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 the last three decades. Further, GOI has adopted watershed management as a national policy since 2003. Several studies have highlighted that appropriate natural resource management and its utilization results in enhancement 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 complete utilization of the available natural resources.

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

In order to implement watershed area (IWMP II) programme a systematic survey has been conducted to know the potentiality of each village / Micro-Watershed. With this view, a baseline survey in IWMP II comprising of twelve micro watershedsAtohan (2C5E1h4), Khera Sarai (2C5E1c6), Selothi (2CE1w4), Khatela Sarai (2C5E1d5), Rundhi (2C5E1c3), Dighot (2C5E1c5), Aurangabad A (2C5E1d5), Aurangabad B (2C5E1d8), Mitnol (2C5E1c4), Gudrana (2C5E1c1), Marroli (2C5E1d4) and Dakora (2C5E1d2). The base line survey conducted shall be considered as bench mark against which the results of project could be compared at the end of the implementation. It would also be helpful in guiding watershed

programmes and to plan its goal in identifiable terms and be used as future reference. PRA techniques and transect walk were conducted with the Gram Sabha members and beneficiaries for building confidence in participation during project planning.

1.1 SCIENTIFIC PLANNING

1.1.1 Cluster Approach

This envisages a broader vision of Geo-hydrological unit which involves treating the cluster (IWMP II) of 12 micro watersheds namelyAtohan (2C5E1h4), Khera Sarai (2C5E1c6), Selothi (2CE1w4), Khatela Sarai (2C5E1d5), Rundhi (2C5E1c3), Dighot (2C5E1c5), Aurangabad A (2C5E1d5), Aurangabad B (2C5E1d8), Mitnol (2C5E1c4), Gudrana (2C5E1c1), Marroli (2C5E1d4) and Dakora (2C5E1d2)with their respective codes.

1.1.2Base Line Survey

Bench mark survey was conducted for collection of base line data on various bio-physical and socio-economic aspects initiated by the following methods:-

1.1.3 Collection of Primary Data

The project was sanctioned in 30th Steering committee meeting for IWMP on 30.01.2013 and the preparatory phase started in 2013.Initially, a meeting was arranged with officials of concerned departments and technical experts located at Atohan, Khera Sarai, Selothi, Khatela Sarai, Rundhi, Dighot, Aurangabad A, Aurangabad B, Mitnol, Gudrana, Marroli and Dakoramicro- watersheds. During this meeting, preliminary detail of the proposed project including location of villages and criteria of selection and PPR was thoroughly discussed.

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

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

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

1.1.4 Collection of Secondary data

The data with regard to Demographic, socio-economic, infrastructure, land use, primary and secondary occupation, major crops grown and the production of crops and seasonal vegetable, marketing facilities, fodder production, agro-forestry crops, livestock and milk production, status of self help groups, previous watershed schemes and works undertaken under MGNREGA etc. was gathered with the help of a designed Performa. Additional information was gathered by group and individual discussions with women groups, landless and other poor sections of the society. The issues concerning water availability, use of common property resources, fuel and fodder availability, wage employment opportunity and other major concerns were 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/ Construction of New ponds, Roof top rainwater harvesting kund, Small Earthen Embankment with vegetative support, Water Conveyance System, Open channel, Construction of Ramp, Construction of Retaining wall etc. were recommended to conserve and store water used for life saving additional irrigation potential in the rainfed area and to avoid further degradation of the land.

1.2.2 Community Participants in Social Mapping

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

1.2.3 Transect Walk

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

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.

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 and Land Capability classes. All these parameters were given weight age 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 experience of the experts working in the area and catchment area characteristics each structure like Renovation/ Construction of New ponds, Roof top rainwater harvesting kund, Small Earthen Embankment with vegetative support, Water Conveyance System, Open channel, Construction of Ramp, Construction of Retaining wall etc.were provided in consultation with the Gram Sabha Members. However finally only those activities are included which were suggested by the Gram Sabha according to their needs.

1.3.3 Hydrological modeling

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

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

S.No.	Scientific Criteria/input used	Whether Scientific Criteria was used
A	**Planning**	
	Cluster approach	Yes
	Hydro-geological survey	Yes
	Contour Mapping	Yes
	Participatory net planning (PNP)	Yes
	Remote sensing data-especially soil	Yes

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

1.4 Preparation of Action Plan and Approval

Based on the need and problems in watershed area; a draft action plan was prepared and placed before the concerned watershed development committee as per schedule circulated by Additional Deputy Commissioner for approval of the Watershed Committees. After detailed deliberations and incorporation of relevant recommendation/ suggestions, 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 falls in Hodal block of Palwal district in Haryana state. The project is a cluster of twelve micro- watersheds namely Atohan (2C5E1h4), Khera Sarai (2C5E1c6), Selothi (2CE1w4), Khatela Sarai (2C5E1d5), Rundhi (2C5E1c3), Dighot (2C5E1c5), Aurangabad A (2C5E1d5), Aurangabad B (2C5E1d8), Mitnol (2C5E1c4), Gudrana (2C5E1c1), Marroli (2C5E1d4) and Dakora (2C5E1d2). The total geographical area of the project is **8084 ha** out of which **6520 ha** has been undertaken to be treated under IWMP II starting from year 2012-2013. The project is divided into twelve micro watersheds. The Base map is shown in Annexure I.

Table 1: Basic Project Information

Sr. No	Name of the project	Name of the micro watersheds	Code No.	Name of the villages	Block	District	Area of the Project (ha)	Area proposed to be treated (ha)	Total Project cost (Rs lacs)	PIA
1	Aurangabad	Atohan	2C5E1h4	Atohan	Hodal	Palwal	266	205	24.6	ASCO, Palwal
2	Aurangabad	Atohan	2C5E1h4	Bathrola	Hodal	Palwal	280	210	25.2	ASCO, Palwal
3	Aurangabad	Khera Sarai	2C5E1c6	Khera Sarai	Hodal	Palwal	632	520	62.4	ASCO, Palwal
4	Aurangabad	Sailothi	2CE1w4	Sailothi	Hodal	Palwal	581	475	57	ASCO, Palwal
5	Aurangabad	Sailothi	2CE1w4	Nngal Brahman	Hodal	Palwal	322	285	34.2	ASCO, Palwal
6	Aurangabad	Khatela	2C5E1d5	Khatela Sarai	Hodal	Palwal	608	510	61.2	ASCO,

Sr. No	Name of the project	Name of the micro watersheds	Code No.	Name of the villages	Block	District	Area of the Project (ha)	Area proposed to be treated (ha)	Total Project cost (Rs lacs)	PIA
		Sarai								Palwal
7	Aurangabad	Rundhi	2C5E1c3	Rundhi	Hodal	Palwal	630	505	60.6	ASCO, Palwal
8	Aurangabad	Dighot	2C5E1c5	Dighot	Hodal	Palwal	728	610	73.2	ASCO, Palwal
9	Aurangabad	Aurangabad A	2C5E1d5	Aurangabad A	Hodal	Palwal	748	625	75	ASCO, Palwal
10	Aurangabad	Aurangabad B	2C5E1d8	Aurangabad B	Hodal	Palwal	700	610	73.2	ASCO, Palwal
11	Aurangabad	Mitnol	2C5E1c4	Mitnol	Hodal	Palwal	382	305	36.6	ASCO, Palwal
12	Aurangabad	Mitnol	2C5E1c4	Tumasera	Hodal	Palwal	256	205	24.6	ASCO, Palwal
13	Aurangabad	Gudrana	2C5E1c1	Gudrana	Hodal	Palwal	694	510	61.2	ASCO, Palwal
14	Aurangabad	Maroli	2C5E1d4	Sholaka	Hodal	Palwal	160	120	14.4	ASCO, Palwal
15	Aurangabad	Maroli	2C5E1d4	Maroli	Hodal	Palwal	547	375	45	ASCO, Palwal
16	Aurangabad	Dakora	2C5E1d2	Dakora	Hodal	Palwal	550	450	54	ASCO, Palwal
					Grand Total		**8084**	**6520**	**782.4**	

2.2 NEED OF WATERSHED DEVELOPMENT PROGRAMME

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

i. poverty index,

ii. percentage of SC,

iii. actual wages,

iv. percentage of small and marginal farmers,

v. ground water status,

vi. moisture index,

vii. area under rain fed agriculture,

viii. drinking water situation in the area ,

ix. percentage of degraded land,

x. productivity potential of land,

xi. continuity of any other watershed already developed/treated,

xii. cluster approach for plain terrain,

xiii. cluster approach for hilly terrain,

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

Table 2. Criteria and Weightage for Selection of Watershed

Sr. 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/	15	-66.7 & below (15) DDP	-33.3 to -66.6 (10) DPAP	0 to -33.2 (0) Non	

Sr. No.	Criteria	Maximum Score	Ranges and Scores			
	DPAP/DDP block		block	Block	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)	
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 73 concerning these thirteen parameters, a composite ranking was given to Aurangabad Watershed (IWMP II) project as given in **Table- 3.**

The total numbers of families under BPL are above 80% of the total number of households in the village. Hence a score of 10 was allotted. Rain fed agriculture is more than 80 percent and about 50 % to 80% farmers are small and marginal. So the scoring was done 10 and 5 respectively. The ground water is over exploited of the area, so the ground water status score is 5. The percentage of schedule castes in this watershed is less than 20% of the total population, hence 3 score was allotted. Due to high percentage of the poor population i.e. about 70 percent thus the scope of poverty index is 7.5. More than 60 percent of the farmers are small and marginal in nature. Hence a composite rank of 5 is allotted. With all the parameters taken together gives the watershed score to be 73.

Table- 3: Weightage of the Project

1	2	3	4	5	6	7	8													
S. No.	District	Name of the project	No. of micro-watersheds proposed to be covered	Proposed project area (ha)	Type of project (Hilly/ Desert/ Others)	Proposed cost (Rs. in lakh)	Weight age under the criteria													
							i	Ii	iii	iv	v	vi	vii	viii	ix	x	xi	xii	xiii	Total
1.	Palwal	Aurangabad Sub-Watershed (IWMP II)	12	6520	Semi Arid	782.40	5	3	0	5	5	0	10	5	10	15	5	10	0	73

Table 4: Watershed Information

Name of the Project	No. of Micro-Watersheds to be Treated	Watershed codes	Watershed regime/type/order
Aurangabad Watershed (IWMP II)	12	2C5E1h4, 2C5E1c6, 2CE1w4, 2C5E1d5, 2C5E1c3, 2C5E1c5, 2C5E1d8, 2C5E1c4, 2C5E1c1, 2C5E1d4 and 2C5E1d2	Others

2.3 OTHER ONGOING DEVELOPMENT PROJECTS / SCHEMES IN THE PROJECT VILLAGES

These villages being backward have been on top priority of a number in developmental projects. These programmes are Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGA). The micro watershed wise ongoing development programme in the project area is tabulated in Table 5.

Table 5. Ongoing Developmental Programs in the Project Area

Sr. No.	Name of the Program /Project	Name of Micro watersheds	Sponsoring agency	Objective	Estimated number of beneficiaries
1	MGNREGA	Atohan	DRDA, Palwal	To provide assured employment of 100 days in a year to unskilled labour and development of village.	75
2	MGNREGA	Bahrola	DRDA, Palwal	To provide assured employment of 100 days in a year to unskilled labour and development of village.	22
3	MGNREGA	Khera Sarai	DRDA, Palwal	To provide assured employment of 100 days in a year to unskilled labour and development of village.	-
4	MGNREGA	Sailothi	DRDA, Palwal	To provide assured employment of 100 days in a year to unskilled labour and development of village.	19
5	MGNREGA	Nangal Brahman	DRDA, Palwal	To provide assured employment of 100 days in a year to unskilled labour and development of village.	86
6	MGNREGA	Khatela Sarai	DRDA, Palwal	To provide assured employment of 100 days in a	-

				year to unskilled labour and development of village.	
7	MGNREGA	Rundhi	DRDA, Palwal	To provide assured employment of 100 days in a year to unskilled labour and development of village.	52
8	MGNREGA	Dighot	DRDA, Palwal	To provide assured employment of 100 days in a year to unskilled labour and development of village.	54
9	MGNREGA	Aurangabad A+B	DRDA, Palwal	To provide assured employment of 100 days in a year to unskilled labour and development of village.	64
10	MGNREGA	Mitnol	DRDA, Palwal	To provide assured employment of 100 days in a year to unskilled labour and development of village.	33
11	MGNREGA	Tumasera	DRDA, Palwal	To provide assured employment of 100 days in a year to unskilled labour and development of village.	70
12	MGNREGA	Gudrana	DRDA, Palwal	To provide assured employment of 100 days in a year to unskilled labour and development of village.	116
13	MGNREGA	Sholaka	DRDA, Palwal	To provide assured employment of 100 days in a year to unskilled labour and development of village.	25
14	MGNREGA	Maroli	DRDA, Palwal	To provide assured employment of 100 days in a year to unskilled labour and development of village.	67
15	MGNREGA	Dakora	DRDA, Palwal	To provide assured employment of 100 days in a year to unskilled labour and development of village.	139

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)

1	2	3		4						5	
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.	Palwal	143	95130	8	2050	-	-	8	2050	135 (balance) 44	93080 (balance) 25500

CHAPTER – 3

BASIC INFORMATION OF THE PROJECT AREA

GEOGRAPHY AND GEOHYDROLOGY

The Aurangabad Watershed (IWMP-II) falls in Hodal Block of District Palwal. The area of watershed lies in between 27˚56'00''to 28˚06'00'' N Latitude & 77˚18'00'' to 77˚24'00'' east longitude with general elevation varies between 185-193 m (MSL) above mean sea level. Area experiences the 507 mm of rainfall in the state about 80 percent of its annual rainfall is received in the month of July to September. The Drainage and Contour 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 Aurangabad 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	Atohan	Atohan	266	205	233	172	1	32
2	Atohan	Bathrola	280	210	223	153	24	33
3	Khera Sarai	Khera Sarai	632	520	495	383	6	131
4	Sailothi	Sailothi	581	475	507	401	21	53
5	Sailothi	Nangal Brahman	322	285	256	219	38	28
6	Khatela Sarai	Khatela Sarai	608	510	497	399	11	100
7	Rundhi	Rundhi	630	505	563	438	21	46
8	Dighot	Dighot	728	610	384	266	34	310
9	Aurangabad A	Aurangabad A	748	625	497	135	290	200
10	Aurangabad B	Aurangabad B	700	610	461	344	53	213
11	Mitnol	Mitnol	382	305	325	248	12	45
12	Mitnol	Tumasera	256	205	177	126	54	25

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
13	Gudrana	Gudrana	694	510	615	431	-	79
14	Maroli	Sholaka	160	120	150	110	-	10
15	Maroli	Maroli	547	375	454	282	68	25
16	Dakora	Dakora	550	450	483	383	5	62
			8084	**6520**	**6320**	**4756**	**585**	**1179**

(Source – District Census Handbook, 2001 Palwal)

3.2 SOIL AND TOPOGRAPHY

The soils of Aurangabad Watershed are very deep, loamy sand to clay loam, typic, ustipssament, typic torripssament, typic, torriorthent, typic haplustepts, typic ustifluvent and lithic ustorthent in the area and rock out crops/hillocks found in twelve micro watersheds. The topography of the area ranges from level to gentle with steep slope along sand dunal area. Soils are subject to susceptible to moderate to severe water and wind erosion. The slope ranges from 0.5 to 5% and above (high in case of sand dune area) most of the area of micro watersheds falls under level to nearly level. 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.	Atohan	2C5E1h4	546	Sandy loam to clay loam	Level to nearly level except sand dunal area where the slope is more than 5%
2.	Khera Sarai	2C5E1c6	832		
3.	Sailothi	2CE1w4	903		
4.	Khatela Sarai	2C5E1d5	808		
5.	Rundhi	2C5E1c3	630		
6.	Dighot	2C5E1c5	1528		
7.	Aurangabad A	2C5E1d5	1248		
8.	Aurangabad B	2C5E1d8	1200		
9.	Mitnol	2C5E1c4	638		
10.	Gudrana	2C5E1c1	694		

11.	Maroli	2C5E1d4	765		
12.	Dakora	2C5E1d2	550		
			10342		

Source: - Department of Agriculture, Haryana

3.2.1 Flood and Drought Condition

There was no incidence of flood recorded and drought as well in watershed villages as per data collected from the revenue department reveals drought conditions is once in a ten years. The absence of assured irrigation 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.	Atohan	Once in a 5 year	Once in a 10 year
2.	Khera Sarai		
3.	Sailothi		
4.	Khatela Sarai		
5.	Rundhi		
6.	Dighot		
7.	Aurangabad A		
8.	Aurangabad B		
9.	Mitnol		
10.	Gudrana		
11.	Maroli		
12.	Dakora		

3.3 SOILS

3.3.1 Soil Erosion

In the identified twelve micro watersheds in fifteen villages, it is observed that due to thin vegetative cover to increase the loss of surface soil in the watershed area. This results in degradation of agricultural land and low organic matter contents. The organic carbon content in areas comparatively low to restrict average in agriculture production and degradation of soil physical and chemical properties. Average annual rainfall 507 mm of the area. During rainy season the soil of upper layer washed away in the form of runoff which also carries valuable top soil (sheet). Majority of the watershed Community are dependent on rain fed agriculture due to lack of assured irrigation facility. Agriculture suffers due to area being rain fed and due to erratic rains in the region, resulting in further deterioration of socio economic conditions of community.

3.3.2 Soil Salinity/Alkalinity

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

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

Table 4. Soil pH and Salinity

S.No.	Name of the Micro Watersheds	Name of village	Soil pH
1	Atohan	Atohan	7.5
		Bahrola	7.4
2	Khera Sarai	Khera Sarai	8.10
3	Sailothi	Sailothi	7.60
		Nangal Brahman	7.50
4	Khatela Sarai	Khatela Sarai	8.10
5	Rundhi	Rundhi	8.00
6	Deeghot	Deeghot	8.27
7	Aurangabad A	Aurangabad A	8.58

8	Aurangabad B	Aurangabad B	8.30
9	Mitrol	Mitrol	8.10
		Tumasra	7.75
10	Gudrana	Gudrana	7.90
11	Marroli	Marroli	7.80
		Sholaka	7.70
12	Dakora	Dakora	7.75

3.3.3 SOIL CLASSIFICATION

The Soil map is presented in **Annexure V.** The fertility status of the project area, available nitrogen and available phosphorus are low. However, the available potash is low, medium and 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 III and class IV land is suited to agriculture.

The soils of the selected Watersheds have been grouped into three 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 deep to very deep soils, light to coarse loamy texture located on slight to gentle slope. These soils are well drained, moderately permeable and moderate to severe erosion hazard.

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

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

Land capability subclass IV e3s3

These soils are greatly, light textured soils nearly level to gentle sloping lands. The water holding capacity is poor to very poor and the water erosion hazard is severe to very severe.

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

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

3.3.5 Climatic Conditions

The average rainfall of the district is 507mm (during the past 10 years). The highest rainfall is 857 mm during the year 2008 and lowest in 2006 as 255.5mm. The uneven rainfall distribution is leading to run off soil every year to the steams, rivulets and depressed area of the Aurangabad Watershed (IWMP II). The year wise rainfall from 2004 to 2013 is presented in **Table.5.**

Table 5. Rainfall during the years 2004-13

Sr . no.	Year	Rainfall (in mm)
1	2004	498.5
2	2005	421.5
3	2006	255.5
4	2007	613.0
5	2008	857.0
6	2009	391.0
7	2010	772.0
8	2011	659.0
9	2012	454.2
10	2013	486.0
Average Rainfall		**507.0**

(Source: - Deputy Director Agriculture, Palwal)

The mean maximum temperature is 40.5˚ C (May and June) and mean minimum is 5.0˚ C (January) of the district.

3.3.6 Physiography and Reliefs

The area has monotonous physiography and the elevation based on the contour maps varies from 185 to 193 m. The leveled surface, fertile alluvial soil and facilities for irrigation is best treated for cultivation. The river Yamuna forms consistent flood plains.

The major river is Yamuna and Gonchi drain is used to irrigate the watershed area.

