= 2639.70	100 cum	35477.57
4	Extra for admixture for single or kanker Exceeding 30% but up to 40%. H.S.R. 6.2 (h) ii	1344.00 cum	Rs. 318.55 + 350% C. Prem.= 1433.48	100 cum	19265.97
5	Extra for every 7.5 meter additional lead beyond 60mt but up to 255 m by the animal or animal driven cart (5 leads) H.S.R. 6.2 (c) (ii)	1344.00 cum	[(15.00 x 5 No.)+ 350% C. Prem.= 337.50	100 cum	4536.00
6	Dressing of earthwork H.S.R. 6.3 (i)	1344.00 cum	Rs.45.90 + 350 % C. Prem.= 206.55	100 cum	2776.03
Total =					**74243.4712**
Add Contingency at the rate of 3% =					2227.30
Grand Total =					**76470.78**

Table. 2. Detail Estimate of Cement Stone Masonry Structure

S.No.	Description	No.	Length (mts)	Breadth (mts)	Height (mts)	Content (cums)
1	**Excavation of earthwork in foundation And plinth H.S.R 6.6**					
	Crest wall with extensions	1	8.00	2.00	1.20	19.20
	Side walls	2	1.50	1.00	1.20	3.60
	Wing walls	2	2.00	1.00	1.20	4.80
	Toe wall with extensions	1	6.00	1.00	1.20	7.20
	Appron	1	4.00	1.50	0.30	1.80
				Total =		**36.60**
2	**Cement concrete work 1 : 4 : 8 in the Foundation and plinth H.S.R 10.39**					
	Crest wall with extensions	1	8.00	1.70	0.20	2.72
	Side walls	2	1.50	0.70	0.20	0.42
	Wing walls	2	2.00	0.70	0.20	0.56
	Toe wall with extensions	1	6.00	0.70	0.20	0.84
	Appron	1	4.00	1.50	0.20	1.20
				Total =		**5.74**
3	**Square rubble stone masonry course1: 5 in foundation and plinth H.S.R 12.23**					
	Crest wall with extensions	1	8.00	(1.5+1.0)/2= 1.25	1.00	**10.00**

S.No.	Description	No.	Length (mts)	Breadth (mts)	Height (mts)	Content (cums)
	Side walls	2	1.50	0.50	1.00	**1.50**
	Wing walls	2	2.00	0.50	1.00	**2.00**
	Toe wall with extensions	1	6.00	0.50	1.00	**3.00**
				Total =		**16.50**
4	**Square rubble stone masonry course1: 5 above G.L. H.S.R 12.23 and 12.31**					
	Crest wall with extensions	1	8.00	(1.0+0.5)/2= 0.75	1.20	7.20
	Side walls	2	(1.5+2.0)/2= 1.75	0.50	(1.7+0.5)/2= 1.1	1.93
	Wing walls	2	2.00	0.50	1.70	3.40
	Toe wall with extensions	1	6.00	0.50	0.20	0.60
	Toe wall extensions	1	1.00	0.50	0.50	0.25
				Total =		**13.38**
5	**Cement concrete work 1 : 2 : 4 in the Foundation and plinth H.S.R 10.41**					
	On the top of crest wall	1	4.00	(1.0+0.5)/2= 0.75	0.05	0.15
	On the top of crest wall extensions	2	2.00	0.50	0.05	0.10
	On the top of side walls	2	1.50	0.50	0.05	0.08
	On the top of wing walls	2	2.00	0.50	0.05	0.10
	Toe wall with extensions	1	6.00	0.50	0.05	0.15
	Apron	1	4.00	1.50	0.10	0.60

S.No.	Description	No.	Length (mts)	Breadth (mts)	Height (mts)	Content (cums)
				Total =		**1.18**
6	**Cement plastering work 1:4 on the**					
	Crest wall both side	2	4.00	_	1.20	9.60
	Crest wall extensions	2 x 2	2.00	_	0.50	4.00
	Side walls	2	(1.5+2.0)/2= 1.75	_	(1.7+0.5)/2= 1.1	3.85
	Wing walls	2	2.00	_	1.70	6.80
	Toe wall with extensions	1	6.00	_	0.20	1.20
	Toe wall extensions	2 x 2	1.00	_	0.50	2.00
				Total =		**27.45**

Table. 3. MATERIAL STATEMENT AND COST OF MATERIAL

S.No.	Item of work Quantity	Cement	Sand	Stone blast	Bajri 20 mm	Stone boulders
	(cum)	(bags)	(cum)	(cum)	(cum)	(cum)
1	C.C work 1 : 4 : 8 5.74	19.516	2.7552	5.5104	_	_
2	Sq. stone masonry work 16.50	28.38	4.95	_	_	18.15
	1: 5 in foundation.					

3	Sq. stone masonry work 13.38	23.005	4.0125	_	_	14.7125
	1: 4 above ground level.					
4	C.C work 1 : 2 : 4 1.18	7.4025	0.517	_	1.034	_
5	C. plastering work 1 : 4 27.45 sqm	3.02	0.41	_	_	_
	Total =	**81.323**	**12.64645**	**5.5104**	**1.034**	**32.8625**
	Rates of material	245.00 per bag	950.00 per cum	965.00 per cum	985.00 per cum	945.00 per cum
	Cost of Materials	**19924**	**12014**	**5318**	**1018**	**31055**
	Total Cost of Materials =	**Rupees**	**69329**	**/-only**		

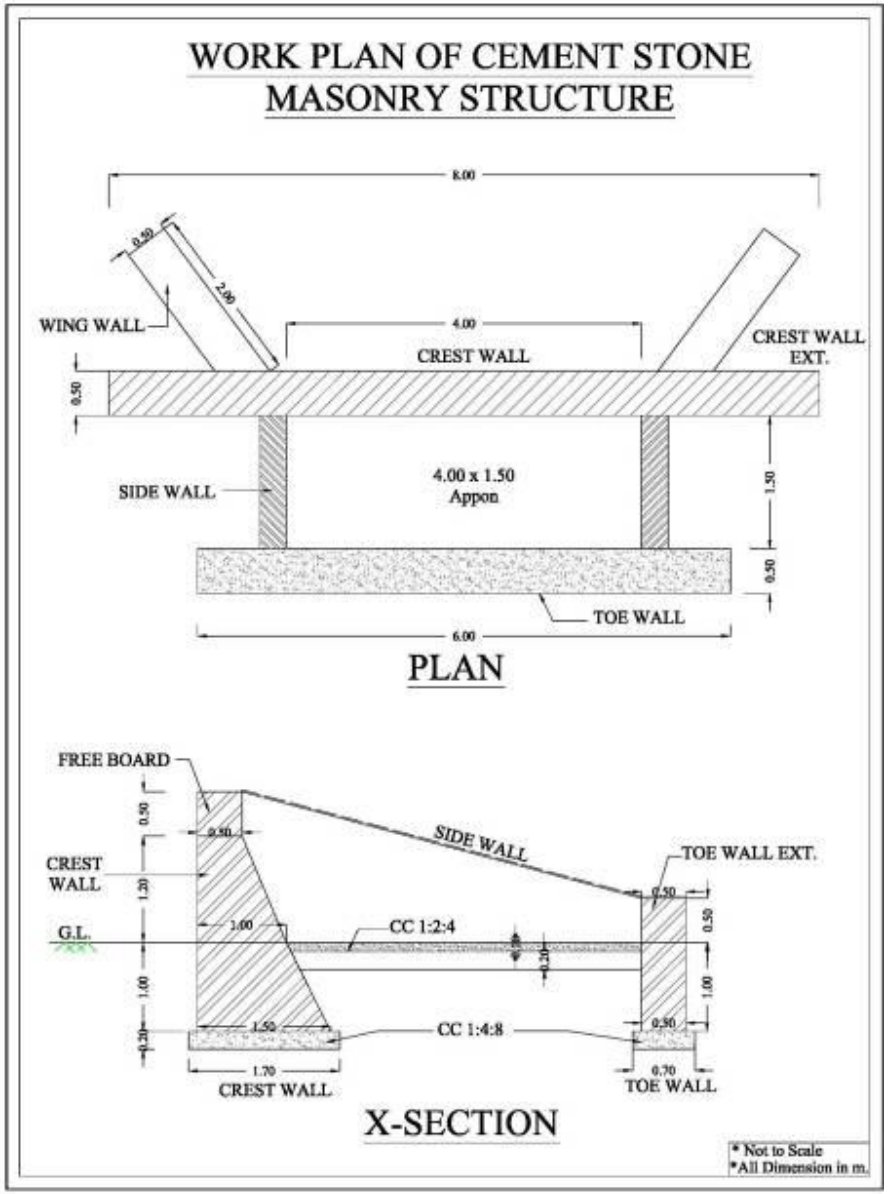
Table. 4. LABOUR COST

S. No.	**Item of work Quantity**		**Rate**	**Unit**	**Amount**
1	Excavation of earthwork in foundation and plinth H.S.R 6.6	36.60 cum	1108.10 +350% C. Prem. =4986.45	100 cum	**1825.04**
2	Cement concrete work 1 : 8 : 16 in the Foundation and plinth H.S.R 10.39	5.74 cum	64.95 +370% C. Prem. =305.27	cum	**1752.25**
3	Square rubble stone masonry course1: 5 in foundation and plinth H.S.R 12.23	16.50 cum	(160.35+26.00) +250% C. Prem. =652.22	cum	**10761.63**
4	Square rubble stone masonry course1: 5 above G.L. H.S.R 12.23 and 12.31	13.38 cum	(160.35+26.00+27.20) +200% Prem.=	cum	**9996.74**

