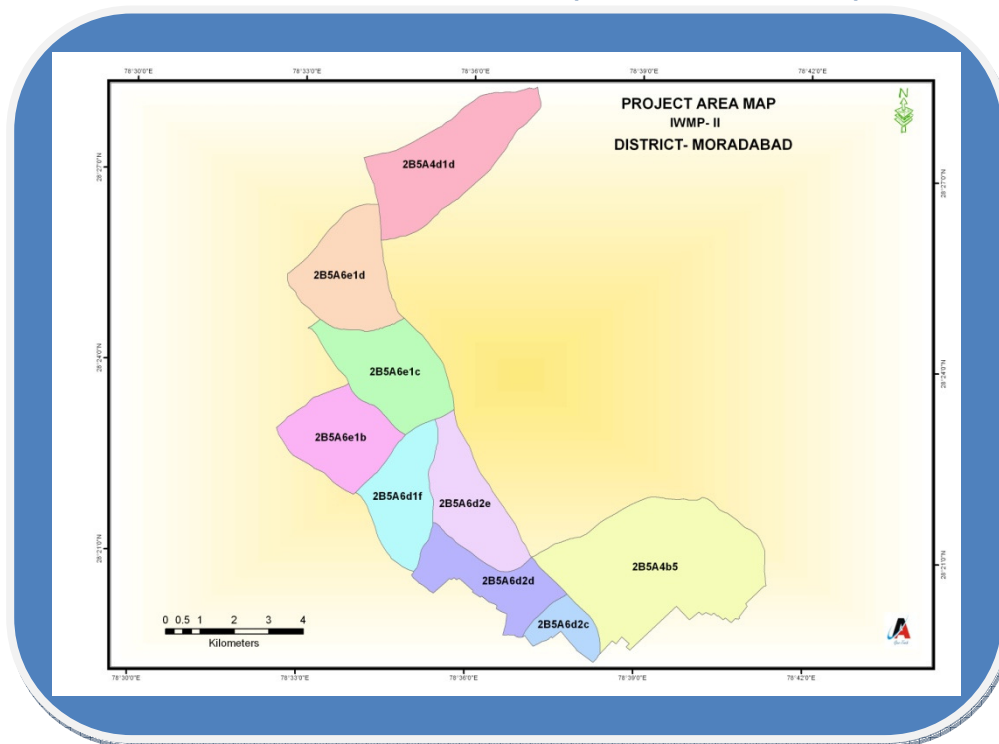


# DETAILED PROJECT REPORT (D.P.R.)

(I.W.M.P. 2<sup>nd</sup> - MORADABAD)  
INTEGRATED WATERSHED MANAGEMENT PROGRAMME, BLOCK- BEHJOI  
DISTRICT - MORADABAD (UTTAR PRADESH)



**Submitted to: -**  
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## EXECUTIVE SUMMARY

The Watershed comprises of Forty one villages in Behjoi & panwasa Block of Moradabad District of Utter Pradesh. All these watersheds has been identified by the Land development and water resources by IWMP scheme proper prioritization of different parameter for watershed selection criteria Moradabad. The watershed is located in the north west of Moradabad District. Its lies between: 28<sup>0</sup> 19' 23.37" N to 28<sup>0</sup>28' 23.33 N Latitude and 78<sup>0</sup> 32' 34.82" E to 78<sup>0</sup> 41' 18.46" E Longitudes (2B5A6e1d, 2B5A6e1c, 2B5A6e1b, 2B5A6d2e, 2B5A6d2d, 2B5A6d2c, 2B5A4d1d, 2B5A6d1f, 2B5A4b5). Its altitude 190 to 200 M above the mean sea Level (MSL) The total area of watershed is 7170.00 ha., All these watershed are surrounded by the 20 grampanchayat. A watershed is the entire land areas which drain into a stream from its mouth. The watershed of a stream has not only area, but also depth extending from the top of the vegetation to the confining geologic strata beneath. It is a hydrologic unit. There is an infinite relationship between land & water. In simple words it can be refused to divide separating one drainage basin from other. It is also used a synonym for catchments over or a drainage basin.

The intensification of land use in to traditional agricultural sifting is self deputing because it is exploitive the present agricultures practice greatly increase runoff is soil erosion; reduce ground water recharge, cause flood & sedimentation of reservoirs etc. As a result, the cultivated land resource base is shrinking and its productive co capacity is diminishing.

Run off, erosion & drainage represent serious problems in many areas of semiarid tropics. These problems can be solved by evolving developmental programmers which take into consideration natural topography and drainage pattern of the land. The collection of excess water and its utilization to provide greater stability to rainfed agriculture appears to be a variable developmental alternative. The watershed is the natural frame work for resource development in relation to crop production.

The climate of the region is characterized as arid to semi arid with average annual rainfall ranges 1020 mm annually with an average of 85 rainy days. Out of which above 85% is received during the monsoon season from July to September. The area received very less rainfall in the winter season. How ever temperature ranges from as high as 43.2°C in the May- June to as low as 5.0°C during December January the pattern of rainfall is highly erratic & maximum water goes as run off.

The most soils of targeted area are sodic in nature, where productivity is very low. PH of these soils ranges from 7.5 to 10. These soils are deficient in organic matter, water holding capacity & micronutrients. Improved greed's of animal & high yielding varieties of different crops, which have sodieness tolerance capacity like Usar Dhan 1 & 3 Daincha, Wheat, Barley, Beer, Bal & Anola, Guava have need to introduce, In spite of that 33% area of sandy clay loam in nature, which have good soil characteristics along with productivity.

Farming is the main occupation of the dwellers of the watershed. The major crops are Wheat, Bajra, Urd, Mustard, Sugarcane, Lentil etc. & the secondry crops are rice, Mantha, Potato and pea etc. Rest most of the lands kept fallow during khariff because of irregular & uncertain rainfall during the rainy season; Wheat, Bajra, Urd, Lentil are the most pre dominant cropping system in the area. A tune off 46 % area under agricultural crop is covered during khariff season in the watershed. Among them various crops like Bajra shares maximum area (45%) followed by Urd (30%) Jowar (3%), Maize (3%) & sugarcane (12%) and 7% others.

Natural vegetation of watershed is not very scientific way. The Forest vegetation is far-dominant with shisham (*Dalbergia sissoo*) Karanj (*Dongamain global*), Mango (*Manjifera indica*) Babul (*Acacia lilotica*) Golar, Neem (*Azadirchta indica*) etc. There is no proper pasture in the watershed. Grass patches are seen only on the bunds, road side & other such places, the principal grasses are serpat, dub (*Cynolon ducty bin*) Kans.

The erosion is main problem of the watersheds is to be locked by harvesting additional water is existing water harvesting structure, which have lost most of their capacity due to siltation & creating new water bodies. Water stored in the water harvesting structures shall be properly recycled to provide supplemental irrigation of critical growth stages of crops & for the establishment of fruit orchards and forest trees.

In agricultural land will treated with bunding alongwith minor leveling. Waste land will be treated with the engineering measures like staggered trenches and a forestation etc.

Budget for the various components is given as below –

S.No.	Budge Component	Percentage	Total (Lakhs)
1	Management Cost		
	a) Administration Cost	10%	61.92
	b) Monitoring Cost	1%	6.192
	c) Evaluation	1%	6.192
	<b>Sub Total</b>	<b>12%</b>	<b>74.304</b>
2	Preparatory Phase		
	a) Entry Point Activities	4%	24.768
	b) Capacity building	5%	30.96
	c) Preparation of DPR	1%	6.192
	<b>Sub Total</b>	<b>10%</b>	<b>61.92</b>
3	Watershed Works	50%	309.60
4	Livelihood Activities	10%	61.92
5	Production System and Micro-enterprises	13%	80.496
6	Consolidation Phase	5%	30.96
	<b>Sub Total</b>	<b>78%</b>	<b>482.976</b>
	<b>Grand Total</b>	<b>100%</b>	<b>619.20</b>

## PROJECT AT GLANCE

1.	Name of Project	IWMP-II <sup>nd</sup> Moradabad
2.	Name of Block	Behjoi, Panwasa
3.	Name of District	Moradabad
4.	Name of State	Uttar Pradesh
5.	Name of Micro Watershed	Sot, Mahawa River
6.	Name of Village under Micro Watershed	Sadatwadi , Naroda, Naglia Bhood, Mathra Alpur, MathraDhrampur, Bahpur Patti Prahlad, Bahpur Patti Ashalat, Mau Kather, Pipli , Much Khera, Ramgarh, Manona, Juna Arjunpur, kirari, Kisholi, Atrash, Rafipur, Singhpur Dhadol, Mirjapur Iktra, Ghasipur, Fariedpur khushal, Nadosh, Mohkampur, Birkhera, Pathakpur, Chaupa Shobhapur, Bhojpur, Khazra Khakam, Saruua, Hasanpur Khurd, Pagona, Anandpur , Fattapur Sharifnagar, Bichola, Syorajpur, Dilgora, Chattan, Dhakari, Sultanpur Khurd, Fajalpur
7.	Micro Watershed Code Selected	<b>2B5A6e1d, 2B5A6e1c, 2B5A6e1b,2B5A6d2e, 2B5A6d2d, 2B5A6d2c,2B5A4d1d, 2B5A6d1f, 2B5A4b5</b>
8.	Total Area of the Project	7170.00 ha.
9.	Proposed Area for Treatment	5160.00 ha
10.	Cost per hectare	Rs. 12000.00 per ha.
11.	Project Period	2010-11 to 2014-15
12.	Total cost of Project	619.20 lacs

# 1. INTRODUCTION AND BACKGROUND

## 1.1 Project Background

The watershed is located mainly in Behjoi block along with two partial villages of Panwasa block of Moradabad district on Moradabad-Agra state highway (SH-51) about 60 km. from district head quarter and 10 km surrounding from behjoi block head quarter. The watershed has been identified by the state department under Integrated Watershed Management Project (IWMP) scheme by proper prioritization of different parameter of watershed selection criteria (Annexure VI). The watershed is located in west side of Moradabad districts. It lies between 28°19' 23.37" N to 28°28' 23.33" N Latitude and 78° 32' 34.82" E to 78°41' 18.46" E Longitudes. Altitude range of this watershed is 190 to 200 m from above sea level (MSL). The total area of watershed is 7170.00 ha and treatable area is 5160.00 ha

**Table no.1: Basic Project information**

Name of Project	District	Block	No of Village	No of MWS	Geographical Area	Proposed Area	Treatable Area	Cost (Rs in Lacs)
IWMP IInd	Moradabad	Behjoi & Panwasa	41	9	7170.00	7170.00	5160.00	619.20

## 1.2 Need and Scope for Watershed Development

Watershed Development Programme is prioritized on the basis of thirteen parameters namely poverty index, percentage of SC/ST, Actual wages, Percentage of small and marginal farmers, Ground water status, Moisture index, Area under rain fed agriculture, Drinking water situation in the area, Percentage of degraded land, Productivity potential of the land, Continuity of another watershed that has already developed / treated, Cluster approach for plain and hilly terrain, Based on these thirteen parameter a compost ranking was given table no 2

**Table no.2: Weightage of the project**

Project Name	Project Type	Weightage													Total
		i	ii	iii	iv	v	vi	vii	viii	ix	x	xi	xii	xiii	
IWMP-II	Eastern plain														
		5	5	5	10	5	0	15	5	10	10	5	15	N.A.	90

**Table no 2.1 Criteria and weightage for selection of watershed**

S.No.	Criteria	Maximum Score	Ranges and Score			
i	Poverty index (% of poor to population)	10	Above 80% (10)	80-50% (7.5)	50-20% (5)	Below 20% (2.5)
ii	% of SC/ST Population	10	> 40 % (10)	20-40 % (5)	< 20 % (3)	-
iii	Actual wages	5	Actual wages significantly lower than minimum wages (5)	Actual wages significantly higher than minimum wages (0)	-	-
iv	% of small and marginal farmers	10	> 80 % (10)	50-80 % (5)	< 50 % (3)	-
v	Ground water status	5	Over exploitation (5)	Critical (3)	Sub critical (2)	Safe (0)
vi	Moisture index	15	-66.7 & below (15)	-33.3 to-66.6 (10)	0 to -33.3 (0)	-
vii	Area under rainfed agriculture	15	> 90 % (15)	80-90 % (10)	70-80 % (5)	< 70% (Reject)
viii	Drinking water	10	No source (10)	Problematic village (7.5)	Partially recovered (5)	Fully covered(0)
ix	Degraded land	15	High-above 20% (15)	Medium-10-20% (10)	Low less than 10% (5)	-
x	Productivity potential of the land	15	Land with low production & where productivity can be significantly enhanced with reasonable efforts (15)	Land with moderate production & where productivity can be enhanced with reasonable efforts (10)	Land with high production & where productivity can be marginally enhanced with reasonable efforts (5)	-
xi	Contiguity to another watershed that has already been developed/treated	10	Contagious to previously treated watershed & contiguity within the micro watershed in the project (10)	Contiguity within the micro watershed in the project but non contagious to previously treated watershed (5)	Neither contagious to previously treated watershed nor contiguity within the micro watershed in the project(0)	-
xii	Cluster approach in the watershed	15	Above 6 micro watershed in the cluster (15)	4 to 6 micro watershed in the cluster (15)	2 to 6 micro watershed in the cluster (15)	-
Xiii	Cluster approach in the hills	15	Above 5 micro watershed in the cluster (15)	3 to 5 micro watershed in the cluster (15)	2 to 3 micro watershed in the cluster (15)	-

### 1.3 Objectives and Scope of Project

- a. Conservation, development and sustainable management of natural resources including their use
- b. Enhancement of agriculture production and productivity in a sustainable manner.
- c. Restoration of ecological balance in the degraded and fragile rain-fed ecosystem.
- d. Reduction in regional disparity between rain-fed and irrigated areas.
- e. Creation of sustainable employment opportunities for the rural community for livelihood security.

#### 1.4 Watershed Information

S. No.	Name of the Project	Type of watershed	Micro watershed Name	Code	Area (ha)
1	IWMP 2 <sup>nd</sup> MORADABAD	Micro watershed	Syorajpur	2B5A6e1d	550.00
2		Micro watershed	Nadhosh	2B5A6e1c	570.00
3		Micro watershed	Chopa Shobhapur	2B5A6e1b	480.00
4		Micro watershed	Khajra Khakam	2B5A6d2e	480.00
5		Micro watershed	Sadatwari	2B5A6d2d	400.00
6		Micro watershed	Arjunpur Juna	2B5A6d2c	160.00
7		Micro watershed	Kisoli	2B5A4d1d	740.00
8		Micro watershed	Pathakpur	2B5A6d1f	430.00
9		Micro watershed	Machkhera	2B5A4b5	1350.00

Source: secondary data

#### 1.5 Status of previous watershed programmes & other development project/scheme in the watershed area

The IWMP-II<sup>nd</sup> watershed area being very backward has been on top priority of a number of development projects. These programmes are mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS), Swarnjayanti Gram Swarojgar Yojna (SGSY), Indra Awas Yojna etc.

**Table no. 4 Developmental Programmes running in the project area**

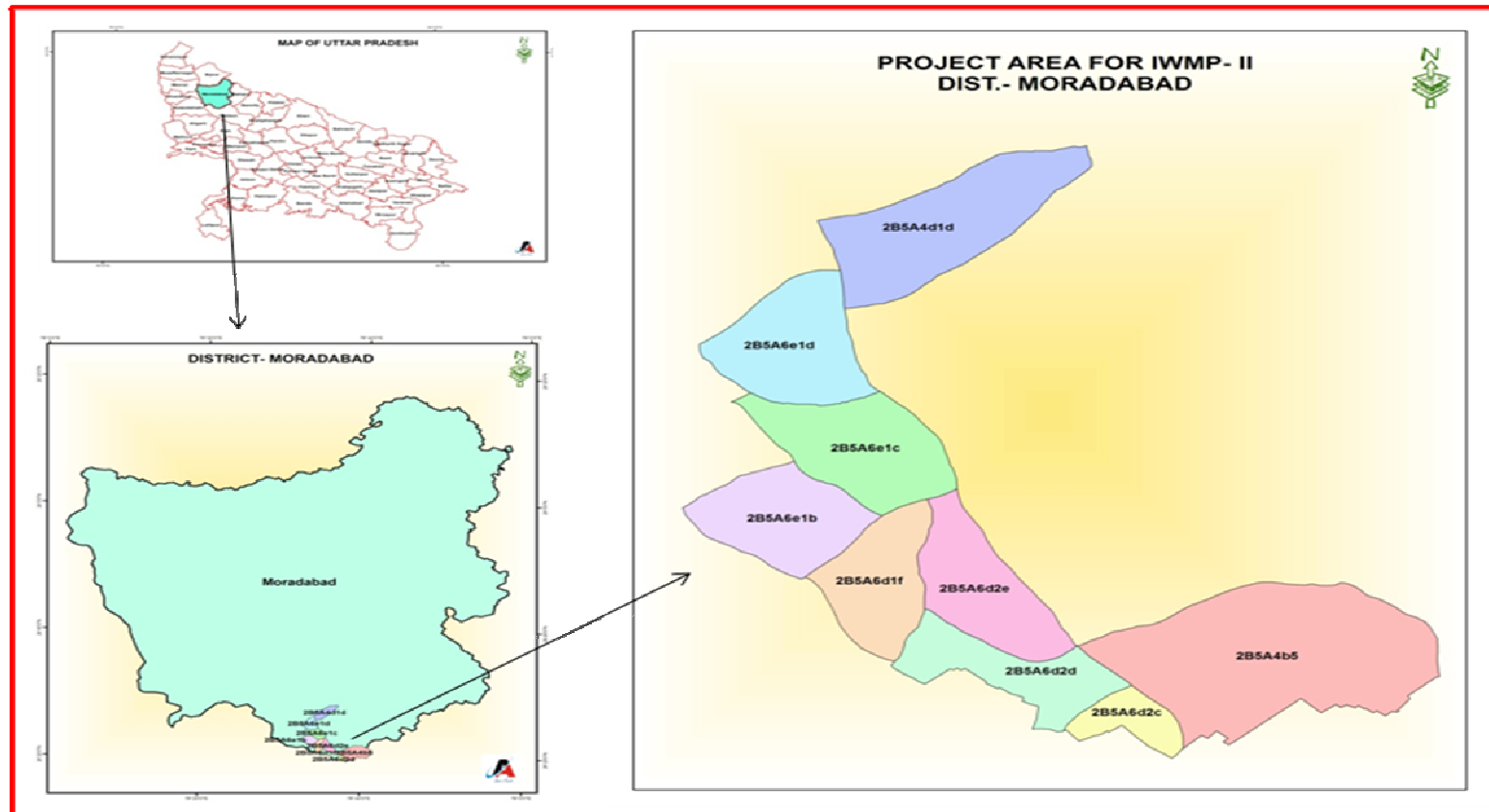
S. No.	Name of Programmes/Scheme	Sponsored Agencies	Objectives	Commencement (year)	Village Covered
1	MGNREGS	Rural Development Dept.	Employment	2009	38
2	IAY	Rural Development Dept.	Housing	2005	40
3	SGSY	Rural Development Dept.	Self employment	1999	27

Source: Primary data

## 2. GENERAL DISCRIPTION OF THE WATERSHED

### 2.1 Location

The nine watersheds are located mainly in Behjoi block along with two partial villages of Panwasa block of Moradabad district on Moradabad-Agra state highway (SH-51) about 60 km. from district head quarter and 10 km surrounding from behjoi block head quarter. The watershed has been identified by the state department under Integrated Watershed Management Project (IWMP) scheme by proper prioritization of different parameter of watershed selection criteria (Annexure VI). The watershed is located in west side of Moradabad districts. It lies between:  $28^{\circ}19' 23.37''$  N to  $28^{\circ}28' 23.33''$  N Latitude and  $78^{\circ} 32' 34.82''$  E to  $78^{\circ}41' 23.51''$  E Longitudes. Altitude range of this watershed is 190 to 200 m from above sea level (MSL).





## 2.2 Area: Land use Pattern

The IWMP II<sup>nd</sup> watersheds has diversified land uses namely agriculture, waste land (open scrub), seasonal water bodies etc. The varied present land use and area under different categories in watershed is shown in Table 6 & 7. The mixed land use followed in the watershed is almost similar in other parts of the U.P. During PRA exercise, the villagers prepared land use. One such map of village of IWMP IInd watershed is shown in table 5.

**Table 5. Area under major land uses, irrigated and rain fed area, etc**

S.N.	Name of Project	No of Micro Watershed	Geographical area	Forest Area	Agriculture land	Rain fed Area	Pasture land	Wastelands		Treatable Area
								Cultivated	Uncultivable	
1	IWMP II <sup>nd</sup>	9	7170.00	15.00	6820.00	5736.00	12.50	-	37.50	5160.00

**Source: Primary data**

Various agricultural land uses in the watershed are extended to diversified land capabilities starting from marginal to good class II lands. The watershed distinctly has three types of lands i.e. leveled, sloping and degraded and undulating. The agriculture is practiced on all these soil types though the productivity considerably varies. The total area under agriculture in the watershed is about 6820.00 ha out of which 1084.00 ha is irrigated while 5736.00 ha is under rain-fed agriculture. The water (both irrigated and drinking) is most scarce natural resource in the watershed. The problem of tube wells for irrigation of agricultural crops frequently leads to the drinking water problem to the farmers of watershed forcing them to carry drinking water from outside the watershed area. The agricultural field bunds are common in the watershed, however, they frequently breach on heavy rains adversely affecting the in situ percolation of rain water in the soils.

