CONTENTS (IWMP V)

CHAPTER- 1

METHODOLOGY

INTRODUCTION

Watershed, in hydrological unit of an area draining to a common outlet point, is recognizing as an ideal unit for planning and development of land, water and vegetation resources. This concept has been used extensively because of the importance of the water balance in the study of ecosystem. The Watershed Management Programme, though less focussed earlier, has a history of about 60 years in India.

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 V) programme a systematic survey has been conducted to know the potentiality of each village / Micro-Watershed. With this view, a baseline survey in IWMP V comprising of five micro watersheds Rambass

(6D1E8f3), Hassanpur (6D1E8f1), Badopur (6D1E8g1), Balah Kalan (6D1E8t2), Balah Khurd (6D1E8d7) falling in six villages of Narnaul block of district Mahendegarh. 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 V) of 5 micro watersheds namely Rambass (6D1E8f3), Hassanpur (6D1E8f1), Badopur (6D1E8g1), Balah Kalan (6D1E8t2), Balah Khurd (6D1E8d7) falling in six villages with their respective codes.

1.1.2 Base Line Survey

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

1.1.3 Collection of Primary Data

Though the project was sanctioned in the September, 2011 but the preparatory phase started in 2012.Initially, a meeting was arranged with officials of concerned departments and technical experts located at Rambass, Hasanpur, Badopur, Balah Kalan, Balah Khurd micro- watersheds. During this meeting, preliminary details 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.

1.2.1 Participatory Net Planning

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

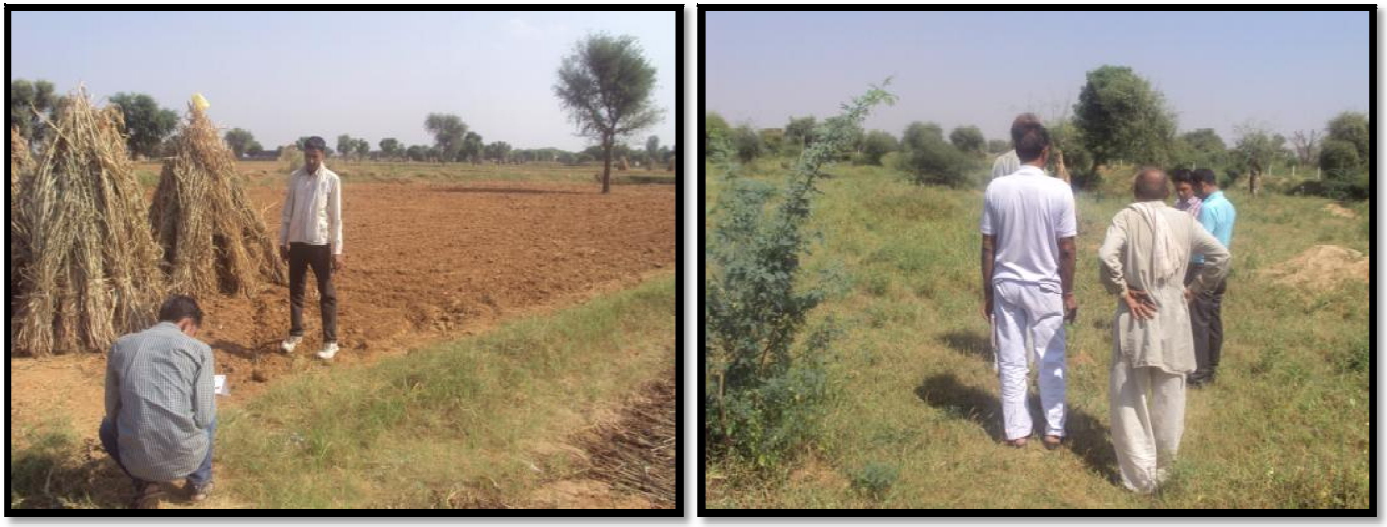
Based on the experience of the experts working in the area and catchment area characteristics each structures like Renovation/ New ponds, Water Conveyance System, Marginal Bundh (Earthen) with pucca outlet, Cement Masonry Structures, Guide Bandh, Earthen Dam with pacca spillway or Silt Detention Dam, Roof Top Rainwater Harvesting/recharging injection well, Community water storage Tank etc. were recommended to conserve and store water used for life saving additional irrigation potential in the rainfed area and to avoid further degradation of the land.

1.2.2 Community Participants in Social Mapping

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

1.2.3 Transect Walk

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



Transect walk

1.2.4 Focus Group Discussions

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

Gram Sabha member's participation in group discussion

1.3 USE OF GIS TECHNOLOGY FOR PLANNING

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

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

1.3.1 Prioritization

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

1.3.2 Planning

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

Based on the experience of the experts working in the area and catchment area characteristics each structure like Renovation/ New ponds, Water Conveyance System, Marginal Bundh (Earthen) with pucca outlet, Cement Masonry Structures, Guide Bandh, Earthen Dam with pacca spillway or Silt Detention Dam, Roof Top Rainwater Harvesting/recharging injection well, Community water storage Tank etc. were provided in consultation with the Gram Sabha Members. However finally only those activities are included which were suggested by the Gram Sabha according to their needs.

1.3.3 Hydrological modeling

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

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

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

S. No.	Scientific Criteria/input used	Whether Scientific Criteria was used
	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 V) project is falls in Narnaul block of Mahendergarh district in Haryana state. The project is a cluster of five micro- watersheds namely Rambass (6D1E8f3), Hassanpur (6D1E8f1), Badopur (6D1E8g1), Balah Kalan (6D1E8t2), Balah Khurd (6D1E8d7). The total geographical area of the project is **3270 ha** out of which **3094 ha** has been undertaken to be treated under IWMP V starting from year 2011-12. The project is divided into five 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	Rambass watershed (IWMP V)	Rambass	6D1E8f3	Rambass	Narnaul	Mahendergarh	697	622	74.64	ASCO Narnaul
2	Rambass	Hasanpur	6D1E8f1	Hasanpur	Narnaul	Mahendergarh	569	528	63.36	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
	watershed (IWMP V)			Rambass (part)						Narnaul
3	Rambass watershed (IWMP V)	Badopur	6D1E8g1	Badopur	Narnaul	Mahendergarh	675	650	78.00	ASCO Narnaul
4	Rambass watershed (IWMP V)	Balah Kalan	6D1E8t2	Balah Kalan Dochana	Narnaul	Mahendergarh	752	734	88.08	ASCO Narnaul
5	Rambass watershed (IWMP V)	Balah Khurd	6D1E8d7	Balah Khurd Balah Kalan (part)	Narnaul	Mahendergarh	577	560	67.20	ASCO Narnaul
					Grand Total		**3270**	**3094**	**371.28**	

2.2 NEED OF WATERSHED DEVELOPMENT PROGRAMME

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

i. poverty index,
ii. percentage of SC,
iii. actual wages,
iv. percentage of small and marginal farmers,
v. ground water status,
vi. moisture index,
vii. area under rain fed agriculture,

viii. drinking water situation in the area ,

ix. percentage of degraded land,

x. productivity potential of land,

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

xii. cluster approach for plain terrain,

xiii. cluster approach for hilly terrain,

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

Table 2. Criteria and Weightage for Selection of Watershed

S. No.	Criteria	Maximum Score	Ranges and Scores			
i.	Poverty index (% of poor to population)	10	Above 80 % (10)	80 to 50 % (7.5)	50 to 20 % (5)	Below 20% (2.5)
ii.	% of SC/ST population	10	More than 40 % (10)	20 to 40 % (5)	Less than 20% (3)	
iii.	Actual wages	5	Actual wages are significantly lower than minimum wages (5)	Actual wages are equal to or higher than minimum wages (0)		
iv.	% of small and marginal farmers	10	More than 80 % (10)	50 to 80 % (5)	Less than 50% (3)	

S. No.	Criteria	Maximum Score	Ranges and Scores			
v.	Ground water status	5	Over exploited (5)	Critical (3)	Sub Critical (2)	Safe (0)
vi.	Moisture index/ DPAP/DDP block	15	-66.7 & below (15) DDP block	-33.3 to -66.6 (10) DPAP Block	0 to -33.2 (0) Non DPAP/DDP Block	
vii	Area under rain fed agriculture	15	More than 90 % (15)	80 to 90 % (10)	70 to 80 % (5)	Below 70 % (Reject)
viii	Drinking water	10	No source (10)	Problematic village (7.5)	Partially covered (5)	Fully covered(0)
ix	Degraded land	15	High-above 20 % (15)	Medium-10 to 20 % (10)	Low-less than 10 % of TGA (5)	
x	Productivity potential of the land	15	Lands with low production & where productivity can be significantly enhanced with reasonable efforts (15)	Lands with moderate production & where productivity can be enhanced with reasonable efforts (10)	Lands with high production & where productivity can be marginally enhanced with reasonable efforts (5)	
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	Neither contiguous to previously treated watershed nor contiguity within the micro-watersheds in the	

S. No.	Criteria	Maximum Score	Ranges and Scores			
				watershed (5)	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 113 concerning these thirteen parameters, a composite ranking was given to Rambass Watershed (IWMP V) project as given in **Table- 3.**

The total numbers of families under BPL are less than the total number of households in the village. Hence a score of 5 was allotted. Rain fed agriculture is more and more than 80 percent and more than 50 % farmers are small and marginal. So the scoring was done

10. So accordingly, scoring was done like project area comes under Arravalli range and Krishnawati of Haryana, has no assured irrigation facility, erratic rainfall, deep, poor quality and less ground water discharge, hence the ground water status score is 5. The percentage of schedule castes in this watershed is about 30 percent 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 113.

Table- 3: Weightage of the Project

1	2	3	4	5	6	7	8	9												
Sr. No.	District	Name of the project	No. of micro-water-sheds proposed to be covered	Geographical area (ha)	Proposed Area for Development	Type of project (Hilly/ Desert/ Others)	Proposed cost (Rs. In Lakh)	Weightage under the criteria												
								i	ii	iii	iv	v	vi	vii	viii	ix	x	xi	xii	xiii	Total
1.	Mahendergarh	Rambass watershed (IWMP V)	5	3270	3094	others	371.28	7.5	3	0	10	5	15	15	7.5	10	10	10	10	10	113

Table 4: Watershed Information

Name of the Project	No. of Micro-Watersheds to be	Watershed codes	Watershed regime/type/order

	Treated		
Rambass Watershed (IWMP V)	5	6D1E8f3, 6D1E8f1, 6D1E8g1, 6D1E8t2, 6D1E8d7	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 (MGNREGS). The micro watershed wise ongoing developmental programme in the project area is tabulated in Table 5.

Table 5. Ongoing Developmental Programs in the Project Area

S. No.	Name of the Program /Project	Name of Micro watersheds	Sponsoring agency	Objective	Estimated number of beneficiaries
1	MGNREGA	Rambass	DRDA, Mahendergarh	To provide assured employment of 100 days in a year to unskilled labour and development of village.	251
2	MGNREGA	Hasanpur	DRDA, Mahendergarh	To provide assured employment of 100 days in a year to unskilled labour and development of village.	Nil
3	MGNREGA	Badopur	DRDA, Mahendergarh	To provide assured employment of 100 days in a year to unskilled labour and development of	375

				village.	
4	MGNREGA	Balah Kalan	DRDA, Mahendergarh	To provide assured employment of 100 days in a year to unskilled labour and development of village.	226
5	MGNREGA	Balah Khurd	DRDA, Mahendergarh	To provide assured employment of 100 days in a year to unskilled labour and development of village.	258

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

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

Watershed Area Development Treated/Sanctioned											
1	2	3		4						5	
S. No.	Names of District	Total micro watersheds in the District		Micro- watersheds covered so far						Net watersheds to be covered	
				Deptt. of Land Resources		Other Ministries/ Deptt.		Total watersheds covered			
				Pre- IWMP projects (DPAP+DDP+IWDP)		Any other watershed project					
		No.	Area (ha)	No.	Area (ha)	No.	Area (ha)	No.	Area (ha)	No.	Area (ha)
1	Mahendergarh	374	187000	130	65000	17 (EAS)	8500	169	85639	205	101361
						22 (NWDPRA)	12139				

CHAPTER – 3

BASIC INFORMATION OF THE PROJECT AREA

GEOGRAPHY AND GEOHYDROLOGY

The Rambass Watershed (IWMP V) falls in Narnaul Block of District Mahendergarh. The area is occupied by Indo- Gangetic alluvium plains and area is traversed and drained by seasonal streams of Krishnavati river system. Physiographically, the area is divided Interdunal plains and Krishnavati River watershed. The area of watershed lies in between 27˚59'45''to 28˚06'10'' N Latitude & 75˚55'40'' to 76˚03'15'' east longitude with general elevation varies between 305-327 m (MSL) above mean sea level (as per Google Earth maps). Area experiences the second lowest rainfall in the state about 80 percent of its annual rainfall is received in the month of July to September. Intensity of rainfall is scattered and erratic in this area; water retention capacity is very low, so area receives drought conditions in alternative years. 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 Rambass Watershed (IWMP V)

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	Rambass	Rambass	697	622	616	541	12	69
2	Hasanpur	Hasanpur	569	528	457	416	12	100
3	Badopur	Badopur	370	358	205	193	-	165
		Dochana	305	292	235	222	-	70
4	Balah Kalan	Balah Kalan	752	734	677	659	5	70
5	Balah Khurd	Balah Khurd	577	560	514	497	10	53
Total			**3270**	**3094**	**2704**	**2528**	**39**	**527**

(Source – District Census Handbook, 2001 Mahendergarh)

3.2 SOIL AND TOPOGRAPHY

The soils of Rambass Watershed are very deep, loamy sand to clay loam, typic ustipsamment, typic torripsamment, lithic ustorthents, typic torriorthent and typic haplustepts in the area. The topography of the area ranges from nearly level to steep slope in Hasanpur and Rambass micro watersheds and level to nearly level in rest of the area. Soils are subject to susceptible to moderate to severe water and wind erosion near hillocks and moderate soil erosion in rest of the area.The slope ranges from 3 to 10% and above along/on the hillocks and 0.5 to 3% in rest of the area of micro watersheds. In some low lying area small saline patches observed. Slope map is presented in Annexure IV.

Table 2. Soil type and Topography

Sr. No.	Name of Micro Watersheds	Code	Geographical area (ha)	Major Soil types	Topography

Sr. No.	Name of Micro Watersheds	Code	Geographical area (ha)	Major Soil types	Topography
1	Rambass	6D1E8f3	697	Sand, loamy sand, sandy loam, loam, sandy clay loam and gravely texture along/on hillock.	Nearly level to steep slope
2	Hasanpur	6D1E8f1	569	Sand, loamy sand, sandy loam, loam, sandy clay loam and gravely texture along/on hillock.	Nearly level to steep slope
3	Badopur	6D1E8g1	675	Sand, loamy sand, sandy loam, loam, sandy clay loam etc.	Level to nearly level
4	Balah Kalan	6D1E8t2	752	Sand, loamy sand, sandy loam, loam, sandy clay loam etc.	Level to nearly level
5	Balah Khurd	6D1E8d7	577	Sand, loamy sand, sandy loam, loam, sandy clay loam etc.	Level to nearly level
	Total		**3270**		

Source: - Department of Agriculture, Haryana

3.2.1 Flood and Drought Condition

There has been incidence of flood and drought as well in watershed villages. The data collected from the revenue department reveals the instances of temporary flood on an average once in 5- 8 years and drought every or alternative Year. The absence of assured irrigation and drought resulted in low to very low yields of the crops.