S. No.	Item of work Quantity		Rate		Unit	Amount
			747.42			
5	Cement concrete work 1 : 2 : 4 in the Foundation and plinth H.S.R 10.41	1.18 cum	64.95 +370% C. Prem. =305.27		cum	**358.69**
6	Cement plastering work 1:4 on the stone walls H.S.R 15.5	27.45 sqm	5.50 +340 % C. Prem. =24.2		cum	**664.29**
	Total =	29.875 cum				**25358.64525**
					or say Rs.25359/- only	

Table. 5. ABSTRACT OF COST

Labour cost	25359.00
Cost of Materials as per detail attached	69329.00
Total =	**94688.00**
Add contingency at the rate of 3%	2841.00
Grand Total =	**97529.00**
Per cum Rate = 97529 /29.88 = 3264.02 or say Rs.3260/- only	



X-section of Masonry Structure

Table. 6. Detailed estimate of Pond

Detail Estimate of village Pond						
	Volume of Pond	=	A+AB+C x D			
			6			
		=	(50x50)+4(41x41)+(32x32)		X 3.00	
			6			
		=	5124 cum			
	Volume of Stone Pitching	=	Area X Depth/ Height			
		=	3824 X 0.15			
		=	423.60 cum			
			or say - 1461.55 cft.			
Leads Statement						
	Horizontal Leads	=	(length/2) +(cross section area/2 x 0.60)			
		=	80/2 + {(16.50 + 3)/2 x 2.25}/2 x0.60			
		=	61.94 mtr.			
	Vertical Leads	=	(Depth + Height) x 0.4 x 10			
		=	21.00 mtr.			
	Total Leads	=	{(61.94 + 21.00) - 15.00}/7.5			
		=	9 Leads			

Table. 7. Abstract of cost of estimate for Digging Village Pond

S.No.	Particulars	H.S.R. No.	Quantity	Rates	Unit	Amount
1	Excavation of earth work for digging of the vill. Pond	6.2 (b)	5124.00	2243.75	100 cum	114969.75
2	Extra for every 7.50 mtr. Additional lead upto 60 mtr. For 6 No. leads	6.2 (c')(i)	5124.00	496.29	100 cum	25429.90
3	Extra for admixture of shingle or Kanker upto 30%-40%		5124.00	1218.45	100 cum	62433.38
4	Extra for compaction in 25 cm layers but excluding rolling	6.2 (g_(i)	5124.00	260.48	100 cum	13347.00
5	Extra for watering in 25 cm layers as per specifications for compaction	6.2 (g_(ii)	5124.00	286.88	100 cum	14699.73
6	Extra for rolling in 25 cm layers as per specifications by sheep foot roller	6.2 (g)(v)	5124.00	401.62	100 cum	20579.01
					Total	**251458.76**
					Add. Contigency @2%	**5029.1753**
					Grand Total	**256487.94**
					Or say `	**2.60 Lac**

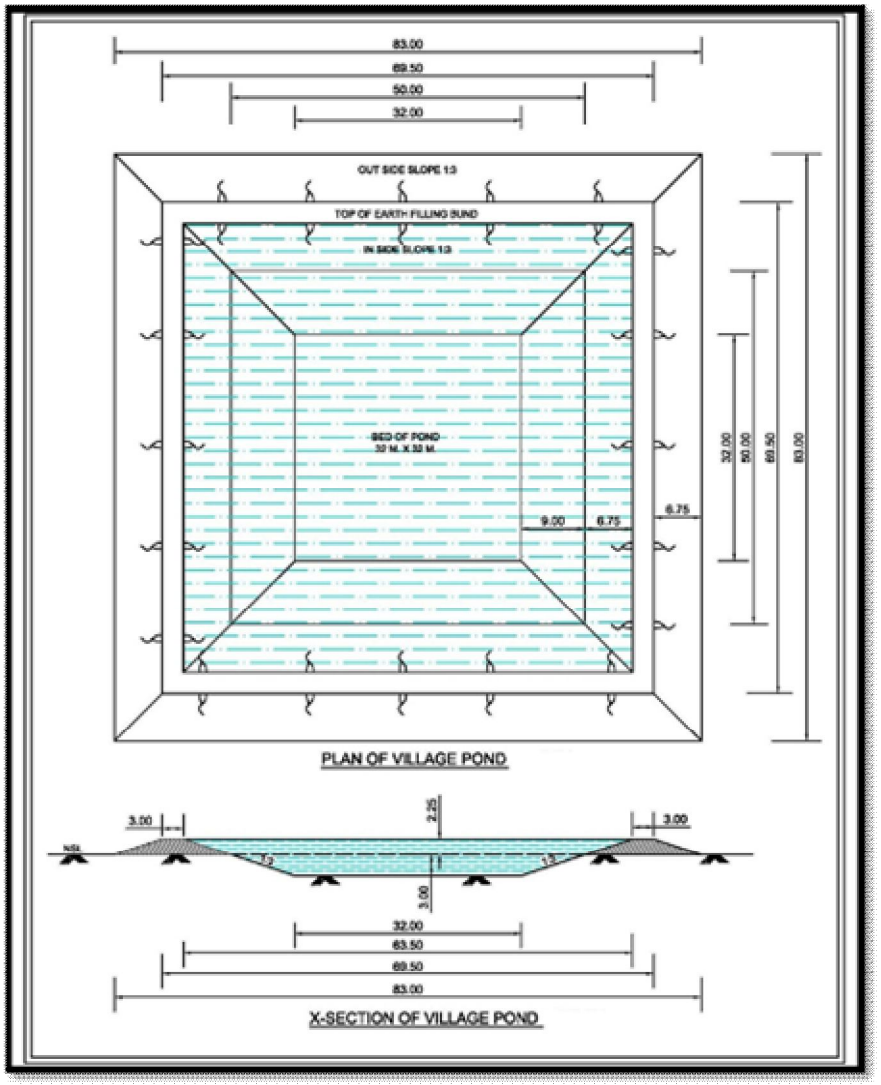

83.00
69.50
50.00
32.00
OUT SIDE SLOPE 1:3
TOP OF EARTH FILLING BUND
IN SIDE SLOPE 1:2
BED OF POND
32 M. X 32 M.
9.00
6.75
6.75
32.00
50.00
69.50
83.00
PLAN OF VILLAGE POND
3.00
2.25
3.00
NSL
3.00
32.00
63.50
69.50
83.00
X-SECTION OF VILLAGE POND

Table. 8. Estimate of Orchard Development in the Watersheds Per Hectare (Lemon, Kinnoo)

A. Horticulture

Sr. No.	Particulars	Quantity	Unit	Rate	Amount
1	Soil working 1m x 1m x 1m size pits (390 Nos.) including cost of refilling(At the distance 15'x15')	390.00	cum	36.66	14297.40
2	Application of Farmyard Manure, including cost			L.S.	750.00
3	Cost of fertiliser/ pesticide @250gm/plant			L.S.	750.00
4	Cost of plants (including 15% etc. for mortality) including transportation and planting	450.00	Nos.	15/Plant	6750.00
5	Casualty replacement @ 10% of item No. 4 & 5				465.00
6	Cost of 2 weedings and hoeing			1.00/Pant	540.00
7	Contingency and unforeseen (3%)				492.00
				Total	**24044.40**
				Say `	**24000.00**
	Maintenance cost 2nd year			**L.S.**	**1000.00**
	For next 5 years i.e. , ` 1000 x 5				**5000.00**
				Total	**30000.00**
				Say `	**30000.00**

Estimate of Orchard Development in the Watersheds Per Hectare (Guava ,Amla & Ber)

B. Horticulture

Sr. No.	Particulars	Quantity	Unit	Rate	Amount
1	Soil working 1m x 1m x 1m size pits (225 Nos.) including cost of refilling(At the distance 20'x20')	225.00	cum	36.66	8248.50
2	Application of Farmyard Manure, including cost			L.S.	450.00
3	Cost of fertiliser/ pesticide @250gm/plant			L.S.	450.00
4	Cost of plants (including 15% etc. for mortality) including transportation and planting	260.00	Nos.	30/Plant	7800.00
5	Casualty replacement @ 10% of item No. 4 & 5				465.00
6	Cost of 2 weedings and hoeing			1.00/Pant	540.00
7	Contingency and unforeseen (3%)				492.00
				Total	**18445.50**
				Say `	**18500.00**
8	Maintenance cost 2nd year			L.S.	**1000.00**
	For next 5 years i.e. , ` 1000 x 5				**5000.00**
				Total	**24500.00**
				Say `	**24500.00**

Table. 9. Estimate of Agro- Forestry/ Afforestation

Plantation Model						
Cost statement of 1 Ha. Of activities of Plantation for 1st year (wage rate Rs. 94.13/-)						
Sr. No.	**Item of work**	**Unit**	**Qty.**	**SOR**	**Man days**	**Cost**
B	**Nursery**					
i	Raising of Plants in nursery	Nos.	660	18	5601.00	**11880.00**
C	**Carriage**					
i	Loading/ Unloading of plants up to 100 mtr.	Nos.	605	21.18	1.36	128.139
ii	Multistage carriage of plants					
a)	By tractor up to 10 km.	Nos.	605	18.83	12.10	1139.22
c)	By manual labour in plantation area	Nos.	605	42.36	2.72	256.28
					Total	**1523.63**
D	**Planting**					
ii	Soil working for patch sowing	M3	31.25	61.18	20.31	1911.88
	500 x 0.50 x 0.50 x 0.25					
iii	Planting of seeding including 10% replacement 20 x 30 cm.	Nos.	550	188.26	10.99	1035.43
					Total	**2947.31**

