CONTENTS (IWMP II)

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 last three decades. Further, GOI has adopted watershed management as anational policy since 2003. Several studies have highlighted that appropriate natural resource management shall results in enhancement in 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-II) area programme a systematic survey has been conducted to know the potentiality of each village / Micro-Watershed. With this view, a base line surveywas conducted in eight micro- watershedsGijhi (2C5f4n2), Humayunpur (part) (2C5F5d4), Dattaur (2C5f4n1), Morkheri(Part) (2 C5F4p3), Bakheta(part) (2C5F5d5), Kansala(Part) (2c5f4R6), Mungan (Part) (2C5F4r8) and Kisranti (2C5F4p3).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 programs 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-II) of 8 micro watersheds namelyGijhi (2C5f4n2), Humayunpur (part) (2C5F5d4), Dattaur (2C5f4n1), Morkheri(Part) (2C5F4p3), Bakheta(part) (2C5F5d5), Kansala(Part) (2c5f4R6), Mungan (Part) (2C5F4r8) and Kisranti (2C5F4p3)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 Gijhi, Humayunpur,Dattaur, Morkheri, Bakheta, Kansala, Mungan and Kisrantimicro- 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 firsthand information, a joint visit in the project area was made along with PRI members. In this survey, physical location of the watershed, drainage pattern, slope, land use and other problems related to the area were

assessed. Sarpanches and local people were involved in the discussions, their needs and scope of watershed works were taken up.

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

The primary data was also compiled from revenue records, Anganwari workers and statistical officers of the district. Rainfall data was collected from the Ground Water Cell to maintain the record of rainfall from rain gauge station located in the Sub division/district headquarter of the project area.

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 discussed, debated and recorded.

1.2 PARTICIPATORY RURAL APPRAISAL

The due process of Participatory Rural Appraisal was followed in which village committees were sensitized about project activities. An appraisal of land resources, water resources, forest and pasture land resources, common property resources, production system and livestock resources was carried out by collecting data from primary and secondary

sources. Group 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 Renovation and digging of percolation pond, Drainage measures, land development works, retaining wall, ramp and inlet of pond, water conveyance system, culverts, plantation, land leveling, bunding etc. were recommended to conserve and store water used for life saving irrigation potential in the rain fed area and to avoid 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 and site visit

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 and existing 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, Soil fertility 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, structures like Renovation and digging of percolation pond, Drainage measures, land development works, retaining wall, ramp and inlet of pond, water conveyance system, culverts, plantation, land leveling, bunding 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

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, Rohtak 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-II) project is falls in Rohtak and Sampla block of Rohtak district in Haryana state. The project is a cluster of eight micro- watersheds namely Gijhi (2C5f4n2), Humayunpur (part) (2C5F5d4), Dattaur (2C5f4n1), Morkheri(Part) (2C5F4p3), Bakheta(part) (2C5F5d5), K ansala(Part) (2c5f4R6), M ungan (Part) (2C5F4r8) and Kisranti (2C5F4p3). The total geographical area of the project is **4645 ha** out of which **3724 ha** has been undertaken to be t reated under IWMP II starting from year 2012-13. The project is divided into eight 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/ villages	Code No.	Block	District	Area of the Project (ha)	Area proposed to be treated (ha)	Total Project cost (Rs lacs)	PIA
1	Sampla watershed IWMP II	Gijhi	2C5f4n2	Sampla	Rohtak	661	457	54.84	ASCO, Rohtak
2		Humayunpur (Part)	2C5F5d4	Rohtak	Rohtak	540	435	52.20	
3		Dattaur	2C5f4n1	Sampla	Rohtak	695	540	64.80	
4		Morkheri (Part)	2C5F4p3	Sampla	Rohtak	517	459	55.08	
5		Bakheta (Part)	2C5F5d5	Rohtak	Rohtak	612	553	66.36	
6		Kansala (Part)	2c5f4R6	Rohtak	Rohtak	657	505	60.60	
7		Mungan	2C5F4r8	Rohtak	Rohtak	469	390	46.80	
8		Kisranti	2C5F4p3	Sampla	Rohtak	494	385	46.20	

Sr. No	Name of the project	Name of the micro watersheds/ villages	Code No.	Block	District	Area of the Project (ha)	Area proposed to be treated (ha)	Total Project cost (Rs lacs)	PIA
						4645	3724	446.88	

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 Weight Age 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 71 concerning above thirteen parameters, a composite ranking was given to Sampla Watershed (IWMP II) project as given in **Table- 3.**

The percentage of schedule caste in the watershed is less than 20% so the score is given as 3. The percentage of poor population is between 20-50 percent so 5 score was allotted. The moisture index is below -33.2 the score allotted is 10

whereas rainfed area is between 80 to 90 percent so the score allotted is 10. Considering all the parameter mentioned for criteria and weightage for selection of watershed in the project, the composite score is 71.

Table- 3: Weight-age of the Project

1	2	3	4	5	6	7	8	9													
Sr. No.	District	Name of the project	No. of micro-water-sheds proposed to be covered	Geographical area (ha)	Proposed Area for Development	Type of project (Hilly/ Desert/ Others)	Proposed cost (Rs. In Lakh)	Weightage under the criteria													
								i	ii	iii	Iv	v	vi	vii	viii	ix	x	xi	xii	xiii	Total
1.	Rohtak	Sampla watershed (IWMP II)	8	4645	3724	Semi Arid	446.88	5	3	0	5	3	0	10	5	10	15	5	10	0	71

Table 4: Watershed Information

Name of the Project	No. of Micro-Watersheds to be Treated	Watershed codes	Watershed regime/type/order
Sampla Sub- watershed IWMP II	8	2C5f4n2, 2C5F5d4, 2C5f4n1, 2C5F4p3, 2C5F5d5, 2c5f4R6, 2C5F4r8, 2C5F4p3	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.**

Table 5. Ongoing Developmental Programs in the Project Area

S.No.	Name of the Program /Project	Name of Micro watersheds	Sponsoring agency	Objective	Estimated number of beneficiaries for year 2012-13(Job card issued)
1	MGNREGA	Gijhi	DRDA, Rohtak	To provide assured employment of 100 days in a year to unskilled labour and development of village.	119
2	MGNREGA	Humayunpur (Part)	DRDA, Rohtak	To provide assured employment of 100 days in a year to unskilled labour and development of village.	72
3	MGNREGA	Dattaur	DRDA, Rohtak	To provide assured employment of 100 days in a year to unskilled labour and development of village.	82
4	MGNREGA	Morkheri (Part)	DRDA, Rohtak	To provide assured employment of 100 days in a year to unskilled labour and development of village.	151
5	MGNREGA	Bakheta (Part)	DRDA, Rohtak	To provide assured employment of 100 days in a year to unskilled labour and development of village.	443
6	MGNREGA	Kansala (Part)	DRDA, Rohtak	To provide assured employment of 100 days in a year to unskilled labour and development of village.	53
7	MGNREGA	Mungan	DRDA, Rohtak	To provide assured employment of 100 days in a year to unskilled labour and development of village.	38

8	MGNREGA	Kisranti	DRDA, Rohtak	To provide assured employment of 100 days in a year to unskilled labour and development of village.	148

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.	Rohtak	288	158460	38	19000	-	-	38	19000	250 (balance) 21	139460 (balance) 10061

CHAPTER – 3

BASIC INFORMATION OF THE PROJECT AREA

GEOGRAPHY AND GEOHYDROLOGY

The Sampla Watershed (IWMP II) falls in Rohtak and Sampla block of District Rohtak. The area is occupied by Indo-Gangetic alluvium/ aeolian plains. Physiographically, the area falls under duny and inter dune plains. The area lying in between 28°56'30'' to 29°07'00'' N latitude and 76°15'30'' to 76°26'00''E longitude. The general elevation varies between 217-226 m **(MSL)** above mean sea level. Area experiences the lowest rainfall in the state 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 Sampla Watershed (IWMP II)

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	Gijhi	Gijhi	661	457	570	366	40	51
2	Humayunpur (Part)	Humayunpur (Part)	540	435	478	373	19	43
3	Dattaur	Dattaur	695	540	605	450	-	90
4	Morkheri (Part)	Morkheri (Part)	517	459	448	390	14	55
5	Bakheta (Part)	Bakheta (Part)	612	553	505	446	6	101
6	Kansala (Part)	Kansala (Part)	657	505	550	398	28	79

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
7	Mungan (Part)	Mungan (Part)	469	390	417	338	22	30
8	Kisranti	Kisranti	494	385	444	335	1	49
			4645	**3724**	**4017**	**3096**	**130**	**498**

(Source – District Census Handbook, 2001 Rohtak)

3.2 SOIL AND TOPOGRAPHY

The soils of Sampla Watershed are fine loamy and coarse loamy to sandy. The topography of the area ranges from level to nearly level slopes. Soils are subject to susceptible to moderate to severe water and wind erosion. The slope ranges from 0.5 to 3% and above most of the area of micro watersheds falls under level to nearly level slopes on dune and most of the areas fall under lands. 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.	Gijhi	2C5f4n2	661	Sandy loam to sandy clay loam	Level to nearly level
2.	Humayunpur (Part)	2C5F5d4	540	Sandy loam to sandy clay loam	
3.	Dattaur	2C5f4n1	695	Sandy loam to sandy clay loam	
4.	Morkheri (Part)	2C5F4p3	517	Sandy loam to sandy clay loam	
5.	Bakheta (Part)	2C5F5d5	612	Sandy loam to sandy clay loam	
6.	Kansala (Part)	2c5f4R6	657	Sandy loam to sandy clay loam	
7.	Mungan (Part)	2C5F4r8	469	Sandy loam to sandy clay	

				loam	
8.	Kisranti	2C5F4p3	494	Sandy loam to clay loam	
			4645		

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 drought once in 4 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 Micro- watersheds	Flood Incidence	Drought Incidence
1.	Gijhi	Nil	Once in four years
2.	Humayunpur (Part)		
3.	Dattaur		
4.	Morkheri (Part)		
5.	Bakheta (Part)		
6.	Kansala (Part)		
7.	Mungan (Part)		
8.	Kisranti		

3.3 SOILS

3.3.1 Soil Erosion

In the identified eight micro watersheds, it is observed that due to light texture & less vegetative cover to increase the loss of soil in the watershed area. This results in degradation of agricultural land, deforestation and low organic matter contents. Average annual rainfall of the area is 274 mm. In the watershed area the upper soil crest gets washed away in

the form of runoff during rainy season if heavy storm occur, which also carries valuable top soil (sheet). Soil erosion in respect of sheet is moderate. Majority of the watershed Community are dependent on agriculture. Agriculture suffers due to area being rain fed and due to deficit rains in the region, resulting in further deterioration of socio economic conditions of community.

3.3.2 Soil Salinity/Alkalinity (Salinity ingress)

There is moderate soil salinity in the Project and pH is normal and within the limits of 7.2 to 8.8.

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

Table 4. Soil pH and Salinity

Sr. No.	Name of Micro Watersheds	Soil pH	Type of salinity
1	Kansala	7.9	Medium to Safe
2	Bakheta	7.3	Medium to Safe
3	Mungan	7.8	Medium to Safe
4	Humayupur	8.8	Medium to Safe
5	Kasrantee	7.2	Medium to Safe
6	Dattaur	7.4	Medium to Safe
7	Gijji	7.2	Medium to Safe
8	Morkheri	7.5	Medium to Safe

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 suitable to agriculture. Classes V to VIII are not suitable for agriculture. These are used for pastures, forestry, and wildlife and recreation purposes and other industrial and township. Depending upon the degree of limitation and the kind of problems involved in management of soils, the land capability sub classes were indicated by adding the following limitation symbols to the capability classes:

1. Erosion and runoff (e) including risk of erosion and great erosion damage.
2. Excess of water (w) including wetness, high water table, and problem of drainage.
3. Root zone limitation (s) including shallow depth, low water holding capacity, salinity or alkalinity/rockiness.
4. Climate limitation (c).

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

Land capability subclass III e2s2

These soils are moderately deep, light to coarse textured, level to nearly level land and intra dunal plains. These soils are well drained, moderately permeable, and have low water holding capacity with slight to moderate erosion hazard.

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

1. Land leveling should be done as per guidelines, because farmers are not economically capable to bear the cost of land leveling.
2. Engineering measures like earthen embankments (if required) with drop structure for safe disposal of excess rainwater should be under taken.
3. Agronomic measures; mainly dry land farming, leguminous crop growing as mix cropping should be recommended.

4. Provide proper drainage system in low lying depression in the area.
5. Increase biomass through adopting agro- forestry on field bunds.

Land capability subclass IV e3s3

These soils are greatly light textured soils developed on nearly level. The water holding capacity is very poor and the water and wind erosion hazard is moderate to severe.

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 as per guidelines, 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 and dune stabilization.

3.3.5 Climatic Conditions

The average annual rainfall of the district is 274 mm (during the past 10 year's data). The highest rainfall is 465 mm during the year 2005 and lowest 130 mm during the year 2006. The uneven rainfall distribution is leading to run off soil every year to the steams, rivulets and depressed area of the Sampla Watershed (IWMP II). 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	272
2	2005	465
3	2006	130
4	2007	238
5	2008	411
6	2009	257
7	2010	414
8	2011	239
9	2012	184
10	2013	132
	Average	**274.2**

(Source: - Ground Water Cell, Rohtak)

T The mean maximum temperature is 40.5˚ C (May and June) and mean minimum is 7˚ C (January) of the district. The rainfall data reveals that the district has 23 rainy days in the year.