Table 3. Flood and Drought condition

S.No.	Name of Micro- watersheds	Flood Incidence	Drought Incidence
1	Rambass	1 time in 5-8 Years	Every or Alternative Year
2	Hasanpur	1 time in 5-8 Years	Every or Alternative Year
3	Badopur	1 time in 5-8 Years	Every or Alternative Year
4	Balah Kalan	1 time in 5-8 Years	Every or Alternative Year
5	Balah Khurd	1 time in 5-8 Years	Every or Alternative Year

3.3 SOILS

3.3.1 Soil Erosion

In the identified five micro watersheds, it is observed that due to thin vegetative cover to increase the loss of surface soil in the watershed area. This results in degradation of agricultural land and low organic matter contents. The organic carbon content in areas comparatively low to restrict average in agriculture production and degradation of soil physical and chemical property. Average annual rainfall of the area falling under these watersheds gets washed away in the form of runoff which also carries valuable top soil (sheet). Soil erosion in respect of sheet is quite high. Majority of the watershed Community are dependent on rainfed 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 Micro Watersheds	Soil pH	Type of salinity
1	Rambass	7.15- 8.50	Low to Moderate
2	Hasanpur	7.16- 8.35	Low to Moderate
3	Badopur	7.15- 8.15	Low to Moderate
4	Balah Kalan	7.17- 8.35	Low to Moderate
5	Balah Khurd	7.15- 8.45	Low to Moderate

3.3.3 SOIL CLASSIFICATION

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

Soil Mapping Unit- 5 (Ruppu Saroi Soil Association)

The Ruppu Saroi soil series is only series in this soil association. The soil series is excessively drained, Sandy loam to Loam, Loamy Skeletal Mixed hyperthermic Lithic Ustorthents. The soil series is non calcareous, shallow to deep, pH 7.15-7.45, dark yellowish brown to yellowish brown in colour (10YR 4/4-10YR 5/4) developed on Steep to Very steep slope in Aravali Hills.

Soil Mapping Unit- 6 (Akrata- Basal Soil Association)

The Akrata soil series is dominated in this soil association and associated soil series is Basal. The dominant soil excessively drained, Sand to Loamy sand, Sandy Mixed hyperthermic Typic Torripsamments, 1st associate soil series is excessively drained, Loamy sand to Silt loam, Coarse loamy mixed hyperthermic Typic Torriorthents. Akrata soil series is strongly calcareous, very deep, pH 7.90-8.20, pale brown to yellowish brown in colour (10YR 6/3-10YR 5/4) developed on Very gentle sloping/Undulating Topography of Aravali pediments, Basal soil series is moderate to strong calcareous, very deep, pH 7.15-8.00, brown to yellowish brown in colour (10YR 5/3-10YR 5/6) developed on Pediments formed by accumulation of eroded particles of Aravali hills.

Soil Mapping Unit- 11 (Zerpur Soil Association)

The Zerpur soil series is only series in this soil association. The soil series is well drained, Sand, Sandy Mixed hyperthermic Typic Ustipsamments. The soil series is non calcareous, very deep, pH 8.00-8.90 , yellowish brown to brownish yellow in colour (10YR 5/6-10YR 6/6) developed on unstable sand dune of dune complexes/Aeolian sand.

Soil Mapping Unit- 15 (Pathera- Zerpur Soil Association)

The Pathera soil series is dominated in this soil association and associated soil series is Zerpur. The dominant soil well drained, Sandy loam to Sandy Clay loam, Sandy Mixed hyperthermic Typic Ustipsamments, 1st associate soil series is well drained, Sand, Fine loamy Mixed hyperthermic Typic Haplustepts. Pathera soil series is non calcareous, very deep, pH 8.20-8.60, brown to yellowish brown in colour (10YR 4/3-10YR 5/6) developed on Gentle sloping Fluvo-aeolian plains over alluvium, Zerpur soil series is non calcareous, very deep, pH 8.00-8.90, yellowish brown to brownish yellow in colour (10YR 5/6-10YR 6/6) developed on unstable sand dune of dune complexes/Aeolian sand.

Soil Mapping Unit- 16 (Majri- Basal Soil Association)

The Majri soil series is dominated in this soil association and associated soil series is Basal. The dominant soil excessively drained, Sand to Loamy sand to Silt loam, Sandy Mixed hyperthermic Typic Torripsamments, 1st associate soil series is excessively drained, Loamy sand to Silt loam, Coarse loamy Mixed hyperthermic Typic Torriorthents. Majri soil series is moderate to strong calcareous, very deep, pH 8.40-8.60, yellowish brown in colour (10YR 5/4-10YR 5/8) developed on Sandunes of dune complexes/Aeolian sand on undulating terrain with Common medium hard concretions of calcium carbonate in C horizon, Basal soil series is moderate to

strong calcareous, very deep, pH 7.15-8.00, brown to yellowish brown in colour (10YR 5/3-10YR 5/6) developed on Pediments formed by accumulation of eroded particles of Aravali hills.

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

3.3.4 Land Capability Classification

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

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

The soils of the selected Watersheds have been grouped into 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 e3s3

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 subsidies, because farmers are not economically capable to bear the rate of land leveling.
2. Engineering measures like Check Dams, 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 bunds 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 e4s4

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 subsidies, because farmers 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.

Land capability subclass VI es

These soils are shallow to deep, coarse fragments, light to medium textured soils on nearly level to gentle slopes, hilly and undulated, sloping, moderate to severely eroded lands developed on and along hillocks. The water holding capacity is very poor and the water erosion hazard is moderate to severe.

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

1. Specific and special soil conservation measures should be adopted to check water erosion adopting land development majors soils should be provided permanent vegetation (A forestation) and rainfed horticulture cover to check further deterioration of soils.
2. Soils would be suitable for pasture development; forestation and other major water harvesting structures (Percolation pond), silt detention/ percolation dams, drop structures and stone check dams.
3. Provide community water storage tanks for supplementary irrigation during lean period.
4. 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 366mm (during the past 13 year's data). The highest rainfall is 689 mm during the year 2010 and lowest in 2002 as 141mm. The uneven rainfall distribution is leading to run off soil every year to the steams, rivulets and depressed area of the Rambass Watershed (IWMP V). The year wise rainfall from 2000 to 2012 is presented in **Table.5.**

Table 5. Rainfall during the years 2000-12

S.No.	Year	Rainfall (in mm)
1	2000	228
2	2001	384
3	2002	141
4	2003	339
5	2004	354
6	2005	530
7	2006	267
8	2007	312
9	2008	554
10	2009	321
11	2010	689
12	2011	362
13	2012	287
	Average Rainfall	**366**

(Source: - Deputy Director Agriculture, Mahendergarh)

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

Physiographically, the area slope falls South- West to North- East. The general Elevation in the area belongs to old alluvium plains with sand overburden in pockets to make small hummocks in the area. 305-327 m above mean sea level (google earth map). Area experiences second lowest rainfall in state and 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 (%)	Major Streams
Rambass Watershed (IWMP V)	305-327	0.5 to 10% and above	Krishnavati River

3.4 LAND AND AGRICULTURE

The land holding pattern of the villages under Rambass 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 is Narnaul, Rewari, Delhi, Gurgaon, Dharuhera and Bhiwadi. This affects directly the demographic profile of the villages.

The major crops Bajra, Gawar, green fodder and pulses in Kharif under rainfed conditions. The major crops during Rabi wheat, mustard, gram, green fodder and seasonal vegetables in rainfed and irrigated conditions. The soil and water conservation measures such as Engineering like Renovation/ New ponds, Water Conveyance System, Marginal Bundh (Earthen) with pucca outlet, Cement Masonry Structures, Guide Bandh, Earthen Dam with pacca spillway or Silt Detention Dam, Roof Top Rainwater Harvesting/recharging injection well, Community water storage Tank etc. The project would help the farmers to take crop production which will enhance the net production value. The following plants are commonly observed in the Project Area. The natural vegetation in the project area is exhibited in **Table 7.**

Table 7. NATURAL VEGETATION

Sr. No.	Trees	Fruits	Shrubs	Grasses
1	Khairi	Amla	Pala	Anjan
2	Jand	Ber	Hins	Dhaman
3	Dhak	Guava	Puthkanda	Dub
4	Babool	Citrus	Bansa	Kana
5	Beri		Panwar	Dabh
6	Pipal		Karir	Pala
7	Lasura		Khip	Chirya
8	Shisham		Ak	
9	Neem		Phog	
10	Siris		Nagphani	

Sr. No.	Trees	Fruits	Shrubs	Grasses
11	Kikar			

3.4.1 Land Ownership Details

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

Table-8:- Land Ownership Details

GENERAL	OBC	SC	ST	Total owners
470	**1682**	**95**	**-**	**2247**

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	Rambass	Rambass	616	465	435
2	Hasanpur	Hasanpur	457	361	323
3	Badopur	Badopur	205	156	138
		Dochana	235	183	167
4	Balah Kalan	Balah Kalan	677	497	473
5	Balah Khurd	Balah Khurd	514	395	371
		Total	**2704**	**2057**	**1907**

(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.

S. No.	Name of Micro Watersheds	Name of Villages	Source 2: Groundwater (Tube wells)	
			Availability months	Net area (ha)
1	Rambass	Rambass	July to June	95
2	Hasanpur	Hasanpur	July to June	114
3	Badopur	Badopur	July to June	185
		Dochana	July to June	145
4	Balah Kalan	Balah Kalan	July to June	540
5	Balah Khurd	Balah Khurd	July to June	212
				1291

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

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)

S. No.	Name of Micro Watersheds	Village	Rabi crops(Wheat)				(Mustard)				(Pulses)		
			Area (ha)	Prod. (kg)	Productivity (kg/ha) Avg.	Use of fertilizer	Area (ha)	Prod. (kg)	Productivity (kg/ha) Avg.	Use of fertilizer	Area (ha)	Prod. (kg)	Productivity (kg/ha) Avg.
1	Rambass	Rambass	173	813619	4703	Yes	184	313720	1705	Yes	42	55314	1317
2	Hasanpur	Hasanpur	108	507600	4700	Yes	104	176280	1695	Yes	16	21088	1318
3	Badopur	Badopur	28	131264	4688	Yes	55	93775	1705	Yes	23	30015	1305
		Dochana	46	216338	4703	Yes	81	138915	1715	Yes	17	22389	1317
4	Balah Kalan	Balah Kalan	87	409161	4703	Yes	234	403650	1725	Yes	59	78234	1326
5	Balah Khurd	Balah Khurd	84	396060	4715	Yes	178	303490	1705	Yes	45	59265	1317
		Total	**526**				**836**				**202**		

Table 11 B. Crop Details (Kharif)

S. No.	Name of Micro Watersheds	Village	(Bajra)				(Gwar)		
			Area (ha)	Prod. (kg)	Productivity (kg/ha) Avg.	Use of fertilizer	Area (ha)	Prod. (kg)	Productivity (kg/ha) Avg.
1	Rambass	Rambass	395	620545	1571	Yes	6	10230	1705
2	Hasanpur	Hasanpur	147	231084	1572	Yes	85	148325	1745
3	Badopur	Badopur	112	176400	1575	Yes	15	26925	1795

S. No.	Name of Micro Watersheds	Village	(Bajra)				(Gwar)		
			Area (ha)	Prod. (kg)	Productivity (kg/ha) Avg.	Use of fertilizer	Area (ha)	Prod. (kg)	Productivity (kg/ha) Avg.
		Dochana	149	225735	1515	Yes	1	1701	1701
4	Balah Kalan	Balah Kalan	326	512146	1571	Yes	47	80135	1705
5	Balah Khurd	Balah Khurd	291	454542	1562	Yes	36	62820	1745
		Total	**1420**				**190**		

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 Rambass Watershed (IWMP V)

S. No	Name of Micro Watersheds	Villages	Buffalo(*Lit/per day/annum) for 6 months	Cow(*lit/per day/annum) for 6 months	Sheep	Goat	Camel
1	Rambass	Rambass	797/11158/2008440 (lit/per day/annum)	80/480/86400 (lit/per day/annum)	0	609	22
2	Hasanpur	Hasanpur	495/5940/1069200 (lit/per day/annum)	60/300/54000 (lit/per day/annum)	0	120	16
3	Badopur	Badopur	258/3870/696600 (lit/per day/annum)	10/60/10800 (lit/per day/annum)	0	252	4
		Dochana	264/3696/665280 (lit/per day/annum)	31/217/39060 (lit/per day/annum)	0	329	2
4	Balah Kalan	Balah Kalan	1495/22425/4036500 (lit/per day/annum)	166/830/149400 (lit/per day/annum)	0	193	25
5	Balah Khurd	Balah Khurd	201/3216/578880 (lit/per day/annum)	7/35/6300 (lit/per day/annum)	10	72	8

(Source: Animal Husbandry, Mahendergarh)

***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

Ground Water Cell of Haryana has fixed hydrograph station mostly open well for monitoring purposes. The water level data is observed during pre and post monsoon. The data generated has been analyzed for the purpose of ground water studies in the watershed area. The ground water behavior in the watershed reveals the variation of depth to water level from 60 to 80 m and above the ground level. The water table of Rambass and part of Hasanpur micro watershed falls in the depth range of 60-80 m below ground level where as Balah Kalan, Balan Khurd, Badopur and part of Hasanpur micro watersheds have depth above 80 m. The village wise water level data has been tabulated in Table 13. Depth to water level map has been prepared and presented in the Annexure VIII.

Table 13. Village Wise Depth to Water Level of Rambass Watershed (IWMP V)

S. No.	Name of Micro Watersheds	Name of Villages	Source	Pre- Project level (m)
1	Rambass	Rambass	Open well	65.8
2	Hasanpur	Hasanpur	Open well	78.2
3	Badopur	Badopur	Open well	85.6
		Dochana	Open well	82.1

S. No.	Name of Micro Watersheds	Name of Villages	Source	Pre- Project level (m)
4	Balah Kalan	Balah Kalan	Open well	89.4
5	Balah Khurd	Balah Khurd	Open well	92.0

The source of drinking water supply is through the tube wells network in the area. The micro watershed wise quality ranges from fresh to marginal. The water quality distribution in Balah Kalan, Balan Khurd, Badopur, Rambass and part of Hasanpur micro watershed is fresh where as in part of Hasanpur micro watershed is marginal. The area falls under overexploited category where the exploitation of ground water is over 100%. The water quality map of the area is presented in Annexure-IX. The drinking water supply is available thought the year but shortage in villages during May and June where the supply is augmented by tankers. The department of Public Health Engineering is responsible for the water supply for drinking purpose.

b) Water table fluctuation

Historical ground water table data (1974 to 2010) was analyzed and the water table is falling at the rate of 88 cm/yr. There is need of recharging of aquifer by rain water harvesting.