Annual average rainfall of the district is 507 mm and the water is drained through field to field and ultimately create temporary water logging in low lying areas to create haphazard condition during rainy season if heavy rain received. The elevation range and percentage slope distribution has been presented in **Table 6.**

Table 6. Physiography and Relief

Project Name	Elevation (MSL)	Slope Range (%)
Aurangabad Watershed (IWMP-II)	185-193 m	0.5-3% and above

3.4 LAND AND AGRICULTURE

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

The major crops Paddy, Jawar, green fodder and pulses in Kharif under rain fed conditions. The major crops during Rabi wheat, mustard, gram, green fodder and seasonal vegetables in rain fed and irrigated conditions. The soil and water conservation measures such as Renovation/ Construction of New ponds, Roof top rainwater harvesting kund, Small Earthen Embankment with vegetative support, Water Conveyance System, Open channel, Construction of Ramp, Construction of Retaining wall 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

S.No.	Trees	Fruits	Grasses and Shrubs
1	Babbul	Guava, Jamun, Sahtut	Green grass
2	Neem	Jamun	
3	Bur	Ber	
4	Sisam		
5	Peepal		

3.4.1 Land Ownership Details

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

Table-8:- Land Ownership Details

Sr .No.	Name of micro watershed	Name of village	GENRAL	OBC/Meo	ST	SC	Total owners
1	Atohan	Atohan	1150	163	-	431	1744
		Bahrola	510	1110	-	614	2234
2	Khera Sarai	Khera Sarai	5190	917	-	2381	8488
3	Sailothi	Sailothi	960	2100	-	543	3603
		Nangal Brahman	1117	54	-	391	1562
4	Khatela Sarai	Khatela Sarai	16	8462	-	352	8830
5	Rundhi	Rundhi	1520	398	-	716	2634
6	Deeghot	Deeghot	6220	1936	-	2798	10954

7	Aurangabad A	Aurangabad A	5216	326	-	64	5606
8	Aurangabad B	Aurangabad B	4304	800	-	900	6004
9	Mitrol	Mitrol	2023	487	--	2158	4668
		Tumasra	112	1610	-	585	2307
10	Gudrana	Gudrana	20	1508	-	1938	3466
11	Marroli	Marroli	211	2309	-	697	3217
		Solaka	07	2021	-	273	2301
12	Dakora	Dakora	413	2308	-	693	3414
			28989	**26509**		**15534**	**71032**

3.4.2 AGRICULTURE/PATTERN

Table 9. Agriculture/ Pattern

Sr. No.	Name of Micro Watersheds	Village	Land under agriculture use (ha)	Net Sown area (ha)	
				One time	Two times
1	Atohan	Atohan	233	195	145
		Bathrola	223	193	133
2	Khera Sarai	Khera Sarai	495	411	321
3	Sailothi	Sailothi	507	425	328
		Nngal Brahman	256	218	163
4	Khatela Sarai	Khatela Sarai	497	423	318
5	Rundhi	Rundhi	563	473	352
6	Dighot	Dighot	384	333	236
7	Aurangabad A	Aurangabad A	497	427	314
8	Aurangabad B	Aurangabad	461	384	301

Sr. No.	Name of Micro Watersheds	Village	Land under agriculture use (ha)	Net Sown area (ha)	
				One time	Two times
		B			
9	Mitnol	Mitnol	325	274	207
		Tumasera	177	167	94
10	Gudrana	Gudrana	615	504	412
11	Maroli	Sholaka	150	128	94
		Maroli	454	384	291
12	Dakora	Dakora	483	397	320
	Total		**6320**	**5336**	**4029**

(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. The remaining cultivable area is under rainfed agriculture. The present source of irrigation in the watershed has been tabulated in **Table 10.**

Table 10. Irrigation Pattern.

Sr. No	Name of Micro Watersheds	Name of Villages	Source 1: Canal		Source 2: Groundwater (Tube wells)	
			Availability months	Net area (ha)	Availability months	Net area (ha)
1	Aurangabad Sub Watershed (IWMP-II)	Atohan	Aug-Oct	41	July to June	20
2		Bahrola	Aug-Oct	52	July to June	18
3		Khera Sarai	Aug-Oct	31	July to June	81
4		Sailothi	Aug-Oct	52	July to June	54
5		Nangal Brahman	Aug-Oct	28	July to June	9
6		Khatela Sarai	Aug-Oct	48	July to June	50
7		Rundhi	Aug-Oct	57	July to June	68

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)
8		Dighot	Aug-Oct	49	July to June	69
9		Aurangabad	Aug-Oct	304	July to June	175
10		Mitnol	Aug-Oct	37	July to June	40
11		Tumasera	Aug-Oct	51	July to June	
12		Gudrana	Aug-Oct	184	July to June	
13		Sholaka	Aug-Oct	12	July to June	28
14		Maroli	Aug-Oct	81	July to June	91
15		Dakora	Aug-Oct	34	July to June	66
Total				1061		769

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

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)

Crops			Wheat				Mustard			
S.No	Name of the Micro watershed	Village	Area (ha)	Prod. (Qtl)	Productivity (Qtl/ha)Avg.	Use of fertilizer	Area (ha)	Prod.(Qtl)	Productivity (Qtl/ha)Avg.	Use of fertilizer
1	Atohan	Atohan	104	3640	35	D.A.P/ Urea	30	330	11	Urea/ sulphet
		Bahrola	90	3240	36	-do-	26	312	12	-do-
2	Khera Sarai	Khera Sarai	300	10500	35	-do-	35	385	11	-do-
3	Sailothi	Sailothi	260	8840	34	-do-	37	444	12	-do-
		Nangal Brahma	160	5280	33	-do-	32	384	12	
4	Khatela Sarai	Khatela Sarai	380	12920	34	-do-	52	572	11	-do-

5	Rundhi	Rundhi	300	9600	32	-do-	41	492	12	-do-
6	Deeghot	Deeghot	670	22110	33	-do-	55	660	12	-do-
7	Aurangabad A	Aurangabad A	650	22100	34	-do-	48	624	13	-do-
8	Aurangabad B	Aurangabad B	610	20740	34	-do-	43	559	13	-do-
9	Mitrol	Mitral	101	3232	32	-do-	21	231	11	-do-
		Tumasra	84	2772	33	-do-	19	228	12	-do-
10	Gudrana	Gudrana	290	9860	34	-do-	35	455	13	-do-
11	Marroli	Marroli	180	5940	33	-do-	27	351	13	-do-
		Solaka	82	2624	32	-do-	18	216	12	-do-
12	Dakora	Dakora	170	5610	33	-do-	33	429	13	-do-
	Total		**4431**	**149008**			**552**	**6672**		

Table 11 B. Crop Details (Kharif)

Crops			Paddy				Jawar			
S.No	**Name of the Micro watershed**	**Village**	**Area (ha)**	**Prod. (Qtl)**	**Productivity (Qtl /ha)Avg.**	**Use of fertilizer**	**Area (ha)**	**Prod.(Qtl)**	**Productivity (Qtl /ha)Avg.**	**Use of fertilizer**
1	Atohan	Atohan	66	2112	32	Urea	20	Fodder	-	-
		Bahrola	54	1674	31	Urea	40	-do-	-	-
2	Khera Sarai	Khera Sarai	132	4092	31	Urea	30	-do-	-	-
3	Sailothi	Sailothi	112	3696	33	Urea	34	-do+200	10	-
		Nangal Brahman	85	2720	32	Urea	21	Fodder	-	-
4	Khatela Sarai	Khatela Sarai	121	3751	31	Urea	34	Fodder	--	-
5	Rundhi	Rundhi	115	3910	34	Urea	35	Fodder+250	9	-
6	Deeghot	Deeghot	210	6930	33	Urea	45	Fodder+300	10	-
7	Aurangabad A	Aurangabad A	234	8190	35	Urea	53	Fodder+200	9	-
8	Aurangabad B	Aurangabad B	231	7854	34	Urea	51	-do-+150	8.5	-
9	Mitrol	Mitrol	68	2244	33	Urea	38	Fodder+450	8	-
		Tumasra	53	1696	32	Urea		Fodder	-	-
10	Gudrana	Gudrana	95	3135	33	Urea	32	-do+250	9	-
11	Marroli	Marroli	87	2871	33	Urea	25	-do-	-	-
		Sholaka	53	1696	32	Urea	18	-do-	-	-
12	Dakora	Dakora	86	2924	34	Urea	24	Fodder	-	-
	Total		**1802**	**59495**			**500**	**1802**		

3.4.5 Livestock

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

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

S.No.	Name of Micro Watersheds	Buffalo (*lit/per/annum) for 6 months	Cow (*lit/per day annum) for 6 months	Sheep	Goat	Camel/Horse/hens
1	Atohan	2000/15000/2700000	1310/4585/825300	0	0	120 hens
2	Khera Sarai	3000/21000/3780000	1900/8550/1539000	10	50	0
3	Sailothi	1800/15300/2754000	900/3600/648000	0	0	20 hens
4	Khatela Sarai	1750/13125/2362500	210/630/113400	50	100	200 hens
5	Rundhi	1230/9840/1771200	790/2765/497700	20	40	50 hens
6	Deeghot	5050/35350/6363000	1930/8685/1563300	160	240	150 hens
7	Aurangabad A	2430/20655/3717900	1240/4340/781200	50	109	59 hens
8	Aurangabad B	1800/13500/2430000	980/2940/529200	70	96	47 hens
9	Mitrol	2680/20100/3618000	1170/4095/737100	30	57	109hens
10	Gudrana	1500/10500/1890000	900/3600/648000	248	127	156 hens
11	Marroli	1500/12000/2160000	500/1500/270000	267	246	263 hens
12	Dakora	1600/11200/2016000	900/3150/567000	0	45	16 hens

(Source: Animal Husbandry, Palwal)

***Average yield of Buffalo is 11-12 lit/day and Average yield of Cow is 5-6 lit/day**

3.4.6 Ground Water Concern

a) Depth to Water

The ground water hydrology focuses on occurrence and distribution of movement of water below the surface. Ground Water Cell of Haryana has fixed hydrograph station whose monitoring is undertaken during pre and post monsoon season. The water level data has been analyzed for the purpose of ground water studies in the watershed area. The ground water behavior in the watershed reveals the variation from 6 to 14 m. The depth to water level follows the topography of the area except in the hydrograph station which is located near the water bodies. 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 Aurangabad Watershed (IWMP II)

S.No	Name of Micro watersheds	Name of Villages	Pre-Project level (m)
1	Atohan	Atohan	6.30
		Bahrola	13.70
2	Khera Sarai	Khera Sarai	9.30
3	Sailothi	Sailothi	5.30
		Nangal Brahman	7.30
4	Khatela Sarai	Khatela Sarai	6.10
5	Rundhi	Rundhi	7.25
6	Deeghot	Deeghot	12.20
7	Aurangabad A	Aurangabad A	12.10
8	Aurangabad B	Aurangabad B	12.20
9	Mitrol	Mitrol	9.15

		Tumasra	10.10
10	Gudrana	Gudrana	11.60
11	Marroli	Marroli	12.20
		Sholaka	13.70
12	Dakora	Dakora	12.80

The source of drinking water supply is through the canal and tube wells where the quality of ground water is acceptable under shallow aquifer in the area. The water quality analysis data was utilized to prepare using GIS technique and presented in plate……. The micro watershed area is underlain by three category of water quality i.e. fresh (small patch in the western side falling in Gopalgarh whereas in the remaining area of the watershed is underlain by marginal water quality except a pocket of Dakora falls in saline quality of water) and marginal. The marginal water quality dominates in the watershed area. The water quality map of the area is presented in **Annexure-IX**. The drinking water supply is available thought the year but shortage in villages during May and June where the supply is augmented by tankers.

b) Water table fluctuation

From the availability of the data from the period June 1974 to June 2010, it is observed that the water table is declining at the rate of about 1m per year.

The seasonal fluctuation i.e. Pre and Post monsoon period is 1- 1.5m. The pattern of ground water depletion is almost uniform in the project area.

c) Rain water harvesting and Recharging

With the excessive withdrawal of the ground water for irrigation and drinking, the area falls in the over exploited category. There is a need to recharge the aquifers which have been de-circulated.

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

Table 14. Detail of Common Property Resources

Name of the Project	CPR Particulars	Total Area, ha (Area owned/ in possession of)					Area available for treatment (ha)				
		Pvt. Person	Govt.	PRI	Any other	Total	Pvt. Persons	Govt.	PRI	Any other	Total
Aurangabad	Wasteland	1179	5	385	0	1569	1179	0	385	0	1569
	Pasture	0	0	0	0	0	0	0	0	0	0
	Orchard	0	0	0	0	0	0	0	0	0	0
	Lot	0	0	0	0	0	0	0	0	0	0
	Forest	0	0	20	0	20	0	0	20	0	20
	Village Ponds , lake	92	0	70	0	162	92	0	70	0	162
	Community Buildings	200	0	300	0	500	0	0	0	0	0
	Weekly Mkts	0	0	0	0	0	0	0	0	0	0
	Permanent Mkts	150	0	150	0	300	0	0	0	0	0
	Temples/ place of workship	300	0	200	0	500	0	0	0	0	0
	Others or agriculture land	0	0	0	6320	6320	0	0	0	0	6210

	Grand Total total		**9371**		**7961**

3.5 SOCIO ECONOMIC AND LITERACY PROFILE

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

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

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

3.5.1 Demographic Status

Table 15. Demographic Status/ Population Pattern

Sr. No.	Name of the Micro watershed	Name of villages	Total no. of houses	Total Population			SC			
				Male	Female	Total	Male	Female	Total	%age
1	Aurangabad Watershed (IWMP-II)	Atohan	290	945	799	1744	229	202	431	24.7
2		Bahrola	337	1174	1060	2234	327	287	614	27.5
3		Khera Sarai								
4		Sailothi	569	1917	1686	3603	293	250	543	15.1
5		Nangal Brahman	291	838	724	1562	221	170	391	25.0
6		Khatela Sarai	1266	4596	4234	8830	185	167	352	4.0
7		Rundhi	466	1419	1215	2634	372	344	716	27.2
8		Dighot	1851	5919	5035	10954	1528	1270	2798	25.5
9		Aurangabad A+B	1965	6203	5407	11610	507	457	964	8.3
10		Mitnol	797	2502	2166	4668	1133	1025	2158	46.2

Sr. No.	Name of the Micro watershed	Name of villages	Total no. of houses	Total Population			SC			
				Male	Female	Total	Male	Female	Total	%age
11		Tumasera	299	1212	1095	2307	298	287	585	25.4
12		Gudrana	603	1845	1621	3466	1024	914	1938	55.9
13		Sholaka	345	1192	1109	2301	134	139	273	11.9
14		Maroli	534	1769	1448	3217	385	312	697	21.7
15		Dakora	595	1855	1559	3414	362	331	693	20.3
			10208	**33386**	**29158**	**62544**	**6998**	**6155**	**13153**	**21.0**

(Source- District Census 2011)

Table 16. Village wise Literacy Rate in Aurangabad Watershed (IWMP II)

Sr. No.	Name of the Micro watershed	Name of villages	Total population	Literacy					
				Total Literates	% age	Male	% age	Female	% age
1	Aurangabad Watershed (IWMP-II)	Atohan	1744	1123	64.4	731	65.1	392	34.9
2		Bahrola	2234	1376	61.6	842	61.2	534	38.8
3		Khera Sarai							
4		Sailothi	3603	2285	63.4	1444	63.2	841	36.8
5		Nangal Brahman	1562	909	58.2	592	65.1	317	34.9
6		Khatela Sarai	8830	3707	42.0	2610	70.4	1097	29.6
7		Rundhi	2634	1739	66.0	1111	63.9	628	36.1
8		Dighot	10954	6428	58.7	4199	65.3	2229	34.7
9		Aurangabad A+B	11610	7283	62.7	4639	63.7	2644	36.3
10		Mitnol	4668	2843	60.9	1828	64.3	1015	35.7
11		Tumasera	2307	1457	63.2	932	64.0	525	36.0
12		Gudrana	3466	2080	60.0	1332	64.0	752	36.2
13		Sholaka	2301	1042	45.3	705	67.7	337	32.3
14		Maroli	3217	1937	60.2	1299	67.1	638	32.9

15		Dakora	3414	1988	58.2	1314	66.1	674	33.9
			62544	**36197**	**57.9**	**23578**	**65.1**	**12623**	**34.9**

(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		Atohan	229	202	106	5	109	9	7	1	196	15
2		Bahrola	327	287	120	11	22	3	7	106	175	134
3		Khera Sarai										
4		Sailothi	293	250	247	8	94	6	15	1	215	5
5		Nangal Brahman	221	170	51	3	26	35	4	2	229	32
6		Khatela Sarai	185	167	716	36	97	2	33	8	343	13
7		Rundhi	372	344	112	14	17	0	36	0	382	19
8		Dighot	1528	1270	942	149	289	202	41	7	860	59
9		Aurangabad A+B	507	457	1397	295	177	19	57	1	834	73
10		Mitnol	1133	1025	327	39	36	4	10	3	446	74
11		Tumasera	298	287	226	2	122	0	21	0	161	1
12		Gudrana	1024	914	114	7	62	9	17	0	166	11
13		Sholaka	134	139	174	4	56	19	12	0	30	3
14		Maroli	385	312	143	7	8	0	6	0	180	11
15		Dakora	362	331	244	71	70	7	11	0	244	11
		Total	**6998**	**6155**	**4919**	**651**	**1185**	**315**	**277**	**129**	**4461**	**461**

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 Aurangabad Watershed (IWMP II)

S.No.	Name of the Micro watersheds	Name of Villages	Total population	No. of persons migrating	No. of days per year of migration	Main reason for migration	Income during migration /person/month
1	Atohan	Atohan	1744	418	2 to 3months	Lack of employment	10000 to 12000
		Bahrola	2234	650	2 to 3months	Lack of employment	10000 to 12000
2	Khera Sarai	Khera Sarai	8488	520	2 to 3months	Lack of employment	10000 to 12000
3	Sailothi	Sailothi	3603	585	2 to 3months	Lack of employment	10000 to 12000
		Nangal Brahman	1562	205	2 to 3months	Lack of employment	10000 to 12000
4	Khatela Sarai	Khatela Sarai	8830	430	2 to 3months	Lack of employment	10000 to 12000
5	Rundhi	Rundhi	2634	154	2 to 3months	Lack of employment	10000 to 12000
6	Deeghot	Deeghot	10954	740	2 to 3months	Lack of employment	10000 to 12000
7	Aurangabad A	Aurangabad A	5606	550	2 to 3months	Lack of employment	10000 to 12000
8	Aurangabad B	Aurangabad B	6004	580	2 to 3months	Lack of employment	10000 to 12000
9	Mitrol	Mitrol	4668	280	2 to 3months	Lack of employment	10000 to 12000
		Tumasra	2307	119	2 to 3months	Lack of employment	10000 to 12000

10	Gudrana	Gudrana	3466	126	2 to 3months	Lack of employment	10000 to 12000
11	Marroli	Marroli	3217	186	2 to 3months	Lack of employment	10000 to 12000
		Sholaka	2301	120	2 to 3months	Lack of employment	10000 to 12000
12	Dakora	Dakora	3414	146	2 to 3months	Lack of employment	10000 to 12000

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

Table 19. BPL Pattern

S.No.	Name of the Micro watersheds	Name of villages	Total Houses	Total Household -BPL	% of BPL HH
1	Atohan	Atohan	290	39	13.44
		Bahrola	337	31	9.1
2	Khera sarai	Khera sarai	1461	407	27.85
3	Selothi	Selothi	569	130	22.84
		Nangal Brahman	291	57	19.58
4	Khatela sarai	Khatela sarai	1266	52	4.10
5	Rundhi	Rundhi	466	101	21.67
6	Deeghot	Deeghot	1851	495	26.74
7	Aurangabad A	Aurangabad A	1000	138	13.8
8	Aurangabad B	Aurangabad B	965	100	10.36
9	Mitrol	Mitrol	797	128	16.06
		Tumasra	299	33	11.03
10	Gudrana	Gudrana	603	67	11.11
11	Marroli	Marroli	534	123	23.03
		Sholaka	345	108	31.30

12	Dakora	Dakora	595	145	24.36
			11669	**2154**	**286.37**

(Source: District Administration Palwal, Haryana)