3.3.6 Physiography and Relief

Physiographically, the area is divided into two parts active and stabilized sand dunes. The general Elevation in the area belongs to stabilized sand dunes and Interdunal plains 217-226 m above mean sea level. The water is drained through fields and create temporary water logging conditions in depressions and along the canal**.** Upper area is badly affected by wind er osion due t o abse nce of ve getative co ver and uneve n slopes. The el evation r ange and per centage sl ope distribution has been presented in **Table 6.**

Table 6. Physiography and Relief

Project Name	Elevation (MSL)	Slope Range (%)
Sampla Watershed (IWMP II)	217-226	0.5-3%

3.4 LAND AND AGRICULTURE

The land holding pattern of the villages under Sampla Watershed shows that the majority of the land holding is below 10 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 rainfed agriculture not fulfill of their daily needs. The nearest Industrial Area is Rohtak. This affects directly the demographic profile of the village.

The major crops Bajra, Gwar, Arahar, Green fodder and pulses in Kharif under rainfed conditions. The major crops during Rabi Wheat, Green fodder and seasonal vegetables, Gram, Mustard in rain fed and irrigated conditions. The soil and water conservation measures such as Engineering like Renovation and digging of percolation pond, Drainage measures, land development works, retaining wall, ramp and inlet of pond, water conveyance system, culverts, plantation, land leveling, bunding 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 Shrubs
1	Neem	Ber	Doob
2	Keekar	Aonla	Botha
3	Sheesham	Guava	Congress Grass
4		Kinnow	
5		Mango	
6		Chiku	

Sr. No.	Trees	Fruits	Grasses and Shrubs
7		Papaya	

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
4417	248	35	-	4700

3.4.2 AGRICULTURE/PATTERN

Table 9. Agriculture/ Pattern

Sr. No.	Name of Micro Watersheds	Land under agriculture use (ha)	Net Sown area (ha)	
			One time	Two times
1	Gijhi	570	456	399
2	Humayunpur (Part)	478	391	316
3	Dattaur	605	501	398
4	Morkheri (Part)	448	360	304
5	Bakheta (Part)	505	416	322
6	Kansala (Part)	550	463	341
7	Mungan (Part)	417	336	271
8	Kisranti	444	363	291
		4017	**3286**	**2642**

(Source: Department of Agriculture, Haryana)

3.4.3 IRRIGATION

Lack of Assured Irrigation Facilities

The present source of irrigation is ground water where the area is underlain by fresh to marginal water quality and partially by canal n etwork. The r emaining cu ltivable ar ea i s under r ainfed agr iculture. The pr esent so urce of i rrigation i n t he 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	Gijhi	Gijhi	July to March	182	July to June	22
2	Humayunpur (Part)	Humayunpur (Part)	July to March	91	July to June	14
3	Dattaur	Dattaur	July to March	136	July to June	19
4	Morkheri (Part)	Morkheri (Part)	July to March	44	July to June	14
5	Bakheta (Part)	Bakheta (Part)	July to March	48	July to June	11
6	Kansala (Part)	Kansala (Part)	July to March	129	July to June	23
7	Mungan (Part)	Mungan (Part)	July to March	67	July to June	12
8	Kisranti	Kisranti	July to March	104	July to June	5
				801		**120**

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

3.4.4 CROPPING PATTERN (crop details)

Cropping Pattern

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

Table 11 A. Crop Details (Rabi)

Sr. No	Name of Micro Watersheds	Village	Rabi crops(Wheat)				(Oilseed)			
			Area (ha)	Prod. (000'kg)	Productivity (kg/ha) Avg.	Use of fertilizer	Area (ha)	Prod. (000'kg)	Productivity (kg/ha) Avg.	Use of fertilizer
1	Gijhi	Gijhi	265	1171.6	4421	DAP/Urea	80	110.8	1385	DAP/Urea
2	Humayunpur (Part)	Humayunpur (Part)	215	953.7	4436	DAP/Urea	105	143.2	1364	DAP/Urea
3	Dattaur	Dattaur	315	1384.4	4395	DAP/Urea	65	86.2	1326	DAP/Urea
4	Morkheri (Part)	Morkheri (Part)	309	1378.8	4462	DAP/Urea	45	60.7	1348	DAP/Urea
5	Bakheta (Part)	Bakheta (Part)	315	1388.5	4408	DAP/Urea	85	115.9	1363	DAP/Urea
6	Kansala (Part)	Kansala (Part)	325	1424.8	4384	DAP/Urea	65	86.6	1333	DAP/Urea
7	Mungan (Part)	Mungan (Part)	255	1126.1	4416	DAP/Urea	33	44.6	1352	DAP/Urea
8	Kisranti	Kisranti	251	1115.2	4443	DAP/Urea	38	50.8	1338	DAP/Urea
			2250	**9943.1**			**516**	**698.8**		

Table 11 B. Crop Details (Kharif)

Sr. No	Name of Micro Watersheds	Village	(Bajra)				(Paddy)			
			Area (ha)	Prod. (kg)	Productivity (kg/ha) Avg.	Use of fertilizer	Area (ha)	Prod. (kg)	Productivity (kg/ha) Avg.	Use of fertilizer
1	Gijhi	Gijhi	138	188.2	1364	DAP/Urea	45	69.0	1533	DAP/Urea
2	Humayunpur (Part)	Humayunpur (Part)	150	210.5	1403	DAP/Urea	57	86.7	1521	DAP/Urea
3	Dattaur	Dattaur	170	235.6	1386	DAP/Urea	110	169.7	1543	DAP/Urea
4	Morkheri (Part)	Morkheri (Part)	222	309.5	1394	DAP/Urea	83	129.8	1564	DAP/Urea
5	Bakheta (Part)	Bakheta (Part)	195	263.3	1350	DAP/Urea	85	127.8	1503	DAP/Urea

Sr. No	Name of Micro Watersheds	Village	(Bajra)				(Paddy)			
			Area (ha)	Prod. (kg)	Productivity (kg/ha) Avg.	Use of fertilizer	Area (ha)	Prod. (kg)	Productivity (kg/ha) Avg.	Use of fertilizer
6	Kansala (Part)	Kansala (Part)	211	291.0	1379	DAP/Urea	104	159.7	1536	DAP/Urea
7	Mungan (Part)	Mungan (Part)	141	194.9	1382	DAP/Urea	62	96.4	1555	DAP/Urea
8	Kisranti	Kisranti	128	180.6	1411	DAP/Urea	63	98.3	1561	DAP/Urea
		Total	**1355**	**1873.5**			**609**	**937.5**		

3.4.5 Livestock

Farmers in these villages have managing 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 nut ritive f eed. I ntroduction of cr oss breed co ws and m urrah buf falo w ith bet ter m ilk production w ill popularize dairy farming in the area. Also, the farmyard manure procured from these animals would help improve the soil healt

Table 12. Village Wise Distribution of Milk Production in Sampla Watershed (IWMP II)

S. No	Name of Micro Watersheds	Buffalo (Lit*/per day/annum) for 6 months	Cow (lit*/per day/annum) for 6 months	Sheep	Goat	Camel
1.	Gijhi	885/6637/1194750	172/602/108360	-	30	-
2.	Humayunpur (Part)	581/4067/732060	290/1305/234900	7	13	-
3.	Dattaur	982/8347/1502460	247/741/133380	-	64	-
4	Morkheri (Part)	561/3646/656370	249/996/179280	5	38	-
5	Bakheta (Part)	968/6776/1219680	102/357/64260	22	-	-
6	Kansala (Part)	1015/8120/1461600	340/1530/275400	56	4	-
7	Mungan (Part)	489/3667/660150	200/700/126000	180	74	-
8	Kisranti	358/2327/418860	112/336/60480	-	-	-

(Source: Animal Husbandry, Rohtak)

***Average Yield of Buffalo is 7-8 Lit/day and cow yield is 3-4 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 watershed varies from 1-6 m depth. Most of the area in micro watersheds Kansala, Kisranti and Morkheri falls in the range of 1-2 m depth. The part of the area of the Sampla microwatershed falls from 2-3m range. 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 Sampla Watershed (IWMP II)

Sr. No.	Name of Micro-watersheds	Ground water Level
1	Kasranti	2.31
2	Kansala	2.55
3	Hamauypur	2.55
4	Bakheta	1.92
5	Mungan	6.02
6	Dataur	6.02
7	Mor Kheri	4.07
8	Gijjil	3.86

Most of the area under watershed is underlain by marginal ground water quality. The deeper quality of ground water is saline, which is unfit for irrigation and drinking purpose. The water quality map of the area is presented in **Annexure-IX**. The source of drinking water supply is through canal network and tube well where the quality of ground water is acceptable for drinking purposes in the area.

b. Water table fluctuation

From the availability of the data from the period June 2002 to June 2012, 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 fresh to marginal quality of ground water. The seasonal fluctuation i.e. Pre and Post monsoon period is 1- 1.5 m.

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, Rohtak. The details of common property resource in Sampla Watershed (IWMP II) are tabulated in **Table 14.**

Table14. Detail of Common Property Resources

Name of the Project	CPR Particulars	Total Area, ha (Area owned / in possession of)				Area available for treatment (ha)			
		Pvt. Person	Govt.	PRI	Any Other	Pvt. Person	Govt.	PRI	Any Other
Sampla Watershed (IWMP II)	Waste land	12	-	596	20	5		370	10
	Pasture	-	-	-	-	-	-	-	-
	Orchards	2	-	-	-	-	-	-	-
	Village wood lot	3	-	39	-	-	-	-	-
	Forest	-	-	38	-	-	-	-	-
	Village ponds, lake	-	-	-	-	-	-	-	-
	Community Buildings	-	-	-	-	-	-	-	20
	Weekly Mkts	-	-	-	-	-	-	-	-
	Permanent Mkts	1	-	-	-	-	-	-	-
	Temples/place of worship	-	-	-	19	-	-	-	-

	Others	-	-	-	-	-	-	-	-

3.5 SOCIO ECONOMIC AND LITERACY PROFILE

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

Poor economic conditions of farmers: The general 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	Gijhi	Gijhi	707	2019	1718	3737	574	505	1079	28.87
2	Humayunpur (Part)	Humayunpur (Part)	729	2143	1745	3888	346	285	631	16.23
3	Dattaur	Dattaur	692	1928	1679	3607	366	359	725	20.10
4	Morkheri (Part)	Morkheri (Part)	661	1910	1536	3446	320	256	576	16.72
5	Bakheta (Part)	Bakheta (Part)	593	1611	1343	2954	304	282	586	19.84
6	Kansala (Part)	Kansala (Part)	1062	3010	2503	5513	311	240	551	9.99
7	Mungan (Part)	Mungan (Part)	508	1500	1285	2785	452	401	853	30.63
8	Kisranti	Kisranti	379	1077	875	1952	85	71	156	7.99
		Total	**5331**	**15198**	**12684**	**27882**	**2758**	**2399**	**5157**	**18.50**

(Source- District Census 2011)

Table16. Village wise Literacy Rate in Sampla Watershed (IWMP II)

Sr.No.	Name of the Micro watershed	Name of villages	Total population	Literacy					
				Total Literates	% age	Male	% age	Female	% age
1	Gijhi	Gijhi	3737	2604	69.68	1598	61.37	1008	38.71
2	Humayunpur (Part)	Humayunpur (Part)	3888	2716	69.86	1682	61.93	1034	38.07
3	Dattaur	Dattaur	3607	2582	71.58	1532	59.33	1050	40.67
4	Morkheri (Part)	Morkheri (Part)	3446	2415	70.08	1498	62.03	917	37.97
5	Bakheta (Part)	Bakheta (Part)	2954	2123	71.87	1303	61.38	820	38.62
6	Kansala (Part)	Kansala (Part)	5513	3943	71.52	2394	60.72	1594	40.43
7	Mungan (Part)	Mungan (Part)	2785	1872	67.22	1122	59.94	750	40.06
8	Kisranti	Kisranti	1952	1400	71.72	885	63.21	515	36.79
		Total	**27882**	**19655**	**70.49**	**12014**	**61.12**	**7688**	**39.11**

(Source- District Census- 2011)

Table 17. EMPLOYMENT STATUS

Sr.No.	Name of Micro Watersheds	Name of villages	Schedule caste		Cultivators		Agricultural labourers		Household industry workers		Other workers	
			Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
1	Gijhi	Gijhi	574	505	118	1	52	3	2	0	502	54
2	Humayunpur (Part)	Humayunpur (Part)	346	285	535	217	104	41	43	89	335	90
3	Dattaur	Dattaur	366	359	307	109	10	8	23	10	401	36

4	Morkheri (Part)	Morkheri (Part)	320	256	381	111	49	147	1	1	229	35
5	Bakheta (Part)	Bakheta (Part)	304	282	374	24	34	3	6	4	215	29
6	Kansala (Part)	Kansala (Part)	311	240	810	117	41	6	3	1	421	59
7	Mungan (Part)	Mungan (Part)	452	401	215	28	120	42	12	54	159	43
8	Kisranti	Kisranti	85	71	238	61	4	3	4	0	155	16
		Total	**2758**	**2399**	**2978**	**668**	**414**	**253**	**94**	**159**	**2417**	**362**

Source: Census 2011

3.5.2 MIGRATION PATTERN

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

Table 18. Migration Pattern in Sampla Watershed (IWMP II)