E	**Cultural operations & chemical treatment**					
i	Fertilizer application	Nos.	500	9.41	0.50	47.05
ii	Insecticide application	Nos.	500	9.41	0.50	47.05
iii	First Weeding & hoeing	Nos.	500	141.2	7.5	706.00
vi	Subsequent weeding & hoeing two time	Nos.	1000	94.13	10.00	941.30
					Total	**1741.40**

G	**Material**					
ii	Spade and pick axes	----	----	----	----	135.00
iii	Basket/Bucket	----	----	----	----	135.00
v	Fertilizer	----	----	----	----	135.00
vi	Insecticide	----	----	----	----	270.00
					Total	**675.00**

	G. Total =	**18767.34**
	or Say =	**18767.00**

PRODUCTION SYSTEM- 10%

7.3 PRODUCTION SYSTEM

7.3.1 Crop Production

Present Status: Agriculture is the mainstay of the inhabitants of the project area which is mainly rainfed and people gamble with the uncertain rains. The fertility of the soil is very poor especially in available nitrogen and available phosphorous because the organic carbon contained in the soil is very low and the available potash in the soil is medium. Mustard, Wheat and Bajra are the main crops. Due to frequent droughts, crop failures are common, and yield levels are low. Farmers maintain fodder plants on the field bunds. Because of extensive damage by wildlife, farmers are gradually shifting towards dairy farming. But there is acute shortage of green and dry fodder. Still traditional farm practices are followed such as manual weeding and hoeing, use of desi ploughs and bullock power in tillage operations. The systematic and regular soil testing has not been done. Only farm yard manure is added to maintain yield levels. Food grains are hardly sufficient for 6 to 8 months with small farmers. Post-harvest gain storage, food processing and value addition techniques are not prevalent.

Scope of Improvement: There appears tremendous scope in improving production systems of the project area. The following practices are suggested for better harvests.

- Conservation farming concept based on getting highest yield per drop of water shall be introduced.
  This would also include better tillage practices for in-situ rain water conservation.
- Weather related contingent crop planning shall be introduced to reduce the impact of droughts.
- The varieties of wheat are old and shall be replaced with latest varieties.
- There is a good scope of introducing hybrid varieties of Bajra. Intercropping of Moong and Urad is suggested with Bajra.
- The application of fertilizers on soil test basis and minimum use of chemicals for weed and disease control shall be promoted.

- Farmers would be linked to farm advisory services and Krishi Vigyan Kendras.
- The dry land farming techniques should be adopted for better production.
- Agro-forestry with integration of trees like Neem, Acacia, Shisham would be promoted on large scale.
- Leguminous crops mainly Moong and mash short duration varieties needs to be introduced

7.3.2 Horticulture

Existing System: Ber, Amla and Guava are the most preferred fruit crop of the farmers and scattered plants of local citrus fruits are seen in farm lands. Some farmers have started raising Guava and Kinnow where irrigation facilities are available. Citrus fruits also raised but mostly for domestic use. Well organized marketing system in fruit plants.

Proposed System: The average annual rainfall is 702 mm in the project area. The project areas are well connected by roads and the economic condition of the locals can be improved by introducing improved cultural practices of fruit plants coupled with rain water harvesting and efficient use of water. Large number of farmers are interested to increase area under Guava, Ber and Kinnow requested for supply of good quality nursery raised plants. Several families have shown interest in raising Citrus fruits and Amla. The following activities are proposed to promote horticulture in the area.

- Supply of quality seedlings arranged from approved nurseries as per choice of farmers.
- Soil testing up to a depth of 180 cm depth to ensure suitability of soil for fruit plants.
- Proper back up technical support on orchard management by involving HAU Farm Advisory Service and department of horticulture.
- Appropriate safeguards from wildlife damage, frost damage and wind breaks.
- Arrangements for limited irrigation at least for first few years.
- Organizing SHGs around horticulture and joint purchase of inputs and marketing.

7.3.3 Vegetable cultivation

Present status: Vegetable cultivation as such for market purpose is not followed mainly because of the limitation of irrigation facilities. Most farmers raise vegetable crops in back yards for domestic use. Some poly houses have come up in the area with financial support from National Horticulture Mission and have started commercial cultivation of off season vegetables.

7.3.4 Promotion of Farm Forestry and Agro-forestry

Most of the privately owned non-arable the area is under mix of trees and bushes. Lantana, sarkanda and parthenium, the most obnoxious weeds have invaded such area.

- Planting of improved cultivars of Neem in the project as single rows on field bunds and also as blocks has been proposed to promote agro-forestry as an alternate source of income.

7.3.5 Livestock Improvement Including Fodder Production

Livestock rearing is the most important subsidiary occupation of the project villagers. In addition to selling milk for regular daily income, farm yard manure is most needed to maintain fertility and moisture retention of soils. Even landless families also maintain few numbers of animals. The animal breed improvement work was initiated in these villages under Aravali, DDP, DPAP projects and it is a regular program of the Animal Husbandry Department. However, the availability of animal health services at the door step is grossly lacking. The programs proposed under the project for livestock improvement include:

- In order to promote animal health care camps shall be organized and medicines for de-worming, mineral mixture shall be supplied in addition to awareness generation about prevention of animal diseases.
- Provision of quality seed of fodder crops and demonstration.

7.3.6 Marketing Arrangements and Proposal for Improvement

There is no organized system of marketing although market surplus is limited. The marketing of Wheat, Mustard and Bajra is not a problem because of fixed prices and government controlled procurement system. There is no organized system of marketing of vegetables and milk though both are source of income with many families.

The efforts through the project are made towards diversification of agriculture to include fruit and vegetable crops and dairy development. The transfer of area to these high value crops would depend on development of irrigation facilities, facilitation in input supplies, transfer of production technology, easy credit and market linkages. Efforts have been made to reactivate the non-functional SHGs and UGs. New watershed committees have been formed in each village. Farmers have shown interest in joint management of resources and join hands for processing, value addition and marketing.

Fortunately, the involvement of Rural Development Department means regular interaction with the district administration whose good offices would be used to involve rural banking institutions in funding support for SHGs, User Groups and other interest groups.

7.3.7 Detail of production system to be promoted

Based on the discussions during PRA, the scope of production systems was worked out and as per the provision of funds @ 10% of the budget, the following activities were finalized.

Table 10.Detail of Production System proposed to be promoted in the project village

S. No.	Particulars	Contents	No. of micro watersheds	No. of beneficiaries per micro watershed	No. of total beneficiaries	Cost per beneficiaries	Total
1	Agriculture	To introduce Summer Moong or Mash, gwar and groundnut as a third crop in bajra-wheat rotation. Supply of mini- kits to 40 farmers of each micro watershed/year @ Rs.200/ kit as assistance is provided.	10	400(farmers)	2000 (mini kits)	200 per mini kits	400000
	Agriculture	Application of farm inputs like Zinc Sulphate or Sulphur or weedicides or pesticides. 40 farmer of each micro watershed/ year @ Rs.200/ kits as assistance is provided.	10	400(farmers)	2000 (mini kits)	200 per mini kits	400000
	Agriculture	Supplying of Agriculture implements – 15 farmers (average) per micro watershed @ Rs. 1000/ units as assistance is provided.	10	150(farmers)	750	1000	750000
	Agriculture	Agro Forestry: Neem on 50% subsidy @ Rs. 10/ plant as assistance is provided.	10	5000(plants)	25000 plants	Rs. 10 per plant	250000
2	Horticulture	Potential for Grafted Horticulture plants. Supply of plants at 50 % cost share for cultivation of fruits like Citrus fruits, Guava, Amla, Ber floriculture and vegetables (especially, turmeric, garlic, onion and tomato)	10	500 plants	2500 plants	Rs.40 per plant	100000
	Horticulture	Kitchen gardening Packets distributed to 50 farmers in each micro watershed/ year @ Rs.25/ packet.	10	500	2500	Rs. 25 Per packet	62500
	Horticulture	Three units of Bee keeping in each micro watershed @ 3000/ unit as assistance are provided.	10	30	150	3000	450000
	Horticulture	One units of Vermi compost in each micro watershed per year @ Rs. 10000 per unit as	10	10	50	10000	500000

S. No.	Particulars	Contents	No. of micro watersheds	No. of beneficiaries per micro watershed	No. of total beneficiaries	Cost per beneficiaries	Total
		assistance is provided.					
3	Animal Husbandry	Problems being faced due to some diseases in the animals and low yield of milk. Production of free life saving medicines/ minerals for animals – the provision for 40 farmers of each micro watershed/year @ Rs.225 has been provided.	10	400	2000	225	450000
	Animal Husbandry	Livestock Management supply of feed supplements to improve health of cattle's. The provision to benefit 40 farmers of each micro watershed/year @ Rs.225 has been kept in the project proposals.	10	400	2000	225	450000
	Animal Husbandry	Supply of mini- kits of high yielding variety green fodder seeds to 20 farmers in each micro watershed/year @ Rs.200/- mini kits.	10	200(farmers)	1000 Seeds of mini kit	200 per mini kit of seeds	200000
4	Joint camps with Line Departments	Two training camps to beneficiaries on Proven technology in agriculture are provided (during pre kharif and rabi season).	10	20	100	20000	2000000
		Contingency					58300

Total: Rs. 6070800/-

Note. The development of Horticulture, Animal Husbandry and Agro forestry has limited scope because of scattered & small land holding, wild life problems and drought conditions. The National Horticulture Mission has already implementing various schemes in the project area. The beneficiaries are taking advantages under their ongoing schemes.