INFRASTRUCTURE DETAILS

All the villages are well connected by pucca road and primary or middle school exists in all villages. Health facilities are available in villages and have easy access to 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

S.No.	Name of the Micro watersheds	Name of villages	Bank Y/N	Post office Y/N	School primary/High/ Sr. Sec	Milk Collection Center Y/N	Pucca Reads to Village Y/N	Health Facility Govt./ private	Veterinary Facility Y/N
1	Atohan	Atohan	Y	N	1, 1,0	N	Y	N	N
		Bahrola	N	N	1,1,0	N	Y	N	N
2	Khera sarai	Khera sarai	Y	Y	1,1,3	N	Y	Y	Y
3	Selothi	Selothi	N	N	1,1,2	N	Y	Y	Y
		Nangal Brahman	N	N	1,1,0	N	Y	N	N
4	Khatela sarai	Khatela sarai	N	Y	1,0,0	N	Y	N	N
5	Rundhi	Rundhi	N	N	1,1,1	N	Y	N	N
6	Deeghot	Deeghot	Y	Y	2,2,2	Y	Y	Y	Y
7	Aurangabad A	Aurangabad A	Y	Y	1,2,1	Y	Y	Y	Y
8	Aurangabad B	Aurangabad B	Y	Y	1,4,2	Y	Y	Y	Y
9	Mitrol	Mitrol	N	N	1,1,2	N	Y	N	N
		Tumasra	N	N	1,1,0	N	Y	N	N
10	Gudrana	Gudrana	N	N	1,1,1	N	Y	N	Y
11	Marroli	Marroli	Y	Y	1,2,2	Y	Y	Y	Y
		Sholaka	N	N	1,1,	N	Y	N	N
12	Dakora	Dakora	N	N	1,1,1,	N	Y	N	Y

FACILITIES/ HOUSEHOLD ASSETS

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

S.No.	Name of micro watersheds	Name of Villages	Total no. of House	HH with Safe Latrines	HH with phones		HH with vehicles		HHs with TV sets	HHs with cooking gas	HHs with drinking water	HHs with fridge
					Landline	Mobile	2 wheelers	4 wheelers				
1	Atohan	Atohan	290	245	0	200	210	100	208	140	220	105
		Bahrola	337	280	0	208	220	140	180	208	145	130
2	Khera sarai	Khera sarai	1461	1095	10	1009	900	470	950	750	900	309
3	Selothi	Selothi	569	309	0	430	230	227	430	380	543	345
		Nangal Brahman	291	235	0	280	250	180	197	210	231	180
4	Khatela sarai	Khatela sarai	1266	890	0	1000	905	200	750	350	680	579
5	Rundhi	Rundhi	466	380	0	308	411	215	400	325	390	200
6	Deeghot	Deeghot	1851	1550	10	1500	1200	500	800	1225	1090	448
7	Aurangabad A	Aurangabad A	1000	543	7	745	590	325	645	345	438	134
8	Aurangabad B	Aurangabad B	965	648	0	724	587	432	587	450	680	480
9	Mitrol	Mitrol	797	532	0	689	588	245	200	205	409	180
		Tumasra	299	80	0	123	134	133	135	145	180	80
10	Gudrana	Gudrana	603	324	0	456	480	125	245	145	270	150
11	Marroli	Marroli	534	345	0	457	420	157	301	150	302	50
		Sholaka	345	125	0	223	234	120	224	110	150	20
12	Dakora	Dakora	595	245	0	367	487	189	210	178	310	79

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

Table 22. Per capita (Household) income Aurangabad Watershed (IWMP II)

S.No.	Name of the Micro watersheds	Name of Villages	Agriculture in Rs. P.A	Animal Husbandry in Rs. P.A	Casual labours in Rs. P.A	Others in Rs. P.A	Total in Rs. P.A
1	Atohan	Atohan	27174	6522	6957	4348	45000
		Bahrola	22143	6429	5714	3571	37857
2	Khera sarai	Khera sarai	15000	4286	2857	3571	25714
3	Selothi	Selothi	11979	4688	4167	3125	23958
		Nangal Brahman	19868	7450	7947	7450	42715
4	Khatela sarai	Khatela sarai	15862	6724	3448	2586	28621
5	Rundhi	Rundhi	12887	4639	3093	2320	22938
6	Deeghot	Deeghot	30347	7803	6936	6936	52023
7	Aurangabad A	Aurangabad A	12125	5196	3464	2598	23383
8	Aurangabad B	Aurangabad B	16917	4511	3008	2820	27256
9	Mitrol	Mitrol	17236	4193	3727	2329	27484
		Tumasra	19486	9517	5438	3399	37840
10	Gudrana	Gudrana	12842	3596	2397	2140	20976
11	Marroli	Marroli	19773	6136	4091	3068	33068
		Sholaka	12898	3869	3095	1935	21797
12	Dakora	Dakora	15000	7683	4390	2744	29817
			281537	**93242**	**70729**	**54940**	**500447**

3.5.4 Comparative Status of crop Productivity

Three major crops namely Wheat, Mustard and Bajra are sown in Watershed villages. Though main crops grown in this area is 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

- Lack of assured irrigation for agriculture.
- Poor availability and quality of ground water.
- Irregular and erratic rainfall: there is long span between two subsequent rainfalls in the area.
- Sudden change in climate of the area.
- Low organic carbon content.
- Poor physical and chemical properties of the soils are light in texture with boulders in pockets and poor fertility.
- Low water holding/ retention capacity.
- Moderate to rapid permeability.
- Poor phosphorous and medium potash nutrients availability.
- Acceptance of hybrid/ high yielding varieties are nil to negligible.
- Soil erosion.
- Essential micro- nutrient deficiency in the soil.
- Dependence of monsoon.
- Low fertilizer consumption per unit cropped area.
- Lack of economic condition of farmers.
- Lack of good quality of seeds and fertilizer.
- Lack of post harvesting facilities such as storage and marketing.

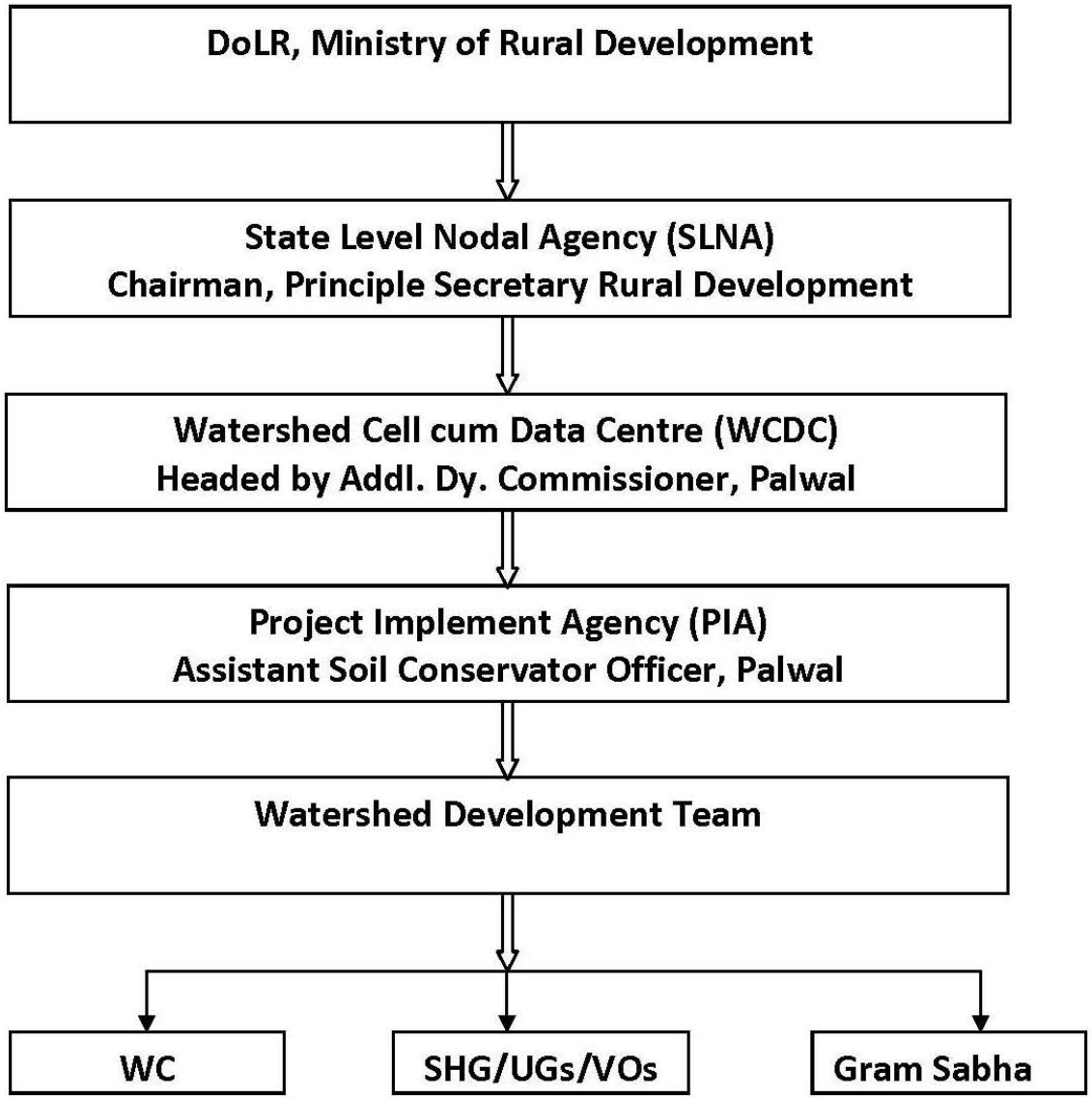
CHAPTER-4

PROJECT MANAGEMENT AGENCIES

4.1 INSTITUTIONAL ARRANGEMENT

Institutions play a major role in managing the projects. Realizing the importance of Community Participation, Decentralized Participatory Approach has been adopted for Watershed Management. Following decentralization and to achieve the objectives, there is a dire need for establishment of Institutional set up from National to Village Level (Micro Watershed Level), including cluster (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, Palwal
Project Implement Agency (PIA)
Assistant Soil Conservator Officer, Palwal
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 completely functional. The regular meetings with PIA and other stake holders are held to provide necessary guidance 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, PALWAL

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

Organization of WCDC and its Objective

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

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

4.4 Project Implementation Agency

The project Implementing Agencies (PIA), ASCO Palwal is selected by the State Level Nodal Agency (SLNA) for Integrated Watershed Management Programme (IWMP) in Haryana. In the district Palwal, where the area of development is 25500 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, Palwal will guide with its. He has a vast experience in implementing various watershed development Projects.

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

PIA will also undertake:

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

Table 1. PIA/ Project Implementing Agency

S.No.	Name of the Project	Details of PIA	
1	Aurangabad Watershed (IWMP II)	i) Type of organization	Government
		ii) Name of organization	Department of Agriculture, Haryana
		iii) Designation & Address	ASCO, Palwal
		iv) Telephone	09896191440
		v) Fax	-
		vi) E-mail	ascopalwal2009@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 and attain to a 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 Palwal district to apprise themselves of the status of ongoing project.

4.5 Watershed Development Team

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

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

a) Constitution of Watershed Committee and its functioning,
b) Organizing and strengthening User groups, Self Help Groups,
c) Mobilizing women to ensure that the perspectives and interests of women are adequately reflected in the watershed action plan
d) Conducting Training and Capacity Building,
e) Common property resource management and equitable sharing

f) Preparing detailed resource development plan including Soil & Water Conservation,
g) Undertake engineering surveys,
h) Prepare engineering drawings and cost estimate for structures to be built.
i) Monitoring, checking, assessing, undertaking physical verification and measurements of the work done
j) Facilitating the development of livelihood opportunities for the landless
k) Maintaining project accounts
l) Arranging physical, financial and social audit of the work undertaken
m) Setting up suitable arrangements for post- project operation, maintenance and future development of the assets created during the project period.

4.6 WATERSHED COMMITTEE DETAILS

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

Their representation of various groups is as under:

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

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

- All alive ex-Sarpanches of concerned Gram Panchayats,

- ❖ Concerned member of Panchayat Samiti,
- ❖ Concerned member of Zila Parishad,

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

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

4.6.1 Formation of Watershed Committees (WC)

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

Table 2. Watershed Committees (WC) Details

Name of the Micro watersheds	Name of village	Name of president	Name of Secretary	Name of Members
Atohan	Atohan	Vimlesh	Ashok Kumar	Nanak Chand, Rameshwari, Santa, Hukam Singh, Chatar Singh, Jile Singh, Jitendar Singh, Ved Wati, Kanta, Janta Devi, Neeraj, Rishipal,Tejpal
	Bahrola	Satte	Mithun	Dayachand, Rajwala, Sohanlal, Satpal, Harbhajan, Horam, Neeraj, Rajvir, Rajesh, Janta Devi, Raj Kumari, Gyan Singh, Lakhpat
Khera Sarai	Khera Sarai	Radha Raman	Om Prakash	Khema, Urmila, Khem Chand, Shusila, Sheela, Raman Lal, Prem, Dharam, Jyoti Arya, Janta, Lakshmi, Vidya Sagar, Prem
Sailothi	Sailothi	Chandrapal	Manoj Kumar	Balraj, Sarla, Manohar, Udaywati, Bijendar, Jagdish, Sukant Devi, Atar singh, Neeraj, Rakesh, Girraj, Janta Devi, Narvir
	Nangal Brahman	Savitri	Yogesh Kumar	Somota, Trilok Chand, Sunita, Ramvati, Fateram, Shri Ram, Fateram, Lahri, Neeraj , Ramesh, Lokesh Kumar, Narvir,Janta Devi

Khatela Sarai	Khatela Sarai	Mufida	Jamsade	Deen Mohmad, Rojdar Khan, Zile Singh, Mukut, Akbar, Rafik, Khusimba, Hasan Mohmad, Gaurav Yadav, Mahendra, Veer wati, Sakila, Firoja
Rundhi	Rundhi	Shiv Narayan	Ganga Ram	Rajpal, Bal Mukand, Ram Sharan, Hari Ram, Sakuntla, Sukhvir, Khiladi, Manoj Kumar, Janta Devi, Nenpal, Nirmala, Neeraj,Shivram
Deeghot	Deeghot	Savitri	Dulichand	Chinta Devi, Jayraj, Hansraj, Veer Singh, Rajvir, Vijan, Prahlad, Jyoti Arya, Harkhyal, Priti, Janta Devi, Rajvir, Satvir
Aurangabad A	Aurangabad A	Mukhtyar Singh	Shyam Lal	Bijendra Singh, Kamlesh, Attar Singh, Dhanpat Ram, Malook Chand, Sukh Ram, Tej Singh, Tej Pal, Janta Devi, Vijay Singh, Bhavna, Ratan, Jyoti arya
Aurangabad B	Aurangabad B	Hardeep	Randhir	Indar, Rajjan Devi, Kashmiri, Khem Chand, Dev Datt, Sohan Lal, Raj Vala, Jagdish, Janta Devi, Devi Singh, Rajendra Prasad, Shivram, Jyoti Arya
Mitrol	Mitrol	Bhajan Lal Arya	Tota Ram	Shyam Sundar Varma, Geeta, Devendar, Shamsher, Ranjit Singh, Naresh, Hari Singh, Sher Singh, Jyoti Arya, Vedraj, Ved Prakash, Bijendar, Hoshiyar
	Tumasra	Indraj	Jashvir	Parkash, Gyan Singh, Harchand, Raju, Javitri, Ramhet, Vinod, Kartar Singh, Manhori Lal, Gaurav Yadav, Narendra, Mahendra, Nanak Chand,
Gudrana	Gudrana	Sushil Kumar	Madan Kumar	Chhajia, Shyamwati, Yadram, Hukam Chand, Nihal Singh, Radha Devi, Bhagmal, Santpal, Gaurav Yadav, Mahendra, Narendra, Sukhnandan, Uday Kumar
Marroli	Marroli	Brham Prakash	Pushkar	Shyam Lal, Radhe Lal, Ratti Ram, Chatra Devi, Dharam Lal, Jogendar, Ram Singh, Jogendra Singh, Gaurav Yadav, Mahendra, Pratap, Vijay, Harkishan
	Sholaka	Sher Mohmad	Irsad	Sodik, Jamaluddin, Safiran, Pahlu, Iqbal, rasid, Safid, Shakina, Gaurav Yadav, Mahendra, Pratap, Babu, Sakil,
Dakora	Dakora	Ganga Devi	Pravin Kumar	Chandar Wati, Satvir, Mohan, Satpal, Rajendar, Dharampal, Mukesh, Ajay, Gaurav Yadav, Gajendra, pahladi, Saroj, Ram Prasad

As per the Government decision, Sarpanch of the village is the chairman of the watershed committee. The Secretary of the Watershed Committee has been appointed by the Watershed Committee in the meeting of Gram Sabha. The

Secretary will be paid honorarium and would be independent from the functioning of Panchayat Secretary. The secretary would be dedicated in the project activities and would take care of the watershed supervision and would be fully responsible for organizing the meeting and maintenance of records. The main responsibilities of secretary are as under:

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

4.7 INSTITUTIONAL SETUP AT WATERSHED LEVEL

4.7.1 Self Help Groups

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

4.7.2 User Groups

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

CHAPTER- 5

BUDGETING

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

IWMP II AURANGABAD 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
Aurangabad Watershed (IWMP II)	8084	6520	78240000	Administrative costs	782400	782400	2347200	2347200	1564800	**7824000**
				Monitoring	0	0	0	782400	0	**782400**
				Evaluation	0	195600	195600	195600	195600	**782400**
				Entry point activities	3129600	0	0	0	0	**3129600**
				Institution and capacity building	0	3912000	0	0	0	**3912000**
				Detailed project report	782400	0	0	0	0	**782400**
				Watershed development works	0	6259200	12518400	13300800	11736000	**43814400**
				Livelihood activities for the asset less persons	0	0	2347200	3912000	782400	**7041600**
				Production system and micro enterprises	0	0	2347200	3129600	2347200	**7824000**
				Consolidation phase	0	0	0	0	2347200	**2347200**
				Total	**4694400**	**11149200**	**19755600**	**23667600**	**18973200**	**78240000**
				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: Atohan)

(BUDGET AT A GLANCE)

Effective Area	Funds Available	Name of activity	1st Year	2nd Year	3rd Year	4th Year	5th Year	Total
415	4980000	Administrative costs	49800	49800	149400	149400	99600	**498000**
		Monitoring	0	0	0	49800	0	**49800**
		Evaluation	0	12450	12450	12450	12450	**49800**
		Entry point activities	199200	0	0	0	0	**199200**
		Institution and capacity building	0	249000	0	0	0	**249000**
		Detailed project report	49800	0	0	0	0	**49800**
		Watershed development works	0	398400	796800	846600	747000	**2788800**
		Livelihood activities for the asset less persons	0	0	149400	249000	49800	**448200**
		Production system and micro enterprises	0	0	149400	199200	149400	**498000**
		Consolidation phase	0	0	0	0	149400	**149400**
		Total	**298800**	**709650**	**1257450**	**1506450**	**1207650**	**4980000**
		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: Khera Sarai)

(BUDGET AT A GLANCE)

Effective Area	Funds Available	Name of activity	1st Year	2nd Year	3rd Year	4th Year	5th Year	Total
520	6240000	Administrative costs	62400	62400	187200	187200	128400	**627600**
		Monitoring	0	0	0	62400	0	**62400**
		Evaluation	0	15600	15600	15600	15600	**62400**
		Entry point activities	249600	0	0	0	0	**249600**
		Institution and capacity building	0	312000	0	0	0	**312000**
		Detailed project report	62400	0	0	0	0	**62400**
		Watershed development works	0	499200	998400	1060800	932400	**3490800**
		Livelihood activities for the asset less persons	0	0	187200	312000	62400	**561600**
		Production system and micro enterprises	0	0	187200	249600	187200	**624000**
		Consolidation phase	0	0	0	0	187200	**187200**
		Total	**374400**	**889200**	**1575600**	**1887600**	**1513200**	**6240000**
		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: Selothi)
(BUDGET AT A GLANCE)