Sr. No.	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 (in Rs.)
1	Kasrantee	4200	300	135 days	Poor economic condition	8000
2	Kansala	10000	700	150		8000
3	Hamauypur	4000	300	180		7000
4	Bakheta	6050	600	180		7000
5	Mungan	4500	450	180		7500
6	Dataur	6000	550	180		9000
7	Mor Kheri	5000	450	150		7500
8	Gijjil	5000	800	180		7500

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	Gijhi	Gijhi	707	202	28.6
2	Humayunpur (Part)	Humayunpur (Part)	729	122	16.7
3	Dattaur	Dattaur	692	115	16.6
4	Morkheri (Part)	Morkheri (Part)	661	134	20.3
5	Bakheta (Part)	Bakheta (Part)	593	96	16.2
6	Kansala (Part)	Kansala (Part)	1062	210	19.8
7	Mungan (Part)	Mungan (Part)	508	165	32.5
8	Kisranti	Kisranti	379	57	15.0
		Total	**5331**	**1101**	**20.7**

(Source: District Administration Rohtak, Haryana)

INFRASTRUCTURE DETAILS

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

Table 20. Village Infrastructure

Sr. No.	Name of Micro watersheds	Name of villages	Bank Y/N	Post office Y/N	School Primary/ High/ Sr. Sec	Milk Collection Centre Y/N	Pucca Road to Village Y/N	Health Facility Govt/Private Y/N	Veterinary facility Y/N
1	IWMP-II	Kasrantee	N	N	-/1/-	N	Y	N	Y
2		Kansala	Y	Y	-/-/1	Y	Y	Y	Y
3		Hamauypur	N	Y	-/2/1	Y	Y	Y	Y
4		Bakheta	N	Y	-/1/-	Y	Y	Y	Y
5		Mungan	N	Y	-/-/1	Y	Y	Y	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	Pucca Road to Village Y/N	Health Facility Govt/Private Y/N	Veterinary facility Y/N
6		Dataur	Y	N	-/-/1	Y	Y	N	N
7		Mor Kheri	Y	Y	-/-/1	Y	Y	Y	Y
8		Gijjil	Y	Y	-/1/-	Y	Y	Y	N

FACILITIES/ HOUSEHOLD ASSETS

Table 21. Facilities/ Household assets in Sampla Watershed (IWMP II)

Sr. No.	Name of Micro-Watersheds	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	Kasrantee	450	410	15	300	220	180	300	120	200	100
2	Kansala	1500	1450	50	1200	300	280	1350	350	1450	210
3	Hamauypur	800	750	25	700	200	250	710	225	650	115
4	Bakheta	850	810	30	800	220	210	750	240	600	90
5	Mungan	700	650	10	600	200	160	680	320	300	80
6	Dataur	900	850	29	800	200	155	550	254	800	100
7	Mor Kheri	700	640	30	600	210	150	300	200	450	120
8	Gijjil	800	720	20	650	200	150	500	150	550	50

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. Household income Sampla Watershed (IWMP II)

S. No.	Name of micro watersheds	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.	Gijhi	14000	8000	5500	4000	**31500**
2.	Humayunpur (Part)	13000	6000	5000	2500	**26500**
3.	Dattaur	16500	5500	6000	3200	**31200**
4	Morkheri (Part)	14500	7500	5000	3500	**30500**
5	Bakheta (Part)	15000	7000	4500	4500	**31000**
6	Kansala (Part)	11000	8500	5000	3000	**27500**
7	Mungan (Part)	10500	6000	5500	3800	**25800**
8	Kisranti	13500	7500	6000	4000	**31000**

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.
- Low 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.

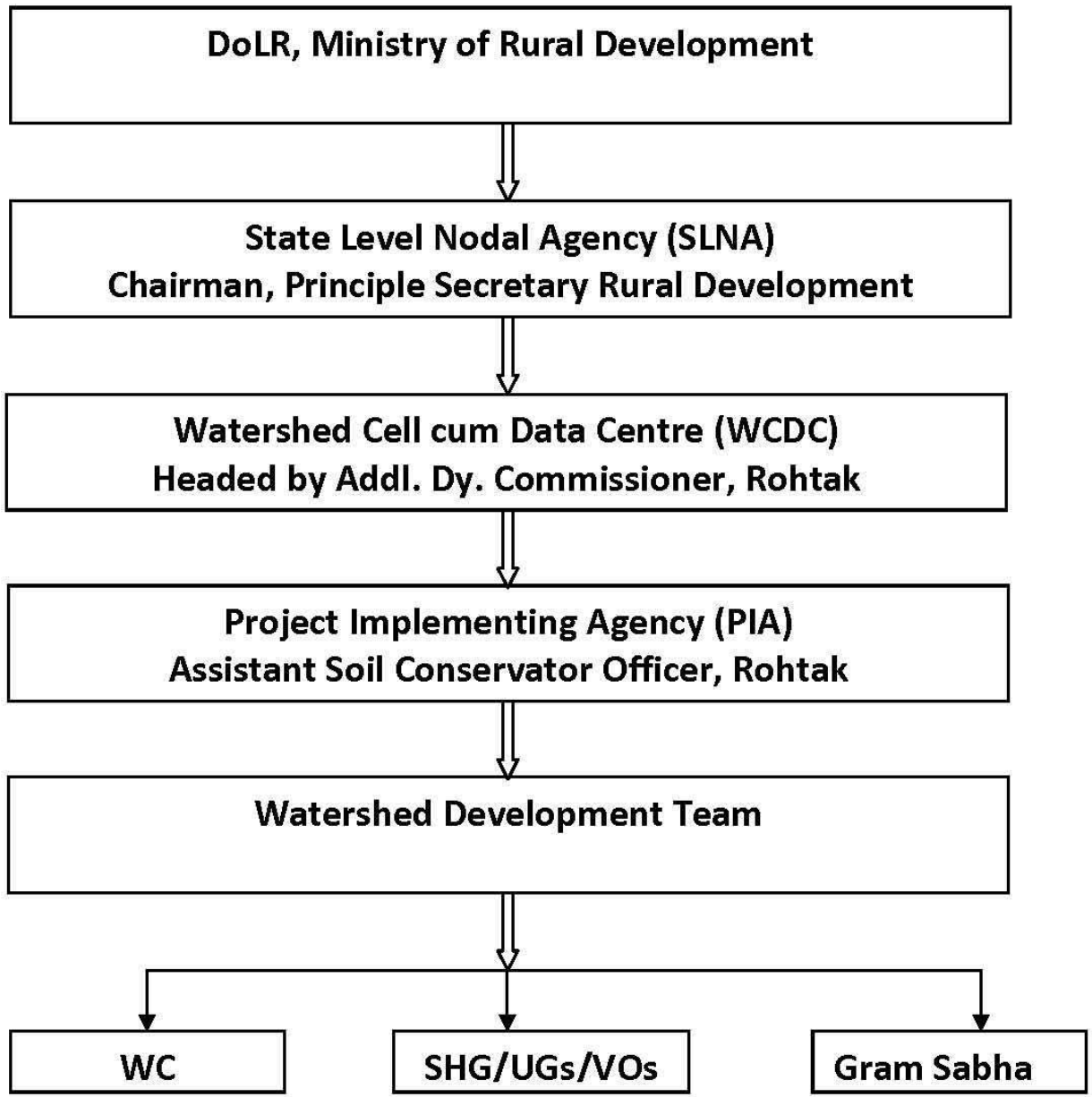
CHAPTER-4

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, Rohtak
Project Implementing Agency (PIA)
Assistant Soil Conservator Officer, Rohtak
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, ROHTAK

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 Rohtak is selected by the State Level Nodal Agency (SLNA) for Integrated Watershed Management Programme (IWMP) in Haryana. In the district Rohtak, where the area of development is 10061 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, Rohtak. 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	Meham Watershed (IWMP-I)	i) Type of organization	Govt Organization
		ii) Name of organization	Assistant Soil Conservation Officer, Rohtak
		iii) Designation & Address	ASCO, Rohtak
		iv) Telephone	-----
		v) Fax	-----
		vi) E-mail	ascorohtak@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 office with officials from the Rohtak 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 Watersheds	Name of Members
Gijhi	Nirmla Devi, Vijender, Jai Pal, Krishna, Gita , Ram Niwas, Vishan
Himayupur	Dharam Pal, Hawa Singh, Shila, Vrinder, Suresh, Rampal, Rambir, Hawa Singh, Shamsher
Dattaur	Rishi, Rohtash, Mukesh, Ashok Kumar, Ram Pyari, Balwant, Ram Chander, Kabita, Krishan Saini, Khim Chand, Satnarayan
Mor Kheri	Baljit, Bajjit, Manohar, Ashok, Kashmir, Sher Singh, Rajesh, Sunita, Balwan, Phulpati
Bkheta	Kartar, Shahib Singh, Dya Nand, Sudesh, Rajinder, Ashit, Bhanmati, Suman, Jagroop, Pooja
Kansala	Mukesh Devi, Jap Singh, Raj Kumar, Rajpal, Randhir, Raju, Ram Kumar, Murti Devi, Kabita Devi, Raj Banti
Mungan	Rajpal, Kamal, Surajbhan, Ramrati, Ram Kawar, Promila, Karambir, Kamlesh, Smunder, Bal Kishan
Kisranti	Partap Singh, Bal Kishan, Balwan, Soma Devi, Mishari, Vinod, Raj Kumar, Om Prakash, Rajesh, Rajesh, Babita

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 II DUBETA 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 II

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
Sampla Watershed (IWMP II)	4645	3724	44688000	Administrative costs	446880	446880	1340640	1340640	893760	**4468800**
				Monitoring	0	0	0	446880	0	**446880**
				Evaluation	0	111720	111720	111720	111720	**446880**
				Entry point activities	1787520	0	0	0	0	**1787520**
				Institution and capacity building	0	2234400	0	0	0	**2234400**
				Detailed project report	446880	0	0	0	0	**446880**
				Watershed development works	0	3575040	7150080	7596960	6703200	**25025280**
				Livelihood activities for the asset less persons	0	0	1340640	2234400	446880	**4021920**
				Production system and micro enterprises	0	0	1340640	1787520	1340640	**4468800**
				Consolidation phase	0	0	0	0	1340640	**1340640**
				Total	**2681280**	**6368040**	**11283720**	**13518120**	**10836840**	**44688000**
				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: Gijhi)

(BUDGET AT A GLANCE)

Effective Area	Funds Available	Name of activity	1st Year	2nd Year	3rd Year	4th Year	5th Year	Total
457	5484000	Administrative costs	54840	54840	164520	164520	109680	**548400**
		Monitoring	0	0	0	54840	0	**54840**
		Evaluation	0	13710	13710	13710	13710	**54840**
		Entry point activities	219360	0	0	0	0	**219360**
		Institution and capacity building	0	274200	0	0	0	**274200**
		Detailed project report	54840	0	0	0	0	**54840**
		Watershed development works	0	438720	877440	932280	822600	**3071040**
		Livelihood activities for the asset less persons	0	0	164520	274200	54840	**493560**
		Production system and micro enterprises	0	0	164520	219360	164520	**548400**
		Consolidation phase	0	0	0	0	164520	**164520**
		Total	**329040**	**781470**	**1384710**	**1658910**	**1329870**	**5484000**
		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: Humayunpur)

(BUDGET AT A GLANCE)

Effective Area	Funds Available	Name of activity	1st Year	2nd Year	3rd Year	4th Year	5th Year	Total
435	5220000	Administrative costs	52200	52200	156600	156600	104400	**522000**
		Monitoring	0	0	0	52200	0	**52200**
		Evaluation	0	13050	13050	13050	13050	**52200**
		Entry point activities	208800	0	0	0	0	**208800**
		Institution and capacity building	0	261000	0	0	0	**261000**
		Detailed project report	52200	0	0	0	0	**52200**
		Watershed development works	0	417600	835200	887400	783000	**2923200**
		Livelihood activities for the asset less persons	0	0	156600	261000	52200	**469800**
		Production system and micro enterprises	0	0	156600	208800	156600	**522000**
		Consolidation phase	0	0	0	0	156600	**156600**
		Total	**313200**	**743850**	**1318050**	**1579050**	**1265850**	**5220000**
		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: Dattaur)
(BUDGET AT A GLANCE)

Effective Area	Funds Available	Name of activity	1st Year	2nd Year	3rd Year	4th Year	5th Year	Total
540	6480000	Administrative costs	64800	64800	194400	194400	129600	**648000**
		Monitoring	0	0	0	64800	0	**64800**
		Evaluation	0	16200	16200	16200	16200	**64800**
		Entry point activities	259200	0	0	0	0	**259200**
		Institution and capacity building	0	324000	0	0	0	**324000**
		Detailed project report	64800	0	0	0	0	**64800**
		Watershed development works	0	518400	1036800	1101600	972000	**3628800**
		Livelihood activities for the asset less persons	0	0	194400	324000	64800	**583200**
		Production system and micro enterprises	0	0	194400	259200	194400	**648000**
		Consolidation phase	0	0	0	0	194400	**194400**
		Total	**388800**	**923400**	**1636200**	**1960200**	**1571400**	**6480000**
		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: Morkheri)

(BUDGET AT A GLANCE)

