

CONTENTS (IWMP III)

CHAPTER No.	No.	TITLE	Page No.
CHAPTER- 1	METHODOLOGY		1-9
		Introduction	1
	1.1	Scientific Planning	2
	1.1.1	Cluster Approach	2
	1.1.2	Base Line Survey	2
	1.1.3	Collection of Primary Data	2
	1.1.4	Collection of Secondary data	3
	1.2	Participatory Rural Appraisal (PRA)	3
	1.2.1	Participatory Net Planning	4
	1.2.2	Community Participants in Social Mapping	5
	1.2.3	Transect Walk	5
	1.2.4	Focus Group Discussions	5
	1.3	Use of GIS Technology for Planning	6
	1.3.1	Prioritization	7
	1.3.2	Planning	7
1.3.3	Hydrological modelling	7	
	Table. 1: Detail of scientific planning and inputs in IWMP projects		8
1.4	Preparation of Action Plan and Approval		9
CHAPTER- 2	PROJECT BACKGROUND		10-16
	2.1	Project Background	10

CHAPTER No.	No.	TITLE	Page No.
		Table. 1: Basic Project Information	10
	2.2	Need of Watershed Development Programme	11
		Table. 2: Criteria and Weight Age for Selection of Watershed	12
		Table. 3: Weight-age of the Project	14
		Table. 4: Watershed Information	14
	2.3	Other ongoing Development Projects / Schemes in the project villages	15
		Table. 5: Ongoing Developmental Programs in the Project Area	15
		Table. 6: Previous Watershed Programme in the Project Area (if any)	16
CHAPTER- 3	BASIC INFORMATION OF THE PROJECT AREA		17-36
		Geography And Geo-hydrology	17
	3.1	Land Use Pattern	17
		Table 1. Land use pattern	17
	3.2	Soil and Topography	18
		Table 2. Soil type and Topography	18
	3.2.1	Flood And Drought Condition	19
		Table 3. Flood and Drought condition	19
	3.3	Soils	19
	3.3.1	Soil Erosion	19
	3.3.2	Soil Salinity/Alkalinity (Salinity ingress)	19
		Table 4. Soil pH and Salinity	20
	3.3.3	Soil Classification	20
	3.3.4	Land Capability Classification	20
	3.3.5	Climatic Conditions	22

CHAPTER No.	No.	TITLE	Page No.
		Table-5. Rainfall	22
	3.3.6	Physiography and Reliefs	23
		Table 6. Physiography and Relief	23
	3.4	Land and Agriculture	23
		Table 7. Natural Vegetation	24
	3.4.1	Land Ownership Details	24
		Table-8. Land Ownership Details	24
	3.4.2	Agriculture/Pattern	24
		Table 9. Agriculture/ Pattern	24
	3.4.3	Irrigation	25
		Table 10. Irrigation Pattern	25
	3.4.4	Cropping Pattern (crop details)	25
		Table 11 A. Crop Details (Rabi)	26
		Table 11 B. Crop Details (Kharif)	27
	3.4.5	Livestock	27
		Table 12. Village Wise Distribution of Milk Production	28
	3.4.6	Ground Water Concern	28
		Table 13. Village Wise Depth to Water Level Range	29
	3.4.7	Details of Common Property Resources	29
		Table 14. Detail of Common Property Resources	30
	3.5	Socio Economic And Literacy Profile	30
	3.5.1	Demographic Status	31

CHAPTER No.	No.	TITLE	Page No.
		Table 15. Demographic Status/ Population Pattern	31
		Table 16. Village wise Literacy Rate	31
		Table 17. Employment Status	32
	3.5.2	MIGRATION PATTERN	32
		Table 18. Migration Pattern	32
		Table 19. BPL Pattern	33
		Table 20. Village Infrastructure	34
		Table 21. Facilities/ Household assets	34
	3.5.3	LIVELIHOOD PATTERN	35
		Table 22. Per capita (Household) income	35
	3.5.4	Comparative Status of crop Productivity	36
	3.6	Reason for low productivity	36
CHAPTER- 4	PROJECT MANAGEMENT AGENCIES		37-46
	4.1	Institutional Arrangement	37
	4.2	State Level Nodal Agency, Haryana	39
	4.3	Watershed Cell cum Data Centre, Bhiwani	39
	4.4	Project Implementation Agency	40
		Table 1. PIA/ Project Implementing Agency	41
	4.4.1	Monitoring Level Staff at PIA Head Office	42
	4.5	Watershed Development Team	42
	4.6	Watershed Committee details	43
	4.6.1	Formation of Watershed Committees (WC)	44
		Table No. - 2 Watershed Committees (WC) Details	44

CHAPTER No.	No.	TITLE	Page No.
	4.7	Institutional Setup at Watershed Level	46
	4.7.1	Self Help Groups	46
	4.7.2	User Groups	46
CHAPTER- 5	BUDGETING		47-53
	5.1	Micro Watershed Wise / Component Wise Phasing year Wise Budget Phasing Under IWMP-III	48
		Table. 1: Activity wise allocation of funds for Project Village	48
		Table. 2: Khera Khurampur Micro- Watershed	49
		Table. 3: Duman Micro- Watershed	50
		Table. 4: Alimudinpur Micro - Watershed	51
		Table. 5: Dabuda Micro- Watershed	52
		Table. 6: Basunda Micro- Watershed	53
CHAPTER- 6	PREPARATORY PHASE		54-69
	6.1	Awareness Generation And Motivation For Participation	54
	6.1.1	Collection of Base Line Data And Hydrological Data	54
	6.1.2	Formation of Village Level Institutions	55
	6.1.3	Preparation of DPR	55
	6.2	Capacity Building	58
		Table 1: Statement of Targets under Proposed Training Action Plan at Micro Watershed Level to be conducted by WDT members of Gurgaon District	62
		Table: 2: Statement showing funds Requirement for training on IWMP in Haryana (Preparatory Phase – District Level)	64

CHAPTER No.	No.	TITLE	Page No.
		Table. 3: Micro Watershed Wise Exposure cum training Visit for SLNA, WDT, PIA , Field Functionary , WDC, SHG & UG Members of III (Gurgaon)	65
		Table No. 4. Farmer's/Beneficiaries training camps with Extension Programmes of IWMP III (Gurgaon)	67
	6.2.1	Expected Outcome Of Capacity Building	68
	6.3	Entry Point Activities 4%	68
		Table 5. Entry Point Activities	69
CHAPTER- 7	WORK PHASE		70-126
	7.1	Watershed development Works - 56%	70
	7.2	Proposed Activity	71
	7.2.1	Earthen Embankment	71
	7.2.2	Activities under NRM (56%) Micro Watershed Wise (IWMP III Gurgaon)	72
		Table-1: Village wise distribution of works: Village– Khurampur	72
		Table-2: Village wise distribution of works: Village– Basunda	75
		Table-3: Village wise distribution of works: Village– Daboda	77
		Table-4: Village wise distribution of works: Village– Tirpadi	79
		Table -5: Village wise distribution of works: Village– Palri	81
		Table -6: Village wise distribution of works: Village– DOOMA	83
		Table-7: Village wise distribution of works: Village– Alimudinpur	85
		Table-8 :DETAILED ESTIMATE OF EARTHEN EMBANKMENT	87
		Table. 9 Work Detail Estimate For Retaining Wall	90
		Table 10: Estimate of Open Channel	93

CHAPTER No.	No.	TITLE	Page No.
		Table. 11. Estimate of Orchard Development in the Watersheds Per Hectare (Lemon & Kinnoo)	98
		Table 12: Estimate of Orchard Development in the Watersheds Per Hectare (Guava ,Amla & Ber)	99
		Table. 13 Estimate of Agro- Forestry/ Afforestation	100
	7.3	PRODUCTION SYSTEM	103
	7.3.1	Crop Production	103
	7.3.2	Horticulture	104
	7.3.3	Vegetable cultivation	105
	7.3.4	Promotion of Farm Forestry and Agro-forestry	105
	7.3.5	Livestock Improvement Including Fodder Production	105
	7.3.6	Marketing Arrangements and Proposal for Improvement	106
	7.3.7	Detail of production system to be promoted	107
		Table 14. Detail of Production System proposed to be promoted in the project village	107
	7.3.8	Vermin Compost	110
		Table 15:Model for a Vermin Compost Unit	110
		LIVELIHOOD ACTIVITIES FOR THE ASSET LESS PERSONS-9%	112
	7.4	Livelihood support to SHG's	113
	7.4.1	Activities those are likely to be taken up by SHGs/individuals	114
		Table 16:Revolving Fund Assistance for SHGs	115
		Table 17:Skill Trainings/Skill up gradation for SHGs	115

CHAPTER No.	No.	TITLE	Page No.
		Table 18:Computer Training (6 months) for unemployed youth above 12th passed male and female both recommended by Watershed Development Committee	116
		Table 19:One time assistance as Revolving Fund to unemployed youth who have successfully completed Computer Training for setting up a computer centre	117
		Table 20:Cutting and Tailoring Centre for female beneficiaries	117
		Table 21:Embroidery Centre for female beneficiaries	118
		Table 22: Livelihood Support	118
		CONVERGENCE	121
	7.5	Introduction	122
	7.5.1	Convergence between MGNREGA and Watershed Programmes	123
		Table 23:Gaps In Funds Requirement – Micro Watershed Wise	123
	7.5.2	Non-Negotiable for works executed under MGNREGA	123
	7.5.3	Convergence with Forest Department	124
	7.5.4	Convergence with Horticulture Department	124
	7.5.5	Convergence with Agriculture Department	125
	7.5.6	Convergence with Animal Husbandry Department	125
CHAPTER- 8		QUALITY AND SUSTAINABILITY	126-133
	8.1	Monitoring and Evaluation	126
	8.1.1	Plans for Monitoring and Evaluation	126
	8.1.2	Monitoring	126
		Table 1. Micro Watershed wise details	127

CHAPTER No.	No.	TITLE	Page No.
	8.2	Evaluation	127
		Table 2. Micro Watershed wise details	128
	8.3	Consolidation Phase	130
		Table 3. Consolidated Phase: Khera Khurampur Micro- Watershed	131
		Table 4. Consolidated Phase: Duman Micro- Watershed	131
		Table 5. Consolidated Phase: Alimudinpur Micro- Watershed	132
		Table 6. Consolidated Phase: Dabuda Micro- Watershed	132
		Table 7. Consolidated Phase: Basunda Micro Watershed	133
CHAPTER- 9	EXPECTED OUTCOME		134-150
		EXPECTED OUTCOMES	134
	9.1	Employment	135
		Table 1. Expected Employment Generation in the Project area	135
	9.2	Migration Pattern	136
		Table 2. Pre and Post Migration	136
	9.3	Ground Water Table	137
		Table 3. Detail of average pre- post ground water table depth in the project area (in meters)	137
	9.4	Crops	137
		Table 4. Increase in Expected Yield	138
	9.5	Horticulture	139
		Table 5. Pre and post project area under Horticulture	139
	9.6	Afforestation/ Vegetative Cover	140

CHAPTER No.	No.	TITLE	Page No.
		Table 6. Pre and post project forest and vegetative cover	140
	9.7	Livestock	140
		Table 7. Details of livestock in the project area	140
	9.8	Linkages	142
		Table No. 8: Backward-Forward Linkages	142
	9.8.1	Logical Framework Analysis	143
		Table 9. Logical Framework Analysis	143
ANNEXURES			
Annexure I		Base Map	
Annexure II A		Contour	
Annexure II B		Drainage map	
Annexure III		Land use map	
Annexure IV		Soil map	
Annexure V		Status of Nitrogen in soil	
Annexure VI		Status of Phosphorus in soil	
Annexure VII		Status of Potash in soil	
Annexure VIII		Land Capability map	
Annexure IX		Depth to water level map	
Annexure X		Ground water Quality map	
Annexure XI		Proposed Action Plan map	

CHAPTER- 1

METHODOLOGY

INTRODUCTION

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

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

To implement watershedarea (IWMP III), a systematic survey has been conducted to know the potentiality of each village / Micro-Watershed. With this view, a baseline survey was conducted in fivemicro- watershedsKhera Khurampur (2C5G1a6), Duman/Dooma (2C5G1a5), Alimudinpur (2C5G1a7), Dabuda (2C5G1a7)and Basunda (2C5G1a9) falling in Block Farrukh Nagar of district Gurgaon. 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 III) of 5 micro watersheds falling in seven villages namely Khera Khurampur (2C5G1a6), Duman/Dooma (2C5G1a5), Alimudinpur (2C5G1a7), Dabuda (2C5G1a7) and Basunda (2C5G1a9) with their respective codes. The Micro-watershed is in continuation to other watershed projects in the area.

1.1.2 Base Line Survey

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

1.1.3 Collection of Primary Data

The project was sanctioned in 30th Steering committee meeting for IWMP on 30.01.2013 and the preparatory phase started in 2013. Initially, a meeting was arranged with officials of concerned departments and technical experts located at Khera Khurampur, Duman/Dooma, Alimudinpur, Dabuda and Basunda micro-watersheds. During this meeting, preliminary details of the proposed project including location of villages and criteria of selection and PPR were discussed.

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

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

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

1.1.4 Collection of Secondary data

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

1.2 PARTICIPATORY RURAL APPRAISAL

The due process of Participatory Rural Appraisal was followed in which village committees were sensitized about project activities. An appraisal of land resources, water resources, forest and pasture land resources, common property resources, production system and livestock resources was carried out by collecting data from primary and secondary sources. Group meeting were organized at common places and problem and possible solution were debated, discussed and efforts were made to reach agreement on activities required under the projects. This was followed by transect walks

across the entire area of the village and spots indicated by the community. The Technical possibilities were discussed and measurements were recorded for jointly agreed activities. Similarly, discussions were held about entry point activities and items of work were finalized keeping in view the availability of funds in the project. Through discussions were held on production activities and innovative techniques of improving crop, fruit and milk production. The women groups were sensitized about income generating activities and skill improvement by various types of trainings. The department field staff facilitated the process of participation at the planning stage. The department officials simultaneously stated the process of forming watershed committees for each village. The roles and responsibilities of all stake holders as per guidelines, the mechanism of fund flows, cost sharing arrangement in different components and operational mechanism of the projects was thoroughly discussed with the community and Watershed Committees (WC) in detail.

1.2.1 Participatory Net Planning

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

Based on the experience of the experts working in the area and catchment area characteristics each structures like Water conveyance system, Roof top Rain Harvesting/ Recharge bore, Ramp, inlet & outlet, Earthen Embankments /Marginal bunds with pucca outlet, Small earthen embankment with vegetative support etc. were recommended to conserve and store water used for life saving additional irrigation potential in the rain fed area and to avoid degradation of the land.

1.2.2 Community Participants in Social Mapping

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

1.2.3 Transect Walk

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

1.2.4 Focus Group Discussions

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



Gram Sabha Member's Participation in Group Discussion

1.3 USE OF GIS TECHNOLOGY FOR PLANNING

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

1.3.1 Prioritization

With the assistance of Geographical Information System (GIS), various layers were created like Topography (slope), Drainage and contour, Groundwater conditions, Slope, soil 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 Water conveyance system, Roof top Rain Harvesting/ Recharge bore, Ramp, inlet & outlet, Earthen Embankments /Marginal bunds with pucca outlet, Small earthen embankment with vegetative support 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
	4. Soil (soil fertility status)	Yes
	5. Land use	Yes
6. Ground water status	Yes	
B	Inputs	-
	Bio pesticides	Yes

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

1.4 Preparation of Action Plan and Approval

Based on the need and problems in watershed area; a draft action plan was prepared and placed before the concerned watershed development committee as per schedule circulated by Additional Deputy Commissioner, Gurgaon for approval of the Watershed Committees. After detailed deliberation and incorporation of relevant recommendation/ suggestions into the plan, the action plan was approved in the meeting of Gram Sabha. The resolution of each village falling in the watershed has been received. The record is available with the PIA and WAPCOS.