### 2.3 Physiography

Total area of the IWMP II<sup>nd</sup> Moradabad is 7170.00 ha with treatable area 5160.00 ha. Elevation range and location of altogether nine micro watershed shed are given below above

**Table no. 6: Elevation range, longitude latitude, relief height difference etc\***

District	Name	Location of watershed				Elevation of watershed from MSL		
		Micro watershed	Habitation	Longitude	Latitudes	Highest	Lowest	Relief height difference
Moradabad	Syorajpur	2B5A6e1d	Syorajpur, Dilgora, Chattan, Anandpur, Pagona, Hasanpur Khurd	78°32' 42" to 78°34'47" East	28°26"29 to 28°24'29" North	195	190	5
Moradabad	Nadhosh	2B5A6e1c	Anandpur, Pagona, Hasanpur Khurd, Fattepur Sharifnagar, Bichola, Bhojpur, Birkhera, Nadosh	78°33' 06" to 78°35'45" East	28°24"43 to 28°22'52" North	200	190	5
Moradabad	Chopa Shobhapur	2B5A6e1b	Faridpur Khushal, Nahosh, Mohkampur, Birkhera, Pathakpur, Chopa Shobhapur	78°32' 35" to 78°34'52" East	28°23"40 to 28°21'54" North	195	190	10
Moradabad	Khajra Khakam	2B5A6d2e	Dhakari, Birkhera, Khajra Khakam, Sultanpur Khurd, Fajalpur, Sadatwari	78°35' 24" to 78°37'08" East	28°23"18 to 28°20'44" North	190	190	0
Moradabad	Sadatwari	2B5A6d2d	Sarua, Sadatwari	78°35' 02" to 78°37'48" East	28°21"31 to 28°19'42" North	190	190	0
Moradabad	Arjunpur Juna	2B5A6d2c	Sadatwari, Juna Arjunpur	78°37' 3" to 78°38'25" East	28°20"26 to 28°19'22" North	190	190	0
Moradabad	Kisoli	2B5A4d1d	Kirari, Atrosi, Kisoli, Rafipur, Singhpur, Dhadol, Mirzapur Iktara, Ghasipur	78°34' 2" to 78°37'11" East	28°28"23 to 28°25'56" North	195	190	4
Moradabad	Pathakpur	2B5A6d1f	Bhojpur, Birkhera, Khajara, Khakam, Pathakpur, Sarua	78°34' 0.57" to 78°35'28" East	28°20"43 to 28°22'26" North	190	190	0
Moradabad	Machkhera	2B5A4b5	Sadatwari, Naroda, Naglia Bhood, Mathera Alpur, Mathara Dharampur, Bhapur Patti Prihlad, Bahpur Patti, Asalat, Moradabad Kather, Pipli, Machcuha Khera, Manona, Ramgarh, Juna Arjunpur	78°37' 10" to 78°41'21" East	28°22"0.3 to 28°19'33" North	195	190	5

Source: Remote sensing Lknow.& GPS

### 2.3.1 Major stream

The watershed has 1/3 part on the Bank of the Sot river & 2/3 part of the bank Mahawa river having precipitous slopes and drains into the Sot & Mahawa river.. About 4 % of watershed area has slope more than 1% upright ridges. The top of the watershed exhibit extremely precipitous and manifesting moderate to severe erosion class. The lower portion of the watershed has moderate slopee (less than 1 %). At the outlet of water shed small gullied are notice, covered with sparse vegetation. In Total (1<sup>st</sup> order -4 numbers, 2<sup>nd</sup> order-5 numbers and 3<sup>rd</sup> order-1 numbers) numbers of streams of different order are found in the watershed, with total stream length of 26100 m. Stream characteristics of watershed are presented in the table.

**Table No.7: Stream characteristics of watershed (IWMP IInd Moradabad)**

Stream order	Stream number	Main stream length (M)
1 <sup>st</sup> order	6	5800.00
2 <sup>nd</sup> order	7	7300.00
3 <sup>rd</sup> order	2	13000.00
Total	15	26100.00

### 2.4 Climate

The watershed falls under the semi-arid region of tropical climate. The average annual precipitation is 1020 mm spreading over 85 rainy days. Most of the rainfall (about 85 %) is received during July to September. The rainfall is of moderate to high intensity. The area receives on or scanty rainfall in the winter season. The temperature variation ranges from as high as 42°C in the month of May- June to as low as 5°C in December- January.

#### 2.4.1 Climatic Condition

**Table no. 8: Climatic Condition**

S. No.	Name of Project	Name of the block/	No. of Micro Watershed	No. of revenue villages	Information											
					Average Rainfall and rainy days (in mm)						Temperature (c )			Relative humidity (%)		
					2007		2008		2009		2007	2008	2009	2007	2008	2009
					Avg. in Mm	No. Of Days	Avg. in Mm	No. Of Days	Avg. in Mm	No. Of Days	Min- Max	Min- Max	Min- Max	Min- Max	Min- Max	Min- Max
1	IWMP I1 <sup>nd</sup> Moradabad	Behjoi & Panwasa	9	41	1050	90	750	72	1020	92	38.00	37.9	35	85	85	82

## 2.5 Watershed Characteristics

### 2.5.1 Shape and Size

The watershed shape (IWMP II<sup>nd</sup> Moradabad) is square type. The maximum length and width of IWMP II<sup>nd</sup> Moradabad the watershed are 16000 m and 10000 m, respectively with the length: width ratio 1.6/1

**Table no. 9: Shape and Size of watershed**

S. N.	Micro watershed Name	Code	Area (ha)	Shape	Approximate size in meter		Ratio Length: width
					Length	Width	
1	Syorajpur	2B5A6e1d	538.00	Squire	3500	1300	2.76:1
2	Nadhosh	2B5A6e1c	560.00	Elongate	5300	2000	2.65:1
3	Chopa Shobhapur	2B5A6e1b	473.00	Pentagonal	10000	1400	7.14:1
4	Khajra Khakam	2B5A6d2e	475.00	Elongate	4200	1750	5.06:1
5	Sadatwari	2B5A6d2d	391.00	Cubical	2200	1700	1.29:1
6	Arjunpur Juna	2B5A6d2c	155.00	Rectangular	2900	2550	1.14:1
7	Kisoli	2B5A4d1d	422.00	Hexagonal	3000	2050	1.46:1
8	Pathakpur	2B5A6d1f	828.00	Elongate	7000	2400	2.92:1
9	Machkhera	2B5A4b5	1318.00	Tringale	6000	2000	3.00:1

### 2.5.2 Length of main stream, drainage density, average slopee, watershed relief etc.

**Table no. 10: Length of main stream, drainage density, average slopee, watershed relief etc**

S.No.	Project Name	Main stream	Drainage Density	Average Slopee	Watershed Relief
1	IWMP II <sup>nd</sup> MORADABAD	I-5800 meter II- 7300 meter III- 13000 meter	0.90-1.20 meter/second	0-4%	0-10 meter

## 2.6 Geomorphology and Soils

### 2.6.1 Geomorphology

The IWMP II<sup>nd</sup> Moradabad watershed is located South side of the Moradabad district. The entire watershed is topographically divided into three major landforms. Accordingly, the soils of watershed can be grouped into three major categories. Such as

- Plain land
- Slopepy land,
- Ravinous land

### **2.6.2 Slopepy Land-Sandy Loam**

The topmost portion (western & northwest part) of the watershed is Slopepy land with occasional depressions of flat land. These soils are derived from the Sandy loam and are located at some height of around 10 feet. They have developed from typical alluvial soil slightly alkaline in nature with occasional thin layers of silt in small patches. Near the high level, the soils are coarse and underlying with hard sandstones. The soils of the upper level and very nearby adjoining areas are loamy sand to sand in texture. Depth is the major limitations of these soil groups. As move away upper level, the soil depth gradually increases along with clay content thereby improving the fertility. The soils are alluvial in colour with ferruginous concretions with slightly alkaline in reaction.

### **2.6.3 Fine textured alluvial soils**

These soils are the most extensive soil group found in the IWMP II<sup>nd</sup> Moradabad watershed. The middle portion of watershed is relatively flat land with fine soil texture. These soils are grey in colour and are inherently high in fertility status. These grey soils are sticky with high pH and on drying develop numerous cracks and fissures. Soil texture is silty clay loam particularly in depressions and loam in the elevated portion. The soils of the lower horizon are invariably heavier than the surface, being a zone of compaction and invariably a zone of calcium carbonate accumulation in the form of Kankar nodules. A subsurface indurate pan of kankar of clay or mixtures of both locally called as Potni soils are prevalent, which impede the downward movement of water thereby creating problems of high runoff.

### **2.6.4 Coarse textured alluvial soils**

These soils are lying mostly near the adjoining areas of Gandak River near the outlet and around the lower portion of foot hill of watershed. These soils are coarser in texture and are relatively poor in fertility status. The soils are loamy sand in texture. These soils also occupy significant area of the watershed. The soils are derived from the alluvial deposit and also from residual soils of the hill region. Rill and gully formation in some parts particularly near the outlet of watershed can be seen.

### **2.6.5 Drainage**

Due to prevalence of mild to steep slopes and presence of a number of drainage lines in the watershed, the drainage system is adequate. The watershed forms part of Gandak basin.

### 3. BASELINE SURVEY

#### 3.1. Socio Economic Condition

##### 3.1.1 Demographic pattern

The total population of nine micro watershed are 63412 and 9413 house holds is with average family size is 6.73 person s.

**Table no. 11: Demographic pattern detail**

S. No.	Name of Micro Watershed	Name of Villages	Total No of House Hold	Population			Population of SC/ST		
				Male	Female	Total	Male	Female	Total
1	<b>2B5A6e1d</b>	Syorajpur, Dilgora, Chattan, Anandpur, Pagona, Hasanpur Khurd	1005	3427	2958	6385	879	802	1681
2	<b>2B5A6e1c</b>	Anandpur, Pagona, Hasanpur Khurd, Fattepur Sharifnagar, Bichola, Bhojpur, Birkhera, Nadosh	919	3068	2819	5887	666	584	1250
3	<b>2B5A6e1b</b>	Faridpur Khushal, Nahosh, Mohkampur, Birkhera, Pathakpur, Chopa Shobhapur	832	2866	2680	5546	371	352	723
4	<b>2B5A6d2e</b>	Dhakari, Birkhera, Khajra Khakam, Sultanpur Khurd, Fajalpur, Sadatwari	894	3234	2975	6209	379	368	747
5	<b>2B5A6d2d</b>	Sarua, Sadatwari	1703	5956	5567	11523	928	922	1850
6	<b>2B5A6d2c</b>	Sadatwari, Juna Arjunpur	1373	4751	4545	9296	889	778	1657
7	<b>2B5A4d1d</b>	Kirari, Atrosi, Kisoli, Rafipur, Singhpur, Dhadol, Mirzapur Iktara, Ghasipur	1343	4997	4562	9559	406	400	806
8	<b>2B5A6d1f</b>	Bhojpur, Birkhera, Khajara, Khakam, Pathakpur, Sarua	977	3290	3121	6411	507	489	996
9	<b>2B5A4b5</b>	Sadatwari, Naroda, Naglia Bhood, Mathera Alpur, Mathara Dharampur, Bhapur Patti Prihlad, Bahpur Patti, Asalat, Moradabad Kather, Pipli, Machuha Khera, Manona, Ramgarh, Juna Arjunpur	367	1335	1291	2626	209	170	379
<b>Total</b>			<b>9413</b>	<b>32924</b>	<b>30488</b>	<b>63412</b>	<b>5244</b>	<b>4865</b>	<b>10109</b>

Source: District statistic magazine

### 3.1.2. Literacy rate

**Table no. 12: Literacy rate detail**

S. No.	Name of Micro Watershed	Name of Villages	Total population	% of Literacy		
				Male	Female	Total
1	<b>2B5A6e1d</b>	Syorajpur, Dilgora, Chattan, Anandpur, Pagona, Hasanpur Khurd	6385	60	40	50
2	<b>2B5A6e1c</b>	Anandpur, Pagona, Hasanpur Khurd, Fattepur Sharifnagar, Bichola, Bhojpur, Birkhera, Nadosh	5887	55	41	48
3	<b>2B5A6e1b</b>	Faridpur Khushal, Nahosh, Mohkampur, Birkhera, Pathakpur, Chopa Shobhapur	5546	52	46	49
4	<b>2B5A6d2e</b>	Dhakari, Birkhera, Khajra Khakam, Sultanpur Khurd, Fajalpur, Sadatwari	6209	56	44	50
5	<b>2B5A6d2d</b>	Sarua, Sadatwari	11523	53	33	43
6	<b>2B5A6d2c</b>	Sadatwari, Juna Arjunpur	9296	62	44	53
7	<b>2B5A4d1d</b>	Kirari, Atrosi, Kisoli, Rafipur, Singhpur, Dhadol, Mirzapur Iktara, Ghasipur	9559	66	48	57
8	<b>2B5A6d1f</b>	Bhojpur, Birkhera, Khajara, Khakam, Pathakpur, Sarua	6411	64	44	54
9	<b>2B5A4b5</b>	Sadatwari, Naroda, Naglia Bhood, Mathera Alpur, Mathara Dharampur, Bhapur Patti Prihlad, Bahpur Patti, Asalat, Moradabad Kather, Pipli, Machuha Khera, Manona, Ramgarh, Juna Arjunpur	2626	58	42	50
<b>Total</b>			<b>63412</b>	<b>58.25</b>	<b>42.44</b>	<b>50.35</b>

Source: District statistic magazine

### 3.1.3. Migration pattern

**Table no. 13: Migration detail**

S. No.	Name of Micro Watershed	No. of Villages	Total population	Migration			Migration by Month			Main reason for migration	Income during migration
				Total	Male	Female	<3Month	3-6 Month	>6 month		
1	<b>2B5A6e1d</b>	9	6385	3584	2144	1440	1950	1475	116	Employment	Rs 3500/ month
2	<b>2B5A6e1c</b>	5	5887	3750	2000	1750	2250	1625	75	Employment	Rs 4500/ month
3	<b>2B5A6e1b</b>	9	5546	2138	1710	428	1283	641	214	Employment	Rs 4500/ month
4	<b>2B5A6d2e</b>	4	6209	4468	3574	894	2681	1340	447	Employment	Rs4000/ month
5	<b>2B5A6d2d</b>	10	11523	1049	839	210	629	315	105	Employment	Rs 4500/ month
6	<b>2B5A6d2c</b>	6	9296	4468	3574	894	2681	1340	447	Employment	Rs4000/ month
7	<b>2B5A4d1d</b>	8	9559	5952	4794	1158	3571	1786	595	Employment	Rs 4500/ month
8	<b>2B5A6d1f</b>	7	6411	2068	1550	518	1241	620	207	Employment	Rs 3500/ month
9	<b>2B5A4b5</b>	3	2626	1584	1144	440	950	475	16	Employment	Rs 3500/ month

Source : Secondary data



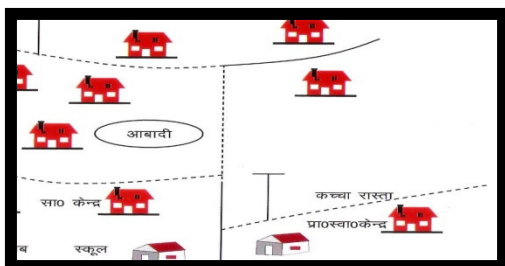
### 3.14 Infrastructure social features

**Table no.14: Details of infrastructure in the project area**

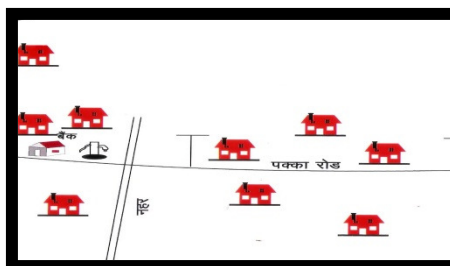
S.No.	Parameters	Status			
		(P)	(S)	(HS)	(VI)
(I)	No. of Villages connected to the main road by an all-weather road	41			
(ii)	No. of villages provided with electricity	28			
(iii)	No. of households without access to drinking water	7898			
(iv)	No. of educational institutions: Primary (p)/Secondary(S)/ Higher secondary(HS)/ vocational Institution (VI)	42	12	6	-
(v)	No. of villages with access to primary Health Center	4			
(vi)	No. of villages with access to Veterinary Dispensary	10			
(vii)	No. of villages with access to Post office	14			
(viii)	No. of villages with access to Banks	4			
(ix)	No. of villages with access to Markets/mandis	11			
(x)	No. of villages with access to Agro-industries	-			
(xi)	Total quantity of surplus milk	3400 liter			
(xii)	No. of milk collection centers (e.g. Union(U)/Society(S)/ Private agency (PA)/ others (O)	(U) No	(S) No	(PA) 32	(O)
(xiii)	No. of villages with access to anganwadi Center	28			
(xiv)	Any other facilities with no. of villages (please specify)	-			

The IWMP II<sup>nd</sup> watersheds have moderate communication facilities and all fiurt two one villages are approachable through motorable road. Literacy rate in the watershed is very low because all villages are having education upto junior high school. All the villages are electrified and have TV & telephonic connection. Nearest small market is at Bhejoi 10 km and nearest big market Moradabad is about 60 km from the watershed. Religious and ritual features are almost common as in other part of the U.P. Small land holding (average less than 2.3 ha) with large family size (average 6.72 person) and more than 45% of the labour force of the total population living below poverty line indicate poor socio economic status of the watershed community. However, strong community spirit among the villager's show positive indication for the success of any programmed to be implemented in participatory mode. Traditionally the entire village community participates in the individual works. Various village features is shown in fig.

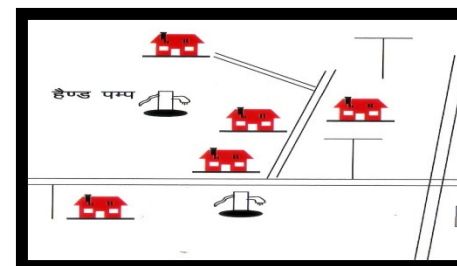
## VILLAGE SOCIAL MAP



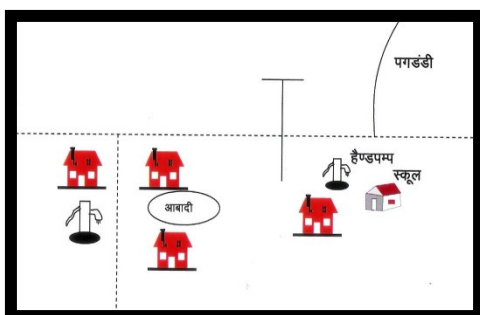
**SYRAJPUR**



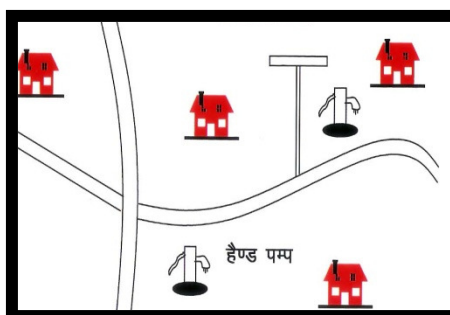
**ANANDPUR**



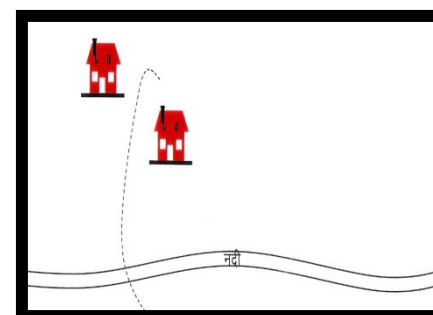
**FATEHPUR KHUSAL**



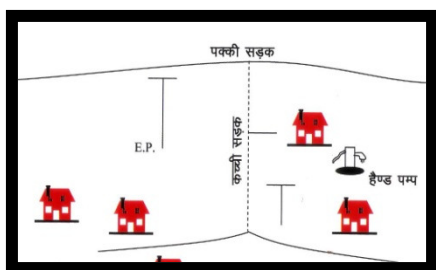
**DHAKARI**



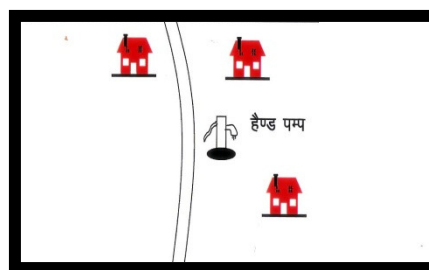
**SARUA**



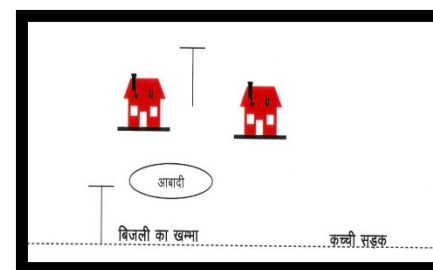
**SADARWARI**



**KIRARI**



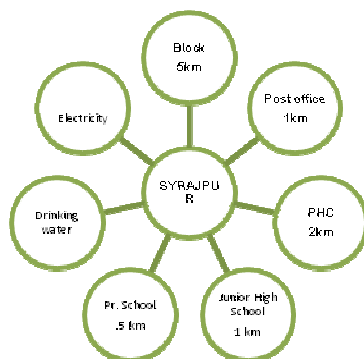
**BHOJPUR**



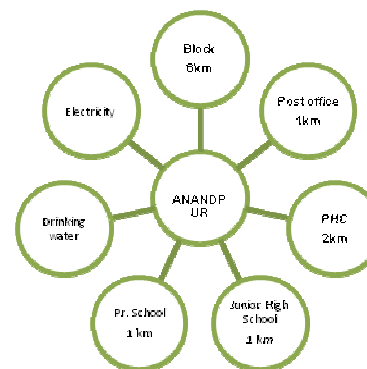
**DHARAMPUR**

### 3.15 Venn diagram

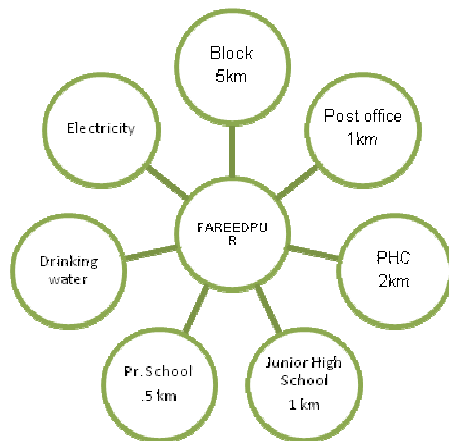
In the Venn diagram, farmers' perceptions were recorded for importance and role of different development institutions in relation to infrastructure development in the villages. Importance has been depicted with the size of the circle, and role with distance from the village circle. The Venn diagram of the IWMP II<sup>nd</sup> watershed villages are being attached here with