Effective Area	Funds Available	Name of activity	1st Year	2nd Year	3rd Year	4th Year	5th Year	Total
459	5508000	Administrative costs	55080	55080	165240	165240	110160	**550800**
		Monitoring	0	0	0	55080	0	**55080**
		Evaluation	0	13770	13770	13770	13770	**55080**
		Entry point activities	220320	0	0	0	0	**220320**
		Institution and capacity building	0	275400	0	0	0	**275400**
		Detailed project report	55080	0	0	0	0	**55080**
		Watershed development works	0	440640	881280	936360	826200	**3084480**
		Livelihood activities for the asset less persons	0	0	165240	275400	55080	**495720**
		Production system and micro enterprises	0	0	165240	220320	165240	**550800**
		Consolidation phase	0	0	0	0	165240	**165240**
		Total	**330480**	**784890**	**1390770**	**1666170**	**1335690**	**5508000**
		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: Bakheta)

(BUDGET AT A GLANCE)

Effective Area	Funds Available	Name of activity	1st Year	2nd Year	3rd Year	4th Year	5th Year	Total
553	6636000	Administrative costs	66360	66360	199080	199080	132720	**663600**
		Monitoring	0	0	0	66360	0	**66360**
		Evaluation	0	16590	16590	16590	16590	**66360**
		Entry point activities	265440	0	0	0	0	**265440**
		Institution and capacity building	0	331800	0	0	0	**331800**
		Detailed project report	66360	0	0	0	0	**66360**
		Watershed development works	0	530880	1061760	1128120	995400	**3716160**
		Livelihood activities for the asset less persons	0	0	199080	331800	66360	**597240**
		Production system and micro enterprises	0	0	199080	265440	199080	**663600**
		Consolidation phase	0	0	0	0	199080	**199080**
		Total	**398160**	**945630**	**1675590**	**2007390**	**1609230**	**6636000**
		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: Kansala)
(BUDGET AT A GLANCE)

Effective Area	Funds Available	Name of activity	1st Year	2nd Year	3rd Year	4th Year	5th Year	Total
505	6060000	Administrative costs	60600	60600	181800	181800	121200	**606000**
		Monitoring	0	0	0	60600	0	**60600**
		Evaluation	0	15150	15150	15150	15150	**60600**
		Entry point activities	242400	0	0	0	0	**242400**
		Institution and capacity building	0	303000	0	0	0	**303000**
		Detailed project report	60600	0	0	0	0	**60600**
		Watershed development works	0	484800	969600	1030200	909000	**3393600**
		Livelihood activities for the asset less persons	0	0	181800	303000	60600	**545400**
		Production system and micro enterprises	0	0	181800	242400	181800	**606000**
		Consolidation phase	0	0	0	0	181800	**181800**
		Total	**363600**	**863550**	**1530150**	**1833150**	**1469550**	**6060000**
		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: Mungan)
(BUDGET AT A GLANCE)

Effective Area	Funds Available	Name of activity	1st Year	2nd Year	3rd Year	4th Year	5th Year	Total
390	4680000	Administrative costs	46800	46800	140400	140400	93600	**468000**
		Monitoring	0	0	0	46800	0	**46800**
		Evaluation	0	11700	11700	11700	11700	**46800**
		Entry point activities	187200	0	0	0	0	**187200**
		Institution and capacity building	0	234000	0	0	0	**234000**
		Detailed project report	46800	0	0	0	0	**46800**
		Watershed development works	0	374400	748800	795600	702000	**2620800**
		Livelihood activities for the asset less persons	0	0	140400	234000	46800	**421200**
		Production system and micro enterprises	0	0	140400	187200	140400	**468000**
		Consolidation phase	0	0	0	0	140400	**140400**
		Total	**280800**	**666900**	**1181700**	**1415700**	**1134900**	**4680000**
		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 9. PHASING YEAR WISE (Name of the Micro Watershed: Kisranti)
(BUDGET AT A GLANCE)

Effective Area	Funds Available	Name of activity	1st Year	2nd Year	3rd Year	4th Year	5th Year	Total
385	4620000	Administrative costs	46200	46200	138600	138600	92400	**462000**
		Monitoring	0	0	0	46200	0	**46200**
		Evaluation	0	11550	11550	11550	11550	**46200**
		Entry point activities	184800	0	0	0	0	**184800**
		Institution and capacity building	0	231000	0	0	0	**231000**
		Detailed project report	46200	0	0	0	0	**46200**
		Watershed development works	0	369600	739200	785400	693000	**2587200**
		Livelihood activities for the asset less persons	0	0	138600	231000	46200	**415800**
		Production system and micro enterprises	0	0	138600	184800	138600	**462000**
		Consolidation phase	0	0	0	0	138600	**138600**
		Total	**277200**	**658350**	**1166550**	**1397550**	**1120350**	**4620000**
		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, baseline data from all possible sources is collected for the purpose of not only future impact assessment but also to design project intervention. Most of this was done at the PPR and DPR stages, which forms integral part of the preparatory phase. In addition, data on rain fall amount and distribution, weather conditions and frequency of floods and drought was compiled at DPR stage.

6.1.2 Formation of Village Level Institutions

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

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

6.1.3 Preparation of DPR

PRA exercise and comprehensive data base have been carried out for DPR preparation. Meetings were held at district, micro-watershed wise and village wise with the lined departments and members of Gram Sabha on this aspect**.** The Draft Project Report was prepared on the basic information generated from primary and secondary sources. This also includes the out come of participatory rural appraisal and out come 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 and existing Activities of works. All the works proposed in the DPR are location specific and are as per the local demand and socio- economic conditions of the watersheds.

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

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

Strengths

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

Weaknesses

- Erratic rainfall
- Poor deep 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.
- ❖ Dry land horticulture activities.
- ❖ Provide training on dairy farming and other income generating activities.
- ❖ Promotion of nursery raising and pasture development.
- ❖ **Consumptive use of ground water.**

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%
22,34,400/-

6.2 Capacity Building

1. Introduction

Watershed development is conceived as a strategy for protecting livelihoods of people inhabiting fragile ecosystems, which over period of time have become subject to multidimensional land degradation. Main stress has been to ensure availability of water for drinking and irrigation to support rainfed horticulture and agroforestry 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 first hand 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 Rohtak 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**				
	Rohtak District	Members of Watershed Committees @ 10 per committee would also include accompanying WDT Members.	210	200-250	1
02	Block Level Functional Programmes for Secretaries of Watershed Committees. **Two Days**				
	Rohtak District	Secretaries of Village Watershed Committees	21	25-30	1
03	Project Level Sensitization Camps for WC **One Days**				
	Rohtak District	Members of Watershed Committees @ 10 Persons (Tentative) per WC	210	50	6
04	Village Level Awareness Camps on IWMP at Micro Watershed Level for User Groups **One Day**				
	Rohtak District	Approximately 50 prospective user groups per micro watershed.	1050	50	21
05	Block Level Functional Programmes for SHGs [Leader, Secretary and Treasurer] under IWMP **One Day**				
	Rohtak District	Three persons (Leader, Secretary and Treasurer) per Self Help Group @ around one SHG per village.	63	50	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	34484
2	Block Level Functional Programmes for Secretaries of Watershed Committees. Two Days	6397
3	Village Level Sensitization Camps for WC One Days	32743
4	Village Level Awareness Camps on IWMP at Micro Watershed Level for Prospective User Groups One Day	42121
5	Block Level Functional Programmes for SHGs [Leader, Secretary and Treasurer] under IWMP One Day	13109
	Total	**128853**

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

S. No.	Target Group	Training Topics	No. of days	Budget per camp	No. of Camps	No. of Participants per camp	Cost for all participants per day	Cost per participant/ per day	Cost per person	Total Budget
1	Self He lp Groups- 2 SHGs- micro watershed level	Orientation on IWMP, S HGs cum Exposure Visit	2	16000	5	8	40000	1000	2000	80000
2	User gr oups from each m icro watershed	NRM, Po st Project Management etc. – Exposure Visit	2	16000	5	8	40000	1000	2000	80000
3	Sub w atershed Level- WDT Members	Part II-Module I to V - Exposure Visit O utside State- Conceptual, Technical, Social, Management of Fi nance, Monitoring and Evaluation.	4	48000	5	8	60000	1500	6000	240000
4	Sub w atershed Level- PIA	Exposure Visit- Within	2	16000	5	8	40000	1000	2000	80000

S. No.	Target Group	Training Topics	No. of days	Budget per camp	No. of Camps	No. of Participants per camp	Cost for all participants per day	Cost per participant/ per day	Cost per person	Total Budget
	Members	Fundamentals of W atershed, Finance Management, Final R eport on WDP etc								
5	District L evel-WDC	Exposure visit to su ccessful watershed/ University.	2	16000	5	8	40000	1000	2000	80000
6	District L evel-Line D eptt., WDC	Exposure visit to su ccessful watersheds within state.	2	16000	5	8	40000	1000	2000	80000
7	SLNA and District L evel Controlling Officers	Exposure visit to su ccessful watersheds outside state	4	48000	5	8	60000	1500	6000	240000
Total			**18**		**35**	**56**				**880000**

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

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	8	2	16	80	12,000	1,20,000	9,60,000
2.	Propaganda & Documentation (Puppet show, documentary movies show, videogr aphy, Photography, wall Painting, Display Board, pam phlets, leaf lets. Etc)	8	1	8	40	5000	25,000	2,00,000
3	Contingency charges							65547
	Total							**1225547**

i) **Training Programmes for SLNA, WDT, PIA , Field Functionary , WDC member's , SHG & UG organize by HIRD = 128853/-**

ii) **Micro Watershed Wise Exposure cum training Visit For SLNA, WDT, PIA , Field Functionary , WDC, SHG & UG Members**
= 8,80,000/-

iii) **Farmer's / Beneficiaries training camps with Extension Program's = 12,25,547/-**

Grand Total = 2234400/-

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. 15.89 lakhs** 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 Sampla Watershed (IWMP II)

(Rs. In Lacs)

Sr. No.	Block	Name of Project	No. of EPA Targeted/Identified	No. of EPAs not yet started	No. of EPA in progress	No. of EPAs completed	Name/Nature of EPA	Location	Expenditure	Remarks
1	2	3	4	5	6	7	8	9	10	11
1	Sampla	IWMP-II	13	0	1	12	1. Drinking water tanki at Govt. Girl School with RO & Water Cooler. 2. Drinking water tanki at Govt. Boys School.-----	Kansala	1.57	
		2012-13					1. Roof rain water harvesting structure in Govt. School. 2. Trough with floor near pond.	Bakheta	2.25	
							1. Drinking water tanki with pipe line. 2. Roof rain water harvesting structure in Govt. School.	Mungan	1.65	
							1. Cattle trough with pucca floor. 2. Cattle trough with floor with pipe line at common land. 3. Cattle trough with brick floor 2 Nos.	Humayupur	1.80	
							1. Tanki with floor/crush, linkage of pipeline & E/filling. 2. Cattle crush with floor	Kisranthi	1.75	

							DWT in Vety. Hospital.			
							1. Pucca water course for drainage of waste water. 2. Trough with floor near stadium.	Dattaur	2.64	
							PVC pipe line from minor to new pond 495.	Gizzi	1.80	
							Pucca water course for drainage of waste water 175 m.	Morkheri	2.43	
	Total		**13**	**0**	**1**	**12**			**15.89**	

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 Renovation and digging of percolation pond, Drainage measures, land development works, retaining wall, ramp and inlet of pond, water conveyance system, culverts, plantation, land leveling, bunding 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.

Natural Resource Management

Most of the area is nearly level, however at few places near stabilized sand dunes where slopes are level to nearly level, small rills with complex slope have been formed which need specific treatment and afforestation to avoid further degradation of the area.

The project area having small or large old ponds which have been silted up and needs strengthening (Ramp). 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 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.

Run-off from upper area (sand dune) shall be reduced by afforestation and other soil conservation measures which would also recharge the aquifer. As per need, retaining walls are proposed at strategic locations to protect the farm lands and bank of ponds.