Effective Area	Funds Available	Name of activity	1st Year	2nd Year	3rd Year	4th Year	5th Year	Total
760	9120000	Administrative costs	91200	91200	273600	273600	182400	**912000**
		Monitoring	0	0	0	91200	0	**91200**
		Evaluation	0	22800	22800	22800	22800	**91200**
		Entry point activities	364800	0	0	0	0	**364800**
		Institution and capacity building	0	456000	0	0	0	**456000**
		Detailed project report	91200	0	0	0	0	**91200**
		Watershed development works	0	729600	1459200	1550400	1368000	**5107200**
		Livelihood activities for the asset less persons	0	0	273600	456000	91200	**820800**
		Production system and micro enterprises	0	0	273600	364800	273600	**912000**
		Consolidation phase	0	0	0	0	273600	**273600**
		Total	**547200**	**1299600**	**2302800**	**2758800**	**2211600**	**9120000**
		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: Khatela Sarai)

(BUDGET AT A GLANCE)

Effective Area	Funds Available	Name of activity	1st Year	2nd Year	3rd Year	4th Year	5th Year	Total
510	6120000	Administrative costs	61200	61200	183600	183600	122400	**612000**
		Monitoring	0	0	0	61200	0	**61200**
		Evaluation	0	15300	15300	15300	15300	**61200**
		Entry point activities	244800	0	0	0	0	**244800**
		Institution and capacity building	0	306000	0	0	0	**306000**
		Detailed project report	61200	0	0	0	0	**61200**
		Watershed development works	0	489600	979200	1040400	918000	**3427200**
		Livelihood activities for the asset less persons	0	0	183600	306000	61200	**550800**
		Production system and micro enterprises	0	0	183600	244800	183600	**612000**
		Consolidation phase	0	0	0	0	183600	**183600**
		Total	**367200**	**872100**	**1545300**	**1851300**	**1484100**	**6120000**
		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: Rundhi)

(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 7. PHASING YEAR WISE (Name of the Micro Watershed: Dighot)
(BUDGET AT A GLANCE)

Effective Area	Funds Available	Name of activity	1st Year	2nd Year	3rd Year	4th Year	5th Year	Total
610	7320000	Administrative costs	73200	73200	219600	219600	146400	**732000**
		Monitoring	0	0	0	73200	0	**73200**
		Evaluation	0	18300	18300	18300	18300	**73200**
		Entry point activities	292800	0	0	0	0	**292800**
		Institution and capacity building	0	366000	0	0	0	**366000**
		Detailed project report	73200	0	0	0	0	**73200**
		Watershed development works	0	585600	1171200	1244400	1098000	**4099200**
		Livelihood activities for the asset less persons	0	0	219600	366000	73200	**658800**
		Production system and micro enterprises	0	0	219600	292800	219600	**732000**
		Consolidation phase	0	0	0	0	219600	**219600**
		Total	**439200**	**1043100**	**1848300**	**2214300**	**1775100**	**7320000**
		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: Aurangabad A)
(BUDGET AT A GLANCE)

Effective Area	Funds Available	Name of activity	1st Year	2nd Year	3rd Year	4th Year	5th Year	Total
625	7500000	Administrative costs	75000	75000	225000	225000	150000	**750000**
		Monitoring	0	0	0	75000	0	**75000**
		Evaluation	0	18750	18750	18750	18750	**75000**
		Entry point activities	300000	0	0	0	0	**300000**
		Institution and capacity building	0	375000	0	0	0	**375000**
		Detailed project report	75000	0	0	0	0	**75000**
		Watershed development works	0	600000	1200000	1275000	1125000	**4200000**
		Livelihood activities for the asset less persons	0	0	225000	375000	75000	**675000**
		Production system and micro enterprises	0	0	225000	300000	225000	**750000**
		Consolidation phase	0	0	0	0	225000	**225000**
		Total	**450000**	**1068750**	**1893750**	**2268750**	**1818750**	**7500000**
		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: Aurangabad B)
(BUDGET AT A GLANCE)

Effective Area	Funds Available	Name of activity	1st Year	2nd Year	3rd Year	4th Year	5th Year	Total
610	7320000	Administrative costs	73200	73200	219600	219600	146400	**732000**
		Monitoring	0	0	0	73200	0	**73200**
		Evaluation	0	18300	18300	18300	18300	**73200**
		Entry point activities	292800	0	0	0	0	**292800**
		Institution and capacity building	0	366000	0	0	0	**366000**
		Detailed project report	73200	0	0	0	0	**73200**
		Watershed development works	0	585600	1171200	1244400	1098000	**4099200**
		Livelihood activities for the asset less persons	0	0	219600	366000	73200	**658800**
		Production system and micro enterprises	0	0	219600	292800	219600	**732000**
		Consolidation phase	0	0	0	0	219600	**219600**
		Total	**439200**	**1043100**	**1848300**	**2214300**	**1775100**	**7320000**
		Percentage of total cost	**6%**	**14.25%**	**25.25%**	**30.25%**	**24.25%**	**100%**

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

Area in Hectares and
Funds in Rs.

Table 10. PHASING YEAR WISE (Name of the Micro Watershed: Mitnol)
(BUDGET AT A GLANCE)

Effective Area	Funds Available	Name of activity	1st Year	2nd Year	3rd Year	4th Year	5th Year	Total
510	6120000	Administrative costs	61200	61200	183600	183600	122400	**612000**
		Monitoring	0	0	0	61200	0	**61200**
		Evaluation	0	15300	15300	15300	15300	**61200**
		Entry point activities	244800	0	0	0	0	**244800**
		Institution and capacity building	0	306000	0	0	0	**306000**
		Detailed project report	61200	0	0	0	0	**61200**
		Watershed development works	0	489600	979200	1040400	918000	**3427200**
		Livelihood activities for the asset less persons	0	0	183600	306000	61200	**550800**
		Production system and micro enterprises	0	0	183600	244800	183600	**612000**
		Consolidation phase	0	0	0	0	183600	**183600**
		Total	**367200**	**872100**	**1545300**	**1851300**	**1484100**	**6120000**
		Percentage of total cost	**6%**	**14.25%**	**25.25%**	**30.25%**	**24.25%**	**100%**

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

Area in Hectares and
Funds in Rs.

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

(BUDGET AT A GLANCE)

Effective Area	Funds Available	Name of activity	1st Year	2nd Year	3rd Year	4th Year	5th Year	Total
510	6120000	Administrative costs	61200	61200	183600	183600	122400	**612000**
		Monitoring	0	0	0	61200	0	**61200**
		Evaluation	0	15300	15300	15300	15300	**61200**
		Entry point activities	244800	0	0	0	0	**244800**
		Institution and capacity building	0	306000	0	0	0	**306000**
		Detailed project report	61200	0	0	0	0	**61200**
		Watershed development works	0	489600	979200	1040400	918000	**3427200**
		Livelihood activities for the asset less persons	0	0	183600	306000	61200	**550800**
		Production system and micro enterprises	0	0	183600	244800	183600	**612000**
		Consolidation phase	0	0	0	0	183600	**183600**
		Total	**367200**	**872100**	**1545300**	**1851300**	**1484100**	**6120000**
		Percentage of total cost	**6%**	**14.25%**	**25.25%**	**30.25%**	**24.25%**	**100%**

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

Area in Hectares and
Funds in Rs.

Table 12. PHASING YEAR WISE (Name of the Micro Watershed: Marroli)

(BUDGET AT A GLANCE)

Effective Area	Funds Available	Name of activity	1st Year	2nd Year	3rd Year	4th Year	5th Year	Total
495	5940000	Administrative costs	59400	59400	178200	178200	118800	**594000**
		Monitoring	0	0	0	59400	0	**59400**
		Evaluation	0	14850	14850	14850	14850	**59400**
		Entry point activities	237600	0	0	0	0	**237600**
		Institution and capacity building	0	297000	0	0	0	**297000**
		Detailed project report	59400	0	0	0	0	**59400**
		Watershed development works	0	475200	950400	1009800	891000	**3326400**
		Livelihood activities for the asset less persons	0	0	178200	297000	59400	**534600**
		Production system and micro enterprises	0	0	178200	237600	178200	**594000**
		Consolidation phase	0	0	0	0	178200	**178200**
		Total	**356400**	**846450**	**1499850**	**1796850**	**1440450**	**5940000**
		Percentage of total cost	**6%**	**14.25%**	**25.25%**	**30.25%**	**24.25%**	**100%**

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

Area in Hectares and
Funds in Rs.

Table 13. PHASING YEAR WISE (Name of the Micro Watershed: Dakora)

(BUDGET AT A GLANCE)

Effective Area	Funds Available	Name of activity	1st Year	2nd Year	3rd Year	4th Year	5th Year	Total
450	5400000	Administrative costs	54000	54000	162000	162000	108000	**540000**
		Monitoring	0	0	0	54000	0	**54000**
		Evaluation	0	13500	13500	13500	13500	**54000**
		Entry point activities	216000	0	0	0	0	**216000**
		Institution and capacity building	0	270000	0	0	0	**270000**
		Detailed project report	54000	0	0	0	0	**54000**
		Watershed development works	0	432000	864000	918000	810000	**3024000**
		Livelihood activities for the asset less persons	0	0	162000	270000	54000	**486000**
		Production system and micro enterprises	0	0	162000	216000	162000	**540000**
		Consolidation phase	0	0	0	0	162000	**162000**
		Total	**324000**	**769500**	**1363500**	**1633500**	**1309500**	**5400000**
		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. These groups shall be revived and new ones were to be formed depending upon willingness of the interest groups. Considering and understanding the type of activities these groups wish to pursue and their capacity building requirements were given importance and duly 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 level, micro-watershed wise and village wise by involving the concerned departments and members of Gram Sabha on this aspect**.** The Draft Project Report was prepared on the basic information generated from primary and secondary sources. This also includes the outcome of participatory rural appraisal and outcome of transect walk and stakeholders' discussions. A list of scope of works that finally emerged was prepared. Based on the technical survey, detailed cost estimates were prepared for components including resource management, entry point activities and production system. A broad frame work for capacity building at all levels as per the guidelines of DoLR was prepared. The livelihood opportunities which emerged from local product and market facility were analyzed and outlines of the same were included. Since the financial provisions were decided according to the area proposed to be covered, these provisions were distributed across project activities. The project activities are sequenced into three phase's namely preparatory phase, work phase, consolidation and withdrawal phase. So, the activities were segregated in the sequence and explained in detail. Finally the details about budget and its spilt up into annual action plan were also attempted. Various maps using GIS were created likes Base map, Present Land Use, Geo-hydrological, Micro Watershed, Drainage, Contours, Slope, Soil

Classification, 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 Palwal district.

Strengths

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

Weaknesses

- Erratic rainfall
- Lack of good quality fodder.
- Lack of advanced cattle breed.
- Low level of milk production.
- Lack of knowledge base regarding scientific cattle management.

- Prevalence of soil erosion
- No organized micro enterprises activities.
- Lack of technical skills.

Opportunities

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

Threats

There are few negative issues that may have adverse effect

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

CAPACITY BUILDING- 5%

Rs. 39, 12, 000/-

6.2 Capacity Building

1. Introduction

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

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

2. Vision

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

3. Need

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

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

4. Rationale

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

- Dedicated & decentralized institutional support & delivery mechanism
- Annual Action Plan for Capacity Building

- Pool of resource persons
- Well prepared training modules and reading materials
- Mechanism for effective monitoring and follow-up.

Keeping in firsthand experience of the state in launching 47 projects under IWMP and current state of planning and implementation under preparatory phase is to primarily prepared and 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 Palwal District

Sl. No.	Title of Training Programme and Duration	Level of Participants	Total persons	Trainees Per Programme	Number of Programmes
01	District Level Sensitization Workshop for Watershed Committees. **One Day**				
	Palwal	Members of Watershed Committees @ 15 per committee would also include accompanying WDT Members.	570	150-250	2
02	Block Level Functional Programmes for Secretaries of Watershed Committees. **Two Days**				
	Palwal	Secretaries of Village Watershed Committees	38	15-45	1
03	Project Level Sensitization Camps for WC **One Days**				
	Palwal	Members of Watershed Committees @ 15 Persons (Tentative) per WC	570	50	12
04	Village Level Awareness Camps on IWMP at Micro Watershed Level for User Groups **One Day**				
	Palwal	Approximately 50 prospective user groups per micro watershed.	1900	50	38
05	Block Level Functional Programmes for SHGs [Leader, Secretary and Treasurer] under IWMP **One Day**				
	Palwal	Average of at least one SHG per village is taken and 15 persons per self help groups are proposed for training (1 SHG x 15 members x 1 village= 2700].	570	50	11

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	40818
2	Block Level Functional Programmes for Secretaries of Watershed Committees. Two Days	5315
3	Village Level Sensitization Camps for WC One Days	28427
4	Village Level Awareness Camps on IWMP at Micro Watershed Level for Prospective User Groups One Day	38206
5	Block Level Functional Programmes for SHGs [Leader, Secretary and Treasurer] under IWMP One Day	10538
	Total	**123304**

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

S. No.	Target Group	Training Topics	No. of days	Budget per camp	No. of Camps	No. of Participants per camp	Cost for all participants per day	Cost per participant/ per day	Cost per person	Total Budget
1	Self Help Groups- 2 SHGs- micro watershed level	Orientation on IWMP, SHGs cum Exposure Visit	2	30000	5	15	75000	1000	2000	150000

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
2	User groups from each micro watershed	NRM, Post Project Management etc. –Exposure Visit	2	30000	5	15	75000	1000	2000	150000
3	Sub watershed Level- WDT Members	Part II-Module I to V-Exposure Visit Outside State- Conceptual, Technical, Social, Management of Finance, Monitoring and Evaluation.	4	90000	5	15	112500	1500	4500	450000
4	Sub watershed Level- PIA Members	Exposure Visit- Within Fundamentals of Watershed, Finance Management, Final Report on WDP etc	2	45000	5	15	1125000	1500	3000	225000
5	District Level-WDC	Exposure visit to successful watershed/ University.	2	30000	5	15	75000	1000	2000	150000
6	District Level-Line Deptt., WDC	Exposure visit to successful watersheds within state.	2	30000	5	15	75000	1000	2000	150000

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
7	SLNA and District Level Controlling Officers	Exposure visit to successful watersheds outside state	4	90000	5	15	112500	1500	4500	450000
Total			**18**		**35**	**105**				**1725000**

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

S. No.	District	No. Micro watersheds	No. of Camps/ Year/ Micro watershed	Total No. of camps per Year	Total No. of camps for 5 Year's	Amount of per Camp	Amount per Micro watershed	Total Budget
1.	Farmer Training Camp in each season	12	2	24	120	12,000	120000	1440000
2.	Propaganda & Documentation (Puppet show, documentary movies show, video-graphy, Photography, wall Painting, Display Board, pamphlets, leaf lets. Etc)	12	2	24	120	5000	50000	600000
3	Contingency charges							23696
	Total							**2063696**

i) **Training Programmes for SLNA, WDT, PIA , Field Functionary , WDC member's , SHG & UG organize by HIRD = Rs. 1,23,304/-**

ii) **Micro Watershed Wise Exposure cum training Visit For SLNA, WDT, PIA , Field Functionary , WDC, SHG & UG Members**
= Rs. 17,25,000/-

iii) **Farmer's / Beneficiaries training camps with Extension Program's = Rs. 20,63,696/-**

Grand Total = Rs. 39,12,000/-

6.2.1. EXPECTED OUTCOME OF CAPACITY BUILDING

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

6.3 Entry Point Activities 4%

EPA activities are taken up under the watershed to build rapport with village community at the beginning of the project, generally certain important works which are in urgent demand of the local community are taken up. A group discussion was conducted in the Gram Sabha meeting/watershed committee regarding EPA activities. It was conveyed to the Gram Sabha that an amount of **Rs. 31, 29,600/-** 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 Aurangabad Watershed (IWMP II)

(Rs. In Lacs)

S.No.	Block	Name of Project	No. of EPAs Identified	No. of EPAs Completed	No. of EPAs In progress	Name/ Nature of EPA	Location	Expenditure Rs. In lacs
1	Hodal	Aurangabad	16	14	---	Retaining wall	Atohan	1.08000
						Retaining Wall	Bahrola	0.99957
						Retaining Wall	Sailothi	3.65000
						Retaining Wall of Pond	Nangal brahman	Nill
						Retaining Wall	Khera Sarai	2.50000
						Construction of Retaining Wall	Khatela Sarai	2.45000
						Construction of Retaining Wall	Rundhi	2.42000
						Construction of Retaining Wall	Deeghot	2.93000

						Retaining Wall of Pond	Aurangabad A	2.10654
						Spoting Wall	…..do…...	0.11389
						Open Channel	….do…..	0.81520
						Retaining Wall of Pond/ Inlet of Pnd	Aurangabad B	2.84048
						UGPL for Drinking Water	Mitrol	1.45683
						Water Tank in School	Tumasra	0.98000
						Cow Ghat	Gudrana	2.45000
						Roof Rain Water HarvestingInlet	Marroli	Nill
						Construction of Retaining Wall	Sholaka	2.38000
						Water Tunki in School	Dakora	0.16000
						Retaining Wall of Pond	Dakora	1.93520
					Total			**31.26771**

Total project Cost @ 4%= Rs. 31,29,600/-

CHAPTER- 7

WORK PHASE

7.1 WATERSHED DEVELOPMENT WORKS - 56%

The Works identified after the detailed investigation and survey of the Project Area and identified works were discussed with the team of experts comprising of PIA associated with the field officers working in the area, Hydrologist and supported by Experts from Livelihood, Agriculture, Animal Husbandry and Horticulture. 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/ Construction of New ponds, Roof top rainwater harvesting kund, Small Earthen Embankment with vegetative support, Water Conveyance System, Open channel, Construction of Ramp, Construction of Retaining wall 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/village wise.

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

Drainage line Treatment

Existing System: The project area has an undulated and hummocks which are restrict to field operations to stabilized agriculture fields/ habitation located along the banks of ponds and agriculture land. The main objectives of these structures are in situ moisture conservation, soil conservation, field boundary stabilization, land leveling and safe disposal

of run off to protect agriculture fields. The land holding is small and loss of land badly affects the economy of the family. The projects executed under DDP/DPAP, stone masonry protection walls were constructed at strategic locations which saved the land of the farmers and banks of village ponds.

Proposed System: Run-off from upper area shall be reduced by Afforestation and rain water harvesting/ Earthen Structures for recharge which would also check the soil erosion. As per need, earthen embankment with pucca outlet are proposed at strategic locations on field boundaries of undulated area to protect the farm lands, bank of ponds, habitation and infrastructure.

7.2 Renovation for capacity enhancement and construction of new Ponds

Existing System: 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, out lets and ramps for water disposal. There is genuine demand for renovation for capacity enhancement construction of new ponds in the area.

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

Gram Panchayat spend much money on renovation under different schemes but due to paucity of funds, works are taken up in piece meal and main works of protection measures are ignored. The stakeholders gave high priority for the construction of protection measures as lot of water was leaking from sides and cutting of banks by waves and animal intervention to reduce capacity of pond. In most villages, the first priority of the entire community is the construction of

protection measures of the ponds as these are considered sacred due to the presence of historic village temples nearby. Some of the works had been covered under entry point activities. It is also stressed to use the labor component from MGNREGA and material from provision from the IWMP so that maximum amount of rainwater is harvested.

