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, Haryali & IWDP 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 (IWMP I) area programme a systematic survey has been conducted to know the potentiality of each village / Micro-Watershed. With this view, a baseline survey was conducted in twelve micro- watershedsChirana (part) (2C5F6h7), Shamdi Sisan (part) (2C5F6h6) (A), Shamdi Buran (part) (2C5F6h6) (B), Pugthala (part) (2C5F6d7), Bajana Kalan (part) (2C5F6d8), Bajana Khurd (part) (2C5F6d7), Kasandi (part) (2C5F6d6), Kheri Damkan (part) (2C5F6d4), Joli (part) (2C5F5m3), Lath (part) (2C5F5m2), Khanpur Kalan (part) (2C5F6h4) + Bidhal (part) (2C5F5m4)and

Bali Qutabpur (part) (2C5F6f7) + Kakana Bahadari (part)(2C5F6d3). 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 12 micro watersheds namelyChirana (part) (2C5F6h7), Shamdi Sisan (part) (2C5F6h6) (A), Shamdi Buran (part) (2C5F6h6) (B), Pugthala (part) (2C5F6d7), Bajana Kalan (part) (2C5F6d8), Bajana Khurd (part) (2C5F6d7), Kasandi (part) (2C5F6d6), Kheri Damkan (part) (2C5F6d4), Joli (part) (2C5F5m3), Lath (part) (2C5F5m2), Khanpur Kalan (part) (2C5F6h4) + Bidhal (part) (2C5F5m4) and Bali Qutabpur (part) (2C5F6f7) + Kakana Bahadari (part) (2C5F6d3)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 initiated by the following methods:-

1.1.3 Collection of Primary Data

The project was sanctioned in 30th Steering committee meeting for IWMP on 30.01.2013 and the preparatory phase started in 2013. Initially, a meeting was arranged with officials of concerned departments and technical experts located at Chirana, Shamdi Sisan(A), Shamdi Buran (B), Pugthala, Bajana Kalan, Bajana Khurd, Kasandi, Kheri Damkan, Joli, Lath,

Khanpur Kalan + Bidhal and Bali Qutabpur + Kakana Bahadarimicro- watersheds. During this meeting, preliminary details of the proposed project including location of villages and criteria of selection and PPR were 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 and other problems related to the area were assessed. Sarpanches and local people were involved in the discussions and needs and scope of watershed works were taken up.

All assigned villages were marked on the maps prepared by Soil and Land Use Survey of India (SLUSI).

The primary data related to land holding, crop area, production, depth to water level, ground water quality and soil were 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 production of crops and seasonal vegetable, marketing facilities, fodder production, agro-forestry crops, livestock 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 collected and debated.

1.2 PARTICIPATORY RURAL APPRAISAL

The due process of Participatory Rural Appraisal approach was followed in which village committees were sensitized on project objectiveand 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 meeting were organized at common places and problem and possible solution were debated, discussed and efforts were made to reach 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 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 was thoroughly discussed with the community and Watershed Committees (WC) in detail.

1.2.1Participatory 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 the Construction of pond, retaining wall, ramp, water conveyance system, Earthen bund, Underground pipelineetc. were

recommended to conserve and store water used for life saving irrigation potential in the rain fed 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.

Gram Sabha Member's Participation in Group Discussion

1.3 USE OF GIS TECHNOLOGY FOR PLANNING

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

Various maps were prepared such as Base map, Present Land Use, Geo-hydrological, Micro Watershed, Drainage, Contours, Slope, Soil Classification, Land Capability Classification, Soil Fertility, Ground Water Depth and Quality, Proposed activities of works. All Watershed maps (micro- watershed) have been prepared based on the watershed maps made available by Soil and Land use Survey of India (SLUSI) 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.

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 need and experience of the experts working in the area and catchment area, structureslike Construction of pond, retaining wall, ramp, water conveyance system, Earthen bund, Underground pipe line 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**	
	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	N.A.
	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
	6. Ground water status	Yes
B	Inputs	-
	Bio pesticides	Yes

S.No.	Scientific Criteria/input used	Whether Scientific Criteria was used
	Organic manure	Yes
	Vermi- 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 Mundlana, Ganaur and Gohana block of Sonepat district in Haryana state. The project is a cluster of twelve micro- watersheds namely Chirana (part) (2C5F6h7), Shamdi Sisan (part) (2C5F6h6) (A), Shamdi Buran (part) (2C5F6h6) (B), Pugthala (part) (2C5F6d7), Bajana Kalan (part) (2C5F6d8), Bajana Khurd (part) (2C5F6d7), Kasandi (part) (2C5F6d6), Kheri Damkan (part) (2C5F6d4), Joli (part) (2C5F5m3), Lath (part) (2C5F5m2), Khanpur Kalan (part) (2C5F6h4) + Bidhal (part) (2C5F5m4) and Bali Qutabpur (part) (2C5F6f7) + Kakana Bahadari (part)(2C5F6d3). The total geographical area of the project is **6936 ha** out of which **5660 ha** has been undertaken to be treated under IWMP I starting from year 2012-2013. The project is divided into twelve 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	IWMP-I Gohana	Chirana (part)	2C5F6h7	Chirana (part)	Mundlana	Sonipat	669	500	60	ASCO, Sonepat
2		Shamdi Sisan (part)	2C5F6h6	Shamdi Sisan (part)	Mundlana	Sonipat	522	400	48	
3		Shamdi Buran (part)	2C5F6h6	Shamdi Buran (part)	Mundlana	Sonipat	527	400	48	
4		Pugthala (part)	2C5F6d7	Pugthala (part)	Ganaur	Sonipat	409	350	42	
5		Bajana Kalan (part)	2C5F6d8	Bajana Kalan (part)	Ganaur	Sonipat	503	400	48	

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
6		Bajana Khurd (part)	2C5F6d7	Bajana Khurd (part)	Ganaur	Sonipat	568	400	48	
7		Kasandi (part)	2C5F6d6	Kasandi (part)	Gohana	Sonipat	457	350	42	
8		Kheri Damkan (part)	2C5F6d4	Kheri Damkan (part)	Gohana	Sonipat	479	400	48	
9		Joli (part)	2C5F5m3	Joli (part)	Gohana	Sonipat	660	560	67.2	
10		Lath (part)	2C5F5m2	Lath (part)	Gohana	Sonipat	542	500	60	
11		Khanpur Kalan (part) + Bidhal (part)	2C5F6h4	Khanpur Kalan (part)	Gohana	Sonipat	899	800	96	
			2C5F5m4	Bidhal (part)	Gohana	Sonipat				
12		Bali Qutabpur + Kakana Bahadari	2C5F6f7	Bali Qutabpur (part)	Ganaur	Sonipat	701	600	72	
			2C5F6d3	Kakana Bahadari (part)	Gohana	Sonipat				
					Grand Total		6936	5660	679.2	

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 reasonable efforts (5)	

S. No.	Criteria	Maximum Score	Ranges and Scores			
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 70.0 concerning these thirteen parameters, a composite ranking was given to Gohana Watershed (IWMP I) project as given in **Table- 3.**

The total numbers of families under BPL are in the range of 20 to 50% of the total number of household in the village. Hence a score of 5 was allotted. Ground water status of the area is over-exploited and the score is given as 5. The percentage of schedule castes in this watershed are in the range of 20 to 40% of the total population, hence 5 score was allotted. More than 80 percent of the farmers are small and marginal in nature and the actual wages earned by them are

less than the minimum wages. Hence a composite rank of 10 is allotted. Considering these parameters watershed score is 70.0.

Table- 3: Weightage of the Project

S. No.	District	Name of the project	No. of micro-watersheds proposed to be covered	Proposed project area (ha)	Type of project (Hilly/ Desert/ Others)	Proposed cost (Rs. in lakh)	Weight age under the criteria												
							i	ii	iii	iv	v	vi	vii	viii	ix	x	xi	xii	xiii	Total
1.	Sonipat	Gohana Watershed (IWMP I)	12	5660	Semi Arid	679.20	5	5	0	10	5	0	5	5	5	5	10	15	0	70

Table 4: Watershed Information

Name of the Project	No. of Micro-Watersheds to be Treated	Watershed codes	Watershed regime/type/order
Gohana Watershed (IWMP I)	12	2C5F6h7, 2C5F6h6, 2C5F6d7, 2C5F6d8, 2C5F6d7, 2C5F6d6, 2C5F6d4, 2C5F5m3, 2C5F5m2, 2C5F6h4, 2C5F5m4, 2C5F6f7 and 2C5F6d3	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 etc. All the active programmes are tabulated in **Table 5.**

Table5. 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 2012-13
1	MGNREGA	Chirana (Part)	DRDA, Sonepat	To provide assured employment of 100 days in a year to unskilled labour and development of village.	117
2	MGNREGA	Shamdi Sisan (Part)	DRDA, Sonepat	To provide assured employment of 100 days in a year to unskilled labour and development of village.	88
3	MGNREGA	Shamdi Buran (Part)	DRDA, Sonepat	To provide assured employment of 100 days in a year to unskilled labour and development of village.	63
4	MGNREGA	Pugthala (Part)	DRDA, Sonepat	To provide assured employment of 100 days in a year to unskilled labour and development of village.	91
5	MGNREGA	Bajana Kalan (Part)	DRDA, Sonepat	To provide assured employment of 100 days in a year to unskilled labour and development of village.	0
6	MGNREGA	Bajana Khurd (Part)	DRDA, Sonepat	To provide assured employment of 100 days in a year to unskilled labour and development of village.	54
7	MGNREGA	Kasandi (Part)	DRDA, Sonepat	To provide assured employment of 100 days in a year to unskilled labour and development of village.	91
8	MGNREGA	Kheri Damkan	DRDA, Sonepat	To provide assured employment of 100 days in a	92

		(Part)		year to unskilled labour and development of village.	
9	MGNREGA	Joli (Part)	DRDA, Sonepat	To provide assured employment of 100 days in a year to unskilled labour and development of village.	107
10	MGNREGA	Lath (Part)	DRDA, Sonepat	To provide assured employment of 100 days in a year to unskilled labour and development of village.	31
11	MGNREGA	Khanpur Kalan (Part)	DRDA, Sonepat	To provide assured employment of 100 days in a year to unskilled labour and development of village.	1
12	MGNREGA	Bidhal (Part)	DRDA, Sonepat	To provide assured employment of 100 days in a year to unskilled labour and development of village.	55
13	MGNREGA	Bali Qutabpur (Part)	DRDA, Sonepat	To provide assured employment of 100 days in a year to unskilled labour and development of village.	0
14	MGNREGA	Kakana Bahadari (Part)	DRDA, Sonepat	To provide assured employment of 100 days in a year to unskilled labour and development of village.	14

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)

S. No.	Names of Districts	Total micro-watersheds in the District		Micro-watersheds covered so far						Net watersheds to be covered	
				Dept. of Land Resources		Other Ministries/ Depts.		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.	Sonipat	390	214795	10	5000	-	-	10	5000	280 (balance) 12	209795 (balance) 5660

CHAPTER – 3

BASIC INFORMATION OF THE PROJECT AREA

GEOGRAPHY AND GEOHYDROLOGY

The Gohana Watershed (IWMP-I) falls in Mundlana, Ganaur and Gohana block of District Sonepat. The area of watershed lies in between 29°2'30''to 29°12'30'' N Latitude & 76°45'00'' to 76°55'00'' east longitude with general elevation varies between 221-229 m (MSL) above mean sea level. Annual average rainfall of the district is 587 mm and about 80 percent of its annual rainfall is received in the month of July to September. 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 Gohana 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	Chirana (part)	Chirana (part)	669	500	528	359	8	133
2	Shamdi Sisan (part)	Shamdi Sisan (part)	522	400	416	294	47	59
3	Shamdi Buran (part)	Shamdi Buran (part)	527	400	385	258	59	83
4	Pugthala (part)	Pugthala (part)	409	350	177	118	94	138
5	Bajana Kalan (part)	Bajana Kalan (part)	503	400	386	283	29	88

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
6	Bajana Khurd (part)	Bajana Khurd (part)	568	400	490	322	0	78
7	Kasandi (part)	Kasandi (part)	457	350	317	210	28	112
8	Kheri Damkan (part)	Kheri Damkan (part)	479	400	337	258	0	142
9	Joli (part)	Joli (part)	660	560	302	202	208	150
10	Lath (part)	Lath (part)	542	500	290	248	87	165
11	Khanpur Kalan (part) + Bidhal (part)	Khanpur Kalan (part) + Bidhal (part)	899	800	501	402	91	307
12	Bali Qutabpur (part) + Kakana Bahadari (part)	Bali Qutabpur (part) + Kakana Bahadari (part)	701	600	232	131	266	203
			6936	**5660**	**4361**	**3085**	**917**	**1658**

(Source – District Census Handbook, 2001 Sonepat)

3.2 SOIL AND TOPOGRAPHY

The soils of Gohana Watershed are very deep, coarse loamy to fine in texture (sandy loam, loam, clay loam and silty clay loam), slightly alkaline in pockets (pH 7.5 to 8.4) dark in colour, calcareous, moderate to poorly drained developed on level to nearly level land. The topography of the area ranges from level to nearly level slopes. Soils are subject to susceptible slight erosion, partially water logged during rainy season in pockets along canals. The slope ranges from 0.5 to1% and above most of the area of micro watersheds falls under level to nearly level land. 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.	Chirana (part)	2C5F6h7	669	Loam to clay loam	Level to nearly level
2.	Shamdi Sisan (part)	2C5F6h6	522	Sandy loam to loam	
3.	Shamdi Buran (part)	2C5F6h6	527	Sandy loam to loam	
4.	Pugthala (part)	2C5F6d7	409	Loamy sand to clay loam	
5.	Bajana Kalan (part)	2C5F6d8	503	Sandy loam to silty loam	
6.	Bajana Khurd (part)	2C5F6d7	568	Sandy loam to clay loam	
7.	Kasandi (part)	2C5F6d6	457	Sandy loam to clay loam	
8.	Kheri Damkan (part)	2C5F6d4	479	Sandy loam to clay loam	
9	Joli (part)	2C5F5m3	660	Sandy loam to clay loam	
10	Lath (part)	2C5F5m2	542	Sandy loam to clay loam	
11	Khanpur Kalan (part) and Bidhal (part)	2C5F6h4 and 2C5F5m4	899	Sandy loam to sandy clay loam	
12	Bali Qutabpur (part) + Kakana Bahadari (part)	2C5F6f7 + 2C5F6d3	701	Sandy loam to clay loam	
			6936		

Source: - Department of Agriculture, Haryana

3.2.1 Flood and Drought Condition

There have been very few incidences of flood in watershed villages. The data collected from the revenue department reveals that the instances of flood and drought are once in 10 years. The flood and drought resulted in low to very low yields of the crops.

Table 3. Flood and Drought condition

Sr. No.	Name of Villages	Flood Incidence	Drought Incidence
1.	Chirana (part)	Once in a 10 year	Once in a 10 year
2.	Shamdi Sisan (part)		
3.	Shamdi Buran (part)		
4.	Pugthala (part)		
5.	Bajana Kalan (part)		
6.	Bajana Khurd (part)		
7.	Kasandi (part)		
8.	Kheri Damkan (part)		
9.	Joli (part)		
10.	Lath (part)		
11.	Khanpur Kalan (part)		
12.	Bidhal (part)		
13.	Bali Qutabpur (part)		
14.	Kakana Bahadari (part)		

3.3 SOILS

3.3.1 Soil Erosion

In the identified twelve micro watersheds in fourteen villages, it is observed that due to medium texture. The agricultural land has low organic matter contents.Average annual rainfall is 587 mm of the area. Soil erosion is sheet erosion during heavy rainfall in monsoon period. Majority of the watershed Community are dependent on agriculture.

3.3.2 Soil Salinity/Alkalinity (Salinity ingress)

There is moderate soil salinity/alkalinity. In the Project, pH is normal and ranges between 7.5 to 8.4.

Based on the soil samples analysis and reports, 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	Chirana (Part)	7.6-7.9	Medium
2	Shamdi Sisan (Part)	7.7-7.9	Medium
3	Shamdi Buran (Part)	7.6-7.9	Medium
4	Pugthala (Part)	7.5-8.4	Medium to high
5	Bajana Kalan (Part)	7.6-8.2	Medium
6	Bajana Khurd (Part)	7.9-8.3	Medium
7	Kasandi (Part)	7.7-7.9	Medium
8	Kheri Damkan (Part)	7.6-8.1	Medium
9	Joli (Part)	7.6-8.1	Medium
10	Lath (Part)	7.6-7.9	Medium
11	Khanpur Kalan (Part)	7.7-7.8	Medium
12	Bidhal (Part)	7.6-8.1	Medium
13	Bali Qutabpur (Part)	7.6-8.0	Safe to medium
14	Kakana Bahadari (Part)	7.6-7.9	Medium

3.3.3 SOIL CLASSIFICATION

The Soil map is presented in **Annexure V. The fertility status of the project area, available nitrogen and phosphorus are low. However, the available potash is high. The fertility status map of the project area is exhibited in Annexure-VI.**

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 II e1s1

These soils are very deep, coarse loamy to fine loamy, textured, slightly eroded located level to nearly level sloping land, soils are slight to moderate saline/alkaline in nature and susceptible to temporary water-logging along the canal network in pockets.

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

1. Suitable soil conservation measures to be adopted to provide sufficient vegetation cover.
2. Proper drainage should be provided during rainy season.
3. More irrigation facilities should be developed for intensive use of land.
4. Proper field embankment should be undertaken with field leveling to reduce water losses during irrigation.

Land capability subclass IV e3s3

These soils are generally light in texture and developed on degraded wasteland near waterbodies and pasture (Gocharan). The soils are degraded due to unscientific earth excavation by villagers for their livelihood needs.

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

1. Suitable soil conservation measures should be adopted to check water and wind erosion. Soils should be provided permanent vegetation (Agro forestry) cover to check further deterioration of soils and check wind erosion.
2. Soils would be occasionally cultivated in suitable crop rotation with indigenous grasses.
3. Land leveling should be done at 50% subsidy, because formers are not economically capable to bear the rate of land leveling.
4. Earthen Embankment and field bunding with agro- forestry should be provided to check water erosion.
5. Use of gypsum in alkaline soil for its reclamation.

3.3.5 Climatic Conditions

The average rainfall of the district is 587 mm (during the past 10 year's data). The highest rainfall is 800 mm during the year 2008 and lowest 258 mm during the year 2012.. The year wise rainfall from 2004 to 2013 is presented in **Table.5.**

Table-5. Rainfall during the years 2000-11

S.No	Year	Rainfall(in mm)
1	2004	676
2	2005	545
3	2006	377
4	2007	400
5	2008	800
6	2009	657

7	2010	787
8	2011	582
9	2012	258
10	2013	789
	Average	**587**

(Source: - Ground Water Cell, Sonepat)

The mean maximum temperature is 47˚ C (May and June) and mean minimum is 7.3˚ C (January) of the district. The rainfall data reveals that the district has 30 rainy days in the year.