There is an acute scarcity of water for livestock as village ponds dry out in summer months. Most ponds are silted up and need desiltation. 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 renovation of pond, inlet, outlet, ramp etc. is the main requirement by project stakeholders which has been provided. 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 huge quantity 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 II Rohtak) is given below and the proposed Action Plan/ Treatment Plan map shown in **Annexure-X.**

Name of Project: IWMP- II Watershed: Sampla/Rohtak Name of Village: Dataur

Sr. No.	Nature of Work	Location			Physical				Unit Cost (Rs. In Lacs)	Estimated Cost (Rs. In lacs)	Objective
		Name	Long.	Lat.	No.	Size	Submergence Area (sqm)	Catchment /benefitted area (Ha.)			
1	Deepening of pond	1 Jailshar pond 2 Dada Dobe wala pond	76°45'.052 76°45'-552	28°48'-737 28°49'-046	1 1	60x60x1.50 (m) 120x50x1.5 (m)	9000 5400	180 120	4.00	8.00	Enhancement of pondage capacity and improvement in ground water level
2	Drainage Measures	Govt. Sr. Sec. School to Drain(UGPL)	76°45'-953	28°48'-771	1	400 m	-	90	500/m	2.00	Improvement in water level and Land development
2	Land Dev works	1 Jungle clearance(Panchayat land) 2 Jailshar pond Area	76°45'-891 76°46'-034	28°48'-996 28°48'-864	1 1	2 ha 5 ha	-	2 5	0.75	5.25	To check soil erosion
3	Retaining wall	1 Dada Dobe wala pond 2 Jailshar pond	76°45'-552 76°45'.052	28°49'-046 28°48'-737	1 1	100 M 60m	-	63	0.09 /M	14.40	Conservation of natural resources
4	Water conveyance system	Bahlot Minor to Dada dobhe pond(UGPL)	76°45'-917	28°48'-999	1	1500 M	-	100	500 /M	7.50	To enhance efficiency of available water to provide drinking water for live stock
5	Culverts	On Atayal Road To Field	76°45'-548	28°49'-284	4	5x3x1 M	-	50	0.50	2.00	To provide passage for proper flow of water and to conserve soil and increase in bio mass
6	Soil & moisture conservation works like Earthen bundh, Field bundh, RRWHS, PWC,Lining of WC,L.R.,Levelling *etc.	Earthen bundh On Atayal Road to field	76°45'-550	28°49'-345	1	300 M	-	15	400 /Mt	1.20	Conservation of natural resources and to protect flood hazards.
7	Ramp	Dada Dobe wala pond	76°45'-552	28°49'-046	2	15x10 m			3.00 /	3.00	To conserve natural resources
Total								**645**		**43.35**	
Available fund								**540**		**36.29**	

Convergence	**105**		**7.06**	

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

Name of Project: IWMP- II Watershed: Sampla/Rohtak Name of Village: Kansala

Sr. No.	Nature of Work	Location			Physical				Unit Cost (Rs. In Lacs)	Estimated Cost (Rs. In lacs)	Objective
		Name	Long.	Lat.	No.	Size	Submergence Area (sqm)	Catchment /benefitted area (Ha.)			
1	Deepening of pond	1 Baba Haridas opposite pond 2 Dinawali, Kamlawali, Loharuwali, jagramwali singhawali, Ujja wali	76°46.614 76°46.694	28°53'-739 28°53'-385	1 6	60x40x1.5 (m) 50x40x1.5	3600 3000	80 145	4.00 .50	4.00 3.00	Enhancement of pondage capacity and improvement in ground water level
2	Water conveyance system	1 Jasrana Minor to Samser pond 2 Jasrana Minor to Naya Talab 3 Naya Talab to Maharana pond 4 Jasrana Minor to RajSingh field (UGPL)	76°47'-008 76°46.694 76°46.464 76°47'-573	28°53'-694 28°53'-385 28°53'-391 28°53'-636	1 1 1 1	400 Mtr 600 m 200 m 400 m	-	40 55 20 20	500 /M	8.00	To enhance efficiency of available water to provide drinking water for live stock
3	Retaining wall	1 Samser pond 2 Maharana pond	76°47'-008 76°46.464	28°53'-694 28°53'-391	1 1	90 Mtr. 100 m	-	110	0.09 /M	17.10	Conservation of natural resources
4	Drainage Measures	Baba Haridas School pond to Drain	76°46.614	28°53'-739	1	600 m	-	50	500/m	3.00	Improvement in water level and Land development
Total								522		35.10	
Available fund								505		33.94	
Convergence								17		1.16	

Name of Project: IWMP- II Watershed: Sampla/Rohtak Name of Village: Bakheta

Sr. No.	Nature of Work	Location			Physical				Unit Cost (Rs. In Lacs)	Estimated Cost (Rs. In lacs)	Objective
		Name	Long.	Lat.	No.	Size	Submergence Area (sqm)	Catchment /benefitted area (Ha.)			
1	Deepening of pond	Julawala pond	76°48'.739	28°55'-515	1	50x50x1	2500	60	3.00	3.00	Enhancement of pondage capacity and improvement in ground water level
2	Land Dev works	Panchayati land	76°48'-252	28°55'-294	1	2 ha	-	2	0.75	1.50	To check soil erosion
3	Retaining wall	1 Brahamnowala pond 2 Kesar Pond	76°48'-774 76°48'-442	28°55'-381 28°55'-274	1 1	60 M 30 m	-	140	0.09 /M	8.10	Conservation of natural resources
4	Water conveyance system	1 Jasrana Minor to Julawala pond 2 Julawala pond to Brahamnowala pond 3 Mukesh field to Bamsher Talab	76°48'.739 76°48'-774 76°48'-634	28°55'-515 28°55'-381 28°55'-131	1	400 M 180 m 600m	-	225	1500 /M	17.70	To enhance efficiency of available water to provide drinking water for live stock
5	Culverts	Main Road	76°48'-774	28°55'-381	10	5x3x1 M	-	50	0.50	5.00	To provide passage for proper flow of water and to conserve soil and increase in bio mass
6	Ramp	Julawala pond	76°48'.739	28°55'-515	1	15x10x2 m		50	3.00	3.00	To conserve natural resources
7	Drainage Measures	Vijay's field to Drain	76°48.666	28°55'-109	1	500 m	-	50	500/m	2.50	Improvement in water level and Land development
Total								**607**		**40.80**	
Available fund								**553**		**37.16**	
Convergence								**54**		**3.64**	

Name of Project: IWMP- II Watershed: Sampla/Rohtak Name of Village: Mungan

Sr. No.	Nature of Work	Location			Physical				Unit Cost (Rs. In Lacs)	Estimated Cost (Rs. In lacs)	Objective
		Name	Long.	Lat.	No.	Size	Submergence Area (sqm)	Catchment /benefitted area (Ha.)			
1	Deepening of pond	1 Purana pond 2Poad wala pond	76°46'.105 76°46'.105	28°55'-905 28°55'-905	1 1	60x60x2 60x50x1.5	3600 3000	110	2.50	5.00	Enhancement of pondage capacity and improvement in ground water level
2	Land Dev works	Panchayati land	76°46'.163	28°55'-738	1	1 ha	-	1	0.75	0.75	To check soil erosion
3	Retaining wall	1 Hariya wala pond 2 Baba wala Pond	76°46'-084 76°46'-163	28°55'-916 28°55'-738	1 1	50 M 50 m	-	70	0.09 /M	9.00	Conservation of natural resources
4	Water conveyance system	1 Kishrenti Minor to Hariya wala pond 2 Jasrana Minor to Baba wala Pond	76°46'-084 76°46'-163	28°55'-916 28°55'-738	1 1	1200 M 500 m	-	140	500 /M	8.50	To enhance efficiency of available water to provide drinking water for live stock
5	Culverts	1 Asan Road 2 Rurki Road	76°46'.106	28°55'-833	3 2	5x3x1 M	-	15	0.50	2.50	To provide passage for proper flow of water and to conserve soil and increase in bio mass
6	Ramp	1 Hariya wala pond 2 Baba wala Pond	76°46'-084 76°46'-163	28°55'-916 28°55'-738	1 1	15x10x2 m		60	3.00	6.00	To conserve natural resources
7	Drainage Measures	Polagi Road to Purana Talab (pucca nala)	76°46'.106	28°55'-833	1	80 m	-	50	1500/m	1.20	Improvement in water level and Land development
Total								**446**		**29.95**	
Available fund								**390**		**26.21**	
Convergence								**56**		**3.74**	

Name of Project: IWMP- II Watershed: Sampla/Rohtak Name of Village: Kisrehti

Sr. No.	Nature of Work	Location			Physical				Unit Cost (Rs. In Lacs)	Estimated Cost (Rs. In lacs)	Objective
		Name	Long.	Lat.	No.	Size	Submergence Area (sqm)	Catchment /benefitted area (Ha.)			
1	Deepening of pond	1 Somal pond 2Gogniya pond	76°45'.615 76°45'.884	28°51'-889 28°51'-765	1 1	60x40x1.5 80x60x1.5	2400 4800	150	2.00	4.00	Enhancement of pondage capacity and improvement in ground water level
2	Retaining wall	1 Bada pond 2Gogniya pond	76°45'.615 76°45'.884	28°51'-889 28°51'-765	1 1	75 M 50 m	-	115	0.09 /M	11.25	Conservation of natural resources
3	Water conveyance system	1 Jasrana Minor to Gogniya pond 21 Bada pond ToGogniya pond	76°45'.884 76°45'.884	28°51'-765 28°51'-765	1 1	1200 M 200 m	-	90	500 /M	7.00	To enhance efficiency of available water to provide drinking water for live stock
4	Culverts	1 Kansala Road 2 Atayal Road	76°45'.884 76°45'878	28°51'-765 28°51'634	2 2	5x3x1 M	-	10	0.50	2.00	To provide passage for proper flow of water and to conserve soil and increase in bio mass
5	Ramp	Bada pond	76°45'.615	28°51'-889	1 1	15x10x2 m		50	3.00	3.00	To conserve natural resources
6	Drainage Measures	Gogniya pond to Mor kheri Drain(UGPL)	76°45'.884	28°51'-765	1	1200 m	-	80	500/m	6.00	Improvement in water level and Land development
Total								**495**		**33.25**	
Available fund								**459**		**30.84**	
Convergence								**36**		**2.41**	

Name of Project: IWMP- II Watershed: Sampla/Rohtak Name of Village: Mor Kheri

Sr. No.	Nature of Work	Location			Physical				Unit Cost (Rs. In Lacs)	Estimated Cost (Rs. In lacs)	Objective
		Name	Long.	Lat.	No.	Size	Submergence Area (sqm)	Catchment /benefitted area (Ha.)			
1	Deepening of pond	Bad wala talab	76°47'-565	28°51'-350	1	80x60x1.50 mt	4800	80.0	3.0	3.0	Enhancement of pondage capacity and improvement in ground water level
2	Draining measures	1 To drain out waste water from balbir ke khet se Naresh ke khet tak	76°47'-861	28°51'-584	1	380 mt	-	20.0	1500 /m	5.7	To check soil erosion
		2To drain out waste water Suresh ke khet se Hoshiyar ke khet tak	76°47'-861	28°51'-584	1	500 mt	-	40.0	N	7.5	
3	Land development	Panchayati land	76°47'-565	28°51'-350	1	2 ha	-	2.0	0.75	1.5	Conservation of natural resources
4	Retaining wall	Bad wala talab	76°47'-565	28°51'-350	1	40 mt	-	70.0	9000 /m	3.6	Conservation of natural resources
5	Water conveyance system	1 From jasrana talab to bad wala talab	76°47'-565	28°51'-350	1	1650 mt	-	182.00	500/mt	8.2	To enhance efficiency of available water to provide drinking water for live stock
		2 Jasrana miner to siwada talab	76°47'-861	28°51'-584	1	600 mt	-	80.0	N	3.0	
6	Culvert	Panchayati land	76°47'-721	28°51'-370	10	-	-	10	-	-	To provide passage for proper flow of water and to conserve soil and increase in bio mass
Total								**484**		**32.50**	
Available fund								**459**		**30.84**	
Convergence								**25**		**1.66**	

Name of Project: IWMP- II Watershed: Sampla/Rohtak Name of Village: Humayunpur

Sr. No.	Nature of Work	Location			Physical				Unit Cost (Rs. In Lacs)	Estimated Cost (Rs. In lacs)	Objective
		Name	Long.	Lat.	No.	Size	Submergence Area (sqm)	Catchment /benefitted area (Ha.)			
1	Deepening of pond	**Dhobi wala talab**	**76°49'016**	**28°54'392**	**1**	**40x30x1.50**	**1200**	**35 ha**	**1.50**	**1.50**	**Enhancement of pondage capacity and improvement in ground water level**
2	**Drainage measures**	**From dhobi wala talab to drain**	**76°49'016**	**28°54'392**	**1**	**400 m**	**-**	**63 ha**	**500 /mt**	**2.00**	**Conservation of natural resources**
3	**Land development**	**Panchayati land**	**76°48'836**	**28°53'170**	**-**	**2 ha**	**-**	**2 ha**	**0.50**	**1.00**	**To check soil erosion**
4	**Retaining wall**	**1 Naya talab** **2 dahar wala talab**	**76°48'776** **76°48'836**	**28°52'565** **28°53'170**	**1** **1**	**60** **60**	**-**	**42 ha** **38 ha**	**9000 /m**	**5.40** **5.40**	**To conserve natural resources**
5	**Ramp**	**1 Naya talab** **2 Dahar wala pond**	**76°48'776** **76°48'836**	**28°52'565** **28°53'170**	**1** **1**	**15x10** **15x10**	**-** **-**	**-** **-**	**2.00**	**2.00** **2.00**	**Conservation of natural resources and to protect flood hazards**
6	**Fruit Plantation & Micro Irrigation**	**Common Land(Dadi Plasin Temple)**	**76°49'016**	**28°54'392**	**1**	**4 ha**		**4ha**	**3.00**	**3.00**	**To Promote Horticultural activities**
7	**Water conveyance system**	**1Rajewali Pond** **2 Naya Pond**	**76°48'830** **76°48'776**	**28°53'850** **28°53'170**	**1** **1**	**1500m** **1000m**		**160** **128**	**500/m**	**7.50** **5.00**	**To enhance efficiency of available water to provide drinking water for live stock**
Total								**518**		**34.80**	
Available fund								**434**		**29.23**	
Convergence								**84**		**5.57**	