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

c) Rain water harvesting and Recharging

Ground water development potential of Rambass watershed area is over-exploited and there is need for rain water harvesting and recharging. It has been proposed to make rainwater-harvesting by construction of water harvesting structure. The provision of this has been provided in the project proposal.

3.4.7 DETAILS OF COMMON PROPERTY RESOURCES: The department of panchayat has maintained the record of common property resources of area under various institutions. The data has been taken has been collected DDPO, Mahendergarh. The details of common property resource in Rambass Watershed (IWMP V) 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	Pvt. Person	Govt.	PRI	Any Other
Rambass Watershed (IWMP V)	Waste land	-	167	511	-	-	167	511	-
	Pasture	-	-	11	-	-	-	11	-
	Orchards	-	-	-	-	-	-	-	-
	Village wood lot	-	-	-	-	-	-	-	-
	Forest	-	-	42	-	-	-	30	-
	Village ponds, lake	-	-	20	-	-	-	18	-
	Community Buildings	-	26	17	-	-	-	-	-
	Weekly Mkts	-	-	-	-	-	-	-	-

	Permanent Mkts	-	-	-	-	-	-	-	-
	Temples/place of worship	-	-	36	-	-	-	-	-
	Others	-	-	-	-	-	-	-	-

3.5 SOCIO ECONOMIC AND LITERACY PROFILE

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

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

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

3.5.1 Demographic Status

Table 15. Demographic Status/ Population Pattern

S. No.	Name of the Micro watersheds	Name of villages	Total no. of houses	Total Population			SC			
				Male	Female	Total	Male	Female	Total	%age
1	Rambass	Rambass	543	1548	1419	2967	322	265	587	19.78
2	Hasanpur	Hasanpur	332	943	802	1745	173	127	300	17.19
3	Badopur	Badopur	310	861	778	1639	192	180	372	22.70
		Dochana	435	1214	1037	2251	323	277	600	26.65
4	Balah Kalan	Balah Kalan	900	2514	2177	4691	366	287	653	13.92
5	Balah Khurd	Balah Khurd	213	564	510	1074	117	114	231	21.51
		Total	**2733**	**7644**	**6723**	**14367**	**1493**	**1250**	**2743**	**19.09**

(Source- District Census 2011)

Table16. Village wise Literacy Rate in Rambass Watershed (IWMP V)

S.No.	Name of the Micro watersheds	Name of villages	Total population	Literacy					
				Total Literates	% age	Male	% age	Female	% age
1	Rambass	Rambass	2967	1933	65.15	1178	60.94	755	39.06
2	Hasanpur	Hasanpur	1745	1186	67.97	733	61.80	453	38.20
3	Badopur	Badopur	1639	1103	67.30	673	61.02	430	38.98
		Dochana	2251	1528	67.88	936	61.26	592	38.74

4	Balah Kalan	Balah Kalan	4691	3327	70.92	2063	62.01	1264	37.99
5	Balah Khurd	Balah Khurd	1074	741	68.99	477	64.37	264	35.63
		Total	**14367**	**9818**	**68.34**	**6060**	**61.72**	**3758**	**38.28**

(Source- District Census- 2011)

Table 17. EMPLOYMENT STATUS

S.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	Rambass	Rambass	322	265	68	20	24	2	4	0	220	19
2	Hasanpur	Hasanpur	173	127	113	6	9	0	0	0	103	7
3	Badopur	Badopur	192	180	46	31	2	2	0	0	226	71
		Dochana	323	277	90	46	5	1	6	2	352	26
4	Balah Kalan	Balah Kalan	366	287	52	11	10	5	6	1	275	22
5	Balah Khurd	Balah Khurd	117	114	1	1	0	0	1	0	74	12
		Total	**1493**	**1250**	**370**	**115**	**50**	**10**	**17**	**3**	**1250**	**157**

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 Rambass Watershed (IWMP V)

S. No.	Name of Micro Watersheds	Name of villages	Total Population	No. of persons migrating	No. of days per year of migration	Main reason for migration	Income during migration/ month/person
1	Rambass	Rambass	2967	32	120	Lack of employment opportunity	6500- 10000
2	Hasanpur	Hasanpur	1745	14	120	Lack of employment opportunity	6500- 10000
3	Badopur	Badopur	1639	17	90	Lack of employment opportunity	6500- 10000
		Dochana	2251	23	90	Lack of employment opportunity	6500- 10000
4	Balah Kalan	Balah Kalan	4691	28	120	Lack of employment opportunity	6500- 10000
5	Balah Khurd	Balah Khurd	1074	11	120	Lack of employment opportunity	6500- 10000

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

Table 19. BPL Pattern

S. No.	Name of Micro watersheds	Name of villages	Total houses	Total Household-BPL	% of BPL HH
1	Rambass	Rambass	543	83	15.29
2	Hasanpur	Hasanpur	332	70	21.08

S. No.	Name of Micro watersheds	Name of villages	Total houses	Total Household-BPL	% of BPL HH
3	Badopur	Badopur	310	61	19.68
		Dochana	435	127	29.20
4	Balah Kalan	Balah Kalan	900	191	21.22
5	Balah Khurd	Balah Khurd	213	50	23.47
		Total	**2733**	**582**	**21.30**

(Source: District Administration Mahendergarh, Haryana)

INFRASTRUCTURE DETAILS

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

Table 20. Village Infrastructure

S. No.	Name of Micro watersheds	Name of villages	Bank Y/N	Post office Y/N	School Primary/ High/ Sr.Sec	Milk Collection Centre Y/N	Pucca Road to Village Y/N	Health Facility Govt/Private Y/N	Veterinary facility Y/N
1	Rambass	Rambass	Y	N	Sec.	Y	Y	Y	Y
2	Hasanpur	Hasanpur	N	N	Middle	Y	Y	N	Y
3	Badopur	Badopur	N	N	Middle	N	Y	N	N

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

FACILITIES/ HOUSEHOLD ASSETS

Table 21. Facilities/ Household assets in Rambass Watershed (IWMP V)

S. No.	Name of micro water sheds	Name of villages	Total no. of Houses	HHs with Safe latrines	HHs with phones		HHs with vehicles		HHs with TV sets	HHs with cooking gas	HHs with drinking water	HHs with fridge
					Landline	Mobile	2 wheelers	4 wheelers				
1	Rambass	Rambass	543	230	7	456	210	15	345	140	45	65
2	Hasanpur	Hasanpur	332	145	8	310	74	2	68	170	2	40
3	Badopur	Badopur	310	140	6	260	38	12	154	52	11	46
		Dochana	435	210	12	330	90	12	340	120	25	72
4	Balah Kalan	Balah Kalan	900	524	32	620	280	11	650	450	70	350
5	Balah Khurd	Balah Khurd	213	106	4	180	22	5	140	95	5	72

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 Rambass Watershed (IWMP V)

S. No.	Name of micro watersheds	Name of villages	Agriculture in Rs. P.A	Animal Husbandry in Rs. P.A	Casual labour in Rs. P.A	Others in Rs. P.A	Total in Rs.
1	Rambass	Rambass	21000	15000	14000	19000	69000
2	Hasanpur	Hasanpur	18000	10000	17000	20000	65000
3	Badopur	Badopur	20000	14000	12000	19000	65000
		Dochana	19000	11000	20000	22000	72000
4	Balah Kalan	Balah Kalan	21000	16000	14000	24000	75000
5	Balah Khurd	Balah Khurd	18000	11000	12000	19000	60000

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

- Moderate to severe erosion hazard

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

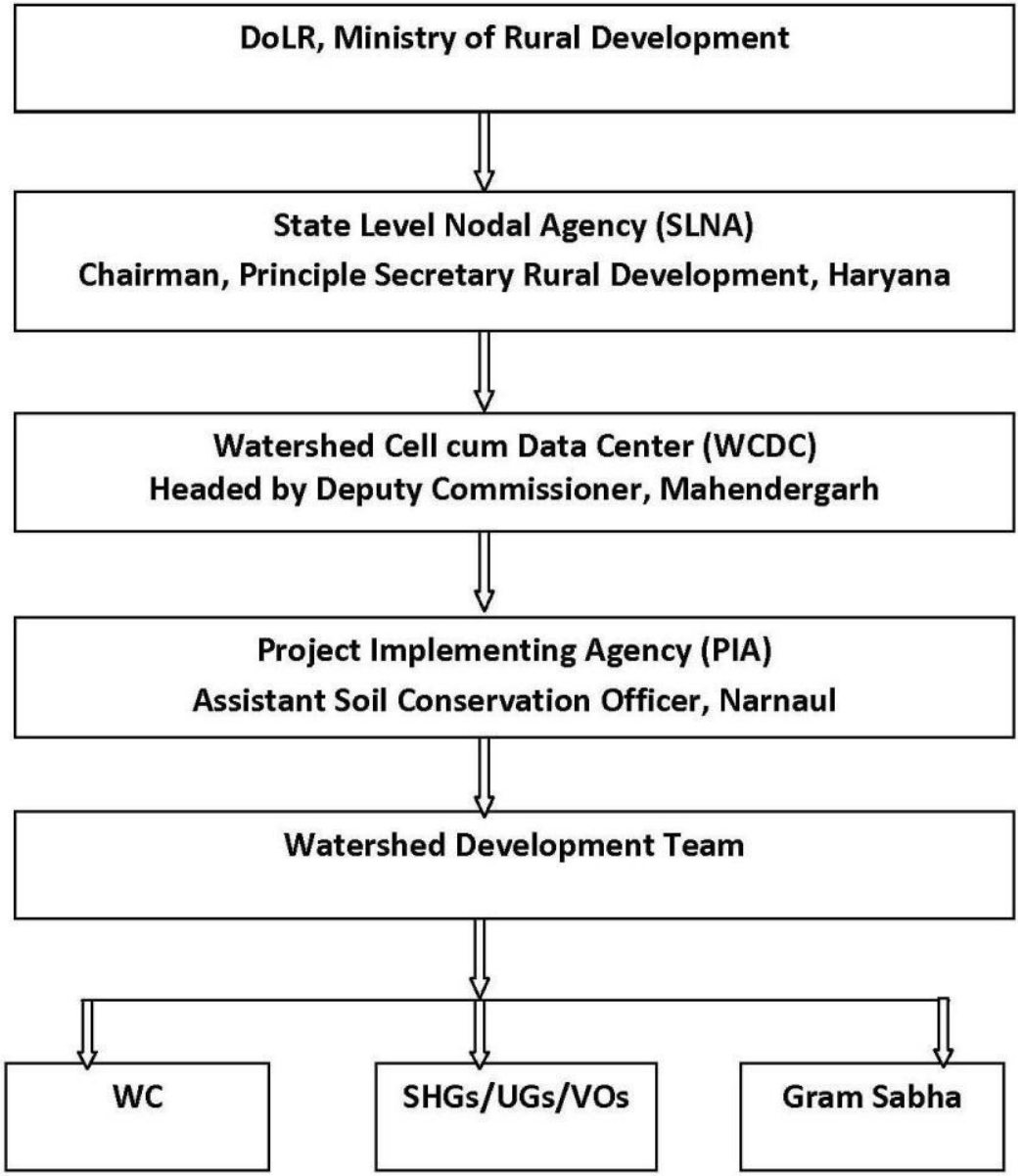
CHAPTER-4

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, Haryana
Watershed Cell cum Data Center (WCDC)
Headed by Deputy Commissioner, Mahendergarh
Project Implementing Agency (PIA)
Assistant Soil Conservation Officer, Narnaul
Watershed Development Team
WC
SHGs/UGs/VOs
Gram Sabha

4.2 STATE LEVEL NODAL AGENCY, HARYANA

State Level Nodal Agency (SLNA) is headed by Chief Executive Officer and supported by Technical Experts is 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, MAHENDERGARH

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 Narnaul is selected by the State Level Nodal Agency (SLNA) for Integrated Watershed Management Programme (IWMP) in Haryana. In the district Mahendergarh, where the area of development is 27898 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, Narnaul 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	Rambass Watershed (IWMP V)	i) Type of organization	Agriculture Department
		ii) Name of organization	Assistant Soil Conservation Officer

		iii) Designation & Address	Assistant Soil Conservation Officer, Narnaul, Nizampur Road, Narnaul Distt. Mahendergarh
		iv) Telephone	94160-57724
		v) Fax	-
		vi) E-mail	-

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

4.4.1 Monitoring Level Staff at PIA Head Office

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

4.5 Watershed Development Team

The watershed development team (WDT) is an integral part of the PIA. WDT would consist of subject specialists such as Agriculture, Animal Husbandry, Horticulture, Soil & Water Management and Forest. One woman member with experience in Social mobilization is

also included in WDT. Assistant Soil Conservation Officer would be team leader of the WDTs. Team Leader will coordinate with other WDT members for smooth implementation of the project. One member of the WDT will be departmental official of the rank ADO (Soil Conservation)/ ADO (Agriculture) who will also be responsible for disbursement of funds along with Secretary Watershed Committee.

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

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

4.6 WATERSHED COMMITTEE DETAILS

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

Their representation of various groups is as under:

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

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

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

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

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

4.6.1 Formation of Watershed Committees (WC)

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

Table 2. Watershed Committees (WC) Details

Name of Micro Watersheds	Name of villages	Name of President/Chairman	Name of Members
Rambass	Rambass	Kamla Devi	Pavitra Devi, Sher Singh, Mahabir Singh, Aflatun, Laxmi Narain, Hajari lal, Saroj Devi, Vinod Yadav, Manju, Raj Kumar, Surender, Rajbala, Saitan Singh, Radha Krishan, Kuldeep, Mahender Singh, Parbhu Singh, Sat parkash, Sumesh
Hasanpur	Hasanpur	Krishan Kumar	Ram Niwas, Chiranji Lal, Dharampal, Surji devi, Deendayal, Ghisa Ram, Rohtash, Davender, Vinod Yadav, Parbhudayal, Shri Chand, Beg Raj, Sube Sing, Satpal, Raj

Name of Micro Watersheds	Name of villages	Name of President/Chairman	Name of Members
			Kumar, Babu Lal, Misri Devi
Badopur	Badopur	Savitri Devi	Munsi Ram, Indraj Singh, Murti Devi, Ram Kumar, Phul Chand, Vinod Yadav, Manju Devi, Kamla Devi, Sumer Singh, Om Parkash, Phul Chand, Bhagwana Ram, Jai Singh, Balbir Singh
	Dochana	Laxmi devi	Rameshwar dayal, Pahlad Singh, Bimla devi, Dharampal, Phul Chand, Vinod Yadav, Shankar Lal, Shiv Kumar, Hosiyar Singh, Anil Kumar, Ram Singh, Bindu Devi, Ajit Singh, Manshi, Santosh
Balah Kalan	Balah Kalan	Mujkesh Devi	Shiv Kumar, Ram Kumar, Imrati devi, Ghisa Ram, Kanta Devi, Vinod Yadav, Ram Niwas, Jawahar lal, Sube Singh, Suraj Bhan, Hanuman, Amar Singh, Het Ram, Surender, Shish Ram, Kamla Devi
Balah Khurd	Balah Khurd	Karan Singh	Bhoop Singh, Badlu Ram, Manni, Amar Singh, Nathu Ram, Budh Ram, Ram Kumar, Phul Chand, Vinod Yadav, Kishan Lal, DuliChand, Lila Devi, Ramesh Kumar, DharmPal, Amar Singh

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 V RAMBASS 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 V

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
Rambass Watershe	3270	3094	37128000	Administrative costs	371280	371280	1113840	1113840	742560	3712800
				Monitoring	0	0	0	371280	0	371280

d (IWMP V)				Evaluation	0	0	0	0	371280	371280
				Entry point activities	1485120	0	0	0	0	1485120
				Institution and capacity building	0	1856400	0	0	0	1856400
				Detailed project report	371280	0	0	0	0	371280
				Watershed development works	0	2970240	5940480	6311760	5569200	20791680
				Livelihood activities for the asset less persons	0	0	1113840	1856400	371280	3341520
				Production system and micro enterprises	0	0	1113840	1485120	1113840	3712800
				Consolidation phase	0	0	0	0	1113840	1113840
				Total	**2227680**	**5197920**	**9282000**	**11138400**	**9282000**	**37128000**
				Percentage of total cost	**6%**	**14%**	**25%**	**30%**	**25%**	**100%**

MICRO WATERSHED WISE/COMPONENT WISE PHASING

YEAR WISE BUDGET PHASING UNDER IWMP

Area in Hectares and

Funds in Rs.