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

Sample estimates are as follows:

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

Name of the Project: IWMP-2		**Name of Watershed:-Aurangabad**						**Name of Village: – Atohan**		
Sr. No.	**Nature of work**	**Location**	**Latitude N**	**Longitude E**	**Unit**	**No. of work**		**1.Catchment in cum 2. Catchment area 3.command area**	**Estimated Cost Rs. In lacs**	**Objective**
						Phy.	**Unit cost (Rs.)**			
1	Deepening of pond	Out of village	28.05593’	077.20.996’	No.	1	4.00 lacs	10100 18 hac 16 hac 8 farmer	4.00	Enhancement of pondage capacity and recharge water table & Water harvesting
2	Land Leveling *& Bunding	Panchayat Land	28.05.873’	077.20.805’	ha	10	0.30 lacs	------	3.00	To provide suitable field surface for controlling flow of water, check soil erosion, better surface drainage and conservation of moisture
3	Injection Well	Near Temple Pond	28.05.081’	077.20.743’	No.	1	3.00 lacs	-------	3.00	Recharging of rain water and improve water quality
4	Water Conveyance System	Community land	-	-	m	800	500	8 hac 10 farmer	4.00	Enhancing crop production
Total cost									**14.00**	
Available fund									**13.77**	
Convergence									**0.23**	

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Name of the Project: IWMP -2		**Name of Watershed: Aurangabad**			**Name of Village: Bahrola**				
Sr. No.	**Nature of work**	**Location**	**Latitude N**	**Longitude E**	**Unit**	**No. of work**		**1.Catchment in cum 2. Catchment area 3.command area**	**Estimate Cost Rs. In lacs**	**Objective**
						Phy.	**Unit cost (Rs.)**			
1	Deepening of pond	Village pond	28.05.078’	077.20.252’	No.	2/20 hac	4.00	5600 10 hac 7 hac/ 3farmer	8.00	Enhancement of pondage capacity and to provide drinking water
2	Retaining wall / in let out let	Village Periphery	28.05.182’	077.20.421’	M	1	7.00 lacs	----------	7.00	To check soil erosion
Total cost									**15.00**	
Available fund									**14.11**	
Convergence									**0.89**	

Name of the Project: IWMP-2		**Name of Watershed:- Aurangabad**		**Name of Village:- Khera Sarai**						
Sr. No.	**Nature of work**	**Location**	**Latitude N**	**Longitude E**	**Unit**	**No. of work**		**1.Catchment in cum 2. Catchment area 3.command area**	**Estimate Cost Rs. In lacs**	**Objective**
						Phy.	**Unit cost (Rs.)**			
1	Injection well for recharging	Panchayat land, Barat ghar	28.03.713' 28.04.165'	077.20.706' 077.21.140'	No.	2	4.00	-----	8.00	For recharging of water for improve water quality increase water table
2	Water Conveyance system	Sailothi Minor to Near Temple pond			M	5500	250	5100 9 hac 8 hac 8 Farmer	13.75	Saving of water and enhancing the irrigation area
3	Digging of New Pond	Panchayat land (large pond)	28.04.355'	077.21.245'	No.	1/20 hac	6.00	7800 14 hac 10 hac 8farmer	6.00	Enhancement of pondage capacity and to provide drinking water to livestock water recharging
4	Construction of Ramp	Phatak Wala pond, Temple pond	28.03.705' 28.04.355	077.21.270' 077.21.270'	2	2	1.50	-------	3.00	To check soil and water erosion
5	Roof Top Rain Water harvesting structure	Govt. School	28.03.636'	077.20.900	No.	1	5.00	--------	5.00	To store clean water for drinking purpose and check mud problems
6	Land Leveling & Bunding *	Community land	28.04.410'	077.21.230'	ha	5	0.30	----------	1.50	To provide suitable field surface for controlling flow of water, check soil erosion, better surface drainage and conservation of moisture
7	Horticulture	Panchayat & Private land	28.03.636'	077.20.900	Ha	5.0	0.40	----------	2.00	To Increase Fruit production

8	Agro Forestry	Panchayat & Private land	28.04.410’	077.21.230’	Ha	7.5	0.20	----------	1.50	For Environment Safety, soil &water conservation and fodder for animals
Total cost									**35.50**	
Available fund									**34.94**	
convergence									**0.56**	

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Name of the Project: IWMP-2		**Name of Watershed: Aurangabad A**			**Name of Village: –Sailoti**					
Sr. No.	**Nature of work**	**Location**	**Latitude N**	**Longitude E**	**Unit**	**No. of work**		**1.Catchment in cum 2. Catchment area 3.command area**	**Estimate Cost Rs. In lacs**	**Objective**
						Phy.	**Unit cost (Rs.)**			
1	Renovation of Pond & Construction of Ramp	Badhera Pond& bada pond near temple	28.09.605’	077.22.081’	No.	1/20 hac	4.00	8900 16 hac 14 hac 7 Farmer	4.00	Enhancement of pondage capacity and to provide inlet and outlet, and provide drinking water for animals
2	Water Conveyance System	From Sailothi Minor to Badhra Pond,Community land	28.03.995’	077.21.581’	m	2700 m	500	---do--	13.50	Saving of conveyance losses and enhancing the irrigation area For crop production
3	Injection well	bada pond near temple ,Govt school	28.09.605’ 28.04.781’	077.22.081’ 077.21.844’	No	2	2.00	----------	4.00	For recharging and excess water
4	Roof Top Rain Water Harvesting	School building	28.04.781’	077.21.844’	No.	2	6.00	-------	6.00	To save clean drinking water and check flood and mud problem.
5	Plantation	School building	28.04.771’	077.21.840’	Ha	1	0.50	-------	5.00	Increase Bio mass cover
6	Horticulture	Panchayat & Private land			Ha	8	0.40	-------	3.20	To Increase Fruit production
7	Agro Forestry	Panchayat & Private land			Ha	5	0.20	--------	1.00	For Environment Safety
Total cost									**32.20**	

Available fund		**31.92**	
Convergence		**0.28**	

Name of the Project: IWMP-2		**Name of Watershed: Aurangabad**			**Name of Village: Nangal Brahmn**				
Sr. No.	**Nature of work**	**Location**	**Latitude N**	**Longitude E**	**Unit**	**No. of work**		**1.Catchment in cum 2. Catchment area 3.command area**	**Estimate Cost Rs. In lacs**	**Objective**
						Phy.	**Unit cost (Rs.)**			
1	Artificial Water Recharging (Injection Well)	Community land	28.04.373’	077.22.932’	No.	3	2.00	----------	6.00	Water conservation and recharging, & check flood and mud problem
2	Deepening of Pond for enhancement of capacity	Community land (large pond)	28.04.340’	077.22.892’	No.	1/20	4.00	7800 14 hac 12 hac 10 farmer	4.00	Enhancement of pondage capacity and recharge water table, and To provide drinking water To live stock
3	Land leveling &Bunding *	Community land	28.04.373’	077.22.932’	No.	1	1.50	---------	1.50	To check soil and water Erosion
4	Water Conveyance System	Community land			m	1600	500	15 hac 12 farmer	8.00	Saving of conveyance losses and enhancing the irrigation area for crop production
5	Plantation	Panchayat land and school			ha	2	0.50	---------	1.00	To increase biomass cover
Total cost									**20.50**	
Available fund									**19.15**	
Convergence									**1.35**	

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Name of the Project: IWMP-2		**Name of Watershed: Aurangabad**			**Name of Village: Rundhi**				
Sr. No.	**Nature of work**	**Location**	**Latitude N**	**Longitude E**	**Unit**	**No. of work**		**1.Catchment in cum 2. Catchment area 3.command area**	**Estimate Cost Rs. In lacs**	**Objective**
						Phy.	**Unit cost (Rs.)**			
1	Deepening of Pond & Ramp	Panchayat Pond &Near Temple pond	28.02.934’	077.23.296’	No.	2/40 hac	2.50	6700 12 hac 10 hac 8 Farmer	5.00	Enhancement of pondage capacity and recharge water table
2	Farm pond /new Pond	Community Land	28.03.700’	077.22.395’	No.	1	3.00	5600 10 hac 8 hac 5 Farmer	3.00	To increase water table and Recharging oduction and And used of drip irrigation system ,save water, increase production
3	Recharging & Renovation of well (Injection well)	Community well	28.03.096’	077.23.335	No.	2	2.00	---------	4.00	To recharge rainwater Excess system, improve quality Of water
4	Land leveling * & Fencing	Community Land	28.03.096’	077.23.335	ha	5	0.30	----------	1.50	To provide suitable field surface for controlling flow of water, check soil erosion, better surface drainage and conservation of moisture
5	Water Conveyance System	Community Land			m	2000	500	18 hac 5 farmer	10.00	Saving of conveyance losses and enhancing the irrigation area

6	Plantation	Community Land and school	28.03.096’	077.23.335	ha	5	0.50	----------	2.50	To increase biomass cover& check soil and water erosion
7	Horticulture	Panchayat & Private			Ha	15	0.40	----------	6.00	To increase Fruit Production
8	Agro Forestry	Panchayat & Private			Ha	10	0.20	----------	2.00	For Environment Safety, soil &water conservation and fodder for animals
Total cost									**35.00**	
Available fund									**33.93**	
Convergence									**1.07**	

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Name of the Project: IWMP-2		**Name of Watershed: Aurangabad**			**Name of Village: Deeghot**				
Sr. No.	**Nature of work**	**Location**	**Latitude N**	**Longitude E**	**Unit**	**No. of work**		**.Catchment in cum 2. Catchment area 3.command area**	**Estimate Cost Rs. In lacs**	**Objective**
						Phy.	**Unit cost (Rs.)**			
1	Deepening of pond and construction of ramp	Panchayat land (large pond)	28.02.546’	077.21.068’	No.	3	3.00	10100 18 hac 16 hac 9 Farmer	9.00	Enhancement of pondage capacity and to provide drinking water to live stock
2	Injection well	Large pond	28.01.969’	077.22.691’	2	2	2.00	---------	4.00	For recharging of excess water
3	Plantation	ponds, school	28.02.743’	077.21.018’	Ha	6 hac	0.50	---------	3.00	To increase biomass cover
4	Water Conveyance System	Communit y land			M	3000	500	28 hac 20 farmer	15.00	Saving of conveyance losses and enhancing the irrigation area for crop Production
5	Roof Top Rain Water Harvesting	School building	28.02.014’	077.22.656’	No.	1	4.00	----------	4.00	To check flood and Mud problem.
6	Horticulture	Private & panchayat land			Ha	10	0.40	----------	4.00	Increase Fruit Production
7	Land Levelling *	panchayat land& school	28.02.088’	077.21.949’	Ha	2	2.50	----------	5.00	To provide better Environment &, check soil erosion in crop Production
Total cost									**44.00**	
Available fund									**40.99**	
Convergence									**3.01**	

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Name of the Project: IWMP-2		**Name of Watershed: Aurangabad**			**Name of Village: Aurangabad-A**				
Sr. No.	**Nature of work**	**Location**	**Latitude N**	**Longitude E**	**Unit**	**No. of work**		**1. Catchment in cum 2. Catchment area 3.command area**	**Estimate Cost Rs. In lacs**	**Objective**
						Phy.	**Unit cost (Rs.)**			
1	Deepening of Pond /Ramp	Panchayat land	28.04.499' 28.04.482	077.18.133' 077.18.188'	No.	2/40	4.00	4500 8 hac /7 ha 8 Farmer & 9600 17 hac/14 hac/ 10 Farmer	8.00	To provide drinking water for live Stock
2	Water conveyance system	Community land	28.03.817	077.18.768	m	2300	500	23 hac 13 Farmer	11.50	Saving of conveyance losses and enhancing the irrigation area for crop production
3	Roof Top Rain Water Harvesting Structure	School and Temple building	28.02.733	077.19.889	No.	2	3.00	--------	6.00	To provide drinking water for live stock and human And human and avoid floor, mud problem
4	Recharging and Renovation of well (Injection well)	Private and PRI well	28.02.738	077.19.893	No.	2	2.00	----------	4.00	To improve quality of water and increasing Water table
5	Land leveling * & Bunding	Community land	28.02.820	077.18.889	Ha	16	0.30	----------	4.80	To provide suitable field surface for controlling flow of

										water, check soil erosion, better surface drainage and conservation of moisture
6	Plantation	Panchayat Land	28.02.466	077.19.00	ha	4	0.50	----------	2.00	To increase biomass cover
7	Horticulture	Private & panchayat land	28.02.730	077.19.872	Ha	10	0.40	----------	4.00	To increase Fruit production
9	Agro Forestry	Private & Panchayat land	28.02.734	077.19.879	Ha	10	0.20	----------	3.00	To provide stick and useful wood For many purpose
Total cost									**43.30**	
Available fund									**42.00**	
convergence									**1.30**	

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Name of the Project: IWMP-		**Name of Watershed: Aurangabad**			**Name of Village: Aurangabad B**					
Sr. No.	**Nature of work**	**Location**	**Latitude N**	**Longitude E**	**Unit**	**No. of work**		**1. Catchment in cum 2. Catchment area 3.command area**	**Estimate Cost Rs. In lacs**	**Objective**
						Phy.	**Unit cost (Rs.)**			
1	Water channel linkage pond to pond	Community land	28.00.908	077.19.511	m	1000	500	7300 13 hac 11 hac 8 Farmer	5.00	Drain out excess water of main pond of drain
2	Water conveyance system	village pond, to Kondal drain	28.01.034’	077.18.749’	No.	3600	500	11 hac 12 farmer	18.00	To avoid flood excess water of pond use for Irrigation in agriculture land
3	Injection well	Panchayat land	28.01.456’ 28.01.536’	077.19.624’ 077.19.541’	m	4	2.00	----------	8.00	For rain water recharging
4	Plantation	Community land and school	28.01.907	077.19.573	ha	4	0.50	----------	2.00	To increase biomass cover and to check water and soil erosion
6	Horticulture	Private & Panchat land	28.01.919	077.19.784	Ha	10	0.40	----------	4.00	To increase Fruit production
7	Agro Forestry	Private & Panchayat land	28.01.925	077.19.775	Ha	20	0.20	----------	4.00	For Environment Safety, soil &water conservation and fodder for animals
Total cost									**41.00**	
Available fund									**40.99**	
Convergence									**0.01**	

Name of the Project: IWMP-2		**Name of Watershed: Aurangabad**			**Name of Village: Mitrol**				
Sr. No.	**Nature of work**	**Location**	**Latitude N**	**Longitude E**	**Unit**	**No. of work**		**Catchment in cum 2. Catchment area 3.command area**	**Estimate Cost Rs. In lacs**	**Objective**
						Phy.	**Unit cost (Rs.)**			
1	Renovation of Pond & construction of Ramp	Tulsi Kund & Bani Wala	28.01.700	077.20.838	No.	2/40	4.00	8900 16 hac 13 hac 11 Farmer	8.00	Enhancement of pondage capacity and to provide drinking water for Live stock
2	Injection well	Panchayat land	28.01.765	077.21.185	No.	2	2.00	---------	4.00	To check flood mud problem and Recharging of water
3	Digging of pond , ramp and retaining wall	Village pond	28.01.783	077.20.195	No.	1	5.00	7300 13 hac 10 hac 8 farmer	5.00	Drinking water to live stock & Recharging of lesses water
4	Water conveyance system	Tulsi Kund to Private land	28.01.873	077.20.190	m	1200	500	8 hac 6 farmer	6.00	Saving of conveyance losses and enhancing the irrigation area for crop production.
Total cost									**23.00**	
Available fund									**20.49**	
Convergence									**2.51**	

Name of the Project: IWMP-2 **Name of Watershed: Aurangabad** **Name of Village: Tumasra**

Sr. No.	Nature of work	Location	Latitude N	Longitude E	Unit	No. of work		Catchment in cum 2. Catchment area 3.command area	Estimate Cost Rs. In lacs	Objective
						Phy.	Unit cost (Rs.)			
1	Deepening of pond & Bunding	Panchayat land (large pond)	28’00.571’	077’20.346’	No.	1	2.00	10100 18 hac 14 hac 10 farmer	2.00	To enhance pondage area and provide drinking water for livestock and to recharging of water and improve water quality
2	Plantation	Community Land	28’00.718’	077’20.941’	Ha	3	0.50	------ ------	1.50	To increase biomass cover and check soil and water erosion
3	Water conveyance system	Drain to Pond	28’00.713’	077’20.939’	M	1600	500 (8 inch)	15 hac 9 farmer	8.00	Saving of conveyance losses and enhancing the irrigation area
4	Recharging & Renovation of well / Injection Well	Panchayat well	28’00.560’	077’20.355’	No.	1	2.00	-------- --------	2.00	For recharging of rain water improve water quality increase water table
5	Drainage of Exees Water from School to Pond	Panchayat Land	28’00.560’	077’20.355’	M	100	500	-------- --------	0.50	To avoid flood water from school boundary
Total cost									**14.00**	
Available fund									**13.77**	
Convergence									**0.23**	

Name of the Project: IWMP		Name of Watershed: Aurangabad					Name of Village: Gudrana		
Sr. No.	**Nature of work**	**Location**	**G.P.S Point**		**Unit**	**No. of work**		**1.Catchment in cum 2.Catchment area 3.Command area**	**Estimate Cost Rs. In lacs**	**Objective**
			Latitude N	**Longitude E**		**Phy.**	**Unit cost (Rs.)**			
1	Water conveyance system	Badi Committee To Choti Committee &Sarai minar to Pond	27’59.217’	077’21.344’	M	2000 + 1000	500 (8 inch)	16 hact. 10 farmer	15.00	To provide drinking water for livestock enhancing irrigation area for crop production , recharging of water to improve water quality increasing water table
2	Renovation of Well / Injection Well	Panchayat land	27’59.807’	077’20.859’	No.	3	2.00	--------- ---------	6.00	For water recharging
3	Land Leveling * & Field Bunding	Community land	27’59.563’	077’20.715’	Ha	10	0.30	--------- ---------	3.00	To provide suitable field surface for controlling flow o water check soil erosion, better surface drainage and conservation of moisture
4	New Pond Ramp /Inlet, Deepning	Panchayat land	27’59.807’	077’20.859’	Mt	150	5.00	8400 15 hac 12 hac 10 Farmer	5.00	To enhance pondage capacity to provide drinking water for livestock
5	Horticulture	Panchayat & Private	28’00.220’	077’20.913’	Ha	10	0.40	-------	4.00	To increase Fruit production
6	Agro Forestry	Panchayat & Private	28’00.215’	077’20.910’	Ha	10	0.20	--------	2.00	For Environmental Safety
Total cost									**35.00**	
Available fund									**34.27**	
Convergence									**0.73**	

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

Name of the Project: IWMP-2			**Name of Watershed:- Aurangabad**		**Name of Village:- Marroli**				
Sr. No.	**Nature of work**	**Location**	**Latitude N**	**Longitude E**	**Unit**	**No. of work**		**1.Catchment in cum 2.Catchment area 3.Command area**	**Estimate Cost Rs. In lacs**	**Objective**
						Phy.	**Unit cost (Rs.)**			
1	Digging of new pond /Ramp / Inlet	Panchayat land Near Goshala	27’57.522’	077’23.221’	No.	1	7.00`	11800 21 hac 16 hac/12 Farmer	7.00	To provide water for animals and to recharge ground water table
2	Water conveyance system	Khambi Miner to P.land & New Pond	27’58.114’	077’24.277’	M	3000	500	12 hac 10 Farmer	15.00	Filling of pond to provide drinking water to livestock enhancing irrigation area for crop production and water recharging
3	Repair & Renovation of Well / Injection Well	Panchayat land	27’57.988’	077’22.457’	No.	2	2.00	---------- ----------	4.00	For water recharging
3	Repair & Renovation of Well / Injection Well	Panchayat land	27’57.988’	077’22.457’	No.	2	2.00	---------- ----------	4.00	For water recharging
4	Plantation	Panchayat land	27’58.012’	077’22.490’	Ha	2	0.50	----------	1.00	To increase biomass cover and check soil and water erosion, forage production

5	Horticulture	Private land	27’58.009’	077’22.495’	Ha	2.5	0.40	----------	1.00	To increase Fruit production
Total cost									**28.00**	
Available fund									**25.20**	
Convergence									**2.80**	

Name of the Project: IWMP-2	**Name of Watershed: Aurangabad**	**Name of Village: Solaka**

Sr. No.	**Nature of work**	**Location**	**Latitude N**	**Longitude E**	**Unit**	**No. of work**		**1.Catchment in cum 2.Catchment area 3.Command area**	**Estimate Cost Rs. In lacs**	**Objective**
						Phy.	**Unit cost (Rs.)**			
1	Water convance System	Village periphery to P. Pond	27’58.341’	077’22.737’	M	1000	500 (8 inch)	10100 18 hac 12 hac/12 Farmer	5.00	To provide drinking water for livestock enhancing the irrigation area for crop production
2	Recharging & repair of well	Panchayat land	27’58.385’	077’22.730’	No.	1	2.00	-------	2.00	For recharging rain water
3	Plantation	Community land	27’58.382’	077’22.705’	ha	2	0.50	--------	1.00	To increase biomass cover, check soil and water erosion
4	Horticulture	Private	27’58.360’	077’22.715’	Ha	2.5	0.40	---------	1.00	To increase Fruit production
Total cost									**9.00**	
Available fund									**8.06**	
Convergence									**0.94**	