CHAPTER – 2

PROJECT BACKGROUND

2.1 PROJECT BACKGROUND

Integrated Watershed Management Programme (IWMP-III) project is falls in Farrukh Nagar block of Gurgaon district in Haryana state. The project is a cluster of five micro- watersheds namely Khera Khurampur (2C5G1a6), Duman (2C5G1a5), Alimudinpur (2C5G1a7), Dabuda (2C5G1a7) and Basunda (2C5G1a9) fall in seven villages. The total geographical area of the project is **3670 ha** out of which **3081 ha** has been undertaken to be treated under IWMP III starting from year 2012-2013. The Base map is shown in Annexure I.

Table 1: Basic Project Information

Sr. No	Name of the project	Name of the micro watersheds	Code No.	Name of the villages	Block	District	Area of the Project (ha)	Area proposed to be treated (ha)	Total Project cost (Rs lacs)	PIA
1	IWMP-III Farrukh Nagar	Khera Khurampur	2C5G1a6	Khera Khurampur	Farrukh Nagar	Gurgaon	1051	745	89.4	ASCO, Gurgaon
2		Duman	2C5G1a5	Duman	Farrukh Nagar	Gurgaon	591	550	66	ASCO, Gurgaon
3		Alimudinpur	2C5G1a7	Garhi Nathekhan	Farrukh Nagar	Gurgaon	346	315	37.8	ASCO, Gurgaon
4		Alimudinpur	2C5G1a7	Alimudinpur	Farrukh Nagar	Gurgaon	472	310	37.2	ASCO, Gurgaon
5		Dabuda	2C5G1a7	Dabuda	Farrukh Nagar	Gurgaon	448	440	52.8	ASCO, Gurgaon

Sr. No	Name of the project	Name of the micro watersheds	Code No.	Name of the villages	Block	District	Area of the Project (ha)	Area proposed to be treated (ha)	Total Project cost (Rs lacs)	PIA
6		Basunda	2C5G1a9	Basunda	Farrukh Nagar	Gurgaon	481	460	55.2	ASCO, Gurgaon
7		Basunda	2C5G1a9	Tripari	Farrukh Nagar	Gurgaon	281	271	32.52	ASCO, Gurgaon
					Grand Total		3670	3091	370.92	

2.2 NEED OF WATERSHED DEVELOPMENT PROGRAMME

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

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

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

Table 2. Criteria and Weight-age for Selection of Watershed

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

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

Based on above criteria and weightage of 88.0 concerning these thirteen parameters, a composite ranking was given to Farrukh Nagar Watershed (IWMP III) project as given in **Table- 3**.

More than 90% of the project area is under rainfed agriculture, hence a score of 15 is awarded. The percentage of schedule castes in this watershed is more than 40 percent of the total population, hence 10 score was allotted. Due to high percentage of the poor population i.e. above 80 percent thus the scope of poverty index is 10. More than 80 percent of the farmers are small and marginal by nature, hence a score of 10 is allotted and the actual wages earned by them are more than the minimum wages. Hence a rank of 0 is allotted. With all the parameters taken together gives the watershed score to be 88.0.

Table- 3: Weight-age of the Project

District	Name of the project	No. of micro-watersheds proposed to be covered	Proposed project area (ha)	Type of project (Hilly/ Desert/ Others)	Proposed cost (Rs. in lakh)	Weight age under the criteria													Total
						i	ii	iii	iv	v	vi	vii	viii	ix	x	xi	xii	xiii	
Gurgaon	Farrukh Nagar Watershed (IWMP III)	5	3081	others	369.72	10	10	0	10	3	0	15	5	10	15	0	10	0	88

Table 4: Watershed Information

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

Farrukh Nagar Watershed (IWMP III)	5	2C5G1a6, 2C5G1a5, 2C5G1a7, 2C5G1a7 and 2C5G1a9	Others
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2.3 OTHER ONGOING DEVELOPMENT PROJECTS / SCHEMES IN THE PROJECT VILLAGES

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

Table 5. Ongoing Developmental Programs in the Project Area

S. No.	Name of the Program /Project	Name of Micro watersheds	Sponsoring agency	Objective	Estimated number of beneficiaries
1	MGNREGA	Khera Khurampur	DRDA, Gurgaon	To provide assured employment of 100 days in a year to unskilled labour and development of village.	--
2	MGNREGA	Duman	DRDA, Gurgaon	To provide assured employment of 100 days in a year to unskilled labour and development of village.	--
3	MGNREGA	Garhi Nathekhani	DRDA, Gurgaon	To provide assured employment of 100 days in a year to unskilled labour and development of village.	--
4	MGNREGA	Slimudinpur	DRDA, Gurgaon	To provide assured employment of 100 days in a year to unskilled labour and development of village.	--

5	MGNREGA	Dabuda	DRDA, Gurgaon	To provide assured employment of 100 days in a year to unskilled labour and development of village.	37
6	MGNREGA	Basunda	DRDA, Gurgaon	To provide assured employment of 100 days in a year to unskilled labour and development of village.	20
7	MGNREGA	Tripari	DRDA, Gurgaon	To provide assured employment of 100 days in a year to unskilled labour and development of village.	58

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)

Names of Districts	Total micro-watersheds in the District		Micro-watersheds covered so far						Net watersheds to be covered	
			Dept. of Land Resources		Other Ministries/ Depts.		Total watersheds covered			
			Pre-IWMP projects (DPAP +DDP +IWDP)		Any other watershed project					
	No.	Area (ha.)	No.	Area (ha.)	No.	Area (ha.)	No.	Area (ha.)	No.	Area (ha.)
Gurgaon	141	81624	2	2300	33	22756	35	25056	106 (Balance)	56568 (Balance)

CHAPTER – 3

BASIC INFORMATION OF THE PROJECT AREA

GEOGRAPHY AND GEOHYDROLOGY

The Farrukh Nagar Watershed (IWMP III) falls in Farrukh Nagar block of District Gurgaon. The area is occupied by Indo-Gangetic alluvium/ aeolian plains. The area is without any natural drainage system. The area of watershed lies in between 28°24'00" to 28°28'30" N Latitude & 76°45'00" to 76°48'00" east longitude with general elevation varies between 216-222 m (MSL) above mean sea level (as per Google Earth data). Area experiences the 494 mm rainfall. Despite total rainfall received in this area, water retention is very low, due to light texture and dune topography. The Contour and Drainage map is presented in **Annexure-II**.

3.1 LAND USE PATTERN

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

Table. 1 Land use pattern of Farrukh Nagar Watershed (IWMP III)

Sr. No.	Name of Micro Watersheds With Code	Name of Villages	Geographic Area in (ha)	Treatable area of the village(ha)	Land under agriculture use (ha)	Rain fed area (ha)	Wasteland	
							Cultivable	Non-Cultivable
1	Khera Khurampur	Khera Khurampur	1051	745	933	627	-	118
2	Duman/Dooma	Duman/Dooma	591	550	550	509	-	41
3	Alimudinpur	Garhi Nathekhan/Palari	346	315	317	286	-	29
		Alimudinpur	472	310	416	254	-	56

Sr. No.	Name of Micro Watersheds With Code	Name of Villages	Geographic al Area in (ha)	Treatable area of the village(ha)	Land under agriculture use (ha)	Rain fed area (ha)	Wasteland	
							Cultivable	Non-Cultivable
4	Dabuda	Dabuda	448	440	404	396	29	15
5	Basunda	Basunda	481	460	398	377	23	60
		Tripari	281	271	256	246	10	15
			3670	3091	3274	2695	62	334

(Source – District Census Handbook, 2001 Gurgaon)

3.2 SOIL AND TOPOGRAPHY

The soils of Farrukh Nagar Watershed are Loamy sand to clay loam. The topography of the area ranges from level to nearly level. Soils are subject to susceptible to moderate water and wind erosion. The slope ranges from 0.5 to 3% most of the area of micro watersheds falls under level inter dune plains. Slope map is presented in Annexure IV.

Table 2. Soil type and Topography

Sr. No.	Name of Micro Watersheds	Code	Geographical area (ha)	Major Soil types	Topography
1.	Khera Khurampur	2C5G1a6	1051	Loamy sand to clay loam	Level to gentle
2.	Duman /Dooma	2C5G1a5	591		
3.	Alimudinpur	2C5G1a7	818		
4.	Dabuda	2C5G1a7	448		
5.	Basunda	2C5G1a9	762		

Source: - Department of Agriculture, Haryana

3.2.1 Flood and Drought Condition

Based on the climatic data collected from ground watershed and revenue department reveals that the instances of flood and drought occur once in 10 years. The flood and drought incidences resulted in low to very low yields of the crops.

Table 3. Flood and Drought condition

Sr. No.	Name of Micro- watersheds	Flood Incidence	Drought Incidence
1.	Khera Khurampur	Once in a 10 Year	Once in a 10 Year
2.	Duman /Dooma		
3.	Alimudinpur		
4.	Dabuda		
5.	Basunda		

3.3 SOILS

3.3.1 Soil Erosion

In the identified five micro watersheds in seven villages, it is observed that due to light texture & low vegetative cover to increase the loss of soil in the watershed area. This results in degradation of agricultural land, deforestation and low organic matter contents. Average annual rainfall is 494 mm of the area. In the watershed area the upper soil crest gets washed away in the form of runoff during rainy season if heavy storm occur, which also carries valuable top soil (sheet). Soil erosion in respect of sheet is moderate. Majority of the watershed Community are dependent on agriculture. Agriculture suffers due to area being rain fed and due to deficit rains in the region, resulting in further deterioration of socio economic conditions of community.

3.3.2 Soil Salinity/Alkalinity (Salinity ingress)

There is moderate soil salinity in the Project and pH is normal and within the limits of 7.9 to 8.53.

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

Table 4. Soil pH and Salinity

Sr. No.	Name of Micro Watersheds	Soil pH	Type of salinity
1.	Khera Khurampur	8.17	Low to moderate
2.	Duman/Dooma	8.27	Low to moderate
3.	Alimudinpur	8.53	Moderate to high salinity
4.	Dabuda	7.9	Low to moderate
5.	Basunda	8.1	Moderate to high salinity

3.3.3 SOIL CLASSIFICATION

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

3.3.4 Land Capability Classification

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

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

4. Climate limitation (c).

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

Land capability subclass III e₂s₂

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

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

1. Land leveling should be done at 50% subsidy, because farmers are not economically capable to bear the cost of land leveling.
2. Engineering measures like earthen embankments if require with drop structure for safe disposal of excess rainwater should be under taken.
3. Agronomic measures; mainly dry land farming, leguminous crop growing as mix cropping should be recommended.
4. Provide proper drainage system in low lying depression in the area.
5. Increase biomass through adopting agro- forestry on field bunds.
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 IV e₃s₃

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

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

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

3.3.5 Climatic Conditions

The average annual rainfall of this area is 494 mm (during the past 10 year's data). The highest rainfall is 548 mm during the year 2003 and lowest 145 mm during the year 2000. The uneven rainfall distribution is leading to run off soil every year to the steams, rivulets and depressed area of the Farrukh Nagar Watershed (IWMP III). The year wise rainfall from 2000 to 2012 is presented in **Table.5**.

Table-5. Rainfall during the years 2004-13

Sr. No.	Year	Rainfall (in mm)
1	2004	654
2	2005	483
3	2006	200
4	2007	324
5	2008	624
6	2009	505
7	2010	864
8	2011	356

9	2012	559
10	2013	373
	Total Average	494

(Source: - Ground Water Cell, Gurgaon)

The mean maximum temperature is 49° C (May and June) and mean minimum is 2° C (January) of the district.

3.3.6 Physiography and Relief

Physiographically, the area is divided into two parts active and stabilized sand dunes. The general Elevation in the area is 216-222 m above mean sea level. The elevation range is presented in **Table 6**.

Table 6. Physiography and Relief

Project Name	Elevation (MSL)	Slope Range
Farrukh Nagar Watershed (IWMP III)	216-222 m	Level to nearly level

3.4 LAND AND AGRICULTURE

The land holding pattern of the villages under Farrukh Nagar Watershed shows that the majority of the land holding is 1-3 ha. In the majority of Watershed area suffering from assured irrigation source has forced the majority of the farmers adopt side income source to survive because the rainfed agriculture not fulfill of their daily needs. The nearest Industrial Area is Gurgaon. This affects directly the demographic profile of the village.

The major crops Bajra, Gwar, Arahara, Green fodder and pulses in Kharif under rainfed conditions. The major crops during Rabi Wheat, Green fodder and seasonal vegetables, Gram, Mustard in rain fed and irrigated conditions. The soil and water conservation measures such as Engineering like Water conveyance system, Roof top Rain Harvesting/ Recharge bore, Ramp, inlet & outlet, Earthen Embankments /Marginal bunds with pucca outlet, Small earthen embankment with vegetative support etc. The project would help the farmers to take crop production which will enhance the net production

value. The following plants are commonly observed in the Project Area. The natural vegetation in the project area is exhibited in **Table 7**.

Table 7. NATURAL VEGETATION

Sr. No.	Trees	Fruits	Grasses and Shrubs
1	Neem	Gullar	Bathua
2	Pipal	Sahsoot	cholai
3	Khajri	Anjir	Congress Grass
4	Bargad		Munj Grass
5	Bakan		Dub Grass
6	Kikar		Sahnti

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
672	2220	23	-	2915

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	Khera Khurampur	Khera Khurampur	933	793	596
2	Duman/Dooma	Duman/Dooma	550	469	334
3	Alimudinpur	Garhi	317	276	189

Sr. No.	Name of Micro Watersheds	Village	Land under agriculture use (ha)	Net Sown area (ha)	
				One time	Two times
		Nathekhan/Palri			
4	Alimudinpur	Alimudinpur	416	351	264
5	Dabuda	Dabuda	404	358	241
6	Basunda	Basunda	398	338	253
7	Basunda	Tripari	256	221	161
		Total	3274	2806	2038

(Source: Department of Agriculture, Haryana)

3.4.3 IRRIGATION

Lack of Assured Irrigation Facilities

In absence of any canal network in project area, irrigation is being undertaken with the shallow tubewells where the quality of ground water is fresh to marginal. The micro-watershed wise distribution of irrigation system is presented in Table 10.

Table 10. Irrigation Pattern.

Sr. No	Name of Micro Watersheds	Name of Villages	Source 1: Canal		Source 2: Groundwater (Tube wells)	
			Availability months	Net area (ha)	Availability months	Net area (ha)
1	Khera Khurampur	Khera Khurampur	-	-	July to June	306
2	Duman/Dooma	Duman/Dooma	-	-	July to June	41
3	Alimudinpur	Garhi Nathekhan /Palri	-	-	July to June	31
4	Alimudinpur	Alimudinpur	-	-	July to June	162
5	Dabuda	Dabuda	-	-	July to June	8

Sr. No	Name of Micro Watersheds	Name of Villages	Source 1: Canal		Source 2: Groundwater (Tube wells)	
			Availability months	Net area (ha)	Availability months	Net area (ha)
6	Basunda	Basunda	-	-	July to June	21
7	Basunda	Tripari	-	-	July to June	10
				-		579

(Source – District Census Handbook Gurgaon)

3.4.4 CROPPING PATTERN (crop details)

Cropping Pattern

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

Table 11 A. Crop Details (Rabi)

Sr. No.	Name of Micro Watersheds	Village	Wheat				Mustard			
			Area (ha)	Prod. (kg)	Productivity (kg/ha) Avg.	Use of fertilizer	Area (ha)	Prod. (kg)	Productivity (kg/ha) Avg.	Use of fertilizer
1	Khera Khurampur	Khera Khurampur	560	2324000	4150	D.A.P. / Urea	285	498750	1750	D.A.P. Urea/Sulphur
2	Basunda	Basunda	350	1452500	4150	D.A.P. / Urea	18	31500	1750	D.A.P. Urea/Sulphur
		Tirpadi	71	294650	4150	D.A.P. / Urea	24	42000	1750	D.A.P. Urea/Sulphur
3	Daboda	Daboda	270	1120500	4150	D.A.P. / Urea	72	126000	1750	D.A.P. Urea/Sulphur
4	Alimmudinpur	Alimmudinpur	394	1635100	4150	D.A.P. / Urea	9	15750	1750	D.A.P. Urea/Sulphur
		Garhi Nathekhan	135	560250	4150	D.A.P.	19	33250	1750	D.A.P.