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

(BUDGET AT A GLANCE)

Effective Area	Funds Available	Name of activity	1st Year	2nd Year	3rd Year	4th Year	5th Year	Total
622	7464000	Administrative costs	74640	74640	223920	223920	149280	746400
		Monitoring	0	0	0	74640	0	74640
		Evaluation	0	0	0	0	74640	74640
		Entry point activities	298560	0	0	0	0	298560
		Institution and capacity building	0	373200	0	0	0	373200
		Detailed project report	74640	0	0	0	0	74640
		Watershed development works	0	597120	1194240	1268880	1119600	4179840
		Livelihood activities for the asset less persons	0	0	223920	373200	74640	671760
		Production system and micro enterprises	0	0	223920	298560	223920	746400
		Consolidation phase	0	0	0	0	223920	223920
		Total	**447840**	**1044960**	**1866000**	**2239200**	**1866000**	**7464000**
		Percentage of total cost	**6%**	**14%**	**25%**	**30%**	**25%**	**100%**

MICRO WATERSHED WISE/COMPONENT WISE PHASING

YEAR WISE BUDGET PHASING UNDER IWMP

Area in Hectares and

Funds in Rs.

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

(**BUDGET AT A GLANCE)**

Effective Area	Funds Available	Name of activity	1st Year	2nd Year	3rd Year	4th Year	5th Year	Total
528	6336000	Administrative costs	63360	63360	190080	190080	126720	633600
		Monitoring	0	0	0	63360	0	63360
		Evaluation	0	0	0	0	63360	63360
		Entry point activities	253440	0	0	0	0	253440
		Institution and capacity building	0	316800	0	0	0	316800
		Detailed project report	63360	0	0	0	0	63360
		Watershed development works	0	506880	1013760	1077120	950400	3548160
		Livelihood activities for the asset less persons	0	0	190080	316800	63360	570240

		Production system and micro enterprises	0	0	190080	253440	190080	633600
		Consolidation phase	0	0	0	0	190080	190080
		Total	**380160**	**887040**	**1584000**	**1900800**	**1584000**	**6336000**
		Percentage of total cost	**6%**	**14%**	**25%**	**30%**	**25%**	**100%**

MICRO WATERSHED WISE/COMPONENT WISE PHASING

YEAR WISE BUDGET PHASING UNDER IWMP

Area in Hectares and

Funds in Rs.

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

(BUDGET AT A GLANCE)

Effective Area	Funds Available	Name of activity	1st Year	2nd Year	3rd Year	4th Year	5th Year	Total

650	7800000	Administrative costs	78000	78000	234000	234000	156000	780000
		Monitoring	0	0	0	78000	0	78000
		Evaluation	0	0	0	0	78000	78000
		Entry point activities	312000	0	0	0	0	312000
		Institution and capacity building	0	390000	0	0	0	390000
		Detailed project report	78000	0	0	0	0	78000
		Watershed development works	0	624000	1248000	1326000	1170000	4368000
		Livelihood activities for the asset less persons	0	0	234000	390000	78000	702000
		Production system and micro enterprises	0	0	234000	312000	234000	780000
		Consolidation phase	0	0	0	0	234000	234000
		Total	**468000**	**1092000**	**1950000**	**2340000**	**1950000**	**7800000**
		Percentage of total cost	**6%**	**14%**	**25%**	**30%**	**25%**	**100%**

MICRO WATERSHED WISE/COMPONENT WISE PHASING

YEAR WISE BUDGET PHASING UNDER IWMP

Area in Hectares and

Funds in Rs.

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

(**BUDGET AT A GLANCE)**

Effective Area	Funds Available	Name of activity	1st Year	2nd Year	3rd Year	4th Year	5th Year	Total
734	8808000	Administrative costs	88080	88080	264240	264240	176160	880800
		Monitoring	0	0	0	88080	0	88080
		Evaluation	0	0	0	0	88080	88080
		Entry point activities	352320	0	0	0	0	352320
		Institution and capacity building	0	440400	0	0	0	440400
		Detailed project report	88080	0	0	0	0	88080
		Watershed development works	0	704640	1409280	1497360	1321200	4932480
		Livelihood activities for the asset less persons	0	0	264240	440400	88080	792720

		Production system and micro enterprises	0	0	264240	352320	264240	880800
		Consolidation phase	0	0	0	0	264240	264240
		Total	**528480**	**1233120**	**2202000**	**2642400**	**2202000**	**8808000**
		Percentage of total cost	**6%**	**14%**	**25%**	**30%**	**25%**	**100%**

MICRO WATERSHED WISE/COMPONENT WISE PHASING

YEAR WISE BUDGET PHASING UNDER IWMP

Area in Hectares and Funds in Rs.

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

(**BUDGET AT A GLANCE)**

Effective	**Funds**	**Name of activity**	**1st Year**	**2nd Year**	**3rd Year**	**4th Year**	**5th Year**	**Total**

Area	Available							
560	6720000	Administrative costs	67200	67200	201600	201600	134400	672000
		Monitoring	0	0	0	67200	0	67200
		Evaluation	0	0	0	0	67200	67200
		Entry point activities	268800	0	0	0	0	268800
		Institution and capacity building	0	336000	0	0	0	336000
		Detailed project report	67200	0	0	0	0	67200
		Watershed development works	0	537600	1075200	1142400	1008000	3763200
		Livelihood activities for the asset less persons	0	0	201600	336000	67200	604800
		Production system and micro enterprises	0	0	201600	268800	201600	672000
		Consolidation phase	0	0	0	0	201600	201600
		Total	**403200**	**940800**	**1680000**	**2016000**	**1680000**	**6720000**
		Percentage of total cost	**6%**	**14%**	**25%**	**30%**	**25%**	**100%**

CHAPTER – 6

PREPARATORY PHASES

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

6.1 AWARENESS GENERATION AND MOTIVATION FOR PARTICIPATION

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

6.1.1 Collection of Base Line Data and Hydrological Data

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

6.1.2 Formation of Village Level Institutions

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

The self- Help Groups were formed during earlier projects but most of them are inactive and non – functional. 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 were 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 Mahendergarh 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. 18, 56, 400/-

6.2 Capacity Building

1. Introduction

Watershed development is conceived as a strategy for protecting livelihoods of people inhabiting fragile ecosystems, which over period of time have become subject to multidimensional land degradation. Main stress has been to ensure availability of water for drinking and irrigation to support agro-horti-forestry operation vis-à-vis raise income level and provide adequate employment opportunities for communities living in such areas of concerns. As an intervention Integrated Wasteland Development is nearly 20 years old. The initiatives have been subjected 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 47 projects are outlined as follows:-

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

Table 1. Statement of Targets under Proposed Training Action Plan at Micro Watershed Level to be conducted by WDT members of Mahendergarh 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**				
	Mahendergarh	Members of Watershed Committees @ 10 per committee would also include accompanying WDT Members.	700	300-350	2
02	Block Level Functional Programmes for Secretaries of Watershed Committees. **Two Days**				
	Mahendergarh	Secretaries of Village Watershed Committees	70	35-40	2
03	Project Level Sensitization Camps for WC **One Days**				
	Mahendergarh	Members of Watershed Committees @ 10 Persons (Tentative) per WC	700	50	14
04	Village Level Awareness Camps on IWMP at Micro Watershed Level for User Groups **One Day**				
	Mahendergarh	Approximately 50 prospective user groups per micro watershed.	2050	50	41
05	Block Level Functional Programmes for SHGs [Leader, Secretary and Treasurer] under IWMP **One Day**				

	Mahendergarh	Three persons (Leader, Secretary and Treasurer) per Self Help Group @ around one SHG per village.	210	50	4

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	39349
2	Block Level Functional Programmes for Secretaries of Watershed Committees. Two Days	5124
3	Village Level Sensitization Camps for WC One Days	27404
4	Village Level Awareness Camps on IWMP at Micro Watershed Level for Prospective User Groups One Day	36831

5	Block Level Functional Programmes for SHGs [Leader, Secretary and Treasurer] under IWMP One Day	10159
	Total	**118867**

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

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

S. No.	Target Group	Training Topics	No. of days	Budget per camp	No. of Camps	No. of Participants per camp	Cost for all participants per day	Cost per participant/ per day	Cost per person	Total Budget
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	30000	5	5	7500	1500	4500	112500
4	Sub watershed Level- PIA Members	Exposure Visit-Within Fundamentals of Watershed, Finance Management, Final Report on WDP etc	2	14000	5	10	7000	700	4500	225000
5	District Level-WDC	Exposure visit to successful watershed/ University.	2	14000	5	10	7000	700	1400	70000

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
6	District Level-Line Deptt., WDC	Exposure visit to successful watersheds within state.	2	14000	5	10	7000	700	1400	70000
7	SLNA and District Level Controlling Officers	Exposure visit to successful watersheds outside state	4	30000	5	5	7500	1500	6000	150000
Total			**18**		**35**	**60**				**837500**

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

S. No.	District	No. Micro watershed	No. of Camps/ Year/ Micro watershed	Total No. of camps per Year	Total No. of camps for 5 Year's	Amount of per Camp	Amount per Micro watershed	Total Budget
1.	Farmer Training Camp in each season	5	2	10	50	12,000	1,20,000	6,00,000
2.	Propaganda & Documentation (Puppet show, documentary movies show, video-graphy, Photography, wall Painting, Display Board, pamphlets, leaf lets. Etc)	5	2	10	50	5000	50,000	2,50,000
3	Contingency charges							50033
	Total							**900033**

i) **Training Programmes for SLNA, WDT, PIA , Field Functionary , WDC member's , SHG & UG organize by HIRD = Rs. 1,18,867/-**

ii) **Micro Watershed Wise Exposure cum training Visit For SLNA, WDT, PIA , Field Functionary , WDC, SHG & UG Members**
= Rs. 8, 37,500/-

iii) **Farmer's / Beneficiaries training camps with Extension Program's = Rs. 9,00,033/-**

Grand Total = Rs. 18, 56,400/-

6.2.1. EXPECTED OUTCOME OF CAPACITY BUILDING

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

6.3 Entry Point Activities 4%

EPA activities are taken up under the watershed to build rapport with village community at the beginning of the project, generally certain important works which are in urgent demand of the local community are taken up. A group discussion was conducted in the Gram Sabha meeting/watershed committee regarding EPA activities. It was conveyed to the Gram Sabha that an amount of **Rs. 14, 85,120/-** 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 Rambass Watershed (IWMP V)

(Rs. In Lacs)

Sr. No.	Block	Name of Project	No. of EPAs Identified	No. of EPAs Completed	No. of EPAs in progress	Name/Nature of EPA	Location	Expenditure
1.	Narnaul	Rambass Watershed (IWMP V)	6	6	Nil	1.RCC Road of Shamshan Ghat	Rambass	4.12
						2.Interlocking Tile Road	Hassanpur	1.50
						3.Pipe line for drinking water	Dochana	1.68
						4.Pipe line for drinking water	Badopur	1.72
						5.Interlocking Tile Road	Balaha Kalan	4.96
						6.Pipe line for drinking water	Balaha Khurd	1.06
						Total		**15.04**

Total project Cost @ 4%= Rs. 14, 85,120/-

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/ New ponds, Water Conveyance System, Marginal Bundh (Earthen) with pucca outlet, Cement Masonry Structures, Guide Bandh, Earthen Dam with pacca spillway or Silt Detention Dam, Roof Top Rainwater Harvesting/recharging injection well, Community water storage Tank 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.

Natural Resource Management / Drainage Line Treatment

Construction of Cement Stone/Brick Masonry structure /Drop Structure/ Outlet / Protection wall

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 retaining walls are the basic need by project stakeholders which has been provided. In some villages, the construction 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.

7.3 Earthen Embankment with pucca outlet / Silt Detention Dams / Marginal bandhs

Present Status: The most of area covered in project are undulated, sloppy, hilly and dune. There are feasible sites where Silt Detention Dam and Earthen Embankment with pucca outlet can be constructed to reduce erosion hazard and recharge of ground water. But this is not viable at individual level so the provision for as common cause has been provided in community basis.

Suggested Interventions: In quite a number of villages, sites have been identified for Earthen Embankment with pucca outlet / Silt Detention Dams, etc and provision has been kept as per the allocation of funds. In some watershed village paths have converted in

nalas due to erosion to be strengthened by construction of earthen embankments with pucca outlet. In some villages where Krishnawati River flows Silt Detention Dam proposed. The necessary provision has been kept.

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 retaining walls of village ponds has emerged as an important activity. The scope of integrated watershed regeneration/rehabilitation works which emerged from the PRA is now presented.