Name of Project: IWMP- II Watershed: Sampla/Rohtak Name of Village: Gijji

Sr. No.	Nature of Work	Location			Physical				Unit Cost (Rs. In Lacs)	Estimated Cost (Rs. In lacs)	Objective
		Name	Long.	Lat.	No.	Size	Submergence Area (sqm)	Catchment /benefitted area (Ha.)			
1	Deepening of pond	Gijji wala pond	76°46'-225	28°48'559	1	120x60x140	7200	100	4.00	5.04	Enhancement of pondage capacity and improvement in ground water level
2	Drainage Measures	1 Gijji wala pond 2 Dharam Singh Talab to Drain	76°46'-265 76°46'-404	28°48'-627 28°48'-340	1 1	900 m 250 M	-	180 80	500/ m	4.50 1.25	To check soil erosion
3	Land development	Panchayati land (Dataur Road)	76°47'-314	28°48'-839	-	4 ha	-	4	0.75	3.00	To check soil erosion
4	Retaining wall	Gijji wala pond	76°46'-225	28°48'559	2	130 Mtr.	-	140	0.09 /M	11.71	Conservation of natural resources
5	Ramp	1 Gijji wala pond 2 Dhak wala Pond	76°46'-225 76°45'-103	28°48'559 28°48'513	1 1	20x15m		10	2.75 /	5.50	To conserve natural resources
6	Culverts	1 Samchana road 2 Mahsru Road	76°47'-272 76°47'-316	28°48'-709 28°48'-871	5 5	5x3x1 Mt	-	4	0.50	5.00	To provide passage for proper flow of water and to conserve soil and increase in bio mass
7	Soil & moisture conservation works like Earthen bundh, Field bundh, RRWHS, PWC,Lining of WC,L.R.,Levelling * etc.	1 Earthen bundh on Mahsaru road 2 Cattle Trough with floor on both sides	76°47'-272 76°46'-404	28°48'-709 28°48'457	1 2	100 Mt 25x1x.80	-	109	500 /Mt 0.75	0.50 1.50	Conservation of natural resources and to protect flood hazards.
Total								**565**		**38.00**	
Available fund								**456**		**30.71**	
Convergence								**109**		**7.29**	

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

Table. 16. Detailed estimate of Pond

Detail Estimate of village Pond

Volume of Pond	=	$\frac{A+AB+C \times D}{6}$	
	=	$\frac{(50x50)+4(41x41)+(32x32)}{6}$	X 3.00
	=	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. 17. 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. Contingency @2%	**5029.1753**
					Grand Total	**256487.94**
					Or say `	**2.60 Lac**

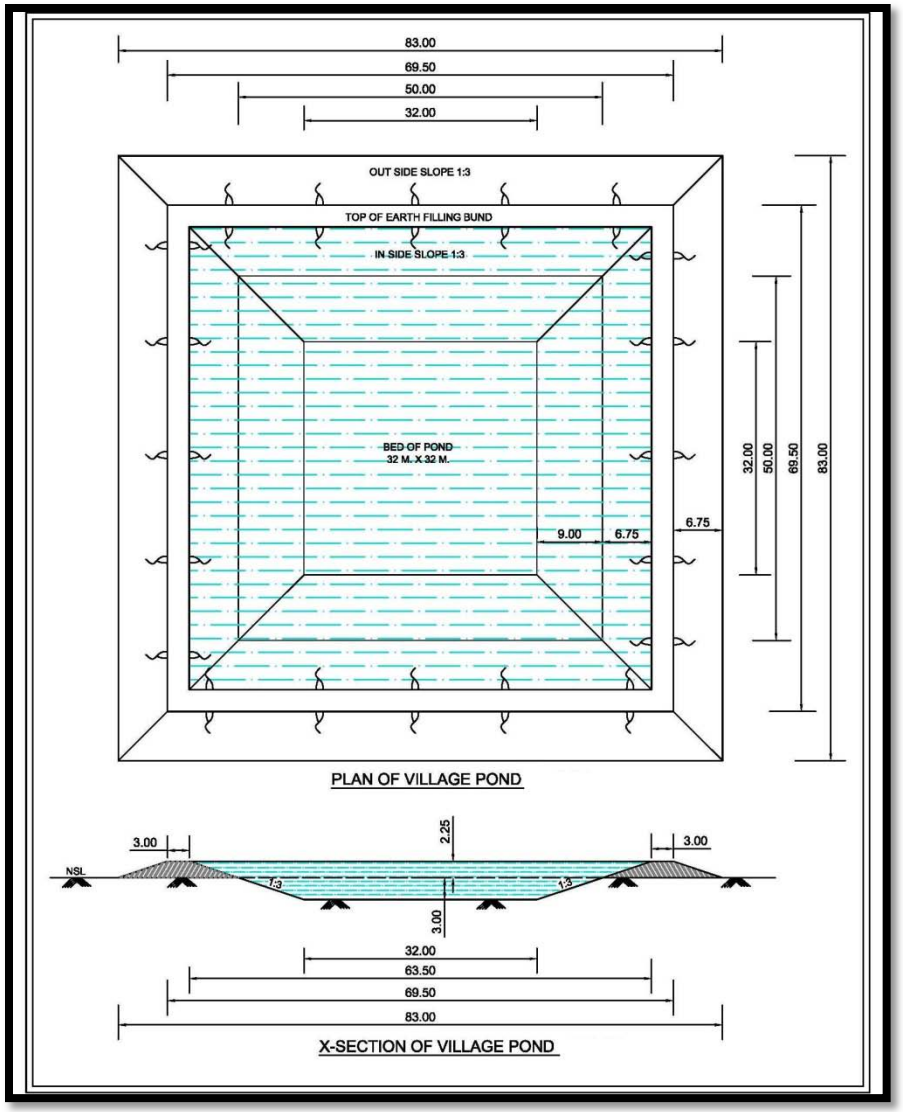

83.00
69.50
50.00
32.00
OUT SIDE SLOPE 1:3
TOP OF EARTH FILLING BUND
IN SIDE SLOPE 1:3
BED OF POND
32 M. X 32 M.
9.00
6.75
6.75
32.00
50.00
69.50
83.00
PLAN OF VILLAGE POND
3.00
2.25
3.00
NSL
1:3
1:3
3.00
32.00
63.50
69.50
83.00
X-SECTION OF VILLAGE POND

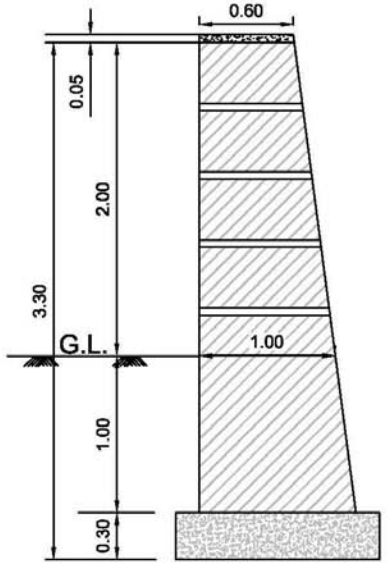
Table. 22. Work Detail Estimate For Retaining Wall

Sr. No.	Particulars	No.	L	B	D	Contents	Unit
1	Earth Work Excavtion for R/wal	1	8.00	1.00	1.30	10.40	cum.
2	C.C. 1:3:6 in foundation	1	8.00	1.00	0.30	2.40	cum.
3	Sq. Rubble Masonary work 1:4 For R/wall	1	8.00	0.80	3.00	19.20	cum.
4	C.C. 1:2:4	1	8.00	1.00	0.05	0.40	cum.
5	20 mm Thick plaster 1:3						
i	R/wall outer side	1	8.00	--	3.00	24.00	sqm.
Material Statement							
Sr. No.	**Particulars**	**Qty.**	**Cement**	**Sand**	**Concrete**	**Gatka**	**Stone**
1	C.C. 1:3:6 in foundation	240	10.56	1.10	--	2.20	--
2	Masonry work in 1:4	19.2	41.28	5.76	--	--	21.12
3	C.C. 1:2:4	0.24	1.51	0.10	0.20	--	--
4	20 mm Thick Plaster in 1:3	24.00 Sqm.	6.00	0.36	--	--	--
	Total		**59.35**	**7.32**	**0.20**	**2.20**	**21.12**
	Rate		340/- P/bag	1400/- P/cum	1500/- Per cum.	1450/- Per cum.	
	Total		**21539.00**	**10248.00**	**300.00**	**3190.00**	
	Grand Total		**35298.12**				

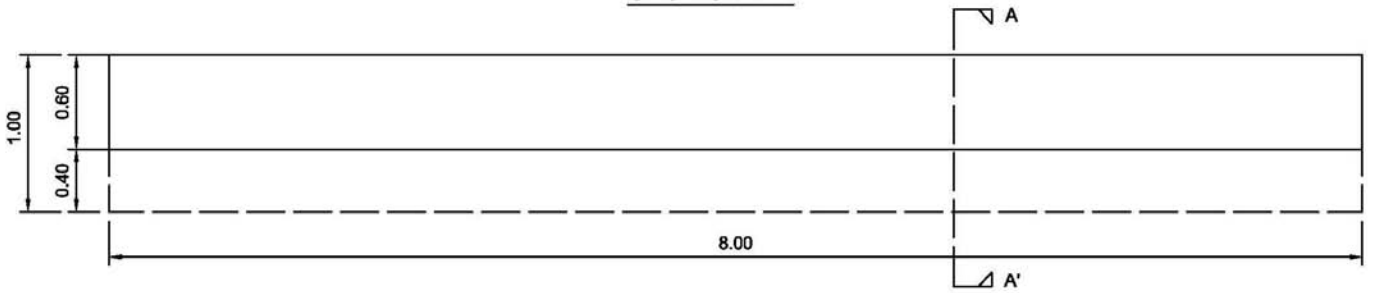
Table. 23. Abstract Cost of Retaining Wall

Sr. No.	Particular	Qty.	Rate	Unit	Amount
1	Earth work excavation in foundation and trench with pick and jumper HSR 7.2	10.40 cum	1745+400% = 8725	Per 100 cum	907.40
2	C.C. 1:3:6 in foundation per HSR 10.40	2.40 cum	64.85+550% = 422.18	per cum	1013.23
3	Sq. Rubble masonry work in 1:4 HSR 12.23+12.31	19.20 cum	(160.35+27.20)+300% = 750.20	per cum	14403.84
4	C.C. 1:2:4 on top as per HSR 10.41	0.24 cum	64.95+550% = 422.18	per cum	101.32
5	20mm. Thick plaster work in 1:3 as HSR 10.41	40 sqm.	8.15 + 500% = 48.90	Per sq.m.	1956.00
6	Collection the stone by donkey load upto 1 qtl. 'and distance upto 10 km excluding donkey man HSR. 5.3(a)	21.12 x 23.20 = 489.00	8.00 + 200% = 24.00	each	11736.00
7	Donkeies as HSR. 5.3 (b)	489.98/6	20.52+200% = 61.56	each	5027.19
8	Tipping work of Crate as HSR. 23.33	7.20 cum	11.10+450% = 61.05	Per cum	439.56
				Total	**35584.55**
				Cost of material as per detail attached	**35494.00**
				G. Total	**71078.55**
				or Say Rs. =	**71100.00**

RETAINING WALL



SECTION-AA'



PLAN

Table. 7. 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 pi ts (390 N os.) 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% et c. f or m ortality) including transportation and planting	450.00	Nos.	15/Plant	6750.00
5	Casualty replacement @ 10% of item No. 4 & 5				465.00
6	Cost of 2 weedings and hoeing			1.00/Pant	540.00
7	Contingency and unforeseen (3%)				492.00
				Total	**24044.40**
				Say `	**24000.00**
	Maintenance cost 2nd year			**L.S.**	**1000.00**
	For next 5 years i.e. , ` 1000 x 5				**5000.00**
				Total	**30000.00**
				Say `	**30000.00**

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

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**

Table. 8. Estimate of Agro- Forestry/ Afforestation

Plantation Model						
Cost statement of 1 Ha. Of activities of Plantation for 1st year (wage rate Rs. 94.13/-)						
Sr. No.	**Item of work**	**Unit**	**Qty.**	**SOR**	**Man days**	**Cost**
B	**Nursery**					
i	Raising of Plants in nursery	Nos.	660	18	5601.00	**11880.00**
C	**Carriage**					
i	Loading/ Unloading of plants up to 100 mtr.	Nos.	605	21.18	1.36	128.139
ii	Multistage carriage of plants					
a)	By tractor up to 10 km.	Nos.	605	18.83	12.10	1139.22
c)	By manual labour in plantation area	Nos.	605	42.36	2.72	256.28
					Total	**1523.63**
D	**Planting**					
ii	Soil working for patch sowing	M3	31.25	61.18	20.31	1911.88
	500 x 0.50 x 0.50 x 0.25					
iii	Planting of seeding including 10% replacement 20 x 30 cm.	Nos.	550	188.26	10.99	1035.43
					Total	**2947.31**
E	**Cultural operations & chemical treatment**					
i	Fertilizer application	Nos.	500	9.41	0.50	47.05
ii	Insecticide application	Nos.	500	9.41	0.50	47.05
iii	First Weeding & hoeing	Nos.	500	141.2	7.5	706.00
vi	Subsequent weeding & hoeing two time	Nos.	1000	94.13	10.00	941.30

					Total	**1741.40**

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

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

PRODUCTION SYSTEM- 10%

7.3 PRODUCTION SYSTEM

7.3.1 Crop Production

Present Status: Agriculture is the mainstay of the inhabitants of the project area which is mainly rainfed and people gamble with the uncertain rains. The fertility of the soil is very poor especially in 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 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 376 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 9 .Detail of Production System proposed to be promoted in the project village

S. No.	Particulars	Contents	No. of micro watershed	No. of beneficiaries per micro watershed	No. of total beneficiaries	Cost per beneficiaries	Total
1	Vermi Compost	Vermi compost is organic matter that is decomposed and recycled, used as fertilizer for soil amendment which is a key ingredient in organic farming. Under IWMP, financial assistance of 25% of total cost of Rs. 24000/- is provided.	8	20	160	6000	960000
2	Green Manuring	Addition of organic matter required, which is deficient in project area. Under IWMP, financial assistance @ Rs. 500 for 20 Kg.s per farmer for 2 Acre (0.8 ha) holding is provided.	8	100	800	500	400000
3	Bio-fertilizers	For integrated nutrient management (combination of chemical fertilizers, organic manure, crop residue and nitrogen fixing. Under IWMP, financial assistance @ Rs. 40 per farmer for 2	8	125	1000	40	40000

S. No.	Particulars	Contents	No. of micro watershed	No. of beneficiaries per micro watershed	No. of total beneficiaries	Cost per beneficiaries	Total
		Acre (0.8 ha) holding is provided.					
4	Pest-Management	For integrated pest Management, the bio control technique has been reported eco-friendly for control of pests. A provision of Azadirachtin bio pesticide @ Rs. 250/lit. per farmer is provided.	8	150	1200	250	300000
5	Sprinkler irrigation	Sprinkler irrigation is a method of 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.	8	15	120	7500	900000
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.	8	20	160	5800	928000
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	8	150	1200	322.5	387000
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	8	200	1600	100	160000

S. No.	Particulars	Contents	No. of micro watershed	No. of beneficiaries per micro watershed	No. of total beneficiaries	Cost per beneficiaries	Total
		year) is provided.					
9	Horticulture	Potential for Grafted Horticulture plants. Supply of plants @ Rs. 40/- per plant under IWMP 50 % cost share for cultivation of fruits like Citrus fruits, Guava, Amla, Ber floriculture and vegetables (especially, turmeric, garlic, onion and tomato)	8	200	1600 (16000 plants)	Rs.20 per plant	320000
		TOTAL					4395000
Contingency, printing material other unforeseen items							**73800**
Total fund available under this component							**4468800**

Total: Rs. 4468800/-

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 decompost and converted from raw animal dung to well de compost highly nutritive organic manure.