In order to manage the fodder scarcity the latest rain fed varieties of fodder crop will be introduced on the recommendation of experts of Haryana Agriculture University and Central Soil and Water Conservation Research Institute, Chandigarh. Necessary provision for organizing the various training programme / exposure visits has been provided in the Capacity Building activity.

7.3.8. Vermin Compost

The vermin compost is one of the very useful organic manure. The vermin compost prepared by induction of various types worms (Earth Worm), to de compost and converted from raw animal dung to well de compost highly nutritive organic manure.

One of the important occupations of villagers is the animal husbandry. At present, the animal wastes are not being used by the villagers. This waste can be utilized as vermin- compost on the farm where the productivity and physical condition of the soil can be increased manifold. The animal waste can be used for preparation of vermin- compost. The available nutrients in vermin- compost are higher than country type farmyard manure. As per NHM guideline, the installation cost of structure of 1 vermin compost unit (size) 500 Sq. ft., the total cost of the unit would be is Rs. 60000/-. Out of this the 50% subsidy i.e. Rs.30000/- is met from the ongoing programme of horticulture department. The additional amount i.e. Rs. 10000/- will be form under IWMP Programme. The nutrition value of vermin compost is more than Farm Yard Manure and compost i.e. nitrogen- 1.2 to 1.6%, Phosphorous 1.5 to 1.8%, Potash 1.2 to 2% are just double.

Table 11: Model/ Estimate for a Vermin Compost Unit

Sr. No	Component	Expenditure to be incurred
1	Construction of shed of size 500 Sq. ft.@ Rs. 100 per Sq. ft. with pacca floor, beds and coverings etc.	50000/-
2	Cost on breeding material and purchase of worms etc.	8000/-

3	Tools and equipments etc.	2000/-
	Total	**60000/-**

Components of Vermin Compost Unit

1. Shed

Due to the high temperature in summer, shed structure is needed for vermin compost unit. It can be made by use of bricks/ concrete pillars. While designing the shed adequate room has to be left around the beds for easy movements of labours attending to the filling and harvesting the beds.

2. Vermin- beds

Scientific bed side depending upon the provision of filtered for drainage of excess water is prepared of about 75- 90 cm thick. The whole bed should be above the ground, the proper bed width to be not more than 1.5 m to allow easy access to the centre of the bed is constructed.

3. Land

About 125 sq. m. land is required to set up the vermin compost production. It should have 2- 3 sheds each of 180- 200 sq. ft. Good watering arrangement is required as the moisture is very essential for vermin compost production.

4. Seed Stock

This is important because worms multiply at the rate of 350 worms per cubic meter of bed space over a period of six months in a year.

5. Machinery

Farm machinery and implements are required for cutting the raw material in small pieces, conveying shredded raw material to the out sheds, loading, unloading, collection of compost, loosening of beds for aeration, shifting of the compost. Costs of providing necessary implements and the machinery have to be included in the project cost.

LIVELIHOOD ACTIVITIES FOR THE ASSET LESS PERSONS-9%

7.4 LIVELIHOOD SUPPORT TO SHG'S

The key issue of inclusion of this chapter is that about 70% of the population in the proposed villages depends on agriculture and allied activities, but it rarely provides sufficient means of survival to small and marginal farmers. During the base line survey, this aspect was discussed with the existing Self Help Group/ Gram Sabha members. The representative of WAPCOS, Sociologist of the team held comprehensive discussions on the possibilities of livelihood in the rain fed areas. The main objectives of these discussions were:

1. Assure one livelihood option to poor families.
2. Assured livelihood for at least 300 days in a year including MGNREGA.
3. At least one daily job per family mainly SCs/BPL/very poor families.

SHGs would be imparted Skill Training on identified Economic Activities and it is proposed to impart them trainings at Krishi Vigyan Kender (CCSHAU) Rewari and Haryana Institute of Rural Development, Nilokheri, Agriculture University, Hisar, Central Soil and Water Research and Training Institute, Chandigarh. It is proposed to lend revolving fund of Rs. 25000/- to each SHG/individual formed in the watershed villages. Since the members from SHGs/landless are very poor, they do not have resources to start micro enterprises, it is envisaged that they should be assisted and given loan of this amount in the shape of Revolving Fund Assistance (RFA) so that they do not get trapped by money lenders. Funds thus given on loan are recoverable from SHGs/individuals in easy installments. It is also proposed to impart skill training to at least 10 unemployed youth from each village and give them trainings of their choice so that they establish some small enterprises. It is further proposed to give them interest free loan of Rs. 12000/- each as Revolving Fund Assistance to meet their urgent needs of funds for establishing micro enterprises. Such funds recovered could either be given back to SHGs/individual or some other SHGs/individuals depending upon assessment of their respective needs. It is proposed to form 2 SHGs in each village and identify at least 10 youths in each village for imparting training and giving Revolving Fund.

7.4.1 Activities those are likely to be taken up by SHGs/individuals

1. Cutting and Tailoring
2. Embroidery
3. Mushroom cultivation
4. Plumbing
5. Carpentry
6. Bee keeping
7. Animal husbandry
8. Vermi composting
9. Cattle rearing and selling milk
10. Household wiring, Motor winding
11. Backyard poultry
12. Skill Development in Computer

The details of funds proposed to be utilized under this component are as under:

Table 12. Revolving Fund Assistance for SHGs

S.No.	Name of micro watersheds	No. of villages	Total SHGs	Amount of RFA per SHG	Total
1	Jhal	1	2	25000	50000
2	Sudhrana	1	2	25000	50000

3	Juddi	1	2	25000	50000
4	Gujjarwas	1	2	25000	50000
5	Surheli	1	2	25000	50000
6	Shyam nagar	1	2	25000	50000
7	Dahina A	1	2	25000	50000
8	Dahina B	1	2	25000	50000
9	Lissan	1	2	25000	50000
10	Dakhora	1	2	25000	50000
	Total	**10**	**20**		**500000**

Table 13. Skill Trainings/Skill up gradation for SHGs

S.No.	Name of micro watersheds	No. of villages	Total SHGs	Amount of Training per SHG	Total
1	Jhal	1	2	35000	70000
2	Sudhrana	1	2	35000	70000
3	Juddi	1	2	35000	70000
4	Gujjarwas	1	2	35000	70000
5	Surheli	1	2	35000	70000

6	Shyam nagar	1	2	35000	70000
7	Dahina A	1	2	35000	70000
8	Dahina B	1	2	35000	70000
9	Lissan	1	2	35000	70000
10	Dakhora	1	2	35000	70000
	Total	**10**	**20**		**700000**

Note: This training cost includes Travel, boarding/lodging, cost of training and faculty support for different discipline e.g. Bakery Product, Soap and detergent making, fisheries, Bee keeping, Vermi Compost, Domestic poultry, Mushroom cultivation, Plumbing, Carpentry, Food Processing, Animal Husbandry, Product Processing etc.

Table 14. Computer Training (6 months) for unemployed youth above 12th passed male and female both recommended by Watershed Development Committee

S.No.	Name of micro watersheds	No. of villages	No. of Persons in micro watershed	Amount of Training per trainee for 6 month	Total
1	Jhal	1	12	10000	120000
2	Sudhrana	1	12	10000	120000
3	Juddi	1	12	10000	120000
4	Gujjarwas	1	12	10000	120000

5	Surheli	1	11	10000	110000
6	Shyam nagar	1	11	10000	110000
7	Dahina A	1	11	10000	110000
8	Dahina B	1	11	10000	110000
9	Lissan	1	11	10000	110000
10	Dakhora	1	11	10000	110000
	Total	**10**	**114**		**1140000**

Note: The beneficiaries will contribute 10% as cost sharing of the livelihood support programme Rs. 1140000 @ 10% cost sharing.

= 1140000- 114000

= 1026000/-

Table 15. One time assistance as Revolving Fund to unemployed youth who have successfully completed Computer Training for setting up a computer centre

S. No.	Name of micro watersheds	No. of villages	No. of Persons in micro watershed	Amount of Training per Trainee	Total
1	Jhal	1	12	20000	240000
2	Sudhrana	1	12	20000	240000
3	Juddi	1	12	20000	240000

4	Gujjarwas	1	12	20000	240000
5	Surheli	1	11	20000	220000
6	Shyam nagar	1	11	20000	220000
7	Dahina A	1	11	20000	220000
8	Dahina B	1	11	20000	220000
9	Lissan	1	11	20000	220000
10	Dakhora	1	11	20000	220000
	Total	**10**	**114**		**2280000**

Note: This training cost includes Travel, boarding/lodging, cost of training and faculty support.

Note: The beneficiaries will contribute 10% as cost sharing of the livelihood support programme Rs. 2280000 @ 10% cost sharing.