3.3.6 Physiography and Relief

The topography of the area ranges from level to nearly level slopes. Soils are subject to susceptible slight erosion hazard, partially water logged during rainy season in pockets along the canal network. The slope ranges from 0.5 to1% and above most of the area of micro watersheds falls under level to gentle slopes. The elevation range and percentage slope distribution has been presented in **Table 6.**

Table 6. Physiography and Relief

Project Name	Elevation (MSL)	Slope Range (%)
Gohana Watershed (IWMP I)	221-229	0.5 to 1

3.4 LAND USE AND AGRICULTURE

The land holding pattern of the villages under Gohana Watershed shows that the majority of the land holding is in the range of 1-2 ha. In the majority of Watershed area suffering from assured irrigation source has forced the majority of the

farmers adopt side income source to survive because the rain-fed agriculture not fulfill of their daily needs. The nearest Industrial Area is Sonepat. This affects directly the demographic profile of the village.

The major crops Paddy, Bajra and green fodder in Kharif. The major crops during Rabi Wheat, Mustered, Green fodder and seasonal vegetables under irrigation, Gram and Mustard in rain fed conditions. The soil and water conservation measures such as Excavation of pond, construction of retaining wall, ramp, water conveyance system, Earthen bund, Underground pipe line 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	Neem	Guava	Desi grass
2	Bad	Jamun	
3	Kikar	Mango	
4	Pipal		
5	Shisham		

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
8873	41	2	-	8912

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	Chirana (part)	Chirana (part)	528	446	321
2	Shamdi Sisan (part)	Shamdi Sisan (part)	416	351	264
3	Shamdi Buran (part)	Shamdi Buran (part)	385	336	234
4	Pugthala (part)	Pugthala (part)	177	147	113
5	Bajana Kalan (part)	Bajana Kalan (part)	386	333	238
6	Bajana Khurd (part)	Bajana Khurd (part)	490	403	327
7	Kasandi (part)	Kasandi (part)	317	273	197
8	Kheri Damkan (part)	Kheri Damkan (part)	337	283	214
9	Joli (part)	Joli (part)	302	263	186
10	Lath (part)	Lath (part)	290	251	181
11	Khanpur Kalan (part) + Bidhal (part)	Khanpur Kalan (part) + Bidhal (part)	501	423	318
12	Bali Qutabpur (part) + Kakana Bahadari (part)	Bali Qutabpur (part) + Kakana Bahadari (part)	232	209	131
		Total	**4361**	**3718**	**2724**

(Source: Department of Agriculture, Haryana)

3.4.3 IRRIGATION

Lack of Assured Irrigation Facilities

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)	
			Availability months	Net area (ha)	Availability months	Net area (ha)
1	Chirana (part)	Chirana (part)	July to June	160	July to June	9
2	Shamdi Sisan (part)	Shamdi Sisan (part)	July to June	103	July to June	19
3	Shamdi Buran (part)	Shamdi Buran (part)	July to June	117	July to June	10
4	Pugthala (part)	Pugthala (part)	July to June	21	July to June	38
5	Bajana Kalan (part)	Bajana Kalan (part)	July to June	103	--	--
6	Bajana Khurd (part)	Bajana Khurd (part)	July to June	151	July to June	17
7	Kasandi (part)	Kasandi (part)	July to June	91	July to June	16
8	Kheri Damkan (part)	Kheri Damkan (part)	July to June	79	--	--
9	Joli (part)	Joli (part)	July to June	88	July to June	12
10	Lath (part)	Lath (part)	July to June	36	July to June	6
11	Khanpur Kalan (part)	Khanpur Kalan (part)	July to June	42	July to June	7
12	Bidhal (part)	Bidhal (part)	July to June	45	July to June	5
13	Bali Qutabpur (part)	Bali Qutabpur (part)	July to June	17	July to June	41
14	Kakana Bahadari (part)	Kakana Bahadari (part)	July to June	39	July to June	4
				1092		**184**

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

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	Wheat				Mustard			
			Area (ha)	Prod. (Qtl.)	Productivity (Qtl./ha) Avg.	Use of fertilizer	Area (ha)	Prod. (Qtl.)	Productivity (Qtl./ha) Avg.	Use of fertilizer
1	Chirana (Part)	Chirana (Part)	825	31350	38	DAP/Urea	22	242	11	Urea/ Sulphur
2	Shamdi Sisan (Part)	Shamdi Sisan (Part)	675	24975	37	DAP/Urea	9	108	12	Urea/ Sulphur
3	Shamdi Buran (Part)	Shamdi Buran (Part)	577	23080	40	DAP/Urea	1	11	11	Urea/ Sulphur
4	Pugthala (Part)	Pugthala (Part)	585	22230	38	DAP/Urea	4	48	12	Urea/ Sulphur
5	Bajana Kalan (Part)	Bajana Kalan (Part)	899	35960	40	DAP/Urea	2	22	11	Urea/ Sulphur
6	Bajana Khurd (Part)	Bajana Khurd (Part)	603	24120	40	DAP/Urea	4	48	12	Urea/ Sulphur
7	Kasandi (Part)	Kasandi (Part)	552	22632	41	DAP/Urea	3	33	11	Urea/ Sulphur
8	Kheri Damkan (Part)	Kheri Damkan (Part)	647	25880	40	DAP/Urea	-	-	-	Urea/ Sulphur
9	Joli (Part)	Joli (Part)	1029	41160	40	DAP/Urea	4	40	10	Urea/ Sulphur
10	Lath (Part)	Lath (Part)	1099	43960	40	DAP/Urea	3	33	11	Urea/ Sulphur
11	Khanpur Kalan (Part)	Khanpur Kalan (Part)	1143	41148	36	DAP/Urea	54	648	12	Urea/ Sulphur

Sr. No	Name of Micro Watersheds	Village	Wheat				Mustard			
			Area (ha)	Prod. (Qtl.)	Productivity (Qtl./ha) Avg.	Use of fertilizer	Area (ha)	Prod. (Qtl.)	Productivity (Qtl./ha) Avg.	Use of fertilizer
12	Bidhal (Part)	Bidhal (Part)	468	17316	37	DAP/Urea	6	66	11	Urea/ Sulphur
13	Bali Qutabpur (Part)	Bali Qutabpur (Part)	598	21824	38	DAP/Urea	3	36	12	Urea/ Sulphur
14	Kakana Bahadari (Part)	Kakana Bahadari (Part)	438	19726	37	DAP/Urea	18	198	11	Urea/ Sulphur

Table 11 B. Crop Details (Kharif)

Sr. No	Name of Micro Watersheds	Village	Paddy				Bajra			
			Area (ha)	Prod. (Qtl.)	Productivity (Qtl./ha) Avg.	Use of fertilizer	Area (ha)	Prod. (Qtl.)	Productivity (Qtl./ha) Avg.	Use of fertilizer
1	Chirana (Part)	Chirana (Part)	404	12928	32	DAP/Urea	31	310	10	Urea
2	Shamdi Sisan (Part)	Shamdi Sisan (Part)	185	5735	31	DAP/Urea	58	580	10	Urea
3	Shamadi Buran (Part)	Shamadi Buran (Part)	185	5550	30	DAP/Urea	50	550	11	Urea
4	Pugthala (Part)	Pugthala (Part)	495	15840	32	DAP/Urea	-	-	-	-
5	Bajana	Bajana	668	20708	31	DAP/Urea	4	40	10	Urea

Sr. No	Name of Micro Watersheds	Village	Paddy				Bajra			
			Area (ha)	Prod. (Qtl.)	Productivity (Qtl./ha) Avg.	Use of fertilizer	Area (ha)	Prod. (Qtl.)	Productivity (Qtl./ha) Avg.	Use of fertilizer
	Kalan (Part)	Kalan (Part)								
6	Bajana Khurd (Part)	Bajana Khurd (Part)	556	16680	30	DAP/Urea	3	33	11	Urea
7	Kasandi (Part)	Kasandi (Part)	280	8960	32	DAP/Urea	12	120	10	Urea
8	Kheri Damkan (Part)	Kheri Damkan (Part)	609	18879	31	DAP/Urea	-	-	-	-
9	Joli (Part)	Joli (Part)	962	30784	32	DAP/Urea	3	30	10	Urea
10	Lath (Part)	Lath (Part)	857	26567	31	DAP/Urea	-	-	-	-
11	Khanpur Kalan (Part)	Khanpur Kalan (Part)	436	13080	30	DAP/Urea	233	2330	10	Urea
12	Bidhal (Part)	Bidhal (Part)	275	8250	30	DAP/Urea	29	290	10	Urea
13	Bali Qutabpur (Part)	Bali Qutabpur (Part)	508	16256	32	DAP/Urea	4	44	11	Urea
14	Kakana Bahadari (Part)	Kakana Bahadari (Part)	187	5797	31	DAP/Urea	-	-	-	-

3.4.5 Livestock

Farmers in these villages have maintaining 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 would help improve the soil health.

Table 12. Village Wise Distribution of Milk Production in Gohana 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	Chirana (part)	Chirana (part)	1800/13500/2430000	30/135/24300	40	25	-
2	Shamdi Sisan (part)	Shamdi Sisan (part)	1600/11200/2016000	30/120/21600	-	-	-
3	Shamdi Buran (part)	Shamdi Buran (part)	700/5950/1071000	40/200/36000	-	-	-
4	Pugthala (part)	Pugthala (part)	4200/27300/4914000	600/2100/378000	125	65	-
5	Bajana Kalan (part)	Bajana Kalan (part)	1200/8400/1512000	50/200/36000	50	100	-
6	Bajana Khurd (part)	Bajana Khurd (part)	1400/10500/1890000	55/220/39600	-	50	-
7	Kasandi (part)	Kasandi (part)	1500/10500/1890000	50/200/36000	10	5	-
8	Kheri Damkan (part)	Kheri Damkan (part)	1200/9600/1728000	50/250/45000	50	150	-
9	Joli (part)	Joli (part)	3000/21000/378000	400/1600/288000	300	150	-
10	Lath (part)	Lath (part)	1250/8125/1462500	30/105/18900	20	30	-
11	Khanpur Kalan (part)	Khanpur Kalan (part)	5200/41600/7488000	250/1250/225000	500	300	-
12	Bidhal (part)	Bidhal (part)	1200/9000/1620000	100/450/81000	-	20	-
13	Bali Qutabpur (part)	Bali Qutabpur (part)	1070/7490/1348200	100/400/72000	-	155	-
14	Kakana Bahadari (part)	Kakana Bahadari (part)	1800/11700/2106000	20/70/12600	60	10	-

(Source: Animal Husbandry, Sonepat)

***Average yield of Buffalo is 6.5-8 lit/day and the Average yield of Cow is 3-5 lit/day**

3.4.6 Ground Water Concern

a) Depth to Water

Ground Water Cell of Haryana has fixed hydrograph station scattered over 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 level of all micro watersheds varies from 2.9-9.6m depth. Micro watersheds Bidhal, Lath and some part of Kheri Damkan have depth of ground water below 4 m. Kakana Bahadri and Khanpur Kalan have water table in the range of 4-6 m. Parts of Bali Qutabpur, Pugthala and Shamri have water table in the range of 6-8 m. Bajana Kallan, Bajana Khurd and Chirana have water table more than 8 m. 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 Gohana Watershed (IWMP I)

Sr. No.	Name of Micro Watersheds	Name of Villages	Source	Pre- Project level (m)
1	Chirana (part)	Chirana (part)	Open wells or Bore wells or Others	5.68
2	Shamdi Sisan (part)	Shamdi Sisan (part)		5.15
3	Shamdi Buran (part)	Shamdi Buran (part)		2.21
4	Pugthala (part)	Pugthala (part)		9.62
5	Bajana Kalan (part)	Bajana Kalan (part)		4.45
6	Bajana Khurd (part)	Bajana Khurd (part)		4.50
7	Kasandi (part)	Kasandi (part)		3.90
8	Kheri Damkan (part)	Kheri Damkan (part)		4.25
9	Joli (part)	Joli (part)		2.96
10	Lath (part)	Lath (part)		3.10
11	Khanpur Kalan (part) and Bidhal (part)	Khanpur Kalan (part)		2.96
		Bidhal (part)		2.96
12	Bali Qutabpur (part) and	Bali Qutabpur (part)		3.90
		Kakana Bahadari		3.90

Sr. No.	Name of Micro Watersheds	Name of Villages	Source	Pre- Project level (m)
	Kakana Bahadari (part)	(part)		

The quality of ground water in the area is marginal and marginal to saline. Few pockets in the North-East and South-West are underlain by fresh ground water. The quality of ground water in deeper aquifers is saline. The water quality map of the area is presented in **Annexure-IX**. The source of drinking water supply is through the tube wells as well as canal network in the area.

b) Water table fluctuation

From the availability of the data from the period June 1974 to June 2014, it is observed that the water table is rising where the area is underlain by poor quality water and falling in the areas underlain by marginal and marginal to saline quality of ground water.

The seasonal fluctuation i.e. Pre and Post monsoon period is 1-1.5 m.

c) Rain water harvesting

The watershed area experiences shallow ground water conditions where rainwater harvesting structures have been provided in the area where exploitation of marginal water table is being undertaken and the existing water table is below 5 m. Recharging is recommended for improving the quality of ground water.

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

Table14. Detail of Common Property Resources

Data not available

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	Chirana (part)	Chirana (part)	934	2583	2187	4770	603	509	1112	23.3
2	Shamdi Sisan (part)	Shamdi Sisan (part)	641	1843	1545	3388	195	168	363	10.7
3	Shamdi Buran (part)	Shamdi Buran (part)	563	1547	1321	2868	296	268	564	19.7
4	Pugthala (part)	Pugthala (part)	728	2225	1797	4022	320	277	597	14.8
5	Bajana Kalan (part)	Bajana Kalan (part)	473	1391	1160	2551	164	152	316	12.4
6	Bajana Khurd (part)	Bajana Khurd (part)	512	1495	1248	2743	241	176	417	15.2

Sr. No.	Name of the Micro watershed	Name of villages	Total no. of houses	Total Population			SC			
				Male	Female	Total	Male	Female	Total	%age
7	Kasandi (part)	Kasandi (part)	568	1559	1362	2921	256	257	513	17.6
8	Kheri Damkan (part)	Kheri Damkan (part)	820	2446	2001	4447	503	417	920	20.7
9	Joli (part)	Joli (part)	1100	3213	2750	5963	403	358	761	12.8
10	Lath (part)	Lath (part)	893	2613	2213	4826	619	516	1135	23.5
11	Khanpur Kalan (part) and Bidhal (part)	Khanpur Kalan (part)	1987	5273	7271	12544	1384	1275	2659	21.2
		Bidhal (part)	660	1861	1561	3422	530	445	975	28.5
12	Bali Qutabpur (part) and Kakana Bahadari (part)	Bali Qutabpur (part)	512	1503	1256	2759	117	80	197	7.1
		Kakana Bahadari (part)	261	764	691	1455	224	179	403	27.7
		Total	**10652**	**30316**	**28363**	**58679**	**5855**	**5077**	**10932**	**18.6**

(Source- District Census 2011)

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

Sr.No.	Name of the Micro watershed	Name of villages	Total population	Literacy					
				Total Literates	% age	Male	% age	Female	% age
1	Chirana (part)	Chirana (part)	4770	3138	65.8	1930	61.5	1208	38.5
2	Shamdi Sisan (part)	Shamdi Sisan (part)	3388	2165	63.9	1340	61.9	825	38.1

3	Shamdi Buran (part)	Shamdi Buran (part)	2868	1865	65.0	1142	61.2	723	38.8
4	Pugthala (part)	Pugthala (part)	4022	2632	65.4	1604	60.9	1028	39.1
5	Bajana Kalan (part)	Bajana Kalan (part)	2551	1780	69.8	1093	61.4	687	38.6
6	Bajana Khurd (part)	Bajana Khurd (part)	2743	1744	63.6	1078	61.8	666	38.2
7	Kasandi (part)	Kasandi (part)	2921	1992	68.2	1202	60.3	790	39.7
8	Kheri Damkan (part)	Kheri Damkan (part)	4447	2773	62.4	1700	61.3	1073	38.7
9	Joli (part)	Joli (part)	5963	3860	64.7	2337	60.5	1523	39.5
10	Lath (part)	Lath (part)	4826	3300	68.4	2015	61.1	1285	38.9
11	Khanpur Kalan (part) and Bidhal (part)	Khanpur Kalan (part)	12544	9060	72.2	3806	42.0	5254	58.0
		Bidhal (part)	3422	2306	67.4	1443	62.6	863	37.4
12	Bali Qutabpur (part) and Kakana Bahadari (part)	Bali Qutabpur (part)	2759	1848	67.0	1127	61.0	721	39.0
		Kakana Bahadari (part)	1455	986	67.8	574	58.2	412	41.8
		Total	**58679**	**39449**	**67.2**	**22391**	**56.8**	**17058**	**43.2**

(Source- District Census- 2011)

Table 17. EMPLOYMENT STATUS

Sr.No.	Name of	Name of	Schedule	Cultivators	Agricultural	Household	Other

	Micro Watersheds	villages	caste				labourers		industry workers		workers	
			Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
1	Chirana (part)	Chirana (part)	603	509	573	178	139	84	18	2	313	85
2	Shamdi Sisan (part)	Shamdi Sisan (part)	195	168	518	22	17	6	3	1	131	15
3	Shamdi Buran (part)	Shamdi Buran (part)	296	268	397	53	24	7	14	3	110	13
4	Pugthala (part)	Pugthala (part)	320	277	633	206	180	71	5	0	240	55
5	Bajana Kalan (part)	Bajana Kalan (part)	164	152	416	19	28	0	10	1	166	26
6	Bajana Khurd (part)	Bajana Khurd (part)	241	176	337	10	6	2	1	0	108	10
7	Kasandi (part)	Kasandi (part)	256	257	225	13	23	2	4	8	171	35
8	Kheri Damkan (part)	Kheri Damkan (part)	503	417	563	125	31	6	19	1	419	33
9	Joli (part)	Joli (part)	403	358	819	322	225	63	26	16	445	68
10	Lath (part)	Lath (part)	619	516	371	57	42	24	1	0	263	28
11	Khanpur Kalan (part) and Bidhal (part)	Khanpur Kalan (part)	1384	1275	913	115	261	69	54	18	840	267
		Bidhal (part)	530	445	346	103	95	59	19	12	374	67
12	Bali Qutabpur (part) and Kakana Bahadari (part)	Bali Qutabpur (part)	117	80	290	105	295	31	7	1	101	8
		Kakana Bahadari (part)	224	179	230	27	62	30	1	0	32	5

		Total	**5855**	**5077**	**6631**	**1355**	**1428**	**454**	**182**	**63**	**3713**	**715**

Source: Census 2011

3.5.2 MIGRATION PATTERN

During the base line survey, the stake holders intimated that there is no permanent migration. The small farmers and landless labors are seeking employment on day to day basis in near-by city and in the NCR area. With the introduction of the project, the employment would be generated in the villages.