		/Palri				/ Urea				Urea/Sulphur
5	Duman /Dooma	Duman /Dooma	419	1738850	4150	D.A.P. / Urea	46	80500	1750	D.A.P. Urea/Sulphur

Table 11 B. Crop Details (Kharif)

Sr . No.	Name of Micro Watersheds	Village	Bajra				Rice			
			Area (ha)	Prod. (kg)	Productivity (kg/ha) Avg.	Use of fertilizer	Area (ha)	Prod. (kg)	Productivity (kg/ha) Avg.	Use of fertilizer
1	Khera Khurampur	Khera Khurampur	653	1281839	1963	FYM/Urea /DAP	26	84760	3260	FYM/Urea
2	Basunda	Tirpadi	89	174707	1963	FYM/Urea /DAP	30	97800	3260	FYM/Urea
		Basunda	205	402415	1963	FYM/Urea /DAP	4	13040	3260	FYM/Urea
3	Daboda	Daboda	293	575159	1963	FYM/Urea /DAP	44	143440	3260	FYM/Urea
4	Alimmudinpur	Alimmudinpur	50	98150	1963	FYM/Urea /DAP	-	-	-	-
		Garhi Nathekhan /Palri	41	80483	1963	FYM/Urea /DAP	-	-	-	-
5	Duman /Dooma	Duman /Dooma	131	257153	1963	FYM/Urea /DAP	-	-	-	-

3.4.5 Livestock

Farmers in these villages have maintaining the milch animals; mostly buffalos. The milk production of these animals (local breeds) is low (**Table 12**). There is a need for the improvement of the local breed through artificial insemination, proper vaccination and nutritive feed. Introduction of cross breed cows and murrh buffalo with better milk production will

popularize dairy farming in the area. Also, the farmyard manure procured from these animals would help improve the soil health.

Table 12. Village Wise Distribution of Milk Production in Farrukh Nagar Watershed (IWMP III)

Sr. No.	Name of Micro Watersheds	Villages	Buffalo (Lit/per day/annum) for 6 months	Cow (Lit/per day/annum) for 6 months	Sheep	Goat	Camel
1	Khera Khurampur	Khera Khurampur	694/5552/999360	110/440/79200	-	-	-
2	Basunda	Tirpadi	265/2120/381600	36/144/25920	-	-	-
		Basunda	239/1912/344160	34/136/24480	-	-	-
3	Daboda	Daboda	206/1648/296640	34/136/24480	-	-	-
4	Alimmudinpur	Alimmudinpur	327/2616/470880	36/144/25920	-	-	-
		Garhi Nathekhan /Palri	127/1016/182880	16/64/11520	-	-	-
5	Duman /Dooma	Duman /Dooma	292/2336/420480	68/272/48960	-	-	-

(Source: Animal Husbandry, Gurgaon)

*Average Yield of Buffalo is 7-8 Lit/day and cow yield is 3-4 Lit/day

3.4.6 Ground Water Concern

a) Depth to Water

The ground water level of all micro watersheds varies from 21-24 m depth. The village wise water level data has been tabulated in **Table 13**. Based on the observation of key wells fixed by ground water cell, the depth to water map has been prepared and is presented in the **Annexure VIII**. About 60 % of the area is underlain by depth to water more than 20 m where as remaining area is below 20 m. The area located in depressions is under water-logged condition.

Table 13. Village Wise Depth to Water Level of Farrukh Nagar Watershed (IWMP III)

Sr. No.	Name of Micro Watersheds	Name of Villages	Source	Pre-Project level (m)
1	Khera Khurampur	Khera Khurampur	Well	22.59
2	Basunda	Tirpadi	Well	22.97
		Basunda	Well	23.35
3	Daboda	Daboda	Well	23.13
4	Alimmudinpur	Alimmudinpur	Well	22.85
		Garhi Nathekhan /Palri	Well	22.39
5	Duman /Dooma	Duman /Dooma	Well	21.87

The quality of the ground water in 80% of the area is fresh whereas remaining area is underlain by marginal quality of water. The water quality map of the area is presented in **Annexure-IX**.

b) Water table fluctuation

From the availability of the data from the period June 1974 to June 2014, it is observed that the water table is declining at the rate 33 cm per year in the project area.

The seasonal fluctuation i.e. Pre and Post monsoon period is 0.5 to 1 m.

c) Rain water harvesting and Recharging

It has been proposed to construct rainwater-harvesting for utilization in the areas having shallow water table conditions and recharging in the areas where water tables are declining at alarming rates. 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, Gurgaon. The details of common property resource in Farrukh Nagar Watershed (IWMP III) are tabulated in **Table 14**.

Table14. Detail of Common Property Resources

Name of the Project	CPR Particulars	Total Area, ha (Area owned / in possession of)				Area available for treatment (ha)			
		Pvt. Person	Govt.	PRI	Any Other	Pvt. Person	Govt.	PRI	Any Other
Farrukh Nagar Watershed (IWMP III)	Waste land	50	28	190	66	29.5	15	135.5	19
	Pasture	-	9	33	-	-	9	33	-
	Orchards	-	-	-	-	-	-	-	-
	Village wood lot	-	-	12	-	-	-	12	-
	Forest/ Agro forestry	-	-	20	-	-	-	20	-
	Village ponds, lake	-	2	11	-	-	2	11	-
	Community Buildings	-	4	19	-	-	4	19	-
	Weekly Mkts	-	-	-	-	-	-	-	-
	Permanent Mkts	-	6	3	-	-	6	3	-
	Temples/place of worship	-	-	-	-	-	-	-	-
	Others	50	28	190	66	29.5	15	135.5	19

3.5 SOCIO ECONOMIC AND LITERACY PROFILE

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

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

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

3.5.1 Demographic Status

Table 15. Demographic Status/ Population Pattern

Sr. No.	Name of the Micro watershed	Name of villages	Total no. of houses	Total Population			SC			
				Male	Female	Total	Male	Female	Total	%age
1	Khera Khurampur	Khera Khurampur	939	2531	2245	4776	364	333	697	14.6
2	Duman/Dooma	Duman/Dooma	-	-	-	-	-	-	-	-
3	Alimudinpur	Garhi Nathekhan/Palri	151	420	367	787	162	146	308	39.1
4	Alimudinpur	Alimudinpur	339	957	861	1818	164	139	303	16.7
5	Dabuda	Dabuda	265	782	702	1484	154	138	292	19.7
6	Basunda	Basunda	263	713	675	1388	127	120	247	17.8
7	Basunda	Tripari	254	704	618	1322	139	104	243	18.4
			2211	6107	5468	11575	1110	980	2090	18.1

(Source- District Census 2011)

Table16. Village wise Literacy Rate in Farrukh Nagar Watershed (IWMP III)

Sr. No.	Name of the Micro watershed	Name of villages	Total population	Literacy					
				Total Literates	% age	Male	% age	Female	% age
1	Khera Khurampur	Khera Khurampur	4776	3358	70.3	1964	58.5	1394	41.5
2	Duman/Dooma	Duman/Dooma	-	-	-	-	-	-	-
3	Alimudinpur	Garhi Nathekhan/Palri	787	552	70.1	329	59.6	223	40.4
4	Alimudinpur	Alimudinpur	1818	1332	73.3	773	58.0	559	42.0
5	Dabuda	Dabuda	1484	1037	69.9	609	58.7	428	41.3
6	Basunda	Basunda	1388	981	70.7	556	56.7	425	43.3

7	Basunda	Tripari	1322	923	69.8	538	58.3	385	41.7
			11575	8183	70.7	4769	58.3	3414	41.7

(Source- District Census- 2011)

Table 17. EMPLOYMENT STATUS

Sr. No.	Name of Micro Watersheds	Name of villages	Schedule caste		Cultivators		Agricultural labourers		Household industry workers		Other workers	
			Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
1	Khera Khurampur	Khera Khurampur	364	333	645	12	25	2	6	1	564	183
2	Duman/Dooma	Duman/Dooma	-	-	-	-	-	-	-	-	-	-
3	Alimudinpur	Garhi Nathekhan/Palri	162	146	88	7	7	0	1	0	64	3
4	Alimudinpur	Alimudinpur	164	139	197	17	21	4	3	1	159	18
5	Dabuda	Dabuda	154	138	164	14	3	0	0	2	207	183
6	Basunda	Basunda	127	120	80	6	7	0	1	0	169	8
7	Basunda	Tripari	139	104	136	23	22	1	0	0	80	21
			1110	980	1310	79	85	7	11	4	1243	416

Source: Census 2011

3.5.2 MIGRATION PATTERN

As per the discussions with the PIA and Project Manager of WCDC during the presentation it was informed that there is no permanent migration in area, only unemployed youth serving in the vicinity of the area.

Table 18. Migration Pattern in Farrukh Nagar Watershed (IWMP III)

Sr. No.	Name of Micro Watersheds	Name of villages	Total Population	No. of persons migrating	No. of days per year of migration	Main reason for migration	Income during migration/month/persons
1	Khera Khurampur	Khera Khurampur	4776	125	210	Seasonal labour/Bhutta	8400

						labour	
2	Basunda	Tirpadi	1322	85	220	Seasonal labour/Bhutta labour	8400
		Basunda	1388	70	210	Seasonal labour/Bhutta labour	8400
3	Daboda	Daboda	1484	40	125	Seasonal labour/Bhutta labour	8400
4	Alimmudinpur	Alimmudinpur	1818	65	130	Seasonal labour/Bhutta labour	8400
		Garhi Nathekhan /Palri	801	40	90	Seasonal labour/Bhutta labour	8400
5	Duman /Dooma	Duman /Dooma	1756	80	100	Seasonal labour/Bhutta labour	8400

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

Table 19. BPL Pattern

Sr. No.	Name of Micro watersheds	Name of villages	Total Houses	Total Household BPL	% of BPL HH
1	Khera Khurampur	Khera Khurampur	939	182	19.38
2	Basunda	Tirpadi	254	51	20.07
		Basunda	263	69	26.23
3	Daboda	Daboda	265	59	22.26
4	Alimmudinpur	Alimmudinpur	339	72	21.23
		Garhi Nathekhan /Palri	167	77	46.10
5	Duman /Dooma	Duman /Dooma	319	64	20.06

(Source: District Administration Gurgaon, Haryana)

INFRASTRUCTURE DETAILS

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

Table 20. Village Infrastructure

Sr. No.	Name of Micro watersheds	Name of villages	Bank Y/N	Post office Y/N	School Primary/High/Sr. Sec.	Milk Collection Centre Y/N	Pucca Road to Village Y/N	Health Facility Govt/Private Y/N	Veterinary facility Y/N
1	Khera Khurampur	Khera Khurampur	No	No	Primary/High	No	Yes	Yes	No
2	Basunda	Tirpadi	No	No	Primary	No	Yes	No	No
		Basunda	No	No	Primary	No	Yes	No	No
3	Daboda	Daboda	No	No	Primary/High	No	Yes	Yes	No
4	Alimmudinpur	Alimmudinpur	No	No	Primary/Middle	No	Yes	No	No
		Garhi Nathekhan /Palri	No	No	Primary	No	Yes	No	No
5	Duman /Dooma	Duman /Dooma	No	No	Primary	No	Yes	No	No

FACILITIES/ HOUSEHOLD ASSETS

Table 21. Facilities/ Household assets in Farrukh Nagar Watershed (IWMP III)

Sr. No.	Name of micro watershed	Name of villages	Total No. of Houses	HHs with Safe latrines	HHs with phones		HHs with vehicles		HHs with TV	HHs with cooking gas	HHs with drinking water	HHs with fridge
					Landline	Mobile	2 wheelers	4 wheelers				

									sets			
1	Khera Khurampur	Khera Khurampur	939	885	11	1408	737	506	823	757	939	839
2	Basunda	Tirpadi	254	226	7	508	198	123	225	203	254	217
		Basunda	263	182	9	526	203	139	229	213	263	212
3	Daboda	Daboda	265	239	9	397	205	125	209	204	265	239
4	Alimmudinpur	Alimmudinpur	339	290	8	711	250	201	298	250	339	313
		Garhi Nathekhan /Palri	167	119	3	417	133	103	140	119	167	137
5	Duman /Dooma	Duman /Dooma	319	271	7	638	293	147	225	285	319	298

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 Farrukh Nagar Watershed (IWMP III)

Sr. No.	Name of micro watersheds	Name of villages	Agriculture in Rs. P.A.	Animal Husbandry in Rs. P.A.	Casual labour in Rs. P.A.	Others in Rs. P.A.	Total in Rs.
1	Khera Khurampur	Khera Khurampur	19250	14000	4000	3800	41050
2	Basunda	Tirpadi	18500	13800	3900	3750	39950
		Basunda	18500	13800	3900	3750	39950
3	Daboda	Daboda	18300	13500	3850	3600	39250
4	Alimmudinpur	Alimmudinpur	18100	13000	3750	3300	38350
		Garhi Nathekhan /Palri	18100	13000	3750	3300	38350
5	Duman /Dooma	Duman /Dooma	18250	13250	3800	3550	38850