= 2280000- 228000

= 2052000/-

Table 16. Cutting and Tailoring Centre for female beneficiaries

S. No.	Name of micro watersheds	No. of villages	No. of centre's	Requirement for sewing machines per village (2 No.)	Payment to trainer per months	Period of training for each centre	Total payment to trainer

1	Jhal	1	1	2	2000	6	12000
2	Sudhrana	1	1	2	2000	6	12000
3	Juddi	1	1	2	2000	6	12000
4	Gujjarwas	1	1	2	2000	6	12000
5	Surheli	1	1	2	2000	6	12000
6	Shyam nagar	1	1	2	2000	6	12000
7	Dahina A	1	1	2	2000	6	12000
8	Dahina B	1	1	2	2000	6	12000
9	Lissan	1	1	2	2000	6	12000
10	Dakhora	1	1	2	2000	6	12000
	Total	**10**	**10**	**20**			**120000**

Total cost for 10 Centres

1. Payment to trainers 120000/-

2. Sewing Machine Cost 45000/- (lump sum)

Table 17. Embroidery Centre for female beneficiaries

S.No.	Name of micro watersheds	No. of villages	No. of centers	Payment to Trainer per Month	Period months	Payment to trainer for 6 months @ Rs. 2000 p.m	Total trainers	Grand Total
1	Jhal	1	1	2000	6	12000	1	12000
2	Sudhrana	1	1	2000	6	12000	1	12000
3	Juddi	1	1	2000	6	12000	1	12000
4	Gujjarwas	1	1	2000	6	12000	1	12000
5	Surheli	1	1	2000	6	12000	1	12000
6	Shyam nagar	1	1	2000	6	12000	1	12000
7	Dahina A	1	1	2000	6	12000	1	12000
8	Dahina B	1	1	2000	6	12000	1	12000
9	Lissan	1	1	2000	6	12000	1	12000
10	Dakhora	1	1	2000	6	12000	1	12000
	Total	**10**	**10**					**120000**

Total Cost:

Payment to trainer: Rs.120000/-

Table 18. Livelihood Support

S.No.	Name of micro watersheds	No. of villages	Revolving fund assistance to individuals unemployed youth/ landless, women	
			Dairy Unit	Bee Keeping, Mushroom Cultivation, Vermi compost etc.
1	Jhal	1	3	3
2	Sudhrana	1	2	2
3	Juddi	1	2	2
4	Gujjarwas	1	2	2
5	Surheli	1	2	2
6	Shyam nagar	1	2	2
7	Dahina A	1	2	2
8	Dahina B	1	3	3
9	Lissan	1	3	3
10	Dakhora	1	2	2
	Total	**10**	**23**	**23**
	Rate (Rs)		**25000**	**10000**
	Cost (Lakh Rs)		**5.75**	**2.30**

Contingency, printing material and other unseen items: Rs. 95720/-

Total funds available under this component are Rs. 5463720/-

In addition to HAU, the following institutions are also identified for imparting trainings:

i. HIRD, Nilokheri
ii. Agriculture, Technology and Extension, Hisar Agriculture University
iii. Central Soil and Water research and training Institute, Chandigarh
iv. Mushroom Training Centre, Sonipat and Solan
v. NIRD, Hyderabad
vi. Krishi Vigyan Kender (CCSHAU), Rewari

There appears to be great potential for these activities and these activities are likely to generate income of Rs. 2000/- to Rs. 2500/- per member per month. However no activities would be forced upon on any SHGs and they would be free to decide the activity they would like to opt for their additional income. The PIA can take up the activities as per the need and approval of the Watershed Committee. Based on their choice, Project report for the specified activity would be prepared and revolving fund of Rs. 20000/ Rs. 25000/- per SHG would be given for running their respective micro enterprise. If need arises for more funds for their Income Generation Activities at later stage, they would be assisted in getting loan from banks. SHGs thus formed would be provided all possible assistance to uplift for their Socio- Economic conditions.

CONVERGENCE

7.5 INTRODUCTION

The National Rural Employment Guarantee Act (NREGA), notified on September 7, 2005, marked a paradigm shift from the previous wage employment programmes with its rights-based approach that makes the Government legally accountable for providing employment to those who demand it. The act aims at enhancing livelihood security households in rural areas of the country by providing at least one hundred days of guaranteed wage employment in a financial year to every household whose audit members volunteer to do unskilled manual work. Such Inter sectoral convergence becomes instrumental towards.

- Establishing synergy among different government programmes in planning and implementation to optimize use of public investments
- Enhancing economic opportunities
- Strengthening democratic Processes
- Mitigating the effects of Climate Change
- Creating conditions for sustainable development.
- One of the significant areas for convergence is the Watershed Management Programme of the Dept. of Land Resources (DoLR) in the Ministry of Rural Development (MoRD),
- Convergence is an evolving process and while broad principles can be laid out at the centre, the actual contours of convergence will be determined by the resources at the Central, State, District and the project level. Also, to fully identify the possibilities of convergence, it may be necessary to make a beginning with select programmes, so that the experience of implementation may further inform and refine strategies for convergence.

➢ 7.5.1 Convergence between MGNREGA and Watershed Programmes

Most of the activities under watershed development are covered under MGNREGA and there is a need for convergence to meet gap in requirement under IWMP. The labour component would be met out of funds made available under MGNREGA. The village wise details of the fund requirement are exhibited below (table. 35)

Detail of Convergence of IWMP and other schemes

Table 19. GAPS IN FUNDS REQUIREMENT – MICRO WATERSHED WISE

S.No	Name of micro watersheds	Total cost requirement for works	Total funds available under IWMP for works	Gap in funds requirement for works	Convergence with MGNREGA
1	Jhal	49.59	46.70	2.89	2.89
2	Sudhrana	31.20	28.90	2.30	2.30
3	Juddi	27.91	25.13	2.78	2.78
4	Gujjarwas	26.11	23.65	2.46	2.46
5	Surheli	28.87	26.34	2.53	2.53
6	Shyam nagar	26.02	24.86	1.16	1.16
7	Dahina A+B	93.52	90.45	3.07	3.07
8	Lissan	54.92	51.74	3.18	3.18
9	Dakhora	24.68	22.18	2.50	2.50

	Total	**362.82**	**339.95**	**22.87**	**22.87**

- Under NREGA almost all the activities required for watershed development are permitted. Convergence between NREGA and Watershed Programmes of DoLR will be mutually beneficial for rain fed areas.

7.5.2 Non-Negotiable for works executed under MGNREGA

- Only Job Card holders to be employed for MGNREGA component.
- Muster rolls will be maintained on work site, with copies in the Gram Panchayat and to be electronically maintained on nrega.nic.in
- Wage payments will be through no-frills accounts in banks/post offices.

Need for Convergence: Since more than 56% of activities related to Watershed development are covered under MGNREGA, there is need for convergence to meet gap in Funds requirements under IWMP. Detailed survey had been conducted in Watershed villages and it has emerged that there is need for more funds to augment and strengthen the activities under IWMP. All nine micro watersheds need more funds to meet the gap. Therefore, some of the works are proposed to be converged with MGNREGA. The labour component would be met out of funds made available under MGNREGA.

7.5.3 Convergence with Forest Department

The unit cost of agro- forestry component for 1 ha area (1100 plant) for plantation and other activity is Rs. 18767/-. The provision of Rs. 15000/- per ha has given in IWMP programme. The rest amount of Rs. 3767/- will be convergent from lined department from departmental schemes or MGNREGA.

7.5.4 Convergence with Horticulture Department

National Horticulture Mission is implementing the horticulture development programme which includes construction of water harvesting structures, drip and sprinkler irrigation activities which would be undertaken in convergence with the horticulture department. Under this activity 38 ha horticulture development programme with the financial assistance of Rs. 9.5 lakh has been provided in the project proposals. This would also be undertaken by convergence with the horticulture department.

7.5.5 Convergence with Agriculture Department

The activities under NRM like Water conveyance system, Strengthening of Water Conveyance Channel (Water Course in fields), Dug Out Pond (New/Renovation), Small Earthen Embankment with vegetative support, Earthen Embankment with pucca outlet, Ramp/Ghat Inlet and Outlet, Roof top rain water recharge structures, Community Water Storage Tanks etc. where the machinery and material component is required and the unit cost exceeds for completion exceeds to the project provision, the same will be met in convergence with the similar activities of the agriculture.

7.5.6 Convergence with Animal Husbandry Department

The watershed falls in the water deficit conditions for production of fodder and depends upon the rain. The rainfall pattern is erratic. There is deficiency of green fodder and nutrients for the animals. The provision has been kept for providing mini kits for of life saving medicines/ mineral mixture, concentrate feed and fodder seeds. Since the provision of these kits is less than the required, hence this would be met with the lined department who has a provision under their ongoing programmes.

CHAPTER – 8

QUALITY AND SUSTAINABILITY

8.1 Monitoring and Evaluation

8.1.1 Plans for Monitoring and Evaluation:

Web based GIS system is being developed for Monitoring and Evaluation at various stages of project under progress and post project. The satellite imageries are also helpful in monitoring all activities of the watershed area (Pre project, during project and post project). All the details relating to Watershed Activities would be available on website. The system is very useful to know the progress of the project at the click of the button. The higher officials would be able to monitor the progress and could generate the desired reports. The system would also help beneficiaries to know the area of importance, already treated area/ area to be treated. The system would serve an aiding tool to the planners and evaluators for judging the efficacy of the project.