Table 18. Migration Pattern in Gohana 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	Chirana (Part)	Chirana (Part)	4770	-	-	-	-
2	Shamdi Sisan (Part)	Shamdi Sisan (Part)	3388	-	-	-	-
3	Shamdi Buran (Part)	Shamdi Buran (Part)	2868	-	-	-	-
4	Pugthala (Part)	Pugthala (Part)	4022	-	-	-	-
5	Bajana Kalan (Part)	Bajana Kalan (Part)	2551	-	-	-	-
6	Bajana Khurd (Part)	Bajana Khurd (Part)	2743	-	-	-	-
7	Kasandi (Part)	Kasandi (Part)	2921	-	-	-	-
8	Kheri Damkan (Part)	Kheri Damkan (Part)	4447	-	-	-	-
9	Joli (Part)	Joli (Part)	5963	-	-	-	-
10	Lath (Part)	Lath (Part)	4826	-	-	-	-
11	Khanpur Kalan (Part) and	Khanpur Kalan (Part)	12544	-	-	-	-

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
	Bidhal (Part)	Bidhal (Part)	3422	-	-	-	-
12	Bali Qutabpur (Part) and	Bali Q utabpur (Part)	2759	-	-	-	-
	Kakana B ahadari (Part)	Kakana B ahadari (Part)	1455	-	-	-	-

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	Chirana (Part)	Chirana (Part)	934	250	26.8
2	Shamdi S isan (Part)	Shamdi Sisan (Part)	641	101	15.8
3	Shamdi B uran (Part)	Shamdi Buran (Part)	563	105	18.7
4	Pugthala (Part)	Pugthala (Part)	728	115	15.8
5	Bajana K alan (Part)	Bajana Kalan (Part)	473	72	15.2
6	Bajana K hurd (Part)	Bajana Khurd (Part)	512	95	18.6
7	Kasandi (Part)	Kasandi (Part)	568	141	24.8
8	Kheri D amkan (Part)	Kheri Damkan (Part)	820	215	26.2
9	Joli (Part)	Joli (Part)	1100	178	16.2
10	Lath (Part)	Lath (Part)	893	199	22.3
11	Khanpur K alan (Part) and	Khanpur Kalan (Part)	1987	650	32.7
		Bidhal (Part)	660	198	30.0

Sr. No.	Name of Micro watersheds	Name of villages	Total houses	Total Household-BPL	% of BPL HH
	Bidhal (Part)				
12	Bali Q utabpur (Part) and Kakana B ahadari (Part)	Bali Qutabpur (Part)	512	144	28.1
		Kakana Bahadari (Part)	261	111	42.5
			10652	**2574**	**24.2**

(Source: District Administration Sonepat, 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	Health Facility Govt/Private Y/N	Veterinary facility Y/N
1	Chirana (Part)	Chirana (Part)	N	Y	3 Sr. Sec. Schools & 2 Primary Schools	N	Y	Y
2	Shamdi Sisan (Part)	Shamdi Sisan (Part)	Y	Y	2 Primary Schools	Y	N	Y
3	Shamdi Buran (Part)	Shamdi Buran (Part)	Y	N	N	N	Y	N
4	Pugthala (Part)	Pugthala (Part)	Y	Y	1 Sr. Sec. School + 2 Primary Schools	N	Y	Y
5	Bajana Kalan (Part)	Bajana Kalan (Part)	Y	N	1 High School + 2 Primary	N	N	Y

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	Health Facility Govt/Private Y/N	Veterinary facility Y/N
					Schools			
6	Bajana Khurd (Part)	Bajana Khurd (Part)	N	Y	1 Middle School + 1 Sr. Sec. School	N	Y	Y
7	Kasandi (Part)	Kasandi (Part)	--	Y	2 Primary + 1 High School	N	Y	Y
8	Kheri Damkan (Part)	Kheri Damkan (Part)	N	Y	1 Sr. Sec. School	N	Y	Y
9	Joli (Part)	Joli (Part)	Y	Y	2 Sr. Sec. School+ 1 High School	Y	N	Y
10	Lath (Part)	Lath (Part)	Y	Y	2 Govt. Primary School	Y	N	Y
11	Khanpur Kalan (Part) and Bidhal (Part)	Khanpur Kalan (Part)	Y	Y	3 Middle Schools & 2 High Schools	N	Y	Y
		Bidhal (Part)	Y	Y	2 Primary + 1 Sr. Sec. School	Y	Y	N
12	Bali Qutabpur (Part) and Kakana Bahadari (Part)	Bali Qutabpur (Part)	N	Y	1 High School	N	N	Y
		Kakana Bahadari (Part)	N	N	1 Primary School	N	N	N

FACILITIES/ HOUSEHOLD ASSETS

Table 21. Facilities/ Household assets in Gohana 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	Chirana (Part)	Chirana (Part)	1200	500	10	100	1100	4	-	700		500
2	Shamdi Sisan (Part)	Shamdi Sisan (Part)	800	650	-	1100	180	5	700	650	650	250
3	Shamdi Buran (Part)	Shamdi Buran (Part)	800	550	-	1000	200	10	695	700		550
4	Pugthala (Part)	Pugthala (Part)	1425	1100	-	870	-	5	1050	850	-	950
5	Bajana Kalan (Part)	Bajana Kalan (Part)	600	400	-	1700	185	5	490	400	-	220
6	Bajana Khurd (Part)	Bajana Khurd (Part)	700	580	-	1200	300	20	600	620	-	400
7	Kasandi (Part)	Kasandi (Part)	750	650	5	1000	250	4	500	500	710	350
8	Kheri Damkan (Part)	Kheri Damkan (Part)	650	600	-	1100	600	6	410	585	10	375
9	Joli (Part)	Joli (Part)	1500	900	-	150	620	8		1310	1250	975
10	Lath (Part)	Lath (Part)	1150	200	30	950	200	4	850	850		250
11	Khanpur Kalan (Part) and	Khanpur Kalan (Part)	2400	1250	120	5000	1000	50	1475	1500	2350	1500
		Bidhal	517	320	-	100	-	-	320	285	-	320

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				
	Bidhal (Part)	(Part)										
12	Bali Qutabpur (Part) and Kakana Bahadari (Part)	Bali Qutabpur (Part)	452	380	25	1050		5	385	400		280
		Kakana Bahadari (Part)	500	395	5	50	20	-	320	285	390	120

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 Gohana Watershed (IWMP I)

S. 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.	Chirana (Part)	Chirana (Part)	16000	7500	4500	3000	31000
2.	Shamdi Sisan (Part)	Shamdi Sisan (Part)	18000	7000	4000	3200	32200
3.	Shamdi Buran (Part)	Shamdi Buran (Part)	15000	8000	3200	2900	29100
4.	Pugthala (Part)	Pugthala (Part)	17500	6500	3800	3300	31100
5.	Bajana Kalan (Part)	Bajana Kalan (Part)	18000	8500	4200	3500	34200

S. 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.
6.	Bajana K hurd (Part)	Bajana K hurd (Part)	15000	7000	4500	4000	30500
7.	Kasandi (Part)	Kasandi (Part)	16000	6000	4200	3200	29400
8.	Kheri D amkan (Part)	Kheri D amkan (Part)	18000	7500	4000	3800	33300
9.	Joli (Part)	Joli (Part)	16500	8000	3800	3500	31800
10.	Lath (Part)	Lath (Part)	17000	6500	4500	3000	31000
11.	Khanpur K alan (Part) and Bidhal (Part)	Khanpur K alan (Part)	14500	7500	3500	3300	28800
		Bidhal (Part)	15000	8500	4200	2900	30600
12.	Bali Q utabpur (Part) and Kakana Bahadari (Part)	Bali Q utabpur (Part)	17000	6000	3200	3500	29700
		Kakana B ahadari (Part)	17500	7500	3500	3800	32300

3.5.4 Comparative Status of crop Productivity

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

3.6 REASONS FOR LOW PRODUCTIVITY

- Moderate to severe erosion hazard
- Poor physical and chemical properties of the soils are light in texture with boulders in pockets and poor fertility.
- Low water holding/ retention capacity.

- Medium to Moderate permeability.
- Low organic carbon content.
- Poor phosphorous and medium potash nutrients availability.
- Lack of assured irrigation facility.
- Acceptance of hybrid/ high yielding varieties is very low.
- Irregular and erratic rainfall: there is long span between two subsequent rainfalls in the area.
- Sudden change in climate of the area.
- Essential micro- nutrient deficiency in the soil.
- Full and partial dependence of monsoon.
- Improper use of fertilizer 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.
- Poor ground water quality in deeper zone.

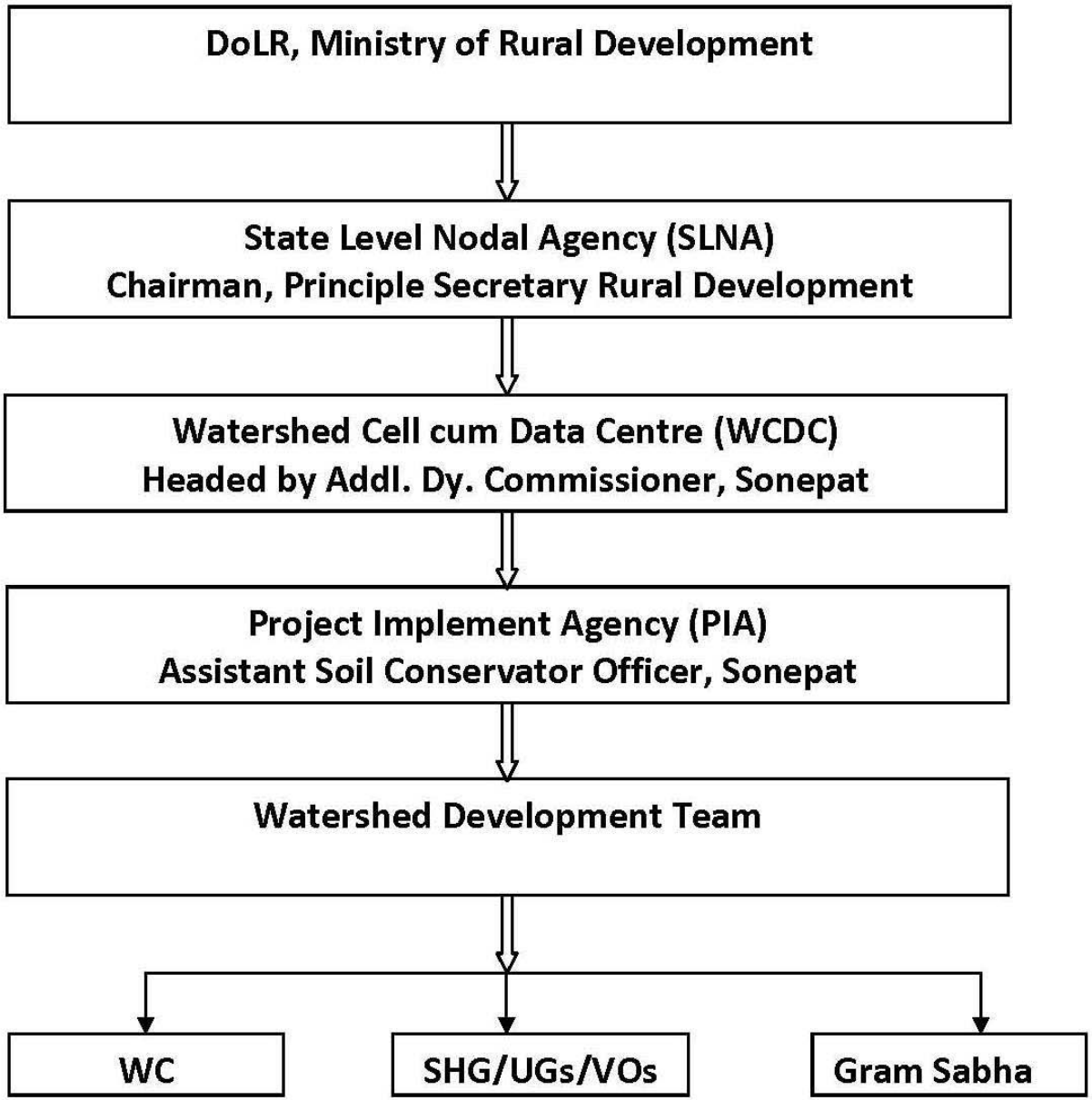
CHAPTER-4

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 (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
Watershed Cell cum Data Centre (WCDC)
Headed by Addl. Dy. Commissioner, Sonepat
Project Implement Agency (PIA)
Assistant Soil Conservator Officer, Sonepat
Watershed Development Team
WC
SHG/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, SONEPAT

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 that 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 Sonepat is selected by the State Level Nodal Agency (SLNA) for Integrated Watershed Management Programme (IWMP) in Haryana. In the district Sonepat, where the area of development is 5660 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, Sonepat. With the 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

S.No.	Name of the Project	Details of PIA	
1	Gohana Watershed (IWMP-I)	i) Type of organization	Govt Organization
		ii) Name of organization	Department of Agriculture
		iii) Designation & Address	ASCO, Sonepat
		iv) Telephone	
		v) Fax	-----
		vi) E-mail	ascosonepat@gmail.com

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 of fice with officials from the Sonepat 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 below: **(Table 2)**

Table 2. Watershed Committees (WC) Details

Name of Micro Watershed	Name of President	Name of Secretary	Name of Members
Bidhal	Smt. Seema	Sh. Karmvir S/o Sh. Nafe Singh	Rajbeer, Ramchandra, Jagmati ,Kartar Singh Savitri ,Hoshiar Singh, Raaj Singh ,Yashpal, Karan Singh Karambeer, Bimla, Rakesh, Satpal, Omprakash
Lath	Sh Jagbir Singh	Sh. Ravinder Kumar	Jile Singh, Omprakash, Yogesh, Monu, Satbeer ,Suresh Kumar, Gopi, Rajbeer, Krishan, Mehar ,Ravinder Kumar, Rohtash, Sarswati, Rakesh

Jolly	Ratan Singh	Sh. Dharmbir Singh	Dharambeer S ingh, Balwan, K aran Singh, K amal, Yashpal, S unil, Ishwar, Vijay Singh, Dayanand, Smt. Darshan Devi, Smt. Kitabo Satbir, Rakesh
Kheri Damkan	Sh. Ramchander	Sudhir	Bhale Ram ,Rannbeer ,Krishana Devi ,Suresh ,Sukhpati ,Virender, Dheer Singh Nambardar, Darshna, Khushi Ram, Dhaniram, Rajbala, Rajrani, Rakesh, Sudhir
Kakana Bhadhuri	Smt. Dhanno	Vijay	Anita Devi , Subhash ,Suresh Brahma, Mehar Singh, Jaykanwar, Rajkunwar, Rajkunwar, Khubram, Vijay, Rajpal, Rakesh, Ishwer Singh
Khanpur Kalan	Sh. Ashok Kumar Malik	Sh. Ramesh	Jagbir , Bijender , Shushila ,Satbeer Chatar singh , Ramesh, Naresh Dinesh, Jaibeer , Amit , Raj, Baljeet Rakesh
Kasandi	Sh. Dharmbir Singh	Anil Kumar	Smt. Daya, Raj Singh , Mrs. Kavita, Rambhaj, Dinesh, Jogender, Anil , Abhimanyu, Jagdeesh, Satish, Kuldeep, Kesri Devi,Rakesh
Chidana	Sh. Ramesh	Sh. Sandeep Kumar	Mehar Singh, Ramkishan, Jasmer, Bijende, Surender, Bala, Kamlesh, Rannveer, Ishwar, Mahabeer , Sandeep, Sadji, Bijender, Ramphal, Nambardar, Ishwer, Harender Singh, Dahaya
Samri Buran	Sh. Ishwar Singh	Smt. Seema	Krishan Lal, Mahaveer, Ramehar, Kelo, Praveen, Ramchandra, Sudesh, Jayanti, Bheem Singh, Jagdish, Beermati, Seema, Harender Singh Dahia

Samri Sisan	Smt. Shanti Devi	Suresh Kumar	Surajmal, Baljeet Singh, Hukam Chand, Sumitra, Baljeet Singh, Parminder Singh, Mahabeer Singh, Ramesh, Savitri, Chandra, Ishwanti, Ishwar Singh, Harender Singh Dahia, Rambag
Bajana Kalan	Smt. Sakuntla Devi	Dalbir Singh	Mahabeer Namberdar, Dharamabeer, Rajbeer, Dalbeer, Pradeep, Rajender, Bheem singh, Surender, Ishwar, Sunita, Mahasingh, krishan, Nirmla, Mahabeer Sharma, Ishwar, Harender Singh Dahia
Bajana Khurd	Sh. Ramkumar	Ankit Kumar	Ishwar, Ravinder, Poonam, Naveen , Rakesh, Munshi Ram, Sukhvarsha, Jora Singh, Gyano Devi, Parvinder, Harender Singh Dahia, Rama, Jaan, Suresh
Pugthala	Sh. Suresh	Sh. Satyawan	Shamsher , Ramesh, Tara Chand , Narender Prakasho , Ravinder, Karambir, Annand, Maha Singh, Raj Kumar, Sandeep, Satyawan Ikbal, Harender Singh Dahia
Bali Kutubpur	Sh. Ishwer Singh	Sh. Tejveer Singh	Shaukin, Dharam Singh, Satpal, Raghbir, Pale Ram, Mrs. Santro, Tek Ram Yashpal, Mehtab, Ishwar Mauji, Harender Singh Dahia, Ajit Singh, Tejbir, Vijay

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 is 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 GOHANA 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
Gohana Watershed (IWMP I)	6936	5660	67920000	Administrative costs	679200	679200	2037600	2037600	1358400	**6792000**
				Monitoring	0	0	0	679200	0	**679200**
				Evaluation	0	169800	169800	169800	169800	**679200**
				Entry point activities	2716800	0	0	0	0	**2716800**
				Institution and capacity building	0	3396000	0	0	0	**3396000**
				Detailed pr oject report	679200	0	0	0	0	**679200**
				Watershed development works	0	5433600	10867200	11546400	10188000	**38035200**
				Livelihood ac tivities for the as set l ess persons	0	0	2037600	3396000	679200	**6112800**
				Production system and micro enterprises	0	0	2037600	2716800	2037600	**6792000**
				Consolidation phase	0	0	0	0	2037600	**2037600**
				Total	**4075200**	**9678600**	**17149800**	**20545800**	**16470600**	**67920000**
				Percentage of total cost	**6%**	**14.25%**	**25.25%**	**30.25%**	**24.25%**	**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: Chirana)

(BUDGET AT A GLANCE)

Effective Area	Funds Available	Name of activity	1st Year	2nd Year	3rd Year	4th Year	5th Year	Total
500	6000000	Administrative costs	60000	60000	180000	180000	120000	**600000**
		Monitoring	0	0	0	60000	0	**60000**
		Evaluation	0	15000	15000	15000	15000	**60000**
		Entry point activities	240000	0	0	0	0	**240000**
		Institution and capacity building	0	300000	0	0	0	**300000**
		Detailed pr oject report	60000	0	0	0	0	**60000**
		Watershed development works	0	480000	960000	1020000	900000	**3360000**
		Livelihood ac tivities for the as set l ess persons	0	0	180000	300000	60000	**540000**
		Production system and micro enterprises	0	0	180000	240000	180000	**600000**
		Consolidation phase	0	0	0	0	180000	**180000**
		Total	**360000**	**855000**	**1515000**	**1815000**	**1455000**	**6000000**
		Percentage of total cost	**6%**	**14.25%**	**25.25%**	**30.25%**	**24.25%**	**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: Shamdi Sisan)

(BUDGET AT A GLANCE)