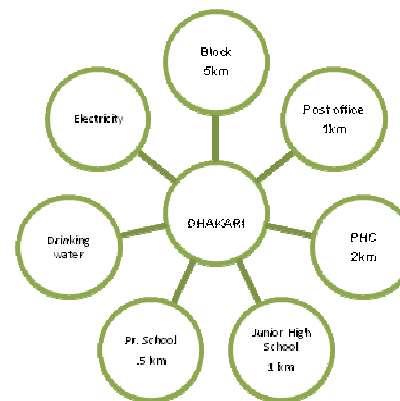
V  
ENN DIGRAM OF VILLAGE **SYORAJPUR**



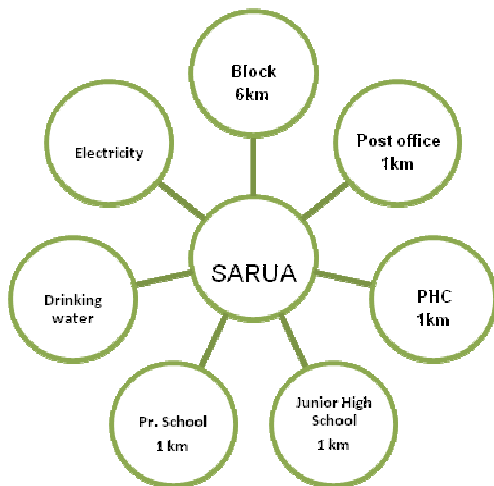
VENN DIGRAM OF VILLAGE **ANANDPUR**



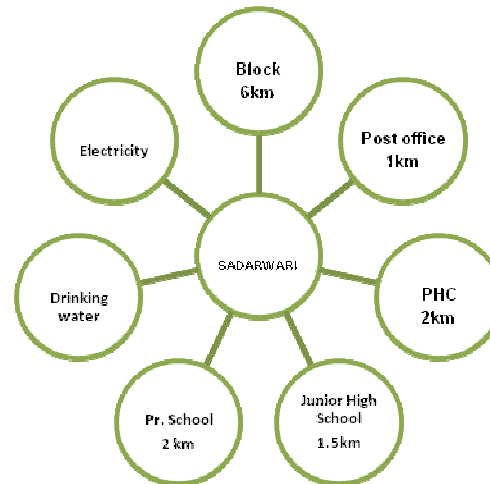
VENN DIGRAM OF VILLAGE **FAREEDPUR**



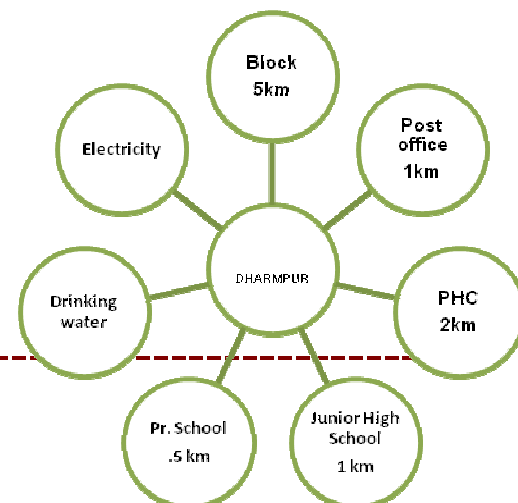
VENN DIGRAM OF VILLAGE **DHAKARI**

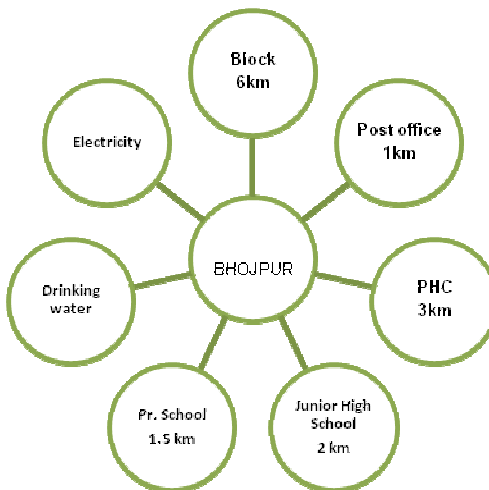
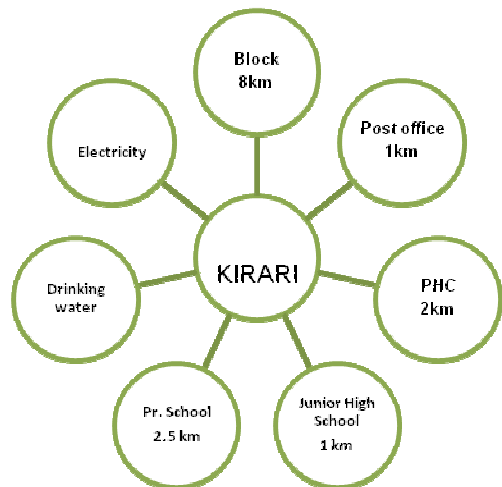


VENN DIGRAM OF VILLAGE **SARUA**



VENN DIGRAM OF VILLAGE **SADARWARI**





VENN DIGRAM OF VILLAGE **KIRARI** VENN DIGRAM OF VILLAGE **BHOJPUR** VENN DIGRAM OF VILLAGE **DHARAMPUR**

### 3.1.6. Historical timeline

An historical timeline is the chronological record of important events in the history of the village which is useful in understanding its background in the context of nine watersheds of Moradabad district. Historical timeline depicting important events in

respect of different villages of the IWMP II<sup>nd</sup> watershed was prepared through PRA. Historical timeline for important villages are given in table.

Village- SYORAJPUR		Village- ANANDPUR	
Year	Activities	Year	Activities
1700	Established	1710	Established
1960	Construction Bandhi (water harvesting structure)	1960	Construction Bandhi (water harvesting structure)
1965	Opening up Primary School	1985	Opening up Primary School
1976	Introduction of Tractor	1980	Introduction of Tractor
1978	Establishment of Gobar gas plant	1978	Establishment of Gobar gas plant
1979	Kacha road	1982	Kacha road
1985	Introduction of thresher	1987	Introduction of thresher
1986	First Tube well	1988	First Tube well
1990	First motorcycle	1992	First motorcycle
1993	TV and DVD player	1996	TV and DVD player
2002	Electricity in the village	2002	Electricity in the village
2003	Bituminous road	2003	Bituminous road
2005	Temple renovation	2007	Temple renovation
2009-10	Planning for watershed project	2009-10	Planning for watershed project
Village- FAREEDPUR KHUSAL		Village-DHAKARI	
Year	Activities	Year	Activities
1702	Established	1707	Established
1960	Construction Bandhi (water harvesting structure)	1965	Construction Bandhi (water harvesting structure)
1985	Opening up Primary School	1986	Opening up Primary School

1980	Introduction of Tractor	1985	Introduction of Tractor
1978	Establishment of Gobar gas plant	1980	Establishment of Gobar gas plant
1982	Kacha road	1982	Kacha road
1987	Introduction of thresher	1988	Introduction of thresher
1988	First Tube well	1987	First Tube well
1992	First motorcycle	1993	First motorcycle
1996	TV and DVD player	1998	TV and DVD player
2002	Electricity in the village	2002	Electricity in the village
2003	Bituminous road	2004	Bituminous road
2007	Temple renovation	2009-10	Planning for watershed project
2009-10	Planning for watershed project	1707	Established

<b>Village-SARUA</b>		<b>Village-SADARWARI</b>	
<b>Year</b>	<b>Activities</b>	<b>Year</b>	<b>Activities</b>
1810	Established	1712	Established
1962	Construction Bandhi (water harvesting structure)	1963	Construction Bandhi (water harvesting structure)
1984	Opening up Primary School	1985	Opening up Primary School
1985	Introduction of Tractor	1980	Introduction of Tractor
1980	Establishment of Gobar gas plant	1978	Establishment of Gobar gas plant
1982	Kacha road	1982	Kacha road
1988	Introduction of thresher	1987	Introduction of thresher
1987	First Tube well	1988	First Tube well
1993	First motorcycle	1992	First motorcycle
1998	TV and DVD player	1996	TV and DVD player
2002	Electricity in the village	2002	Electricity in the village
2004	Bituminous road	2003	Bituminous road
2009-10	Planning for watershed project	2007	Temple renovation
1810	Established	2009-10	Planning for watershed project

<b>Village-KIRARI</b>		<b>Village-BHOJPUR</b>	
<b>Year</b>	<b>Activities</b>	<b>Year</b>	<b>Activities</b>
1879	Established	1878	Established
1965	Construction Bandhi (water harvesting structure)	1968	Construction Bandhi (water harvesting structure)
1980	Opening up Primary School	1982	Opening up Primary School
1984	Introduction of Tractor	1981	Introduction of Tractor

1986	Establishment of Gobar gas plant	1985	Establishment of Gobar gas plant
1982	Kacha road	1983	Kacha road
1987	Introduction of thresher	1985	Introduction of thresher
1988	First Tube well	1984	First Tube well
1993	First motorcycle	1992	First motorcycle
1998	TV and DVD player	1995	TV and DVD player
2002	Electricity in the village	2002	Electricity in the village
2004	Bituminous road	2004	Bituminous road
2009-10	Planning for watershed project	2009-10	Planning for watershed project

Source : Secondary data

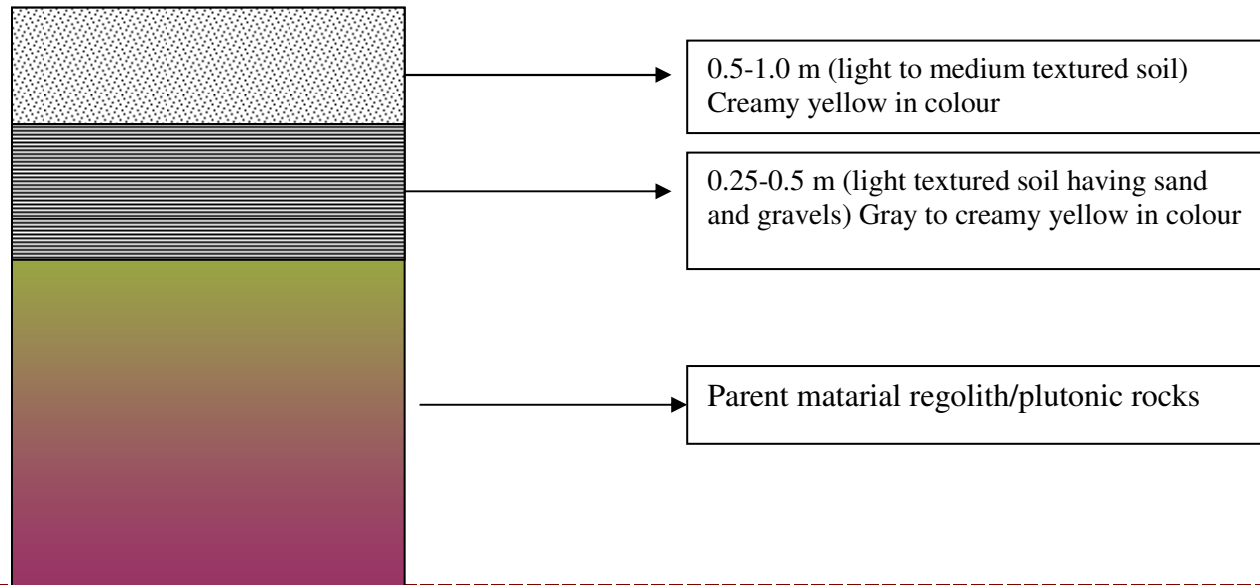
### 3.2. SOIL AND LAND USE

#### 3.2.1 Soil morphology

The nine watershed of IWMP II<sup>nd</sup> is located south west corner of the Moradabad district. The entire watershed is topographically divided into three major landforms accordingly; the soils of watershed have been grouped in three major categories.

- 1 Slopepy land
- 2 Plain land
- 3 Ravinous land

Soil profile A representative soil profile (Dominant soil- table 15)



### 3.2.2 Morphology of a typical soil profile of micro watershed (dominant soil)

**Table no. 15: Morphology of a typical soil profile of micro watershed (dominant soil)**

Horizon	Depth (cm)	Morphology
A	0-150	Light grayish colour 28% with free NaCO <sub>3</sub> , Sticky when moist, hard when dry, high elasticity, fissures and cracks, occasional occurrence of free calcium carbonate granules ph 8.3-8.7
B	150-600	Whitish-yellow in colour, high effervescence with dilute NaOH. very fine mixed with free CaCO <sub>3</sub> and granules, very hard when dry, compact & indurate hard pan, restricting development of root and downward water transmission (locally called as Potni soil)
C	> 600	White and white sandstone, Regolith (Parent material)

### 3.2.3. Soil characteristics and fertility status

**Table no. 15.1: Soil characteristics and Fertility Status up to 6”**

Soil Properties	LCC I	LCC II	LCC III
Sand (%)	47.04	75.04	73.04
Silt (%)	24.6	18.6	20.3
Clay (%)	28.36	6.36	6.66



Texture	Sandy clay loam	Loamy sand	Loamy sand
pH (1:2)	8.41	8.67	6.85
EC(dS m-1)	0.47	0.12	0.16
Organic carbon(%)	0.37	0.12	0.19
Available N (kg ha-1)	316	173	224
Available P (kg ha-1)	29	15	5-8
Available K (kg ha-1)	189	325	230

\* values correspond to soil fraction <2mm

### 3.2.4. Land Capability Classification (LCC)

Land capability classification was done to classify the soils in different groups based upon the limitations and to emphasize prevailing in the watershed under different kinds of soils. Initially reconnaissance survey was carried out for entire watershed in order to find out the different topo-sequences, landforms, soil depth and erosion hazards. This was followed by the detailed investigation of selected landforms to bring out the LCC classes of the Micro Watershed. Three classes of land capability namely II, III and IV were demarcated in the IWMP II<sup>nd</sup> watersheds. The areas under different classes are shown in table and figure.

**Table no. 16: Area under different land capability class under micro watersheds**

Land Capability Class	Area (ha)
I	2064.00
II	1548.00
III	1032.00
IV	516.00
<b>Total</b>	<b>5160.00</b>

#### 3.2.4.1. Land capability class I (White)

This group is one of the most extensive LCC class of the watershed. This group of soil is occupying around 2064.00 ha of the

watershed area. The soils are clay loam or silty clay loam in texture in alkaline in nature. The land under this class is nearly level to mild sloping (1 %). The soils are deep and erosion hazard is slight. Most of the productive agriculture land comes under class I. A considerable area of watershed is seasonally waterlogged comes under this LCC clas, primarily found near the earthen check. These areas are subject to eater logging in most part of the year. The lands are almost flat, silty clay or clay loam in texture, deep and very mild sloping. These lands have no major limitations other occasional water logging. During rabi season, the water is drained out and cultivation is carried out. These lands potentially very productive but due to water logging the rainy season, it could not be brought out under cultivation during the kharif season. The mapping unit for this class is given as under.

Land capability class Ie =scl-d5/b-e1

#### **3.2.4.2 Land capability class II (whitish yellow)**

A considerable area of watershed i.e. 1548.00 ha is under class II. This class is found in lower portion i.e. near the outlet of watershed. The soils are coarser in texture (loamy sand/sand), deep, susceptible to erosion hazard and undulating in topography. Rill and initiation of gully can be seen near the outlet of the watershed. mapping unit for this class is as follows.

Land capability class IIe=Is-d5-e3.IVes= Is-d3/D-e3 (Foot hill soil)

#### **3.2.4.4. Land capability class III/IV (Greysh yellow)**

These lands are occupying an area of 1032.00 ha of the watershed. This class of land is mostly found in hilly terrain of watershed. The soils are found under this class. Class III and IV are intermixed in near top of the watershed. Mostly class IV (516.00ha) lands are located on topes, where soil depth is almost negligible. Soils with admixture of gravels/rock fragments are found in these classes of lands. The mapping unit for this class of land is as follows:

Land capability class IIIe= gls-d1/H/I-e4

#### **3.2.4.5. Mapping units symbol**

Soil depth (cm)d5->90 cm;d3=22.5-45.0;d17.5 cm

Texture cl-clay loam; Is- loamy sand; gls-gravelly loamy sand

Slopee (%) B-1-3;C-3-5;D-d-10%;H-25-33;I-33-50

Erosion e1-25% of A horizon lost; e2-50-75% of a horizon lost e4-50-75% B horizon lost.

### 3.3. Land Use Pattern

#### 3.3.1 Land holding

Majority of the farmers are in the category of marginal (< 1 ha) and small (1-2 ha) with average land holding of about 2.2 ha. These small land holding are further scattered at different places, which makes cultivation very difficult. Distribution of farm families according to the size of the land holdings are given in the table.

**Table no. 17: Distribution of farm families according to their size of landings.**

S.N.	Name of Micro Watershed	Name of Villages	Land holding			
			Marginal (<1 ha)	Small (1-2 ha)	Large (>2 ha)	Total
1	<b>2B5A6e1d</b>	Syorajpur, Dilgora, Chattan, Anandpur, Pagona, Hasanpur Khurd	907	247	93	1247
2	<b>2B5A6e1c</b>	Anandpur, Pagona, Hasanpur Khurd, Fattepur Sharifnagar, Bichola, Bhojpur, Birkhera, Nadosh	941	256	96	1293
3	<b>2B5A6e1b</b>	Faridpur Khushal, Nahosh, Mohkampur, Birkhera, Pathakpur, Chopa Shobhapur	802	206	72	1080
4	<b>2B5A6d2e</b>	Dhakari, Birkhera, Khajra Khakam, Sultanpur Khurd, Fajalpur, Sadatwari	794	201	70	1065
5	<b>2B5A6d2d</b>	Sarua, Sadatwari	678	164	57	899
6	<b>2B5A6d2c</b>	Sadatwari, Juna Arjunpur	263	72	25	360
7	<b>2B5A4d1d</b>	Kirari, Atrosi, Kisoli, Rafipur, Singhpur, Dhadol, Mirzapur Iktara, Ghasipur	1221	302	92	1615
8	<b>2B5A6d1f</b>	Bhojpur, Birkhera, Khajara, Khakam, Pathakpur, Sarua	704	178	58	940

9	<b>2B5A4b5</b>	Sadatwari, Naroda, Naglia Bhood, Mathera Alpur, Mathara Dharampur, Bhapur Patti Prihlad, Bahpur Patti, Asalat, Moradabad Kather, Pipli, Machuha Khera, Manona, Ramgarh, Juna Arjunpur				
			2242	581	202	3025
		<b>Total</b>	<b>8552</b>	<b>2207</b>	<b>765</b>	<b>11524</b>

Source : District statistic magazine

### 3.3.2. Land Use

The IWMP II<sup>st</sup> watersheds has diversified land uses namely agriculture, waste land (open scrub), seasonal water bodies etc. The varied present land use and area under different categories in watershed is shown in Table 18. The mixed land use followed in the watershed is almost similar in other parts of the U.P. During PRA exercise, the villagers prepared land use. One such map of village of IWMP II<sup>nd</sup> watershed is shown in table

**Table no 18: Land use pattern**

S.N.	Name of Project	No of Micro Watershed	Geographical area	Forest Area	Agriculture land	Rain fed Area	Pasture land	Wastelands		Treatable Area
								Cultivated	Uncultivable	
1	IWMP II <sup>nd</sup>	9	7170.00	15.00	6820.00	5736.00	12.50	-	37.50	5160.00

Source : District statistic magazine

#### 3.3.2.1 Agriculture

Various agricultural land uses in the watershed are extended to diversified land capabilities starting fro marginal to good class II lands. The watershed distinctly has three types of lands i.e. leveled, sloping and degraded and undulating. The agriculture is practiced on all these soil types though the productivity considerably varies. The total area under agriculture in the watershed is about

6820.00 ha out of which 1084.00 ha is irrigated while 5736.00 ha is under rain-fed agriculture. The water (both irrigated and drinking) is most scarce natural resource in the watershed. The problem of tube wells for irrigation of agricultural crops frequently leads to the drinking water problem to the farmers of watershed forcing them to carry drinking water from outside the watershed area. The agricultural field bunds are common in the watershed, however, they frequently breach on heavy rains adversely affecting the in situ percolation of rain water in the soils.

The agriculture soils in the watershed have diversified texture i.e. loam sand, silty clay loam and boulder mixed textures which are located in patches through out the watershed. The heavy soils are almost kept fallow during rainy season. The agricultural soils also have hard calcium pan at variable depths. The irrigation water is conveyed in earthen channels and surface irrigation methods following mainly border method or flood method of irrigation by the farmers in the watershed. These factors substantially reduce the Water use efficiency of limited available and valuable irrigation water in the watershed. The quality of irrigation water needs to be tested for assessing fitness of the quality for irrigation and other purposes.

Rehabilitation of waste lands with appropriate drought hardy species like *Prosopis juliflora*, introduction of suitable multi-purpose trees, promoting agro-forestry on agricultural lands with appropriate fruit and forest species, suitable vegetative barriers on sloping lands can of high future value in meeting out not only fire wood and fodder demands in the watershed but also for soil and water conservation, rehabilitation of wasteland and substantial income generation for socio-economic up-liftmen of farmers in the watershed.

### **One year rotation**

#### **Single cropping**

Fallow- mustard/wheat/gram/lentil/winter vegetables, Paddy/ bajra/jowar/sesame/black gram/ green gram,- fallow.

#### **Double cropping**

Paddy/ Bajra/ jowar/ sesame/black gram/gram gram- mustard/wheat/gram/lentil/winter vegetables

**Irrigated agriculture**

**One year rotation**

Paddy/Bajra/jowar/sesame/black gram/ green gram- mustard/wheat/winter vegetables

**3.3.2.2. Crop Productivity**

**Table no. 19 Production and productivities of important commodities in IWMP IIInd Moradabad**

Sl.	Name of Crop	2006			2007			2008			2009		
		A (Ha.)	P (Tons)	Y (Qt Ha)	A (Ha.)	P (Tons)	Y (Qt Ha)	A (Ha.)	P (Tons)	Y (Qt./Ha)	A (Ha.)	P (Tons)	Y (Qt./Ha)
1	<b>Urd</b>	5146.0	51460	10	5146.0	5606	11	5146.0	61752	12	5146.00	66898.00	13.00
2.	<b>Wheat</b>	5012.0	150360.00	30.0	152360.00	4758.0	32.0	5012.3	150360.00	30.0	5012.30	165396.00	33.00
3.	<b>Mustard</b>	220.0	2090.00	9.5	220.0	1980.00	9.0	220.0	1760.00	8.0	220.00	1980.00	9.00
4.	<b>Lentil</b>	76.0	18.0	9.5	76.0	14.4	8.0	76.0	15.7	7.5	76.00	14.40	8.50
5.	<b>Pea</b>	201.0	1608.00	8.0	1714.00	17.0	8.5	202.0	1818.00	9.0	1818.00	19.80	9.00
6.	<b>Potato</b>	98.0	14506.00	148.0	98.0	15190.00	155.0	98.0	15876.00	162.0	98.00	14506.00	148.00
7.	<b>Sugarcane</b>	100	17700	177.0	100	18200	182.0	100	19000	190.0	100.00	20500.00	205.00

8.	<b>Paddy</b>	490	14700	30	490	15190	31	490	15680	32	490.00	16170.00	33.00
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Source : District statistic magazine

The agricultural productivity is primarily driven by the amount and distribution of rain water specifically during two cropping seasons i.e. rabi and kharif. Productivity of kharif crops is also affected by the late onset or early withdrawal of monsoon as well as intermittent droughts of variable duration and intensity. The farmers also do not have suitable cropping systems to deal aberrant weather. Weeds impose considerable constraint in productivity of both kharif and rabi crops under irrigated as well as rain-fed production system. Farmers undertake normally one manual weeding in mustard and other valuable crops however, practice is energy and time consuming. Use of weedicide is rare in the watershed.