8.1.2 Monitoring

Regular Monitoring of the project will have to be carried out at each stage to monitor the progress of the project. Different streams of monitoring are proposed as under:

1. Internal Monitoring by PIA/ WCDC

2. Progress and Process monitoring
3. GIS/ On line Monitoring
4. Sustainability monitoring
5. Self Monitoring by communities
6. Social Audits
7. Independent and external monitoring

Monitoring of watershed related activities will be carried out after completion of each phase. 1% amount of the project is earmarked under this component. Micro Watershed wise details are given below:

Table 1. Micro Watershed wise details

S.no	Name of the Micro Watershed	Effective Area	Total Cost	Monitoring 1%
1	Jhal	695	83,40,000	83,400
2	Sudhrana	430	51,60,000	51,600
3	Juddi	374	44,88,000	44,880
4	Gujjarwas	352	42,24,000	42,240
5	Surheli	392	47,04,000	47,040
6	Shyam nagar	370	44,40,000	44,400
7	Dahina A	673	80,76,000	80,760
8	Dahina B	673	80,76,000	80,760
9	Lissan	770	92,40,000	92,400
10	Dakhora	330	39,60,000	39,600

8.2 EVALUATION

Each evaluation will include physical, financial, and social audit of all work done. The objective of evaluation of the project is to assess the status of watershed related interventions in the project. The evaluation will be taken up in three stages of the project. The Evaluation will be done by agencies empanelled on SLNA.

1% amount of the project is earmarked under this component. Micro Watershed wise details were as under:

Table 2. Micro Watershed wise details

S.no	Name of the Micro Watershed	Effective Area	Total Cost	Evaluation 1%
1	Jhal	695	83,40,000	83,400
2	Sudhrana	430	51,60,000	51,600
3	Juddi	374	44,88,000	44,880
4	Gujjarwas	352	42,24,000	42,240
5	Surheli	392	47,04,000	47,040
6	Shyam nagar	370	44,40,000	44,400
7	Dahina A	673	80,76,000	80,760
8	Dahina B	673	80,76,000	80,760
9	Lissan	770	92,40,000	92,400
10	Dakhora	330	39,60,000	39,600

CONSOLIDATION PHASE- 3 %

Consolidation Phase = Rs. 18, 21,240 /-

8.3 CONSOLIDATION PHASE

This is another important activity under the project. In this phase, the resources augmented and economic plans developed in Phase II are made the foundation to create new nature based, sustainable livelihoods and raise productivity levels. There needs to be some mechanism at Watershed Level for the following crucial Activities as detailed below:

I. Managing/upgrading of all activities taken up under the Project.

II. Preparation of Project completion report and

III. Documentation of success stories

IV. Management of proper utilization of WDF

V. Mechanism for Quality and sustainability issues under the Project.

VI. Mechanism for fixation and collection of User Charges.

VII. Consolidation of works

VIII. Building the capacity of community based organizations to carry out the new agenda – post project period.

IX. Intensification of farm production systems/off farm livelihoods

X. Project Management related aspects

To take up these activities, it is proposed In the DPR as under:

Name of Micro watershed: Jhal

Table 3. Consolidated Phase

S. No	Type of activity	Amount earmarked (Rs. In lacs)
1	Managing/ upgrading of all activities taken up under the project	0.50
2	Preparation of Project completion report	0.13
3	Documentation of success stories	0.12
4	Management of proper utilization of WDF	0.38
5	Mechanism for quality and sustainability issues under the Project	0.12
6	Watershed activities	1.25

Total: 2.50 lacs

Name of Micro watershed: Sudhrana

Table 4. Consolidated Phase

S. No	Type of activity	Amount earmarked (Rs. In lacs)
1	Managing/ upgrading of all activities taken up under the project	0.31
2	Preparation of Project completion report	0.08
3	Documentation of success stories	0.08
4	Management of proper utilization of WDF	0.23
5	Mechanism for quality and sustainability issues under the Project	0.07
6	Watershed activities	0.78

Total: 1.55 lacs

Name of Micro watershed: Juddi

Table 5. Consolidated Phase

S. No	Type of activity	Amount earmarked (Rs. In lacs)
1	Managing/ upgrading of all activities taken up under the project	0.27
2	Preparation of Project completion report	0.07
3	Documentation of success stories	0.07
4	Management of proper utilization of WDF	0.20
5	Mechanism for quality and sustainability issues under the Project	0.07
6	Watershed activities	0.67

Total: 1.35 lacs

Name of Micro watershed: Gujjarwas

Table 6. Consolidated Phase

S. No	Type of activity	Amount earmarked (Rs. In lacs)
1	Managing/ upgrading of all activities taken up under the project	0.25
2	Preparation of Project completion report	0.07
3	Documentation of success stories	0.06
4	Management of proper utilization of WDF	0.19
5	Mechanism for quality and sustainability issues under the Project	0.06
6	Watershed activities	0.64

Total: 1.27 lacs

Name of Micro watershed: Surheli

Table 7. Consolidated Phase

S. No	Type of activity	Amount earmarked (Rs. In lacs)
1	Managing/ upgrading of all activities taken up under the project	0.28
2	Preparation of Project completion report	0.07
3	Documentation of success stories	0.07
4	Management of proper utilization of WDF	0.21
5	Mechanism for quality and sustainability issues under the Project	0.07
6	Watershed activities	0.71

Total: 1.41 lacs

Name of Micro watershed: Sham nagar

Table 8. Consolidated Phase

S. No	Type of activity	Amount earmarked (Rs. In lacs)
1	Managing/ upgrading of all activities taken up under the project	0.27
2	Preparation of Project completion report	0.07
3	Documentation of success stories	0.06
4	Management of proper utilization of WDF	0.20
5	Mechanism for quality and sustainability issues under the Project	0.07
6	Watershed activities	0.66

Total: 1.33 lacs

Name of Micro watershed: Dahina A

Table 9. Consolidated Phase

S. No	Type of activity	Amount earmarked (Rs. In lacs)
1	Managing/ upgrading of all activities taken up under the project	0.48
2	Preparation of Project completion report	0.13
3	Documentation of success stories	0.12
4	Management of proper utilization of WDF	0.36
5	Mechanism for quality and sustainability issues under the Project	0.12
6	Watershed activities	1.21

Total: 2.42lacs

Name of Micro watershed: Dahina B

Table 10. Consolidated Phase

S. No	Type of activity	Amount earmarked (Rs. In lacs)
1	Managing/ upgrading of all activities taken up under the project	0.48
2	Preparation of Project completion report	0.13
3	Documentation of success stories	0.12
4	Management of proper utilization of WDF	0.36
5	Mechanism for quality and sustainability issues under the Project	0.12
6	Watershed activities	1.21

Total: 2.42lacs

Name of Micro watershed: Lissan

Table 11. Consolidated Phase

S. No	Type of activity	Amount earmarked (Rs. In lacs)
1	Managing/ upgrading of all activities taken up under the project	0.55
2	Preparation of Project completion report	0.14
3	Documentation of success stories	0.14
4	Management of proper utilization of WDF	0.42
5	Mechanism for quality and sustainability issues under the Project	0.14
6	Watershed activities	1.38

Total: 2.77 lacs

Name of Micro watershed: Dakhora

Table 12. Consolidated Phase

S. No	Type of activity	Amount earmarked (Rs. In lacs)
1	Managing/ upgrading of all activities taken up under the project	0.24
2	Preparation of Project completion report	0.06
3	Documentation of success stories	0.06
4	Management of proper utilization of WDF	0.18
5	Mechanism for quality and sustainability issues under the Project	0.06
6	Watershed activities	0.59

Total: 1.19 lacs

As per the common guideline the management of developed natural resources would involve the following features:

- Improving the sustainability of various structures and equitable distribution. The watershed committee will fix the charges of water and the funds generated would be utilized O& M Structures. These users charges account will be maintained separately.
- Involvement of Gram Panchayat for repair, maintenance and protection of created structures.

CHAPTER – 9

EXPECTED OUTCOME

EXPECTED OUTCOMES

The effective area is 5059 ha and the Project Cost is 607.08 lacs covering 10 no. micro watersheds and in all 9 villages. Benefits will be much more than the project cost as detailed below:

With the several interventions under IWMP I project such as Livelihood support, Farm production system, various types of activities relating to soil conservation measures for diversification of crops, Protection to field by constructing the structures etc, it is expected that these Watershed villages will gain a lot. This intervention will have multiple benefits available to communities in terms of employment, check in migration, improvement in water table, more area under agriculture and horticulture, check in soil loss and decrease in Flood and drought incidences, improvement in crop yield, milk yield, check in degradation of land etc. The benefits thus accrued would be short term and long term. With the judicious use of funds available under IWMP and with convergence from MGNREGA and other schemes of Departments, this project of Jhal Watershed I will prove to be very beneficial in improving socio – economic status of people residing in Project villages.

Expected outcomes as mentioned above are given in the following tables:

9.1 EMPLOYMENT

Employment has always been a problem in the village. The principal occupations of the people are rain fed agriculture, animal husbandry and casual labour work. However, rainfall being limited and erratic, agriculture suffers, i.e. best they can take only single crop, which keeps them partially engage 4 to 5 months. Similarly due to lack of fodder animal husbandry does not keep them engage

full time. Thus the people mainly depend upon casual labour either in the villages is in Delhi, Gurgaon, Bhiwadi, Dharuhera Industrial Complex**.**

Table 1. Expected Employment Generation in the Project area

S. No.	Name of micro watersheds	Wage employment						Self employment			
		No of man days			No. of Beneficiaries			No. of Beneficiaries			
		SC	others	Total	SC	others	Total	SC	others	Women	Total
1	Jhal	356	7117	7473	80	261	341	11	-	11	22
2	Sudhrana	112	4511	4623	45	212	257	-	11	11	22
3	Juddi	374	3647	4021	97	291	388	11	11	-	22
4	Gujjarwas	57	3728	3785	35	120	155	-	11	11	22
5	Surheli	98	4117	4215	28	208	236	11	-	11	22
6	Shyam Nagar	125	3853	3978	54	191	245	11	11	-	22
7	Dahina A+B	459	14013	14472	141	760	901	11	11	22	44
8	Lisan	369	7910	8279	107	393	500	11	-	11	22
10	Dakhora	133	3415	3548	53	248	301	11	11	-	22
	Total	**2083**	**52311**	**54394**	**640**	**2684**	**3324**	**77**	**66**	**77**	**220**

54394 man days would be generated with the implementation of the project in Jhal Watershed (IWMP I), which means 108 person for 100 days per year would be employed for the period of five years. In addition to this cropped area/ productivity would be increased and will also generate employment.