Sample estimates are as follows:

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

Table-1: Village wise distribution of works: Village– Rambass

Name of Project IWMP-5 **Name of Micro Watershed: Rambass** **Name of Village: Rambass**

Sr. No.	Nature of Works	Location	Unit	No. of Works		Estimated Cost Rs. In Lacs	Objective
				Unit Cost Rs. in Lacs	Phy		
1	(1 No.) Renovation for Capacity enhancement of old ponds (1 No.) New pond	Dalla pond,near Dalla pond and in River.	No.	3	1	3.00	For ground water recharging & availability of water for village community animals.
2	Water Conveyance System(WCS)	From canal to pond.	Rmt	0.007	1800	12.60	For conservation of water and ground water recharging.
3	Marginal Bundh (Earthen) with pacca outlet	near village Pahari and at panchayat land,Bani.	No.	0.77+0.20=0.97	12	11.64	For the control of soil erosion, in situ moisture conservation.
4	Cement Masonry Structures(CMS),(Drainage channel, Ramp, outlets and Inlets)	In the pond and Dams	cum	0.0326	91	2.97	For the control of soil erosion, in situ moisture conservation.
5	Earthen Dam with pacca spillway or Silt Detention Dam	Near village Pahari and at panchayat land.	No.	4.95	4	19.80	For the control of soil erosion, in situ moisture conservation.
6	Rainfed Horticulture	On field boundaries and panchayat land	Ha.	0.25	4	1.00	Proper utilisation of uncultivated fields and additional income for farmers.

7	Agro Forestry/Plantation	On field boundaries and panchayat land	Ha.	0.15	6	0.90	Increase biomass and additional income to the farmers
8	Recharge Bore	Panchyat land	No.	1	2	2.00	For the conservation of water and ground water recharging.
9	Roof Top Rainwater Harvesting/recharging injuction well	Govt. School building/community places	No.	2	2	4.00	For the conservation of water and ground water recharging.
Total Cost						**57.91**	
Available Funds						**56.45**	
Convergence						**1.46**	

Table-2: Village wise distribution of works: Village– Hasanpur

Name of Project IWMP-5 **Name of Micro Watershed: Rambass** **Name of Village: Hasanpur**

Sr. No.	Nature of Works	Location	Unit	No. of Works	Estimated Cost	Objective

				Unit Cost **Rs. in Lacs**	**Phy**	**Rs. In Lacs**	
1	(2 No.) Renovation for Capacity enhancement of old ponds (2 No.) New pond	In panchyat farm, Khanawala pond, near Samshan Ghat, near Kharia Kuwa.	No.	3	4	12.00	For ground water recharging & availability of water for village community animals.
2	Water Conveyance System(WCS)	From canal to pond.	Rmt	0.007	461	3.23	For conservation of water and ground water recharging.
3	Marginal Bundh (Earthen) with pacca outlet	at panchyat land	No.	0.77+0.20 =0.97	4	3.88	For the control of soil erosion, in situ moisture conservation.
4	Cement Masonry Structures(Drainage channel, Ramp, outlets and Inlets)	In the pond and Dams and in UGPL.	cum	0.0326	55	1.79	For the control of soil erosion, in situ moisture conservation.
5	Rainfed Horticulture	On field boundaries and panchayat land	Ha.	0.25	1	0.25	Proper utilisation of uncultivated fields and additional income for farmers.
6	Agro Forestry/Plantation	On field boundaries and panchayat land	Ha.	0.15	4	0.60	Increase biomass and additional income to the farmers

7	Roof Top Rainwater Harvesting/recharing injuction well	Govt. School building/community places	No.	2	1	2.00	For the conservation of water and ground water recharging.
Total Cost						**23.75**	
Available Funds						**20.83**	
Convergence						**2.92**	

Table-3: Village wise distribution of works: Village– Badopur

Name of Project IWMP-5 **Name of Micro Watershed: Rambass** **Name of Village: Badopur**

Sr. No.	Nature of Works	Location	Unit	No. of Works		Estimated Cost Rs. In Lacs	Objective
				Unit Cost Rs. in Lacs	Phy		
1	Stock Pond	At panchayat land (in river)	No.	3	2	6.00	For ground water recharging & availability of water for village community animals.
2	Water Conveyance System(WCS)	From canal to Baba Bahiya pond.	Rmt	0.007	892	6.24	For conservation of water and ground water recharging.

3	Guide Bandh	In river.	No.	0.77	4	3.08	For the control of soil erosion and also conservation of water and ground water recharging.
4	Marginal Bundh(Earthen) with pacca outlet	At panchayat land, bani and in river.	No.	0.770.20=0.97	6	5.82	For the control of soil erosion, in situ moisture conservation.
5	Cement Masonry Structures(Drainage channel, Ramp, outlets and Inlets)	In the pond and Dams and in UGPL.	cum	0.0326	61	1.99	For the control of soil erosion, in situ moisture conservation.
6	Rainfed Horticulture	On field boundaries and panchayat land	Ha.	0.25	2	0.50	Proper utilisation of uncultivated fields and additional income for farmers.
7	Agro Forestry/Plantation	On field boundaries and panchayat land	Ha.	0.15	4	0.60	Increase biomass and additional income to the farmers
8	Roof Top Rainwater Harvesting/recharing injuction well	Govt. School building/community places	No.	2	1	2.00	For the conservation of water and ground water recharging.
Total Cost						**26.23**	
Available Funds						**24.06**	
Convergence						**2.17**	

Table-4: Village wise distribution of works: Village– Dochana

Name of Project IWMP-5 **Name of Micro Watershed: Rambass** **Name of Village: Dochana**

Sr. No.	Nature of Works	Location	Unit	No. of Works		Estimated Cost Rs. In Lacs	Objective
				Unit Cost Rs. in Lacs	Phy		
1	(1 No.) Renovation for Capacity enhancement of old ponds (1 No.) New pond	Nihalora pond,Chota pond.	No.	3	2	6.00	For ground water recharging & availability of water for village community animals.
2	Water Conveyance System (WCS)	From Taran johar to talab & village to Gangla johar.	Rmt	0.007	385	2.70	For conservation of water and ground water recharging.
3	Marginal Bundh (Earthen) with pacca outlet	at panchayat /individual land	No.	0.77+0.20=0.97	5	4.85	For the control of soil erosion, in situ moisture conservation.
4	Cement Masonry Structures (Drainage channel, Ramp, outlets and Inlets)	In the pond and Nalla.	cum	0.0326	92	3.00	For the control of soil erosion, in situ moisture conservation.

5	Rainfed Horticulture	On field boundaries and panchayat land	Ha.	0.25	2	0.50	Proper utilisation of uncultivated fields and additional income for farmers.
6	Agro Forestry/Plantation	On field boundaries and panchayat land	Ha.	0.15	2	0.30	Increase biomass and additional income to the farmers
7	Roof Top Rainwater Harvesting/recharing injuction well	Govt. School building/community places	No.	2	2	4.00	For the conservation of water and ground water recharging.
Total Cost						**21.34**	
Available Funds						**19.62**	
Convergence						**1.72**	

Table-5: Village wise distribution of works: Village– Balaha Kalan

Name of Project IWMP-5 **Name of Micro Watershed: Rambass** **Name of Village: Balaha Kalan**

Sr. No.	**Nature of Works**	**Location**	**Unit**		**No. of Works**	**Estimated Cost Rs. In Lacs**	**Objective**
				Unit Cost Rs. in Lacs	**Phy**		

1	Renovation for Capacity enhancement of old ponds	Ramsar pond	No.	3	3	9.00	For ground water recharging & availability of water for village community animals.
2	Water Conveyance System(WCS)	From canal to Dalla pond & Around village Firni to pond.	Rmt	0.007	2185	15.30	For conservation of water and ground water recharging.
3	Marginal Bundh(Earthen) with pacca outlet	at panchayat /individual land	No.	0.77+0.20=0.97	15	14.55	For the control of soil erosion, in situ moisture conservation.
4	Cement Masonry Structures(Drainage channel, Ramp, outlets and Inlets)	In the pond and Nalla.	cum	0.0326	156	5.09	For the control of soil erosion, in situ moisture conservation.
5	Rainfed Horticulture	On field boundaries and panchayat land	Ha.	0.25	5	1.25	Proper utilisation of uncultivated fields and additional income for farmers.
6	Agro Forestry/Plantation	On field boundaries and panchayat land	Ha.	0.15	15	2.25	Increase biomass and additional income to the farmers
7	Roof Top Rainwater Harvesting/recharing injuction well	Govt. School building/community places	No.	2	3	6.00	For the conservation of water and ground water recharging.

8	Community water storage Tank with pipeline	In agriculture field near minor/canal	Nos	3	6	18.00	For store of surplus canal water for irrigation during lean period
Total Cost						**71.43**	
Available Funds						**69.48**	
Convergence						**1.95**	

Table-6: Village wise distribution of works: Village– Balaha Khurd

Name of Project IWMP-5 Name of Micro Watershed: Rambass Name of Village: Balaha Khurd

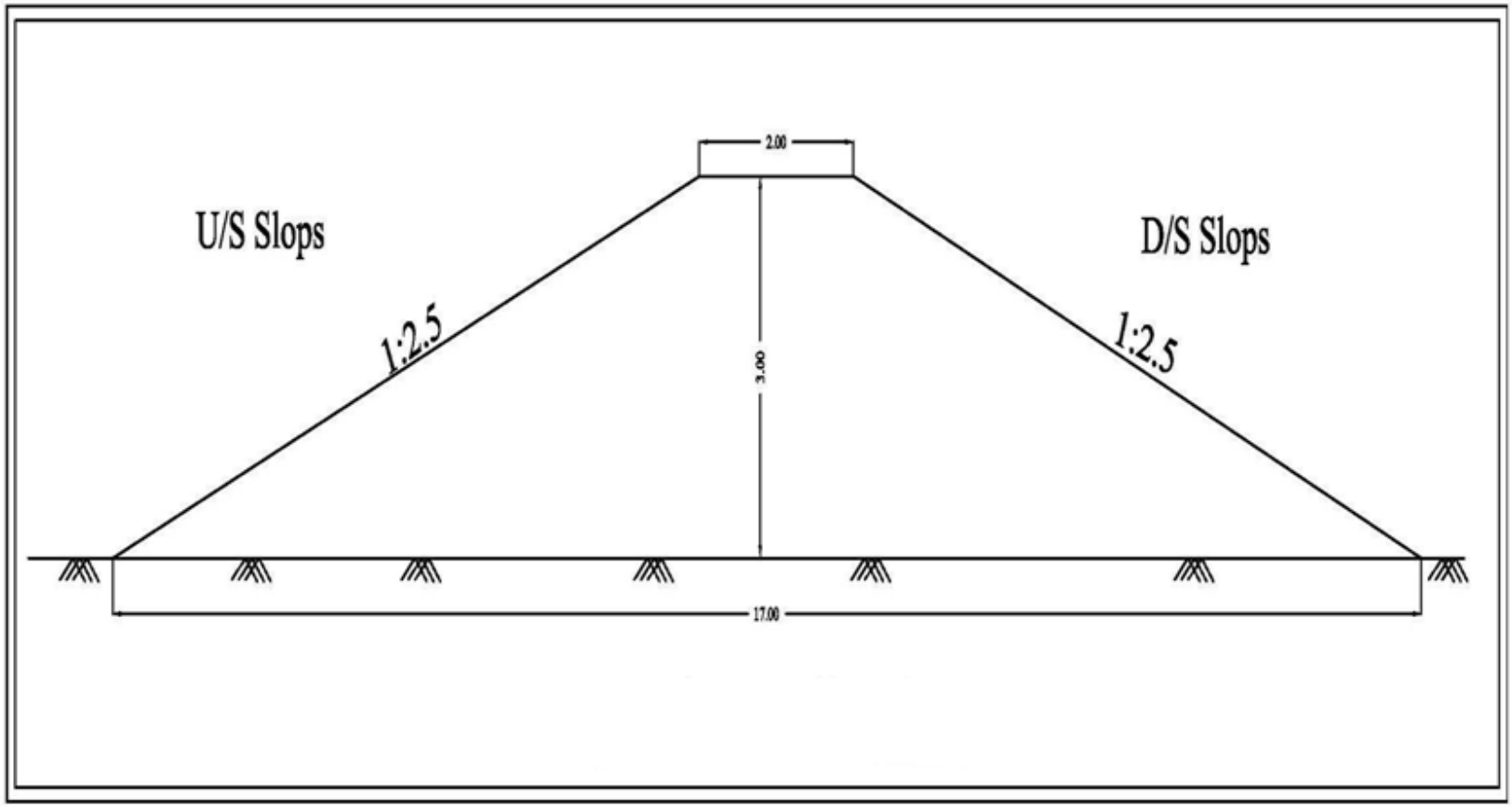
Sr. No.	Nature of Works	Location	Unit	No. of Works		Estimated Cost Rs. In Lacs	Objective
				Unit Cost Rs. in Lacs	Phy		
1	(1 No.) Renovation for Capacity enhancement of old ponds (1 No.) New pond	Kanna pond& in village Bani.	No.	3	2	6.00	For ground water recharging & availability of water for village community animals.
2	Marginal Bundh (Earthen) with pacca outlet	at panchyat /individual land	No.	0.77+0.20=0.97	3	2.91	For the control of soil erosion, in situ moisture conservation.

3	Cement Masonry Structures (Drainage channel, Ramp, outlets and Inlets)	In the pond and Nalla.	cum	0.0326	69	2.25	For the control of soil erosion, in situ moisture conservation.
4	Water Conveyance System(WCS)	From village to New pond.	Rmt	0.007	410	2.87	For the control of soil erosion and also conservation of water and ground water recharging.
5	Rainfed Horticulture	On field boundaries and panchayat land	Ha.	0.25	2	0.50	Proper utilisation of uncultivated fields and additional income for farmers.
6	Agro Forestry/Plantation	On field boundaries and panchayat land	Ha.	0.15	2	0.30	Increase biomass and additional income to the farmers
7	Roof Top Rainwater Harvesting/recharging injection well	Govt. School building/community places	No.	2	2	4.00	For the conservation of water and ground water recharging.
Total Cost						**18.83**	
Available Funds						**17.47**	
Convergence						**1.36**	

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 7. DETAILED ESTIMATE OF EARTHEN EMBANKMENT

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



EARTHEN EMBANKMENT

Leads Statement :-

Cross Section Area = (Base + Top) ÷ 2 x Height i.e {(17.00 +2.00) ÷ 2} x 3.00 = 28.50 Square meters

Horizontal leads = (Base/2) + (Cross section area/ 2 x 0.6) i.e. (17.00/2) + [{28.50}/(2 x 0.6)] =32.25 meters

Vertical leads = (Height +0.60) x 0.4 x 10 i.e. (3.00 +0.60) x 0.4 x 10 = 14.40 meters

Total leads = 32.25 meters + 14.40 meters = 46.65 meters

Number of leads = (46.65 - 15.00) / 7.5 = 4.22 leads Or Say 5 No. of Leads

Area of Jungle Clearance :-

Area to be covered by the body of Dam = Length x Average base i.e. 40.00 x 17.00 = 680.00 Sq. meters

Area from where E/W is to be excavated = Av. Length x leads i.e. 40.00 x 46.65 = 1866.00 Sq. meters

Total Area = 680.00 + 1866.00 =	2546.00	Sq. meters.