The mixed cropping is in practice in limited area with kharif crops like bajra and jowar but it is not only irrational but also unscientific and beset with low productivity. Subsequent rabi crops in general and mustard crop in particular are raised on residual soil moisture under rain-fed production system during post monsoon season. Imbalanced use of fertilizers is common in not only rabi and kharif crops but also in rain-fed and irrigated production system. The recommended deep plowing for enhanced in situ residual soil moisture conservation and higher production is also not followed in the watershed. The shallow ploughing tractor drawn tillage implements are available with the farmers in the watershed but deep ploughing implements yet need to be introduced.

The soil fertility/health restoration practices like green manuring, crop rotations and intercropping specifically with legumes, use of FYM/compost, Vermicompost, bio fertilizers, soil and water conservation measures, use of brought up or in situ mulches are widely lacking in the watershed. The soil and water conservation measures are limited to mechanical/earthen measures created by the state Govt. agencies. Conservation agronomical measures like seeding and plowing across the slope, weed mulching, agro-forestry, vegetative barriers etc also completely lack in the watershed.

### **3.3.2.3. Indigenous technological knowledge (ITK)**

The agriculture is an old traditional practice of farmers in the watershed who have improved themselves with passage of the time according to their domestic need and technological reforms in the nearby areas. The villagers have their traditional village ponds, practice of field bunding which typically constitute agriculture related ITKs in the watershed. The mustard being a cash/fire wood crop

of the watershed is being cultivated in self designed manner by the farmers. However, limited fertilizer application specifically the DAP came in to practice since about 20 years.

### 3.4 Horticulture

The subtropical fruits and vegetables have very good potential in the watershed. The fruit trees has limited in number like mango, guava, papaya, lemon, lime, ber, aonal, bael as vegetables like cucurbits, okra, radish, tomato,cauliflower cabbage, garlic, onion, brinjal, chilly, but they are found surviving well in the watershed villages. Organized orchards, commercial vegetable cultivation, horti-agri and other systems of agro-forestry etc are lacking but have good potential in the water shed.

### 3.5 Live Stock Population

Total livestock population of the IWMP II watersheds is 12311 bufallow is preferred as milch animal compared to cow, but milk yield is very low. Goats are also kept for milk as well as for meat purpose. The detail of live stock population is given in table below

**Table no. 20: Live stock population**

S. N.	Name of Micro Watershed	Name of Villages	Buffaloes	Cows	Bullocks	Goat	Sheep	Total
1	2B5A6e1d	Syorajpur, Dilgora, Chattan, Anandpur, Pagona, Hasanpur Khurd	952	172	7	70	20	1221
2	2B5A6e1c	Anandpur, Pagona, Hasanpur Khurd, Fattepur Sharifnagar, Bichola, Bhojpur, Birkhera, Nadosh	2003	861	12	48	50	2973
3	2B5A6e1b	Faridpur Khushal, Nahosh, Mohkampur, Birkhera, Pathakpur, Chopa Shobhapur	3014	1255	3	2210	120	6602
4	2B5A6d2e	Dhakari, Birkhera, Khajra Khakam, Sultanpur Khurd, Fajalpur, Sadatwari	2270	1630	2	2103	85	4620
5	2B5A6d2d	Sarua, Sadatwari	574	610	-	725	35	1944
6	2B5A6d2c	Sadatwari, Juna Arjunpur	774	810	-	575	40	1679
7	2B5A4d1d	Kirari, Atrosi, Kisoli, Rafipur, Singhpur, Dhadol, Mirzapur Iktara, Ghasipur	525	620	-	475	55	1675
8	2B5A6d1f	Bhojpur, Birkhera, Khajara, Khakam, Pathakpur, Sarua	1674	1710	-	1475	-	4339



9	<b>2B5A4b5</b>	Sadatwari, Naroda, Naglia Bhood, Mathera Alpur, Mathara Dharampur, Bhapur Patti Prihlad, Bahpur Patti, Asalat, Moradabad Kather, Pipli, Machuha Khera, Manona, Ramgarh, Juna Arjunpur	525	620	-	475	55	1675
<b>Total</b>			<b>12311</b>	<b>8288</b>	<b>24</b>	<b>8156</b>	<b>460</b>	<b>26728</b>

Source : District statistic magazine and secondary data

### **3.6 Fisheries**

Commercial fish farming was not done by the farmers of in IWMP IInd, but there is a average scope for fish farming in these area. Aware farmers gated 25.00q/ha production, it was very low.

### **3.7. Forest and other Vegetation**

#### **3.7.1. Forests**

The watershed has no forest area only some wild trees are found in scattered manner.

#### **3.7.2. Horticulture/ Agro-forestry**

No horticulture and Agro forestry practices were observed in the watershed.

#### **3.7.3. Agro-forestry**

The agro-forestry practices are highly lacking in the watershed though it has good potential under existing dispositions and may play a vital role particularly with respect to minimization of cropping risk, build up soil fertility and productivity, soil conservation, partly meeting out the fire wood demand of rural community and moreover, optimizing the economical return from system as a whole under typical semi arid climate in the watershed. The other agro-forestry systems like agri-silvi, silvi-pastoral, bund and boundary plantations also have good potential to cater the fire wood and fodder demands of the rural community in the watershed. The existing area under agro-forestry is almost negligible. Prosopis juliflora may be planted as block or sole plantation specifically on marginal and degraded lands in the watershed. The agro-forestry interventions comprising of ber, bail, aonla, guava, popular etc may be applied to benefit of the farmers under rain-fed to irrigated production systems on leveled to slopeing and marginal agricultural using proper planting techniques and termite control measures. The multipurpose trees may also help in supplementing fire wood and fodder demands of the rural community in the watershed and may be planted as hedge rows on rain-fed, marginal and degraded lands.

### **Conclusions**

The land capability classification of IWMP II<sup>nd</sup> watershed provides reasonable good information with regard to capability of soil, that could be used for agriculture, agri-horticulture, silviculture and pasture development. The majority of land form is coming under class II, which give an insight of good agriculture production potential of this watershed. The productivity of these lands could be further enhanced by adoption of simple soil & water conservation measures like mild leveling, bunding, diversion drain and in-situ moisture conservation practices. The reasonable area is under class III indicating greater potential of this watershed for forestry and pasture development. The major physical limitations in case of agriculture soils are the sub soil hardness, low water infiltrability and slope. In case of area under topes of watershed, the most pronounced limitation of soil depth was noticed followed by severe erosion hazard and coarse soil texture. A small portion of watershed is under seasonally waterlogged. The soils under waterlogged area could be used for some other beneficial farming activities during the kharif season also.

### 3.7 Livelihood Pattern

The people of watershed area earn their livelihood from agriculture and animal husbandry. During lean period they migrate for daily wage labourers in block and district head quarter and as agriculture labour in other parts of the state. Another occupation of the people is parental small scale occupation.

**Table no. 21: Livelihood pattern (Occupational Distribution)**

S. N.	Name of Micro Watershed	Total Workforce	Agriculture	A. Husbandry	Agriculture + A. Husbandry	Casual Labour	Service	Handcraft	Daily wage labour
1	<b>2B5A6e1d</b>	3584	2115	615	615	1010	5	3	840
2	<b>2B5A6e1c</b>	3750	2410	1110	2110	3045	12	7	742
3	<b>2B5A6e1b</b>	2138	2135	912	912	1245	8	4	231
4	<b>2B5A6d2e</b>	4468	3450	670	670	982	2	6	123
5	<b>2B5A6d2d</b>	1049	970	120	120	472	14	5	258
6	<b>2B5A6d2c</b>	4468	2112	210	210	956	1	6	847
7	<b>2B5A4d1d</b>	5952	3876	815	815	889	4	2	1212
8	<b>2B5A6d1f</b>	2068	989	455	455	850	8	6	240
9	<b>2B5A4b5</b>	1584	910	272	272	312	5	4	324

### 3.7.1. Per capita income

**Table no. 22: Per capita income in IWMP IInd Moradabad**

S. no.	Name of Project	Agriculture (Rs)	A. Husbandry (Rs)	Casual labour (Rs)	Others (Rs)	Total (Rs)
1	IWMP 2 <sup>nd</sup> Moradabad	7750.00	4825.50	4900.00	2120.00	19100.50

Source : District statistic magazine and secondary data

### 3.8 Hydrology and water resource

#### 3.8.1. Table no 23: Hydrology status

S.No.	Name of Project	Item	Unit of measurement	Status
1	IWMP 2 <sup>nd</sup> Moradabad	Status of water table	Meters	15-16 mt
2		Ground water structures repaired/ rejuvenated	No.	-
3		Quality of drinking water	Quality	Poor
4		Availability of drinking water	Days	300
5		Irrigation potential	%	4

#### 3.8.2. Water Resource

**Table no. 24: Information about water resources**

S. N.	Name of Micro Watershed	Canal		Wells/Borewells		Tubewells		Ponds		Govt. handpump		Pvt. handpumps		Others	
		D	N	D	N	D	N	D	N	D	N	D	N	D	N
1	2B5A6e1d	-	-	325	4	250	3	310	5	235	12	284	26	-	-
2	2B5A6e1c	-	-	325	7	250	5	310	7	235	18	284	42	-	-
3	2B5A6e1b	-	-	325	2	250	2	310	9	235	14	284	10	-	-
4	2B5A6d2e	-	-	325	9	250	3	310	6	235	18	284	12	-	-

5	2B5A6d2d	-	-	325	4	250	3	310	5	235	12	260	26	-	-
6	2B5A6d2c	-	-	325	7	250	5	310	7	235	18	284	32	-	-
7	2B5A4d1d	-	-	325	4	250	3	310	5	235	12	260	26	-	-
8	2B5A6d1f	-	-	325	7	250	5	310	7	235	18	284	32	-	-
9	2B5A4b5	-	-	325	4	250	3	310	5	235	12	260	26	-	-

**D= Availability of water in days**

**N= Number**

Source : District statistic magazine and secondary data

### **3.9 PROBLEMS AND NEEDS OF THE AREA**

#### **3.9.1 Problem Identification and prioritization**

Food sufficiency, economic growth and environmental security were identified as the major issues to be addressed in the watershed area. The area has undulating topography, steep unstable slopes, and excessive channel gradient and hence highly prone to soil erosion. Effective soil depth is limited and spatially highly variable hampering good crop growth (Table 11).

Problems identified and prioritized during the transact walk and PRA exercises in all the villages of this IWMP I<sup>st</sup> watershed were pooled and a list of nine problems representing the whole watershed was prepared. Problems were ranked as per their total weight age in the three villages. Lack of irrigation water was the greatest problem experienced by the people followed by low production of field crops, lack of fodder availability and low animal productivity (Annexure- I).

Strength, weakness, opportunity and threat (SWOT) analysis is a useful decision support tool, A SWOT analysis of the Micro watersheds is presented in Table.

**Table no. 25: Problem identification and prioritization for Micro Watersheds**

<b>S. No.</b>	<b>Problem</b>	<b>Rank</b>
1	Low production of field crops	2
2	Lack of drinking water	3
3	Lack of irrigation water	1

4	Low production of fish	5
5	Non-availability of fuel wood	7
6	Lack of inputs like quality seeds, fertilizer, pesticides ets.	9
7	Lack of market facility	8
8	Lack of medical, educational and transportation facilities	4
9	Medical and Health care facilities for milching animals and low productivity.	6

**Table no. 26: SWOT analysis of the Micro Watersheds**

Strengths (S)		Weakness (W)	
1	Cooperative work culture in traditional activities.	1	Poor water management
2	Close ethnic ties	2	Resource poor farmers
3	Road at the top as well as outlet of the watershed	3	Out migration of youth
4	Hard working	4	Low and erratic rainfall
5	Resource pool of crop genetics diversity	5	Fragile geology
6	Awareness of farmers about watershed management programme	6	Fragmented land holding
7	Well established CPR maintaining and sharing system	7	Heavy infestation of wild animals
8	Stall feeding of animals	8	Problem of fuel and fodder
9	Well maintained seasonal water bodies	9	Shallow soil depth and with high percentage of gravel
10	Social outlook of the community towards land less		
Opportunities (O)		Threats (T)	
1	Wide range of annual and perennial crops	1	Prone to adverse climate like drought

2	Scope of regular employment opportunities to check out migration	2	High market risk
3	Strengthening of existing irrigation system	3	Social conflicts owing to PRI and WSM polices and local politics
4	Conducive climate for rainfed crop diversification	4	Weak coordination among line departments
5	Good scope for Agro forestry and dry land horticulture	5	Lack of expertise of implementing agency in different aspects of WSM
6	Potential for collective action and management of CPR		

## 4. INSTITUTION BUILDING AND PROJECT MANAGEMENT

### 4.1 Participatory Rural Appraisal (PRA)

The past experience of watershed has given tremendous input to focus on creating accountability of the stakeholders towards the programme. This has created an emphasis to include the all stakeholders' communities and their local indigenous technological knowledge while planning for any activity. Participatory approach provides a new path for planning, implementing, monitoring and post withdrawal activities with a complete accountability of the stakeholders. Various PRA techniques like resource mapping, social mapping, matrix ranking and season calendar were used to understand the physical and social orientation of the village in general and watershed specific. These tools put the villagers in ease than the complicated questionnaires. Various tool like matrix ranking, Venn diagramme were used to identify various local vegetation (apt for afforestation), fodder crops, various institution and their significance in the life of the farmers.

### 4.2 Social Mobilization and Community Organization

**Table no. 27: Physical outlays oh PIA,U.G., S.H.G., W.D.T. and W.C.**

S. No.	Name of watershed	Code No.	U.G. (No.)	SHG (No.)	WDT (No.)	PIA	WC (No.)
1	Syorajpur	2B5A6e1d	0	4	1	1	1
2	Nadhosh	2B5A6e1c	0	1			1
3	Chopa Shobhapur	2B5A6e1b	0	10			1
4	Khajra Khakam	2B5A6d2e	0	10			1

5	Sadatwari	2B5A6d2d	0	5			1
6	Arjunpur Juna	2B5A6d2c	0	7			1
7	Kisoli	2B5A4d1d	0	11			1
8	Pathakpur	2B5A6d1f	0	6			1
9	Machkhera	2B5A4b5	0	20			1

#### 4.2.1 Watershed Committee

Watershed committee has been constituted in all nine nos of micro-watersheds partially by WDT and Gram Sabha village of micro watershed. Capacity building trainings will be given to the watershed committee has been by WDT. The watershed committee has a pivotal role to play during and after the project implementation period. Detail of W.C. is given below

**Table no. 28: Details of Watershed Committees (WC)**

S. No.	Name of Watershed & Code	Date of Formation	Name of President	Name of Secretary	Member of User Group	Member of SHG	Female Member	SC Member	Landless Member	Ward Member	Work in Charge & WDT Member
1	2	3	4	5	6	7	8	9	10	11	12
1	Syorajpur 2B5A6e1d	5-2-11	Veeral	Rahul Yadav	Bhoodev Dharmveer Chandrapal	Kirpal Santosh Devpal	Smt. Laxmi	Sompal	Chandra Prakash	Jasveer Maya Devi	R.D.Sharma P.C.Sharma
2	Nadhosh 2B5A6e1c	7-2-11	Rajendra	Tinak	Prem Singh Ramesh Chandr Iswar Das	Anwar Manveer Dalveer	Smt. Radha	Amar Singh	Mehandi Hussan	Makkhan Singh Ramprakash	Vikram Singh P.C.Sharma
3	Chopa Shobhapur 2B5A6e1b	8-2-11	Shubash Chand	Sunil Kumar	Prem Sankar Ganshyam Chandra Prakash	Narendra Jitendra Umesh	Smt. Bhoori	Karu	Rambhaja n	Abhirai Jai Pal	Vikram Singh P.C.Sharma
4	Khajra Khakam 2B5A6d2e	9-2-11	Mukesh	Surendra Pal	Mannu Singh Satprakash Sharma Dinesh Kumar	Km. Pooja Shalendra Ravendra	Km. Rachna	Kallu	Pooran	Satendra Latoori	A.K.Parihar A.K.Verma
5	Sadatwari 2B5A6d2d	14-2-11	Sri Prakash	Sriram Sharma	Satveer Singh Ramaotar Verendra Singh	Kallu Bhole Kuwarpal	Smt. Neeru	Kishanlal	Ramsevak	Brahmpal Ramwati	Nakshatra Singh A.K.Verma
6	Arjunpur Juna 2B5A6d2c	17-2-11	Jaipal	Tilak Singh	Veeral Singh Hazarilal Badam Singh	Ram Kumar Jeet pal Arvind	Smt. Veermati	Jitendra	Beerbal	Mahendra Bhoop Singh	Rajendra Prashad A.K.Verma
7	Kisoli 2B5A4d1d	28-6-11	Talewar Singh	Abhishek kumar	Amit Kumar Bhrampal	Avdhesh Ranveer	Smt. Ramwati	Amarpal	Rajkumar	Krishanpal Pan singh	R.D.Sharma P.C.Sharma

					<b>Rambhadur</b>	<b>Vijendra</b>					
<b>8</b>	Pathakpur 2B5A6d1f	<b>18-2-11</b>	<b>Balveer</b>	<b>Arun</b>	<b>Nathu Dular Praveen</b>	<b>Umesh Laxmi Smt. Sonu</b>	<b>Smt. Kusum</b>	<b>Nareshpal</b>	<b>Omkar</b>	<b>Jairam Smt Nerawati</b>	<b>A.K.Parihar A.K.Verma</b>
<b>9</b>	Machkhera 2B5A4b5	<b>27-6-11</b>	<b>Kunwarpal</b>	<b>Munesh kumar</b>	<b>Rajveer Shubashchand Naresh Singh</b>	<b>Brahmpal Vijendra Maheshchand</b>	<b>Smt. Chandrawati</b>	<b>Jitendra Singh</b>	<b>Ram Kishor</b>	<b>Smt. Manwati Gangaram</b>	<b>Sanjay Kr. A.K.Verma</b>

## Detail of Gram Panchayat wise Committee

S. No	Name of Gram Panchyat/	Date of Formation	Name of President	Name of Secretary	Member of User Group	Member of SHG	Female Member	SC Member	Landless Member	Work in Charge	WDT Member
1	Chatan	11-06-2010	Netrapal	Shripal	Naresh Pal Ram Nivas	Smt.Geeta Devi Smt. Vimlesh	Smt.Suman	Sher Singh	Jagdeesh	Sanjay Kumar	A.K.Verma
2	Partappur	13-06-2010	Virendra Singh	KishanPal	Virendra , Ompal	Bhagwan Das,Mahaveer	Smt.Gyanwati	Kanhai	JawaharLa l	Sanjay Kumar	A.K. Verma
3	Bhapurpatti- prahlad	11-06-2010	Omprakash	Vijendra Singh	Ikrar,	Raju, Rajendra, Somveer	Smt. Sheela	Tarachandr a	Kishanveer	A.K. Parihar	A.K.Verma
4	Naroda	19-06-2010	Sompal	Ramkumar	Tetaram , Gajendra	-	Smt.Virmavati	Ramkumar	Happu	Nakchatra Singh	A.K.verma
5	Sadatwari	22-06-2010	Kallupal	Bhupkishore	Babu, Natthu	Rambux, Bhurai	Smt.Gajrani	Ramshaiva k	Bhup Singh	Nakchatra Singh	A.K.Verma
6	Sultanpur Khurd	28-06-2010	Lotan Singh	Jagdesn Singh	Bhagat Singh, Lakpat	Mohar Singh, Vishan Lal	Smt. Valesh	Ramkumar	Teekam Singh	Nakchatra SIngh	A.K.Verma
7	Kirari	Under Progress	Vijaypal Singh	Sant Kumar	Nathu Singh Rahde Shyam Dinesh	Satish Gulab jain Sunil	Smt. Rahjo	Brajbashi	Krishanpal	R.D.Sharm a	P.C.Sharma
8	Dilgora	Under Progress	Shodan Singh	Satpal	Alwale Syuraj Devendra	Dalveer Rajnish Yasveer	Smt. Yashodha	Mashichara n	Mahendra singh	R.D.Sharm a	P.C.Sharma
9	Syorajpur	Under Progress	Rakesh	Chandra kesh	Dindayal Bhure Randas	Jaisankar Drampal Satendra	Smt. Veermati	Harkisan	Chotte lal	R.D.Sharm a	P.C.Sharma



10	Arjunpur juna	Under Progress	Shila devi	Avdeshchandra	Umesh Gulfan Ompal	Satendra Mahipal Udayveer	Smt. Kushum	Rambabu	Leyakat	A.K. Parihar	A.K.Verma
11	Pathakpur	Under Progress	Rajpal	Nor Mohmad	Sompal Rajendra singh Ali Husan	Umasankar Panvesbri Jayanti	Smt. Rekha	Rishipal	Ramesh	A.K. Parihar	A.K.Verma
12	Kajra Khakam	Under Progress	Smt. Pinky	Shishupal	Rajveer Kushiram Radhe Shyam	Raju yadav Kuldeep yadav Shurendra	Smt. Neeresh	Dalveer	Gubhan	A.K. Parihar	A.K.Verma
13	Methra Allpur	Under Progress	Dalpat singh	Syoraj	Babau Rajendra Talewar Shompal Ramsharan	Dalchand Sarla Bhavna	Madhuwala	Bhimpuri	Umesh	A.K. Parihar	A.K.Verma
14	Rangrgh	Under Progress	Awrar	Avdesh	Prakash Mahipal Lakhpal	Ashok Shiv Dayal Jogendra	Ram Pyari	Devraj	Roshan	A.K. Parihar	A.K.Verma
15	Mau Kather	Under Progress	Jhetendra	Rajveer	Nagendra Kirpal Baburam	Bhagwaan Das Dalveer Kishan Lal	Rajkumari	Praaveen	Ram Niwas	A.K. Parihar	A.K.Verma

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S. No	Name of Gram Panchayat	Date of formation	Name of president	Name of secretary	Member of UGs	Members of SHG	Female Member	SC Member	Landless Member	Work in charge	WDT member
16	Mach Kehra	Under Progress	Hariom	Khelas singh	Ompal singh Narendra pal Udayveer	Ramesh Rajesh Prempal	Smt. Chandrakanta	Yashveer singh	Tarachandra	Sanjay	A.K. Verma
17	Fareedpur	Under Progress	Shahid Ali	Feroj	Pappu Shuvrati Gajendra	Pappu Jetendra Hosiyaar	Munni Devi	Ranjeet	Harish	Vikram	P.C.Sharma
18	Chopa Shobhapur	Under Progress	Amar Singh	Ram barose	Ram Kishan Karan Singh	Raju Narendra	Smt. Kranti	kusrush	Shuresh	Vikram	P.C.Sharma