3.5.4 Comparative Status of crop Productivity

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

3.6 REASONS FOR LOW PRODUCTIVITY

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

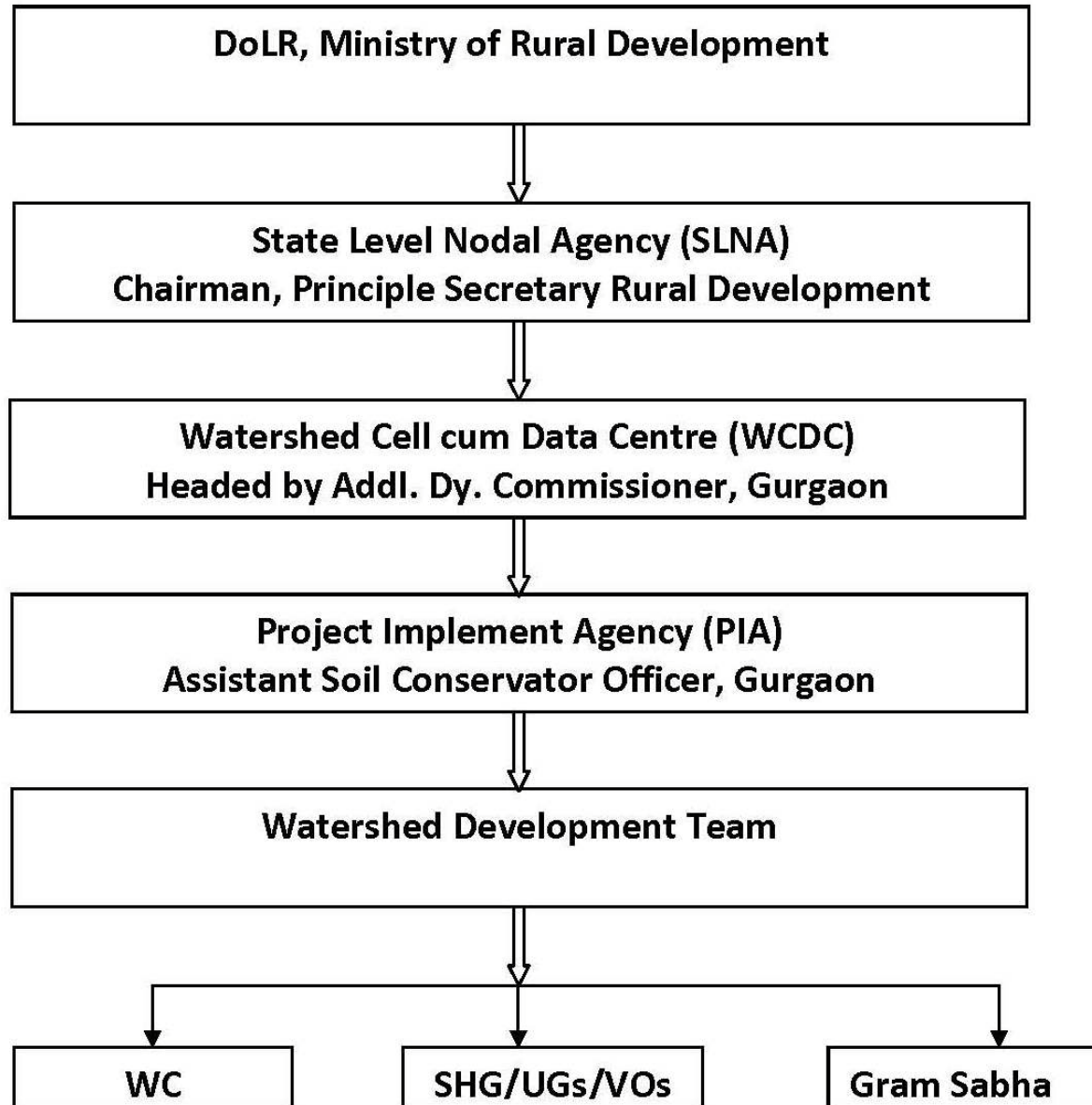
CHAPTER-4

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:



4.2 STATE LEVEL NODAL AGENCY, HARYANA

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

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

4.3 WATERSHED CELL CUM DATA CENTRE, GURGAON

WCDC has been notified by SLNA and the same has been constituted. The team comprises of 3 to 4 subject matter specialists on Agriculture, Water Management, Social Mobilization and Management & Accounts. WCDC is be headed by

Deputy Commissioner and Additional Deputy Commissioner has been designated as Project Manager under IWMP. The WCDC members comprise of Technical Expert, Computer Operator and Accountant. As per guideline 3 to 6 full time staff (3 in district with less than 25000 ha project area and 6 in districts with more than 25000 ha project area) would assist the Project Manager. The Project Manager will prepare well defined annual goals against which the performance that will be monitored. The WCDC will be financially supported by the DoLR after review of available staff, infrastructure and actual requirement.

Organization of WCDC and its Objective

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

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

4.4 Project Implementation Agency

The project Implementing Agencies (PIA), ASCO Gurgaon is selected by the State Level Nodal Agency (SLNA) for Integrated Watershed Management Programme (IWMP) in Haryana. In the district Gurgaon, where the area of development is 24944 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, Gurgaon. With the vast experience in implementing various watershed development Projects. PIA will put dedicated watershed development team and will provide necessary technical guidance

to the Gram Sabha /Watershed Committee for implementation of development plans for the watershed projects through Participatory Rural Appraisal Exercise.

PIA will also undertake:

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

Table 1. PIA/ Project Implementing Agency

S.No.	Name of the Project	Details of PIA	
1	Farrukh Nagar Watershed (IWMP-III)	i) Type of organization	Govt Organization
		ii) Name of organization	Department of Agriculture, Haryana
		iii) Designation & Address	ASCO, Gurgaon
		iv) Telephone	
		v) Fax	-----
		vi) E-mail	ascogurgaon@gmail.com

The PIA is well competent to effectively manage this project and has a good rapport with the village community. The watershed committee members are giving them positive response in the preparatory phase. The overall responsibility of the PIA would be to oversee the project progresses well and to provide technical knowhow as when required. PIA has

qualified and highly experienced staff to accomplish this task and take this project forward for its logical conclusion. PIA will be assisted by the Watershed Development Team.

4.4.1 Monitoring Level Staff at PIA Head Office

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

4.5 Watershed Development Team

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

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

- a) Constitution of Watershed Committee and its functioning,
- b) Organizing and strengthening User groups, Self Help Groups,
- c) Mobilizing women to ensure that the perspectives and interests of women are adequately reflected in the watershed action plan

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

4.6 WATERSHED COMMITTEE DETAILS

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

Their representation of various groups is as under:

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

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

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

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

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

4.6.1 Formation of Watershed Committees (WC)

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

Table 2. Watershed Committees (WC) Details

Name of Villages	Name of President	Name of Secretary	Name of Members
Khera Khurampur	Kavita	Mahesh	Dharambir,Pawan,Nihal,Santosh,Manoj,Veerpal
Tirpadi	Madhubala	Krishan kumar	Jitender,Rammeher,Mangat,Babli,Imrit

Basunda	Madhubala	Krishan kumar	Jitender,Rammeher,Mangat,Babli,Imrit
Daboda	Mahender singh	Pardeep kumar	Dayaram,Sonu,Poonam,Mukesh
Alimmudinpur	Om Parkash	Surender singh	Nisha,Balwan,Ramkumar,Ushadevi
Palri	Sukhbir Yadav	Virender	Sunita,Poonam,Dharmchand,Bhagwandass
Dooma	Mamta	Yadram	Bhimsingh,pooran,Sunita,Devi,Roshan

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 III FARRUKH NAGAR 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 III**

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
Farrukh Nagar Watershed (IWMP III)	3670	3081	36972000	Administrative costs	369720	369720	1109160	1109160	739440	3697200
				Monitoring	0	0	0	369720	0	369720
				Evaluation	0	92430	92430	92430	92430	369720
				Entry point activities	1478880	0	0	0	0	1478880
				Institution and capacity building	0	1848600	0	0	0	1848600
				Detailed project report	369720	0	0	0	0	369720
				Watershed development works	0	2957760	5915520	6285240	5545800	20704320
				Livelihood activities for the asset less persons	0	0	1109160	1848600	369720	3327480
				Production system and micro enterprises	0	0	1109160	1478880	1109160	3697200
				Consolidation phase	0	0	0	0	1109160	1109160
				Total	2218320	5268510	9335430	11184030	8965710	36972000
				Percentage of total cost	6%	14.25%	25.25%	30.25%	24.25%	100%

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

Area in Hectares and
Funds in Rs.

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

(BUDGET AT A GLANCE)

Effective Area	Funds Available	Name of activity	1st Year	2nd Year	3rd Year	4th Year	5th Year	Total	
745	8940000	Administrative costs	89400	89400	268200	268200	178800	894000	
		Monitoring	0	0	0	89400	0	89400	
		Evaluation	0	22350	22350	22350	22350	89400	
		Entry point activities	357600	0	0	0	0	357600	
		Institution and capacity building	0	447000	0	0	0	447000	
		Detailed project report	89400	0	0	0	0	89400	
		Watershed development works	0	715200	1430400	1519800	1341000	5006400	
		Livelihood activities for the asset less persons	0	0	268200	447000	89400	804600	
		Production system and micro enterprises	0	0	268200	357600	268200	894000	
		Consolidation phase	0	0	0	0	268200	268200	
		Total		536400	1273950	2257350	2704350	2167950	8940000
		Percentage of total cost		6%	14.25%	25.25%	30.25%	24.25%	100%

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

Area in Hectares and
Funds in Rs.

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

(BUDGET AT A GLANCE)

Effective Area	Funds Available	Name of activity	1st Year	2nd Year	3rd Year	4th Year	5th Year	Total
550	6600000	Administrative costs	66000	66000	198000	198000	132000	660000
		Monitoring	0	0	0	66000	0	66000
		Evaluation	0	16500	16500	16500	16500	66000
		Entry point activities	264000	0	0	0	0	264000
		Institution and capacity building	0	330000	0	0	0	330000
		Detailed project report	66000	0	0	0	0	66000
		Watershed development works	0	528000	1056000	1122000	990000	3696000
		Livelihood activities for the asset less persons	0	0	198000	330000	66000	594000
		Production system and micro enterprises	0	0	198000	264000	198000	660000
		Consolidation phase	0	0	0	0	198000	198000
		Total		396000	940500	1666500	1996500	1600500
Percentage of total cost		6%	14.25%	25.25%	30.25%	24.25%	100%	

MICRO WATERSHED WISE/COMPONENT WISE PHASING

YEAR WISE BUDGET PHASING UNDER IWMP

Area in Hectares and

Funds in Rs.

**Table 4. PHASING YEAR WISE (Name of the Micro Watershed: Alimudinpur)
(BUDGET AT A GLANCE)**

Effective Area	Funds Available	Name of activity	1st Year	2nd Year	3rd Year	4th Year	5th Year	Total	
615	7380000	Administrative costs	73800	73800	221400	221400	147600	738000	
		Monitoring	0	0	0	73800	0	73800	
		Evaluation	0	18450	18450	18450	18450	73800	
		Entry point activities	295200	0	0	0	0	295200	
		Institution and capacity building	0	369000	0	0	0	369000	
		Detailed project report	73800	0	0	0	0	73800	
		Watershed development works	0	590400	1180800	1254600	1107000	4132800	
		Livelihood activities for the asset less persons	0	0	221400	369000	73800	664200	
		Production system and micro enterprises	0	0	221400	295200	221400	738000	
		Consolidation phase	0	0	0	0	221400	221400	
		Total		442800	1051650	1863450	2232450	1789650	7380000
		Percentage of total cost		6%	14.25%	25.25%	30.25%	24.25%	100%

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

Area in Hectares and
Funds in Rs.

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

(BUDGET AT A GLANCE)

Effective Area	Funds Available	Name of activity	1st Year	2nd Year	3rd Year	4th Year	5th Year	Total	
440	5280000	Administrative costs	52800	52800	158400	158400	105600	528000	
		Monitoring	0	0	0	52800	0	52800	
		Evaluation	0	13200	13200	13200	13200	52800	
		Entry point activities	211200	0	0	0	0	211200	
		Institution and capacity building	0	264000	0	0	0	264000	
		Detailed project report	52800	0	0	0	0	52800	
		Watershed development works	0	422400	844800	897600	792000	2956800	
		Livelihood activities for the asset less persons	0	0	158400	264000	52800	475200	
		Production system and micro enterprises	0	0	158400	211200	158400	528000	
		Consolidation phase	0	0	0	0	158400	158400	
		Total		316800	752400	1333200	1597200	1280400	5280000
		Percentage of total cost		6%	14.25%	25.25%	30.25%	24.25%	100%

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

Area in Hectares and
Funds in Rs.

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

(BUDGET AT A GLANCE)

Effective Area	Funds Available	Name of activity	1st Year	2nd Year	3rd Year	4th Year	5th Year	Total	
731	8772000	Administrative costs	87720	87720	263160	263160	175440	877200	
		Monitoring	0	0	0	87720	0	87720	
		Evaluation	0	21930	21930	21930	21930	87720	
		Entry point activities	350880	0	0	0	0	350880	
		Institution and capacity building	0	438600	0	0	0	438600	
		Detailed project report	87720	0	0	0	0	87720	
		Watershed development works	0	701760	1403520	1491240	1315800	4912320	
		Livelihood activities for the asset less persons	0	0	263160	438600	87720	789480	
		Production system and micro enterprises	0	0	263160	350880	263160	877200	
		Consolidation phase	0	0	0	0	263160	263160	
		Total		526320	1250010	2214930	2653530	2127210	8772000
		Percentage of total cost		6%	14.25%	25.25%	30.25%	24.25%	100%

CHAPTER – 6

PREPARATORY PHASES

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

6.1 AWARENESS GENERATION AND MOTIVATION FOR PARTICIPATION

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

6.1.1 Collection of Base Line Data and Hydrological Data

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

6.1.2 Formation of Village Level Institutions

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

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

6.1.3 Preparation of DPR

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

Land Capability Classification, Ground Water (depth and quality), soil fertility and 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 Gurgaon district.

Strengths

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

Weaknesses

- ❖ Erratic rainfall
- ❖ Poor ground water quality for irrigation
- ❖ Lack of good quality fodder.
- ❖ Lack of advanced cattle breed.
- ❖ Low level of milk production.
- ❖ Lack of knowledge base regarding scientific cattle management.

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

Opportunities

- ❖ Available Rain Water harvesting for life saving irrigation.
- ❖ Promotion of organic farming.
- ❖ Dry land horticulture activities.
- ❖ Provide training on dairy farming and other income generating activities.
- ❖ Promotion of nursery raising and pasture development.
- ❖ Consumptive use of ground water.

Threats

There are few negative issues that may have adverse effect

- ❖ Unreliable rainfall.
- ❖ Absence of assured irrigation and poor ground water quality.
- ❖ Lack of cooperation and contribution from local residents.
- ❖ Low literacy rate in the project area.
- ❖ Rapid climate change affecting crops.
- ❖ Lack of awareness of Dairy farming as a commercial activity.
- ❖ Frequent droughts.
- ❖ Poor avenues for employment.
- ❖ Wild life menace.

CAPACITY BUILDING- 5%
18, 48,600/-

6.2 Capacity Building

1. Introduction

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

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

2. Vision

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

3. Need

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

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

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

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

4. Rationale

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

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

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

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

5. Objectives

The main objectives of the current action plan for ongoing 13 projects are outlined as follows:-

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

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

Sr. No.	Title of Training Programme and Duration	Level of Participants	Total persons	Trainees Per Programme	Number of Programmes
01	District Level Sensitization Workshop for Watershed Committees. <u>One Day</u>				
	Gurgaon District	Members of Watershed Committees @ 10 per committee would also include accompanying WDT Members.	320	300-350	1
02	Block Level Functional Programmes for Secretaries of Watershed Committees. <u>Two Days</u>				
	Gurgaon District	Secretaries of Village Watershed Committees	32	35-40	1
03	Project Level Sensitization Camps for WC <u>One Days</u>				
	Gurgaon District	Members of Watershed Committees @ 10 Persons (Tentative) per WC	320	50	6
04	Village Level Awareness Camps on IWMP at Micro Watershed Level for User Groups <u>One Day</u>				
	Gurgaon District	Approximately 50 <u>prospective</u> user groups per micro watershed.	1600	50	32
05	Block Level Functional Programmes for SHGs [Leader, Secretary and Treasurer] under IWMP <u>One Day</u>				
	Gurgaon District	Three persons (Leader, Secretary and Treasurer) per Self Help Group @ around one SHG per village.	86	50	2

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

6. Training Methods

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

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

7. Tools

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

8. Resource Persons

8.1. Internal

Around two persons per WDT identified from the initial training activities by HIRD, Nilokheri would be trained on various aspects for designing and conducting the training programmes. It is expected that each WDT members would be required to function as a

internal resource person for the proposed training programmes. Technical experts from each WCDC and PIA would also function as facilitators in the proposed training activities.