Effective Area	Funds Available	Name of activity	1st Year	2nd Year	3rd Year	4th Year	5th Year	Total
400	4800000	Administrative costs	48000	48000	144000	144000	96000	**480000**
		Monitoring	0	0	0	48000	0	**48000**
		Evaluation	0	12000	12000	12000	12000	**48000**
		Entry point activities	192000	0	0	0	0	**192000**
		Institution and capacity building	0	240000	0	0	0	**240000**
		Detailed pr oject report	48000	0	0	0	0	**48000**
		Watershed development works	0	384000	768000	816000	720000	**2688000**
		Livelihood ac tivities for the as set l ess persons	0	0	144000	240000	48000	**432000**
		Production system and micro enterprises	0	0	144000	192000	144000	**480000**
		Consolidation phase	0	0	0	0	144000	**144000**
		Total	**288000**	**684000**	**1212000**	**1452000**	**1164000**	**4800000**
		Percentage of total cost	**6%**	**14.25%**	**25.25%**	**30.25%**	**24.25%**	**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: Shamdi Buran)
(BUDGET AT A GLANCE)

Effective Area	Funds Available	Name of activity	1st Year	2nd Year	3rd Year	4th Year	5th Year	Total
400	4800000	Administrative costs	48000	48000	144000	144000	96000	**480000**
		Monitoring	0	0	0	48000	0	**48000**
		Evaluation	0	12000	12000	12000	12000	**48000**
		Entry point activities	192000	0	0	0	0	**192000**
		Institution and capacity building	0	240000	0	0	0	**240000**
		Detailed pr oject report	48000	0	0	0	0	**48000**
		Watershed development works	0	384000	768000	816000	720000	**2688000**
		Livelihood ac tivities for the as set l ess persons	0	0	144000	240000	48000	**432000**
		Production system and micro enterprises	0	0	144000	192000	144000	**480000**
		Consolidation phase	0	0	0	0	144000	**144000**
		Total	**288000**	**684000**	**1212000**	**1452000**	**1164000**	**4800000**
		Percentage of total cost	**6%**	**14.25%**	**25.25%**	**30.25%**	**24.25%**	**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: Pugthala)

(BUDGET AT A GLANCE)

Effective Area	Funds Available	Name of activity	1st Year	2nd Year	3rd Year	4th Year	5th Year	Total
350	4200000	Administrative costs	42000	42000	126000	126000	84000	**420000**
		Monitoring	0	0	0	42000	0	**42000**
		Evaluation	0	10500	10500	10500	10500	**42000**
		Entry point activities	168000	0	0	0	0	**168000**
		Institution and capacity building	0	210000	0	0	0	**210000**
		Detailed pr oject report	42000	0	0	0	0	**42000**
		Watershed development works	0	336000	672000	714000	630000	**2352000**
		Livelihood ac tivities for the as set l ess persons	0	0	126000	210000	42000	**378000**
		Production system and micro enterprises	0	0	126000	168000	126000	**420000**
		Consolidation phase	0	0	0	0	126000	**126000**
		Total	**252000**	**598500**	**1060500**	**1270500**	**1018500**	**4200000**
		Percentage of total cost	**6%**	**14.25%**	**25.25%**	**30.25%**	**24.25%**	**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: Bajana Kalan)

(BUDGET AT A GLANCE)

Effective Area	Funds Available	Name of activity	1st Year	2nd Year	3rd Year	4th Year	5th Year	Total
400	4800000	Administrative costs	48000	48000	144000	144000	96000	**480000**
		Monitoring	0	0	0	48000	0	**48000**
		Evaluation	0	12000	12000	12000	12000	**48000**
		Entry point activities	192000	0	0	0	0	**192000**
		Institution and capacity building	0	240000	0	0	0	**240000**
		Detailed pr oject report	48000	0	0	0	0	**48000**
		Watershed development works	0	384000	768000	816000	720000	**2688000**
		Livelihood ac tivities for the as set l ess persons	0	0	144000	240000	48000	**432000**
		Production system and micro enterprises	0	0	144000	192000	144000	**480000**
		Consolidation phase	0	0	0	0	144000	**144000**
		Total	**288000**	**684000**	**1212000**	**1452000**	**1164000**	**4800000**
		Percentage of total cost	**6%**	**14.25%**	**25.25%**	**30.25%**	**24.25%**	**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: Bajana Khurd) (BUDGET AT A GLANCE)

Effective Area	Funds Available	Name of activity	1st Year	2nd Year	3rd Year	4th Year	5th Year	Total
400	4800000	Administrative costs	48000	48000	144000	144000	96000	**480000**
		Monitoring	0	0	0	48000	0	**48000**
		Evaluation	0	12000	12000	12000	12000	**48000**
		Entry point activities	192000	0	0	0	0	**192000**
		Institution and capacity building	0	240000	0	0	0	**240000**
		Detailed pr oject report	48000	0	0	0	0	**48000**
		Watershed development works	0	384000	768000	816000	720000	**2688000**
		Livelihood ac tivities for the as set l ess persons	0	0	144000	240000	48000	**432000**
		Production system and micro enterprises	0	0	144000	192000	144000	**480000**
		Consolidation phase	0	0	0	0	144000	**144000**
		Total	**288000**	**684000**	**1212000**	**1452000**	**1164000**	**4800000**
		Percentage of total cost	**6%**	**14.25%**	**25.25%**	**30.25%**	**24.25%**	**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: Kasandi) (BUDGET AT A GLANCE)

Effective Area	Funds Available	Name of activity	1st Year	2nd Year	3rd Year	4th Year	5th Year	Total
350	4200000	Administrative costs	42000	42000	126000	126000	84000	**420000**
		Monitoring	0	0	0	42000	0	**42000**
		Evaluation	0	10500	10500	10500	10500	**42000**
		Entry point activities	168000	0	0	0	0	**168000**
		Institution and capacity building	0	210000	0	0	0	**210000**
		Detailed pr oject report	42000	0	0	0	0	**42000**
		Watershed development works	0	336000	672000	714000	630000	**2352000**
		Livelihood act ivities for t he as set l ess persons	0	0	126000	210000	42000	**378000**
		Production syst em and m icro enterprises	0	0	126000	168000	126000	**420000**
		Consolidation phase	0	0	0	0	126000	**126000**
		Total	**252000**	**598500**	**1060500**	**1270500**	**1018500**	**4200000**
		Percentage of	**6%**	**14.25%**	**25.25%**	**30.25%**	**24.25%**	**100%**

		total 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: Kheri Damkan)
(BUDGET AT A GLANCE)

Effective Area	Funds Available	Name of activity	1st Year	2nd Year	3rd Year	4th Year	5th Year	Total
400	4800000	Administrative costs	48000	48000	144000	144000	96000	**480000**
		Monitoring	0	0	0	48000	0	**48000**
		Evaluation	0	12000	12000	12000	12000	**48000**
		Entry point activities	192000	0	0	0	0	**192000**
		Institution and capacity building	0	240000	0	0	0	**240000**
		Detailed pr oject report	48000	0	0	0	0	**48000**
		Watershed development works	0	384000	768000	816000	720000	**2688000**
		Livelihood act ivities for t he as set l ess persons	0	0	144000	240000	48000	**432000**
		Production syst em and m icro enterprises	0	0	144000	192000	144000	**480000**
		Consolidation phase	0	0	0	0	144000	**144000**
		Total	**288000**	**684000**	**1212000**	**1452000**	**1164000**	**4800000**

		Percentage of total cost	**6%**	**14.25%**	**25.25%**	**30.25%**	**24.25%**	**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: Joli) (BUDGET AT A GLANCE)

Effective Area	Funds Available	Name of activity	1st Year	2nd Year	3rd Year	4th Year	5th Year	Total
560	6720000	Administrative costs	67200	67200	201600	201600	134400	**672000**
		Monitoring	0	0	0	67200	0	**67200**
		Evaluation	0	16800	16800	16800	16800	**67200**
		Entry point activities	268800	0	0	0	0	**268800**
		Institution and capacity building	0	336000	0	0	0	**336000**
		Detailed pr oject report	67200	0	0	0	0	**67200**
		Watershed development works	0	537600	1075200	1142400	1008000	**3763200**
		Livelihood act ivities for t he as set l ess persons	0	0	201600	336000	67200	**604800**
		Production system and m icro enterprises	0	0	201600	268800	201600	**672000**
		Consolidation phase	0	0	0	0	201600	**201600**
		Total	**403200**	**957600**	**1696800**	**2032800**	**1629600**	**6720000**

		Percentage of total cost	**6%**	**14.25%**	**25.25%**	**30.25%**	**24.25%**	**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: Lath)
(BUDGET AT A GLANCE)

Effective Area	Funds Available	Name of activity	1st Year	2nd Year	3rd Year	4th Year	5th Year	Total
500	6000000	Administrative costs	60000	60000	180000	180000	120000	**600000**
		Monitoring	0	0	0	60000	0	**60000**
		Evaluation	0	15000	15000	15000	15000	**60000**
		Entry point activities	240000	0	0	0	0	**240000**
		Institution and capacity building	0	300000	0	0	0	**300000**
		Detailed project report	60000	0	0	0	0	**60000**
		Watershed development works	0	480000	960000	1020000	900000	**3360000**
		Livelihood activities for the asset less persons	0	0	180000	300000	60000	**540000**
		Production system and micro enterprises	0	0	180000	240000	180000	**600000**
		Consolidation phase	0	0	0	0	180000	**180000**
		Total	**360000**	**855000**	**1515000**	**1815000**	**1455000**	**6000000**

		Percentage of total cost	**6%**	**14.25%**	**25.25%**	**30.25%**	**24.25%**	**100%**

MICRO WATERSHED WISE/COMPONENT WISE PHASING
YEAR WISE BUDGET PHASING UNDER IWMP

Area in Hectares and Funds in Rs.

Table 12. PHASING YEAR WISE (Name of the Micro Watershed: Khanpur Kalan and Bidhal)
(BUDGET AT A GLANCE)

Effective Area	Funds Available	Name of activity	1st Year	2nd Year	3rd Year	4th Year	5th Year	Total
800	9600000	Administrative costs	96000	96000	288000	288000	192000	**960000**
		Monitoring	0	0	0	96000	0	**96000**
		Evaluation	0	24000	24000	24000	24000	**96000**
		Entry point activities	384000	0	0	0	0	**384000**
		Institution and capacity building	0	480000	0	0	0	**480000**
		Detailed pr oject report	96000	0	0	0	0	**96000**
		Watershed development works	0	768000	1536000	1632000	1440000	**5376000**
		Livelihood act ivities for t he as set l ess persons	0	0	288000	480000	96000	**864000**
		Production syst em and m icro enterprises	0	0	288000	384000	288000	**960000**
		Consolidation phase	0	0	0	0	288000	**288000**
		Total	**576000**	**1368000**	**2424000**	**2904000**	**2328000**	**9600000**

		Percentage of total cost	**6%**	**14.25%**	**25.25%**	**30.25%**	**24.25%**	**100%**

MICRO WATERSHED WISE/COMPONENT WISE PHASING
YEAR WISE BUDGET PHASING UNDER IWMP

Area in Hectares and Funds in Rs.

Table 13. PHASING YEAR WISE (Name of the Micro Watershed: Bali Qutabpur and Kakana Bahadari)
(BUDGET AT A GLANCE)

Effective Area	Funds Available	Name of activity	1st Year	2nd Year	3rd Year	4th Year	5th Year	Total
600	7200000	Administrative costs	72000	72000	216000	216000	144000	**720000**
		Monitoring	0	0	0	72000	0	**72000**
		Evaluation	0	18000	18000	18000	18000	**72000**
		Entry point activities	288000	0	0	0	0	**288000**
		Institution and capacity building	0	360000	0	0	0	**360000**
		Detailed pr oject report	72000	0	0	0	0	**72000**
		Watershed development works	0	576000	1152000	1224000	1080000	**4032000**
		Livelihood act ivities for t he as set l ess persons	0	0	216000	360000	72000	**648000**
		Production syst em and m icro enterprises	0	0	216000	288000	216000	**720000**
		Consolidation phase	0	0	0	0	216000	**216000**
		Total	**432000**	**1026000**	**1818000**	**2178000**	**1746000**	**7200000**
		Percentage of total cost	**6%**	**14.25%**	**25.25%**	**30.25%**	**24.25%**	**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, base line 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, Land Capability Classification, Ground Water Depth and Quality, Proposed 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 for the all Seven watersheds in Sonepat district.

Strengths

- Strong linkage with national and state level institutes and KGK for capacity building and technical guidance. The HAU is situated nearby the watershed so the services can be utilized in case of assistance in farming.
- 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
- Poor ground water quality for irrigation
- 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

- ❖ Available Rain Water harvesting for life saving irrigation.
- ❖ 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.

Threats

There are few negative issues that may have adverse effect

- ❖ Unreliable rainfall.
- ❖ Absence of assured irrigation and poor ground water quality.
- ❖ 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.
- ❖ Frequent droughts.
- ❖ Poor avenues for employment.
- ❖ Wild life menace.

CAPACITY BUILDING- 5%

Rs. 33, 96,000/-

6.2 Capacity Building

1. Introduction

Watershed development is conceived as a strategy for protecting livelihoods of people inhabiting fragile eco systems, 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 13 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 Sonepat District

Sr. 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**				
	Sonepat District	Members of Watershed Committees @ 10 per committee would also include accompanying WDT Members.	120	100-150	1
02	Block Level Functional Programmes for Secretaries of Watershed Committees. **Two Days**				
	Sonepat District	Secretaries of Village Watershed Committees	12	15-20	1
03	Project Level Sensitization Camps for WC **One Days**				
	Sonepat District	Members of Watershed Committees @ 10 Persons (Tentative) per WC	120	30	6
04	Village Level Awareness Camps on IWMP at Micro Watershed Level for User Groups **One Day**				
	Sonepat District	Approximately 50 prospective user groups per micro watershed.	600	50	12
05	Block Level Functional Programmes for SHGs [Leader, Secretary and Treasurer] under IWMP **One Day**				
	Sonepat District	Three persons (Leader, Secretary and Treasurer) per Self Help Group @ around one SHG per village.	36	20	2

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	19171
2	Block Level Functional Programmes for Secretaries of Watershed Committees. Two Days	2545
3	Village Level Sensitization Camps for WC One Days	13186
4	Village Level Awareness Camps on IWMP at Micro Watershed Level for Prospective User Groups One Day	30542
5	Block Level Functional Programmes for SHGs [Leader, Secretary and Treasurer] under IWMP One Day	4807
	Total	**70251**

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

S. No.	Target Group	Training Topics	No. of days	Budget per camp	No. of Camps	No. of Participant per camp	Cost for all participant per day	Cost per partici pant/ per day	Cost per person	Total Budget
1	Self He lp Groups- 2 SHGs- micro watershed level	Orientation on IWMP, S HGs cum Exposure Visit	2	24000	5	12	60000	1000	2000	120000
2	User gr oups from each micro watershed	NRM, Po st Pr oject Management et c. – Exposure Visit	2	24000	5	12	60000	1000	2000	120000
3	Sub w atershed Level- WDT Members	Part II -Module I t o V-Exposure Vis it Outside S tate-Conceptual, Technical, So cial, Management of Finance, Monitoring and Evaluation.	4	72000	5	12	90000	1500	6000	360000
4	Sub w atershed Level- PIA Members	Exposure Visi t-Within Fundamentals of Watershed, Finance Management, Fi nal Report on WDP etc	2	36000	5	12	90000	1500	3000	180000
5	District L evel-WDC	Exposure visit t o successful watershed/ University.	2	24000	5	12	60000	1000	2000	120000

S. No.	Target Group	Training Topics	No. of days	Budget per camp	No. of Camps	No. of Participant per camp	Cost for all participant per day	Cost per partici pant/ per day	Cost per person	Total Budget
6	District L evel-Line D eptt., WDC	Exposure visit t o successful watersheds w ithin state.	2	24000	5	12	60000	1000	2000	120000
7	SLNA and District L evel Controlling Officers	Exposure visit t o successful watersheds out side state	4	72000	5	12	90000	1500	6000	360000
Total			**18**		**35**	**84**				**1380000**

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

S. No.	District	No. Micro watershed	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 Tr aining C amp i n each season	12	2	24	120	12,000	120000	1440000
2.	Propaganda & Documentation (Puppet show, doc umentary movies show, v ideography, Photography, w all P ainting, Display B oard, pam phlets, leaf lets. Etc)	12	2	24	120	5000	50000	600000
3	Contingency charges							94251
	Total							**2134251**

i) **Training Programmes for SLNA, WDT, PIA , Field Functionary , WDC member's , SHG & UG organize by HIRD = 70,251/-**

ii) **Micro Watershed Wise Exposure cum training Visit For SLNA, WDT, PIA , Field Functionary , WDC, SHG & UG Members**
= 13, 80,000/-

iii) **Farmer's / Beneficiaries training camps with Extension Program's = 21,34,251/-**

Grand Total = 33, 96,000/-

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. 27, 16,800/-** 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 Gohana 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	Ganaur, Mundlana and Gohana	IWMP I Gohana	44	14	10	Cattle Crush (3 No.)	Jolly	0.96
						Water Tank (2 No.)		
						Cattle Crush (3 No.)	Bidhal	0.43
						Cattle Trough (1 No.)	Kakana Bhadri	0.93
						Brick Flooring (1 No.)		
						Cattle Crush (2 No.)		
						Cattle Crush (1 No.)	Kasandi	0.38
						Cattle Trough (1 No.)		
						Cattle Crush (2 No.)	Bajana Khurd	0.28
						Cattle Trough (1 No.)	Bajana Khurd	0.40
						Brick Flooring (1 No.)	Bajana Khurd	0.16
						Water Tank (1 No.)	Bajana Khurd	0.25
						Water Tank and C attle Crush (3 No.)	Chidana	0.50
						Cattle Crush (3 No.)	Shamri Sisan	0.57
						Cattle Crush (3 No.)	Shamri Buran	0.52
						Cattle Trough (1 No.)	Khanpur Kalan	0.45
						Brick Flooring (1 No.)	Khanpur Kalan	0.15
						Cattle Crush (3 No.)	Khanpur Kalan	0.55
						Cattle Crush (1 No.)	Bajana Kalan	0.14
						Cattle Trough (2 No.)	Bali Qutubpur	0.80
						Brick Flooring (2 No.)	Bali Qutubpur	0.32
						Cattle Trough (1 No.)	Pugthala	0.40
						Brick Flooring (1 No.)	Pugthala	0.15
						Water Tank (1 No.)	Pugthala	0.20
							Total	**8.34**

Total Cost of project area @ 4%: Rs. 27,16,800/-

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 team of experts comprising of PIA, Hydrologist from Haryana supported by Livelihood expert, Agriculture and Horticulture expert and expert in 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 Construction of pond, retaining wall, ramp, water conveyance system, Earthen bund, Underground pipe line 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.

Proper publicity about the proposed project proposal through brochure , pamphlet, wall writing at common place must be carried out in the project areas.

Drainage line Treatment

The project area having small or large old ponds requires strengthening and is given priority for storage and drinking water for animals. 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, field bunding has been undertaken but still at few places inlet of the ponds and outlet needs to be constructed. So their repair and renovation is proposed during the

discussion it was felt to be genuine demand for repair, renovation and capacity enhancement in the area. This will increase the rain water harvesting.