Volume of Loose soil to be removed :-

Area to be covered by the body of Dam X Depth of loose soil i.e (680.00 x 0.30) = 204.00 cum

Volume of Earthwork in bund filling :-

(Cross Section Area X Length) + Loose soil to be removed i.e.(28.50 x 40.00)+ 204.00 = 1344.00 cum

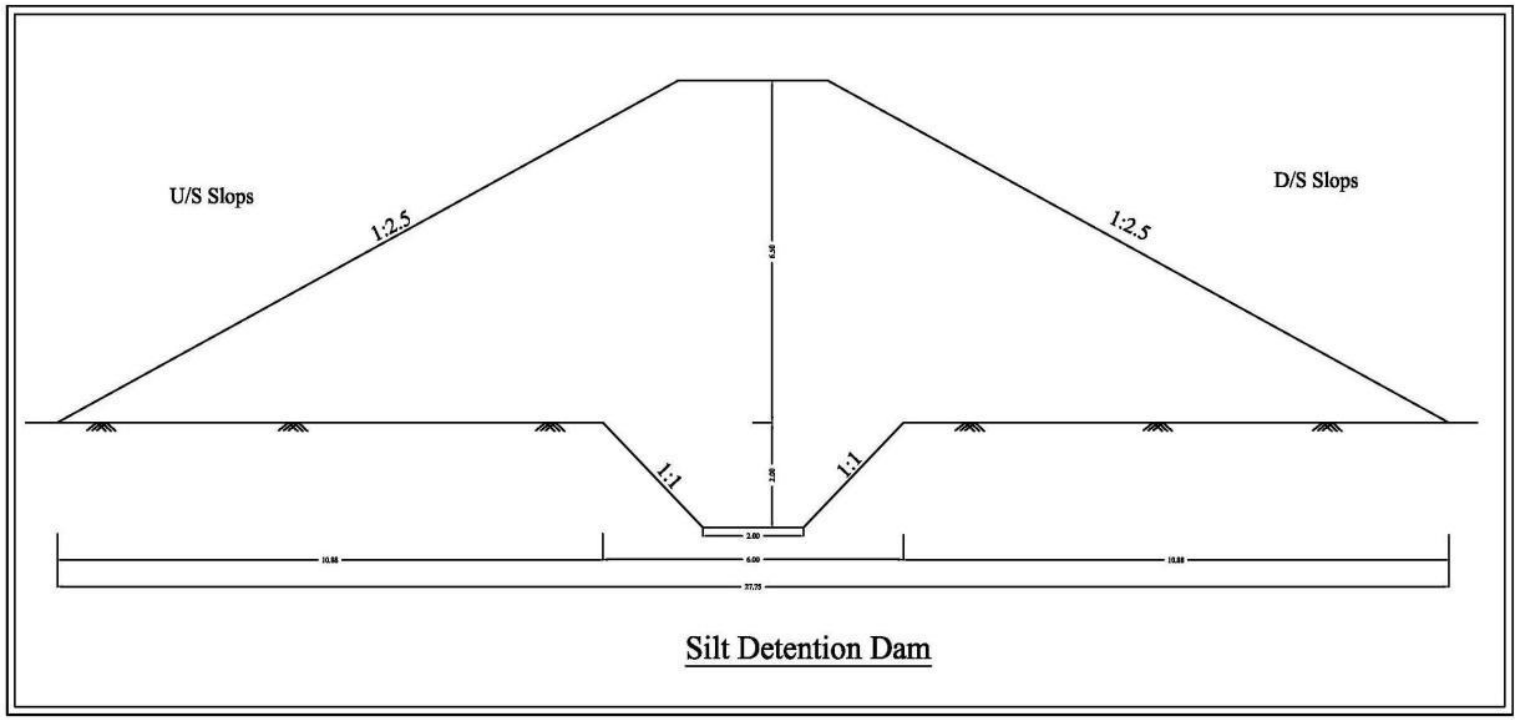
ABSTRACT OF COST

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

	H.S.R. 6.2 (c) (ii)				
6	Dressing of earthwork H.S.R. 6.3 (i)	1344.00 cum	Rs.45.90 + 350 % C. Prem.= 206.55	100 cum	2776.03
Total =					**74243.4712**
Add Contingency at the rate of 3% =					2227.30
Grand Total =					**76470.78**

Table. 8. DETAILED ESTIMATE OF SILT DETENTION DAM

	Let the Average length of the Dam =	50 meters			
	Let the Average Height of the Dam =	4.5 meters			
	Up Stream Slope of the Dam =	1 : 3			
	Down Stream Slope of the Dam =	1 : 2.5			



Silt Detention Dam

Table. 9. Leads Statement

Leads Statement :-
Cross Section Area = (Base + Top) ÷ 2 x Height i.e {(27.75 +3.00) ÷ 2} x 4.50 = 69.19 Square meters

Horizontal leads = (Base/2) + (Cross section area/ 2 x 0.6) i.e. (27.75/2) + [{69.19}/(2 x 0.6)] =71.54 meters							
Vertical leads = (Height +0.60) x 0.4 x 10 i.e. (4.50 +0.60) x 0.4 x 10 = 20.40 meters							
Total leads = 71.54 meters + 20.40 meters = 91.94 meters							
Number of leads = (91.94 - 15.00) / 7.5 = 10.25 leads Or Say 11 No. of Leads							
Area of Jungle Clearance :-							
Area to be covered by the body of Dam = Length x Average base i.e. 50.00 x 27.75 = 1387.50 Sq. meters							
Area from where E/W is to be excavated = Av. Length x leads i.e. 50.00 x 91.94 = 4597.00 Sq. meters							
Total Area = 1387.50 + 4597.00 =		5984.50	Sq. meters.				
Volume of Key Trench :-							
(Length - 2 x 2.50) x Av. Width x Height i.e (50.00 - 2 x 2.50) x (6.00 +2.00)/2 x 2.00=						360.00	cum
Volume of Loose soil to be removed :-							
Area to be covered by the body of Dam X Depth of loose soil i.e (1387.50 x 0.30) =						416.25	cum
Volume of Earthwork in bund filling :-							
(Cross Section Area X Length) + Loose soil to be removed i.e.(69.19 x 50.00)+ 416.25 =						3875.75	cum
DETAILED ESTIMATE OF CHUTE SPILLWAY							
S.No.	**Description**	**No.**	**Length (mts)**	**Breadth (mts)**	**Height (mts)**	**Content (cums)**	
1	**Excavation of earthwork in foundation And plinth**				**H.S.R 6.6**		
	Crest wall	1	2.00	1.00	1.50	3.00	

	Side walls	2	24.00	1.00	1.50	72.00	
	Wing walls	2	2.00	1.00	1.50	6.00	
	Toe with extension	1	4.00	1.00	1.50	6.00	
	Apron	1	24.00	2.00	(2.0+1.0)/2 =1.50	72.00	
				Total =		**159.00**	
2	**Cement concrete work 1 : 4 : 8 in the Foundation and plinth H.S.R 10.39**						
	Crest wall	1	2.00	0.90	0.20	0.36	
	Side walls	2	24.00	0.90	0.20	8.64	
	Wing walls	2	2.00	0.90	0.20	0.72	
	Toe with extension	1	4.00	0.90	0.20	0.72	
	Apron	1	24.00	2.00	0.20	9.60	
				Total =		**20.04**	
3	**Square rubble stone masonry course 1: 5 in foundation and plinth H.S.R 12.23**						
	Crest wall	1	2.00	0.70	1.30	1.82	
	Side walls	2	24.00	0.70	0.30	10.08	
	Wing walls	2	2.00	0.70	1.30	3.64	

	Toe with extension	1	4.00	0.70	0.30	0.84	
				Total =		**16.38**	
4	**Square rubble stone masonry course 1: 5 above G.L. H.S.R 12.23 and 12.31**						
	Side walls	2	24.00	0.50	(1.0+0.6)/2=0.80	19.20	
	Wing walls	2	2.00	0.50	1.00	2.00	
	Toe with extension	1	6.00	0.50	0.20	0.60	
		1	1.00	0.50	0.60	0.30	
	Toe wall extensions			**Total =**		**22.10**	
	Cement concrete work 1 : 2 : 4 in the Foundation and plinth H.S.R 10.41						
	On top of crest wall	1	2.00	0.50	0.05	0.05	
	On top of side walls	2	24.00	0.50	0.05	1.20	
	On top of wing walls	2	2.00	0.50	0.05	0.10	
	On top of Toe wall	1	4.00	0.50	0.05	0.10	
		1	24.00	2.00	0.10	4.80	
5	Apron			**Total =**		**6.25**	
6	**Cement plastering work 1:4 on the**						

	Crest wall both side	2	2.00	_	1.30	5.20	
	Side walls	2	24.00	_	(1.0+0.6)/2=0.80	38.40	
	Wing walls	2	2.00	_	2.30	9.20	
	Toe with extensions	1	4.00	_	0.20	0.80	
	Toe wall extensions	2 x 2	1.00	_	0.60	2.40	
				Total =		**56.00**	

Material Statement and cost of Material:-

S.No.	**Item of Work**	**Quantity (cum)**	**Cement (bags)**	**Sand (cum)**	**Stone blast (cum)**	**Bajri 20 mm (cum)**	**Stone boulders (cum)**
1	C.C work 1 : 4 : 8	20.04	68.136	9.6192	19.2384	_	_
2	Sq. Rub. Masonry 1: 5 in foundation.	16.38	28.1736	4.914	_	_	18.018
3	Sq. Rub. Masonry 1: 5 above ground level.	22.10	38.012	6.63	_	_	24.31
4	C.C work 1 : 2 : 4	6.25	39.375	2.75	_	5.50	_
5	C. plastering work 1 : 4	56.00 sqm	6.16	0.84	_	_	_

	Total =	**179.8566**	**24.7532**	**19.2384**	**5.5**	**42.328**
	Rates of material	245.00 per bag	950.00 per cum	965.00 per cum	985.00 per cum	945.00 per cum
	Cost of Materials	**44065**	**23516**	**18565**	**5418**	**40000**
Total Cost of Materials =		**Rupees**	**131563**	***/-only***		

ABSTRACT OF COST

S.No.	**Item of Work**	**Quantity**	**Rate**	**Unit**	**Amount**
1	Jungle clearance including uprooting of rank vegetarian, grass, bush woods etc H.S.R.6.26	5984.50 sq.m	Rs.66.80 + 300% C. Prem. =267.20	100 sq.m	15990.58
2	Removal of loose soil up to 0.3 m below Natural surface level H.S.R. 6.2 (b)	416.25 cum	Rs.586.60 + 350% C. Prem.= 2639.70	100 cum	10987.75
3	E/Work excavation for digging of the key trench H.S.R. 6.6	360.00 cum	Rs.1108.10 + 350% C. Prem.= 4986.45	100 cum	17951.22
4	Excavation of E/Work for clay filling in Key trench including lead up to 495 mts. H.S.R. 6.2(b)and 6.2 (c)	360.00 cum	586.60+(6x15)+(32x13.25)+ (26x12.00) + 350% C. Prem.= 6356.70	100 cum	22884.12

5	Extra for puddling work in key trench H.S.R. 6.6 (f)	360.00 cum	Rs. 498.60 + 350% C. Prem.= 2243.70	100 cum	8077.32
6	E/work excavation for making embank- ment undressed including breaking of Clods. H.S.R. 6.2 (b)	3875.75 cum	Rs.586.60 + 350% C. Prem.= 2639.70	100 cum	102308.17
7	Extra for admixture for single or kanker Exceeding 30% but up to 40%. H.S.R. 6.2 (h) ii	3875.75 cum	Rs. 318.55 + 350% C. Prem.= 1433.48	100 cum	55558.10
8	Extra for every 7.5 meter additional lead beyond 60mt but up to 255 m by the animal or animal driven cart (11 leads) H.S.R. 6.2 (c) (ii)	3875.75 cum	[(15.00 x 6 No.)+ (13.25 x 5 No.)] + 350% C. Prem.= 703.12	100 cum	27251.17
9	Extra for compaction and watering earth laying in 25cm layers source of water leads up to 1 km. H.S.R. 6.2 (g) (ii),(i)	3875.75 cum	Rs.(75.00+ 68.10)+350% C. Prem.= 643.95	100 cum	24957.89
10	Extra for rolling with road roller / tractor H.S.R. 6.2 (g) (v)	3875.75 cum	Rs.225.00 + 110 % C. Prem.= 472.50	100 cum	18312.92
11	Excavation of earthwork in foundation and plinth	159.00 cum	Rs.1108.10 + 350 % C. Prem.	100 cum	**7928.46**

	H.S.R 6.6		=4986.45		
12	Cement concrete work 1 : 4 : 8 in the Foundation and plinth H.S.R 10.39	20.04 cum	Rs. 64.95 + 370 % C. Prem. =305.27	cum	**6117.61**
13	Square rubble stone masonry course1: 5 in foundation and plinth H.S.R 12.23	16.38 cum	Rs. (160.35+26.00) +250% C. Prem. =652.22	cum	**10683.36**
14	Square rubble stone masonry course1: 5 above G.L. H.S.R 12.23 and 12.31	22.10 cum	Rs. (160.35+26.00+27.20) +200% C. Prem.= 747.42	cum	**16517.98**
15	Cement concrete work 1 : 2 : 4 in the Foundation and plinth H.S.R 10.41	6.25 cum	Rs.64.95 + 370 % C. Prem. =305.27	cum	**1907.94**
16	Cement plastering work 1:4 on the stone walls H.S.R 15.5	56.00 sqm	Rs. 5.50 + 340 % C. Prem. =24.20	cum	**1355.20**
17	Total Cost of Materials =				**131562.923**
Total =					**480352.726**
Add Contingency at the rate of 3% =					14410.5818
Grand Total =					**494763.31**

Say Rs. 4.95 Lacs

Table. 10. Detail Estimate of Cement Stone Masonry Structure

S.No.	Description	No.	Length (mts)	Breadth (mts)	Height (mts)	Content (cums)
1	**Excavation of earthwork in foundation And plinth H.S.R 6.6**					
	Crest wall with extensions	1	8.00	2.00	1.20	19.20
	Side walls	2	1.50	1.00	1.20	3.60
	Wing walls	2	2.00	1.00	1.20	4.80
	Toe wall with extensions	1	6.00	1.00	1.20	7.20
	Appron	1	4.00	1.50	0.30	1.80
				Total =		**36.60**
2	**Cement concrete work 1 : 4 : 8 in the Foundation and plinth H.S.R 10.39**					
	Crest wall with extensions	1	8.00	1.70	0.20	2.72
	Side walls	2	1.50	0.70	0.20	0.42
	Wing walls	2	2.00	0.70	0.20	0.56
	Toe wall with extensions	1	6.00	0.70	0.20	0.84
	Appron	1	4.00	1.50	0.20	1.20
				Total =		**5.74**
3	**Square rubble stone masonry course1: 5 in foundation and plinth H.S.R 12.23**					
	Crest wall with extensions	1	8.00	(1.5+1.0)/2= 1.25	1.00	**10.00**
	Side walls	2	1.50	0.50	1.00	**1.50**
	Wing walls	2	2.00	0.50	1.00	**2.00**
	Toe wall with extensions	1	6.00	0.50	1.00	**3.00**
				Total =		**16.50**
4	**Square rubble stone masonry course1: 5 above G.L. H.S.R 12.23 and 12.31**					
	Crest wall with extensions	1	8.00	(1.0+0.5)/2=	1.20	7.20