8.2. External

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

9. Fund Requirement

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

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

Sr. No.	Training Programmes for SLNA, WDT, PIA , Field Functionary , WDC member’s , SHG & UG organize by HIRD	Total Funds
1	District Level Sensitization Workshop(s) for Watershed Committees	20018
2	Block Level Functional Programmes for Secretaries of Watershed Committees. <u>Two Days</u>	2657
3	Village Level Sensitization Camps for WC <u>One Days</u>	13768
4	Village Level Awareness Camps on IWMP at Micro Watershed Level for Prospective User Groups <u>One Day</u>	31891
5	Block Level Functional Programmes for SHGs [Leader, Secretary and Treasurer] under IWMP <u>One Day</u>	5020
	Total	73354

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

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
3	Sub watershed Level- WDT Members	Part II-Module I to V- Exposure Visit Outside State- Conceptual, Technical, Social, Management of Finance, Monitoring	4	30000	5	5	7500	1500	4500	112500

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
		and Evaluation.								
4	Sub watershed Level- PIA Members	Exposure Visit- Within Fundamentals of Watershed, Finance Management, Final Report on WDP etc	2	14000	5	10	7000	700	4500	225000
5	District Level- WDC	Exposure visit to successful watershed/ University.	2	14000	5	10	7000	700	1400	70000
6	District Level- Line Deptt., WDC	Exposure visit to successful watersheds 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 III (Gurgaon)

S. No.	District	No. Micro watersheds	No. of Camps/ Year/ Micro watershed	Total No. of camps per Year	Total No. of camps for 5 Year's	Amount of per Camp	Amount per Micro watershed	Total Budget
1.	Farmer Training Camp in each season	5	2	10	50	12,000	1,20,000	6,00,000
2.	Propaganda & Documentation (Puppet show, documentary movies show, videography, Photography, wall Painting, Display Board, pamphlets, leaf lets. Etc)	5	2	10	50	5000	50,000	2,50,000
3	Contingency charges							87746
	Total							937746

- i) **Training Programmes for SLNA, WDT, PIA , Field Functionary , WDC member's , SHG & UG organize by HIRD = 73,354/-**
- ii) **Micro Watershed Wise Exposure cum training Visit For SLNA, WDT, PIA , Field Functionary , WDC, SHG & UG Members = 8, 37,500/-**
- iii) **Farmer's / Beneficiaries training camps with Extension Program's = 9,37,746/-**

Grand Total = 18, 48,600/-

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 programs 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 programs 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, 78,880/-** 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 Farrukh Nagar Watershed (IWMP III)

(Rs. In Lacs)

Block	Name of Project	No. of EPAs Identified	No. of EPAs Completed	No. of EPAs in progress	Name/Nature of EPA	Location	Expenditure
Farukhnagar	IWMP-III	16	16	-	Excavation of Pond	Khera Khurampur	0.34
					Pucca Channel (1)	Khera Khurampur	2.89
					Ramp (1)	Khera Khurampur	0.25
					Drinking Water Tank (2)	Tirpadi	1.24
					Pucca Channel (2)	Basunda	2.1
					Ramp (1)	Basunda	0.12
					Drinking Water Tank	Daboda	0.62
					Cattle trough	Daboda	0.33
					Inlet Ramp	Daboda	1.12
					Pucca Channel (1)	Alimmudinpur	2.0
					Pucca Channel (1)	Palri	0.89
					Pucca Channel (2)	Dooma	2.57
							14.47

CHAPTER- 7

WORK PHASE

7.1 WATERSHED DEVELOPMENT WORKS - 56%

The Works under the project have been identified after the detailed survey of the Project Area and discussions held with team of experts comprising of PIA, Hydrologist from Haryana supported by Livelihood expert, Agriculture and Horticulture expert and expert in Animal Husbandry. Participatory approach has been adopted to identify the activities under the project. The detailed discussions were held with watershed committees and works identified along with villagers after making visits to identified sites. The works mainly relate to soil and water conservation activities like Water conveyance system, Roof top Rain Harvesting/ Recharge bore, Ramp, inlet & outlet, Earthen Embankments /Marginal bunds with pucca outlet, Small earthen embankment with vegetative support etc. The proposed project proposals were presented in the Gram Sabha meeting as per the schedule and were approved with certain changes. The works thus identified are given in the attached sheets along with estimates – micro watershed wise.

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

Natural Resource Management

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

The land holding is small and any loss of land nearby area would be loss to the farmer. Under the IWDP/ Haryali some works like renovation of farm ponds, field bunding has been undertaken but still at few places inlet of the ponds and outlet needs to be constructed. So their repair and renovation is proposed during the discussion it was felt to be genuine demand for repair, renovation and capacity enhancement in the area. This will increase the rain water harvesting.

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

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

7.2 Proposed Activity

The provision for renovation of pond, inlet, outlet, ramp and retaining walls are the main requirement by project stakeholders which has been provided. Due to the paucity funds the repair works has been undertaken under different schemes in piece meal. The main requirement of retaining wall was ignored due to inadequate funds. During the discussions/interaction the stake holders gave high priority for construction of retaining wall as lot of water is being wasted through cutting of banks.

7.2.1 Earthen Embankment

In order to conserve the rain water, the provisions of earthen embankment have been provided along the field boundaries across the slope for in-situ moisture conservation.

Suggested Interventions: In a number of villages, sites have been proposed for in-situ moisture conservation and construction of embankments where village paths have got converted in to nalas due to severe erosion.

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

Sample estimates are as follows:

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

Table 1 Village wise distribution of works.

Name of Project: IWMP III		Name of Watershed: Farrukh Nagar				Name of Village: KHURAMPUR			
Sr. No.	Nature of Works	Location	Catchment, capacity, command, and submergence area and capacity (wherever applicable)	Location (with latitude and longitude)	Unit	No. of Works		Estimated Cost Rs. In Lacs.	Objective
						Phy.	Unit Cost (Rs. in Lacs)		
1	Water conveyance system	N28.26.794 E76.46.930	-	From Mushaidpur canal to village	Mtr	3000	0.005	15	Waste water saving , smoothly divert waste water and availability of irrigated water to Farm pond and all

				pond					villagers are beneficiaries
2	Digging of pond	N28.26.856 E76.46.887.	-	Near mandir	No.s	1	4.5	4.5	Increasing water level , availability cattle drinking water and for live stock and irrigated water and all villagers are beneficiaries
3	Deepening of pond	N28.26.848 E76.47.512	20 hac. 11200 cum 7400 sqm 10hac.	Mandir wala Pond	No.s	1	3	3	Increasing water level , availability cattle drinking water and for live stock and irrigated water and all villagers are beneficiaries er
	Digging of pond	N28.26.378 E76.46.741	1 hac. 560 cum 370 sqm	Panchayati land		1	4.5	4.5	Increasing water level , availability cattle drinking water and for live stock and irrigated water and all villagers are beneficiaries
4	Land leveling	N28.26.394 E76.46.550	-	In panchayat land near mandir	hac	5	0.5	2.5	convenient for the agriculture purpose and increase yield of crop
4	Earthen Embankment with pacca outlet	N28.26.509 E76.46.702	-	joining village to field	Nos	20	0.97	19.4	Convenient way from field to field and control the soil Erosion
5	Agro forestry	N28.26.761 E76.46.790	-	Near village Farm pond	hac	5	0.2	1	For the greenery, vegetation and peaceful environment
6	Plantation	N28.26.856 E76.46.913	-	In Ashram	hac	5	0.5	2.5	For the greenery, vegetation and peaceful environment

7	Bore well or Recharge for rainwater harvesting	N28.26.857 E76.46.888	-	Near Farm pond	Nos	4	0.75	3	To improve water level and decrease the salinity of water
		N28.26.848 E76.47.515							
		N28.26.380 E76.46.550							
		N28.26.384 E76.46.555							
Total Cost								55.4	
Available Fund								50.1	
Convergence								5.3	

Name of Project: IWMP III			Name of Watershed: Farrukh Nagar			Name of Village: Basunda.			
Sr. No.	Nature of Works	Location (with latitude and longitude)	Catchment, command, submergence area and capacity (wherever applicable)	Location	Unit	No. of Works		Estimated Cost Rs. In Lacs.	Objective
						Phy.	Unit Cost (Rs.in Lacs)		
1	Agroforestry	N28'23.857' E76'46.472'		In panchayat land	hac	5	0.2	1	For the greenery , vegetation and peaceful environment
2	Land levelling *	N28'23.856 E76'46.472		In panchayat land	hac	10	0.5	5	convenient for the agriculture purpose and increase yield of crop
3	Digging of pond	N28'24.052 E76'46.841 18hac. 14700 cu.ltr 14hac.	18hac. 10100 cum 6700 sqm 14hac.	Near mandir and canal	Nos	1	6.5	6.5	Increasing water level , availability cattle drinking water and for live stock and irrigated water and all villagers are beneficiaries
4	Digging of pond	N28'24.038' E76'46.618 11hac. 8000 cu.ltr. 8hac	11hac. 6100 cum 4100 sqm 8hac	Panchayati land		1	4.5	4.5	Increasing water level , availability cattle drinking water and irrigated water
5	Deepening of pond	N28'23.761 E76'46.439 25 hac. 6400 cu.ltr. 12hac	25 hac. 14100 cum 9400 sqm 12hac	Mandir wala Pond		1	4	4	Increasing water level , availability cattle drinking water and for live stock and irrigated water and all villagers are beneficiaries
6	Water conveyance system for the Live stock	N28'24.637 E76'46.796		Patoda Minor to Canal pond	Mtr	1500	0.005	7.5	Waste water saving , smoothly divert waste water

7	Earthen Embankment with pacca outlet	N28'24.175 E76'46.425		Village joining to field	Mtr	20	0.97	19.4	Convenient way from field to field and control the soil Erosion
8	Small Earthen Embanlement for vegetative cover spot	N28'24.272 E76'46.503		Village to field	Nos	2200	0.29	6.38	Convenient way from field to field and control the soil Erosion
9	Bore well or recharge pit	N28'24.274 E76'46.458 N28'24.053 E76'46.841 N28'24.038 E76'46.618 N28'23.759 E76'46.440		Near mandir pond(2), canal pond, govt.school.	Nos	4	0.75	3	To improve water level and decrease the salinity of water
Total Cost								57.28	
Available Fund								49.12	
Convergence								8.16	

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

Name of Project: IWMP III		Name of Watershed: Farrukh Nagar				Name of village: Daboda			
Sr. No.	Nature of Works	Location (with latitude and longitude)	Catchment, command, submergence area and capacity (wherever applicable)	Location	Unit	No. of Works		Estimated Cost Rs. In Lacs.	Objective
						Phy.	Unit Cost (Rs.in Lacs)		
1	Digging of pond	N28.25.167 E76.46.949	40 hac. 22400 cum 14900 sqm 23hac	Near mandir	Nos	1	5.5	5.5	Increasing water level , availability cattle drinking water and for live stock and irrigated water and all villagers are beneficiaries
2	Digging of pond	N28.25.164 E76.47.398	33 hac. 18500 cum 12300 sqm 25hac	In Banni		1	5.5	5.5	Increasing water level , availability cattle drinking water and irrigated water
3	Deepening of pond	N28.25.224 E76.47.262	25 hac. 14100 cum 9400 sqm 13hac	Near ashram		1	4	4	Increasing water level , availability cattle drinking water and for live stock and irrigated water and all villagers are beneficiaries
4	Water conveyance system for the Live stock	N28.24.628 E76.46.796	-	Patoda Minor to Mandir pond	Mtr	1800	0.005	9	Waste water saving , smoothly divert waste water
6	Small Earthen Embankment for vegetative spot	N28.25.245 E76.47.113 N28.25.133 E76.47.437	-	From village to field	Nos	26	0.29	7.54	Convenient way from field to field and control the soil Erosion

7	Rain water harvesting structure	N28.25.240 E76.47.331	-	In govt. school	Nos	1	2	2	waste water saving and increase the ground water level
8	Bore well and recharge pit	N28.25.336 E76.47.200 N28.25.165 E76.46.949 N28.25.223 E76.47.261	-	Near mandir, canal pond and school	Nos	3	0.75	2.25	To improve water level and decrease the salinity of water
Total Cost								35.79	
Available Fund								29.5	
Convergence								6.29	

Name of Project: IWMP III		Name of Watershed: Farrukh Nagar			Name of Village: Tirpadi				
Sr. No.	Nature of Works	Location (with latitude and longitude)	Catchment, command, submergence area and capacity (wherever applicable)	Location	Unit	No. of Works		Estimated Cost Rs. In Lacs.	Objective
						Phy.	Unit Cost (Rs.in Lacs)		
1	Water conveyance system	N28'23.723 E76'46.542		Govt. school to village Farm pond	Mtr	2200	0.005	11	Waste water saving , smoothly divert waste water
2	Digging of pond	N28'23.884 E76'47.635 23hac. 9900 cu.ltr. 18hac	23hac. 14100 cum 9400 sqm 18hac	In Panchayati land	Nos	1	6	6	Increasing water level , availability cattle drinking water and irrigated water
	Deepening of pond	N28.23.734 E76.46.762 18 hac. 10000 cu.ltr. 11hac	18 hac. 10100 cum 6700 sqm 11hac	Near mandir,shamshan ghat		1	5	5	Increasing water level , availability cattle drinking water and for live stock and irrigated water and all villagers are beneficiaries
	Deepening of pond	N28.23.793 E76.46.814 15 hac. 6500 cu.ltr. 7hac	15 hac. 8400 cum 5600 sqm 7hac	Near shamshan ghat		1	4	4	Increasing water level , availability cattle drinking water and for live stock and irrigated water and all villagers are beneficiaries
3	Small Earthen Embankment for vegetative cover spot	N28.23.800. E76.46.492 N28.23.888		jointing village to field	Mtr	43	0.29	12.47	convenient way from village to field

		E76.47.571 N28.23.665 E76.46.742							
5	Land levelling*	N28.23.887 E76.47.576		Near govt. school	hac	5	0.5	2.5	convenient for the agriculture purpose and increase yield of crop
6	Plantation	N28.23.794 E76.46.492		In panchayati land	hac	1	0.5	0.5	For the greenery , vegetation and peaceful environment
7	Rainwater harvesting structure	N28.23.794 E76.46.489		In govt. school	Nos	1	2	2	waste water saving and increase the ground water level
Total Cost								43.47	
Available Fund								38.3	
Convergence								5.17	

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

Name of Project: IWMP III		Name of Watershed: Farrukh Nagar			Name of Village: Palri				
Sr. No.	Nature of Works	Location (with latitude and longitude)	Catchment, command, submergence area and capacity (wherever applicable)	Location	Unit	No. of Works		Estimated Cost Rs. In Lacs.	Objective
						Phy.	Unit Cost (Rs.in Lacs)		
1	Digging of pond	N28.26.165 E76.44.796	21 hac. 11800 cum 7800 sqm 15hac	Near mandir, Harijan basti	Nos.	1	5	5	Increasing water level , availability cattle drinking water and irrigated water
	Digging of pond	N28.25.651 E76.44.605	15 hac. 8400 cum 5600 sqm 9hac	Near Harijan basti		1	4	4	Increasing water level , availability cattle drinking water and for live stock and irrigated water and all villagers are beneficiaries
	Deepening of pond	N28.25.607 E76.44.619	11 hac. 6100 cum 4100 sqm 7hac	Panchpeer pond		1	3	3	Increasing water level , availability cattle drinking water and for live stock and irrigated water and all villagers are beneficiaries
2	Small Earthen Embankment with pacca outlet	N28.25.994 E76.94.798 N28.25.677 E76.44.621	-	connecting village to field		42	0.29	12.18	Convenient way from field to field and control the soil Erosion
3	Water conveyance system	N28.25.616 E76.44.600 N28.25.812 E76.44.693	-	Open drain to waste Farm pond	Mtr	1700	0.005	8.5	Waste water saving , smoothly divert waste water

6	Bore well and recharge pit	N28.26.164 E76.44.796 N28.25.652 E76.44.605 N28.25.606 E76.44.619	-	Near mandir, Harijan basti, panchpeer pond	Nos. 3	0.75	2.25	To improve water level and decrease the salinity of water
Total Cost							34.93	
Available Fund							32.93	
Convergence							2.00	