There is an acute scarcity of water for livestock as village ponds dry out in summer months. Most ponds are silted up and need de-silting. Some are leaking from sides and water is lost quickly. Most of ponds do not have proper inlets, outlets and ramps for water disposal. There is genuine demand for repair, renovation and capacity enhancement construction of new ponds in the area.

7.2 Proposed Activity

The provision for construction/ renovation of pond, inlet, outlet, ramp etc. is the main requirement by project stakeholders which has been provided. In some villages, the constructions of new ponds are proposed, subject to availability of funds. Ponds as such are the best source of rainwater harvesting.

Due to the paucity funds the repair works has been undertaken under different schemes in piece meal. The main requirement of retaining wall was ignored due to inadequate funds. During the discussions/interaction the stake holders gave high priority for construction of retaining wall as lot of water is being wasted through cutting of banks.

The DPR proposals shall be implemented in participatory mode. In this watershed management program, it was planned to rehabilitate the degraded watersheds. The scope of integrated watershed regeneration/rehabilitation works which emerged from the PRA are as under:-

Sample estimates are as follows:

Activities under NRM (56%) Micro Watershed Wise (IWMP I Sonepat) is given below and the proposed Action Plan/ Treatment Plan map shown in **Annexure-X.**

Table 1:

Name of the project: IWMP I		**Name of watershed: Gohana (IWMP-I)**				**Name of village: Samri Buran**				
Sr. No.	**Nature of work**	**Location**	**Catchment Area (ha)**	**Command Area (ha)**	**Capacity**	**Unit**	**No. of work**		**Estimate Cost Rs. In Lacs**	**Objective**
							Phy.	**Unit cost (Rs. Lacs)**		
1	Construction of Retaining wall	New pond N – 29°12’ 06.5” E - 76° 49’ 15.8”	-	-	-	M	155	9000/-	13.95	To provide safety to banks of the pond.
2	Construction of Ramp	New pond N – 29°12’06.5” E - 76°49’15.8”	-	-	-	No	1	3.0	3.00	To provide inlet and outlet of the pond
3	Open dr ainage channel to irrigate common land	Omprakash N -29°12’ 28.2” E – 76° 49’ 05.2” To New pond N -29° 12’ 09.8” E –76°49’18.0”	-	-	-	M	700	800/-	5.60	To provide irrigation facility to c ommon land
4	Culvert	Omprakash N -29°12’ 26.4” E –76°49’06.4” & Ravinder N -29° 12’ 22.6” E –76°49’09.3”	-	-	-	No	3	0.75	2.25	Soil and water conservation

5	Construction of Retaining wall	Sindhara pond N – 29°12’ 01.5” E - 76°49’32.9”	-	-	-		30	9000/-	2.70	To provide safety to banks of the pond.
	Total		400							
Total									**27.50**	
Available fund									26.88	
Convergence 10 ha									0.62	

Table 2:

Name of the project: IWMP I		**Name of watershed: Gohana (IWMP-I)**								**Name of village: Lath**
Sr. No.	**Nature of work**	**Location**	**Catchment Area (ha)**	**Command Area (ha)**	**Capacity**	**Unit**	**No. of work**		**Estimate Cost Rs. In Lacs**	**Objective**
							Phy.	**Unit cost (Rs.)**		
1	Deepening	Burshana w ala pond N – 29°04’ 37.5” E – 76° 46’ 41.6”	50	27	6000 cum	No.	1	3.0	3.0	Enhancement of pon d age capacity.
2	Ramp	Burshana w ala pond N – 29° 04’ 37.5” E – 76° 46’ 41.6”	-	-	-	No.	1	2.0	2.0	To pr ovide i nlet an d outlet and t o pr otect banks of the pond
3	Construction of ramp	Burewala pond N – 29° 04’ 34.2” E – 76° 47’ 02.8”	-	-	-	No.	1	3.0	3.0	To pr ovide i nlet an d outlet and t o pr otect the banks of the pond
4	Construction of r etaining wall	Guniwala pond N – 29° 04’ 34.2” E – 76° 47’ 02.8”	-	-	-	mtr	56	9000/-	5.04	To pr ovide sa fety to banks of the pond.

5	Construction of r etaining wall	Burewala pond N – 29° 04’ 14.0” E – 76° 47’ 39.2”	-	-	-	mtr	100	9000/-	9.00	To pr ovide sa fety to banks of the pond.
6	Open drainage channel	Burewala pond t o Drain N – 29° 04’ 14.0” E – 76° 47’ 39.2”	-	-	-	m	1050	1200/- mtr	12.60	Provide ir rigation facility to co mmon land.
7	Bio-Drainage (Plantation)	In govt School N- 29°04, 32.6 E – 76° 47, 01.0	-	-	-	Ha	4	0.50	2.00	To i ncrease bi omass cover and to check the rise i n w ater t able under cr itical water table condition area
	Total		500		6000					
Total									**36.64**	
Available fund									33.60	
Convergence 46 ha									3.04	

Table 3 : Name of the project: IWMP I		Name of watershed: Gohana (IWMP-I)							Name of village: Khanpur Kallan	
Sr. No.	**Nature of work**	**Location**	**Catchment Area (ha)**	**Command Area (ha)**	**Capacity**	**Unit**	**No. of work**		**Estimate Cost Rs. In Lacs**	**Objective**
							Phy.	**Unit cost (Rs.)**		
1	Deepening of pond / Ramp	Smadh wala pond N-29°09'23.5" E-76°47'39.2"	70	30	6000 cum	No.	1	5.00	5.00	Enhancement of pond age ca pacity and t o provide inlet and outlet and t o pr otect banks
2	Open drainage channel	Dhanak wali C hopal to perifery of pond N-29°09'45.1" E-76°47'17.8"	-	-	-	M	200	800/- mtr	1.60	Provide ir rigation facility to co mmon land
3	Construction of r etaining wall	Smadha wala N-29°09'24.8" E-76°47'34.7"	-	-	-	M	100	9000/-	9.0	To pr ovide sa fety to banks of the pond.
4	Construction of r etaining wall	Jota wala pond N-29°09'33.1" E-76°47'16.3"	-	-	-	M	80	9000/-	7.20	To pr ovide sa fety to banks of the pond.
5	Water Conveyance System (UGPL)	N-29°08'19.1" E-76°47'46.8" to N-29°09'23.5" E-76°47'39.2"	-	-	-	M	2000	500	10.0	To pr ovide w ater f or drinking p urpose f or live stock
6	Roof r ain water harvest	In Govt school N-29°09'31.3" E-76°47'46.1"	-	-	-	No	1	2.50	2.50	To i ncrease w ater level
7	Bio-Drainage (Plantation)	In Govt school N-29°09'31.3" E-76°47'46.1"	-	-	-	Ha	1	0.50	0.50	To i ncrease bi omass cover and t o ch eck the rise in water table

										under critical w ater table condition area
	Total		511		6000					
Total									**35.80**	
Available fund									**34.36**	
Convergence 22 ha									1.44	

Table 4: Name of the project: IWMP I Name of watershed: Gohana (IWMP-I) Name of village: Bidhal										
Sr. No.	**Nature of work**	**Location**	**Catchment Area (ha)**	**Command Area (ha)**	**Capacity**	**Unit**	**No. of work**		**Estimate Cost Rs. In Lacs**	**Objective**
							Phy.	**Unit cost (Rs.)**		
1	Deepening/Digging of pond,	Bada pond N-29°04'05.7" E-76°49'08.9"	60	30	14000 cum	No.	1	7.0	7.0	Enhancement of pond age capacity.
2	Open drainage channel	N-29°04'05.7" E-76°49'08.9" to N - 29°03'55.1" E-76°48'55.7"	-	-	-	M	600	1200/-mtr	7.20	Provide irrigation facility to common land
3	Ramp/ Inlet/outlet	Bada pond N-29°04'05.7" E-76°49'08.9"	-	-	-	No.	1	3.0	3.0	To provide inlet and outlet and to protect banks
4	Water Conveyance System (UGPL)	Bhinswalwa minor N-29°04'26.8" E-76°48'58.6 to Bada talab N-29°04'20.2" E-76°49'11.0"	-	-	-	M	600	500	3.0	To provide water for drinking purpose for live stock
5	Bio-Drainage (Plantation)	In Arya samaj mandir N-29°04'21.5" E-76°48'51.2"	-	-	-	Ha	2	0.50	1.0	To increase biomass cover and to check the rise in water table under critical water table condition area

6	Land Leveling *	Panchayat land N-29°04’23.0” E-76°48’49.0”	-	-	-	Ha	4	0.50	2.00	To provide suitable field surface for controlling flow of water, check soil erosion, better surface drainage and conservation of moisture
	Total		288		14000					
Total									**23.20**	
Available fund									**19.40**	
Convergence 57 ha									3.80	

*** Before executing detail topographic survey and assessment must be carried out before implementation.**

Table 5:Name of the project: IWMP I		Name of watershed: Gohana (IWMP-I)								Name of village: Jauli
Sr. No.	**Nature of work**	**Location**	**Catchment Area (ha)**	**Command Area (ha)**	**Capacity**	**Unit**	**No. of work**		**Estimate Cost Rs. In Lacs**	**Objective**
							Phy.	**Unit cost (Rs.)**		
1	Deepering /Digging Of pond	Mann wala, N-29°06'06.2" E-76°47'59.0"	65	30	10000 cum	No.	1	5.0	5.0	Enhancement of pond age capacity
2	Construction of Ramp	Mann wala, N-29°06'06.2" E-76°47'59.0"	-	-	-	No.	1	3.0	3.0	To provide inlet and outlet and to protect banks
3	Construction of Retaining wall	N-29°06'06.2" E-76°47'59.0" Mannwala pond	-	-	-	M	100	9000/-	9.0	To provide safety to banks of the pond.
4	Construction of Retaining wall	N-29°05'35.5" E-76°48'08.7" Rwa wala pond	-	-	-	M	50	9000/-	4.50	To provide safety to banks of the pond.
5	Open drainage channel	Kalanler N-29°05'52.8" E-76°48'08.9" to pond N-29°06'0.04" E-76°48'12.4"	-	-	-	m	600	800/-	4.80	To provide irrigation facility to common land.
6	Earthen bund	In Micro - watershed area	-	-	-	No.	2	2.50	5.00	Soil and water conservation

7	Water Conveyance System (UGPL)	Tej wala pond N-29°06'02.6" E-76°48'44.1"& Rwa wala pond N-29°05'35.5" E-76°48'08.7"	-	-	-	M	800	500	4.00	To pr ovide w ater f or drinking purpose t o live stock
8	Bio-Drainage (Plantation)	In M icro - watershed area	-	-	-	Ha	5	0.50	2.50	To i ncrease bi omass cover and to check the rise i n water t able under cr itical water table condition area
	Total		560		10000					
Total									**37.80**	
Available fund									**37.63**	
Convergence 3 ha									0.17	

Table 6: Name of the project: IWMP I Name of watershed: Gohana (IWMP-I) Name of village: Chidana										
Sr. No.	**Nature of work**	**Location**	**Catchment Area (ha)**	**Command Area (ha)**	**Capacity**	**Unit**	**No. of work**		**Estimate Cost Rs. In Lacs**	**Objective**
							Phy.	**Unit cost (Rs.)**		
1	Deepening of pond	Makrolia pond N- 29°12’27.7” E- 76°47’36.9”	50	23	16000 cum	No	1	8.0	8.00	Enhancement of pond age capacity
2	Construction of Ramp	Mann wala pond N-29°12’45.8” E-76°47’26.4”	-	-	-	No.	1	3.0	3.00	To provide inlet and outlet and to protect the banks of the pond
3	Construction of Ramp	Singhu pond N-29°12’47.3” E-76°47’12.3”	-	-	-	No.	1	3.0	3.00	To provide inlet and outlet and to protect the banks of the pond
4	Construction of Retaining wall	Singhu pond N-29°12’47.3”	-	-	-	M	60	9000/-	6.30	To provide safety to banks of the pond

		E-76°47’12.3”								
5	Construction of Ramp	Thandewala pond N-29°12’48.8” E-76°47’44.0”	-	-	-	No.	1	3.0	3.00	To provide inlet and outlet and to protect the banks of the pond
6	Roof Rain Water Harvest	In School N-29°12’39.3” E-76°47;21.1”	-	-	-	No	1	2.5	2.5	To increase the under ground water level
7	Water Conveyance System (UGPL)	Chidana minor N- 29°12’48.1” E- 76°47’18.5” to Singhu pond	-	-	-	M	65	500	0.325	To provide water for drinking purpose for live stock.
8	Water Conveyance System (UGPL)	Chidana minor N- 29°12’55.1” E- 76°47’20.0” to Mann wala pond	-	-	-	M	180	500	0.900	To provide water for drinking purpose for live stock

9	Water Conveyance System (UGPL)	Chidana minor N- 29°12'55.1" E- 76°47'20.0" to Thandewala pond	-	-	-	M	1500	500	7.50	To provide water for drinking purpose for live stock
	Total		500		16000					
Total									**34.52**	
Available fund									**33.60**	
Convergence 14 ha									0.925	

Table 7 :Name of the project: IWMP I Name of watershed: Gohana (IWMP-I) Name of village: Shamdi Sisan										
Sr. No.	**Nature of work**	**Location**	**Catchment Area (ha)**	**Command Area (ha)**	**Capacity**	**Unit**	**No. of work**		**Estimate Cost Rs. In Lacs**	**Objective**
							Phy.	**Unit cost (Rs.)**		
1	Construction of r etaining wall	Belwala pond N – 29°12'02.7" E – 76°49'43.2"	-	-	-	M	100	9000/-	9.00	To pr ovide sa fety to banks of the pond
2	Construction of l n l et/ out let	Belwala pond N – 29°12'02.4" E – 76°49'43.4"	-	-	-	No	1	3.0	3.0	To provide inlet and outlet and to pr otect the banks of t he pond
3	Deepening/ Digging o f pond	Belwala pond N – 29°12'02.4" E – 76°49'43.4"	110	50	10000 cum	No	1	5.0	5.0	Enhancement of pond age capacity
4	Water Conveyance System (UGPL)	Ramgarh minor N – 29° 10' 48.2" E – 76° 48' 31. 5" t o Heru w ala pond , Dhanasher w ala pond & S hivalya wala pond N – 29°11' 38.3" E – 76° 49' 23.4"	-	-	-	M	2500	500/-	12.5	To pr ovide w ater f or drinking purpose f or live stock
	Total		400							
Total									**29.50**	
Available fund									26.88	

Convergence 39 ha	2.62	

Table 8: Name of the project: IWMP I		**Name of watershed: Gohana (IWMP-I)**					**Name of village: Bajana Khurd**	
Sr. No.	**Nature of work**	**Location**	**Catchment Area (ha)**	**Command Area (ha)**	**Unit**	**No. of work**		**Estimate Cost Rs. In Lacs**	**Objective**
						Phy.	**Unit cost (Rs.)**		
1	Construction of Retaining wall	Thaliwala pond N- 29°10'01.1" E- 76°51'49.0"	45	16	M	120	9000/-	10.80	To pr ovide safety to banks of the pond
2	Water Conveyance System (UGPL)	Drain N- 29°10'13.1" E-76°51'41.5	190	130	m	1200	500	6.0	To pr ovide w ater f or drinking purpose f or l ive stock
3	Roof Ra in Water Harvest	In Girls School N- 29°10'00.7" E-76°51'53.9" High school N-29°09'43.8" E-76°51'47.4"	7	3	No.	2	4.0	8.0	To i ncrease of un der ground water level
4	Bio-Drainage (Plantation)	In sch ool, panchayat land	5	4	Ha	5	0.50	2.50	To i ncrease bi omass cover and t o ch eck the rise i n w ater t able under critical water t able condition area
	Total		400						
Total								**27.30**	
Available fund								**26.88**	
Convergence 7 ha								0.42	

Table 9: Name of the project: IWMP I		Name of watershed: Gohana (IWMP-I)						Name of village: Bali Qutabpur	
Sr. No.	**Nature of work**	**Location**	**Catchment Area (ha)**	**Command Area (ha)**	**Unit**	**No. of work**		**Estimate Cost Rs. In Lacs**	**Objective**
						Phy.	**Unit cost (Rs.)**		
1	Construction of Retaining wall	Sardhana r oad pond N- 29°11'48.8" E-76°54'24.3"	23	11	M	60	9000/-	5.40	To pr ovide sa fety to banks of the pond
2	Bricks/ St one pitching on f ield bandh	N-29°12'04.2" E-76°54'11.7"	130	58	No	2	6.0	12.0	To protect soil erosion
3	Roof Rain Water Harvest	In School N- 29°12'19.0" E- 76°54'29.5"	3	1	No	1	2.50	2.50	To i ncrease of t he under ground water level
4	Bio-Drainage (Plantation)	In School N- 29°12'19.0" E- 76°54'29.5"	1	1	Ha	1	0.50	0.50	To increase biomass cover and t o ch eck the r ise i n water t able under cr itical water table condition area
5	Water Conveyance System (UGPL)	Sardhana r oad pond N-29°12'04.2" E-76°54'11.7" t o Drain N-29°11'55.5"" E-76°53'48.8"	78	35	No	1000	500	5.00	To pr ovide w ater f or drinking p urpose f or l ive stock
	Total		341						
Total								**25.40**	
Available fund								**22.91**	
Convergence 37 ha								**2.49**	

Table 10 :Name of the project: IWMP I		Name of watershed: Gohana (IWMP-I)						Name of village: Bajana Kallan	
Sr. No.	**Nature of work**	**Location**	**Catchment Area (ha)**	**Command Area (ha)**	**Unit**	**No. of work**		**Estimate Cost Rs. In Lacs**	**Objective**
						Phy.	**Unit cost (Rs.)**		
1	Construction of Retaining wall	Babawala pond N- 29°'08'58.8" E-76°51'56.3"	60	25	No.	150	9000/-	13.50	To provide safety to banks of the pond
2	Roof Rain Water Harvest	In High School N- 29°08'58.0" E- 76°52'01.5"	6	3	No.	1	2.50	2.50	To increase of the under ground water level
3	Open drainage channel	Dhokri pond N- 29°09'00.2' E-76°52'06.3" to Behind Babawala pond N- 29°08'50.4" E- 76°51'57.6"	125	55	M	450	1000/- mtr	4.50	To provide irrigation facility to common land

4	Culvert	Dupeta w ala katcha r asta Mahavir land N- 29°08’33.1” E- 76°52’11.7” & N- 29°08’44.1” E- 76°52’18.0”	40	18	No.	2	2.50	5.0	Soil and w ater conservation
5	Bio-Drainage (Plantation)	Stadium N- 29°08’57.7” E- 76°52’04.1”	5	4	Ha	5	0.50	2.50	To increase biomass cover and t o ch eck the r ise i n water t able under c ritical water table condition area
	Total		341						
Total								**28.00**	
Available fund								**26.88**	
Convergence 17 ha								**1.12**	