Name of the Project: IWMP-2			**Name of Watershed: Aurangabad**			**Name of Village: Dakora**				
Sr. No.	**Nature of work**	**Location**	**Latitude N**	**Longitude E**	**Unit**	**No. of work**		**1. Catchment in cum 2.Catchment area 3.Command area**	**Estimate Cost Rs. In lacs**	**Objective**
						Phy.	**Unit cost (Rs.)**			
1	Water conveyance system	Minar to Goolar Wala Pond	27’57.675’	077’21.252’	M	2000	500 (8 inch)	15 hac 12 Farmer	10.00	To provide drinking water for livestock enhancing irrigation area for crop production recharging of water
2	Land leveling * /Bunding /Plantation	Panchayat land	27’56.758	077’21.704’	Ha	5	0.50	---------	2.50	To provide suitable field surface for controlling flow of water, check soil erosion, better surface drainage and conservation of moisture
3	Digging of Pond and construction of ramp /Retaining wall (Mudla Wala, Gular wala)	Panchayat land	27’57.826’	077’21.145’	No.	2	4.00	8900 16 hac 13 hac/10 farmer	8.00	To provide water for animals and to recharge ground water table
5	Repair & Renovation of Well / Injection Well	Panchayat land	27’56.848’	077’22.334’	No.	2	2.00	---------	4.00	For Water recharging and cheking of flood
6	Horticulture	Panchayat & Private	27’57.835’	077’22.071’	Ha	5	0.40	---------	2.00	To increase Fruit production
7	Agro Forestry	Panchayat & Private	27’57.830’	077’22.065’	Ha	5	0.20	----------	1.00	Environment Safety
Total cost									**27.50**	
Available fund									**30.24**	
Convergence									**Nil**	

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

Name of the Project: IWMP -2			**Name of Watershed: Aurangabad**		**Name of Village: Khatela Sarai**				
Sr. No.	**Nature of work**	**Location**	**Latitude N**	**Longitude E**	**Unit**	**No. of work**		**1.Catchment in cum 2.Catchment area 3.Command area**	**Estimate Cost Rs. In lacs**	**Objective**
						Phy.	**Unit cost (Rs.)**			
1	Retaining Wall	Near Kabristan Pond	27’59.907’	077’19.350’	No.	1	8.00	11800 21 hac 11 hac /12 farmer	8.00	To Check soil and Water erosion
2	Injection Well	Govt.School	27’59.844’	077’19.278’	No.	3	2.00	…… …….	6.00	Recharging of acess rain Water to Improve Water Quality and increase water table
3	Water Conveyance System	Canal to Pond, pond to miner	27’59.775’	077’18.624’	m	2500	500 (8inch)	17 hac 13 farmer	12.50	To increase irrigated area for crop Production
4	Land Leveling *& Bunding	Community land	28’00.161’	077’19.866’	ha	10	0.30	…… …….	3.00	To provide suitable field surface for controlling flow of water, check soil erosion, better surface drainage and conservation of moisture
5	Drainage of Execs Water from Kabristan to Pond	Kabristan to Pond	27’59.930’	077’19.278’	m	400	500	…… ……	2.00	To avoid flood Problem
6	Plantation	Private land	27’59.905’	077’19.363’	Ha	3	0.50	……. …….	1.50	To increase biomass cover, Check soil and water erosion
7	Horticulture	Panchayat & Private			Ha	5	0.40		2.00	To increase Fruit production
Total cost									**35.00**	
Available fund									**34.27**	
Convergence									**0.73**	

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

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

Table. 20. Detailed estimate of Pond

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

Table. 21 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**

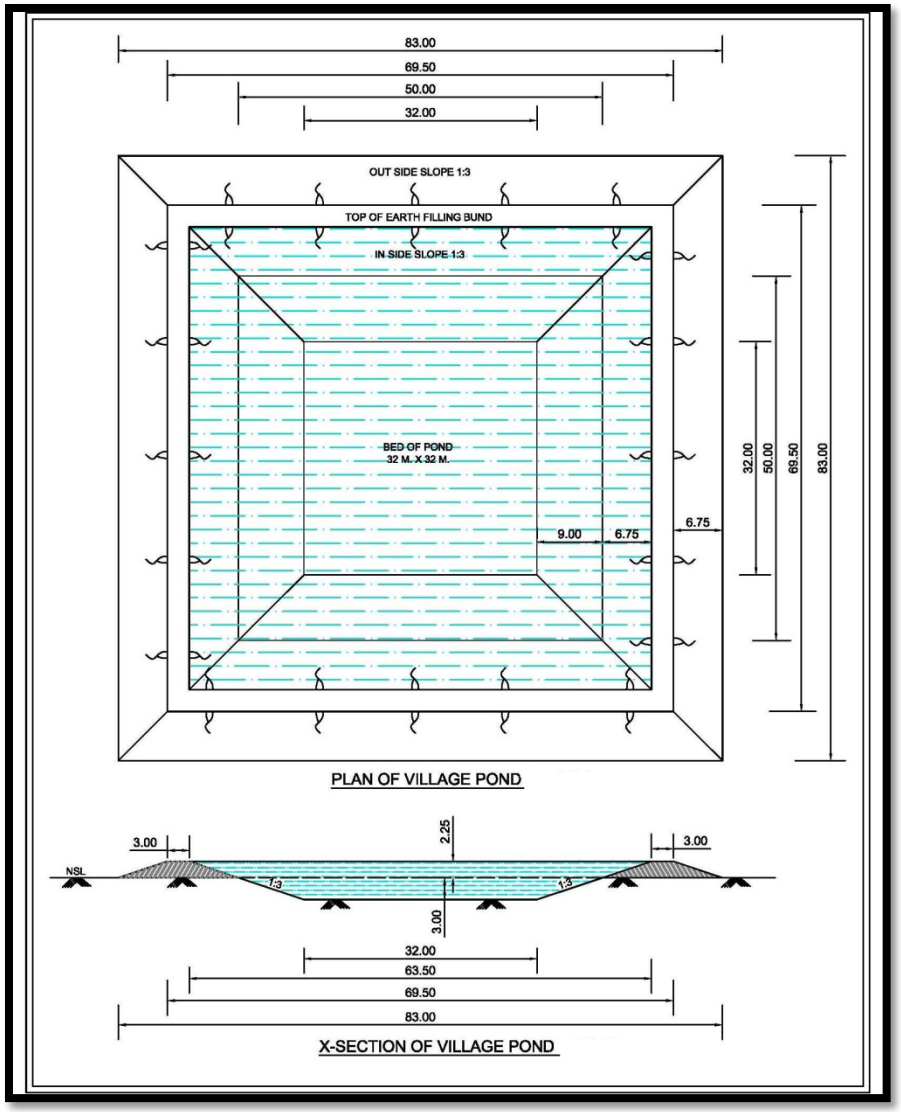

83.00
69.50
50.00
32.00
OUT SIDE SLOPE 1:3
TOP OF EARTH FILLING BUND
IN SIDE SLOPE 1:3
BED OF POND
32 M. X 32 M.
9.00
6.75
6.75
32.00
50.00
69.50
83.00
PLAN OF VILLAGE POND
3.00
2.25
3.00
NSL
1:3
1:3
3.00
32.00
63.50
69.50
83.00
X-SECTION OF VILLAGE POND

Table. 25 Work Detail Estimate For Retaining Wall

Sr. No.	Particulars	No.	L	B	D	Contents	Unit
1	Earth Work Excavation for R/wall	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 Masonry 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**				

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**

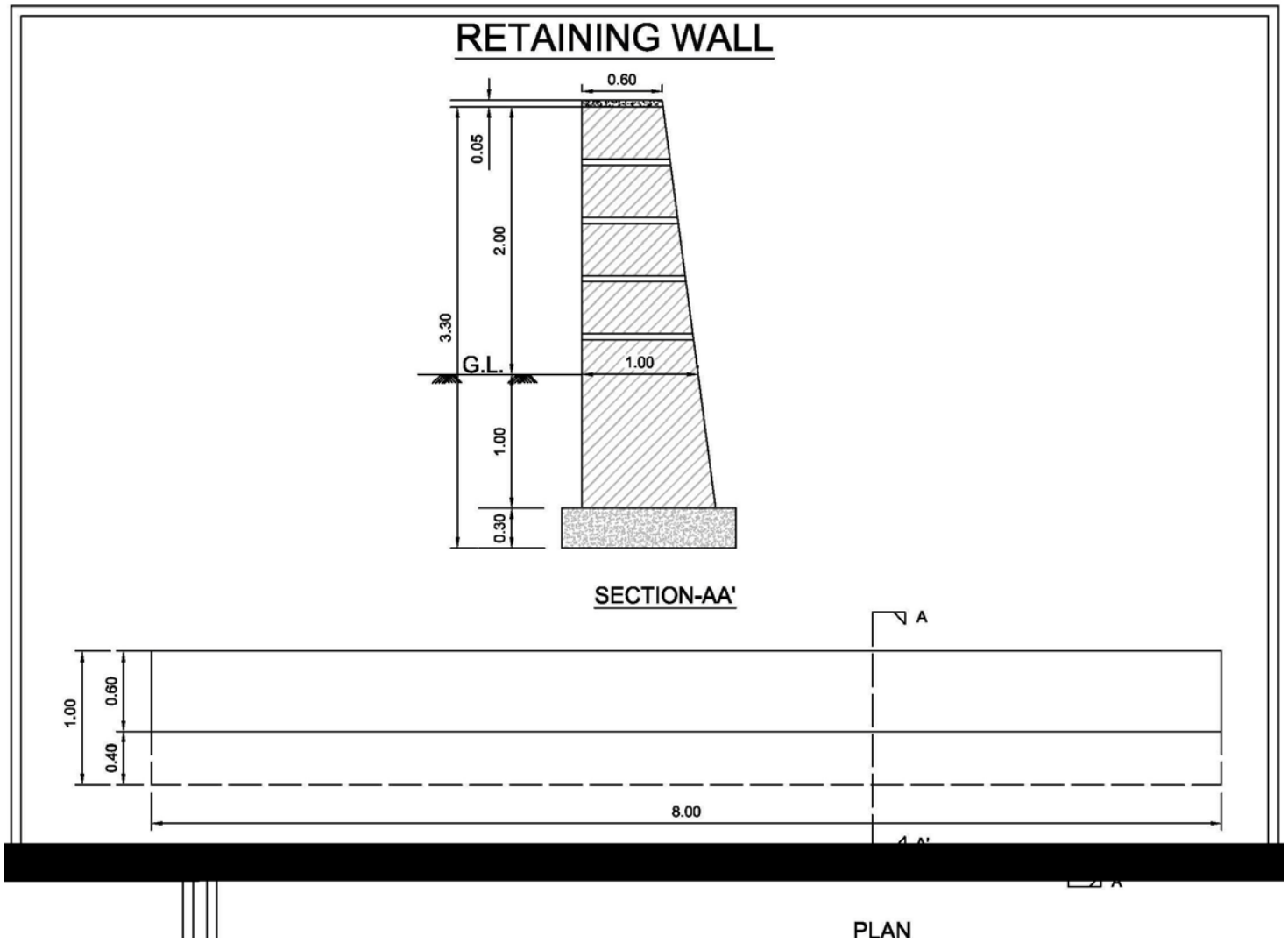

RETAINING WALL
0.60
0.05
2.00
3.30
G.L.
1.00
1.00
0.30
SECTION-AA'
A
1.00
0.60
0.40
8.00
A'
A
PLAN

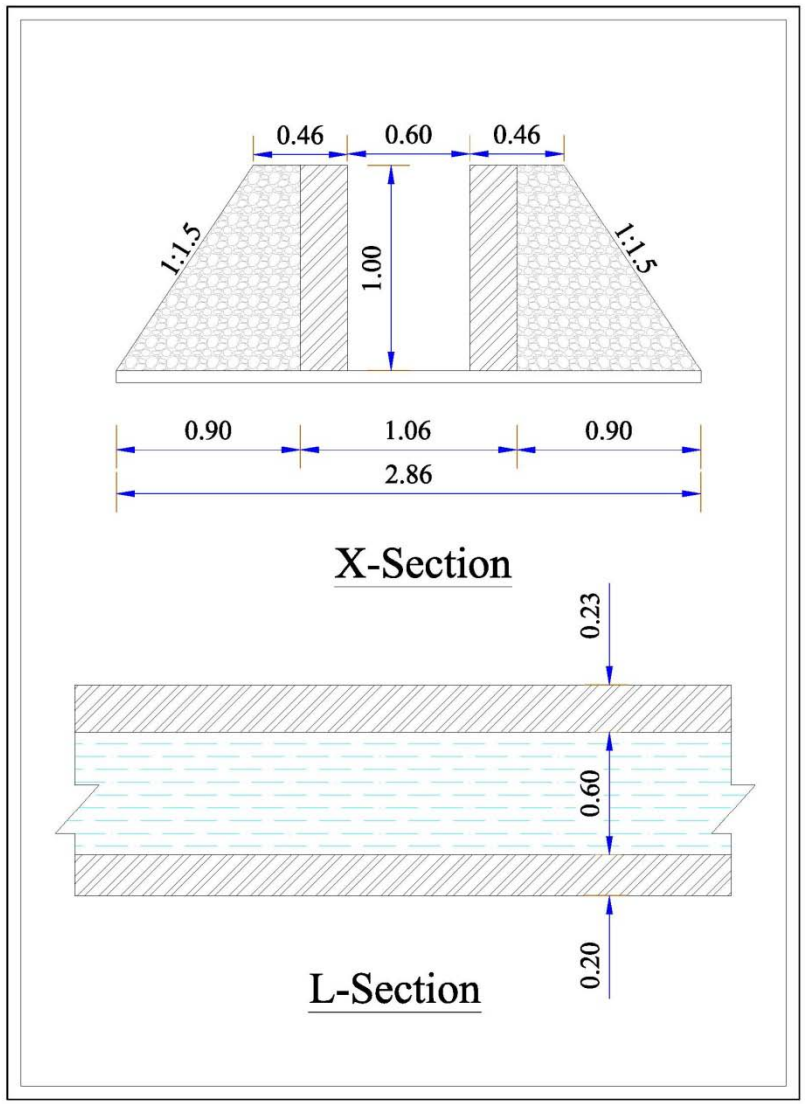
Table: Estimate of Open Channel

Abstract cost of Pucca Disposal open channel in

Detail estimate of Pucca disposal open channel

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

Sr. No.	Particular	Quantity	Rate	Unit	Amount
1	Excavation of earth work in ordinary soil as per HSR 6.1(a)	64.8 m3	415.50-15% +425% =1854.16	100 m³	1201.49
2	Flat bricks laid in bed HSR 14.24	106 m2	520-15%+600% = 296.60	m²	3279.64
3	First class bricks works land in CSM 1.5 HSR 11.23	20.25 m3	49.85 + 15% + 600% =296.60	m³	6339.62
4	Plaster bed 1.4 12 mm thick 15.5 HSR	60 m2	5.5 + 15% + 500% = 28.05	m²	1683.00
5	Plaster 14 m side wall 15.5 HSR	90 m2	5.5 + 15% + 500% = 28.05	m²	2574.50
6	Field Gota 1.4 HSR 15.5	23.4 m2	5.5 + 15% + 500% = 28.05	m²	656.37
7	Topping 25 mm thick on top of wall HSR 14.8	46 M2	8.60+15% + 600% = 51.17	m²	2302.65
8	E/work for wall protection HSR 6.1 (a)	85.50 M3	415.50 +15% + 500%	100 m³	1077.53
			Total labour cost		**18596.64**
			Material cost		**98783.00**
			Total		**117379.64**
			Contingency 2%		**2347.59**
			Grand total		**49929.23**