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					Ram Gopal	Amit					
19	Mohkampur	Under Progress	Mahendra	Mukesh	Chandra Kesh Chedha Lal Kallu	Visan singh Bhikam singh Jaisankar	Smt. Sheema Devi	Satypal	Manveer	Vikram	P.C.Sharma
20	Nadosh	Under Progress	Mahesh	Mohan Singh	Harish Hariom Lal Singh	Harpal Mahendra Prempal	Smt. Rajnesh	Har Saroop	Nazeerr	Vikram	P.C.Sharma

#### 4.2.2 Watershed Development Team

As per as common guide line direction/ instruction given in para 5.3 point 40 P.I.A. has been constitute watershed development team as given below

**Table no.29 : Details of Watershed Development Teams (WDTs) in the project area**

<i>S. No.</i>	<i>Name of the PIA</i>	<i>Name of the water shed</i>	<i>Names of WDT members</i>	<i>M/F</i>	<i>Age</i>	<i>Qualification/ Experience</i>	<i>Description of professional training</i>	<i>Role/ Function##</i>	<i>Date of appointment of WDT member</i>
1	2	3	4	5	6	7	8	9	10
1	Bhomi Sanrakshan Adhikari Land development and water resources Department Moradabad (U.P.)	IWMP-II <sup>nd</sup>	Sri N. C Sharma	M	62	B. Sc. Ag	40 years experience in soil conservation/ agronomy	Agriculture expert	7-6-2010
			Sri M. P. Singh	M	64	B. Sc.Ag	35 years experience in soil conservation/ agronomy	Agriculture expert	
			Sri P C Sharma	M	55	Intermediate Civil Diploma	29 years experience in soil & water management	Soil & Water management	
			Sri A. K. Verma	M	55	MA Agriculture Diploma	29 years experience in soil & water management	Soil & Water management	

			Sri Sanjay Kumar	M	40	M Sc Ag	7 years experience in watershed programme	Soil science	
			Smt. Mamta Rani Gupta	F	33	MA	3.5 years experience in social work	Social Mobilizer	

#### 4.2.3 Self Help Group

Self Help Groups have been constituted by W.C. in all micro watershed for generating income & improved their social status with the help and financial support through scheme by technical support of P.I.A., detail of 74 SHG<sub>s</sub> is given below

**Table no. 30 SHG detail**

#### ***FORMATION OF SELF HELP GROUP IWMP – II***

<i>Micro Watershed code &amp; name</i>	<i>Name Of Village</i>	<i>Name of SHG</i>	<i>Date formation</i>	<i>Representative I</i>	<i>Representative II</i>	<i>Work</i>
2B5A6e1d Syorajpur	Syorajpur	Kirpal	27-1-11	Kirpal	Jaisankar	Animal husbandry
	Pagona	Jaldhara Dharma	28-1-11	Omkar manveer	Kamal singh Rupesh	Animal husbandry Animal husbandry
	Dilghora	Jaishree	28-1-11	Dalveer	Rajnesh	Animal husbandry
2B5A6e1c Nadosh	Nadosh	Hari	27-1-11	Mhendi hasan	Harpal	Animal husbandry
2B5A6e1b Chopa Shobhapur	Chopa shobhapur	Neeraj Veer	24-1-11	Raju Narendrapal	Rajveer Amit	Animal husbandry Animal husbandry
	Faredpur kushal	Hoshiyar Raja Abhimanyu	24-1-11	Ramjeet Jetendra kumar Jetendra	Hoshiyar singh Pappu Bhup singh	Animal husbandry Animal husbandry Animal husbandry
	Mhokampur	Sundar Akbar Janki Tej Bheekam	25-1-11	Manveer Rampal Bhusankar Vijaypal Vishnu	Mohan Yadram Shurajpal Sanjeev Bhekam singh	Animal husbandry Animal husbandry Animal husbandry Animal husbandry Animal husbandry
2B5A6d2e	Sultanpur Khurd	Basnti	19-2-11	Satiesh	Satpal	Animal husbandry

Khajra Khakam		Hariom Insaf		Kamla devi Jahied	Gyan singh Javed	Animal husbandry Goat Keeping
	Shadatwari	Pooran Ganga Nawal Meena Veerwala Saroj Charan	8-2-11	Surendra Kallu Hariom Jeetpal Meera Shripal Umesh	Neterpal Roop Kishor Azadi Ranveer Smt. Vinod Surendra Naresh	Animal husbandry Goat Keeping Animal husbandry Animal husbandry Tailoring Animal husbandry Animal husbandry
2B5A6d2d Sadatwari	Sherua	Jashoda Suevesh Rohan Dinesh Bhagwan	17-1-11	Shada Ramshree Bhole Vijevdra Bhagwan das	Pradeep Nandram Rodas Ramprakash Neeraj	Animal husbandry Animal husbandry Animal husbandry Animal husbandry Animal husbandry
2B5A6d2c Arjunpur juna	Arjunpur juna	Gopi Vijay Bhoodevi Uday Swami Kumar Rashi	18-1-11	Asheram Raheshpal Mahipal Satendra Hariom Veresh Viresh	Manoj Rampal Papu Arvind Pretamber Upendra Beerpal	Animal husbandry Animal husbandry Animal husbandry Animal husbandry Animal husbandry Animal husbandry Animal husbandry
2B5A4d1d Kisoli	Gashipur	Sudha ashok	20-1-11	Sunil gaurav	Shivam Kamlesh	Animal husbandry Animal husbandry
	Rafipur	Geeta Kasturi Jai	20-1-11	Kamesh Dinesh Ranveer	Vedpal Agarpal Devendra	Animal husbandry Animal husbandry Animal husbandry
	Kerari	Jayanti Suhaga Banshi Kavita Prabha Tilak	28-1-11	Vejendra Rakesh Lokhi Gulab jain Satish Sant kumar	Kisanpal Madan Chandra hans Kapil Sunil Hem singh	Animal husbandry Piggery Animal husbandry Animal husbandry Animal husbandry Animal husbandry
2B5A6d1f Pathakpur	Patakpur	Vikas Maharani	18-1-11	Neeraj yadav Gyanwati	Sonu yadav Arvind	Animal husbandry Animal husbandry
	Khajra khakam	Mohar Manoj	19-1-11	Raju yadav Manoj	Kuldeep yadav Surendra	Animal husbandry Animal husbandry
	Barkheda	Pravesh Indra	25-1-11	Rekha Shuleman	Sonu Chetram	Tailoring Animal husbandry
2B5A4b5 Mackhera	Naglia Bhurd	Krishna	22-1-11	Nathu Sungh	Mahendra wati	Animal husbandry
	Bhapurpatti	Hussain Prem Gauri	25-1-11	Kurshid Yaspal Neetu	Rubi Ramkishor Suman	Animal husbandry Animal husbandry Tailoring

	Bhapurpatti ashalat	Usha Jagdish Tulsi	25-1-11	Jitendra Surendra Narendra	Surajbhaan Vijendra Krisan Kumar	Animal husbandry Animal husbandry Animal husbandry
	Maun kather	Dalveer Santosh	21-1-11	Pan singh Ram nivas	Dalveer Tekaram	Animal husbandry Animal husbandry
	Mackheda	Kishan Murari	21-1-11	Pankor Murari lal	Priyanka rani Dhamendra	Animal husbandry Animal husbandry
	Ramgrad	Anokhe Dayal	22-1-11	Lala rosan Shiv dayal	Noshe Ashok	Animal husbandry Animal husbandry
	Manona	Raj Badhah Vijay Madan	22-1-11	Raj kumar Jogendra Rajveer Madan singh	Foolwari Om Balveer Mahesh	Animal husbandry Animal husbandry Animal husbandry Animal husbandry
	Methraalpur	Chandra Anita	27-1-11	Mahesh pal yadav Captan	Premchandra Kiranpal	Animal husbandry Animal husbandry
	Pipli	Sapna	21-1-11	puspendra	Vimal	Animal husbandry

#### 4.2.4 User Group

The following user's group are identified and constituted in all micro watershed committee in presence of Watershed Development Team for implementation of watershed work proper use and management of all engineering and vegetative measure to be creating/ constructing under watershed through scheme. Detail of user's group are given below

**Table no. 31: UGs detail**

S.No.	Names of Watershed	Total no. of registered UGs				No. of Members				No. of SC/ST in each category			No. of BPL in each category			Date of formation of UGs
		With only Men	With only Women	With Both	Total	Categories	M	F	Total	M	F	Total	M	F	Total	
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>	<b>13</b>	<b>14</b>	<b>15</b>	<b>16</b>	<b>17</b>
1.	2B5A6e1d	0	1	2	3	(i) Landless	5	11	16	8	9	3	5	2	7	UNDER PROCESS
						(ii) SF	12	3	15	4	1	5	3	1	4	
						(iii) MF	7	-	7	2	-	2	3	-	3	
						(iv) LF	3	-	4	-	-	-	-	-	-	

	<b>Total</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>		<b>27</b>	<b>19</b>	<b>46</b>	<b>14</b>	<b>11</b>	<b>10</b>	<b>11</b>	<b>3</b>	<b>14</b>	
2	<b>2B5A6e1c</b>	0	0	3	3	(i) Landless	5	2	7	2	1	3	5	2	7	
						(ii) SF	12	3	15	4	1	5	3	1	4	
						(iii) MF	7	-	7	2	-	2	3	-	3	
						(iv) LF	3	-	4	-	-	-	-	-	-	
	<b>Total</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>3</b>		<b>27</b>	<b>5</b>	<b>32</b>	<b>8</b>	<b>2</b>	<b>10</b>	<b>11</b>	<b>3</b>	<b>14</b>	
3	<b>2B5A6e1b</b>	0	0	3	3	(i) Landless	7	3	10	3	2	5	5	2	7	
						(ii) SF	11	5	16	4	2	6	3	2	5	
						(iii) MF	5	-	5	3	-	3	2	-	2	
						(iv) LF	3	1	4	-	-	-	-	-	-	
	<b>Total</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>3</b>		<b>26</b>	<b>9</b>	<b>35</b>	<b>10</b>	<b>4</b>	<b>14</b>	<b>10</b>	<b>4</b>	<b>14</b>	
4	<b>2B5A6d2e</b>	0	0	3	3	(i) Landless	5	2	7	2	1	3	5	2	7	
						(ii) SF	12	3	15	4	1	5	3	1	4	
						(iii) MF	7	-	7	2	-	2	3	-	3	
						(iv) LF	3	-	4	-	-	-	-	-	-	
	<b>Total</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>3</b>		<b>27</b>	<b>5</b>	<b>32</b>	<b>8</b>	<b>2</b>	<b>10</b>	<b>11</b>	<b>3</b>	<b>14</b>	

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
5	<b>2B5A6d2d</b>	0	0	3	3	(i) Landless	5	2	7	2	1	3	5	2	7	UNDER PROCESS
						(ii) SF	12	3	15	4	1	5	3	1	4	
						(iii) MF	7	-	7	2	-	2	3	-	3	
						(iv) LF	3	-	4	-	-	-	-	-	-	
	<b>Total</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>3</b>		<b>27</b>	<b>5</b>	<b>32</b>	<b>8</b>	<b>2</b>	<b>10</b>	<b>11</b>	<b>3</b>	<b>14</b>	
6	<b>2B5A6d2c</b>	0	0	1	1	(i) Landless	2	2	4	1	1	2	1	1	2	
						(ii) SF	3	-	3	-	-	-	-	-	-	
						(iii) MF	2	-	2	-	-	-	-	-	-	
						(iv) LF	1	-	1	-	-	-	-	-	-	
	<b>Total</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>3</b>		<b>27</b>	<b>5</b>	<b>32</b>	<b>8</b>	<b>2</b>	<b>10</b>	<b>11</b>	<b>3</b>	<b>14</b>	

7	<b>2B5A4d1d</b>	0	0	3	3	(i) Landless	6	2	8	2	1	3	5	2	7
		(ii) SF	11	4	15	4	1	5	3	1	4				
		(iii) MF	7	-	7	2	-	2	3	-	3				
		(iv) LF	3	-	4	-	-	-	-	-	-				
	<b>Total</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>3</b>		<b>28</b>	<b>5</b>	<b>33</b>	<b>8</b>	<b>2</b>	<b>10</b>	<b>11</b>	<b>3</b>	<b>14</b>
8	<b>2B5A6d1f</b>	0	1	2	3	(i) Landless	5	11	16	8	9	3	5	2	7
		(ii) SF	12	3	15	4	1	5	3	1	4				
		(iii) MF	7	-	7	2	-	2	3	-	3				
		(iv) LF	3	-	4	-	-	-	-	-	-				
	<b>Total</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>3</b>		<b>27</b>	<b>19</b>	<b>46</b>	<b>14</b>	<b>11</b>	<b>10</b>	<b>11</b>	<b>3</b>	<b>14</b>
9	<b>2B5A4b5</b>	0	0	2	2	(i) Landless	4	1	5	1	1	2	1	1	2
		(ii) SF	9	1	10	4	1	5	2	1	3				
		(iii) MF	5	-	5	2	-	2	3	-	3				
		(iv) LF	2	-	2	-	-	-	-	-	-				
	<b>Total</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>2</b>		<b>20</b>	<b>2</b>	<b>22</b>	<b>7</b>	<b>2</b>	<b>9</b>	<b>6</b>	<b>2</b>	<b>8</b>

(M- Male, F- Female)

#### 4.2.5 Focused group discussion during PRA





## FOCUSSED GROUP DISSCUSSION

### 4.3 PROJECT IMPLEMENTING AGENCIES

U.P. Government, Land Development & Water Resources Department Section-1 Lucknow has nominated as PIA to Bhoomi Sanrakshhan Unit, Land Development & Water Resources Department Moradabad for IWMP IInd vide letter no-1394/54-1-10-1(9)/2008 TC dated 22-9-2010

**Table no. 32: Project Implementing Agency (PIA)**

S.No.	Particulars of PIA		Type of organization
(i)	Date of selection of PIA	22-9-2010	A Line Deptt.
(ii)	Type of organization	Govt. organization	
(iii)	Name of organization #	DOLR	
(iv)	Designation & Address	BSA, LDWR, Moradabad	
(v)	Telephone	0591-2480554	
(vi)	Fax`	--	
(vii)	E-Mail	bsargcp.moradabad@gmail.com	



# Only the letter assigned to each type, as given below, needs to be typed.

- |   |                         |   |                             |
|---|-------------------------|---|-----------------------------|
| A | Line Dept.              | B | Autonomous organization     |
| C | Govt. Institute         | D | Research Bodies             |
| E | Zila Parishad           | F | Intermediate Panchayat      |
| G | Voluntary Organisations | H | Any other (please specify). |

**Table no 33: Staff at PIA level**

S.N.	Name	Designation	Qualification
1	2	3	4
1	Sri. Mool Chand Saini	Bhoomi Sanrakshan Adhikari	Intermediate, Graduate in Civil Engg.
2	Sri. Pooran Chandra Sharma	Junior Engineer	Intermediate, Civil Engg. Diploma
3	Sri. Ashok Kumar Verma	Junior Engineer	M.A., Diploma in Agriculture Engg.
4	Sri. Pramod Kumar	Accountant	M.Com., L.L.B.
5	Sri. Ram Babu Sharma	Sr. Clerk	M.A., L.L.B.
6	Sri. Satiesh Kumar Verma	Draughtsman	M.A., Diploma in Draughtsman (Civil)
7	Sri. Bhagwan Dass	Tracer	Intermediate
8	Sri. Vikram Singh	A.S.C.I.	M.Sc. Ag.

9	Sri. Sanjeev Kumar	A.S.C.I.	M.Sc. Ag.
10	Sri. Sanjay Kumar	A.S.C.I.	M.Sc. Ag.
11	Sri. Ashok Kumar Parihar	Work Incharge	M.A.
12	Sri. Ram Dev Sharma	Work Incharge	Intermediate
13	Sri. Rajendra Prasad	Work Incharge	Intermediate
14	Sri. Nakshatra Singh	Work Incharge	B.A.
15	Sri. Rajesh Kumar	IVth Class	B.A.
16	Sri. Pradeep Kumar	IVth Class	VIIIth

#### **4.4 Project Implementation Strategy**

Watershed management as a strategy has been adopted by Government of India especially in the rainfed region of semi arid tropics. These region are characterized by low and undependable rain, low soil fertility, poor infrastructure development, low literacy and high incidence of migration. Several studies have identified that there is a dire need of a systematic and scientific approach to deal with the watershed development. The common guideline generates a fresh and flexible framework for the next generation watershed development.

##### **4.4.1 Scientific Planning**

###### **i) Cluster Approach**

This envisages a broader vision of Geo-hydrological unit which involves treating a cluster of micro watershed. The IWMP 2<sup>nd</sup> Moradabad watershed project consist of nine micro watershed

###### **ii) Base line Survey**

To access the impact of any watershed development programme a detailed baseline survey has to be conducted. This acts a benchmark for any intervention during and post implementation of any development programme. A detailed baseline survey was undertaken which involved household census survey, Bio-physical survey and Village level data collection from *PIA*. Household census survey includes a detailed questionnaire which was been filled by visiting each and every household in the village. This gave in the details of the demographic profile of the village, the literacy percentage, SC/ST population, number of BPL household, cattle population, net consumption rate in the IWMP-2<sup>nd</sup>, average milk production of the cattle and various schemes running and their benefits. Bio-physical survey was undertaken to identify various natural resources available in the village. It included the soil typology, well in the area, crop taken in the field, Cropping pattern, fertilizer used and various sources of irrigation in the field.

### **iii) Participatory Rural Appraisal (PRA)**

The past experience of watershed has given tremendous input to focus on creating accountability of the stakeholders towards the programme. This has created an emphasis to include all the stakeholder communities and their local and indigenous Technological Knowledge (ITK) while planning for any activity. Participatory approach provides a new path for planning, implementing, and monitoring

and post- withdrawal activities with a complete accountability of the stakeholders. Various PRA techniques like resource mapping, social mapping, and season calendars were used to understand the physical and social orientation of the village in general and watershed in specific. These tools put the villagers in ease than the complicated questionnaires. Various tools like Matrix ranking, Venn diagram were used to identify various local vegetations (apt for afforestation), Fodders crops , various institution and their significance in the life of the farmers

### **iv) Use of GIS and Remote Sensing for planning**

Use of various high science tools has been promoted at various stages of watershed development.

#### **a) Prioritization**

Geographical Information System (GIS) has been used for prioritization process. Various layer maps were created like Geomorphological, Soil, BPL Population, SC/ST population, Ground water Status, Drinking water situation Slopee percent. These were all given proper weight age according to the DOLR specification. This helped in prioritization of various watershed areas.

## b) Planning

A action plan matrix was formulated by State Level Nodal Agency (SLNA) taking into account various features like the slope percent, soil Depth, Soil Texture, Soil erosion in the area for wasteland, forest land and agricultural land. Global positioning System (GPS) was used to identify each and every water conservation structures available in the project area. This was used to create a map. Contour Map of vertical interval of 1 meter at a scale of 1:8000 was used for identifying various locations for soil and water conservation structures.

## c) Hydrological modelling

Hydrology modelling technique was used for locating drainage, stream length, flow direction, sink, and flow accumulation. This model overlaid over cadastral map to calculate the catchments area of each structures like the gully plug etc. This has helped to remove the human error which generally occurs while calculating the catchments area of a check dam.

**Table no. 33: Details of Scientific Planning and Inputs in IWMP projects**

Scientific criteria/ inputs used	Whether scientific criteria was used
1	2
<b>(A) Planning</b>	
Cluster approach	Yes
Whether technical back-stopping for the project has been arranged? If yes, mention the name of the Institute	
Baseline survey	Yes
Hydro-geological survey	Yes
Contour mapping	Yes
Participatory Net Planning (PNP)	Yes
Remote sensing data-especially soil/ crop/ run-off cover	

Ridge to Valley treatment	
Online IT connectivity between	
(1) Project and DRDA cell/ZP	Yes
(2) DRDA and SLNA	Yes
(3) SLNA and DOLR	Yes
Availability of GIS layers	
1. Cadastral map	Yes
2. Village boundaries	Yes
3. Drainage	Yes
4. Soil (Soil nutrient status)	Yes
5. Land use	Yes
6. Ground water status	Yes

1	2
7. Watershed boundaries	Yes
8. Activity	Yes
Crop simulation models#	No
Integrated coupled analyzer/ near infrared visible spectroscopy/ medium spectroscopy for high speed soil nutrient analysis	No
Normalized difference vegetation index (NDVI)#	No
Weather Station	
<b>(B) Inputs</b>	No
1. Bio-pesticides	No
2. Organic manures	Yes
3. Vermicompost	Yes

4. Bio-fertilizer	Yes
5. Water saving devices	Yes
6. Mechanized tools/ implements	Yes
7. Bio-fencing	Yes
8. Nutrient budgeting	No
9. Automatic water level recorders & sediment samplers	No

#### 4.5 Convergence of watershed programmes

- 4.5.1 Earthen bund, contour bund, percolation tank, injection well will be made in watershed area convergence with MNREGS
- 4.5.2 Soil health card, crop demonstration, kisan gosthi, kisan mela, farmer's school also organized in watershed area under many scheme of department of Agriculture.
- 4.5.3 Composite fish farming or mixed fish farming popularized in this area with Department of fisheries.
- 4.5.4 Animal health camp, fodder development, vaccination work also made through Veterinary Department.
- 4.5.5 Aforestation in project area also done with Forest Department.
- 4.5.6 Dry land horticulture also convergence with department of horticulture.