9.2 MIGRATION PATTERN

Table 2. Pre and Post Migration in Jhal Watershed (IWMP I)

S. No	Name of micro watersheds	No. of persons migrating		No. of days per year of migration		Comments
		Pre Project	Expected post project	Pre Project	Expected post project	
1	Jhal	18	90	9	45	No. of persons migrating will be reduced and also no. of days would be reduced by over 50%
2	Sudhrana	38	120	19	60	No. of persons migrating will be reduced and also no. of days would be reduced by over 50%
3	Juddi	33	60	16	30	No. of persons migrating will be reduced and also no. of days would be reduced by over 50%
4	Gujjarwas	32	60	14	30	No. of persons migrating will be reduced and also no. of days would be reduced by over 50%
5	Surheli	30	60	12	30	No. of persons migrating will be reduced and also no. of days would be reduced by over 50%
6	Shyam Nagar	18	60	9	30	No. of persons migrating will be reduced and also no. of days would be reduced by over 50%

7	Dahina A	25	60	6	30	No. of persons migrating will be reduced and also no. of days would be reduced by over 50%
8	Dahina B	25	60	6	30	No. of persons migrating will be reduced and also no. of days would be reduced by over 50%
9	Lisan	23	90	9	45	No. of persons migrating will be reduced and also no. of days would be reduced by over 50%
10	Dakhora	19	120	6	60	No. of persons migrating will be reduced and also no. of days would be reduced by over 50%

A comparison of above table with expected migration of table 19 of the Chapter 3 reveals that there will be about 50% reduction in the migration.

9.3 GROUND WATER TABLE (Drinking Water)

The Drinking Water supply is managed by Public health Department by Installing Tube well and Canal water supply in the area. The area is facing scarcity of water during May and June.

Through the ground water table is depleting over the years and presently stands 7.8 to 45.2 m. Most of the area falls under fresh to marginal quality of ground water; the farmers are irrigating their fields through ground water exploitation. Under this condition water table of such area is depleting from t is expected that in the areas which is underlain by the fresh to marginal water table conditions, where the farmers are irrigating their field through ground water development, the water table of such area is depleting on an average 26cm per year. The area falls in Jatusana and Nahar block which comes under the over exploited category. The necessary provision for rain water recharging has been provided in the project proposals through construction of percolation tank/ ponds.

Table 3. Detail of average pre- post ground water table depth in the project area (in meters)

S.No	Name of micro watersheds	Source	Existing pre- project ground water table level (m)	Remarks
1	Jhal	Open wells	15.4	The necessary provision for rain water recharging has been provided in the project proposals through construction of percolation tank/ ponds.
2	Sudhrana	Open wells	7.8	
3	Juddi	Open wells	19.3	
4	Gujjarwas	Open wells	23.0	
5	Surheli	Open wells	22.5	
6	Shyam Nagar	Open wells	21.9	
7	Dahina A	Open wells	45.2	
8	Dahina B	Open wells	45.2	
9	Lisan	Open wells	29.0	
10	Dakhora	Open wells	30.0	

Source: Ground Water Cell, Haryana

9.4 CROPS

Agriculture primary depends upon water, but this is availability of this is lacking without existence of canal network and deeper ground water conditions. All this can change with the integrated land and water management during the watershed project. The planned Water conveyance system, Strengthening of Water Conveyance Channel (Water Course in fields), Dug Out Pond (New/Renovation), Small Earthen Embankment with vegetative support, Earthen Embankment with pucca outlet, Ramp/Ghat Inlet and Outlet, Roof top rain water recharge structures, Community Water Storage Tanks etc. can preserve sub moisture in the soil. This will help in additional area coming under cultivation and increasing productivity too. The crop yield pre project and expected and post project is presented in table 4**.**

Table 4. Increase in Expected Yield in Jhal Watershed (IWMP I)

Name of Micro-Watersheds	Name of Crops	Pre project		Total Production (in Kg)	Total Value Rs (in lacs)	Expected post project		Total Production (in Kg)	Total Value Rs (in lacs)
		Area ha	Average yield kg. Per ha			Area ha	Average yield kg. Per ha		
Jhal	Wheat	156	4606	718536	97.00	172	4836	831792	112.29
	Mustard	232	1772	411104	123.33	250	1861	465250	139.58
	Bajra	315	1867	588105	73.51	340	1960	666400	83.30
Sudhrana	Wheat	104	4606	479024	64.67	112	4836	541632	73.12
	Mustard	161	1772	285292	85.59	173	1861	321953	96.59
	Bajra	174	1867	324858	40.61	183	1960	358680	44.84
Juddi	Wheat	98	4606	451388	60.94	108	4836	522288	70.51
	Mustard	125	1772	221500	66.45	137	1861	254957	76.49
	Bajra	178	1867	332326	41.54	196	1960	384160	48.02
Gujjarwas	Wheat	50	4606	230300	31.09	54	4836	261144	35.25
	Mustard	166	1772	294152	88.25	180	1860	334800	100.44
	Bajra	123	1867	229641	28.71	131	1960	256760	32.10
Surheli	Wheat	44	4606	202664	27.36	48	4836	232128	31.34
	Mustard	174	1772	308328	92.50	191	1860	355260	106.58
	Bajra	169	1867	315523	39.44	186	1960	364560	45.57

Shyam Nagar	Wheat	107	4606	492842	66.53	118	4836	570648	77.04
	Mustard	114	1772	202008	60.60	125	1860	232500	69.75
	Bajra	189	1867	352863	44.11	208	1960	407680	50.96
Dahina A+B	Wheat	309	4199	1297491	175.16	334	4409	1472606	198.80
	Mustard	296	1560	461760	138.53	321	1638	525798	157.74
	Bajra	923	1067	984841	123.11	983	1120	1100960	137.62
Lisan	Wheat	167	4199	701233	94.67	182	4409	802438	108.33
	Mustard	328	1560	511680	153.50	361	1638	591318	177.40
	Bajra	480	1067	512160	64.02	509	1120	570080	71.26
Dakhora	Wheat	79	4199	331721	44.78	85	4409	374765	50.59
	Mustard	106	1560	165360	49.61	115	1638	188370	56.51
	Bajra	122	1067	130174	16.27	129	1120	144480	18.06
Total		**5489**			**1991.87**	**5931**			**2270.06**

Source: Revenue Department and Department of Agriculture, Rewari (Haryana)

9.5 HORTICULTURE

Table 5. Pre and post project area under Horticulture

S.No.	Name of Micro	Existing area under	Additional Area under horticulture proposed to be covered through	Total area in ha – Post Project

	Watersheds	horticulture (ha)	IWMP	
1	Jhal	4	8	12
2	Sudhrana	1	3	4
3	Juddi	1	3	4
4	Gujjarwas	1	2	3
5	Surheli	1	2	3
6	Shyam Nagar	1	2	3
7	Dahina A+B	3	10	13
8	Lisan	2	4	6
9	Dakhora	2	4	6
	Total	**16**	**38**	**54**

9.6 AFFORESTATION/ VEGETATIVE COVER

Table 6. Pre and post project forest and vegetative cover

S.No.	Name of micro watersheds	Existing area under tree covered, ha	Area under tree cover proposed ha	Total
1	Jhal	7	12	19
2	Sudhrana	3	5	8

3	Juddi	4	5	9
4	Gujjarwas	3.5	5	8.5
5	Surheli	6	10	16
6	Shyam Nagar	2	4	6
7	Dahina A+B	35	45	80
8	Lisan	8	10	18
9	Dakhora	7	10	17
	Total	**75.5**	**106**	**181.5**

9.8 LIVESTOCK

Table 7. Details of livestock in the project area

S. No.	Name of micro watershed	Type of Animals	Pre project			Post project			Remarks
			No.	Yield Kg/ day	Income In Rs per day	No.	Yield Kg/ day	Income In Rs per day	
1	Jhal	Buffalo	687	7-8	238-272	790	8-9	320-360	Increase in milk yield and number of animals by approx. 15%
		Cow	111	3-4	75-100	127	5-6	150-180	Increase in milk yield and number of animals by approx. 15%
2	Sudhrana	Buffalo	635	7.5- 8.5	255-289	730	9.5- 10.5	380-420	Increase in milk yield and number of