Pucca disposal open channel

Table. 25 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**				

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**

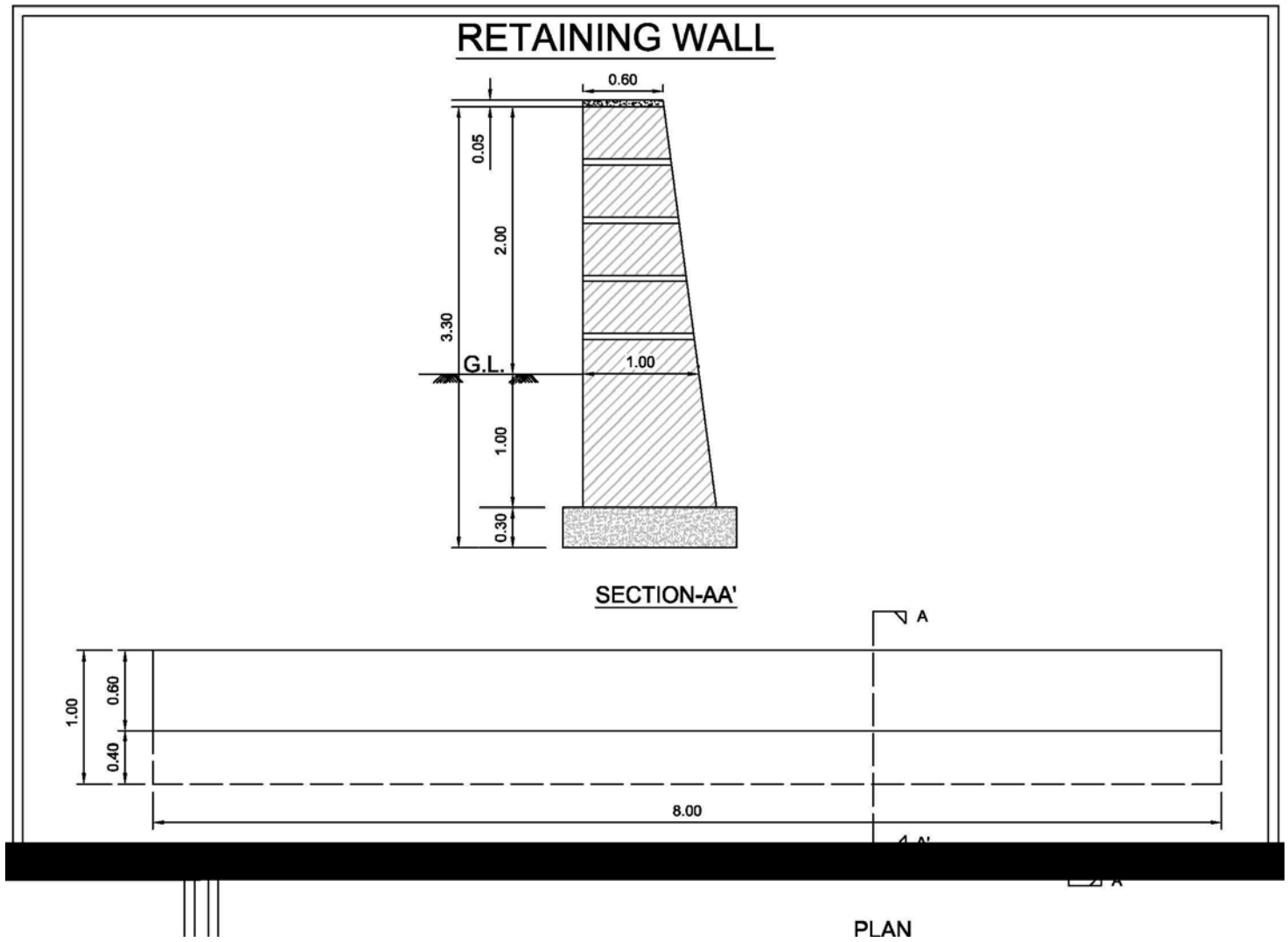

RETAINING WALL
0.60
0.05
2.00
3.30
G.L.
1.00
1.00
0.30
SECTION-AA'
A
1.00
0.60
0.40
8.00
A'
A
PLAN

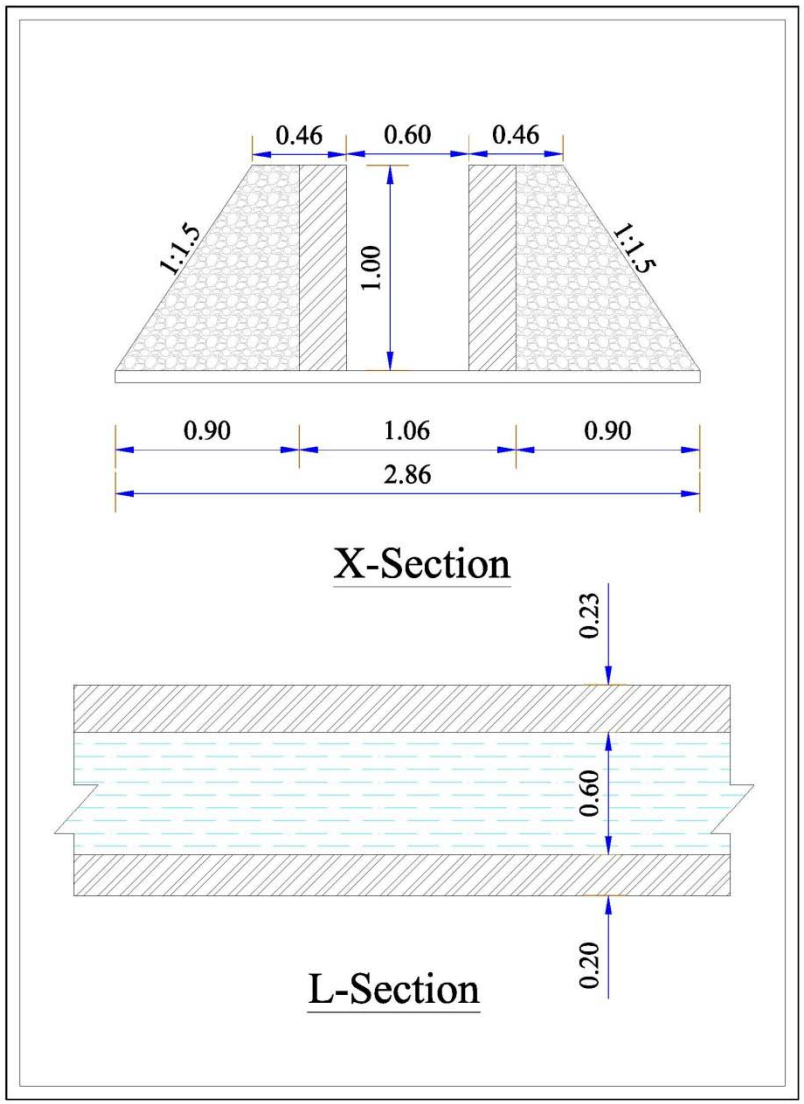
Table: Estimate of Open Channel

Abstract cost of Pucca Disposal open channel in

Detail estimate of Pucca disposal open channel

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

Sr. No.	Particular	Quantity	Rate	Unit	Amount
1	Excavation of earth work in ordinary soil as per HSR 6.1(a)	64.8 m3	415.50-15% +425% =1854.16	100 m³	1201.49
2	Flat bricks laid in bed HSR 14.24	106 m2	520-15%+600% = 296.60	m²	3279.64
3	First class bricks works land in CSM 1.5 HSR 11.23	20.25 m3	49.85 + 15% + 600% =296.60	m³	6339.62
4	Plaster bed 1.4 12 mm thick 15.5 HSR	60 m2	5.5 + 15% + 500% = 28.05	m²	1683.00
5	Plaster 14 m side wall 15.5 HSR	90 m2	5.5 + 15% + 500% = 28.05	m²	2574.50
6	Field Gota 1.4 HSR 15.5	23.4 m2	5.5 + 15% + 500% = 28.05	m²	656.37
7	Topping 25 mm thick on top of wall HSR 14.8	46 M2	8.60+15% + 600% = 51.17	m²	2302.65
8	E/work for wall protection HSR 6.1 (a)	85.50 M3	415.50 +15% + 500%	100 m³	1077.53
			Total labour cost		**18596.64**
			Material cost		**98783.00**
			Total		**117379.64**
			Contingency 2%		**2347.59**
			Grand total		**49929.23**



Pucca disposal open channel

Estimate of Under Ground Pipeline

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

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

Abstract of Cost

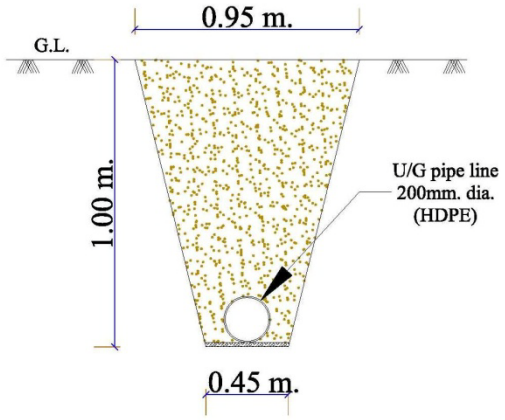
Sr. No.	Particular	Qty.	Rate	Unit	Amount
1	Clearing Jungle including uprooting and vegitation grass buresh wood, Trees removed of rubbish up to distance of SOM outside the periphery of the area cleured H.S.R.-6.26	1500.00	66.80-21.5% + 370% = 246.46	Per 100 Sq.m.	3696.90
2	Excavaton on for pipe line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

Cost of Metrial:-

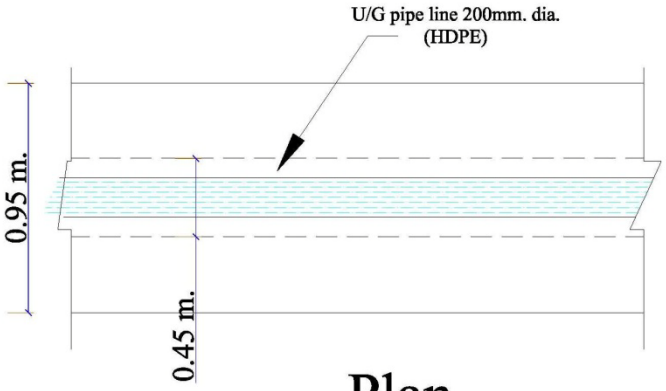
		Qty.	Rate	Amount
I.	Cost of HDPE pipe 200mm. Dia.	142.00	2598.00	368916
II.	Cost of bed 200mm. Dia.	4.00	650.00	2600
III.	Cost of P.C.N.-9	1.00	1200.00	1200
IV.	Cost of air realaas valve	1.00	1440.00	1440
V.	Cost of end C/P	2.00	450.00	900
		Total (2)		**375056.00**

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

Under Ground Pipe Line HDPE 200mm. dia.



Section



Plan

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. 23. 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. Mustard, Wheat and Bajra are the main crops. Due to frequent droughts, crop failures are common, and yield levels are low. Farmers maintain fodder plants on the field bunds. Because of extensive damage by wildlife, farmers are gradually shifting towards dairy farming. But there is acute shortage of green and dry fodder. Still traditional farm practices are followed such as manual weeding and hoeing, use of desi ploughs and bullock power in tillage operations. The systematic and regular soil testing has not been done. Only farm yard manure is added to maintain yield levels. Food grains are hardly sufficient for 6 to 8 months with small farmers. Post-harvest gain storage, food processing and value addition techniques are not prevalent.

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

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

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

7.3.2 Horticulture

Existing System: Ber, Amla and Guava are the most preferred fruit crop of the farmers and scattered plants of local citrus fruits are seen in farm lands. Some farmers have started raising Guava and Kinnow where irrigation facilities are available. Citrus fruits also raised but mostly for domestic use. There is no well organized marketing system in fruit plants. **Proposed System:** The average annual rainfall is 366 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 of technical support on orchard management by involving HAU Farm Advisory Service and department of horticulture.
- Appropriate safeguards from wildlife damage, frost damage and wind breaks.
- Arrangements for limited irrigation at least for first few years.
- Organizing SHGs around horticulture and joint purchase of inputs and marketing.

7.3.3 Vegetable cultivation

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

7.3.4 Promotion of Farm Forestry and Agro-forestry

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

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

7.3.5 Livestock Improvement Including Fodder Production

Livestock rearing is the most important subsidiary occupation of the project villagers. In addition to selling milk for regular daily income, farm yard manure is most needed to maintain fertility and moisture retention of soils. Even landless families also maintain few numbers of animals. The animal breed improvement work was initiated in these villages under 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.

7.3.6 Marketing Arrangements and Proposal for Improvement

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

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

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

7.3.7 Detail of production system to be promoted

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

Table 24.Detail of Production System proposed to be promoted in the project village

S. No.	Particulars	Contents	No. of micro watersheds	No. of beneficiaries per micro watershed	No. of total beneficiaries	Cost per beneficiaries	Total
1	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.	15	20	300	6000	1800000
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.	15	75	1125	500	562500
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 Acre (0.8 ha) holding is provided.	15	250	3750	40	150000
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.	15	150	2250	250	562500
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	15	10	150	7500	1125000

S. No.	Particulars	Contents	No. of micro watersheds	No. of beneficiaries per micro watershed	No. of total beneficiaries	Cost per beneficiaries	Total
		department is provided.					
6	**Drip Irrigation**	**Drip Irrigation is an irrigation method that saves water and fertilizer by allowing water to drip slowly to the roots of plants. Under IWMP, financial assistance @ 10% of Rs. 58000 per ha for horticulture fixed by Agriculture Department is provided.**	15	20	300	5800	1740000
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**	15	100	1500	322.5	483750
8	**Kitchen Gardening**	**To facilitate with inputs, seeds and equipments etc., for development of Kitchen Gardening. Under IWMP, financial assistance @ Rs. 50 per farmer per season (Rs. 100 per year) is provided.**	15	320	4800	100	480000
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)**	15	**300**	**4500 (45000 plants)**	**Rs.20 per plant**	900000
		Total					7803750
		Contingency, printing material other unforeseen items					20250

Total: Rs. 7824000/-

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 is Neem. The impacts of such type's plantation have given extra source of income.

7.3.8. Vermin Compost

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

One of the important occupations of villagers is the animal husbandry. At present, the animal wastes are not being used by the villagers. This waste can be utilized as vermin- compost on the farm where the productivity and physical condition of the soil can be increased manifold. The animal waste can be used for preparation of vermin- compost. The available nutrients in vermin- compost are higher than country type farmyard manure. As per NHM guideline, the installation cost of structure of 1 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 25: Model/ Estimate for a Vermin Compost Unit

Sr. No	Component	Expenditure to be incurred
1	Construction of shed of size 500 Sq. ft.@ Rs. 100 per Sq. ft. with pacca floor, beds and coverings etc.	50000/-
2	Cost on breeding material and purchase of worms etc.	8000/-
3	Tools and equipments etc.	2000/-
	Total	**60000/-**

Components of Vermin Compost Unit

1. **Shed**

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

2. **Vermin- beds**

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

3. **Land**

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

4. Seed Stock

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

5. Machinery

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

LIVELIHOOD ACTIVITIES FOR THE ASSET LESS PERSONS-9%

7.4 LIVELIHOOD SUPPORT TO SHG'S

The key issue of inclusion of this chapter is that about 70% of the population in the proposed villages depends on agriculture and allied activities, but it rarely provides sufficient means of survival to small and marginal farmers. During the base line survey, this aspect was discussed with the existing Self Help Group/ Gram Sabha members. The representative of WAPCOS, Sociologist of the team held comprehensive discussions on the possibilities of livelihood in the rainfed 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) Palwal and Haryana Institute of Rural Development, Nilokheri. Agriculture University, Hisar, Central Soil and Water Research and Training Institute, Chandigarh. It is proposed to lend revolving fund of Rs. 25000/- to each SHG/individual formed in the watershed villages. Since the members from SHGs/landless are very poor, they do not have resources to start micro enterprises, it is envisaged that they should be assisted and given loan of this amount in the shape of Revolving Fund Assistance (RFA) so that they do not get trapped by money lenders. Funds thus given on loan are recoverable from SHGs/individuals in easy installments. It is also proposed to impart skill training to at least 10 unemployed youth from each village and give them trainings of their choice so that they establish some small enterprises. It is further proposed to give them interest free loan of Rs. 12000/- each as Revolving Fund Assistance to meet their urgent needs of funds for establishing micro enterprises. Such funds recovered could either be given back to SHGs/individual or some other SHGs/individuals depending upon assessment of their respective needs. It is proposed to form 2 SHGs in each village and identify at least 10 youths in each village for imparting training and giving Revolving Fund.

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. Backyard poultry
12. Floriculture

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

Table 26. Revolving Fund Assistance for SHGs

S.No.	Name of micro watersheds	No. of villages	Total SHGs	Amount of RFA per SHG	Total
1	Atohan	2	4	25000	100000
2	Khera Sarai	1	2	25000	50000
3	Sailothi	2	4	25000	100000
4	Khatela Sarai	1	2	25000	50000
5	Rundhi	1	2	25000	50000
6	Dighot	1	2	25000	50000
7	Aurangabad A	1	2	25000	50000
8	Aurangabad B				
9	Mitnol	2	4	25000	100000
10	Gudrana	1	2	25000	50000
11	Maroli	2	4	25000	100000
12	Dakora	1	2	25000	50000
	Total	**15**	**30**		**750000**

Table 27. 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	Atohan	2	4	35000	140000
2	Khera Sarai	1	2	35000	70000
3	Sailothi	2	4	35000	140000
4	Khatela Sarai	1	2	35000	70000
5	Rundhi	1	2	35000	70000
6	Dighot	1	2	35000	70000

7	Aurangabad A	1	2	35000	70000
8	Aurangabad B				
9	Mitnol	2	4	35000	140000
10	Gudrana	1	2	35000	70000
11	Maroli	2	4	35000	140000
12	Dakora	1	2	35000	70000
	Total	**15**	**30**		**1050000**

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

Table 28. 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	Atohan	2	20	10000	200000
2	Khera Sarai	1	10	10000	100000
3	Sailothi	2	20	10000	200000
4	Khatela Sarai	1	10	10000	100000
5	Rundhi	1	10	10000	100000
6	Dighot	1	10	10000	100000
7	Aurangabad A	1	10	10000	100000
8	Aurangabad B				
9	Mitnol	2	20	10000	200000
10	Gudrana	1	10	10000	100000
11	Maroli	2	20	10000	200000
12	Dakora	1	10	10000	100000
	Total	**15**	**150**		**1500000**

Note: The beneficiaries will contribute 10% as cost sharing of the livelihood support programme Rs. 1500000 @ 10% cost sharing.

= 1500000- 150000
= 1350000/-

Table 29. 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	Atohan	2	8	25000	200000
2	Khera Sarai	1	4	25000	100000
3	Sailothi	2	8	25000	200000
4	Khatela Sarai	1	4	25000	100000
5	Rundhi	1	4	25000	100000
6	Dighot	1	4	25000	100000
7	Aurangabad A	1	4	25000	100000
8	Aurangabad B				
9	Mitnol	2	8	25000	200000
10	Gudrana	1	4	25000	100000
11	Maroli	2	8	25000	200000
12	Dakora	1	4	25000	100000
	Total	**15**	**60**		**1500000**

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. 1500000 @ 10% cost sharing.

= 1500000- 150000
= 1350000/-

Table 30. 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	Atohan	2	2	4	2000	6	24000
2	Khera Sarai	1	1	2	2000	6	12000
3	Sailothi	2	2	4	2000	6	24000
4	Khatela Sarai	1	1	2	2000	6	12000
5	Rundhi	1	1	2	2000	6	12000
6	Dighot	1	1	2	2000	6	12000
7	Aurangabad A	1	1	2	2000	6	12000
8	Aurangabad B						
9	Mitnol	2	2	4	2000	6	24000
10	Gudrana	1	1	2	2000	6	12000
11	Maroli	2	2	4	2000	6	24000
12	Dakora	1	1	2	2000	6	12000
	Total	**15**	**15**	**30**			**180000**

1. Payment to trainers 180000/-
2. Sewing Machine Cost 180000/- @ Rs. 6000 per machine
3. Total 360000/-

Table 31. 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	Atohan	2	2	2000	6	12000	2	24000
2	Khera Sarai	1	1	2000	6	12000	1	12000
3	Sailothi	2	2	2000	6	12000	2	24000
4	Khatela Sarai	1	1	2000	6	12000	1	12000
5	Rundhi	1	1	2000	6	12000	1	12000

6	Dighot	1	1	2000	6	12000	1	12000
7	Aurangabad A	1	1	2000	6	12000	1	12000
8	Aurangabad B							
9	Mitnol	2	2	2000	6	12000	2	24000
10	Gudrana	1	1	2000	6	12000	1	12000
11	Maroli	2	2	2000	6	12000	2	24000
12	Dakora	1	1	2000	6	12000	1	12000
	Total	**15**	**15**				**15**	**180000**

Payment to trainer: Rs.180000/-

Cost of Machine: Rs. 300000/- @ Rs. 20000 per machine

Total Cost: Rs. 480000/-

Table 32. Livelihood Support

S.No.	Name of micro watersheds	No. of villages	Revolving fund assistance to individuals unemployed youth/ landless, women		
			Dairy Unit	Bee Keeping	Mushroom Cultivation
1	Atohan	2	30	20	4
2	Khera Sarai	1	15	10	2
3	Sailothi	2	30	20	4
4	Khatela Sarai	1	15	10	2
5	Rundhi	1	15	10	2
6	Dighot	1	15	10	2
7	Aurangabad A	1	15	10	2
8	Aurangabad B				
9	Mitnol	2	30	20	4
10	Gudrana	1	15	10	2
11	Maroli	2	30	20	4
12	Dakora	1	15	10	2
	Total	**15**	**225**	**150**	**30**
	Rate (Rs)		**2400**	**2400**	**24000**
	Cost (Lakh Rs)		**5.40**	**3.60**	**7.20**

Contingency, printing material and other unseen items: Rs. 81600/-

Total funds available under this component are Rs. 7041600/-

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

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

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. 33)

Detail of Convergence of IWMP and other schemes

Table 33. GAPS IN FUNDS REQUIREMENT – MICRO WATERSHED WISE

S.No	Name of micro watersheds	Total cost requirement for works	Total funds available under IWMP for works	Gap in funds requirement for works	Convergence with MGNREGA
1	Atohan	29.00	27.89	1.11	1.11
2	Khera Sarai	35.50	34.94	0.56	0.56
3	Sailothi	52.70	51.07	1.63	1.63
4	Khatela Sarai	35.00	34.27	0.73	0.73
5	Rundhi	35.00	33.94	1.06	1.06
6	Dighot	44.00	40.99	3.01	3.01
7	Aurangabad A	43.30	42.00	1.30	1.30
8	Aurangabad B	41.00	40.99	0.01	0.01
9	Mitnol	37.00	34.27	2.73	2.73
10	Gudrana	35.00	34.27	0.73	0.73
11	Maroli	37.00	33.26	3.74	3.74
12	Dakora	27.50	30.24	Nil	Nil
	Total	**452.00**	**438.14**	**16.60**	**16.60**

- 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 seven 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 130 ha horticulture development programme with the financial assistance of Rs. 52 lakh has been provided in the project proposals. This would also be undertaken by convergence with the horticulture department.