Table 11: Name of the project: IWMP I		Name of watershed: Gohana (IWMP-I)						Name of village: Pugthala	
Sr. No.	**Nature of work**	**Location**	**Catchment Area (ha)**	**Command Area (ha)**	**Unit**	**No. of work**		**Estimate Cost Rs. In Lacs**	**Objective**
						Phy.	**Unit cost (Rs.)**		
1	Construction of Retaining wall	Shivalya pond N- 29°11'18.5" E- 76°52'34.8"	80	35	No.	130	9000/-	11.70	To provide safety to banks of the pond
2	Construction of Ramp	Shivalya pond N- 29°11'18.5" E- 76°52'34.8"	17	06	No.	1	3.0	3.0	To provide inlet and outlet and to protect the banks of the pond
3	Roof Rain Water Harvest	In School N- 29°11'16.6" E- 76°52'30.3"	04	01	No.	1	2.5	2.5	To increase of the under ground water level
4	Water Conveyance System (UGPL)	9 No minor N- 29°11'28.2" E-76°51'44.8" to Mada pond N- 29°11'17.1" E- 76°52'22.5"	145	60	M	1500	500	7.5	To provide water for drinking purpose for live stock
5	Bio-Drainage (Plantation)	In Tample, School	1	1	Ha	1	0.50	0.50	To increase biomass cover and to check the rise in water table under critical water table condition area
	Total		350	350					
Total								**25.20**	
Available fund								**23.52**	

Convergence 29 ha	**1.68**	

Table 12 :Name of the project: IWMP I				**Name of watershed: Gohana (IWMP-I)**			**Name of village: Kasandi**			
Sr. No.	**Nature of work**	**Location**	**Catchment Area (ha)**	**Command Area (ha)**	**Capacity**	**Unit**	**No. of work**		**Estimate Cost Rs. In Lacs**	**Objective**
							Phy.	**Unit cost (Rs.)**		
1	Deepening/Digging of pond,	New pond near house N-29°08’34.2” E-76°50’20.5”	70	30	16000 cum	No.	1	8.0	8.0	Fishery / agriculture drinking for the life stock
2	Construction of Retaining wall	New pond near house N-29’08’34.2” E-76°50’20.5”	45	20	-	M	100	9000/-	9,0	To provide safety to banks of the pond.
3	Construction of Ramp	New pond near house N-29°’08’34.2” E-76°50’20.5”	13	6	-	No.	1	3.0	3.0	To provide inlet and outlet and to protect the banks of the pond
4	Roof Rain Water harvest	In govt high School N-29°08’26.0” E-76°50’22.6”	3	1	-	No	1	2.5	2.5	To increase of the under ground water level
5	Water Conveyance System (UGPL)	9 no minor N-29°08’52.8” E-76°49’44.4” to Mamwala pond N-29°08’35.8” E-76°49’53.8”	108	50	-	M	600	500	3.0	To provide water for drinking purpose for live stock

6	Bio-Drainage (Plantation)	In govt sch ool, Panchyat land N-29°08'17.2" E-76°50'27.6"	2	2	-	Ha	2	0.50	1.0	To increase biomass cover and t o ch eck the r ise in w ater table und er cr itical water table co ndition area
	Total		350		16000					
Total									**26.50**	
Available fund									**23.52**	
Convergence 45 ha									2.98	

Table 13 :Name of the project: IWMP I Name of watershed: Gohana (IWMP-I) Name of village: Kheri Damkan										
Sr. No.	**Nature of work**	**Location**	**Catchment Area (ha)**	**Command Area (ha)**	**Capacity**	**Unit**	**No. of work**		**Estimate Cost Rs. In Lacs**	**Objective**
							Phy.	**Unit cost (Rs.)**		
1	Deepening /Digging of pond	Attam wa la talab N-29°06'27.8" E-76°45'42.4"	50	20	10000 cum	No.	1	5.0	5.00	Enhancement of pondage capacity .
2	Construction of Ramp	Attam wa la pond N-29°06'25.2" E-76°45'39.0"	15	5	-	No	1	3.0	3.0	to pr ovide i nlet a nd outlet and t o pr otect banks
3	Retaining wall	Daspu w ala pond N-29°06'13.6" E-76°46'09.3"	60	25	-	M	100	9000/-	9.0	To pr ovide sa fety to banks of the pond
4	Open drainage channel	Sewa house N-29°06'31.6" E-76°46'08.0" to N-29°06'27.8" E-76°45'42.4" Ramphal plot	90	35	-	m	800	1000/- mtr	8.0	To pr ovide i rrigation facility to common land
5	Water Conveyance System (UGPL)	12 no minor N-29°06'52.7" E-76°45'33.7" to Atamwala pond	63	33	-	M	600	500	3.0	To provide w ater f or drinking purpose f or live stock.

		N-29°06’27.8” E-76°45’42.4”								
6	Bio-Drainage (Plantation)	In Micro - watershed area	2	2	-	Ha	2	0.50	1.00	To increase biomass cover and to check the rise in water table under critical water table condition area
	Total		400	400	10000					
Total									**29.00**	
Available fund									26.88	
Convergence 32 ha									**02.12**	

Table 14:Name of the project: IWMP I Name of watershed: Gohana (IWMP-I) Name of village: Kakana Bhadri										
Sr. No.	**Nature of work**	**Location**	**Catchment Area (ha)**	**Command Area (ha)**	**Capacity**	**Unit**	**No. of work**		**Estimate Cost Rs. In Lacs**	**Objective**
							Phy.	**Unit cost (Rs.)**		
1	Deepening / Digging of pond,	Baragi w ala pond N-29°08'04.5" E-76°48'15.9"	45	20	6000 cum	No.	1	3.0	3.0	Enhancement of pon d age capacity
2	Construction of r etaining wall	Brahmin wa la pond N-29°08'03.9" E-76°48'03.7"	55	25	-	M	100	9000/-	9.0	To pr ovide S afety to banks of the pond
3	Water Conveyance System (UGPL)	9 No minor N-29°08'19.5" E-76°47'47.7"to Brahmin wa la pond T - point t o Bragi wala pond	67	27	-	M	1000	500	5.0	To pr ovide w ater for drinking p urpose f or live stock
4	Bio-Drainage (Plantation)	N-29°08'05.1" E-76°47'58.7"	1	1	-	Ha	1	0.50	0.50	To i ncrease bi omass cover and t o ch eck the r ise i n w ater t able under cr itical water table condition area
	Total		241		6000					
Total									**17.50**	
Available fund									**16.20**	

Convergence 20 ha	**1.30**	

Cost Sharing: During the PRA exercise and meeting with the stake holders from time to time, the beneficiaries agreed to contribute in form of material, labour and cash to 10% of structure cost. The watershed development funds and pattern of utilization would be decided by the UGs/ WDT and PIA during implementation programme.

Table 15 :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 16 :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**

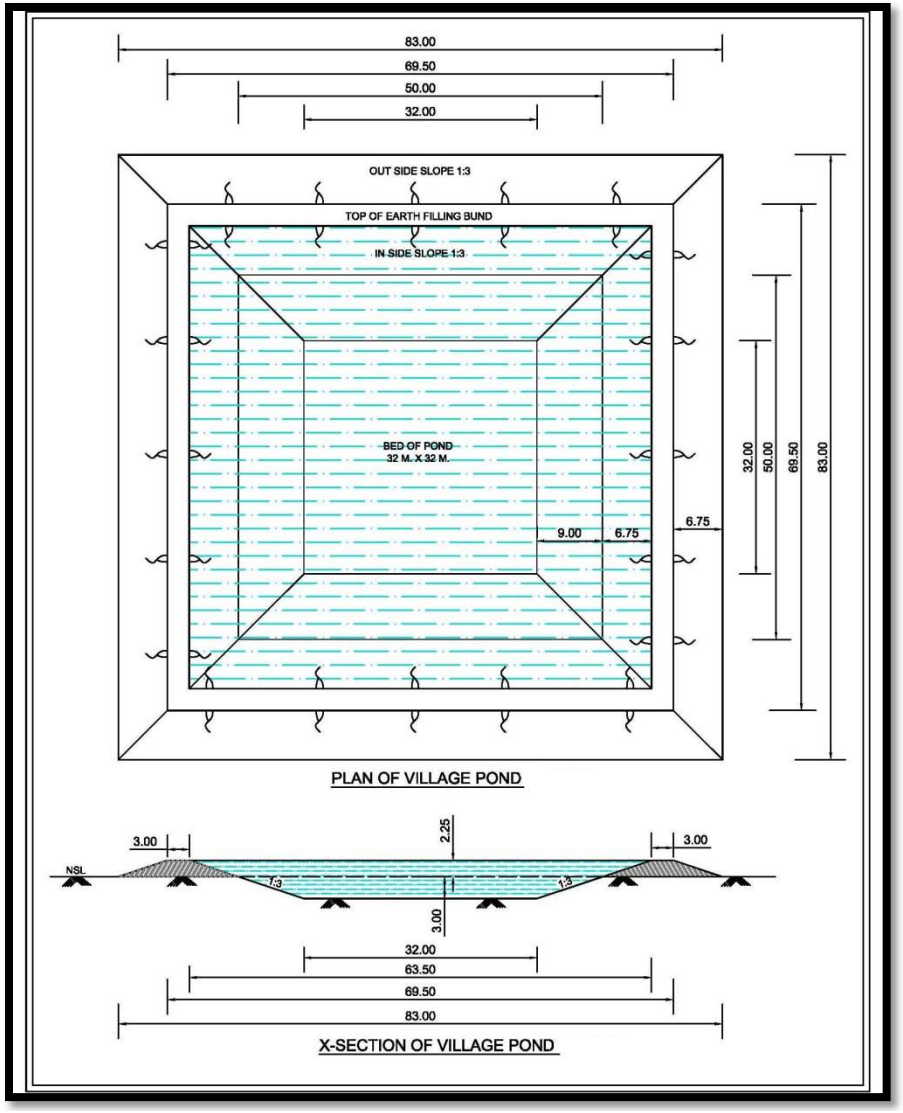

83.00
69.50
50.00
32.00
OUT SIDE SLOPE 1:3
TOP OF EARTH FILLING BUND
IN SIDE SLOPE 1:3
BED OF POND
32 M. X 32 M.
9.00
6.75
6.75
32.00
50.00
69.50
83.00
PLAN OF VILLAGE POND
3.00
NSL
1:3
1:3
2.25
3.00
3.00
32.00
63.50
69.50
83.00
X-SECTION OF VILLAGE POND

Table: Estimate of Open Channel

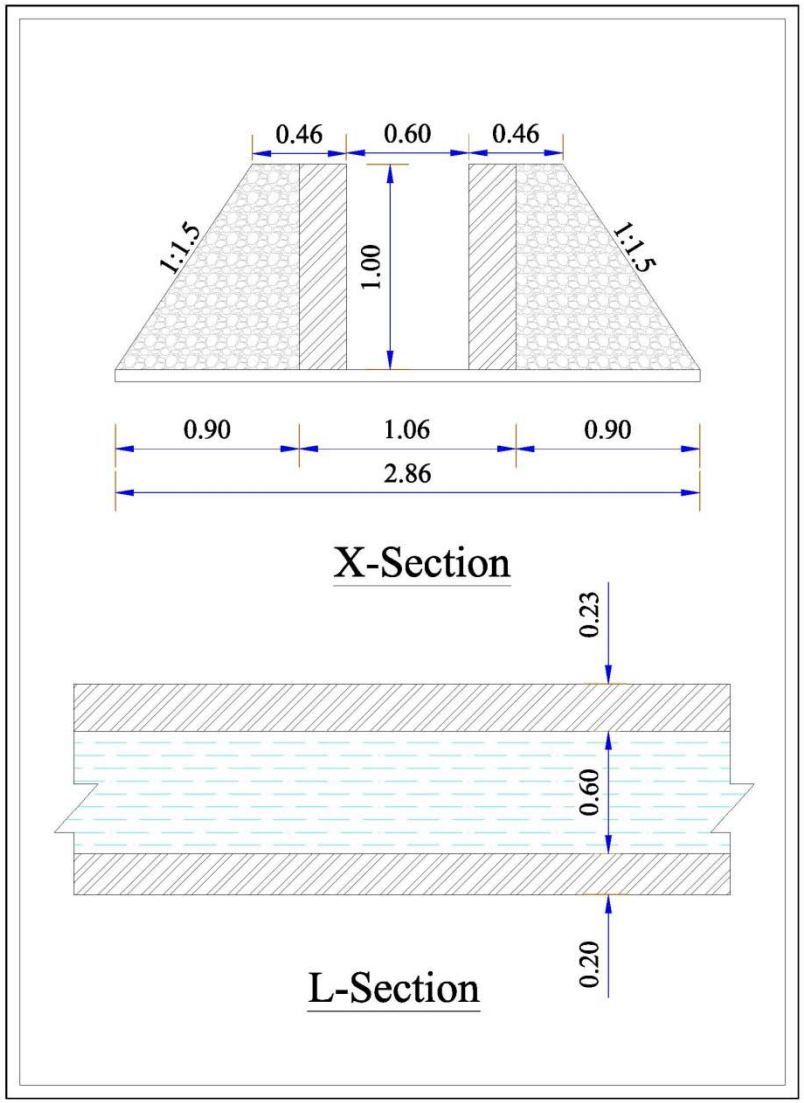
Abstract cost of Pucca Disposal open channel in

Detail estimate of Pucca disposal open channel

Sr. No.	Particular	No.	L	B	D/H	Quantity
1	Earth work of excavation in ordinary 2016 1(a)	1	100 m	1.20 m	0.54	64.8m³
2	Flat brick laid over a bed of 6 mm thick CSM HSR 14-24	1	100 m	1.06 m		106m²
3	First Class bricks work CSM 3.5 in foundation, plinth Nos. 12.23	2	100 m	0.225	0.45	20.25m³
4	Plaster on bed in 1.4 CSM 12 MM thick HSR 15.5	1	100	0.60		60m²
5	Plaster 14.12 mm thick side wall HSR 15.5 inside	2	100		0.45m	90m²
6	Providing field Gola 14 HSR 15.5	2	100	0.117		23.4m²
7	Topping 25 mm thick on top CWC HSR 14.8	2	100	0.225		45m²
8	Earth work for wall protection	2	100	0.565	0.23 + 0.90/2 = 0.45	50.85m³

Sr. No.	Particular	Quantity	Rate	Unit	Amount
1	Excavation of earth work in	64.8 m3	415.50-15%	100 m³	1201.49

	ordinary soil as per HSR 6.1(a)		+425% =1854.16		
2	Flat bricks laid in bed HSR 14.24	106 m2	520-15%+600% = 296.60	m^2	3279.64
3	First class bricks works land in CSM 1.5 HSR 11.23	20.25 m3	49.85 + 15% + 600% =296.60	m^3	6339.62
4	Plaster bed 1.4 12 mm thick 15.5 HSR	60 m2	5.5 + 15% + 500% = 28.05	m^2	1683.00
5	Plaster 14 m side wall 15.5 HSR	90 m2	5.5 + 15% + 500% = 28.05	m^2	2574.50
6	Field Gota 1.4 HSR 15.5	23.4 m2	5.5 + 15% + 500% = 28.05	m^2	656.37
7	Topping 25 mm thick on top of wall HSR 14.8	46 M2	8.60+15% + 600% = 51.17	m^2	2302.65
8	E/work for wall protection HSR 6.1 (a)	85.50 M3	415.50 +15% + 500%	100 m^3	1077.53
			Total labour cost		**18596.64**
			Material cost		**98783.00**
			Total		**117379.64**
			Contingency 2%		**2347.59**
			Grand total		**49929.23**



Pucca disposal open channel

Estimate of Under Ground Pipeline

Length of U.G.P.L. :- 800.00 m.
Bed Width :- 0.45 m.
Top Width :- 0.95 m.
Maximum Depth :- 1.00 m.
Cost of Project :- 4,28,000

Sr. No.	Particular	No.	Length (m.)	Breadth (m.)	Depth (m.)	Unit	Content
1	Clearing Jungle including up rooting and vegetation grass brush wood, Trees removed of rubbish up to distance of SOM out side the periphery of the area cleared H.S.R.-6.26	1	600	2.50	-	Sq.m.	1500.00
2	Excavation on for pipe line running under pressure in open area H.S.R. - 6.8	1	800	$\frac{0.95 + 0.45}{2}$	1.00	Sq.m.	60.00
3	Less portion of road under ground pipe line hole (Kalanour to Beri Road)	1	16	$\frac{0.95 + 0.45}{2}$	1.00	Sq.m.	11.20
4	Laying out 200mm. HDPE pipe I.S.I marked H.S.R. - 28.7	1	800				
5	Jointing of 200mm. HDPE pipe I.S.I. marked H.S.R.- 28.8	1	132				

Abstract of Cost

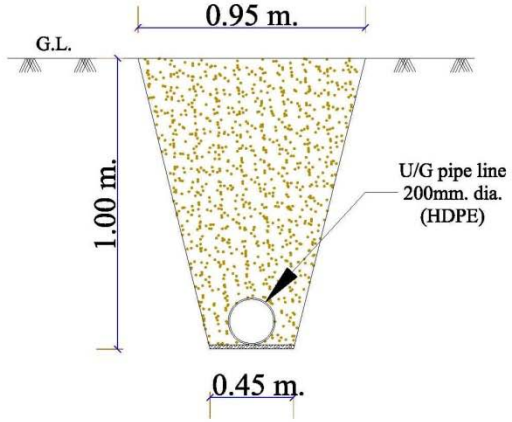
Sr. No.	Particular	Qty.	Rate	Unit	Amount
1	Clearing Jungle including uprooting and vegetation grass brush wood, Trees removed of rubbish up to distance of SOM outside the periphery of the area cleared H.S.R.-6.26	1500.00	66.80-21.5% + 370% = 246.46	Per 100 Sq.m.	3696.90
2	Excavation on for pipe line running under pressure in open area H.S.R. - 6.8	548.80	1030-21.5% + 370% = 3800.18	Per 100 Sq.m.	20855.39
3	Under Ground hole for cross the U.G.P.L. under road	16.00	600.00	Per m.	9600.00
4	Laying out 200mm. Pipe HDPE ISI marked H.S.R.- 28.7	800.00	24.60 - 21.5% + 300% = 77.24	Per 10 Sq.m.	6179.20
5	Jointing of 200mm. HDPE pipe ISI H.S.R.- 28.8	132.00	9.15 -21.5% + 300% = 28.73	Per Jart.	3792.36
			Total (1)		**44123.85**

Cost of Material:-

		Qty.	Rate	Amount
I.	Cost of HDPE pipe 200mm. Dia.	142.00	2598.00	368916
II.	Cost of bed 200mm. Dia.	4.00	650.00	2600
III.	Cost of P.C.N.-9	1.00	1200.00	1200
IV.	Cost of air release valve	1.00	1440.00	1440
V.	Cost of end C/P	2.00	450.00	900
		Total (2)		**375056.00**

Grand Total (1+2)	**419179.85**
Add 2% Contingency	**8383.596957**
Total	**427563.44**
Say	**4,28,000.00**

Under Ground Pipe Line HDPE 200mm. dia.