S. No.	Name of micro watershed	Type of Animals	Pre project			Post project			Remarks
			No.	Yield Kg/ day	Income In Rs per day	No.	Yield Kg/ day	Income In Rs per day	
									animals by approx. 15%
		Cow	144	3.5- 4.5	87-112	165	5.5- 6.5	165-195	Increase in milk yield and number of animals by approx. 15%
3	Juddi	Buffalo	512	8-9	272-306	589	10-12	400-480	Increase in milk yield and number of animals by approx. 15%
		Cow	94	4.5- 5.5	87-112	108	6-8	180-240	Increase in milk yield and number of animals by approx. 15%
4	Gujjarwas	Buffalo	365	7-8	238-272	419	9-11	360-440	Increase in milk yield and number of animals by approx. 15%
		Cow	54	4-5	100-125	62	6.5- 8.5	195-255	Increase in milk yield and number of animals by approx. 15%
5	Surheli	Buffalo	562	7.5 – 8.5	255-289	646	10-12	400-480	Increase in milk yield and number of animals by approx. 15%
		Cow	137	4.5- 5.5	87-138	157	6-8	180-240	Increase in milk yield and number of animals by approx. 15%
6	Shyam Nagar	Buffalo	512	8-9	272-306	589	10-12	400-480	Increase in milk yield and number of animals by approx. 15%
		Cow	144	4.5- 5.5	87-112	165	6-8	180-240	Increase in milk yield and number of animals by approx. 15%
7	Dahina A+B	Buffalo	2103	7-8	238-272	2418	9-11	360-440	Increase in milk yield and number of animals by approx. 15%

S. No.	Name of micro watershed	Type of Animals	Pre project			Post project			Remarks
			No.	Yield Kg/ day	Income In Rs per day	No.	Yield Kg/ day	Income In Rs per day	
		Cow	506	4-5	100-125	582	6.5- 8.5	195-255	Increase in milk yield and number of animals by approx. 15%
8	Lisan	Buffalo	1268	7-8	238-272	1458	8-9	320-360	Increase in milk yield and number of animals by approx. 15%
		Cow	216	3-4	75-100	248	5-6	150-180	Increase in milk yield and number of animals by approx. 15%
9	Dakhora	Buffalo	719	7.5- 8.5	255-289	826	9.5- 10.5	380-420	Increase in milk yield and number of animals by approx. 15%
		Cow	100	3.5- 4.5	87-112	115	5.5- 6.5	165-195	Increase in milk yield and number of animals by approx. 15%

9.9 LINKAGES

The direct livelihood activities need good forward and backward support system. The activities may fail to deliver the desired results. These linkages would involve credit, machinery, input supply, marketing etc.

The backward forward linkages will involved the extension services which are brought available in the project proposal as capacity building and the provision have been kept. 20 kits of agriculture implement have been provided. Milk and other collection centre would be constituted with increased milk production under the project.

Table. 8: Backward-Forward Linkages

Sr. No.	Project	Type of Marketing Facility	Pre-Project (no.)	During the Project (no.)	Post-project (no.)
1	Jhal Watershed (IWMP I)	Backward linkages	-	-	-
		Seed certification	Moderate	Extension and Training	Improved
		Seed supply system	Moderate	Extension and Training	Improved
		Fertilizer supply system	Moderate	Extension and Training	Improved
		Pesticide supply system	Moderate	Extension and Training	Improved
		Credit institutions	Banks	Coordinate to lead banks	Bank intensity increased
		Water supply for irrigation	Scarcity	Promote rain water harvesting	Would be promoted
		Extension services	KGK& Agriculture deptt.	Extension & Training in village level	Improved
		Nurseries	Horticulture and forest	To be promoted	Improved
		Tools/ machinery suppliers	Subsides	Educate by Extension & Training	Supplies would be improved
		Price support system	Major crops	-	Needs for all crops
		Labour	-	Employment generate through works activities	Migration reduce

		Any other (please specify)	-	-	-
		Road network	Available	Coordinate with lined department	Would be strengthen
		Transport facilities	Moderate	Coordinate with lined department	Would be promoted
		Markets / Mandies	Exists	Coordinate with lined department	Intensity would be increased
		Agro and other industries	-	Coordinate with lined department to establish Cottage industries (Kutir Udyog) for landless and unemployed youth	Would be strengthen
		Milk and other collection centres	Milk collection centre in long distance	Coordinate with lined department	For installation on nearest door steps
		Any other (please specify)	-	-	-
			Vermi-compost unit	Convergence with NHM (Horticulture) department	To be increased
			Mushroom Cultivation	Convergence with NHM (Horticulture) department	To be increased
			Animal vitamins/ Minerals Deficit	Coordinate with lined department, to organize camps in watershed area	Animal vitamins feeds Would be promoted

9.9.1 LOGICAL FRAMEWORK ANALYSIS

Table 9. Logical Framework Analysis

Components	Activities	Outputs	Effect	Impact
Village Institution Formation	Formation of Watershed Community, User Groups	• Watershed Committee each village • Number of user groups depending on the coverage of particular intervention	Project can be implemented and managed in a democratic and Participatory way ensuring equity and transparency.	• Unity and prosperity in the village management. • People's Participation and positive perception towards the programme.
Strengthening Village operations	• Organizing training and awareness programme for village institutions (I.E.C. Activities). • Capacity Building workshops and exposure visits for User Group and Watershed Community • Facilitating and monitoring the functioning of	• Awareness camps to be organized • Trainings and exposure visits UGs and WCs to be held Capacity building workshops to be organized one. • Federations of UGs and WC to be formed.	• Quality of management of common resources improved. • Quality of distribution of benefits between people improved. • Increased awareness amongst women about village resources • Women participation enhanced in decision-making of GVCs. • Involvement of youth and children	

Components	Activities	Outputs	Effect	Impact
	UGs and WCs Strengthen linkages between UGs and WCs and Panchayat Institutions • Gender sensitization of UGs and WCs to increase inclusiveness of Samuh (Joint) decision making. • Sensitize Village communities to involve children and youth in development		in village development.	
Fund Management	• Improve management and utilization of UGs and WCs • Prepare communities to explore other sources of	UGs and WCs operating bank account and managing resources on their own.	• Purpose, frequency and volume of use of the fund enhanced • Volume of funds generated for UGs and WCs from other sources of income increased	

Components	Activities	Outputs	Effect	Impact
	income for UGs and WCs.			
Ecological restoration	• Protection, Treatment and regeneration of common and private lands. • Protection, treatment and regeneration of forest lands. • Plantation of fruits and forest species. • Input trainings, conduct meetings and organize exposure visits for communities, village volunteers and staff to effectively plan, execute and monitor activities. • Identification and promotion	• Common and private lands to be brought under new plantations and agro-horti- forestry like Neem, Adussa, prosopis, Banyan and Peepul. • Forest lands to be brought under new plantations and protection. • Trainings, exposure visits and meetings to be organized for communities, village volunteers and staff. • Income generation intervention promoted	• Fodder availability from common and private land increased. • Accessibility to common and forest lands increased with removal of encroachments and resolution of conflicts	• Better Ecological order in the area. • Increase in the proportion of households having more security of fodder. • Reduction in drudgery of fodder and fuel collection, especially women

Components	Activities	Outputs	Effect	Impact
	of non-timber forest produce based income generation activities.			
Rainfed Area Development	• Treatment of land through improved soil and moisture conservation practices on watershed basis. • Promotion of good agricultural practices- horticulture, improved crop and vegetable. • Promotion of organic farming practices. • Formation of Fodder banks to increase fodder security and promote dairy development	• Land to be brought under improved soil moisture conservation practices. • Good agricultural practices to be promoted. • Organic farming to be promoted. Fodder banks to be established. • Agriculture based livelihood income generation activities to be promoted • Water harvesting structures to be constructed. • Drip irrigation facilities to be distributed among farmers. • Approx 15000 person days of employment	• Improved productivity of treated land. • Increased availability of water in cells. • Increase in annual agricultural production. • Farmers adopt organic farming practices. • Fodder security of farmers enhanced. • Increased availability of water for 9 to12 months. • Increased availability of water for livestock • Increase in agricultural productivity of land. • Augmentation of drinking water	Increase in proportion of households having more security of food Increase in contribution of agricultural income to the household income

Components	Activities	Outputs	Effect	Impact
	among communities. • Identification and promotion of agri-produce based income generation activities like grading, processing and packaging. • Promotion of better irrigation practices like drip irrigation • Impart trainings, conduct meetings and organize exposure visits of communities.	to be generated. • Trainings, exposure visits and meetings to be organized for communities, village volunteers.	supply.	
Women's socio-political and economic empowerment	• Formation and strengthening of women' SHG groups • Capacity building of women folk. • Capacity building of SHG leaders and accountants	• Women's SHG groups to be formed. • Federation of Women's SHGs to be formed. • Trainings to be conducted for preparation of woolen products from sheep	• Enhanced capacities of leaders of women's group in taking initiatives to solve problems at different levels. • Improved access to credit for livelihood purposes Increased	• Position of women in household, community, society (politically, socially and economically) as perceived by women and community at large. • Performance

Components	Activities	Outputs	Effect	Impact
	Linking SHGs with external financial institutions	and goats	household income.	enhancement of SHGs in terms of participation, decision-making, leadership and fund management. • Equality and equity in gender relations at home (decision making, expenditure, children's education, health)

The adoption of soil and water management practices, renovation of village ponds and plantations not only improve productivity but also improve village environment. The investments made in water resources development would ease shortage of water both for domestic use and livestock and also make available water for supplemental irrigation.

The introduction of improved production technologies would stabilize crop production, save crops from adverse impacts of droughts and raise income level of farmers. The increased fodder availability and animal health care, the milk production would increase. There would be increased cash flows from subsidiary occupations. The increased awareness, operations through SHGs and easy availability of finance would make the communities more vibrant and enterprising.