Name of Project: IWMP III			Name of Watershed: Farrukh Nagar			Name of Village: DOOMA			
Sr. No.	Nature of Works		Catchment, command, submergence area and capacity (wherever applicable)	Location (with latitude and longitude)	Unit	No. of Works		Estimated Cost Rs. In Lacs.	Objective
						Phy.	Unit Cost (Rs.in Lacs)		
1	Digging of pond	N28.24.052 E76.46.641 23 hac. 10000 cu.ltr 11hac	23 hac. 12900 cum 8600 sqm 11hac	In panchayati land	Nos	1	5	5	Increasing water level , availability cattle drinking water and for live stock and irrigated water and all villagers are beneficiaries
	Digging of pond	N28.24.038 E76.46.618 19 hac. 4900 cu.ltr 11hac.	19 hac. 10600 cum 7100 sqm 11hac.	Near mandir		1	3.5	3.5	Increasing water level , availability cattle drinking water and irrigated water
	Digging of pond	N28.28.247 E76.46.403 17 hac. 4900 cu.ltr. 9hac	17 hac. 9500 cum 6300 sqm 9hac	In panchayati land		1	3.5	3.5	Increasing water level , availability cattle drinking water and for live stock and irrigated water and all villagers are beneficiaries
	Deepening of pond	N28.24.274 E76.46.458 10 hac. 6500 cu.ltr. 7hac	10 hac. 5600 cum 3700 sqm 7hac	Mandir wala pond		1	4	4	Increasing water level , availability cattle drinking water and irrigated water
2	Small Earthen Embankment for vegetative cover	N28.24.175 E76.46.425	-	Jointing village to field	Mtr	17	0.29	4.93	Convenient way from field to field and control the soil Erosion

	spot	N28.24.272 E76.46.503							
		N28.24.381 E76.46.680							
3	Water conveyance system	N28.24.082 E76.46.537	-	Main drain to village Farm pond	Mtr	1600	0.005	8	Waste water saving , smoothly divert waste water
5	Land leveling*	N28.23.855 E76.46.472	-	In panchayati land	hac	20	0.5	10	convenient for the agriculture purpose and increase yield of crop
6	Recharge pit and bore well	N28.24.274 E76.46.458	-	Near Farm pond	Nos	4	0.75	3	To improve water level and decrease the salinity of water
		N28.24.053 E76.46.641							
		N28.24.036 E76.46.618							
		N28.28.246 E76.46.403							
Total Cost								41.93	
Available Fund								36.96	
Convergence								4.97	

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

Name of Project: IWMP III			Name of Watershed: Farrukh Nagar			Name of Village: Alimudinpur			
Sr. No.	Nature of Works	Location (with latitude and longitude)	Catchment, command, submergence area and capacity (wherever applicable)	Location	Unit	No. of Works		Estimated Cost Rs. In Lacs.	Objective
						Phy.	Unit Cost (Rs.in Lacs)		
1	Water conveyance system	N28.25.744 E76.45.848		Waste water drain to Pannchayati pond	Mtr	2000	0.005	10	Waste water saving , smoothly divert waste water and irrigated water to Farm pond
2	Digging of pond	N28.25.553 E76.45.853 26hac. 10500 cu.ltr. 15hac	26hac. 14500 cum 9600 sqm 15hac	Near mandir and water supply	Nos	1	5	5	Increasing water level , availability cattle drinking water and for live stock and irrigated water and all villagers are beneficiaries
	Digging of pond	N28.25.479 E76.45.852 16 hac. 6400 cu.ltr. 11hac	16 hac. 8900 cum 5900 sqm 11hac	Near water supply		1	4	4	Increasing water level , availability cattle drinking water and for live stock and irrigated water and all villagers are beneficiaries
	Deepening of pond	N28.25.716 E76.45.525 13 hac. 10500 cu.ltr. 7hac	13 hac. 7300 cum 4800 sqm 7hac	Mandirwala pond		1	3	3	Increasing water level , availability cattle drinking water and for live stock and irrigated water and all villagers are beneficiaries
4	Land levelling *	N28.25.512 E76.45.858		In panchayati land	hac	5	0.5	2.5	convenient for the agriculture purpose and increase yield of crop

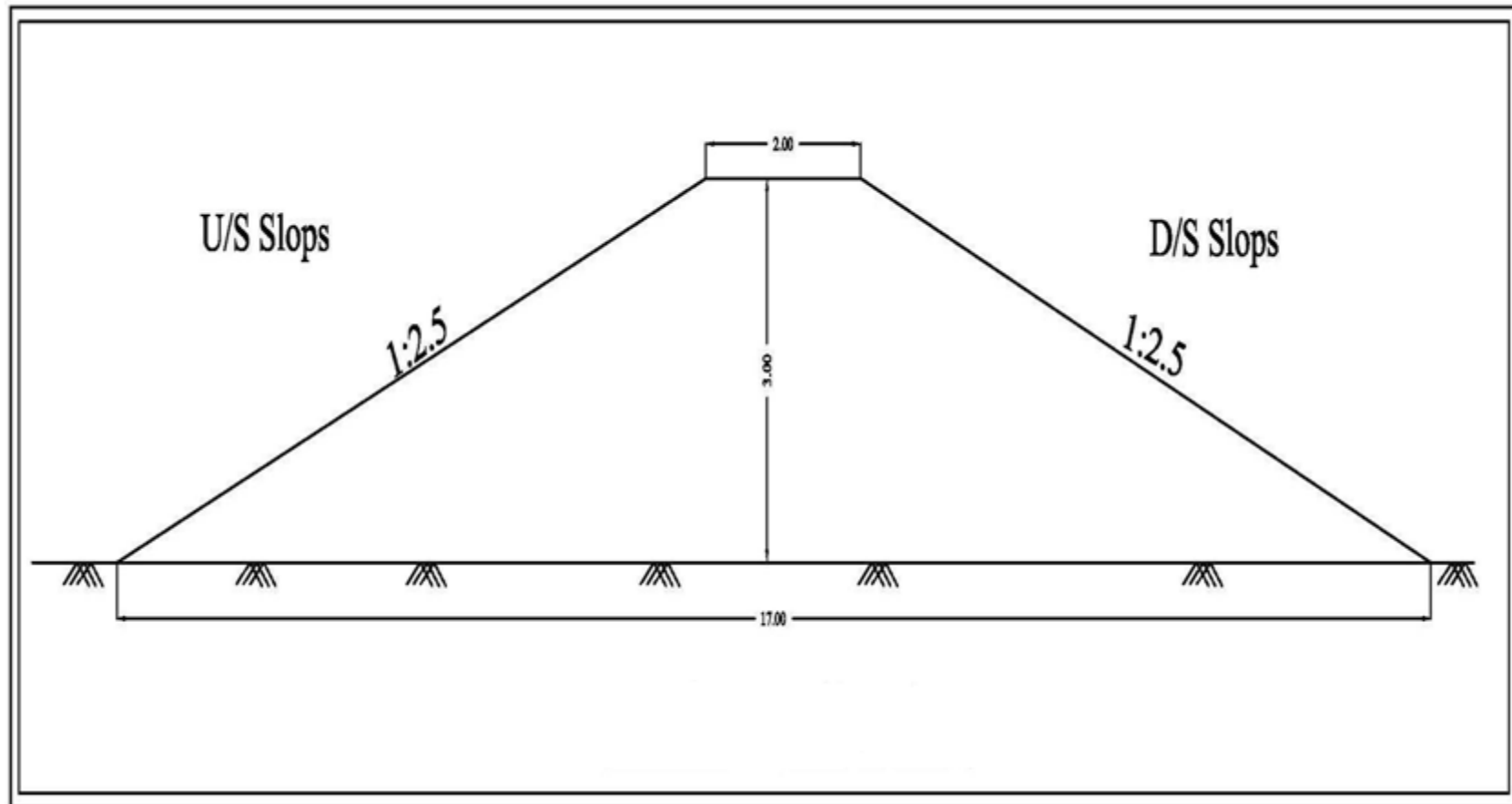
5	Small Earthen Embankment for vegetative cover spot	N28.25.611 E76.45.850 N28.25.642 E76.45.641		Village to Jointing the field	100 cm	57	0.29	16.53	Convenient way from field to field and control the soil Erosion
6	Bore well and recharge pit	N28.25.553 E76.45.851 N28.25.400 E76.45.852 N28.25.716 E76.45.523 N28.25.513 E76.45.685		Near Mandir, water supply, mandir wala pond, panchayati pond	Nos.	4	0.75	3	To improve water level and decrease the salinity of water
Total Cost								44.03	
Available Fund								41.5	
Convergence								2.53	

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

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

Table 2. 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. $\{(17.00 + 2.00) \div 2\} \times 3.00 = 28.50$ Square meters

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

Vertical leads = (Height + 0.60) x 0.4 x 10 i.e. $(3.00 + 0.60) \times 0.4 \times 10 = 14.40$ 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					
<u>Area of Jungle Clearance :-</u>					
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.		
<u>Volume of Loose soil to be removed :-</u>					
Area to be covered by the body of Dam X Depth of loose soil i.e (680.00 x 0.30) =				204.00	cum
<u>Volume of Earthwork in bund filling :-</u>					
(Cross Section Area X Length) + Loose soil to be removed i.e.(28.50 x 40.00)+ 204.00 =				1344.00	cum
<u>ABSTRACT OF COST</u>					
<u>S.No.</u>	<u>Item of Work</u>	<u>Quantity</u>	<u>Rate</u>	<u>Unit</u>	<u>Amount</u>
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 embankment undressed including breaking of Clods. H.S.R. 6.2 (b)	1344.00 cum	Rs.586.60 + 350% C. Prem.= 2639.70	100 cum	35477.57
4	Extra for admixture for single or kanker Exceeding 30% but up to 40%. H.S.R. 6.2 (h) ii	1344.00 cum	Rs. 318.55 + 350% C. Prem.= 1433.48	100 cum	19265.97

5	Extra for every 7.5 meter additional lead beyond 60mt but up to 255 m by the animal or animal driven cart (5 leads) H.S.R. 6.2 (c) (ii)	1344.00 cum	[(15.00 x 5 No.)+ 350% C. Prem.= 337.50	100 cum	4536.00
6	Dressing of earthwork H.S.R. 6.3 (i)	1344.00 cum	Rs.45.90 + 350 % C. Prem.= 206.55	100 cum	2776.03
Total =					74243.4712
Add Contingency at the rate of 3% =					2227.30
Grand Total =					76470.78

Table. 25 Work Detail Estimate For Retaining Wall

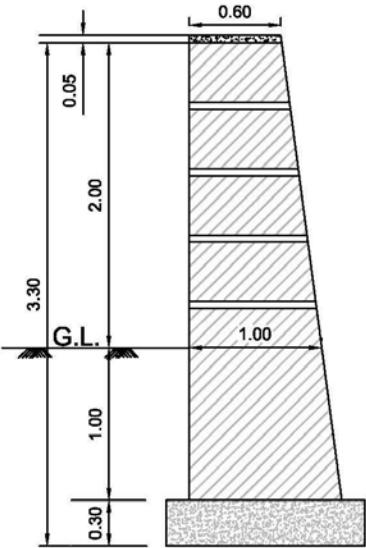
Sr. No.	Particulars	No.	L	B	D	Contents	Unit
1	Earth Work Excavtion for R/wal	1	8.00	1.00	1.30	10.40	cum.
2	C.C. 1:3:6 in foundation	1	8.00	1.00	0.30	2.40	cum.
3	Sq. Rubble Masonary work 1:4 For R/wall	1	8.00	0.80	3.00	19.20	cum.
4	C.C. 1:2:4	1	8.00	1.00	0.05	0.40	cum.
5	20 mm Thick plaster 1:3						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

	Rate		340/- P/bag	1400/- P/cum	1500/- Per cum.	1450/- Per cum.	
	Total		21539.00	10248.00	300.00	3190.00	
	Grand Total		35298.12				

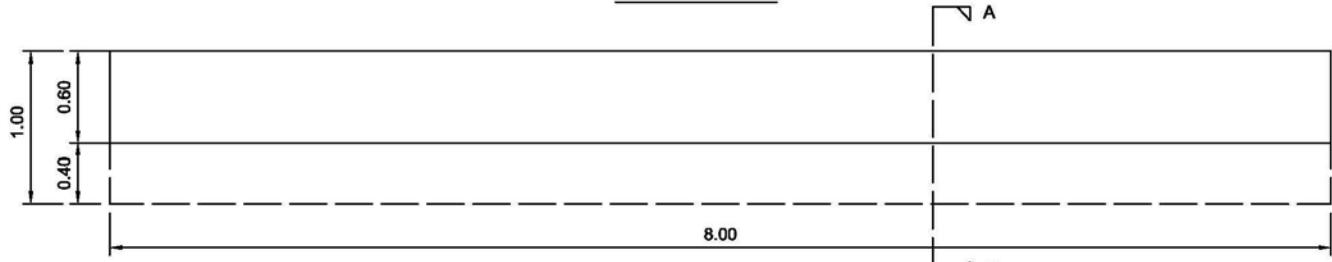
Abstract Cost of Retaining Wall

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

RETAINING WALL



SECTION-AA'



PLAN

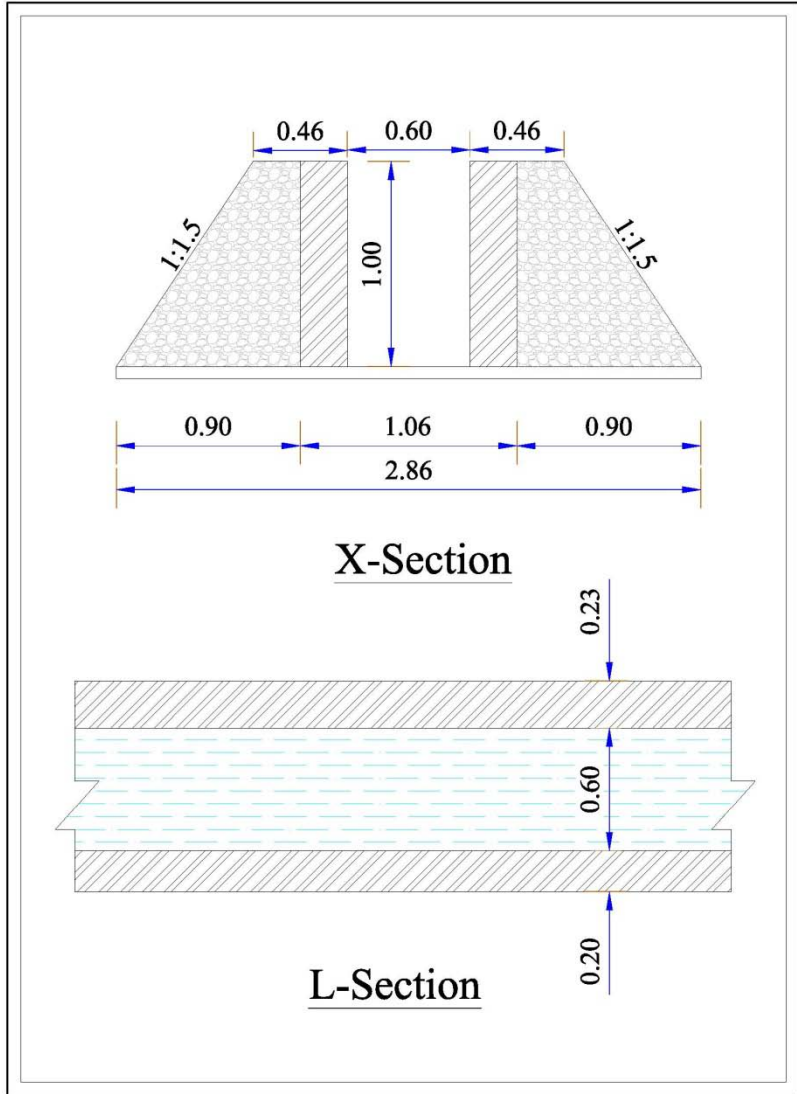
Table: Estimate of Open Channel

Abstract cost of Pucca Disposal open channel in

Detail estimate of Pucca disposal open channel

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

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



Pucca disposal open channel

Estimate of Under Ground Pipeline

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

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

5	Jointing og 200mm. HDPE pipe I.S.I. marked H.S.R.- 28.8	1	132			
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Abstract of Cost