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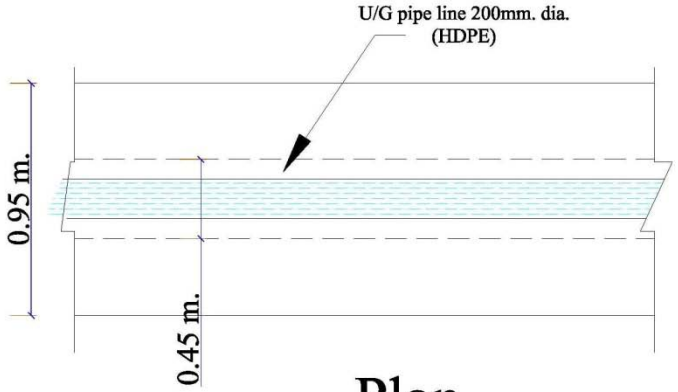

Plan

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 pl ants (including 15% etc. f or m ortality) i ncluding 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)

A. 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**

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 rain-fed and people gamble with the uncertain rains. The fertility of the soil is very poor especially in nitrogen and phosphorous because the organic carbon contained in the soil is very low and the available potash in the soil is medium (fertility map attached in annexure VI). 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 tree farming and 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 use of chemical fertilizer is limited to urea upto 50 Kg/acre in maize and wheat. Only farm yard manure is added to maintain yield levels. Food grains are hardly sufficient for 6 to 8 months with small farmers.

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 elated 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 concept of precision farming and non-monetary inputs shall be introduced.
- Agro-forestry with integration of trees like Eucalyptus, 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. There is no well organized marketing system in fruit plants.
Proposed System: The average annual rainfall is 574 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 and Kinnow and 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.
- Proper planning for raising filler plants like Papaya, pomegranate and shade loving crop like turmeric.
- 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 self use. Some poly houses have come up in the area with financial support from National Horticulture Mission (NHM) and have started commercial cultivation of off season vegetables with the introduction of NHM scheme the farmers are interested for drip/sprinkler irrigation to enhance the net production value of the farm.

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 and parthenium, the most obnoxious weeds have invaded such area.

The following interventions are proposed to popularize agro-forestry as an alternate source of income.

- Planting of improved verity of Eucalyptus and Neem in the project both as single rows on field bunds and also as blocks.

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 Arravali, 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.
- Rising of protein rich fodder plants by promoting Napier Bajra Hybrid and Leucaena hedge rows on field bunds.

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, fruits and milk though these are source of income with many families.

The efforts through the project are directed 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 17.Detail of Production System proposed to be promoted in the project village

S. No.	Particulars	Contents	No. of Villages	No. of beneficiaries per village	No. of total beneficiaries	Cost per beneficiaries	Total
1	Vermi Compost	Vermi co mpost i s organic matter t hat is decomposed and r ecycled, us ed as fertilizer for soil amendment which is a key ingredient i n organic farming. Under I WMP, f inancial assi stance of 25% of t otal co st of R s. 24000/ - is provided.	14	20	280	6000	1680000
2	Green Manuring	Addition of or ganic matter r equired, which is deficient i n pr oject ar ea. Under I WMP, f inancial assi stance @ Rs. 500 for 20 K g.s per f armer f or 2 Acre (0.8 ha) holding is provided.	14	100	1400	500	700000
3	Bio-fertilizers	For i ntegrated nut rient m anagement (combination of ch emical f ertilizers, organic manure, cr op r esidue and nitrogen f ixing. U nder I WMP, f inancial assistance @ R s. 40 per f armer f or 2 Acre (0.8 ha) holding is provided.	14	150	2100	40	84000
4	Pest-Manageme nt	For i ntegrated pest M anagement, t he bio co ntrol t echnique has been reported e co-friendly f or co ntrol of pests. A pr ovision of Azadirachtin bi o pesticide @ R s. 250 /lit. per f armer i s provided.	14	150	2100	250	525000
5	Sprinkler	Sprinkler i rrigation i s a method of	14	10	140	7500	1050000

S. No.	Particulars	Contents	No. of Villages	No. of beneficiaries per village	No. of total beneficiaries	Cost per beneficiaries	Total
	irrigation	applying irrigation water which is similar to natural rainfall. Under IWMP, financial assistance @ 25% of Rs. 30000/- or price fixed by agriculture department is provided.					
6	Drip Irrigation	Drip Irrigation is an irrigation method that saves water and fertilizer by allowing water to drip slowly to the roots of plants. Under IWMP, financial assistance @ 10% of Rs. 58000 per ha for horticulture fixed by Agriculture Department is provided.	14	10	140	5800	812000
7	Lazer Leveling	Lazer Leveling is one such proven technology that is highly useful in conversation of irrigation water. Under IWMP, financial assistance @ 30% of Rs. 1075 per farmer is provided	14	150	2100	322.5	677250
8	Kitchen Gardening	To facilitate with inputs, seeds and equipments etc., for development of Kitchen Gardening. Under IWMP, financial assistance @ Rs. 50 per farmer per season (Rs. 100 per year) is provided.	14	570	7980	100	798000
9	Horticulture	Potential for Grafted Horticulture plants. Supply of plants @ Rs. 40/- per plant under IWMP 50 % cost share for	14	175	2100 (21000 plants)	Rs.20 per plant	490000

S. No.	Particulars	Contents	No. of Villages	No. of beneficiaries per village	No. of total beneficiaries	Cost per beneficiaries	Total
		cultivation of fruits like Citrus fruits, Guava, Amla, Ber f loriculture and vegetables (especially, turmeric, garlic, onion and tomato)					
Total							6816250
Contingency, printing material other unforeseen items							24250

Total: Rs. 6792000/-

The provision of additional subsidy component under IWMP would be utilized by linking with the line department.

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.

Under Agro forestry, tree species commonly planted are eucalyptus and neem. The impacts of such type's plantation have given extra source of income.

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 co mpost and c onverted from r aw ani mal dun g to w ell d e compost hi ghly nutritive or ganic 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 ava ilable nutrients in vermin- compost are higher than country type farmyard manure. As per NHM guideline, the installation cost of structure of 1 vemin 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 depar tment. The addi tional am ount i .e. Rs. 10000/- will be born 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 18: 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 80% 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 HSRLM pattern and it is proposed to impart them trainings at Krishi Vigyan Kender (CCSHAU) Sonepat and Haryana Institute of rural development, Nilokheri. Agriculture University, Sonepat, Central Soil and Water research and training Institute, Chandigarh and HIRD, Nilokheri. 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 (RFP) so that 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 1 SHGs in each village and identify at least 10 youths in each village for imparting training and giving Revolving Fund.

The scheme would be implemented in phased manner in the project area and the project implementation agency will co-ordinate with the Community Resource Persons(CRP) already posted at the grass root level under Haryana State Rural Livelihood Mission(HSRLM). The SHG should follow five Sutras i.e.

1. Regular Meetings
2. Financial saving in the meetings
3. Internal Lending
4. Regular Recovery.
5. Proper maintenance of Account books.

Based on the above five Sutras, grading of SHG should be done.

The following activities are proposed in consultation with the Watershed committees.

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. Pickles, sauces, jam, jelly etc.
12. Backyard poultry
13. Floriculture

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

Table 19. Revolving Fund Assistance for SHGs

S.No.	Name of micro watersheds	No. of villages	Total SHGs	Amount of RFA per SHG	Total
1	Chirana	1	1	25000	25000
2	Shamdi Sisan	1	1	25000	25000
3	Shamdi Buran	1	1	25000	25000
4	Pugthala	1	1	25000	25000
5	Bajana Kalan	1	1	25000	25000
6	Bajana Khurd	1	1	25000	25000
7	Kasandi	1	1	25000	25000
8	Kheri Damkan	1	1	25000	25000
9	Joli	1	1	25000	25000
10	Lath	1	1	25000	25000
11	Khanpur Kalan + Bidhal	2	2	25000	50000
12	Bali Qutabpur + Kakana	2	2	25000	50000

	Bahadari				
	Total	**14**	**14**		**350000**

Table 20. 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	Chirana	1	1	35000	35000
2	Shamdi Sisan	1	1	35000	35000
3	Shamdi Buran	1	1	35000	35000
4	Pugthala	1	1	35000	35000
5	Bajana Kalan	1	1	35000	35000
6	Bajana Khurd	1	1	35000	35000
7	Kasandi	1	1	35000	35000
8	Kheri Damkan	1	1	35000	35000
9	Joli	1	1	35000	35000
10	Lath	1	1	35000	35000
11	Khanpur Kalan + Bidhal	2	2	35000	70000
12	Bali Qutabpur + Kakana Bahadari	2	2	35000	70000
	Total	**14**	**14**		**490000**

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 21. 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	Chirana	1	10	10000	100000
2	Shamdi Sisan	1	10	10000	100000
3	Shamdi Buran	1	10	10000	100000
4	Pugthala	1	10	10000	100000
5	Bajana Kalan	1	10	10000	100000
6	Bajana Khurd	1	10	10000	100000
7	Kasandi	1	10	10000	100000
8	Kheri Damkan	1	10	10000	100000
9	Joli	1	10	10000	100000
10	Lath	1	10	10000	100000
11	Khanpur Kalan + Bidhal	2	20	10000	200000
12	Bali Qutabpur + Kakana Bahadari	2	20	10000	200000
	Total	**14**	**140**		**1400000**

Note: The beneficiaries will contribute 10% as cost sharing of the livelihood support programme Rs. 1400000 @ 10% cost sharing.

= 1400000- 140000
= 1260000/-

Table 22. 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	Chirana	1	5	25000	125000
2	Shamdi Sisan	1	5	25000	125000
3	Shamdi Buran	1	5	25000	125000
4	Pugthala	1	5	25000	125000

5	Bajana Kalan	1	5	25000	125000
6	Bajana Khurd	1	5	25000	125000
7	Kasandi	1	5	25000	125000
8	Kheri Damkan	1	5	25000	125000
9	Joli	1	5	25000	125000
10	Lath	1	5	25000	125000
11	Khanpur Kalan + Bidhal	2	10	25000	250000
12	Bali Qutabpur + Kakana Bahadari	2	10	25000	250000
	Total	**14**	**70**		**1750000**

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. 1750000 @ 10% cost sharing.

= 1750000- 175000
= 1575000/-

Table 23. 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	Chirana	1	1	2	2000	6	12000
2	Shamdi Sisan	1	1	2	2000	6	12000
3	Shamdi Buran	1	1	2	2000	6	12000
4	Pugthala	1	1	2	2000	6	12000
5	Bajana Kalan	1	1	2	2000	6	12000
6	Bajana Khurd	1	1	2	2000	6	12000

7	Kasandi	1	1	2	2000	6	12000
8	Kheri Damkan	1	1	2	2000	6	12000
9	Joli	1	1	2	2000	6	12000
10	Lath	1	1	2	2000	6	12000
11	Khanpur Kalan + Bidhal	2	2	4	2000	6	24000
12	Bali Qutabpur + Kakana Bahadari	2	2	4	2000	6	24000
	Total	**14**	**14**	**28**			**168000**

Total cost for 14 Centres

1. Payment to trainers 168000/-
2. Sewing Machine Cost 168000/- @ Rs. 6000 per machine
3. Total Cost 336000/-

Table 24. 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	Chirana	1	1	2000	6	12000	1	12000
2	Shamdi Sisan	1	1	2000	6	12000	1	12000
3	Shamdi Buran	1	1	2000	6	12000	1	12000
4	Pugthala	1	1	2000	6	12000	1	12000
5	Bajana Kalan	1	1	2000	6	12000	1	12000
6	Bajana Khurd	1	1	2000	6	12000	1	12000
7	Kasandi	1	1	2000	6	12000	1	12000
8	Kheri Damkan	1	1	2000	6	12000	1	12000
9	Joli	1	1	2000	6	12000	1	12000

10	Lath	1	1	2000	6	12000	1	12000
11	Khanpur Kalan + Bidhal	2	2	2000	6	12000	2	24000
12	Bali Qutabpur + Kakana Bahadari	2	2	2000	6	12000	2	24000
	Total	**14**	**14**				**14**	**168000**

Payment to trainer: Rs.168000/-

Machine Cost: Rs. 280000/- @ Rs. 20000 per machine

Total Cost: Rs. 448000/-

Table 25. Livelihood Support

S.No.	Name of micro watershed	No. of villages	Revolving fund assistance to individuals unemployed youth/ landless, women		
			Dairy Unit	Bee Keeping	Mushroom Production
1	Chirana	1	15	10	2
2	Shamdi Sisan	1	15	10	2
3	Shamdi Buran	1	15	10	2
4	Pugthala	1	15	10	2
5	Bajana Kalan	1	15	10	2
6	Bajana Khurd	1	15	10	2
7	Kasandi	1	15	10	2
8	Kheri Damkan	1	15	10	2
9	Joli	1	15	10	2
10	Lath	1	15	10	2
11	Khanpur Kalan + Bidhal	2	30	20	4
12	Bali Qutabpur + Kakana Bahadari	2	30	20	4
	Total	**14**	**210**	**140**	**28**
	Rate (Rs)		**2400**	**2400**	**24000**

	Cost (Lakh Rs)		**5.04**	**3.36**	**6.72**

Contingency, printing material and other unseen items: Rs. 141800/-

Total funds available under this component are Rs. 6112800/-

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

i. HIRD, Nilokheri
ii. Agriculture, Technology and Extension, Sonepat 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), Sonepat

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. 20)

Detail of Convergence of IWMP and other schemes

Table 26. GAPS IN FUNDS REQUIREMENT – MICRO WATERSHED WISE

S.No	Name of micro watershed	Total cost requirement for works	Total funds available under IWMP for works	Gap in funds requirement for works	Convergence with MGNREGA
1	Samri Buran	27.5	26.88	0.62	0.62
2	Lath	36.64	33.6	3.04	3.04
3	Khanpur Kallan	35.8	34.36	1.44	1.44
4	Bidhal	23.2	19.4	3.8	3.8
5	Jauli	37.8	37.63	0.17	0.17
6	Chidana	34.525	33.6	0.925	0.925
7	Shamdi Sisan	29.5	26.88	2.62	2.62
8	Bajana Khurd	27.3	26.88	0.42	0.42
9	Bali Qutabpur	25.4	22.91	2.49	2.49
10	Bajana Kallan	28.0	26.88	1.12	1.12
11	Pugthala	25.2	23.52	1.68	1.68
12	Kasandi	26.5	23.52	2.98	2.98
13	Kheri Damkan	29.0	26.88	2.12	2.12
14	Kakana Bhadri	17.5	16.2	1.3	1.3
	Total	**403.865**	**379.14**	**24.725**	**24.725**

- 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 four 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 28 ha horticulture development programme with the financial assistance of Rs.

14.0 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 Construction of pond, retaining wall, ramp, water conveyance system, Earthen bund, Underground pipe line 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 Watersheds	Effective Area	Total Cost	Monitoring 1%
1	Chirana	500	60,00,000	60,000
2	Shamdi Sisan	400	48,00,000	48,000
3	Shamdi Buran	400	48,00,000	48,000
4	Pugthala	350	42,00,000	42,000
5	Bajana Kalan	400	48,00,000	48,000
6	Bajana Khurd	400	48,00,000	48,000
7	Kasandi	350	42,00,000	42,000
8	Kheri Damkan	400	48,00,000	48,000
9	Joli	560	67,20,000	67,200
10	Lath	500	60,00,000	60,000
11	Khanpur Kalan and Bidhal	800	96,00,000	96,000
12	Bali Qutabpur and Kakana Bahadari	600	72,00,000	72,000

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 Watersheds	Effective Area	Total Cost	Evaluation 1%
1	Chirana	500	60,00,000	60,000
2	Shamdi Sisan	400	48,00,000	48,000
3	Shamdi Buran	400	48,00,000	48,000
4	Pugthala	350	42,00,000	42,000
5	Bajana Kalan	400	48,00,000	48,000
6	Bajana Khurd	400	48,00,000	48,000
7	Kasandi	350	42,00,000	42,000
8	Kheri Damkan	400	48,00,000	48,000
9	Joli	560	67,20,000	67,200
10	Lath	500	60,00,000	60,000
11	Khanpur Kalan and Bidhal	800	96,00,000	96,000
12	Bali Qutabpur and Kakana Bahadari	600	72,00,000	72,000

CONSOLIDATION PHASE- 3 %

Consolidation Phase = Rs. 20, 37,600 /-

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: Chirana

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	0.36
2	Preparation of Project completion report	0.09
3	Documentation of success stories	0.09
4	Management of proper utilization of WDF	0.27
5	Mechanism for quality and sustainability issues under the Project	0.09
6	Watershed activities	0.90

Total: 1.80 lacs

Name of Micro watershed: Shamdi Sisan

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	0.29
2	Preparation of Project completion report	0.07
3	Documentation of success stories	0.07
4	Management of proper utilization of WDF	0.22
5	Mechanism for quality and sustainability issues under the Project	0.07
6	Watershed activities	0.72

Total: 1.44 lacs

Name of Micro watershed: Shamdi Buran

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	0.29
2	Preparation of Project completion report	0.07

3	Documentation of success stories	0.07
4	Management of proper utilization of WDF	0.22
5	Mechanism for quality and sustainability issues under the Project	0.07
6	Watershed activities	0.72

Total: 1.44 lacs

Name of Micro watershed: Pugthala

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	0.63

Total: 1.26 lacs

Name of Micro watershed: Bajana Kalan

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	0.29
2	Preparation of Project completion report	0.07
3	Documentation of success stories	0.07
4	Management of proper utilization of WDF	0.22

5	Mechanism for quality and sustainability issues under the Project	0.07
6	Watershed activities	0.72

Total: 1.44 lacs

Name of Micro watershed: Bajana Khurd

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	0.29
2	Preparation of Project completion report	0.07
3	Documentation of success stories	0.07
4	Management of proper utilization of WDF	0.22
5	Mechanism for quality and sustainability issues under the Project	0.07
6	Watershed activities	0.72

Total: 1.44 lacs

Name of Micro watershed: Kasandi

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	0.25
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	0.63

Total: 1.26 lacs

Name of Micro watershed: Kheri Damkan

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	0.29
2	Preparation of Project completion report	0.07
3	Documentation of success stories	0.07
4	Management of proper utilization of WDF	0.22
5	Mechanism for quality and sustainability issues under the Project	0.07
6	Watershed activities	0.72

Total: 1.44 lacs

Name of Micro watershed: Joli

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	0.40
2	Preparation of Project completion report	0.11
3	Documentation of success stories	0.10
4	Management of proper utilization of WDF	0.30
5	Mechanism for quality and sustainability issues under the Project	0.10
6	Watershed activities	1.01

Total: 2.02 lacs

Name of Micro watershed: Lath

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	0.36
2	Preparation of Project completion report	0.09
3	Documentation of success stories	0.09
4	Management of proper utilization of WDF	0.27
5	Mechanism for quality and sustainability issues under the Project	0.09
6	Watershed activities	0.90

Total: 1.80 lacs

Name of Micro watershed: Khanpur Kalan and Bidhal

Table 13. Consolidated Phase

S. No	Type of activity	Amount earmarked (Rs. In lacs)
1	Managing/ upgrading of all activities taken up under the project	0.58
2	Preparation of Project completion report	0.15
3	Documentation of success stories	0.14
4	Management of proper utilization of WDF	0.43
5	Mechanism for quality and sustainability issues under the Project	0.14
6	Watershed activities	1.44