**Table no. 34 : Details of Convergence of other Schemes in the Project area with IWMP Project**

S.No.	Name of the MW	Names of Departments with Schemes converging with IWMP*	Fund made available to IWMP project due to convergence (Rs. In lakh)	Was this fund included in Rs. 12,000/15,000 Per ha		Name of activity/task/structure undertaken with converged funds (a) Structures (b) Livelihoods (c) Production System	Reference no. of activity/task/structure in DPR	Level at which decision for convergence was taken \$
				Yes	No			
1	2	3	4	5	6	7	8	9
1	2B5A6e1d	MNREGS	4.00		No	a	5	DRDA
		DA	0.40		No	b, c	5	PIA
		DHO	0.10		No	b, c	5	PIA
		DF	0.20		No	b, c	5	PIA
		F	0.30		No	b, c	5	PIA
		<b>Total</b>	<b>5.00</b>		No			
2	2B5A6e1c	MNREGS	15.00		No	a	5	DRDA
		DA	1.50		No	b, c	5	PIA
		DHO	0.30		No	b, c	5	PIA
		DF	0.40		No	b, c	5	PIA
		F	0.30		No	b, c	5	PIA

3	<b>2B5A6e1b</b>	<b>Total</b>	<b>17.50</b>		No			
		MNREGS	17.00		No	<b>a</b>	<b>5</b>	DRDA
		DA	1.70		No	<b>b, c</b>	<b>5</b>	PIA
		DHO	0.50		No	<b>b, c</b>	<b>5</b>	PIA
		DF	0.50		No	<b>b, c</b>	<b>5</b>	PIA
		F	0.30		No	<b>b, c</b>	<b>5</b>	PIA
4	<b>2B5A6d2e</b>	<b>Total</b>	<b>19.00</b>		No			
		MNREGS	14.00		No	<b>a</b>	<b>5</b>	DRDA
		DA	1.40		No	<b>b, c</b>	<b>5</b>	PIA
		DHO	0.30		No	<b>b, c</b>	<b>5</b>	PIA
		DF	0.40		No	<b>b, c</b>	<b>5</b>	PIA
		F	0.45		No	<b>b, c</b>	<b>5</b>	PIA
5	<b>2B5A6d2d</b>	<b>Total</b>	<b>16.55</b>		No			
		MNREGS	5.00		No	<b>a</b>	<b>5</b>	DRDA
		DA	0.50		No	<b>b, c</b>	<b>5</b>	PIA
		DHO	0.20		No	<b>b, c</b>	<b>5</b>	PIA
		DF	0.20		No	<b>b, c</b>	<b>5</b>	PIA
		F	0.20		No	<b>b, c</b>	<b>5</b>	PIA
		<b>Total</b>	<b>6.10</b>		No			

1	2	3	4	5	6	7	8	9
6	<b>2B5A6d2c</b>	MNREGS	8.00		No	<b>a</b>	<b>5</b>	DRDA
		DA	0.60		No	<b>b, c</b>	<b>5</b>	PIA
		DHO	0.30		No	<b>b, c</b>	<b>5</b>	PIA
		DF	0.30		No	<b>b, c</b>	<b>5</b>	PIA
		F	0.25		No	<b>b, c</b>	<b>5</b>	PIA
				<b>Total</b>	<b>9.45</b>		No	
7	<b>2B5A4d1d</b>	MNREGS	11.00		No	<b>a</b>	<b>5</b>	DRDA
		DA	0.90		No	<b>b, c</b>	<b>5</b>	PIA
		DHO	0.40		No	<b>b, c</b>	<b>5</b>	PIA
		DF	0.45		No	<b>b, c</b>	<b>5</b>	PIA
		F	0.60		No	<b>b, c</b>	<b>5</b>	PIA
				<b>Total</b>	<b>13.35</b>		No	
8	<b>2B5A6d1f</b>	MNREGS	20.50		No	<b>a</b>	<b>5</b>	DRDA
		DA	1.60		No	<b>b, c</b>	<b>5</b>	PIA
		DHO	0.50		No	<b>b, c</b>	<b>5</b>	PIA
		DF	0.50		No	<b>b, c</b>	<b>5</b>	PIA

		F	0.60		No	<b>b, c</b>	<b>5</b>	PIA
		<b>Total</b>	<b>22.70</b>		No			
9	<b>2B5A4b5</b>	MNREGS	4.00		No	<b>a</b>	<b>5</b>	DRDA
		DA	0.40		No	<b>b, c</b>	<b>5</b>	PIA
		DHO	0.10		No	<b>b, c</b>	<b>5</b>	PIA
		DF	0.20		No	<b>b, c</b>	<b>5</b>	PIA
		F	0.30		No	<b>b, c</b>	<b>5</b>	PIA
		<b>Total</b>	<b>5.00</b>		No			
		<b>Grand Total</b>	<b>114.65</b>					

# only letter (a) or (b) or (c) needs to be filled. In case more than one activity has been undertaken all the concerned letters may be indicated e.g. (a) + (b)

\$ WC/GP/WDT/PIA/DRDA cell/ZP/DPC/SLNA / DOLR- only initials as indicated here need to be entered.

\* DA= Department of Agriculture, DHO= Department of Horticulture, VO= Department of Veterinary, DF= Department of Fisheries, F= Forest



## 5. MANAGEMENT /ACTION PLAN

### 5.1 PREPARATORY PHASE

#### 5.1.1 Entry Point Activities

Integrated Watershed Development Programme II<sup>nd</sup> is aimed at the socio economic up liftments of the dweller of watershed area and to create trust about the programme to be implemented so that they can coordinate in participatory mode for the success of the programme. As per the new common guidelines total financial outlay for the entry point activities is 4 % of the total project cost. All the work determined by PIA with stake holders and farmers of watershed area. On behalf of open house discussion in village there were only pacca drains are constructed. These drain convey the surface runoff of village in water harvesting structure. Total estimated cost for these activities is Rs 24.768 Lacs.

**Table no. 36: Entry point activities (EPA)**

(All financial figures in lacs Rs.)

S.no.	Names of the Code	Amount earmarked for EPA	Entry point Activities planned	Estimated cost	Expected outcome	Name of agency which selected the EPA#	Expected month & year of completion (mm/yyyy)
1	2	3	4	5	6	7	8
1	2B5A6e1d	1.55	Pacca drain	1.55	–	WC, PIA, WDT	2011
2	2B5A6e1c	3.85	Pacca drain	3.85	–	WC, PIA, WDT	2011
3	2B5A6e1b	2.30	Pacca drain	2.30	–	WC, PIA, WDT	2011

1	2	3	4	5	6	7	8
4	<b>2B5A6d2e</b>	2.44	Pacca drain	2.44	–	WC, PIA, WDT	2011
5	<b>2B5A6d2d</b>	1.25	Pacca drain	1.25	–	WC, PIA, WDT	2011
6	<b>2B5A6d2c</b>	1.27	Pacca drain	1.27	–	WC, PIA, WDT	2011
7	<b>2B5A4d1d</b>	4.78	Pacca drain	4.78	–	WC, PIA, WDT	2011
8	<b>2B5A6d1f</b>	3.088	Pacca drain	3.088	–	WC, PIA, WDT	2011
9	<b>2B5A4b5</b>	4.24	Pacca drain	4.24	–	WC, PIA, WDT	2011
	<b>Total</b>	24.768		24.768			

# was the EPA selected by Gram Panchayat/WC/PIA/WDT/Any other (please specify)

**Table no. 37: Other activities of preparatory phase**

S. No	Item	Initiation of village level institution	Capacity building	IEC activities	Baseline survey	Hydro-geological survey	Identifying technical support agencies	Resource agreements	Preparation of DPR	Evaluation of DPR	Any other (please specify)
1	Estimated cost	0.96	26.00	4.00	3.10	1.24	-	-	1.24	0.6192	-
2	Status of the activity #	Under Complete	Under Complete	Under Complete	Complete	Complete	Complete		Complete	-	
3	Expected month & year of completion (mm/yyyy)	2011	2011	2011	2011	2011	2011	-	2011	-	

**5.1.2 Institution and Capacity Building**

**5.1.2.1 Institution**

**Table no. 38: List of approved Training Institutes for capacity Building in the project area**

S.No.	Name of the Training Institute	Full Address with contact no., website & e-mail	Name & Designation of the Head of Institute	Type of Institute	Area (s) of specialization	Accreditation details
1	Krishi Vigyan Kendra	Moradabad (UP)	Programme Co-ordinator	Research Extension &	Agriculture, Horticulture, A. Husbandry, Fisheries,	GOI
2	DIRD	DIRD, Moradabad	Director,	Vocational Training	Vocational	Govt. UP
3	Smart King education Pvt. Ltd.	Smart King education Pvt. Ltd., IIG-77, Chaitanya Vihar, Makdi Khera, Kanpur	CMD, Smt. Rani Mishra	NGO	Capacity Buildings, Production System	NGO

### 5.1.2.2 Capacity Building

Capacity building and training are the most important components of watershed management programme both for the field level project staff/ officers and functionaries of people institutions i.e. watershed community. Apart from enhancing technical skill of the project staff, this would also provide opportunities to community members to develop their capacity as the future custodians of the programmes after project's withdrawal. IWMP IInd Moradabad financial outlay for capacity buildings is 5% (Rs. 30.96) of the total project cost, out of which Rs 0.96 will be expended for initiation of village level institution.

**Table no 39 : Capacity Building activities in the project**

S.No.	Project Stakeholders	Total no. of persons	No. of persons trained so far	No. of persons of be trained during current financial year	Sources of funding for training		Name and Address of the Institute where Trained
					a) DOLR	b) any other (pl. specify)	
1	PIAs	10	10	-	DOLR	-	1-Central Soil and Water Conservation research and training centre, Challeshwar Agra.
2	WDTs	6	6	-	DOLR	-	
3	UGs	1100	244	856	DOLR	-	
4	SHGs	620	138	482	DOLR	-	2-Din Dayal Upadhyaya Rajya Gram vikas sansthan, Bakshi ka Talab, Lucknow
5	WCs	54	12	42	DOLR	-	
6	GPs	27	6	21	DOLR	-	3-Smartking education Pvt Ltd, Kanpur
7	Community	200	-	200	DOLR	-	
8	Others (pl. specify)						

**Table no 40: Detail of activities undertaken**

Strategy	Proposed activity	No. of Units	Unit cost	Total Cost
Capacity building Activities	Stakeholders - Scientists Interaction,	10	0.10	1.00
	Training (2 days)	100	0.05	5.00
	Vocational/employment Generation Training (5-10 days)	60	0.10	6.00
	In-service Training. (3 days)	20	0.10	2.00
	Exposure visit within State	5	0.20	1.00
	Exposure visit out of State	6	0.50	3.00
	Field days	25	0.20	5.00
	Workshop	5	0.60	3.00
	<b>Total</b>			<b>26.00</b>

**Table no 41 : Information, Education & Communication (IEC) activities in the project area**

S.no.	Activity	Executing agency	Estimated expenditure (Rs.)	Expected Outcome (may quantify wherever possible)
1	Street plays	Local Drama Groups	100000.00	Awareness about importance of watershed project
2	Video Shows	IWMP, Moradabad	100000.00	
3	Pamphlets and Poster	IWMP, Moradabad	100000.00	
4	Banners and Hoardings	IWMP, Moradabad	100000.00	
		<b>Total</b>	<b>400000.00</b>	

### 5.1.3 Detail Project Report

See table no. 37.

## 5.2 WORK PHASE

### 5.2.1 Soil and moisture conservation

For soil and moisture conservation, water resource development, horticulture, besides agro forestry vegetation / plantation work, engineering structure have also been proposed under the project. Engineering structure are important components of soil and water conservation that can play a vital role in erosion control on arable land. Engineering measure usually involves in creating mechanical barriers across the direction of flow of water and thus retards or retains runoff on the following principles:

- Increase the time of concentration.
- Break a long slopee into short ones.
- Protection of drainage channel against damage.
- Prevent excessive soil and water losses.

#### 1. **Ridge Area Treatment Plans:**

It is very important to treat the ridge as this is where the major water resources originate. For the ridge area treatment of IWMP 2<sup>nd</sup> watershed following structures have been Proposed after interaction between the watershed committee, Range Forest Officer (RFO) and other field staff of forest.

#### **A. Contour Bunding/ Field Bunding:**

Contour bunding/ Field Bunding is effective in erosion control and moisture conservation in dry areas having less than 2% slopee to reduce the length of slopee. Contour bund constructed against the slopee in 3683.00 ha of lands with total estimated cost of Rs. 117.856 lacs.

## **B. Graded Bund (Marginal and Peripheral Bund):**

Marginal bunds are the engineering structure to reduce the volume and speed of runoff. Those locations where change in slope and soil texture founded there is peripheral bund will be constructed along with nala bank. Total proposed treatable area is 1323.00 ha with financial outlay of Rs. 85.995 lacs

### **2. Water Resources:**

Water resources are primarily aimed for collecting and storing any form of water enter through rainfall, runoff or subsurface flow for multiple purpose. There will be 24 water harvesting structure/ ponds on 154.00 ha which will be constructed on lower reaches of the watershed. Estimated financial outlay is Rs. 93.745 lacs.

### **3. Agri-Silvi:**

It will be done on field bunds, contour bunds, peripheral bunds, sides of chack-road, and periphery of renovated ponds. Which fulfill the requirement of fruit, fuel and timber wood for the farmers and it will also help in ecological balance. Estimated financial outlay is Rs. 12.004 lacs.

**Table no 42 : Activities related to Surface Water resources in the project areas @**

S. No	Names of villages	Type of structures	Pre-project			Proposed target										
			No.	Area irrigated (ha)	Storage capacity CUM	Augmentation/repair of existing structures				Construction of new structures				Total target		
						No.	Area irrigated (ha)	Storage capacity (cum)	Estimated cost (Rs in lacs)	No.	Area irrigated (ha)	Storage capacity (lit)	Estimated cost(Rs in lacs)	Area irrigated (ha)	Storage capacity (lit)	Estimated cost (Rs in lacs)
1	2B5A6e1d	(ii) Pond	3	20	2160	3	20	5400	9.900	-	-	-	-	20	5400	9.900
2	2B5A6e1c	(ii) Pond	3	20	2160	3	20	5400	10.260	-	-	-	-	20	5400	10.260
3	2B5A6e1b	(ii) Pond	2	14	1500	2	14	3700	8.640	-	-	-	-	14	3700	8.640
4	2B5A6d2e	(ii) Pond	2	14	1440	2	14	3500	8.460	-	-	-	-	14	3500	8.460
5	2B5A6d2d	(ii) Pond	2	12	1400	2	12	3500	7.390	-	-	-	-	12	3500	7.390
6	2B5A6d2c	(ii) Pond	1	3	750	1	3	2000	2.880	-	-	-	-	3	2000	2.880
7	2B5A4d1d	(ii) Pond	3	22	2100	3	22	5200	13.320	-	-	-	-	22	5200	13.320
8	2B5A6d1f	(ii) Pond	2	9	1400	2	9	3500	7.765	-	-	-	-	9	3500	7.765
9	2B5A4b5	(ii) Pond	6	40	4200	6	40	10500	24.950	-	-	-	-	40	10500	24.950
	<b>Total</b>		<b>24</b>	<b>154</b>	<b>17110</b>	<b>24</b>	<b>154</b>	<b>42700</b>	<b>93.745</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>154</b>	<b>42700</b>	<b>93.745</b>



**Table no 44: Activities related to recharging ground water resources in the project areas @ NA**

S · N o ·	Names of villages	Type of structures	Pre-project		Proposed target							Expected month & year of completion (mm/yyyy)	
			No.	Area irrigated (ha)	Augmentation/repair of existing structures			Construction of new structures			Total target		
					No.	Area irrigated (ha)	Estimated cost	No.	Area irrigated (ha)	Estimated cost	Area irrigated (ha)		Estimated cost
1	2B5A6e1d	(i) Open wells	-	-	-	-	-	-	-	-	-	-	-
		(ii) Bore wells	-	-	-	-	-	-	-	-	-	-	-
2	2B5A6e1c	(i) Open wells	-	-	-	-	-	-	-	-	-	-	-
		(ii) Bore wells	-	-	-	-	-	-	-	-	-	-	-
3	2B5A6e1b	(i) Open wells	-	-	-	-	-	-	-	-	-	-	-
		(ii) Bore wells	-	-	-	-	-	-	-	-	-	-	-
4	2B5A6d2e	(i) Open wells	-	-	-	-	-	-	-	-	-	-	-
		(ii) Bore wells	-	-	-	-	-	-	-	-	-	-	-
5	2B5A6d2d	(i) Open wells	-	-	-	-	-	-	-	-	-	-	-
		(ii) Bore wells	-	-	-	-	-	-	-	-	-	-	-
6	2B5A6d2c	(i) Open wells	-	-	-	-	-	-	-	-	-	-	-
		(ii) Bore wells	-	-	-	-	-	-	-	-	-	-	-
7	2B5A4d1d	(i) Open wells	-	-	-	-	-	-	-	-	-	-	-
		(ii) Bore wells	-	-	-	-	-	-	-	-	-	-	-
8	2B5A6d1f	(i) Open wells	-	-	-	-	-	-	-	-	-	-	-
		(ii) Bore wells	-	-	-	-	-	-	-	-	-	-	-
9	2B5A4b5	(i) Open wells	-	-	-	-	-	-	-	-	-	-	-
		(ii) Bore wells	-	-	-	-	-	-	-	-	-	-	-
		<b>Total for the project</b>	-	-	-	-	-	-	-	-	-	-	-

**Table 45: Activities executed by User Groups in the Project @**

S.no	Names of Project	Major activities				No. of UGs involved	Estimated Cost (Rs.)	Amount of WDF to be collected (Rs.)
		Structure/activity proposed			Expected month & year of completion (mm/yyyy)			
		Type	No.#	Treatment				
1	IWMP II <sup>nd</sup>	Structure work		Engineering	March, 2015	60	309.60 laks	18.60 lakh

**Table no 46 : Details of engineering structures in watershed works**

S.No.	Names of villages	Name of structure	Type of treatment			Type of land			Executing agency	Total target		
			(i) Ridge area (R)	(ii) Drainage line (D)	(iii) Land dev. (L)	(i) Private	(ii) Community	(iii) Others (pl. specify)		(i)UG (ii) SHG (iii) Others (pl. specify)	Units (cu.m.)	Estimated cost (Rs. In lakh)
1	2B5A6e1d	Contour bunding/Field bunding	R	-	-	P	-	-	UG &DOLR	31427.00	12.288	2012-14
		Graded bunding (PB+MB)	-	D	-	-	C		UG &DOLR	24271.00	9.490	2012-14
2	2B5A6e1c	Contour bunding/Field bunding	R	-	-	P	-	-	UG &DOLR	32655.00	12.768	2012-14
		Graded bunding (PB+MB)	-	D	-	-	C		UG &DOLR	25102.00	9.815	2012-14
3	2B5A6e1b	Contour bunding/Field bunding	R	-	-	P	-	-	UG &DOLR	27662.00	10.816	2012-14
		Graded bunding (PB+MB)	-	D	-	-	C		UG &DOLR	21278.00	8.320	2012-14
4	2B5A6d2e	Contour bunding/Field bunding	R	-	-	P	-	-	UG &DOLR	27662.00	10.816	2012-14
		Graded bunding (PB+MB)	-	D	-	-	C		UG &DOLR	21278.00	8.320	2012-14
5	2B5A6d2d	Contour bunding/Field bunding	R	-	-	P	-	-	UG &DOLR	23734.00	9.280	2012-14
		Graded bunding (PB+MB)	-	D	-	-	C		UG &DOLR	16291.00	6.370	2012-14
6	2B5A6d2c	Contour bunding/Field bunding	R	-	-	P	-	-	UG &DOLR	9330.00	3.648	2012-14
		Graded bunding (PB+MB)	-	D	-	-	C		UG &DOLR	7148.00	2.795	2012-14
7	2B5A4d1d	Contour bunding/Field bunding	R	-	-	P	-	-	UG &DOLR	43048.00	16.832	2012-14
		Graded bunding (PB+MB)	-	D	-	-	C		UG &DOLR	30918.00	12.483	2012-14
8	2B5A6d1f	Contour bunding/Field bunding	R	-	-	P	-	-	UG &DOLR	25698.00	10.048	2012-14
		Graded bunding (PB+MB)	-	D	-	-	C		UG &DOLR	17787.00	6.955	2012-14
9	2B5A4b5	Contour bunding/Field bunding	R	-	-	P	-	-	UG &DOLR	80204.00	31.360	2012-14
		Graded bunding (PB+MB)	-	D	-	-	C		UG &DOLR	54859.00	21.450	2012-14
Total										203.851		

**Table no 48: Total Treatment of Micro Watershed of IWMP II<sup>nd</sup>**

S.N.	Watershed Reaches	Proposed Work	Treatable Area (ha.)	CMT	Rate (Rs/CMT)	Proposed Cost (Rs in lacs)
1	Upper Reaches	Contour Bund/Field Bund	3683.00	301420.00	39.10	117.856
2	Middle Reaches	Graded Bund (Marginal bund, Peripheral bund)	1323.00	220132.00	39.10	85.995
		Agro-Silvi	-	-	-	12.004
3	Lower Reaches/ Drinage Line Treatment	Water Resourse	154.00	171865.00	54.54	93.745
<b>Total</b>			<b>5160.00</b>	<b>693417.00</b>		<b>309.60</b>

\* details in table no 42 and 44

**Table no 49: Technical detail of engineering works in project area**

S. No.	Project	No of villages	Type of bund	Type of soil	Particulars (meter)				
					Top	Base	Height	Slope	Cross section
1	IWMP 2 <sup>nd</sup>	41	Field Bund	Normal	0.30	1.65	0.45	1.5:1	0.438
			Contour Bund	Clay	0.45	1.65	0.60	1.0:1	0.63
				Loam	0.45	2.25	0.60	1.5:1	0.81
				Sandy	0.45	2.85	0.60	2.0:1	0.99
			Marginal/CRB & peripheral Bund	Plain land	0.60	3.60	1.00	1.5:1	2.10
				Undulating land	1.00	4.00	1.00	1.5:1	2.50

### 5.2.2 PROPOSED LAND USE

Watershed management plan for IWMP-II<sup>nd</sup> Moradabad watershed was prepared with specific objectives of food sufficiency and income and employment generation with environment security. In plan preparation due importance was given to topographic, land suitability, irrigation potentially, prevailing farming systems, micro farming situation, farming, farmers preferences and priorities along with economic and environment securities. Crop and tree selection and area distribution was done as per farmers priorities revealed through PRA exercise.

Technological options were blended with the ITK based on the latest available research/ experiment findings for this region. Due attention was given to the resource of the farmers and adjustments were made in capital intensive/high resource demanding technological outputs while making them adoptable to the resource poor farmers. Emphasis was given on maximum use of farm yard manure. The proposed land use plan of the watershed is shown in table.

**Table no. 50: Present and proposed land use plan of the IWMP-II<sup>nd</sup> watershed**

S.No.	Land use	Present ( ha)	Proposed (ha)
1	Agriculture	6820.00	6872.00
a	Rainfed	5736.00	5736.00
	I Crops	5736.00	5736.00
	II Agro-forestry	0	0
b	Irrigated	1084.00	1136.00
	I Assured	0	0
	II Partial	1084.00	1136.00
2	Waste land	80.00	28.00
a	Afforestation	65.00	13.00
b	Pasture	15.00	15.00
c	Untreatable	0	0
3	Other	270.00	270.00
	<b>Total</b>	<b>7170.00</b>	<b>7170.00</b>

### **5.2.3 WATER RESOURCE DEVELOPMENT AND SOIL CONSERVATION MEASURES**

#### **Status of Present Water Resources Utilization**

The micro watersheds are having four seasonal water bodies on private as well as on community land. Management and maintenance of these water bodies is still in the hand of minor irrigation department. During good rainfall year these water bodies having full of water during kharif season. Before sowing of rabi season crops water from these water bodies is either used for supplementary irrigation for kharif crops or irrigating fields for rabi sowing or allowed to go as waste. After releasing water from bodies, submergence area also put under cultivation for rabi crops.