One of the important occupations of villagers is the animal husbandry. At present, the animal wastes are not being used by the villagers. This waste can be utilized as vermin- compost on the farm where the productivity and physical condition of the soil can be increased manifold. The animal waste can be used for preparation of vermin- compost. The available nutrients in vermin- compost are higher than country type farmyard manure. As per NHM guideline, the installation cost of structure of 1 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 department. The additional amount 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 10: 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) Rohtak and Haryana Institute of rural development, Nilokheri. Agriculture University, Rohtak, 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 2 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 11. Revolving Fund Assistance for SHGs

S.No.	Name of micro watersheds	No. of villages	Total SHGs	Amount of RFA per SHG	Total
1	Gijhi	1	2	25000	50000
2	Humayunpur (Part)	1	2	25000	50000
3	Dattaur	1	2	25000	50000
4	Morkheri (Part)	1	2	25000	50000
5	Bakheta (Part)	1	2	25000	50000
6	Kansala (Part)	1	2	25000	50000
7	Mungan (Part)	1	2	25000	50000
8	Kisranti	1	2	25000	50000
	Total	**8**	**16**		**400000**

Table 12. 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	Gijhi	1	2	35000	70000
2	Humayunpur (Part)	1	2	35000	70000
3	Dattaur	1	2	35000	70000
4	Morkheri (Part)	1	2	35000	70000
5	Bakheta (Part)	1	2	35000	70000
6	Kansala (Part)	1	2	35000	70000
7	Mungan (Part)	1	2	35000	70000
8	Kisranti	1	2	35000	70000
	Total	**8**	**16**		**560000**

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 unit, Domestic poultry, Mushroom cultivation unit, Plumbing, Carpentry, Food Processing, Animal Husbandry, Product Processing etc.

Table 13. 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	Gijhi	1	10	10000	100000
2	Humayunpur (Part)	1	10	10000	100000
3	Dattaur	1	10	10000	100000
4	Morkheri (Part)	1	10	10000	100000
5	Bakheta (Part)	1	10	10000	100000
6	Kansala (Part)	1	10	10000	100000
7	Mungan (Part)	1	10	10000	100000
8	Kisranti	1	10	10000	100000
	Total	**8**	**80**		**800000**

Note: The beneficiaries will contribute 10% as cost sharing of the livelihood support programme Rs. 800000 @ 10% cost sharing.

= 800000- 80000
= 720000/-

Table 14. 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	Gijhi	1	4	25000	100000
2	Humayunpur (Part)	1	4	25000	100000
3	Dattaur	1	4	25000	100000
4	Morkheri (Part)	1	4	25000	100000
5	Bakheta (Part)	1	4	25000	100000
6	Kansala (Part)	1	4	25000	100000
7	Mungan (Part)	1	4	25000	100000
8	Kisranti	1	4	25000	100000
	Total	**8**	**32**		**800000**

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. 800000 @ 10% cost sharing.

= 800000- 80000
= 720000/-

Table 15. 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	Gijhi	1	1	2	2000	6	12000
2	Humayunpur (Part)	1	1	2	2000	6	12000
3	Dattaur	1	1	2	2000	6	12000

4	Morkheri (Part)	1	1	2	2000	6	12000
5	Bakheta (Part)	1	1	2	2000	6	12000
6	Kansala (Part)	1	1	2	2000	6	12000
7	Mungan (Part)	1	1	2	2000	6	12000
8	Kisranti	1	1	2	2000	6	12000
	Total	**8**	**8**	**16**			**96000**

Total cost for 8 Centres

1. Payment to trainers 96000/-
2. Sewing Machine Cost 96000/- @ Rs. 6000 per machine
3. Total cost 192000/-

Table 16. 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	Gijhi	1	1	2000	6	12000	1	12000
2	Humayunpur (Part)	1	1	2000	6	12000	1	12000
3	Dattaur	1	1	2000	6	12000	1	12000
4	Morkheri (Part)	1	1	2000	6	12000	1	12000
5	Bakheta (Part)	1	1	2000	6	12000	1	12000
6	Kansala (Part)	1	1	2000	6	12000	1	12000
7	Mungan (Part)	1	1	2000	6	12000	1	12000
8	Kisranti	1	1	2000	6	12000	1	12000
	Total	**8**	**8**					**96000**

Payment to trainer: Rs.96000/-

Machine Cost Rs. 160000/- @ Rs. 20000 per machine

Total cost Rs. 256000/-

Table 17. Livelihood Support

S.No.	Name of micro watersheds	No. of villages	Revolving fund assistance to individuals unemployed youth/ landless, women		
			Dairy Farming	Bee Keeping	Mushroom Cultivation
1	Gijhi	1	10	20	3
2	Humayunpur (Part)	1	10	20	3
3	Dattaur	1	10	20	3
4	Morkheri (Part)	1	10	20	3
5	Bakheta (Part)	1	10	20	3
6	Kansala (Part)	1	10	20	3
7	Mungan (Part)	1	10	20	3
8	Kisranti	1	10	20	3
	Total	**8**	**80**	**160**	**24**
	Rate (Rs)		**2400**	**2400**	**24000**
	Cost (Lakh Rs)		**1.92**	**3.84**	**5.76**

Contingency, printing material and other unseen items: Rs. 21920/-

Total funds available under this component are Rs. 4021920/-

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

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

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. 18)

Detail of Convergence of IWMP and other schemes

Table 18. 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	Dattaur	43.35	36.29	7.06	7.06
2	Kansala	35.1	33.94	1.16	1.16
3	Bakheta	40.8	37.16	3.64	3.64
4	Mungan	29.95	26.21	3.74	3.74
5	Kisranti	33.25	30.84	2.41	2.41
6	Morkheri	32.5	30.84	1.66	1.66
7	Humanyunpur	34.8	29.23	5.57	5.57
8	Gijhi	38	30.71	7.29	7.29
	Total	**287.75**	**255.22**	**32.53**	**32.53**

- 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 five 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 80 ha horticulture development programme 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 Renovation and digging of percolation pond, Drainage measures, land development works, retaining wall, ramp and inlet of pond, water conveyance system, culverts, plantation, land leveling, bunding 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	Gijhi	457	54,84,000	54,840
2	Humayunpur	435	52,20,000	52,200
3	Dattaur	540	64,80,000	64,800
4	Morkheri	459	55,08,000	55,080
5	Bakheta	553	66,36,000	66,360
6	Kansala	505	60,60,000	60,600
7	Mungan	390	46,80,000	46,800
8	Kisranti	385	46,20,000	46,200

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	Gijhi	457	54,84,000	54,840
2	Humayunpur	435	52,20,000	52,200
3	Dattaur	540	64,80,000	64,800
4	Morkheri	459	55,08,000	55,080
5	Bakheta	553	66,36,000	66,360
6	Kansala	505	60,60,000	60,600
7	Mungan	390	46,80,000	46,800
8	Kisranti	385	46,20,000	46,200

CONSOLIDATION PHASE- 3 %
Consolidation Phase = Rs. 13, 40,640 /-

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: Gijhi

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	0.33
2	Preparation of Project completion report	0.08
3	Documentation of success stories	0.08
4	Management of proper utilization of WDF	0.25
5	Mechanism for quality and sustainability issues under the Project	0.08
6	Watershed activities	0.83

Total: 1.65 lacs

Name of Micro watershed: Humayunpur

Table 4. Consolidated Phase

S. No	Type of activity	Amount earmarked (Rs. In lacs)
1	Managing/ upgrading of all activities taken up under the project	0.31
2	Preparation of Project completion report	0.08
3	Documentation of success stories	0.08
4	Management of proper utilization of WDF	0.24
5	Mechanism for quality and sustainability issues under the Project	0.08
6	Watershed activities	0.78

Total: 1.57 lacs

Name of Micro watershed: Dattaur

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	0.39
2	Preparation of Project completion report	0.10
3	Documentation of success stories	0.09
4	Management of proper utilization of WDF	0.29
5	Mechanism for quality and sustainability issues under the Project	0.10
6	Watershed activities	0.97

Total: 1.94 lacs

Name of Micro watershed: Morkheri

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	0.33
2	Preparation of Project completion report	0.08
3	Documentation of success stories	0.08
4	Management of proper utilization of WDF	0.25
5	Mechanism for quality and sustainability issues under the Project	0.08
6	Watershed activities	0.83

Total: 1.65 lacs
Name of Micro watershed: Bakheta

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	0.40
2	Preparation of Project completion report	0.10
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	0.99

Total: 1.99 lacs

Name of Micro watershed: Kansala

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	0.36
2	Preparation of Project completion report	0.10
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	0.91

Total: 1.82 lacs
Name of Micro watershed: Mungan

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	0.28
2	Preparation of Project completion report	0.07
3	Documentation of success stories	0.07
4	Management of proper utilization of WDF	0.21
5	Mechanism for quality and sustainability issues under the Project	0.07
6	Watershed activities	0.70

Total: 1.40 lacs

Name of Micro watershed: Kisranti

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	0.28
2	Preparation of Project completion report	0.07
3	Documentation of success stories	0.07
4	Management of proper utilization of WDF	0.21
5	Mechanism for quality and sustainability issues under the Project	0.07
6	Watershed activities	0.69

Total: 1.39 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 t he f unds gener ated w ould be ut ilized O & M S tructures. The se use rs charges account w ill be m aintained separately.
- Involvement of Gram Panchayat for repair, maintenance and protection of created structures.

CHAPTER – 9

EXPECTED OUTCOME

EXPECTED OUTCOMES

The effective area is 3724 ha and the Project Cost is 446.88 lacs covering 8 no. micro watersheds and in 8 villages. Benefits will be much more than the project cost as detailed below:

With the several interventions under IWMP II 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, improvement in water table, more area under agriculture, 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 IWMP II 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 or nearby industry.

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	others	Total	SC	others	Total	SC	others	Women	Total
1	Gijhi	1419	3495	4914	177	437	614	11	11	-	22
2	Humayunpur (Part)	759	3918	4677	95	490	585	11	-	11	22
3	Dattaur	1167	4639	5806	146	580	726	11	11	-	22
4	Morkheri (Part)	825	4110	4935	103	514	617	-	11	11	22
5	Bakheta (Part)	1180	4766	5946	148	596	743	-	11	11	22
6	Kansala (Part)	542	4887	5430	68	611	679	11	-	11	22
7	Mungan (Part)	1284	2909	4193	161	364	524	11	11	-	22
8	Kisranti	331	3809	4140	41	476	518	-	11	11	22

		7507	32533	**40040**	**938**	**4067**	**5005**	**55**	**66**	**55**	**176**

40040 man days would be generated with the implementation of the project (IWMP II), which means 80 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 Sampla Watershed (IWMP II)

S. No	Name of micro watersheds	No. of persons migrating		No. of days per year of migration		Comments
		Pre Project	Expected post project	Pre Project	Expected post project	
1	Gijhi	300	150	135	62	No. of persons migrating will be reduced and also no. of days would be reduced by over 50%
2	Humayunpur (Part)	700	350	150	75	No. of persons migrating will be reduced and also no. of days would be reduced by over 50%
3	Dattaur	300	150	180	90	No. of persons migrating will be reduced and also no. of days would be reduced by over 50%
4	Morkheri (Part)	600	300	180	90	No. of persons migrating will be reduced and also no. of days would be reduced by over 50%
5	Bakheta (Part)	450	225	180	90	No. of persons migrating will be reduced and also no. of days would be reduced by over 50%
6	Kansala (Part)	550	275	180	90	No. of persons migrating will be reduced and

						also no. of days would be reduced by over 50%
7	Mungan (Part)	450	225	150	75	No. of persons migrating will be reduced and also no. of days would be reduced by over 50%
8	Kisranti	800	400	180	90	No. of persons migrating will be reduced and also no. of days would be reduced by over 50%

9.3 GROUND WATER TABLE (Drinking Water)

The present water table ranges 1 to 6 m below ground level. Most of the area under watershed is underlain by marginal ground water quality. Thus the project will take care of further rising of water table in the problematic area. Similarly, the area where the water table is declining, the necessary provision of rain water harvesting is provided in the project proposals.