S.No.	Description	No.	Length (mts)	Breadth (mts)	Height (mts)	Content (cums)
				0.75		
	Side walls	2	(1.5+2.0)/2= 1.75	0.50	(1.7+0.5)/2= 1.1	1.93
	Wing walls	2	2.00	0.50	1.70	3.40
	Toe wall with extensions	1	6.00	0.50	0.20	0.60
	Toe wall extensions	1	1.00	0.50	0.50	0.25
				Total =		**13.38**
5	**Cement concrete work 1 : 2 : 4 in the Foundation and plinth H.S.R 10.41**					
	On the top of crest wall	1	4.00	(1.0+0.5)/2= 0.75	0.05	0.15
	On the top of crest wall extensions	2	2.00	0.50	0.05	0.10
	On the top of side walls	2	1.50	0.50	0.05	0.08
	On the top of wing walls	2	2.00	0.50	0.05	0.10
	Toe wall with extensions	1	6.00	0.50	0.05	0.15
	Apron	1	4.00	1.50	0.10	0.60
				Total =		**1.18**
6	**Cement plastering work 1:4 on the**					
	Crest wall both side	2	4.00	_	1.20	9.60
	Crest wall extensions	2 x 2	2.00	_	0.50	4.00
	Side walls	2	(1.5+2.0)/2= 1.75	_	(1.7+0.5)/2= 1.1	3.85
	Wing walls	2	2.00	_	1.70	6.80
	Toe wall with extensions	1	6.00	_	0.20	1.20
	Toe wall extensions	2 x 2	1.00	_	0.50	2.00
				Total =		**27.45**

Table. 11. MATERIAL STATEMENT AND COST OF MATERIAL

S.No.	Item of work Quantity		Cement	Sand	Stone blast	Bajri 20 mm	Stone boulders
		(cum)	(bags)	(cum)	(cum)	(cum)	(cum)
1	C.C work 1 : 4 : 8	5.74	19.516	2.7552	5.5104	_	_
2	Sq. stone masonry work	16.50	28.38	4.95	_	_	18.15
	1: 5 in foundation.						
3	Sq. stone masonry work	13.38	23.005	4.0125	_	_	14.7125
	1: 4 above ground level.						
4	C.C work 1 : 2 : 4	1.18	7.4025	0.517	_	1.034	_
5	C. plastering work 1 : 4	27.45 sqm	3.02	0.41	_	_	_
	Total =		**81.323**	**12.64645**	**5.5104**	**1.034**	**32.8625**
	Rates of material		245.00 per bag	950.00 per cum	965.00 per cum	985.00 per cum	945.00 per cum
	Cost of Materials		**19924**	**12014**	**5318**	**1018**	**31055**
	Total Cost of Materials =		**Rupees**	**69329**	**/-only**		

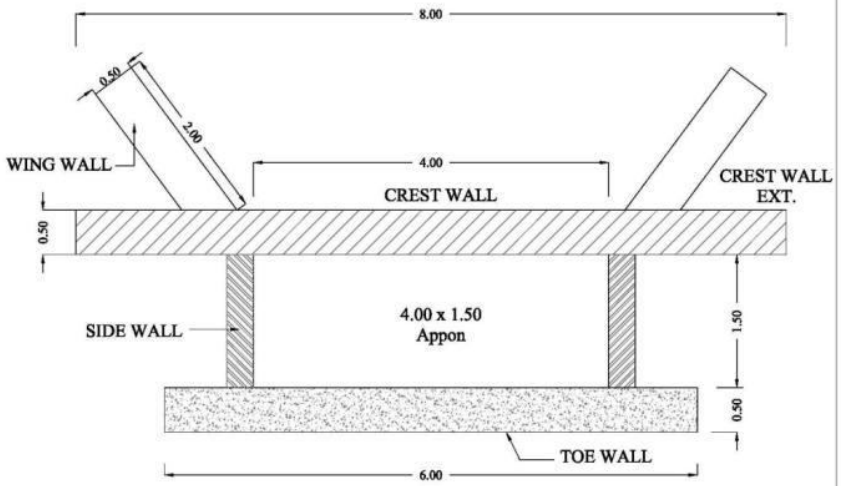
Table. 12. LABOUR COST

S. No.	Item of work Quantity		Rate		Unit	Amount
1	Excavation of earthwork in foundation and plinth H.S.R 6.6	36.60 cum	1108.10 +350% C. Prem. =4986.45		100 cum	**1825.04**
2	Cement concrete work 1 : 8 : 16 in the Foundation and plinth H.S.R 10.39	5.74 cum	64.95 +370% C. Prem. =305.27		cum	**1752.25**
3	Square rubble stone masonry course1: 5 in foundation and plinth H.S.R 12.23	16.50 cum	(160.35+26.00) +250% C. Prem. =652.22		cum	**10761.63**
4	Square rubble stone masonry course1: 5 above G.L. H.S.R 12.23 and 12.31	13.38 cum	(160.35+26.00+27.20) +200% Prem.= 747.42		cum	**9996.74**
5	Cement concrete work 1 : 2 : 4 in the Foundation and plinth H.S.R 10.41	1.18 cum	64.95 +370% C. Prem. =305.27		cum	**358.69**
6	Cement plastering work 1:4 on the stone walls H.S.R 15.5	27.45 sqm	5.50 +340 % C. Prem. =24.2		cum	**664.29**
	Total =	29.875 cum				**25358.64525**
					or say Rs.25359/- only	

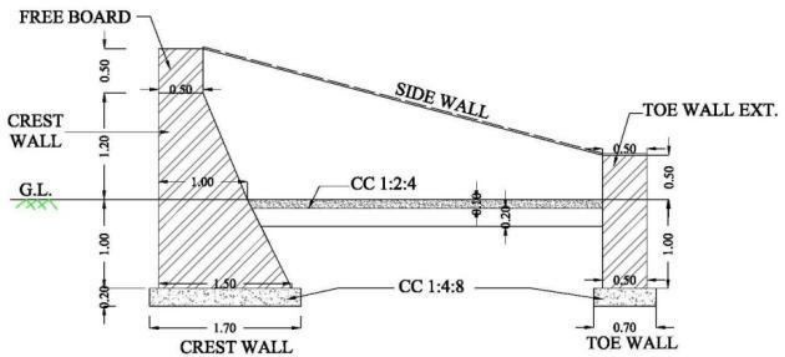
Table. 13. ABSTRACT OF COST

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

WORK PLAN OF CEMENT STONE MASONRY STRUCTURE



PLAN



X-SECTION

* Not to Scale
*All Dimension in m.

X-section of Masonry Structure

Table. 14. 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. 15. 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**

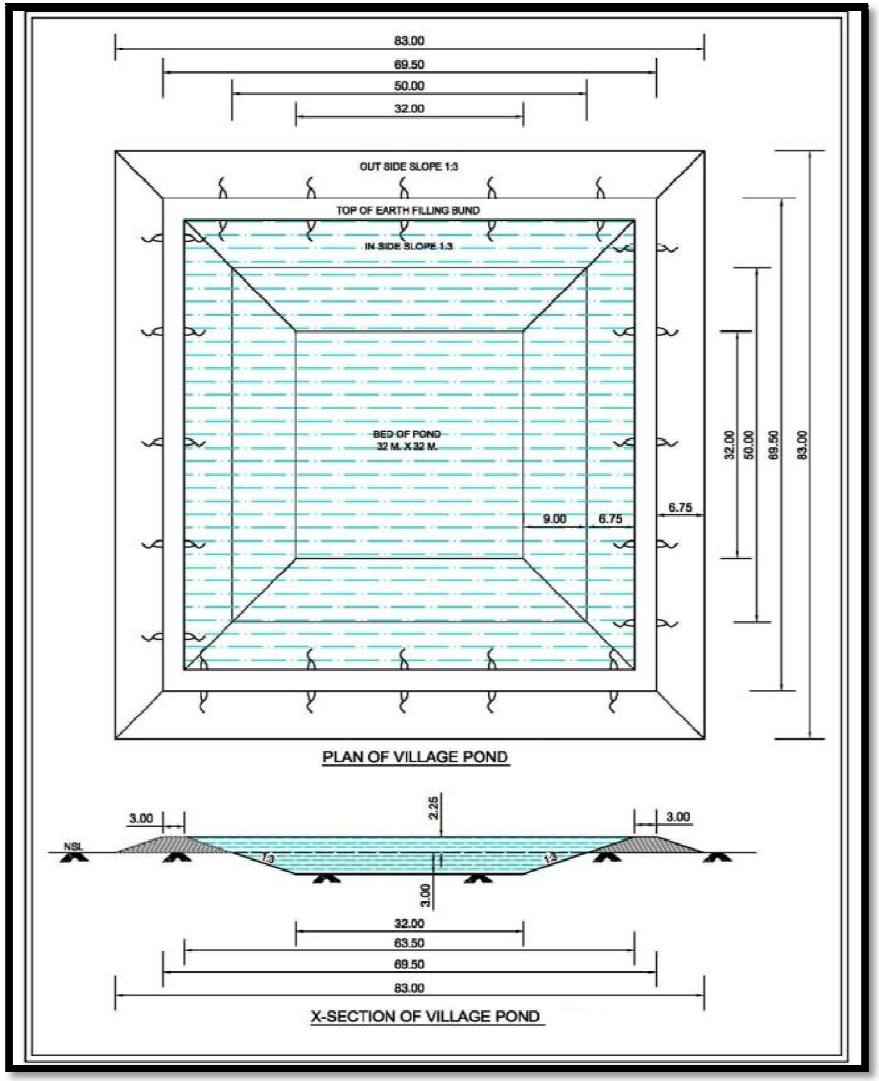

83.00
69.50
50.00
32.00
OUT SIDE SLOPE 1:3
TOP OF EARTH FILLING BUND
IN SIDE SLOPE 1:3
BED OF POND
32 M. X 32 M.
9.00
6.75
6.75
32.00
50.00
69.50
83.00
PLAN OF VILLAGE POND
3.00
2.25
3.00
NSL
1:3
1:3
3.00
32.00
63.50
69.50
83.00
X-SECTION OF VILLAGE POND

Table. 16 Estimate of Orchard Development in the Watersheds Per Hectare (Guava ,Amla & Ber)

A. Horticulture

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

	Say `	**24500.00**

Table. 17. 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 low, medium and high. 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 enhancing the productivity with proven technology:-

- 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 18.Detail of Production System proposed to be promoted in the project village

S. No.	Particulars	Contents	No. of micro water sheds	No. of beneficiaries per micro watershed	No. of total beneficiaries	Cost per beneficiaries	Total
1	Agriculture	To introduce Summer Moong or Mash, gwar and groundnut as a third crop in bajra-wheat rotation. Supply of mini- kits to 50 farmers of each micro watershed/year @ Rs.200/ kit as assistance is provided.	5	250(farmers)	1250 (mini kits)	200 per mini kits	250000
	Agriculture	Application of farm inputs like Zinc Sulphate or Sulphur or weedicides or pesticides. 50	5	250(farmers)	1250 (mini	200 per mini	250000

S. No.	Particulars	Contents	No. of micro water sheds	No. of beneficiaries per micro watershed	No. of total beneficiaries	Cost per beneficiaries	Total
		farmer of each micro watershed/ year @ Rs.200/ kits as assistance is provided.			kits)	kits	
	Agriculture	Supplying of Agriculture implements – 15 farmers (average) per micro watershed @ Rs. 1000/ units as assistance is provided.	5	75(farmers)	375	1000	375000
	Agriculture	Agro Forestry: Eucalyptus/ neem on 50% subsidy @ Rs. 10/ plant as assistance is provided.	5	3000(plants)	15000 plants	Rs. 10 per plant	150000
2	Horticulture	Potential for Grafted Horticulture plants. Supply of plants at 50 % cost share for cultivation of fruits like Citrus fruits, Guava, Amla, ber, floriculture and vegetables (especially, turmeric, garlic, onion and tomato)	5	500 plants	2500 plants	Rs.40 per plant	100000
	Horticulture	Kitchen gardening Packets distributed to 50 farmers in each micro watershed/ year @ Rs.25/ packet.	5	250	1250	Rs. 25 Per packet	31250
	Horticulture	Two units of Bee keeping in each micro watershed @ 3000/ unit as assistance are provided.	5	10	50	3000	150000
	Horticulture	Three units of Vermi compost in each micro watershed per year @ Rs. 10000 per unit as assistance is provided.	5	15	75	10000	750000
3	Animal Husbandry	Problems being faced due to some diseases in the animals and low yield of milk. Production of free life saving medicines/ minerals for animals – the provision for 50	5	250	1250	225	281250

S. No.	Particulars	Contents	No. of micro water sheds	No. of beneficiaries per micro watershed	No. of total beneficiaries	Cost per beneficiaries	Total
		farmers of each micro watershed/year @ Rs.225 has been provided.					
	Animal Husbandry	Livestock Management supply of feed supplements to improve health of cattle's. The provision to benefit 50 farmers of each micro watershed/year @ Rs.225 has been kept in the project proposals.	5	250	1250	225	281250
	Animal Husbandry	Supply of mini- kits of high yielding variety green fodder seeds to 15 farmers in each micro watershed/year @ Rs.200/- mini kits.	5	75(farmers)	375 Seeds of mini kit	200 per mini kit of seeds	75000
4	Joint camps with Line Departments	Two training camps to beneficiaries on Proven technology in agriculture are provided (during pre kharif and rabi season).	5	10	50	20000	1000000
		Contingency					19050

Total: Rs. 3712800/-

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 19: 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 100 days in a year including MGNREGA.
3. At least one daily job per family mainly SCs/BPL/very poor families.

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

proposed to form 2 SHGs in each village and identify at least 10 youths in each village for imparting training and giving Revolving Fund.

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

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

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

Table 20. Revolving Fund Assistance for SHGs

S. No.	Name of micro watersheds	No. of villages	Total SHGs	Amount of RFA per SHG	Total
1	Rambass	1	2	25,000	50,000
2	Hasanpur	1	2	25,000	50,000
3	Badopur	2	4	25,000	1,00,000
4	Balah Kalan	1	2	25,000	50,000
5	Balah Khurd	1	2	25,000	50,000
	Total	**6**	**12**		**3,00,000**

Table 21. 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	Rambass	1	2	35,000	70,000
2	Hasanpur	1	2	35,000	70,000
3	Badopur	2	4	35,000	1,40,000
4	Balah Kalan	1	2	35,000	70,000
5	Balah Khurd	1	2	35,000	70,000
	Total	**6**	**12**		**4,20,000**

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 22. 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	Rambass	1	12	10,000	1,20,000
2	Hasanpur	1	12	10,000	1,20,000
3	Badopur	2	15	10,000	1,50,000
4	Balah Kalan	1	15	10,000	1,50,000
5	Balah Khurd	1	12	10,000	1,20,000
	Total	**6**	**66**		**6,60,000**

Note: The beneficiaries will contribute 10% as cost sharing of the livelihood support programme Rs. 660000 @ 10% cost sharing.