#### **Proposed plan for Irrigation Development of existing water resources**

For efficient utilization of available water resources in the IWMP-II<sup>nd</sup> watersheds, present system of irrigation and wastage of water during October-November need to be made more efficient from water management point of view by minimizing conveyance losses in the existing water courses. The up gradation of the existing system of irrigation will result in:

- a. Minimization of conveyance losses
- b. Increase in frequency of irrigation
- c. Adoption of high yielding varieties of crops, and
- d. Assured cultivation of cash Crops
- e. Drinking water problem will also solved
- f. Local eco system will also improved

#### **New water harvesting structures (Ponds)**

Two new dug type water harvesting structures (pond) of capacity about 1400 cum (each) have been proposed to harvest excess runoff of the watershed. Harvested water will be used for supplementary irrigation and fish rearing. Details of these ponds have been given in the estimated budget in last.

## **Crop production**

### **Mulching and crop residue management**

The sources of mulching material as brought up mulch i.e. litter or pruned material of trees etc are scarce in the watershed. The weeds, in situ grown legume and multi purpose trees (as hedge row on marginal and degraded lands) are some of the options available with growers for mulching the rain-fed crops for moisture conservation, fertility restoration and other purposes. Therefore, weed mulching and hedge row of MPTs will be demonstrated in the watershed for benefit of the rural community.

### **Green manuring**

Intensive cropping with inadequate application of organic manures i.e. FYM, compost etc, has over exploited the existing agricultural production system in the watershed. In order to improve the fertility as well as physico- chemical properties of soils green manuring *in-situ* and *ex-situ* with suitable crops like dhaincha, sun-hemp and legumes are proposed to be demonstrated in the watershed areas of IWMP-2<sup>nd</sup> watersheds.

### **Vermi composting**

In order to provide quality manure with high nutrient content to various field crops, vegetables and cash crops, to save time and proper disposal of on farm organic refuse and cow dung as well as to promote organic farming, vermi-composting will be demonstrated to the farmers so that within a short period they can be able to produce manure from organic waste.

### **Crop rotation and intercropping**

In order to diversify farm produce, minimize the farming risk, mitigate soil erosion, to ensure nutritional security and to optimize farm return, intercropping of legumes (black gram and green gram) in inter row spaces of bajra are proposed to be undertaken in the watershed during kharif season. Sustainable and profitable crop-rotations suiting to various needs of the people of the watershed will be demonstrated.

### **Bio-fertilizers**

The various beneficial bio-fertilizers like nitrogen fixers, phosphate solubliser and organic matter decomposers for both legumes and non legumes will be demonstrated in the farmer's field under the watershed villages.

### **Tillage operations**

Deep tillage technology developed at the NDUAT, Faizabad holds promising in enhancing post monsoon residual soil moisture conservation and improving the yield of subsequent mustard crop. This technology is proposed to be demonstrated for benefit of farmers in the watershed.

### **Introduction of improved seeds of high yielding varieties (HYV)**

Replacement of low yielding traditional varieties of Paddy, wheat, jowar, gram and lentil in the villages in the watershed with improved varieties is necessary for improving the productivity and farm income. These HYVs will be demonstrated in the watershed for the benefit of the farmers.

### **Balanced fertilizer use**

Inadequate and imbalanced fertilizer use in the Paddy, bajra and jowar during kharif season and in wheat, mustard, gram and lentil in rabi season are one of the major constraints in agricultural production system of the watershed. Therefore, fertilizer use in different crops will be demonstrated in the watershed for the benefits of the farming community.

### **Control of insect pest and diseases**

Aphid in the mustard and pod borer in gram are the major insects in the watershed areas leading to loss in crop productivity. Similarly white blister is also a common disease in the mustard crop. The management strategies of these insect pests and diseases will also be demonstrated in the watershed for benefit of the growers.

### **Management of the crop**

The recommended technology (13.7) of crop management will be demonstrated to the farmers in half plot trial approach so as to enable the farmers to assess the benefits and impact of each technology or package of practice for their ultimate adoption in the watershed. The interventions scheduled on prioritization of problems in the crop production following PRA and surveys target specifically solution of the each and problem related to the crop production as per interventions at 13.7. The specific problems, if any shall be dealt with contingency budget.

### **Dry land Horticulture**

About 121 ha of land is suitable for horticultural development. Species like Bael and Ber will be planted at suitable spacing in the watershed.

### **Agri-Horticulture**

Anola and sahjan would be a suitable horticultural crop to the locality. Therefore, about 55 ha land in the farmers field shall be selected and brought under Agri-horti system. The cropping system followed will be Bajra and Wheat.

### **Plantation :**

**Fuel wood plantation:** About 500 ha land will be taken the waste land falling in the class-IV category in the watershed. These lands will be planted with species like *Prosopis juliflora* *Acacia nilatica*, *Prosopis cineraria* and *Holoptelia integrifolia*.



**Table no. 51: Details of activities connected with vegetative cover in watershed works**

S . N o .	Names of villages	Name of structure/work	Type of treatment			Type of land			Executing agency	Total target			
			(i) Ridge area (R)	(ii) Drainag e line (D)	(iii) Land dev. (L)	(i) Private	(ii) Comm unity	(iii) Others (pl. specify)		(i)UG (ii) SHG (iii) Others (pl. specify)	Area (ha)	No. of Plants	Estimated cost (Rs. In lakh)
1	2	3	4	5	6	7	8	9	10	-	12	13	14
1	2B5A6e1d	Agro-Silvi	R	D	L	P	C	-	DOLR, UG, DF	-	8800	1.322	2012-14
2	2B5A6e1c	Agro-Silvi	R	D	L	P	C	-	DOLR,UG, DV	-	9050	1.357	2012-14
3	2B5A6e1b	Agro-Silvi	R	D	L	P	C	-	DOLR, DF	-	6820	1.024	2012-14
4	2B5A6d2e	Agro-Silvi	R	D	L	P	C	-	DOLR, DF	-	6820	1.024	2012-14
5	2B5A6d2d	Agro-Silvi	R	D	L	P	C	-	DOLR, DF	-	6400	0.960	2012-14
6	2B5A6d2c	Agro-Silvi	R	D	L	P	C	-	DOLR, DF	-	1850	0.277	2012-14
7	2B5A4d1d	Agro-Silvi	R	D	L	P	C	-	DOLR, DF	-	11780	1.768	2012-14
8	2B5A6d1f	Agro-Silvi	R	D	L	P	C	-	DOLR, DF	-	6880	1.032	2012-14
9	2B5A4b5	Agro-Silvi	R	D	L	P	C	-	DOLR, DF	-	21600	3.24	2012-14

**Table no. 52: Technical Details of Afforestation and Agro forestry Activities in 1ha**

Particulars	Value	Unit
<b>Crop Name</b>	<i>Prosopis juliflora Acacia nilatica, Prosopis cineraria</i>	
Plant To Plant Spacing	8.00	M
Row to Row Spacing	8.00	M
Pit Length	1.00	M
Pit Width	1.00	M
Pit Depth	1.00	M
No. of Plants	156	Nos.
Plantation Area	1.00	ha.
No. of Plants per ha	1,56	Nos.
Gap Filling	20	%

**Table no. 53: Cost Estimation for afforestation and Agro forestry activity in 1ha**

S. No.	Description	No.	Length (m.)	Width (m.)	Depth (m.)	Unit	Quantity	Rate	Amount
1	Digging of pits for plants	156	1	1	1	Cum	156.00	10	1560.00
2	Plants samplings for plantation in Govt. pasture area, sampling not less than 30 cm. height	156				Nos.	156.00	10	1560.00
3	Transportation of plants from nursery to camp site up to 15Km	156				Nos.	156.00	2	312.00
4	Loading and unloading of plants	156				Nos.	156.00	2	312.00
5	Rehandling of plants from camp site to actual planting site upto 200m.	156				Nos.	156.00	2	312.00
6	Cost of fertiliser & insecticides incl. application	156				Nos.	156.00	10	1560.00
7	Weeding and Hoeing two times (Twice in year)	156				Nos.	156.00	2.46	384.00
<b>Total</b>									<b>6000.00</b>

**Table no. 54: Technical Details of Horticultural Activities in 1ha**

Particulars	Value	
<b>Crop Name</b>	Agri-Silvi Culture	
Plant To Plant Spacing	8.00	M
Row to Row Spacing	8.00	M
Pit Length	1.00	M
Pit Width	1.00	M
Pit Depth	1.00	M
No. of Plants	156	Nos.
Plantation Area	1.00	ha.
No. of Plants per ha	1,56	Nos.
Gap Filling	20	%

**Table no. 55 : Cost Estimation for Horticultural Activities in 1ha**

S. No	Description	No.	Length (m.)	Width (m.)	Depth (m.)	Unit	Quantity	Rate	Amount
1	Digging of pits for plants	156	1	1	1	Cum	1,56.00	10	1560.00
2	Plants samplings for plantation in Govt. pasture area, sampling not less than 30 cm. height	156				Nos.	1,56.00	10	1560.00
3	Transportation of plants from nursery to camp site up to 15Km	156				Nos.	1,56.00	2	312.00
4	Loading and unloading of plants	156				Nos.	1,56.00	2	312.00
5	Rehandling of plants from camp site to actual planting site upto 200m.	156				Nos.	1,56.00	2	312.00
6	Cost of fertiliser & insecticides incl. application	156				Nos.	1,56.00	10	1560.00
7	Weeding and Hoeing two times (Twice in year)	156				Nos.	1,56.00	2.46	384.00
<b>Total</b>									<b>6000.00</b>

**5.2.4 PRODUCTION SYSTEM AND MICRO ENTERPRIZES** (Financial out lays 13% i.e., Rs. 80.50 lacs)

**PROPOSED EXTENSION STRATEGIES**

The following feasible extension strategies have been proposed based on the analysis of data collected through PRA & related issues/problems in IWMP IInd Moradabad district.

**Strategies:**

- A. *Improvement of productivity and income of farmers in the existing enterprises and farming system.*
- B. *Diversification and intensification of existing farming system.*
- C. *Sustainability in productivity/income.*
- D. *Integrated nutrient management.*
- E. *Integrated pest management.*
- F. *Seed multiplication and replacement.*
- G. *Horticulture planting material*
- H. *Success story.*
- I. *Natural resources management.*
- J. *Issue for Policy consideration*
- K. *Farm mechanization.*
- L. *Marketing & Media strategies.*
- M. *Human Resource Development.*
- N. *Farmers Organization.*
- O. *Public Private Partnership.*

A. Improvement of Productivity and income fo farmers in the existing enterprises and farming system

**Table no. 56: Agriculture Production**

Crop	Critical Gap	Strategic issue	Strategies
1	2	3	4
1. Wheat	Yield stagnation	Use of recommended seed rate, Weed management, Popularizing Seed production programme, Popularizing Organic farming	Demonstration, Exposure visits, Training
	Use of untreated seeds	Encouraging sowing with treated seeds	Demonstration, Exposure visits, Training
	Un judicious use of Irrigation water	Irrigation management	Demonstration, Exposure visits, Training
2. Paddy	Imbalance use of Fertilizer	To promote INM	Demonstration, Soil testing, Exposure visits, - Training
	Un Availability of Quality Seed	In crease seed replacement ratio Promote seed production Programme	Demonstration, Exposure visits, Training
	1. Improper nursery raising	-Raised seed beds	Demonstration, Exposure visits, Training
	2. Inadequate Pest and disease management	Popularization of Integrated pest and disease management	- Demonstration - Exposure visits - Training
	3. Weed management	Populazation of chemical Pesticide	Demonstration, Exposure visits, Training

1	2	3	4
3..Maize	1. Non adoption of seed treatment	Application of seed treatment	Demonstration, Exposure visits, Training
	2. Excess application of fertilizes	Use of recommended dose of fertilizer	Demonstration, Exposure visits, Training
	3. Use of Micro nutrients	-Use of recommended quantity of micro nutrients	Demonstration, Exposure visits, Training
	4. Non adoption of hand pollination practices	Following hand pollination	Demonstration, Exposure visits, Training
4. Mustard	1. Higher plant population	Popularization of plant population technique per	Demonstration, Exposure visits, Training
	2. Low production	-Suitable agronomical practices will be popularized	Demonstration, Exposure visits, Training
	3. Imbalance use of fertilizer	-Use of balanced fertilizer promote, sulpher	Demonstration, Exposure visits, Training
	4. Pest & disease management	-Adoption of proper pest and disease management practice	Demonstration, Exposure visits, Training
	5. Post harvest technology	Popularization of improved storage method	Demonstration, Exposure visits, Training
5. Lentil	1. Yield stagnation	Timely sown, line sown, seed rate as per recommendation	Demonstration, Exposure visits, Training
	2. Imbalance use of fertilizers	Popularization of phasphetik fertilizer	Demonstration, Exposure visits, Training
	3. Low quantity of F.Y.M.	Use of recommended practice of F.Y.M.	Demonstration, Exposure visits, Training
	4. Inadequate use of sowing techniques	Use of Recommended techniques	Demonstration, Exposure visits, Training
6. Sugarcane	1. Late sowing	-Timely sowing	Demonstration, Exposure visits, Training
	2. Non application of fertilizers	Application of seed treatment	Demonstration, Exposure visits, Training
	3. Excess application of fertilizers	Use of recommended dose of fertilizer, Popularization of recommended dose of F.Y.M./Green Manure	Demonstration, Exposure visits, Training
	4. Use of Micro Nutrients	-Use of recommended quantity of micro nutrients	Demonstration, Exposure visits, Training
	5. Inadequate pest and disease management	- Adoption of IPM/IDM	Demonstration, Exposure visits, Training
	6. Injudicious use of water	-Irrigation management	Demonstration, Exposure visits, Training

**Table no. 57: Horticultural Production:-**

(1) Potato	I. Un Identified varieties	Popularization of Identified Recommended varieties	Demonstration, Exposure visits, Training
	2. No seed treatment	Adoption of recommended seed treatment	Demonstration, Exposure visits, Training
	3. Non use of Micro nutrients	-Application of recommended Micro nutrients	Demonstration, Exposure visits, Training
	4. Non Adoption of pest and disease management	-IDM	Demonstration, Exposure visits, Training
(2) Tomato	1. No seed treatment	Adoption of recommended seed treatment	Demonstration, Exposure visits, Training
	2. Imbalance use of fertilizers	Application of recommended dose of fertilizers	Demonstration, Exposure visits, Training
	3. Low quantity use of F.Y.M.	Adoption of recommended dose of F.Y.M.	Demonstration, Exposure visits, Training
	4. Inadequate plant protection measure	Popularization of recommended plant protection techniques	Demonstration, Exposure visits, Training
(3) Banana	1. Low quantity use of F.Y.M.	Use of Recommended dose of F.Y.M	Demonstration, Exposure visits, Training
	2. No seed treatment	Popularization of bio agents, <i>Tricoderma</i> and <i>Pseudomonas</i> For seed treatments	Demonstration, Exposure visits, Training
	3. Inadequate plant protection technique	Popularization of plant protection technique	Demonstration, Exposure visits, Training

**Table no. 58: ANIMAL HUSBANDRY**

Animal	Critical gap	Strategy	Activities
Cow & Bufallow	a) Artificial Insemination partial adoption of AI	a) Improving knowledge about advantage and disadvantages of AI	a) Awareness campaign b) Ensure the availability of technical staff. c) Ensure the availability of semen f) Conducting fertility improvement camps. g) Conducting camps for castration of scrub bulls at village level h) Providing wide month cry can & 1 Lit. Thermos for easy transportation of semen to remote villages
	b) Unavailable of quality fodder feed.	Improving the knowledge about animal production capacity and its fodder requirement	a) Organizing awareness camp about animal production capacity, its requirements and dairy economics. b) ensure the supply of good quality fodder seeds. c) Demonstration of conservation of fodder by silage making
	c) Minerals & vitamins. Full gap in adoption of feeding	Motivating farmers about importance of minerals & vitamins.	a) Intensify the awareness programmers about importance of feeding minerals & vitamins by promoting stall feeding
	d) Inter-calving period is long period	Awarding about “a calf a year”	a) Awareness camp for reduction calving period
	e) Health care gap in health care management	Providing knowledge about animal health and hygiene	a) organizing awareness programme about animal health & hygiene through trainings and field visits. b) Awareness campaign about animal health camps
	f) General management Partial gap in Adoption of general. Management	Technology dissemination about animal management and its importance	a organizing awareness programme about animal management through training and field visits.
	g) Average milk yield. Full gap in average milk yield.	Technology dissemination about complete dairy management	By providing awareness about complete dairy management
Goat, Goat & Pig, Poultry	a) <u>Breed up gradation</u>	Awareness about feed and fodder management	a) Providing awareness programme through training and field visits. b) Refresher training course to technical
	b) <u>Feed management</u> Partial adoption of feed management	Awareness about feed and fodder management	a) Providing awareness programme about the feed and fodder requirement of the animal. b) Intesify the supply of fodder seeds
	d) <u>Health care</u> -gap in health care management -non adoption of deworming schedule	-Popularizing the importance of deworming. - Providing knowledge about animal health and hygiene	a) awareness camp about importance of deworming b) Conducting deworming comps c) Organizing awareness programme about animal health and hygiene through training and field visit.
	d) <u>General Management</u> - Partial gap in adoption of general management	- Technology dissemination about animal management and its importance	- Organizing awareness programme about animal management through training and field visit

**Table no. 59: Fish Production**

1. Fish production	1 Poor ground water resource during summer	Water storage facilities from on going schemes	Linkage with credit institution
	2. Silt & weed problem in existing ponds	Desalting of ponds & eradication of weed	Demonstration, Exposure visits, Training
	3. Improper stocking measures	Promotion of proper stocking measures	Demonstration, Exposure visits, Training
	4. Unawareness about composite fish farming	Creating awareness about composite fish farming	Demonstration, Exposure visits, Training
	5. Improper artificial feeding	Promotion of proper artificial feeding	Demonstration, Exposure visits, Training
	6. Marketing of fish through unorganized sectors	To promote marketing of fish through organized sectors	Demonstration, Exposure visits, Training
	7. Unawareness about cold storage and processing of fish	To create awareness about storing fish in cold storage and process the fish	Demonstration, Exposure visits, Training

**Table no. 60: Details of allied/ other activities (Total of the production system and micro enterprises intervention)**

S.no	Names of the villages	Name of activity	Type of land			Executing agency	Total target	
			(i) Private	(ii) Community	(iii) Others (pl. specify)		Estimated cost (Rs. In lakh)	Expected month & year of completion
1	2	3	4	5	6	7	8	9
<b>A. PRODUCTION SYSTEM AND MICRENTERPRIZES INERVENTION (50 % BUDGET OF EACH INTERVENTION USE AS REVOLVING FUND AND 50 % USE AS TRAINING &amp; TRAINING MATERIALS)</b>								
1	2B5A6e1d	Milk Collection Centre	-	Community	-	SHG	1.00	2012-2014
		Bee Keeping	-	Community	-	SHG	1.00	2012-2014
		Fruit preservation	-	Community	-	SHG	1.00	2012-2014
		Small ruminants (Goatry)	-	Community	-	SHG	1.00	2012-2014
		Fisheries	-	Community	-	SHG	1.00	2012-2014
		Portable hatchery	-	-	-	SHG	1.00	2012-2014
		Nursery raising	-	Community	-	SHG	1.00	2012-2014
		Rural craft	-	Community	-	SHG	1.00	2012-2014
		Animal Nutrient	Private	-	-	UG	0.39	2012-2014
	<b>Total</b>					8.39	2012-2014	
2	2B5A6e1c	Bee Keeping	-	Community	-	SHG	1.00	2012-2014
		Fruit preservation	-	Community	-	SHG	2.00	2012-2014
		Fisheries	-	Community	-	SHG	1.00	2012-2014
		Nursery raising	-	Community	-	SHG	2.00	2012-2014
		Medicinal Plant	Private	-	-	SHG	1.00	2012-2014
		Rural craft	-	Community	-	SHG	1.00	2012-2014
		Animal Nutrient	Private	-	-	UG	0.74	2012-2014
	<b>Total</b>					8.74	2012-2014	
3	2B5A6e1b	Milk Collection Centre	-	Community	-	SHG	1.00	2012-2014
		Bee Keeping	-	Community	-	SHG	1.00	2012-2014
		Fruit preservation	-	Community	-	SHG	1.00	2012-2014
		Small ruminants (Goatry)	-	Community	-	SHG	0.50	2012-2014
		Fisheries	-	Community	-	SHG	0.50	2012-2014
		Portable hatchery	-	-	-	SHG	1.00	2012-2014
		Nursery raising	-	Community	-	SHG	1.00	2012-2014
		Rural craft	-	Community	-	SHG	1.00	2012-2014
		Animal Nutrient	Private	-	-	UG	0.37	2012-2014
	<b>Total</b>					7.37		



1	2	3	4	5	6	7	8	9
4	2B5A6d2e	Bee Keeping	-	Community	-	SHG	1.00	2012-2014
		Fruit preservation	-	Community	-	SHG	1.00	2012-2014
		Fisheries	-	Community	-	SHG	1.00	2012-2014
		Portable hatchery	-	-	-	SHG	1.00	2012-2014
		Nursery raising	-	Community	-	SHG	1.00	2012-2014
		Medicinal Plant	Private	-	-	SHG	1.00	2012-2014
		Rural craft	-	Community	-	SHG	1.00	2012-2014
		Animal Nutrient	Private	-	-	UG	0.37	2012-2014
	Total						7.37	2012-2014
5	2B5A6d2d	Milk Collection Centre	-	Community	-	SHG	0.50	2012-2014
		Bee Keeping	-	Community	-	SHG	0.50	2012-2014
		Fruit preservation	-	Community	-	SHG	0.50	2012-2014
		Small ruminants (Goatry)	-	Community	-	SHG	0.50	2012-2014
		Fisheries	-	Community	-	SHG	1.00	2012-2014
		Portable hatchery	-	-	-	SHG	1.00	2012-2014
		Nursery raising	-	Community	-	SHG	1.00	2012-2014
		Rural craft	-	Community	-	SHG	1.00	2012-2014
		Animal Nutient	Private	-	-	UG	0.10	2012-2014
	Total						6.10	2012-2014
6	2B5A6d2c	Milk Collection Centre	-	Community	-	SHG	0.50	2012-2014
		Bee Keeping	-	Community	-	SHG	0.50	2012-2014
		Fruit preservation	-	Community	-	SHG	0.00	2012-2014
		Small ruminants (Goatry)	-	Community	-	SHG	0.00	2012-2014
		Fisheries	-	Community	-	SHG	0.50	2012-2014
		Portable hatchery	-	-	-	SHG	0.50	2012-2014
		Nursery raising	-	Community	-	SHG	0.00	2012-2014
		Rural craft	-	Community	-	SHG	0.00	2012-2014
		Animal Nutient	Private	-	-	UG	0.42	2012-2014
	Total						2.42	2012-2014
7	2B5A4d1d	Milk Collection Centre	-	Community	-	SHG	1.00	2012-2014
		Bee Keeping	-	Community	-	SHG	2.00	2012-2014
		Fruit preservation	-	Community	-	SHG	2.00	2012-2014
		Small ruminants (Goatry)	-	Community	-	SHG	2.00	2012-2014
		Fisheries	-	Community	-	SHG	1.00	2012-2014
		Portable hatchery	-	-	-	SHG	2.00	2012-2014
		Nursery raising	-	Community	-	SHG	1.00	2012-2014
		Rural craft	-	Community	-	SHG	1.00	2012-2014
		Animal Nutient	Private	-	-	UG	0.92	2012-2014
	Total						12.92	