Total: 2.88 lacs

Name of Micro watershed: Bali Qutabpur and Kakana Bahadari

Table 14. Consolidated Phase

S. No	Type of activity	Amount earmarked (Rs. In lacs)
1	Managing/ upgrading of all activities taken up under the project	0.43
2	Preparation of Project completion report	0.11
3	Documentation of success stories	0.11
4	Management of proper utilization of WDF	0.32
5	Mechanism for quality and sustainability issues under the Project	0.11
6	Watershed activities	1.08

Total: 2.16 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 5660 ha and the Project Cost is 679.20 lacs covering micro watersheds and in all 14 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 Gohana 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. 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 Sonepat Industrial Complex**.**

Table 1. Expected Employment Generation in the Project area

S. No.	Name of micro watershed	Wage employment								Self employment				
		No of man days				No. of Beneficiaries				No. of Beneficiaries				
		SC	ST	others	Total	SC	ST	others	Total	SC	ST	others	Women	Total
1	Chirana (Part)	1441	-	3935	5376	180	-	492	672	11	-	-	-	11
2	Shamdi Sisan (Part)	680	-	3621	4301	85	-	453	538	-	-	11	-	11
3	Shamdi Buran (Part)	804	-	3497	4301	101	-	437	538	11	-	-	-	11
4	Pugthala (Part)	595	-	3169	3763	74	-	396	470	-	-	-	11	11
5	Bajana Kalan (Part)	654	-	3647	4301	82	-	456	538	-	-	11	-	11
6	Bajana Khurd (Part)	800	-	3501	4301	100	-	438	538	-	-	-	11	11
7	Kasandi (Part)	933	-	2830	3763	117	-	354	470	-	-	11	-	11
8	Kheri Damkan (Part)	1127	-	3174	4301	141	-	397	538	-	-	11	-	11
9	Joli (Part)	975	-	5046	6021	122	-	631	753	11	-	-	-	11
10	Lath (Part)	1199	-	4177	5376	150	-	522	672	-	-	-	11	11
11	Khanpur Kalan (Part) and Bidhal (Part)	2813	-	5789	8602	352	-	724	1075	11	-	11	-	22
12	Bali Q utabpur (Part) and K akana Bahadari (Part)	1813	-	4638	6451	227	-	580	806	11	-	-	11	22
		13833	-	**47024**	**60856**	**1729**	-	**5878**	**7607**	**55**	-	**55**	**44**	**154**

60856 man days would be generated with the implementation of the project in Gohana Watershed (IWMP I), which means 120 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 Gohana Watershed (IWMP I)

S.No	Name of micro watersheds	Name of Villages	No. of persons migrating		No. of days per year of migration		Comments
			Pre Project	Expected post project	Pre Project	Expected post project	
1	Chirana (Part)	Chirana (Part)	-	-	-	-	-
2	Shamdi Sisan (Part)	Shamdi Sisan (Part)	-	-	-	-	-
3	Shamdi Buran (Part)	Shamdi Buran (Part)	-	-	-	-	-
4	Pugthala (Part)	Pugthala (Part)	-	-	-	-	-
5	Bajana Kalan (Part)	Bajana Kalan (Part)	-	-	-	-	-
6	Bajana Khurd (Part)	Bajana Khurd (Part)	-	-	-	-	-
7	Kasandi (Part)	Kasandi (Part)	-	-	-	-	-
8	Kheri Damkan (Part)	Kheri Damkan (Part)	-	-	-	-	-
9	Joli (Part)	Joli (Part)	-	-	-	-	-
10	Lath (Part)	Lath (Part)	-	-	-	-	-
11	Khanpur Kalan (Part)	Khanpur Kalan (Part)	-	-	-	-	-

12	Bidhal (Part)	Bidhal (Part)	-	-	-	-	-
13	Bali Qutabpur (Part)	Bali Qutabpur (Part)	-	-	-	-	-
14	Kakana Bahadari (Part)	Kakana Bahadari (Part)	-	-	-	-	-

9.3 GROUND WATER TABLE (Drinking Water)

The ground water level of all micro watersheds varies from 2.9-9.6m depth. Micro watersheds Bidhal, Lath and some part of Kheri Damkan have depth of ground water below 4 m. Kakana Bahadri and Khanpur Kalan have water table in the range of 4-6 m. Parts of Bali Qutabpur, Pugthala and Shamri have water table in the range of 6-8 m. Bajana Kallan, Bajana Khurd and Chirana have water table more than 8 m. Rain water harvesting has been made to recharge in the area where water table is declining and in the areas close by irrigation channel where water table is rising the necessary provision of bio drainage/UGPL has been provided.

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

S. No	Names of villages	Ground Water Table Depth (m)	Remarks
1	Chirana	3.69	The area is underlain by shallow water table, the necessary provision of drainage has been
2	Shamdi Sisan	2.66	
3	Shamdi Buran	2.65	
4	Pugthala	8.0	

5	Bajana Kalan	5.06	provided for controlling the further rise in water level. In the areas where the ground water is exploiting and water table is declining, the provision of recharging is provided
6	Bajana Khurd	5.06	
7	Kasandi	5.27	
8	Kheri Damkan	1.22	
9	Joli	1.28	
10	Lath	1.51	
11	Khanpur Kalan	6.29	
12	Bidhal	2.04	
13	Bali Qutabpur	8.02	
14	Kakana Bahadari	5.29	

Source: Ground Water Cell, Haryana

9.4 CROPS

Agriculture primary depends upon water, but this is availability of this is lacking without existence of proper canal network and deeper ground water conditions. All this can change with the integrated land and water management during the watershed project. The planned Construction of pond, retaining wall, ramp, water conveyance system, Earthen bund, Underground pipe line 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 Gohana Watershed (IWMP I)

Sr. No.	Name of Micro Watershed	Village	Name of Crops	Area Ha	Average yield Qtl. Per Ha	Total Production (in Qtl.)	Total Value (Rs. In Lacs)	Area (in ha)	Average yield Qtl. Per ha	Total Production (in Qtl.)	Total Value (Rs. In Lacs)
1	Chidana	Chidana	Wheat	825	38	31350	454.58	908	40	36320	524.64
			Mustered	22	11	242	3.32	24	12	288	36.36
			Paddy	404	32	12928	298.36	444	34	15096	554.1
2	Shamri Sisan	Shamri Sisan	Wheat	675	37	24975	351.93	743	39	28977	420.16
			Mustered	9	12	108	2.37	10	13	130	22.66
			Paddy	185	31	5735	131.9	203	33	6699	154.07
3	Shamri Buran	Shamri Buran	Wheat	577	40	23080	334.66	638	41	26158	379.28
			Mustered	1	11	11	24400	1	12	12	26400
			Paddy	185	30	5550	127.65	203	32	6496	150.1
4	Pugthala	Pugthala	Wheat	585	38	22230	122.26	643	40	25720	373.86
			Mustered	4	12	48	1.05	4	13	52	1.14
			Paddy	495	32	15840	364.32	544	34	18496	910.13
5	Bajana Kalan	Bajana Kalan	Wheat	899	40	35960	551.42	989	41	40549	587.75
			Mustered	2	11	22	48400	1	12	12	52.8
			Paddy	668	31	20708	476.28	735	33	24255	557.86
6	Bajana Khurd	Bajana Khurd	Wheat	603	40	24120	349.74	663	41	27183	394.16
			Mustered	4	12	48	1.05	4	13	52	1.14
			Paddy	556	30	16680	383.64	612	32	19584	427.43
7	Kasandi	Kasandi	Wheat	552	41	22632	327.96	607	42	25494	369.66
			Mustered	3	11	33	72600	3	12	36	74200
			Paddy	280	32	8960	206.08	308	33	10164	233.78
8	Kheri Dhamkan	Kheri Dhamkan	Wheat	647	40	25880	379.26	712	41	29192	426.28
			Mustered			0				0	
			Paddy	690	31	21390	434.21	669	32	21408	493.38
9	Joli	Joli	Wheat	1029	40	41160	596.82	1187	41	48667	704.22
			Mustered	4	10	40	90200	4	11	44	96800

Sr. No.	Name of Micro Watershed	Village	Name of Crops	Area Ha	Average yield Qtl. Per Ha	Total Production (in Qtl.)	Total Value (Rs. In Lacs)	Area (in ha)	Average yield Qtl. Per ha	Total Production (in Qtl.)	Total Value (Rs. In Lacs)
			Paddy	962	32	30784	708.03	1058	34	35972	825.05
10	Lath	Lath	Wheat	1099	40	43960	637.42	1209	41	49569	708.75
			Mustered	3	11	33	77600	3	12	36	74200
			Paddy	857	31	26567	611.04	943	32	30176	694.05
11	Khanpur Kalan and Bidhal	Khanpur Kalan	Wheat	1143	36	41148	596.64	1257	38	47766	704.65
			Mustered	54	12	648	14.25	60	13	780	17.16
			Paddy	436	30	13080	300.84	480	32	15360	363.74
		Bidhal	Wheat	468	37	17316	251.08	515	38	19570	283.75
			Mustered	6	11	66	1.45	6	12	72	1.58
			Paddy	275	30	8250	189.75	302	32	9664	222.27
12	Bali Qutabpur and Kakana Bahadari	Bali Qutabpur	Wheat	598	38	22724	316.44	658	40	26320	381.64
			Mustered	3	12	36	79200	3	13	39	75800
			Paddy	508	32	16256	373.88	558	33	18414	423.52
		Kakana Bahadari	Wheat	438	37	16206	286.07	482	38	18316	265.58
			Mustered	18	11	198	4.25	20	12	240	52800
			Paddy	187	31	5797	133.33	206	32	6592	151.61

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

9.5 HORTICULTURE

Table 5. Pre and post project area under Horticulture

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

		(ha)		
1	Chidana	2.6	3.1	5.7
2	Shamri Sisan	-	2	2
3	Shamri Buran	-	2.5	2.5
4	Pugthala	-	2	2
5	Bajana Kalan	-	2.5	2.5
6	Bajana Khurd	-	2	2
7	Kasandi	-	2.5	2.5
8	Kheri Damkan	-	2	2
9	Jauli	112.25	-	112.25
10	Lath	52.62	-	52.62
11	Khanpur Kalan	1.82	2.3	4.12
12	Bidhal	-	2.5	2.5
13	Bali Qutabpur	-	2	2
14	Kakana Bhadri	1.41	2	3.41

9.6 AFFORESTATION/ VEGETATIVE COVER

Table 6. Pre and post project forest and vegetative cover

S.No.	Name of villages	Existing area under tree covered, ha	Area under tree cover proposed ha	Total
1	Chidana	5	6	11
2	Shamri Sisan	7	10	17
3	Shamri Buran	9	10	19
4	Pugthala	11	12	23
5	Bajana Kalan	7	8	15
6	Bajana Khurd	9	10	19
7	Kasandi	8	10	18

8	Kheri Damkan	6	8	14
9	Jauli	10	11	21
10	Lath	9	10	19
11	Khanpur Kalan	7	8	15
12	Bidhal	9	11	20
13	Bali Qutabpur	13	15	28
14	Kakana Bhadri	9	10	19
	Total	119	139	258

9.7 LIVESTOCK

Table 8. Details of livestock in the project area

S.No.	Name of micro watersheds	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	Chirana	Buffalo	1800	7-8	224-256	2070	9-10	342-380	Increase in milk yield and number of animals by approx. 15%
		Cow	30	3-4	78-104	35	5-6	150-180	Increase in milk yield and number of animals by approx. 15%
2	Shamdi Sisan	Buffalo	1600	7-8	224-256	1840	9-10	342-380	Increase in milk yield and number of animals by approx. 15%
		Cow	30	$3^{1/2}$-$4^{1/2}$	91-117	35	$5^{1/2}$-$6^{1/2}$	165-195	Increase in milk yield and number of animals by approx. 15%
3	Shamdi Buran	Buffalo	700	$7^{1/2}$-$8^{1/2}$	240-272	805	$9^{1/2}$-$10^{1/2}$	361-399	Increase in milk yield and number of animals by approx. 15%
		Cow	40	3-4	78-104	46	5-6	150-180	Increase in milk yield and number of animals by approx. 15%
4	Pugthala	Buffalo	4200	7-8	224-256	4830	9-10	342-380	Increase in milk yield and number of animals by approx. 15%
		Cow	600	$3^{1/2}$-$4^{1/2}$	91-117	690	$5^{1/2}$-$6^{1/2}$	165-195	Increase in milk yield and number of animals by approx. 15%

S.No.	Name of micro watersheds	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	
5	Bajana Kalan	Buffalo	1200	7-8	224-256	1380	9-10	342-380	Increase in milk yield and number of animals by approx. 15%
		Cow	50	$3^{1/2}$-$4^{1/2}$	91-117	58	$5^{1/2}$-$6^{1/2}$	165-195	Increase in milk yield and number of animals by approx. 15%
6	Bajana Khurd	Buffalo	1400	$7^{1/2}$-$8^{1/2}$	240-272	1610	$9^{1/2}$-$10^{1/2}$	361-399	Increase in milk yield and number of animals by approx. 15%
		Cow	55	3-4	78-104	63	5-6	150-180	Increase in milk yield and number of animals by approx. 15%
7	Kasandi	Buffalo	1500	7-8	224-256	1725	9-10	342-380	Increase in milk yield and number of animals by approx. 15%
		Cow	50	$3^{1/2}$-$4^{1/2}$	91-117	58	$5^{1/2}$-$6^{1/2}$	165-195	Increase in milk yield and number of animals by approx. 15%
8	Kheri Damkan	Buffalo	1200	7-8	224-256	1380	9-10	342-380	Increase in milk yield and number of animals by approx. 15%
		Cow	50	$3^{1/2}$-$4^{1/2}$	91-117	58	$5^{1/2}$-$6^{1/2}$	165-195	Increase in milk yield and number of animals by approx. 15%
9	Joli	Buffalo	3000	7-8	224-256	3450	9-10	342-380	Increase in milk yield and number of animals by approx. 15%
		Cow	400	$3^{1/2}$-$4^{1/2}$	91-117	460	$5^{1/2}$-$6^{1/2}$	165-195	Increase in milk yield and number of animals by approx. 15%
10	Lath	Buffalo	1250	7-8	224-256	1438	9-10	342-380	Increase in milk yield and number of animals by approx. 15%
		Cow	30	$3^{1/2}$-$4^{1/2}$	91-117	35	$5^{1/2}$-$6^{1/2}$	165-195	Increase in milk yield and number of animals by approx. 15%
11	Khanpur Kalan	Buffalo	5200	$7^{1/2}$-$8^{1/2}$	240-272	5980	$9^{1/2}$-$10^{1/2}$	361-399	Increase in milk yield and number of animals by approx. 15%
		Cow	250	3-4	78-104	288	5-6	150-180	Increase in milk yield and number of animals by approx. 15%

S.No.	Name of micro watersheds	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	
12	Bidhal	Buffalo	1200	7-8	224-256	1380	9-10	342-380	Increase in milk yield and number of animals by approx. 15%
		Cow	100	$3^{1/2}$-$4^{1/2}$	91-117	115	$5^{1/2}$-$6^{1/2}$	165-195	Increase in milk yield and number of animals by approx. 15%
13	Bali Qutabpur	Buffalo	1070	7-8	224-256	1231	9-10	342-380	Increase in milk yield and number of animals by approx. 15%
		Cow	100	$3^{1/2}$-$4^{1/2}$	91-117	115	$5^{1/2}$-$6^{1/2}$	165-195	Increase in milk yield and number of animals by approx. 15%
14	Kakana Bahadari	Buffalo	1800	$7^{1/2}$-$8^{1/2}$	240-272	2070	$9^{1/2}$-$10^{1/2}$	361-399	Increase in milk yield and number of animals by approx. 15%
		Cow	20	3-4	78-104	23	5-6	150-180	Increase in milk yield and number of animals by approx. 15%

9.8 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 9: Backward-Forward Linkages

Sr. No.	Project	Type of Marketing Facility	Pre-Project (no.)	During the Project (no.)	Post-project (no.)
1	Gohana	Backward linkages	-	-	-

Sr. No.	Project	Type of Marketing Facility	Pre-Project (no.)	During the Project (no.)	Post-project (no.)
	Watershed (IWMP I)	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)	-	-	-

Sr. No.	Project	Type of Marketing Facility	Pre-Project (no.)	During the Project (no.)	Post-project (no.)
			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

9.8.1 LOGICAL FRAMEWORK ANALYSIS

Table 10. 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.	• Awareness camps to be organized • Trainings and exposure visits UGs and WCs to be held Capacity building workshops to be	• Quality of management of common resources improved. • Quality of distribution of benefits between	

Components	Activities	Outputs	Effect	Impact
	Activities). • Capacity Building workshops and exposure visit s for U ser G roup and W atershed Community • Facilitating and monitoring t he functioning of UGs and W Cs Strengthen linkages between U Gs and W Cs and Panchayat Institutions • Gender sensitization of UGs and W Cs to in crease inclusiveness of Samuh (Joint) decision making. • Sensitize Village	organized one. • Federations of U Gs and W C t o be formed.	people improved. • Increased awareness am ongst women about village resources • Women participation enhanced i n decision-making of GVCs. • Involvement of youth and ch ildren in vi llage development.	

Components	Activities	Outputs	Effect	Impact
	communities to involve children and youth in development			
Fund Management	• Improve management and utilization of UGs and WCs • Prepare communities to explore other sources of income for UGs and WCs.	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	
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	• Common and private lands to be brought under new plantations and agro-horti- forestry like Neem, Acadussa, prosopis, Banyan and Peepul. • Forest lands to be brought under new plantations and protection. • Trainings, exposure visits and meetings	• 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
	meetings and organize exposure visits for communities, village volunteers and staff to effectively plan, execute and monitor activities. • Identification and promotion of non-timber forest produce based income generation activities.	to be organized for communities, village volunteers and staff. • Income generation intervention promoted		
Rainfed Area Development	• Treatment of land through improved soil and moisture conservation practices on watershed basis. • Promotion of	• Land to be brought under improved soil moisture conservation practices. • Good agricultural practices to be promoted. • Organic farming to	• Improved productivity of treated land. • Increased availability of water in cells. • Increase in annual agricultural production.	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
	good agricultural practices- horticulture, improved cr op and vegetable. • Promotion of organic farming practices. • Formation of Fodder banks to increase f odder security and promote dai ry development among communities. • Identification and pr omotion of agr i-produce based i ncome generation activities like grading, processing and packaging. • Promotion of better i rrigation	be pr omoted. Fodder banks t o be established. • Agriculture base d livelihood in come generation act ivities to be promoted • Water har vesting structures to b e constructed. • Drip ir rigation facilities t o b e distributed am ong farmers. • Approx 15000 person days of em ployment to be generated. • Trainings, exposure visits and m eetings to be or ganized f or communities, vi llage volunteers.	• Farmers ado pt organic f arming practices. • Fodder se curity of farmers enhanced. • Increased availability of w ater for 9 to12 months. • Increased availability of w ater for livestock • Increase i n agricultural productivity of land. • Augmentation of drinking w ater supply.	

Components	Activities	Outputs	Effect	Impact
	practices like drip irrigation • Impart trainings, conduct meetings and organize exposure visits of communities.			
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 Linking SHGs with external financial institutions	• 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 and goats	• 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 household income.	• Position of women in household, community, society (politically, socially and economically) as perceived by women and community at large. • Performance 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,

Components	Activities	Outputs	Effect	Impact
				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.