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

5	Jaintng of 200mm. HDPE pipe ISI H.S.R.- 28.8	132.00	9.15 -21.5% + 300% = 28.73	Per Jart.	3792.36
			Total (1)		44123.85

Cost of Metrial:-

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

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

**Table. 7. Estimate of Orchard Development in the Watersheds Per Hectare (Lemon & Kinnoo)
A. Horticulture**

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

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

A. Horticulture

Sr. No.	Particulars	Quantity	Unit	Rate	Amount
1	Soil working 1m x 1m x 1m size pits (225 Nos.) including cost of refilling(At the distance 20'x20')	225.00	cum	36.66	8248.50
2	Application of Farmacyard 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 2 nd year			L.S.	1000.00
	For next 5 years i.e. , ` 1000 x 5				5000.00
Total					24500.00
Say `					24500.00

Table. 8. Estimate of Agro- Forestry/ Afforestation

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

					Total	1741.40
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G	Material					
ii	Spade and pick axes	----	----	----	----	135.00
iii	Basket/Bucket	----	----	----	----	135.00
v	Fertilizer	----	----	----	----	135.00
vi	Insecticide	----	----	----	----	270.00
					Total	675.00

					G. Total =	18767.34
					or Say =	18767.00

PRODUCTION SYSTEM- 10%

7.3 PRODUCTION SYSTEM

7.3.1 Crop Production

Present Status: Agriculture is the mainstay of the inhabitants of the project area which is mainly rain-fed and people gamble with the uncertain rains. The fertility of the soil is very poor in available nitrogen and phosphorous in the soil is very low and the available potash in the soil is high (fertility map attached in annexure VI). Wheat, mustard and Bajra are the main crops. Due to frequent droughts, crop failures are common, and yield levels are low. Farmers maintain fodder plants on the field bunds. Because of extensive damage by wildlife, farmers are gradually shifting towards tree farming and dairy farming. But there is acute shortage of green and dry fodder. Still traditional farm practices are followed such as manual weeding and hoeing, use of desi ploughs and bullock power in tillage operations. The use of chemical fertilizer is limited to urea upto 50 Kg/acre wheat. Only farm yard manure is added to maintain yield levels. Food grains are hardly sufficient for 6 to 8 months with small farmers.

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

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

- The application of fertilizers on soil test basis and minimum use of chemicals for weed and disease control shall be promoted.
- Farmers would be linked to farm advisory services and Krishi Vigyan Kendras.
- The concept of precision farming and non-monetary inputs shall be introduced.
- Agro-forestry with integration of trees like Eucalyptus, Neem, Acacia, Shisham would be promoted on large scale.
- Leguminous crops mainly Moong and mash short duration varieties needs to be introduced.

7.3.2 Horticulture

Existing System: Ber, amla and guava are the most preferred fruit crop of the farmers and scattered plants of local citrus fruits are seen in farm lands. Some farmers have started raising Guava and Kinnow where irrigation facilities are available. Citrus fruits also raised but mostly for domestic use. There is no well organized marketing system in fruit plants.

Proposed System: The average annual rainfall is 494 mm in the project area. The project areas are well connected by roads and the economic condition of the locals can be improved by introducing improved cultural practices of fruit plants coupled with rain water harvesting and efficient use of water. Large number of farmers are interested to increase area under Guava and Kinnow and requested for supply of good quality nursery raised plants. Several families have shown interest in raising Citrus fruits and amla. The following activities are proposed to promote horticulture in the area.

- Supply of quality seedlings arranged from approved nurseries as per choice of farmers.
- Soil testing up to a depth of 180 cm depth to ensure suitability of soil for fruit plants.
- Proper back up technical support on orchard management by involving HAU Farm Advisory Service and department of horticulture.
- Appropriate safeguards from wildlife damage, frost damage and wind breaks.

- Arrangements for limited irrigation at least for first few years.
- Proper planning for raising filler plants like Papaya, pomegranate and shade loving crop like turmeric.
- Organizing SHGs around horticulture and joint purchase of inputs and marketing.

7.3.3 Vegetable cultivation

Present status: Vegetable cultivation as such for market purpose is not followed mainly because of the limitation of irrigation facilities. Most farmers raise vegetable crops in back yards for self use. Some poly houses have come up in the area with financial support from National Horticulture Mission (NHM) and have started commercial cultivation of off season vegetables with the introduction of NHM scheme the farmers are interested for drip/sprinkler irrigation to enhance the net production value of the farm.

7.3.4 Promotion of Farm Forestry and Agro-forestry

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

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

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

7.3.5 Livestock Improvement Including Fodder Production

Livestock rearing is the most important subsidiary occupation of the project villagers. In addition to selling milk for regular daily income, farm yard manure is most needed to maintain fertility and moisture retention of soils. Even

landless families also maintain few numbers of animals. The animal breed improvement work was initiated in these villages under DDP, DPAP etc. 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.
- Raising of protein rich fodder plants by promoting Napier Bajra Hybrid and Leucaena hedge rows on field bunds.

7.3.6 Marketing Arrangements and Proposal for Improvement

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

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

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

7.3.7 Detail of production system to be promoted

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

Table 9 .Detail of Production System proposed to be promoted in the project village

S. No.	Particulars	Contents	No. of micro watersheds	No. of beneficiaries per micro watershed	No. of total beneficiaries	Cost per beneficiaries	Total
1	Vermi Compost	Vermi compost is organic matter that is decomposed and recycled, used as fertilizer for soil amendment which is a key ingredient in organic farming. Under IWMP, financial assistance of 25% of total cost of Rs. 24000/- is provided.	7	30	210	6000	1260000
2	Green Manuring	Addition of organic matter required, which is deficient in project area. Under IWMP, financial assistance @ Rs. 500 for 20 Kg.s per farmer for 2 Acre (0.8 ha) holding is provided.	7	100	700	500	350000
3	Bio-fertilizers	For integrated nutrient management (combination of chemical fertilizers, organic manure, crop residue and nitrogen fixing. Under IWMP, financial assistance @ Rs. 40 per farmer for 2 Acre (0.8 ha) holding is provided.	7	100	700	40	28000
4	Pest-Management	For integrated pest Management, the bio control technique has been reported eco-friendly for control of pests. A provision of	7	100	700	250	175000

S. No.	Particulars	Contents	No. of micro watersheds	No. of beneficiaries per micro watershed	No. of total beneficiaries	Cost per beneficiaries	Total
		Azadirachtin bio pesticide @ Rs. 250/lit. per farmer is provided.					
5	Sprinkler irrigation	Sprinkler irrigation is a method of applying irrigation water which is similar to natural rainfall. Under IWMP, financial assistance @ 25% of Rs. 30000/- or price fixed by agriculture department is provided.	7	15	105	7500	787500
6	Drip Irrigation	Drip Irrigation is an irrigation method that saves water and fertilizer by allowing water to drip slowly to the roots of plants. Under IWMP, financial assistance @ 10% of Rs. 58000 per ha for horticulture fixed by Agriculture Department is provided.	7	10	70	5800	406000
7	Lazer Leveling	Lazer Leveling is one such proven technology that is highly useful in conversation of irrigation water. Under IWMP, financial assistance @ 30% of Rs. 1075 per farmer is provided	7	10	70	322.5	22575
8	Kitchen Gardening	To facilitate with inputs, seeds and equipments etc., for development of Kitchen Gardening. Under IWMP, financial assistance @ Rs. 50 per farmer per season (Rs. 100 per year) is provided.	7	100	700	100	70000
9	Horticulture	Potential for Grafted Horticulture plants. Supply of plants @ Rs. 40/- per plant under IWMP 50 % cost share for cultivation of fruits like Citrus fruits, Guava, Amla, Ber floriculture and vegetables (especially, turmeric, garlic, onion and tomato)	7	170	1190 (11900 plants)	Rs.20 per plant	238000

S. No.	Particulars	Contents	No. of micro watersheds	No. of beneficiaries per micro watershed	No. of total beneficiaries	Cost per beneficiaries	Total
10	Reclamation & Alcination	Supply of gypsum bags@ 75	4	5	35	7500	262500
Total							3599575
Contingency, printing material other unforeseen items							97625

Total: Rs. 3697200/-

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

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

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

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

7.3.8. Vermin Compost

The vermin compost is one of the very useful organic manure. The vermin compost prepared by induction of various types worms (Earth Worm), to de 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 10: Model/ Estimate for a Vermin Compost Unit

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

Components of Vermin Compost Unit

1. Shed

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

2. Vermin- beds

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

3. Land

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

4. Seed Stock

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

5. Machinery

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

LIVELIHOOD ACTIVITIES FOR THE ASSET LESS PERSONS-9%

7.4 LIVELIHOOD SUPPORT TO SHG'S

The key issue of inclusion of this chapter is that about 80% of the population in the proposed villages depends on agriculture and allied activities, but it rarely provides sufficient means of survival to small and marginal farmers. During the base line survey, this aspect was discussed with the existing Self Help Group/ Gram Sabha members. The representative of WAPCOS, Sociologist of the team held comprehensive discussions on the possibilities of livelihood in the rain fed areas. The main objectives of these discussions were:

1. Assure one livelihood option to poor families.
2. Assured livelihood for at least 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 HSRLM pattern and it is proposed to impart them trainings at Krishi Vigyan Kender (CCSHAU) Gurgaon and Haryana Institute of rural development, Nilokheri. Agriculture University, Gurgaon, Central Soil and Water research and training Institute, Chandigarh and HIRD, Nilokheri. It is proposed to lend revolving fund of Rs. 25000/- to each SHG/individual formed in the watershed villages. Since the members from SHGs/landless are very poor, they do not have resources to start micro enterprises, it is envisaged that they should be assisted and given loan of this amount in the shape of Revolving Fund Assistance (RFA) so that do not get trapped by money lenders. Funds thus given on loan are recoverable from SHGs/individuals in easy installments. It is also proposed to impart skill training to at least 10 unemployed youth from each village and give them trainings of their choice so that they establish some small enterprises. It is further proposed to give them interest free loan of Rs. 12000/- each as Revolving Fund Assistance to meet their urgent needs of funds for establishing micro enterprises. Such funds recovered could either be given back to SHGs/individual or some other SHGs/individuals depending upon assessment of their respective needs. It is proposed to form 1 SHG in each village and identify at least 10 youths in each village for imparting training and giving Revolving Fund.

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

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

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

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

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

1. Cutting and Tailoring
2. Embroidery
3. Mushroom cultivation
4. Plumbing
5. Carpentry
6. Bee keeping
7. Animal husbandry
8. Vermi composting
9. Cattle rearing and selling milk

- 10. Household wiring, Motor winding
- 11. Pickles, sauces, jam, jelly etc.
- 12. Backyard poultry
- 13. Floriculture

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

Table 11. Revolving Fund Assistance for SHGs

S.No.	Name of micro watersheds	Total SHGs	Amount of RFA per SHG	Total
1	Khera Khurampur	1	25000	25000
2	Duman	1	25000	25000
3	Alimudinpur	2	25000	50000
4	Dabuda	1	25000	25000
5	Basunda	2	25000	50000
	Total	7		175000

Table 12. Skill Trainings/Skill up gradation for SHGs

S.No.	Name of micro watersheds	Total SHGs	Amount of Training per SHG	Total
1	Khera Khurampur	1	35000	35000

2	Duman	1	35000	35000
3	Alimudinpur	2	35000	70000
4	Dabuda	1	35000	35000
5	Basunda	2	35000	70000
	Total	7		245000

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

S.No.	Name of micro watersheds	No. of Persons in micro watershed	Amount of Training per trainee for 6 month	Total
1	Khera Khurampur	20	10000	200000
2	Duman	20	10000	200000
3	Alimudinpur	40	10000	400000
4	Dabuda	20	10000	200000
5	Basunda	40	10000	400000
	Total	140		1400000

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

$$= 1400000 - 140000$$

$$= \mathbf{1260000/-}$$

Table 14. One time assistance as Revolving Fund to unemployed youth who have successfully completed Computer Training for setting up a computer centre

S. No.	Name of micro watersheds	No. of Persons in micro watershed	Amount of Training per Trainee	Total
1	Khera Khurampur	2	25000	50000
2	Duman	2	25000	50000
3	Alimudinpur	4	25000	100000
4	Dabuda	2	25000	50000
5	Basunda	4	25000	100000
	Total	14		350000

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. 350000 @ 10% cost sharing.

$$= 350000 - 35000$$

$$= \mathbf{315000/-}$$

Table 15. Cutting and Tailoring Centre for female beneficiaries

S. No.	Name of micro watersheds	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	Khera Khurampur	1	2	2000	6	12000
2	Duman	1	2	2000	6	12000
3	Alimudinpur	2	4	2000	6	24000
4	Dabuda	1	2	2000	6	12000
5	Basunda	2	4	2000	6	24000

	Total	7	14			84000
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Total cost for 3 Centres

1. Payment to trainers 84000/-

2. Sewing Machine Cost 84000/- @ Rs. 6000 per machine

Total Cost 168000/-

Table 16. Embroidery Centre for female beneficiaries

S.No.	Name of micro watersheds	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	Khera Khurampur	1	2000	6	12000	1	12000
2	Duman	1	2000	6	12000	1	12000
3	Alimudinpur	2	2000	6	12000	2	24000
4	Dabuda	1	2000	6	12000	1	12000
5	Basunda	2	2000	6	12000	2	24000
	Total	7				7	84000

Payment to trainer: Rs.84000/-

Cost of Machine: Rs.140000/- @ Rs. 20000/- per machine

Total Cost: Rs. 224000/-

Table 17. Livelihood Support

S.No.	Name of micro watersheds	No. of villages	Revolving fund assistance to individuals unemployed youth/ landless, women
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			Dairy Unit	Bee-Keeping	Computer cyber café	Vegetable & flower production
1	Khera Khurampur	1	10	10	1	2
2	Duman	1	10	10	1	2
3	Alimudinpur	2	20	20	2	4
4	Dabuda	1	10	10	1	2
5	Basunda	2	20	20	2	4
	Total	7	70	70	7	14
	Rate (Rs)		2400	2400	36000	24000
	Cost (Lakh Rs)		1.44	1.44	2.52	3.36

Contingency, printing material and other unseen items: Rs. 64480/-

Total funds available under this component are Rs. 3327480/-

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

- i. HIRD, Nilokheri
- ii. Agriculture, Technology and Extension, Gurgaon 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), Gurgaon

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 programs 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 programs 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 Programs

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

Detail of Convergence of IWMP and other schemes

Table 18. GAPS IN FUNDS REQUIREMENT – MICRO WATERSHED WISE

S.No	Name of micro watershed	Total cost requirement for works	Total funds available under IWMP for works	Gap in funds requirement for works	Convergence with MGNREGA
1	Khera Khurampur	55.40	50.10	5.30	5.30
2	Duman	41.93	36.96	4.97	4.97
3	Alimudinpur	78.96	74.43	4.53	4.53
4	Dabuda	35.79	29.50	6.29	6.29
5	Basunda	100.75	87.42	13.33	13.33
	Total	312.83	278.41	34.42	34.42

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

7.5.2 Non-Negotiable for works executed under MGNREGA

- Only Job Card holders to be employed for MGNREGA component.