7.5.5 Convergence with Agriculture Department

The activities under NRM like Renovation/ New of ponds, Marginal Bundh(Earthen) with pacca outlet, Roof top rainwater harvesting kund, Loose Stone Check Dam or DSMS, Cement Masonry Structures(CMS) (outlet and Inlet), Earthen Dam with pacca spillway or Silt Detention Dam, Small Earthen Embankment with vegetative support, Water Conveyance System 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 while in progress and post project stage. 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	Atohan	415	49,80,000	49,800
2	Khera Sarai	520	62,40,000	62,400
3	Sailothi	760	91,20,000	91,200
4	Khatela sarai	510	61,20,000	61,200
5	Rundhi	505	60,60,000	60,600
6	Dighot	610	73,20,000	73,200
7	Aurangabad A	625	75,00,000	75,000
8	Aurangabad B	610	73,20,000	73,200
9	Mitnol	510	61,20,000	61,200
10	Gudrana	510	61,20,000	61,200
11	Maroli	495	59,40,000	59,400
12	Dakora	450	54,00,000	54,000

8.2 EVALUATION

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

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

Table 2. Micro Watershed wise details

S.no	Name of the Micro Watersheds	Effective Area	Total Cost	Evaluation 1%
1	Atohan	415	49,80,000	49,800
2	Khera Sarai	520	62,40,000	62,400
3	Sailothi	760	91,20,000	91,200
4	Khatela sarai	510	61,20,000	61,200
5	Rundhi	505	60,60,000	60,600
6	Dighot	610	73,20,000	73,200
7	Aurangabad A	625	75,00,000	75,000
8	Aurangabad B	610	73,20,000	73,200
9	Mitnol	510	61,20,000	61,200
10	Gudrana	510	61,20,000	61,200
11	Maroli	495	59,40,000	59,400
12	Dakora	450	54,00,000	54,000

CONSOLIDATION PHASE- 3 %

Consolidation Phase = Rs. 23, 47,200 /-

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: Atohan

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	0.30
2	Preparation of Project completion report	0.08
3	Documentation of success stories	0.07
4	Management of proper utilization of WDF	0.22
5	Mechanism for quality and sustainability issues under the Project	0.07
6	Watershed activities	0.75

Total: 1.49 lacs

Name of Micro watershed: Khera Sarai

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	0.37
2	Preparation of Project completion report	0.10
3	Documentation of success stories	0.09
4	Management of proper utilization of WDF	0.28
5	Mechanism for quality and sustainability issues under the Project	0.09
6	Watershed activities	0.94

Total: 1.87 lacs

Name of Micro watershed: Sailothi

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	0.55
2	Preparation of Project completion report	0.14
3	Documentation of success stories	0.13
4	Management of proper utilization of WDF	0.41
5	Mechanism for quality and sustainability issues under the Project	0.14
6	Watershed activities	1.37

Total: 2.74 lacs

Name of Micro watershed: Khatela sarai

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	0.37
2	Preparation of Project completion report	0.09
3	Documentation of success stories	0.09
4	Management of proper utilization of WDF	0.28
5	Mechanism for quality and sustainability issues under the Project	0.09
6	Watershed activities	0.92

Total: 1.84 lacs

Name of Micro watershed: Rundhi

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	0.36
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: Dighot

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	0.44
2	Preparation of Project completion report	0.11
3	Documentation of success stories	0.11
4	Management of proper utilization of WDF	0.33
5	Mechanism for quality and sustainability issues under the Project	0.11
6	Watershed activities	1.10

Total: 2.20 lacs

Name of Micro watershed: Aurangabad A

Table 9. Consolidated Phase

S. No	Type of activity	Amount earmarked (Rs. In lacs)
1	Managing/ upgrading of all activities taken up under the project	0.45
2	Preparation of Project completion report	0.11
3	Documentation of success stories	0.11
4	Management of proper utilization of WDF	0.34
5	Mechanism for quality and sustainability issues under the Project	0.11
6	Watershed activities	1.13

Total: 2.25 lacs

Name of Micro watershed: Aurangabad B

Table 10. Consolidated Phase

S. No	Type of activity	Amount earmarked (Rs. In lacs)
1	Managing/ upgrading of all activities taken up under the project	0.44
2	Preparation of Project completion report	0.11
3	Documentation of success stories	0.11
4	Management of proper utilization of WDF	0.33
5	Mechanism for quality and sustainability issues under the Project	0.11
6	Watershed activities	1.10

Total: 2.20 lacs

Name of Micro watershed: Mitnol

Table 11. Consolidated Phase

S. No	Type of activity	Amount earmarked (Rs. In lacs)

1	Managing/ upgrading of all activities taken up under the project	0.37
2	Preparation of Project completion report	0.09
3	Documentation of success stories	0.09
4	Management of proper utilization of WDF	0.28
5	Mechanism for quality and sustainability issues under the Project	0.09
6	Watershed activities	0.92

Total: 1.84 lacs

Name of Micro watershed: Gudrana

Table 12. Consolidated Phase

S. No	Type of activity	Amount earmarked (Rs. In lacs)
1	Managing/ upgrading of all activities taken up under the project	0.37
2	Preparation of Project completion report	0.09
3	Documentation of success stories	0.09
4	Management of proper utilization of WDF	0.28
5	Mechanism for quality and sustainability issues under the Project	0.09
6	Watershed activities	0.92

Total: 1.84 lacs

Name of Micro watershed: Maroli

Table 13. Consolidated Phase

S. No	Type of activity	Amount earmarked (Rs. In lacs)

1	Managing/ upgrading of all activities taken up under the project	0.35
2	Preparation of Project completion report	0.09
3	Documentation of success stories	0.09
4	Management of proper utilization of WDF	0.27
5	Mechanism for quality and sustainability issues under the Project	0.09
6	Watershed activities	0.89

Total: 1.78 lacs

Name of Micro watershed: Dakora

Table 14. Consolidated Phase

S. No	Type of activity	Amount earmarked (Rs. In lacs)
1	Managing/ upgrading of all activities taken up under the project	0.33
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	0.81

Total: 1.62 lacs

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

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

CHAPTER – 9

EXPECTED OUTCOME

EXPECTED OUTCOMES

The effective area is 6520 ha and the Project Cost is 782.40 lacs covering 12 no. micro watersheds and in all 15 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, check in migration, improvement in water table, more area under agriculture and horticulture, check in soil loss and decrease in Flood and drought incidences, improvement in crop yield, milk yield, check in degradation of land etc. The benefits thus accrued would be short term and long term. With the judicious use of funds available under IWMP and with convergence from MGNREGA and other schemes of Departments, this project of Aurangabad Watershed 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, i.e. best they can take only single crop, which keeps them partially engage 4 to 5 months. Similarly due to lack of fodder animal husbandry does not keep them engage full time.

Table 1. Expected Employment Generation in the Project area

S.N.	Name of micro watersheds	Wage employment						Self employment			
		No. of man days			No. of Beneficiaries			No. of Beneficiaries			
		SC	Others	Total	SC	Others	Total	SC	Others	Women	Total
1	Atohan	2400	5000	7400	80	150	230	70	90	60	220
2	Khera Sarai	1200	4000	5200	40	20	60	30	50	25	105
3	Sailothi	2800	4500	7300	70	80	150	60	50	55	165
4	Khatela Sarai	2400	5000	7400	60	80	140	20	30	20	70
5	Rundhi	2000	3000	5000	50	40	90	30	50	10	90
6	Deeghot	1800	5000	6800	60	30	90	40	80	30	150
7	Aurangabad A	1600	1500	3100	40	20	60	50	30	45	125

8	Aurangabad B	1800	2000	6800	60	20	80	45	40	30	115
9	Mitrol	1500	2100	3600	50	30	80	30	45	20	95
10	Gudrana	1800	2000	3800	60	80	140	55	60	40	155
11	Marroli	1600	3000	4600	40	70	110	35	55	20	110
12	Dakora	1500	2500	4000	50	80	130	25	60	20	105
	Total	**22400**	**39600**	**65000**	**660**	**700**	**1360**	**490**	**640**	**375**	**1505**

65000 man days would be generated with the implementation of the project in Aurangabad Watershed (IWMP II), which means 130 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 Aurangabad 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	Atohan	Atohan	418	209	60	30	No. of persons migrating will be reduced and also no. of days would be reduced by over 50%
		Bahrola	650	325	90	45	No. of persons migrating will be reduced and also no. of days would be reduced by over 50%

2	Khera Sarai	Khera Sarai	520	260	90	45	No. of persons migrating will be reduced and also no. of days would be reduced by over 50%
3	Sailothi	Sailothi	585	293	60	30	No. of persons migrating will be reduced and also no. of days would be reduced by over 50%
		Nangal Brahman	205	103	90	45	No. of persons migrating will be reduced and also no. of days would be reduced by over 50%
4	Khatela Sarai	Khatela Sarai	430	215	60	30	No. of persons migrating will be reduced and also no. of days would be reduced by over 50%
5	Rundhi	Rundhi	154	77	90	45	No. of persons migrating will be reduced and also no. of days would be reduced by over 50%
6	Deeghot	Deeghot	740	370	90	45	No. of persons migrating will be reduced and also no. of days would be reduced by over 50%
7	Aurangabad A	Aurangabad A	550	275	60	30	No. of persons migrating will be reduced and also no. of days would be reduced by over 50%
8	Aurangabad B	Aurangabad B	580	290	60	30	No. of persons migrating will be reduced and also no. of days would be reduced by over 50%
9	Mitrol	Mitrol	280	140	90	45	No. of persons migrating will be reduced and also no. of days would be reduced by over 50%
		Tumasra	119	60	90	45	No. of persons migrating will be reduced and also no. of days would be reduced by over 50%
10	Gudrana	Gudrana	126	63	60	30	No. of persons migrating will be reduced and also no. of days would be reduced by over 50%
11	Marroli	Marroli	186	93	60	30	No. of persons migrating will be reduced and also no. of days would be reduced by over 50%
		Sholaka	120	60	60	30	No. of persons migrating will be reduced and also no. of days would be reduced by

							over 50%
12	Dakora	Dakora	146	73	90	45	No. of persons migrating will be reduced and also no. of days would be reduced by over 50%

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

9.3 GROUND WATER TABLE (Drinking Water)

Through the ground water table is depleting over the years and presently stands 29 to 75 m. The project provision for recharging the desaturated aquifers. It is expected that this will help checking the further fall in water table during post project.

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

S.No	Name of Micro watersheds	Name of Villages	Pre-Project level (m)
1	Atohan	Atohan	6.30
		Bahrola	13.70
2	Khera Sarai	Khera Sarai	9.30
3	Sailothi	Sailothi	5.30
		Nangal Brahman	7.30
4	Khatela Sarai	Khatela Sarai	6.10
5	Rundhi	Rundhi	7.25
6	Deeghot	Deeghot	12.20

7	Aurangabad A	Aurangabad A	12.10
8	Aurangabad B	Aurangabad B	12.20
9	Mitrol	Mitrol	9.15
		Tumasra	10.10
10	Gudrana	Gudrana	11.60
11	Marroli	Marroli	12.20
		Sholaka	13.70
12	Dakora	Dakora	12.80

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/ New of ponds, Marginal Bundh (Earthen) with pacca outlet, Roof top rainwater harvesting kund, Loose Stone Check Dam or DSMS, Cement Masonry Structures(CMS) (outlet and Inlet), Earthen Dam with pacca spillway or Silt Detention Dam, Small Earthen Embankment with vegetative support, Water Conveyance System 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 Aurangabad Watershed (IWMP II)

Name of Micro watersheds	Name of crops	Pre project	Total production (in Qtl)	Total value Rs. (in lacs)	Expected post project	Total production (in Qtl)	Total value Rs. (in lacs)

		Area (ha)	**Averge yield Qtl. per. ha**			**Area (ha)**	**Averge yield Qtl. per. ha**		
Atohan	Wheat	194	34	6596	11.78	214	47	10058	13.57
	Mustard	56	11	616	3.19	75	17	1275	3.50
	Paddy	114	32	3648	12.96	130	48	6240	16.22
Khera Sarai	Wheat	300	35	10500	18.22	324	47	15228	20.55
	Mustard	35	11	385	1.05	50	17	850	2.33
	Paddy	132	34	4488	15.10	155	49	7595	19.74
Sailothi	Wheat	380	33	12540	22.05	410	49	20090	27.12
	Mustard	69	12	828	2.27	80	18	1440	3.96
	Paddy	197	32	6304	12.96	217	46	9982	25.95
Khatela Sarai	Wheat	300	32	9600	17.01	325	48	15600	21.06
	Mustard	52	11	572	1.57	67	16	1072	2.94
	Paddy	121	31	3751	12.89	145	46	6670	17.34
Rundhi	Wheat	300	32	9600	17.01	336	47	15792	21.31
	Mustard	41	12	992	2.72	67	16	1072	2.94
	Paddy	115	34	3910	13.15	145	50	7250	18.85
Daeeghot	Wheat	670	33	22110	38.89	695	49	34055	45.97
	Mustard	41	12	492	1.35	65	18	1170	3.21
	Paddy	210	33	6930	23.47	235	48	4230	10.99
Aurangabad A	Wheat	650	34	22100	38.61	720	48	34560	46.65
	Mustard	55	13	660	1.81	75	18	1350	3.71

	Paddy	234	34	7956	27.37	275	49	13475	35.03
Aurangabad B	Wheat	610	34	20740	36.23	645	49	31650	42.72
	Mustard	48	13	624	1.71	69	18	1242	3.41
	Paddy	231	34	7854	26.42	275	49	13475	37.05
Mitrol	Wheat	185	32	5920	10.60	205	48	9840	13.28
	Mustard	64	11	890	2.44	79	16	1264	3.47
	Paddy	121	32	3872	13.39	135	46	6210	16.14
Gudrana	Wheat	290	34	9860	17.22	325	50	16250	21.13
	Mustard	35	13	455	1.25	65	18	1170	3.21
	Paddy	95	33	3135	10.62	119	48	5712	14.85
Marroli	Wheat	262	32	8384	15.09	295	47	13865	18.71
	Mustard	45	12	567	1.55	75	17	1275	3.50
	Paddy	140	32	4480	15.56	165	47	7755	20.16
Dakora	Wheat	170	33	5610	9.86	205	48	9840	13.28
	Mustard	33	13	429	1.17	67	18	1206	3.31
	Paddy	86	34	2924	9.83	105	49	5145	13.37
		6681		**210322**	**468.37**	**7634**		**334953**	**590.53**

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

9.5 HORTICULTURE

Table 5. Pre and post project area under Horticulture

S.No.	Name of Micro watersheds	Existing area under horticulture (ha)	Additional area under horticulture proposed to be covered through IWMP	Total area in ha post project
1	Atohan	1.5	2.00	3.50
2	Khera Sarai	1.25	2.5	3.75
3	Sailothi	1.75	2.00	3.75
4	Khatela Sarai	1.75	2.25	4.00
5	Rundhi	1.50	2.00	3.50
6	Deeghot	1.25	3.00	4.25
7	Aurangabad A	2.50	3.00	5.50
8	Aurangabad B	2.25	3.00	5.25
9	Mitrol	1.50	2.00	3.50
10	Gudrana	1.0	2.00	3.00
11	Marroli	1.25	2.25	3.50
12	Dakora	1.50	2.00	3.50
	Total	**19**	**28**	**47**

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 proposed ha.	Total
1	Atohan	3.25	4.25	7.50
2	Khera Sarai	3.6	3.8	7.40
3	Sailothi	4.20	5.0	9.2
4	Khatela Sarai	3.75	4.00	7.75
5	Rundhi	2.00	4.0	6.0
6	Deeghot	5.0	6.5	11.5
7	Aurangabad A	4.5	6.5	11.0
8	Aurangabad B	4.75	5.0	9.75

9	Mitrol	5.0	6.4	11.4
10	Gudrana	4.50	5.50	11.0
11	Marroli	4.25	5.25	9.50
12	Dakora	3.75	4.25	8.00
	Total	**48.55**	**60.45**	**110**

9.7 LIVESTOCK

Table 7. Details of livestock in the project area

S.No.	Name of Micro watersheds	Types of Animals	Pre project			Post project			Remarks
			No.	Yield Ltr /day	Income in Rs. In lacs Per day	No.	Yield ltr./ day	Income in Rs. In lacs Per day	
1	Atohan	Buffalo	2000	7.5-8.5	240-272	2300	9.5-10.5	361-399	Increase in milk yield and number of animals by approx. 15%
		Cow	1310	3-4	78-104	1507	5-6	150-180	Increase in milk yield and number of animals by approx. 15%
2	Khera Sarai	Buffalo	3000	7-8	224-256	3450	9-10	342-380	Increase in milk yield and number of animals by approx. 15%
		Cow	1900	3-4	78-104	2185	5-6	150-180	Increase in milk yield and number of animals by approx. 15%
3	Sailothi	Buffalo	1800	7.5-8.5	240-272	2070	9.5-10.5	361-399	Increase in milk yield and number

									of animals by approx. 15%
		Cow	900	3.5-4.5	91-117	1035	5.5-6.5	165-195	Increase in milk yield and number of animals by approx. 15%
4	Khatela Sarai	Buffalo	1750	7.5-8.5	240-272	2013	9.5-10.5	361-399	Increase in milk yield and number of animals by approx. 15%
		Cow	210	3-4	78-104	242	5-6	150-180	Increase in milk yield and number of animals by approx. 15%
5	Runndhi	Buffalo	1230	7-8	224-256	1415	9-10	342-380	Increase in milk yield and number of animals by approx. 15%
		Cow	790	3.5-4.5	91-117	909	5.5-6.5	165-195	Increase in milk yield and number of animals by approx. 15%
6	Deeghot	Buffalo	5050	7.5-8.5	240-272	5808	9.5-10.5	361-399	Increase in milk yield and number of animals by approx. 15%
		Cow	1930	3-4	78-104	2220	5-6	150-180	Increase in milk yield and number of animals by approx. 15%
7	Aurangabad A	Buffalo	2430	7.5-8.5	240-272	2795	9.5-10.5	361-399	Increase in milk yield and number of animals by approx. 15%
		Cow	1240	3-4	78-104	1426	5-6	150-180	Increase in milk yield and number of animals by approx. 15%
8	Aurangabad B	Buffalo	1800	7-8	224-256	2070	9-10	342-380	Increase in milk yield and number of animals by approx. 15%
		Cow	980	3.5-4.5	91-117	1127	5.5-6.5	165-195	Increase in milk yield and number of animals by approx. 15%
9	Mitrol	Buffalo	2680	7.5-8.5	240-272	3082	9.5-10.5	361-399	Increase in milk yield and number of animals by approx. 15%
		Cow	1170	3-4	78-104	1346	5-6	150-180	Increase in milk yield and number of animals by approx. 15%
10	Gudrana	Buffalo	1500	7-8	224-256	1725	9-10	342-380	Increase in milk yield and number of animals by approx. 15%
		Cow	900	3-4	78-104	1035	5-6	150-180	Increase in milk yield and number of animals by approx. 15%
11	Marroli	Buffalo	1500	7.5-8.5	240-272	1725	9.5-10.5	361-399	Increase in milk yield and number of animals by approx. 15%
		Cow	500	3.5-4.5	91-117	575	5.5-6.5	165-195	Increase in milk yield and number

									of animals by approx. 15%
12	Dakora	Buffalo	1600	7.5-8.5	240-272	1840	9.5-10.5	361-399	Increase in milk yield and number of animals by approx. 15%
		Cow	900	3-4	78-104	1035	5-6	150-180	Increase in milk yield and number of animals by approx. 15%

9.8 LINKAGES

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

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

Table. 8: Backward-Forward Linkages

Sr. No.	Project	Type of Marketing Facility	Pre-Project (no.)	During the Project (no.)	Post-project (no.)
1	Aurangabad 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/ Minerals Deficit	Coordinate with lined department, to organize camps in watershed area	Animal vitamins feeds Would be promoted

9.8.1 LOGICAL FRAMEWORK ANALYSIS

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

Components	Activities	Outputs	Effect	Impact
	• 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 and Panchayat Institutions • Gender sensitization of UGs and WCs to increase inclusiveness of Samuh (Joint) decision making. • Sensitize Village communities to involve children and youth in development	workshops to be organized one. • Federations of UGs and WC to be formed.	improved. • Increased awareness amongst women about village resources • Women participation enhanced in decision-making of GVCs. • Involvement of youth and children in village development.	
Fund Management	• Improve management and utilization of UGs and WCs • Prepare	UGs and WCs operating bank account and managing resources on their own.	• Purpose, frequency and volume of use of the fund enhanced • Volume of funds generated for UGs and	

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

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

Components	Activities	Outputs	Effect	Impact
	irrigation practices like drip irrigation • Impart trainings, conduct meetings and organize exposure visits of communities.			
Women's socio-political and economic empowerment	• Formation and strengthening of women' SHG groups • Capacity building of women folk. • Capacity building of SHG leaders and accountants Linking SHGs with external financial institutions	• Women's SHG groups to be formed. • Federation of Women's SHGs to be formed. • Trainings to be conducted for preparation of woolen products from sheep and goats	• Enhanced capacities of leaders of women's group in taking initiatives to solve problems at different levels. • Improved access to credit for livelihood purposes Increased household income.	• Position of women in household, community, society (politically, socially and economically) as perceived by women and community at large. • Performance enhancement of SHGs in terms of participation, decision-making, leadership and fund management. • Equality and equity in gender relations at home (decision making, expenditure, children's education, 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.