= 6,60,000- 66,000

= 5,94,000/-

Table 23. One time assistance as Revolving Fund to unemployed youth who have successfully completed Computer Training for setting up a computer centre

S.	Name of micro	No. of villages	No. of Persons in micro	Amount of Training per	Total

No.	watersheds		watershed	Trainee	
1	Rambass	1	12	20,000	2,40,000
2	Hasanpur	1	12	20,000	2,40,000
3	Badopur	2	15	20,000	3,00,000
4	Balah Kalan	2	15	20,000	3,00,000
5	Balah Khurd	1	12	20,000	2,40,000
	Total	**7**	**66**		**13,20,000**

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. 1320000 @ 10% cost sharing.

= 13,20,000- 1,32,000

= 11,88,000/-

Table 24. 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	Rambass	1	1	2	2,000	6	12,000
2	Hasanpur	1	1	2	2,000	6	12,000
3	Badopur	2	2	4	2,000	6	24,000
4	Balah Kalan	1	1	2	2,000	6	12,000
5	Balah Khurd	1	1	2	2,000	6	12,000
	Total	**6**	**6**	**12**			**72,000**

Total cost for 6 Centres

1. Payment to trainers 72,000/-

2. Sewing Machine Cost 18,000/- (lump sum)

Table 25. 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	Rambass	1	1	2,000	6	12,000	1	12,000
2	Hasanpur	1	1	2,000	6	12,000	1	12,000
3	Badopur	2	2	2,000	6	12,000	2	24,000
4	Balah Kalan	1	1	2,000	6	12,000	1	12,000

5	Balah Khurd	1	1	2,000	6	12,000	1	12,000
	Total	**6**	**6**					**72,000**

Total Cost:

Payment to trainer: Rs.72,000/-

Table 26. Livelihood Support

S.No.	**Name of micro watersheds**	**No. of villages**	**Revolving fund assistance to individuals unemployed youth/ landless, women**	
			Dairy Unit	**Bee Keeping, Mushroom Cultivation, Vermi Compost etc.**
1	Rambass	1	3	3
2	Hasanpur	1	3	3
3	Badopur	2	6	6
4	Balah Kalan	1	3	3
5	Balah Khurd	1	3	3
	Total	**6**	**18**	**18**
	Rate (Rs)		**25000**	**10000**
	Cost (Lakh Rs)		**4.50**	**1.80**

Contingency, printing material and other unseen items: Rs. 20520/-

Total funds available under this component are Rs. 3341520/-

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), Mahendergarh

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. 27)

Detail of Convergence of IWMP and other schemes

Table 27. GAPS IN FUNDS REQUIREMENT – MICRO WATERSHED WISE

S. No	Name of micro watershed	Total cost requirement for works	Total funds available under IWMP for works	Gap in funds requirement for works	Convergence with MGNREGA
1	Rambass	57.91	56.45	1.46	1.46
2	Hasanpur	23.75	20.83	2.92	2.92
3	Badopur	47.57	43.68	3.89	3.89
4	Balah Kalan	71.43	69.48	1.95	1.95
5	Balah Khurd	18.83	17.47	1.36	1.36
	Total	**219.49**	**207.91**	**11.58**	**11.58**

- 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 ten 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 16 ha horticulture development programme with the financial assistance of Rs. 4.00 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 ponds, Water Conveyance System, Marginal Bundh (Earthen) with pucca outlet, Cement Masonry Structures, Guide Bandh, Earthen Dam with pacca spillway or Silt Detention Dam, Roof Top Rainwater Harvesting/recharging injection well, Community water storage Tank 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	Rambass	622	74,64,000	74,640
2	Hasanpur	528	63,36,000	63,360
3	Badopur	650	78,00,000	78,000
4	Balah Kalan	734	88,08,000	88,080

5	Balah Khurd	560	67,20,000	67,200

8.2 EVALUATION

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

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

Table 2. Micro Watershed wise details

S. No.	Name of the Micro Watersheds	Effective Area	Total Cost	Evaluation 1%
1	Rambass	622	74,64,000	74,640
2	Hasanpur	528	63,36,000	63,360
3	Badopur	650	78,00,000	78,000
4	Balah Kalan	734	88,08,000	88,080
5	Balah Khurd	560	67,20,000	67,200

CONSOLIDATION PHASE- 3 %

Consolidation Phase = Rs. 11, 13,840 /-

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: Rambass

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	0.45
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	1.12

Total: 2.24 lacs

Name of Micro watershed: Hasanpur

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	0.38
2	Preparation of Project completion report	0.10

3	Documentation of success stories	0.10
4	Management of proper utilization of WDF	0.28
5	Mechanism for quality and sustainability issues under the Project	0.09
6	Watershed activities	0.95

Total: 1.90 lacs

Name of Micro watershed: Badopur

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	0.47
2	Preparation of Project completion report	0.12
3	Documentation of success stories	0.11
4	Management of proper utilization of WDF	0.35
5	Mechanism for quality and sustainability issues under the Project	0.12
6	Watershed activities	1.17

Total: 2.34 lacs

Name of Micro watershed: Balah Kalan

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	0.53
2	Preparation of Project completion report	0.13
3	Documentation of success stories	0.13
4	Management of proper utilization of WDF	0.40
5	Mechanism for quality and sustainability issues under the Project	0.13
6	Watershed activities	1.32

Total: 2.64 lacs

Name of Micro watershed: Balah Khurd

Table 7. Consolidated Phase

S. No.	Type of activity	Amount earmarked (Rs. In lacs)
1	Managing/ upgrading of all activities taken up under the project	0.40
2	Preparation of Project completion report	0.11
3	Documentation of success stories	0.10
4	Management of proper utilization of WDF	0.30
5	Mechanism for quality and sustainability issues under the Project	0.10
6	Watershed activities	1.01

Total: 2.02 lacs

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 3094 ha and the Project Cost is 371.28 lacs covering 5 no. micro watersheds and in 6 villages. Benefits will be much more than the project cost as detailed below:

With the several interventions under IWMP V 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 Rambass Watershed V will prove to be very beneficial in improving socio – economic status of people residing in Project villages.

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

9.1 EMPLOYMENT

Employment has always been a problem in the village. The principal occupations of the people are rain fed agriculture, animal husbandry and casual labour work. However, rainfall being limited and erratic, agriculture suffers, i.e. best they can take only single crop, which keeps them partially engage 4 to 5 months. Similarly due to lack of fodder animal husbandry does not keep them engage full time. Thus the people mainly depend upon casual labour either in the villages is in Narnaul, Rewari, Delhi, Gurgaon, Bhiwadi, Dharuhera Industrial Complex**.**

Table 1. Expected Employment Generation in the Project area

1	2	3						4			
S. No.	Names of the villages	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	Rambass	3259	7515	10774	48	278	326	11	-	11	22
2	Hasanpur	1365	3054	4419	25	182	207	-	11	11	22
3	Badopur	1326	3154	4480	28	153	181	11	11	-	22
4	Dochana	1303	2667	3970	48	215	263	11	-	11	22
5	Balah Kalan	4269	9021	13290	53	482	535	11	11	-	22
6	Balah Khurd	1106	2397	3503	18	109	127	-	11	11	22
	Total	**12628**	**27808**	**40436**	**220**	**1419**	**1639**	**44**	**44**	**44**	**132**

40436 man days would be generated with the implementation of the project in Rambass Watershed (IWMP V), which means 81 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 Rambass Watershed (IWMP V)

S. No.	Name of micro	No. of persons migrating	No. of days per year of migration	Comments

	watersheds	Pre Project	Expected post project	Pre Project	Expected post project	
1	Rambass	32	16	120	60	No. of persons migrating will be reduced and also no. of days would be reduced by over 50%
2	Hasanpur	14	7	120	60	No. of persons migrating will be reduced and also no. of days would be reduced by over 50%
3	Badopur	40	20	90	45	No. of persons migrating will be reduced and also no. of days would be reduced by over 50%
4	Balah Kalan	28	14	120	60	No. of persons migrating will be reduced and also no. of days would be reduced by over 50%
5	Balah Khurd	11	6	120	60	No. of persons migrating will be reduced and also no. of days would be reduced by over 50%

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

9.3 GROUND WATER TABLE (Drinking Water)

Historical ground water table data (1974 to 2010) was analyzed and the water table is falling at the rate of 88 cm/yr. There is need of recharging of aquifer by rain water harvesting. Ground water development potential of Rambass watershed area is over-exploited and there is need for rain water harvesting and recharging. It has been proposed to make rainwater-harvesting by construction of water harvesting structure. The provision of this has been provided in the project proposal.

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	Source	Pre- Project level (m)	Remarks
1	Rambass	Rambass	Open well	65.8	The area experiences falling water table and needs recharging of the aquifer. The necessary provision of recharging has been provided in the project proposal.
2	Hasanpur	Hasanpur	Open well	78.2	
3	Badopur	Badopur	Open well	85.6	
		Dochana	Open well	82.1	
4	Balah Kalan	Balah Kalan	Open well	89.4	
5	Balah Khurd	Balah Khurd	Open well	92.0	

Source: Ground Water Cell, Haryana

9.4 CROPS

Agriculture primary depends upon water, but this is availability of this is lacking without existence of canal network and deeper ground water conditions. All this can change with the integrated land and water management during the watershed project. The planned Renovation/ New ponds, Water Conveyance System, Marginal Bundh (Earthen) with pucca outlet, Cement Masonry Structures, Guide Bandh, Earthen Dam with pacca spillway or Silt Detention Dam, Roof Top Rainwater Harvesting/recharging injection well, Community water storage Tank 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 Rambass Watershed (IWMP V)

Name of Village	Name of Crops	Pre project		Total Production (in Kg)	Total Value Rs (in lacs)	Expected post project		Total Production	Total Value Rs. (in lacs)
		Area ha	Average yield Kg. Per ha			Area ha	Average yield Kg Per ha	(in Kg)	
Rambass	Wheat	173	4703	813619	109.84	190	4844	921830.33	124.45
	Mustered	184	1705	313720	94.12	206	1790	368934.72	110.68
	Bajra	395	1571	620545	77.57	438	1634	716357.15	89.54
Hasanpur	Wheat	108	4700	507600	68.53	119	4841	575110.80	77.64
	Mustered	104	1695	176280	52.88	116	1780	207305.28	62.19
	Bajra	147	1572	231084	28.89	163	1635	266763.37	33.35
Badopur	Wheat	28	4688	131264	17.72	31	4829	148722.11	20.08

	Mustered	55	1705	93775	28.13	62	1790	110279.40	33.08
	Bajra	112	1575	176400	22.05	124	1638	203636.16	25.45
Dochana	Wheat	46	4703	216338	29.21	51	4844	245110.95	33.09
	Mustered	81	1715	138915	41.67	91	1801	163364.04	49.01
	Bajra	149	1515	225735	28.22	165	1576	260588.48	32.57
Balah Kalan	Wheat	87	4703	409161	55.24	96	4844	463579.41	62.58
	Mustered	234	1725	403650	121.10	262	1811	474692.40	142.41
	Bajra	326	1571	512146	64.02	362	1634	591221.34	73.90
Balah Khurd	Wheat	84	4715	396060	53.47	92	4856	448735.98	60.58
	Mustered	178	1705	303490	91.05	199	1790	356904.24	107.07
	Bajra	291	1562	454542	56.82	323	1624	524723.28	65.59
Total									**1203.27**

Source: Revenue Department and Department of Agriculture, Mahendergarh (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	Rambass	2	4	6
2	Hasanpur	1	1	2
3	Badopur	1.5	4	5.5
4	Balah Kalan	1.5	5	6.5
5	Balah Khurd	1	2	3
	Total	**7**	**16**	**23**

9.6 AFFORESTATION/ VEGETATIVE COVER

Table 6. Pre and post project forest and vegetative cover

S. No.	Name of micro watersheds	Existing area under tree covered, ha	Area under tree cover proposed ha	Total
1	Rambass	8	6	14
2	Hasanpur	6	4	10
3	Badopur	9	6	15
5	Balah Kalan	18	15	33

6	Balah Khurd	3	2	5
	Total	**44**	**33**	**77**

9.7 LIVESTOCK

Table 7. Details of livestock in the project area

S. No.	Name of micro watersheds	Type of Animals	Pre project			Post project			Remarks
			No.	Yield Kg/ day	Income In Rs per day	No.	Yield Kg/ day	Income In Rs per day	
1	Rambass	Buffalo	797	11-12	440-480	917	13-14	546-588	Increase in milk yield and number of animals by approx. 15%
		Cow	80	5-6	75-90	92	7-8	140-160	Increase in milk yield and number of animals by approx. 15%
2	Hasanpur	Buffalo	495	11-12	440-480	569	13-14	546-588	Increase in milk yield and number of animals by approx. 15%
		Cow	60	6-7	180-210	69	8-9	256-288	Increase in milk yield and number of animals by approx. 15%
3	Badopur	Buffalo	268	7-8	140-160	308	9-10	225-250	Increase in milk yield and number of animals by approx. 15%

S. No.	Name of micro watersheds	Type of Animals	Pre project			Post project			Remarks
			No.	Yield Kg/ day	Income In Rs per day	No.	Yield Kg/ day	Income In Rs per day	
		Cow	295	5-6	75-90	339	7-8	140-160	Increase in milk yield and number of animals by approx. 15%
4	Balah Kalan	Buffalo	1495	10-12	400-480	1719	12-14	504-588	Increase in milk yield and number of animals by approx. 15%
		Cow	166	6-7	180-210	191	8-9	256-288	Increase in milk yield and number of animals by approx. 15%
5	Balah Khurd	Buffalo	201	11-12	440-480	231	13-14	546-588	Increase in milk yield and number of animals by approx. 15%
		Cow	7	5-6	75-90	8	7-8	140-160	Increase in milk yield and number of animals by approx. 15%

9.8 LINKAGES

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

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

Table No. 8: Backward-Forward Linkages

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

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

Components	Activities	Outputs	Effect	Impact
	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		development.	
Fund Management	• Improve management and utilization of UGs and WCs • Prepare communities to explore other	UGs and WCs operating bank account and managing resources on their own.	• Purpose, frequency and volume of use of the fund enhanced • Volume of funds generated for UGs and WCs from other	

Components	Activities	Outputs	Effect	Impact
	sources of income for UGs and WCs.		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	• 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
	monitor activities. • Identification and promotion of non-timber forest produce based income generation activities.			
Rainfed Area Development	• Treatment of land through improved soil and moisture conservation practices on watershed basis. • Promotion of good agricultural practices- horticulture, improved crop and vegetable. • Promotion of organic farming practices.	• 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	• 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	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
	• 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 irrigation practices like drip irrigation • Impart trainings, conduct meetings and organize exposure visits of communities.	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.	availability of water for livestock • Increase in agricultural productivity of land. • Augmentation of drinking water supply.	

Components	Activities	Outputs	Effect	Impact
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.