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

Sr. No.	Name of village	Source	Pre- project Level (m) (2013)	Remarks
1	Kasranti	Gwc Gridwells	2.31	Area underlain by shallow ground water depth i.e. below 2 m, the provision of drainage works has been provided in the project proposal.
2	Kansala	Gwc Gridwells	2.55	
3	Hamauypur	Gwc Gridwells	2.55	

4	Bakheta	Gwc Gridwells	1.92	
5	Mungan	Gwc Gridwells	6.02	
6	Dataur	Gwc Gridwells	6.02	
7	Mor Kheri	Gwc Gridwells	4.07	
8	Gijji	Gwc Gridwells	3.86	

Source: Ground Water Cell, Haryana

9.4 CROPS

Agriculture primary depends upon water, but this is availability of this is lacking without existence of canal network and deeper ground water conditions. All this can change with the integrated land and water management during the watershed project. The planned Renovation and digging of percolation pond, Drainage measures, land development works, retaining wall, ramp and inlet of pond, water conveyance system, culverts, plantation, land leveling, bunding 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 Sampla Watershed

Name of Micro-	Name of Crops	Pre project	Total Productio	Total Value	Expected post project	Total Production	Total Value Rs

Watersheds		Area ha	Average yield Kg Per ha	n(in Kg)	Rs (in lacs)	Area ha	Averag e yield Kg. Per ha	(in Kg)	(in lacs)
Gijhi	Wheat	265	4421	1171565	169.9	292	4863	1417593.7	205.6
	Oilseed	80	1385	110800	33.2	88	1524	134068.0	40.2
	Paddy	45	1533	68985	10.0	50	1686	83471.9	12.1
Humayunpur	Wheat	215	4436	953740	138.3	237	4880	1154025.4	167.3
	Oilseed	105	1364	143220	43.0	116	1500	173296.2	52.0
	Paddy	57	1521	86697	12.6	63	1673	104903.4	15.2
Dattaur	Wheat	315	4395	1384425	200.7	347	4835	1675154.3	242.9
	Oilseed	65	1326	86190	25.9	72	1459	104289.9	31.3
	Paddy	110	1543	169730	24.6	121	1697	205373.3	29.8
Morkheri	Wheat	309	4462	1378758	199.9	340	4908	1668297.2	241.9
	Oilseed	45	1348	60660	18.2	50	1483	73398.6	22.0
	Paddy	83	1564	129812	18.8	91	1720	157072.5	22.8
Bakheta	Wheat	315	4408	1388520	201.3	347	4849	1680109.2	243.6
	Oilseed	85	1363	115855	34.8	94	1499	140184.6	42.1
	Paddy	85	1503	127755	18.5	94	1653	154583.6	22.4
Kansala	Wheat	325	4384	1424800	206.6	358	4822	1724008.0	250.0
	Oilseed	65	1333	86645	26.0	72	1466	104840.5	31.5
	Paddy	104	1536	159744	23.2	114	1690	193290.2	28.0
Mungan	Wheat	255	4416	1126080	163.3	281	4858	1362556.8	197.6
	Oilseed	33	1352	44616	13.4	36	1487	53985.4	16.2
	Paddy	62	1555	96410	14.0	68	1711	116656.1	16.9
Kisranti	Wheat	251	4443	1115193	161.7	276	4887	1349383.5	195.7
	Oilseed	38	1338	50844	15.3	42	1472	61521.2	18.5
	Paddy	63	1561	98343	14.3	69	1717	118995.0	17.3
Total		**3375**		**11579387**	**1787.5**	**3718**		**14011059**	**2162.9**

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

9.5 HORTICULTURE

Table 5. Pre and post project area under Horticulture

S.No.	Name of Micro Watershed	Existing area under horticulture (ha)	Additional Area under horticulture proposed to be covered through IWMP	Total area in ha – Post Project
1	Gijhi	No horticulture plantation in project area as per Dept. of Horticulture	Atleast 10 ha horticulture plantation will be done in each village under project area	80
2	Humanyunpur			
3	Dattaur			
4	Morkheri			
5	Bakheta			
6	Kansala			
7	Mungan			
8	Kisranti			

9.6 AFFORESTATION/ VEGETATIVE COVER

Table 6. Pre and post project forest and vegetative cover

S.No.	Name of micro watersheds	Existing area under tree covered, ha	Area under tree cover proposed ha	Total
1	Gijhi	5	8	13
2	Humanyunpur	7	10	17
3	Dattaur	10	12	22
4	Morkheri	6	5	11
5	Bakheta	13	15	28
6	Kansala	9	10	19
7	Mungan	4	5	9

8	Kisranti	7	8	15
	Total	**61**	**73**	**134**

9.7 LIVESTOCK

Table 7. Details of livestock in the project area

S. No.	Name of micro watershed	Type of Animals	Pre project			Post project			Remarks
			No.	Yield Kg/ day	Income In Rs per day	No.	Yield Kg/ day	Income In Rs per day	
1	Gijhi	Buffalo	885	7.5-8.5	240-272	1018	9.5-10.5	361-399	Increase in milk yield and number of animals by approx. 15%
		Cow	172	3-4	78-104	198	5-6	150-180	Increase in milk yield and number of animals by approx. 15%
2	Humanyunpur	Buffalo	581	7-8	224-256	668	9-10	342-380	Increase in milk yield and number of animals by approx. 15%
		Cow	290	3-4	78-104	334	5-6	150-180	Increase in milk yield and number of animals by approx. 15%
3	Dattaur	Buffalo	982	7.5-8.5	240-272	1129	9.5-10.5	361-399	Increase in milk yield and number of animals by approx. 15%
		Cow	247	3.5-4.5	91-117	284	5.5-6.5	165-195	Increase in milk yield and number of animals by approx. 15%
4	Morkheri	Buffalo	561	7.5-8.5	240-272	645	9.5-10.5	361-399	Increase in milk yield and number of animals by approx. 15%
		Cow	249	3-4	78-104	286	5-6	150-180	Increase in milk yield and number of animals by approx. 15%
5	Bakheta	Buffalo	968	7-8	224-256	1113	9-10	342-380	Increase in milk yield and number of animals by approx. 15%

S. No.	Name of micro watershed	Type of Animals	Pre project			Post project			Remarks
			No.	Yield Kg/ day	Income In Rs per day	No.	Yield Kg/ day	Income In Rs per day	
		Cow	102	3.5-4.5	91-117	117	5.5-6.5	165-195	Increase in milk yield and number of animals by approx. 15%
6	Kansala	Buffalo	1015	7.5-8.5	240-272	1167	9.5-10.5	361-399	Increase in milk yield and number of animals by approx. 15%
		Cow	340	3-4	78-104	391	5-6	150-180	Increase in milk yield and number of animals by approx. 15%
7	Mungan	Buffalo	489	7.5-8.5	240-272	562	9.5-10.5	361-399	Increase in milk yield and number of animals by approx. 15%
		Cow	200	3-4	78-104	230	5-6	150-180	Increase in milk yield and number of animals by approx. 15%
8	Kisranti	Buffalo	358	7-8	224-256	412	9-10	342-380	Increase in milk yield and number of animals by approx. 15%
		Cow	112	3.5-4.5	91-117	129	5.5-6.5	165-195	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 No. 8: Backward-Forward Linkages

Sr. No.	Project	Type of Marketing Facility	Pre-Project (no.)	During the Project (no.)	Post-project (no.)
1	Sampla Watershed (IWMP II)	Backward linkages	-	-	-
		Seed certification	Moderate	Extension and Training	Improved
		Seed supply system	Moderate	Extension and Training	Improved
		Fertilizer supply system	Moderate	Extension and Training	Improved
		Pesticide supply system	Moderate	Extension and Training	Improved
		Credit institutions	Banks	Coordinate to lead banks	Bank intensity increased
		Water supply for irrigation	Scarcity	Promote rain water harvesting	Would be promoted
		Extension services	KGK& Agriculture deptt.	Extension & Training in village level	Improved
		Nurseries	Horticulture and forest	To be promoted	Improved
		Tools/ machinery suppliers	Subsides	Educate by Extension & Training	Supplies would be improved
		Price support system	Major crops	-	Needs for all crops
		Labour	-	Employment generate through works activities	Migration reduce
		Any other (please specify)	-	-	-
		Road network	Available	Coordinate with lined department	Would be strengthen
		Transport facilities	Moderate	Coordinate with lined department	Would be promoted
		Markets / Mandies	Exists	Coordinate with lined department	Intensity would be increased
		Agro and other industries	-	Coordinate with lined department to establish Cottage industries (Kutir Udyog) for landless and unemployed youth	Would be strengthen
		Milk and other collection centres	Milk collection centre in long distance	Coordinate with lined department	For installation on nearest door steps
		Any other (please specify)	-	-	-
			Vermi-compost unit	Convergence with NHM (Horticulture) department	To be increased

			Mushroom Cultivation	Convergence with NHM (Horticulture) department	To be increased
			Animal vitamins/ MineralsDeficit	Coordinate with lined department, to organize camps in watershed area	Animal vitamins feeds Would be promoted

9.8.1.1 LOGICAL FRAMEWORK ANALYSIS

Table 9. Logical Framework Analysis

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

Components	Activities	Outputs	Effect	Impact
	and P anchayat Institutions • Gender se nsitization of UGs and WCs to increase inclusiveness of S amuh (Joint) decision making. • Sensitize Vil lage communities to i nvolve children and yo uth i n development		children in village development.	
Fund Management	• Improve m anagement and utilization of UGs and WCs • Prepare c ommunities t o explore other so urces of income for UGs and WCs.	UGs and W Cs operating bank account and m anaging resources on their own.	• Purpose, f requency and volume of use of the fund enhanced • Volume of f unds generated f or U Gs and WCs from ot her so urces of income increased	
Ecological restoration	• Protection, Tr eatment and regeneration of co mmon and private lands. • Protection, t reatment and regeneration of f orest lands. • Plantation of f ruits and forest species. • Input t rainings, co nduct	• Common and pr ivate l ands to be br ought und er new plantations and agr o-horti-forestry like Neem, Adussa, prosopis, B anyan an d Peepul. • Forest l ands to be br ought under ne w pl antations and protection.	• Fodder av ailability from common and pr ivate l and increased. • Accessibility t o co mmon and f orest l ands increased with removal of encroachments and resolution of conflicts	• Better E cological or der i n the area. • Increase in the proportion of house holds having more security of fodder. • Reduction in dr udgery of fodder and f uel co llection, especially women

Components	Activities	Outputs	Effect	Impact
	meetings and or ganize exposure visit s f or communities, vil lage volunteers and st aff to effectively plan, e xecute and monitor activities. • Identification and promotion of non -timber forest pr oduce b ased income g eneration activities.	• Trainings, exp osure visit s and m eetings to be organized for co mmunities, village volunteers and staff. • Income gener ation intervention promoted		
Rainfed Area Development	• Treatment of l and t hrough improved soil and moisture conservation pr actices on watershed basis. • Promotion of good agricultural pr actices-horticulture, i mproved cr op and vegetable. • Promotion of or ganic farming practices. • Formation of Fodder banks to i ncrease f odder se curity and pr omote dai ry development am ong communities. • Identification and	• Land t o be brought under improved so il m oisture conservation practices. • Good agr icultural pr actices to be promoted. • Organic farming t o be promoted. Fodder ba nks to be established. • Agriculture base d livelihood in come generation act ivities to be promoted • Water harvesting structures to be constructed. • Drip irrigation facilities to be	• Improved pr oductivity of treated land. • Increased ava ilability of water in cells. • Increase i n a nnual agricultural production. • Farmers adopt or ganic farming practices. • Fodder se curity of farmers enhanced. • Increased ava ilability of water for 9 to12 months. • Increased ava ilability of water for livestock • Increase i n agr icultural	Increase i n pr oportion of households havin g m ore security of f ood I ncrease i n contribution of agr icultural income t o t he h ousehold income

Components	Activities	Outputs	Effect	Impact
	promotion of agr i-produce based income gene ration activities l ike grading, processing and packaging. • Promotion of bet ter irrigation practices like drip irrigation • Impart t rainings, co nduct meetings and or ganize exposure visit s of communities.	distributed among farmers. • Approx 49000 m an days of employment t o be generated. • Trainings, ex posure visit s and m eetings to be organized f or co mmunities, village volunteers.	productivity of land. • Augmentation of dr inking water supply.	
Women's socio-political and eco nomic empowerment	• Formation and strengthening of w omen' SHG groups • Capacity building of women folk. • Capacity building of SHG leaders and acco untants Linking SHGs with external financial institutions	• Women's SHG gr oups to be formed. • Federation of W omen's SHGs to be formed. • Trainings to be co nducted for pr eparation of woolen products from sh eep an d goats	• Enhanced ca pacities of leaders of w omen's group i n t aking initiatives to so lve pr oblems at differt levels. • Improved acce ss t o credit f or live lihood purposes I ncreased household income.	• Position of w omen i n household, co mmunity, society (politically, socially and eco nomically) as perceived by women and community at large. • Performance enhancement of S HGs in terms of par ticipation, decision-making, leadership and f und management. • Equality and eq uity i n gender r elations at hom e (decision m aking, expenditure, ch ildren's

Components	Activities	Outputs	Effect	Impact
				education, health)

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

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