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

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

7.5.3 Convergence with Forest Department

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

7.5.4 Convergence with Horticulture Department

National Horticulture Mission is implementing the horticulture development programme which includes construction of water harvesting structures, drip and sprinkler irrigation activities which would be undertaken in convergence with the horticulture department. Under this activity 95 ha horticulture development programme with the financial assistance of Rs. 38.00 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 Water conveyance system, Roof top Rain Harvesting/ Recharge bore, Ramp, inlet & outlet, Earthen Embankments /Marginal bunds with pucca outlet, Small earthen embankment with vegetative support etc. where the machinery and material component is required and the unit cost exceeds for completion exceeds to the project provision, the same will be met in convergence with the similar activities of the agriculture.

7.5.6 Convergence with Animal Husbandry Department

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

CHAPTER – 8

QUALITY AND SUSTAINABILITY

8.1 Monitoring and Evaluation

8.1.1 Plans for Monitoring and Evaluation:

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

8.1.2 Monitoring

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

1. Internal Monitoring by PIA/ WCDC
2. Progress and Process monitoring
3. GIS/ On line Monitoring
4. Sustainability monitoring

5. Self Monitoring by communities
6. Social Audits
7. Independent and external monitoring

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

Table 1. Micro Watershed wise details

S.no	Name of the Micro Watersheds	Effective Area	Total Cost	Monitoring 1%
1	Khera Khurampur	745	89,40,000	89,400
2	Duman	550	66,00,000	66,000
3	Alimudinpur	615	73,80,000	73,800
4	Dabuda	440	52,80,000	52,800
5	Basunda	731	87,72,000	87,720

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	Khera Khurampur	745	89,40,000	89,400
2	Duman	550	66,00,000	66,000
3	Alimudinpur	615	73,80,000	73,800
4	Dabuda	440	52,80,000	52,800
5	Basunda	731	87,72,000	87,720

CONSOLIDATION PHASE- 3 %
Consolidation Phase = Rs. 11, 09,160 /-

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: Khera Khurampur

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	0.54
2	Preparation of Project completion report	0.14
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	1.34

Total: 2.68 lacs

Name of Micro watershed: Duman

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	0.39
2	Preparation of Project completion report	0.10
3	Documentation of success stories	0.10
4	Management of proper utilization of WDF	0.30
5	Mechanism for quality and sustainability issues under the Project	0.10
6	Watershed activities	0.99

Total: 1.98 lacs

Name of Micro watershed: Alimudinpur

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	0.44
2	Preparation of Project completion report	0.11
3	Documentation of success stories	0.11
4	Management of proper utilization of WDF	0.33
5	Mechanism for quality and sustainability issues under the Project	0.11
6	Watershed activities	1.11

Total: 2.21 lacs

Name of Micro watershed: Dabuda

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	0.32
2	Preparation of Project completion report	0.08
3	Documentation of success stories	0.08
4	Management of proper utilization of WDF	0.24
5	Mechanism for quality and sustainability issues under the Project	0.08
6	Watershed activities	0.79

Total: 1.59 lacs

Name of Micro watershed: Basunda

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	0.53
2	Preparation of Project completion report	0.13
3	Documentation of success stories	0.13
4	Management of proper utilization of WDF	0.39
5	Mechanism for quality and sustainability issues under the Project	0.13
6	Watershed activities	1.32

Total: 2.63 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 3081 ha and the Project Cost is 369.72 lacs covering 5 no. micro watersheds and in all 7 villages. Benefits will be much more than the project cost as detailed below:

With the several interventions under IWMP III 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 Farrukh Nagar Watershed III 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

The principal occupations of the people are rain fed agriculture, animal husbandry and casual labour work. However, rainfall being limited and erratic, agriculture suffers. In absence of assured irrigation, the productivity of crop is low.

Table 1. Expected Employment Generation in the Project area

S. No.	Name of micro watersheds	Wage employment						Self employment			
		No of man days			No. of Beneficiaries			No. of Beneficiaries			
		SC	others	Total	SC	others	Total	SC	others	Women	Total
1	Khera Khurampur	1169	6841	8010	146	855	1001	-	-	11	11
2	Duman	1183	4731	5914	148	591	739	11	-	-	11
3	Alimudinpur	1455	5157	6612	182	645	827	11	11	-	22
4	Dabuda	932	3799	4731	117	475	591	-	11	-	11
5	Basunda	1431	6429	7860	179	804	983	-	11	11	22
		6170	26957	33127	771	3370	4141	22	33	22	154

33127 man days would be generated with the implementation of the project in Farrukh Nagar Watershed (IWMP III), which means about 65 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 Farrukh Nagar Watershed

S. No	Name of micro watersheds	No. of persons migrating		No. of days per year of migration		Comments
		Pre Project	Expected post project	Pre Project	Expected post project	
1	Khera Khurampur	125	62	210	105	No. of persons migrating will be reduced and also no. of days would be reduced by over 50%
2	Duman	80	40	100	50	No. of persons migrating will be reduced and also no. of days would be reduced by over 50%
3	Alimudinpur	105	52	110	55	No. of persons migrating will be reduced and also no. of days would be reduced by over 50%
4	Dabuda	40	20	125	62	No. of persons migrating will be reduced and also no. of days would be reduced by over 50%
5	Basunda	155	77	215	107	No. of persons migrating will be reduced and also no. of days would be reduced by over 50%

9.3 GROUND WATER TABLE (Drinking Water)

The ground water level of all micro watersheds varies from 21-24 m depth. About 60 % of the area is underlain by depth to water more than 20 m where as remaining area is below 20 m. The area located in depressions is under water-logged condition. The historical water table reveals rising trends in project area so necessary provisions of rain water harvesting is proposed in project proposals.

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

Sr. No.	Name of Villages	Source	Pre-Project level (m)	Remarks
1	Khera Khurampur	Well	22.59	Area experiencing deeper water table, necessary provision of percolation tank has been provided in the project proposals and area under waterlogging conditions, the provision of drains and UGPL is provided.
2	Tirpadi	Well	22.97	
3	Basunda	Well	23.35	
4	Daboda	Well	23.13	
5	Alimmudinpur	Well	22.85	
6	Palri	Well	22.39	
7	Dooma	Well	21.87	

Source: Ground Water Cell, Haryana

9.4 CROPS

Agriculture primary depends upon water, but this is availability of this is lacking without existence of canal network and deeper ground water conditions. All this can change with the integrated land and water management during the watershed project. The planned Water course (lined) with culvert (RCC Pipe NP3) on field paths crossing, Water conveyance system, Roof top Rain

Harvesting, Ramp, inlet & outlet, Earthen Embankments /Marginal bunds with pucca outlet, Small earthen embankment with vegetative support for dune stabilization, 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 Farrukh Nagar Watershed (IWMP III)

Name of Micro Watersheds	Name of Crops	Pre Project		Total Production (in Kg)	Total Value Rs. (In Lacs)	Expected post project		Total Production (in Kg)	Total Value Rs. (in lacs)
		Area ha	Average yield kg. Per ha			Area ha	Average yield kg. Per ha		
Khera Khurampur	Wheat	560	4150	2324000	31374	605	4250	2571250	34711.88
	Mustard	285	1750	498750	14962.5	303	1850	560550	16816.5
	Bajra	653	1963	1281839	16022.99	695	2080	1445600	18070
Tirpadi	Wheat	71	4150	294650	3977.78	87	4250	369750	4991.63
	Mustard	24	1750	42000	1260	35	1850	64750	1942.5
	Bajra	89	1963	174707	2183.84	101	2080	210080	2626
Basunda	Wheat	350	4150	1452500	19608.75	365	4250	1551250	20941.88
	Mustard	18	1750	31500	945	25	1850	46250	1387.5
	Bajra	205	1963	402415	5030.19	225	2080	468000	5850
Daboda	Wheat	270	4150	1120500	15126.75	290	4250	1232500	16638.75

	Mustard	72	1750	126000	3780	90	1850	166500	4995
	Bajra	293	1963	575159	7189.49	320	2080	665600	8320
Alimmudinpur	Wheat	394	4150	1635100	22073.85	420	4250	1785000	24097.5
	Mustard	9	1750	15750	472.5	12	1850	22200	666
	Bajra	50	1963	98150	1226.88	65	2080	135200	1690
Palri	Wheat	135	4150	560250	7563.38	150	4250	637500	8606.25
	Mustard	19	1750	33250	997.5	25	1850	46250	1387.5
	Bajra	41	1963	80483	1006.04	50	2080	104000	1300
Dooma	Wheat	419	4150	1738850	23474.48	450	4250	1912500	25818.75
	Mustard	46	1750	80500	2415	60	1850	111000	3330
	Bajra	131	1963	257153	3214.42	145	2080	301600	3770

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

9.5 HORTICULTURE

Table 5. Pre and post project area under Horticulture

Sr. 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	Khera Khurampur	2.5	4	6.5
2	Tirpadi	-	1.5	1.5

3	Basunda	-	1.5	1.5
4	Daboda	4	4	8
5	Alimmudinpur	3	6	9
6	Palri	3	6	9
7	Dooma	-	1	1

9.6 AFFORESTATION/ VEGETATIVE COVER

Table 6. Pre and post project forest and vegetative cover

Sr. No.	Name of micro watersheds	Existing area under tree covered, ha	Area under tree cover proposed ha	Total
1	Khera Khurampur	12	13	25
2	Tirpadi	7	12	19
3	Basunda	18	15	33
4	Daboda	25	20	45
5	Alimmudinpur	12	12	24
6	Palri	10	8	18
7	Dooma	-	4	4

9.7 LIVESTOCK

Table 7. Details of livestock in the project area

Sr. No.	Name of micro watershed	Type of Animals	Pre Project			Post Project			Remarks
			No.	Yield Kg/day	Income in Rs. per day	No.	Yield Kg/day	Income in Rs. per day	
1	Khera Khurampur	Buffalo	694	8-9	320-380	720	9-10	315-368	Increase in milk Yield and number of animals by approx 15%
		Cow	110	4-5	120-165	135	5-6	125-163	Increase in milk Yield and number of animals by

									approx 15%
2	Tirpadi	Buffalo	265	8-9	320-380	300	9-10	315-368	Increase in milk Yield and number of animals by approx 15%
		Cow	36	4-5	120-165	50	5-6	125-163	Increase in milk Yield and number of animals by approx 15%
3	Basunda	Buffalo	239	8-9	320-380	260	9-10	315-368	Increase in milk Yield and number of animals by approx 15%
		Cow	34	4-5	120-165	50	5-6	125-163	Increase in milk Yield and number of animals by approx 15%
4	Daboda	Buffalo	206	8-9	320-380	245	9-10	315-368	Increase in milk Yield and number of animals by approx 15%
		Cow	34	4-5	120-165	50	5-6	125-163	Increase in milk Yield and number of animals by approx 15%
5	Alimmudinpur	Buffalo	327	8-9	320-380	350	9-10	315-368	Increase in milk Yield and number of animals by approx 15%
		Cow	36	4-5	120-165	52	5-6	125-163	Increase in milk Yield and number of animals by approx 15%
6	Palri	Buffalo	127	8-9	320-380	145	9-10	315-368	Increase in milk Yield and number of animals by approx 15%
		Cow	16	4-5	120-165	25	5-6	125-163	Increase in milk Yield and number of animals by approx 15%
7	Dooma	Buffalo	292	8-9	320-380	320	9-10	315-368	Increase in milk Yield and number of animals by approx 15%
		Cow	68	4-5	120-165	90	5-6	125-163	Increase in milk Yield and

									number of animals by approx 15%
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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	Farrukh Nagar Watershed (IWMP III)	Backward linkages	-	-	-
		Seed certification	Moderate	Extension and Training	Improved
		Seed supply system	Moderate	Extension and Training	Improved
		Fertilizer supply system	Moderate	Extension and Training	Improved
		Pesticide supply system	Moderate	Extension and Training	Improved
		Credit institutions	Banks	Coordinate to lead banks	Bank intensity increased
		Water supply for irrigation	Scarcity	Promote rain water harvesting	Would be promoted
		Extension services	KGK& Agriculture deptt.	Extension & Training in village level	Improved
		Nurseries	Horticulture and forest	To be promoted	Improved
		Tools/ machinery suppliers	Subsides	Educate by Extension & Training	Supplies would be improved
		Price support system	Major crops	-	Needs for all crops
		Labour	-	Employment generate through works activities	Migration reduce

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

9.8.1 LOGICAL FRAMEWORK ANALYSIS

Table 9. Logical Framework Analysis

Components	Activities	Outputs	Effect	Impact
Village Institution Formation	Formation of Watershed Community, User Groups	<ul style="list-style-type: none"> Watershed Committee each village Number of user groups depending on 	Project can be implemented and managed in a democratic and Participatory way ensuring equity and transparency.	<ul style="list-style-type: none"> Unity and prosperity in the village management. People's Participation and

Components	Activities	Outputs	Effect	Impact
		the coverage of particular intervention		positive perception towards the programme.
Strengthening Village operations	<ul style="list-style-type: none"> • Organizing training and awareness programme for village institutions (I.E.C. Activities). • Capacity Building workshops and exposure visits for User Group and Watershed Community • Facilitating and monitoring the functioning of UGs and WCs Strengthen linkages 	<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • 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 development. 	

Components	Activities	Outputs	Effect	Impact
	<p>between UGs and WCs and Panchayat Institutions</p> <ul style="list-style-type: none"> • Gender sensitization of UGs and WCs to increase inclusiveness of Samuh (Joint) decision making. • Sensitize Village communities to involve children and youth in development 			
Fund Management	<ul style="list-style-type: none"> • Improve management and utilization of UGs and WCs • Prepare communities to explore other sources of income for UGs 	UGs and WCs operating bank account and managing resources on their own.	<ul style="list-style-type: none"> • Purpose, frequency and volume of use of the fund enhanced • Volume of funds generated for UGs and WCs from other sources of income increased 	

Components	Activities	Outputs	Effect	Impact
Ecological restoration	<p>and WCs.</p> <ul style="list-style-type: none"> • Protection, Treatment and regeneration of common and private lands. • Protection, treatment and regeneration of forest lands. • Plantation of fruits and forest species. • Input trainings, conduct meetings and organize exposure visits for communities, village volunteers and staff to effectively plan, execute and monitor activities. 	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • Fodder availability from common and private land increased. • Accessibility to common and forest lands increased with removal of encroachments and resolution of conflicts 	<ul style="list-style-type: none"> • 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
	<ul style="list-style-type: none"> • Identification and promotion of non-timber forest produce based income generation activities. 			
Rainfed Area Development	<ul style="list-style-type: none"> • Treatment of land through improved soil and moisture conservation practices on watershed basis. • Promotion of good agricultural practices- horticulture, improved crop and vegetable. • Promotion of organic farming practices. • Formation of Fodder banks to 	<ul style="list-style-type: none"> • Land to be brought under improved soil moisture conservation practices. • Good agricultural practices to be promoted. • Organic farming to be promoted. Fodder banks to be established. • Agriculture based livelihood income generation activities to be promoted • Water harvesting structures to be constructed. 	<ul style="list-style-type: none"> • Improved productivity of treated land. • Increased availability of water in cells. • Increase in annual agricultural production. • Farmers adopt organic farming practices. • Fodder security of farmers enhanced. • Increased availability of water for 9 to12 months. • Increased availability of water 	<p>Increase in proportion of households having more security of food Increase in contribution of agricultural income to the household income</p>

Components	Activities	Outputs	Effect	Impact
	<p>increase fodder security and promote dairy development among communities.</p> <ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • 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. 	<p>for livestock</p> <ul style="list-style-type: none"> • Increase in agricultural productivity of land. • Augmentation of drinking water supply. 	

Components	Activities	Outputs	Effect	Impact
Women's socio-political and economic empowerment	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • 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.