1	2	3	4	5	6	7	8	9
8	2B5A6d1f	Milk Collection Centre	-	Community	-	SHG	0.50	2012-2014
		Bee Keeping	-	Community	-	SHG	0.50	2012-2014
		Fruit preservation	-	Community	-	SHG	0.50	2012-2014
		Small ruminants (Goatry)	-	Community	-	SHG	1.00	2012-2014
		Fisheries	-	Community	-	SHG	0.50	2012-2014
		Portable hatchery	-	-	-	SHG	1.00	2012-2014
		Nursery raising	-	Community	-	SHG	1.00	2012-2014
		Rural craft		Community	-	SHG	1.00	2012-2014
		Animal Nutrient	Private	-	-	UG	0.58	2012-2014
	Total						6.58	2012-2014
9	2B5A4b5	Bee Keeping	-	Community	-	SHG	3.00	2012-2014
		Fruit preservation	-	Community	-	SHG	2.00	2012-2014
		Fisheries	-	Community	-	SHG	5.00	2012-2014
		Nursery raising	-	Community	-	SHG	4.00	2012-2014
		Medicinal Plant	Private	-	-	SHG	2.00	2012-2014
		Rural craft	-	Community	-	SHG	3.00	2012-2014
		Animal Nutrient	Private	-	-	UG	1.56	2012-2014
	Total						20.56	
	G. Total (for 41 village)						80.49	

**Table no. 61: Item wise total for the project**

S.no	Names of the villages	Name of activity	Type of land			Executing agency (i)UG (ii) SHG (iii) Others (pl. specify)	Total target	
			(i) Private	(ii) Community	(iii) Others (pl. specify)		Estimated cost (Rs. In lakh)	Expected month & year of completion (mm/yyyy)
1	41 villages in IWMP IInd	Milk Collection Centre	-	Community	-	SHG	4.5	2012-2014
		Bee Keeping	-	Community	-	SHG	10.5	2012-2014
		Fruit preservation	-	Community	-	SHG	10	2012-2014
		Small ruminants (Goatry)	-	Community	-	SHG	5	2012-2014
		Fisheries	-	Community	-	SHG	11.5	2012-2014
		Portable hatchery	-	Community	-	SHG	7.5	2012-2014
		Nursery raising	-	Community	-	SHG	12	2012-2014
		Medicinal Plant	Private	-	-	SHG	4	2012-2014
		Rural craft	-	Community	-	SHG	10.04	2012-2014
		Animal Nutrient	Private	-	-	UG	5.45	2012-2014
	<b>Total</b>					<b>80.49</b>		

**Table no 62: Activities related production system and micro enterprizes intervention by Self Help Groups (SHGs) in the Project areas**

S.no	Names of the Villages	Major activities of the SHGs				No. of SHGs require training	Total assistance planned for the SHG (Amount in Rs.)				Total annual Income to be generated (Rs.)	Total annual Savings to be done (Rs.)
		Name of activity	No. of SHGs involved	Average annual income from activity per SHG	Expected month & year of completion (mm/yyyy)		Loan from revolving	Training	Material	Others (pl. specify)		
1	41 villages in IWMP IInd	Milk Collection Centre	2	100000.00	2012-2014	2	200000.00	60000.00	190000.00	-	200000.00	300000.00
		Bee Keeping	10	70000.00	2012-2014	10	500000.00	100000.00	450000.00	-	700000.00	600000.00
		Fruit preservation	10	75000.00	2012-2014	10	500000.00	300000.00	200000.00	-	750000.00	700000.00
		Small ruminants (Goatry)	5	70000.00	2012-2014	5	250000.00	150000.00	100000.00	-	500000.00	600000.00
		Fisheries	10	100000.00	2012-2014	10	500000.00	300000.00	350000.00	-	1000000.00	900000.00
		Portable hatchery	6	150000.00	2012-2014	6	600000.00	150000.00	550000.00	-	900000.00	600000.00
		Nursery raising	10	40000.00	2012-2014	4	500000.00	150000.00	450000.00	-	400000.00	300000.00
		Medicinal Plant	2	50000.00	2012-2014	2	125000.00	50000.00	75000.00	-	200000.00	100000.00
Rural craft	10	50000.00	2012-2014	10	500000.00	300000.00	200000.00	-	500000.00	600000.00		

### 5.2.5 LIVELIHOOD ACTIVITIES

Income generating activities through self help groups for landless farmers like goat farming, poultry farming bee keeping, livestock development activities, vocational training given with the involvement of KVK, Moradabad and NGOs. Financial out lays for this component is 10 % i.e., Rs 61.92 lacs, details are given below in table.

**Table no. 63: Details of allied/ other activities (Total of livelihood intervention)**

S.no	Names of the villages	Name of activity	Type of land			Executing agency (i)UG (ii) SHG	Total target	
			(i) Private	(ii) Community	(iii) Others (pl. specify)		Estimated cost (Rs. In lakh)	Expected month & year of completion (mm/yyyy)
1	2	3	4	5	6	7	8	9
<b>A. PRODUCTION SYSTEM AND MICREENTERPRIZES INERVENTION (50 % BUDGET OF EACH INTERVENTION (EXCEPT CROP DEMONSTRATION, MEDICINAL PLANT, HORTICULTURE) USE AS REVOLVING FUND AND 50 % USE AS TRAINING &amp; TRAINING MATERIOALS)</b>								
1	2B5A6e1d	Crop demonstration	Private	-	-	UG	0.60	2011-2014
		Medicinal plant	Private	-	-	UG	0.60	2011-2014
		Horticulture	Private	-	-	UG	0.60	2011-2014
		Nursery raising	Private	-	-	UG	0.60	2011-2014
		Fruit preservation	-	-	-	-	-	2011-2014
		Rural craft	-	-	-	-	-	2011-2014
		Goatery	-	-	-	-	-	2011-2014
		Animal Husbandry	-	Community	-	SHG-4 Nos	2.00	2011-2014
		Piggery	-	-	-	-	-	2011-2014
Animal Nutrient	Private	-	-	UG	0.56	2011-2014		
	<b>Total</b>						<b>3.16</b>	<b>2011-2014</b>
2	2B5A6e1c	Crop demonstration	Private	-	-	UG	1.00	2011-2014
		Horticulture	Private	-	-	UG	1.00	2011-2014
		Fruit preservation	-	-	-	-	-	2011-2014
		Rural craft	-	-	-	-	-	2011-2014
		Animal Husbandry	-	Community	-	SHG – 1 No	0.50	2011-2014
		Piggery	-	-	-	-	-	2011-2014
Animal Nutrient	Private	-	-	UG	0.72	2011-2014		
	<b>Total</b>						<b>3.22</b>	<b>2011-2014</b>
3	2B5A6e1b	Crop demonstration	Private	-	-	UG	0.60	2011-2014
		Medicinal plant	Private	-	-	UG	0.60	2011-2014
		Horticulture	Private	-	-	UG	0.60	2011-2014
		Nursery raising	Private	-	-	UG	0.60	2011-2014
		Fruit preservation	-	-	-	-	-	2011-2014
		Goatery	-	-	-	-	-	2011-2014
		Piggery	-	-	-	-	-	2011-2014
		Animal Husbandry	-	Community	-	SHG- 10 Nos	5.00	2011-2014
Animal Nutrient	Private	-	-	UG	0.68	2011-2014		
	<b>Total</b>						<b>8.08</b>	<b>2011-2014</b>

1	2	3	4	5	6	7	8	9
4	2B5A6d2e	Crop demonstration	Private	-	-	UG	1.00	2011-2014
		Horticulture	Private		-	UG	1.00	2011-2014
		Fruit preservation	-		-			2011-2014
		Goat Keeping	-	Community	-	SHG -2 Nos	1.00	2011-2014
		Tailoring		Community	-	SHG -1 No	0.20	2011-2014
		Animal Husbandry	-	Community		SHG – 7Nos	3.50	
		Animal Nutrient	Private	-	-	UG	0.70	2011-2014
	<b>Total</b>						7.40	2011-2014
5	2B5A6d2d	Crop demonstration	Private	-	-	UG	0.60	2011-2014
		Medicinal plant	Private	-	-	UG	0.60	2011-2014
		Horticulture	Private		-	UG	0.60	2011-2014
		Nursery raising	Private	-	-	UG	0.60	2011-2014
		Fruit preservation	-		-			2011-2014
		Animal Husbandry	-	Community	-	SHG – 5 Nos	2.50	2011-2014
		Goatery						2011-2014
		Piggery						2011-2014
	<b>Total</b>						5.58	2011-2014
6	2B5A6d2c	Crop demonstration	Private	-	-	UG	0.00	2011-2014
		Medicinal plant	Private	-	-	UG	0.00	2011-2014
		Horticulture	Private		-	UG	0.00	2011-2014
		Nursery raising	Private	-	-	UG	0.00	2011-2014
		Fruit preservation	-		-			2011-2014
		Animal Husbandry	-	Community	-	SHG – 7 Nos	3.50	2011-2014
		Goatery						2011-2014
		Piggery						2011-2014
			<b>Total</b>					

1	2	3	4	5	6	7	8	9	
7	2B5A4d1d	Crop demonstration	Private	-	-	UG	1.00	2011-2014	
		Medicinal plant	Private	-	-	UG	1.00	2011-2014	
		Horticulture	Private	-	-	UG	1.00	2011-2014	
		Nursery raising	Private	-	-	UG	1.00	2011-2014	
		Fruit preservation	-	-	-	-	-	2011-2014	
		Animal Husbandry	-	Community	-	-	SHG – 10 Nos	5.00	2011-2014
		Goatery	-	-	-	-	-	-	2011-2014
		Piggery	-	Community	-	-	SHG – 1 No	0.50	2011-2014
	Animal Nutrient	Private	-	-	-	UG	0.94	2011-2014	
	<b>Total</b>						<b>10.44</b>	<b>2011-2014</b>	
8	2B5A6d1f	Crop demonstration	Private	-	-	UG	0.00	2011-2014	
		Medicinal plant	Private	-	-	UG	0.60	2011-2014	
		Horticulture	Private	-	-	UG	0.60	2011-2014	
		Fruit preservation	-	-	-	-	-	2011-2014	
		Animal Husbandry	-	Community	-	-	SHG -5 No	2.50	2011-2014
		Tailoring	-	Community	-	-	SHG -1 No	0.20	2011-2014
		Piggery	-	-	-	-	-	-	2011-2014
			Animal Nutrient	Private	-	-	-	UG	0.16
	<b>Total</b>						<b>4.06</b>	<b>2011-2014</b>	
9	2B5A4b5	Crop demonstration	Private	-	-	UG	1.00	2011-2014	
		Medicinal plant	Private	-	-	UG	1.00	2011-2014	
		Horticulture	Private	-	-	UG	1.00	2011-2014	
		Fruit preservation	-	-	-	-	-	2011-2014	
		Animal Husbandry	-	Community	-	-	SHG -19 No	9.50	2011-2014
		Tailoring	-	Community	-	-	SHG -1 No	0.20	2011-2014
		Piggery	-	-	-	-	-	-	2011-2014
			Animal Nutrient	Private	-	-	-	UG	0.92
	<b>Total</b>						<b>13.62</b>	<b>2011-2014</b>	
	<b>G. Total (for 41 village)</b>						<b>61.92</b>		

**Table no. 64: Item wise total for the project**

S.no	Names of the villages	Name of activity	Type of land			Executing agency	Total target		
			(i) Private	(ii) Community	(iii) Others (pl. specify)		Estimated cost (Rs. In lakh)	Expected month & year of completion (mm/yyyy)	
8	41 villages in IWMP Hind	Crop demonstration	Private	-	-	UG	5.50	2011-2014	
		Medicinal plant	Private	-	-	UG	4.00	2011-2014	
		Horticulture	Private	-	-	UG	6.00	2011-2014	
		Nursery raising	Private	-	-	UG	2.50	2011-2014	
		Fruit preservation	-	Community	-	-	SHG	9.50	2011-2014
		Rural craft	-	Community	-	-	SHG	9.00	2011-2014
		Goatery	-	Community	-	-	SHG	10.50	2011-2014
		Piggery	-	Community	-	-	SHG	9.50	2011-2014
	Animal Nutrient	Private	-	-	UG	5.42	March, 2015		
	<b>Total</b>					<b>61.92</b>			

**Table no. 65: Activities related to livelihoods by Self Help Groups (SHGs) in the Project areas**

S.no	Names of the Villages	Major activities of the SHGs				No. of SHGs require training	Total assistance planned for the SHG (Amount in Rs.)				Total annual Income to be generated (Rs.)	Total annual Savings to be done (Rs.)
		Name of activity	No. of SHGs involved	Average annual income from activity per SHG	Expected month & year of completion (mm/yyyy)		Loan from revolving	Training	Material	Others (pl. specify)		
1	41 villages in IWMP IInd	Fruit preservation	8	75000.00	March, 2015	8	400000.00	160000.00	140000.00	-	600000.00	400000.00
		Rural craft	9	50000.00	March,2015	9	450000.00	270000.00	180000.00	-	450000.00	500000.00
		Goatery	10	70000.00	March, 2015	10	500000.00	300000.00	250000.00	-	700000.00	600000.00
		Piggery	9	100000.00	March,2015	9	450000.00	270000.00	230000.00	-	900000.00	700000.00

**Table no 66 : (A) Details of livelihoods created for landless people\*- including micro enterprises**

S.no	Names of the villages	Name of activity	No. of beneficiaries					Pre-project income (Rs.)	Expected change in income from project intervention	Funds required for the activity (Rs.)	Sources of funding(Rs.)					Expected month & year of completion (mm/yyyy)
			SF	MF	LF	Land less	Total				Project Fund	Beneficiary	Financial institution	NGO	Others	
1	41 villages in IWMP IInd	Fruit preservation	10	2		108	120	12000.00	600000.00	800000	800000	-	-	-	-	March, 2015
		Rural craft	22	5	-	168	195	20000.00	650000.00	1300000	1300000	-	-	-	-	March, 2015
		Goatery	31	14	-	60	105	12000.00	490000.00	700000	700000	-	-	-	-	March, 2015
		Piggery	-	-	-	180	180	60000.00	1200000.00	1200000	1200000	-	-	-	-	March, 2015

**Table no. 67: (B) Details of other livelihoods created for farmers**

S.no	Names of the villages	Name of activity	No. of beneficiaries					Pre-project income (Rs.)	Expected change in income from project intervention	Funds required for the activity (Rs.)	Sources of funding(Rs.)					Expected month & year of completion (mm/yyyy)
			SF	MF	LF	Other	Total				Project Fund	Beneficiary	Financial institution	NGO	Others	
1	41 villages in IWMP IInd	Crop demonstration	250	525	125	-	900	900000.00	1200000.00	1800000	1800000	-	-	-	-	March, 2015
		Medicinal plant	15	30	15	-	60	-	3000000.00	600000	600000	-	-	-	-	March, 2015
		Horticulture	10	50	25	-	85	50000.00	8500000.00	850000	850000	-	-	-	-	March, 2015
		Nursery raising	4	2	3	-	9	-	900000.00	450000	450000	-	-	-	-	March, 2015

### 5.2.6 Marketing linkage

The direct livelihood activities need good forward and backward support. Without such support system the activities may fail to deliver the desired results. These linkages would involve credit, machinery, input supply, marketing, etc.

**Table no. 68: Backward and Forward Linkage**

S. No.	Project	Type of Marketing Facility	Pre-project (no.)	During the project (no.)	Post-project (no.)
1	<i>IWMP IIInd</i>	<b>Backward linkages</b>			
		Seed certification	1	1	1
		Seed supply system	10	12	22
		Fertilizer supply system	12	18	20
		Pesticide supply system	6	6	10
		Credit institutions	Bank-5	Bank-7	Bank-10
		Water supply	-	-	-
		Extension services	3	3	12
		Nurseries	1	1	12
		Tools/machinery suppliers	-	-	2
		Price Support system	-	-	4
		Labour	-	-	-
		Any other (please specify)	-	-	-
		<b>Forward linkages</b>			
		Harvesting/threshing machinery	4	8	12
		Storage (including cold storage)	1	1	4
		Road network			
		Transport facilities	-	-	-
		Markets / Mandis	8	9	12
		Agro and other Industries	1	5	6
		Milk and other collection centres	-	2	6
		Labour	-	-	-
		Hatchery (Portable)	-	5	8
Vermi-compost unit	-	2	5		
Animal Mineral Mixture	-	-	50 gm/day/animal		

### 5.3 Convergence Planning for various activities

- 5.3.1 Earthen bund, contour bund, percolation tank, injection well will be made in watershed area convergence with MNREGS
- 5.3.2 Soil health card, crop demonstration, kisan gosthi, kisan mela, farmer's school also organized in watershed area under many scheme of department of Agriculture.
- 5.3.7 Composite fish farming or mixed fish farming popularized in this area with Department of fisheries.
- 5.3.8 Animal health camp, fodder development, vaccination work also made through Veterinary Department.
- 5.3.9 Aforestation in project area also done with Forest Department.
- 5.3.10 Dry land horticulture also convergence with department of horticulture.



**Table no. 69: Details of Convergence of other Schemes in the Project area with IWMP Project**

S.No.	Name of the MW	Names of Departments with Schemes converging with IWMP*	Fund made available to IWMP project due to convergence (Rs. In lakh)	Was this fund included in Rs. 12,000/15,000 Per ha		Name of activity/task/structure undertaken with converged funds (a) Structures (b) Livelihoods (c) Production System	Reference no. of activity/task/structure in DPR	Level at which decision for convergence was taken \$
				Yes	No			
1	2	3	4	5	6	7	8	9
1	2B5A6e1d	MNREGS	4.00		No	a	5	DRDA
		DA	0.40		No	b, c	5	PIA
		DHO	0.10		No	b, c	5	PIA
		DF	0.20		No	b, c	5	PIA
		F	0.30		No	b, c	5	PIA
		<b>Total</b>	<b>5.00</b>		No			
2	2B5A6e1c	MNREGS	15.00		No	a	5	DRDA
		DA	1.50		No	b, c	5	PIA
		DHO	0.30		No	b, c	5	PIA
		DF	0.40		No	b, c	5	PIA
		F	0.30		No	b, c	5	PIA
		<b>Total</b>	<b>17.50</b>		No			
3	2B5A6e1b	MNREGS	17.00		No	a	5	DRDA
		DA	1.70		No	b, c	5	PIA
		DHO	0.50		No	b, c	5	PIA
		DF	0.50		No	b, c	5	PIA
		F	0.30		No	b, c	5	PIA
		<b>Total</b>	<b>19.00</b>		No			
4	2B5A6d2e	MNREGS	14.00		No	a	5	DRDA
		DA	1.40		No	b, c	5	PIA
		DHO	0.30		No	b, c	5	PIA
		DF	0.40		No	b, c	5	PIA
		F	0.45		No	b, c	5	PIA
		<b>Total</b>	<b>16.55</b>		No			
5	2B5A6d2d	MNREGS	5.00		No	a	5	DRDA
		DA	0.50		No	b, c	5	PIA
		DHO	0.20		No	b, c	5	PIA
		DF	0.20		No	b, c	5	PIA
		F	0.20		No	b, c	5	PIA
		<b>Total</b>	<b>6.10</b>		No			

1	2	3	4	5	6	7	8	9
6	<b>2B5A6d2c</b>	MNREGS	8.00		No	a	5	DRDA
		DA	0.60		No	b, c	5	PIA
		DHO	0.30		No	b, c	5	PIA
		DF	0.30		No	b, c	5	PIA
		F	0.25		No	b, c	5	PIA
		<b>Total</b>	<b>9.45</b>		No			
7	<b>2B5A4d1d</b>	MNREGS	11.00		No	a	5	DRDA
		DA	0.90		No	b, c	5	PIA
		DHO	0.40		No	b, c	5	PIA
		DF	0.45		No	b, c	5	PIA
		F	0.60		No	b, c	5	PIA
		<b>Total</b>	<b>13.35</b>		No			
8	<b>2B5A6d1f</b>	MNREGS	20.50		No	a	5	DRDA
		DA	1.60		No	b, c	5	PIA
		DHO	0.50		No	b, c	5	PIA
		DF	0.50		No	b, c	5	PIA
		F	0.60		No	b, c	5	PIA
		<b>Total</b>	<b>22.70</b>		No			
9	<b>2B5A4b5</b>	MNREGS	4.00		No	a	5	DRDA
		DA	0.40		No	b, c	5	PIA
		DHO	0.10		No	b, c	5	PIA
		DF	0.20		No	b, c	5	PIA
		F	0.30		No	b, c	5	PIA
		<b>Total</b>	<b>5.00</b>		No			
		<b>Grand Total</b>	<b>114.65</b>		No			

# only letter (a) or (b) or (c) needs to be filled. In case more than one activity has been undertaken all the concerned letters may be indicated e.g. (a) + (b)

\$ WC/GP/WDT/PIA/DRDA cell/ZP/DPC/SLNA / DOLR- only initials as indicated here need to be entered.

\* DA= Department of Agriculture, DHO= Department of Horticulture, VO= Department of Veterinary, DF= Department of Fisheries, F= Forest

## 6. CAPACITY BUILDING PLAN

Capacity Building is the process of assisting the group or individuals to identify and address issues and gain the insights, knowledge and experience needed to solve problems and implement change.

There is a realization in the development sector that there is a need to appraise the success of development interventions by going beyond the conventional development targets and measures of success (e.g. in the form of commodities, goods and services) to take into account improvements to human potential. Capacity building of stakeholders is also increasingly viewed as an important factor in developmental projects that involve participation of stakeholders at all levels for effective implementation of projects.

### Scope of capacity building at IWMP II<sup>nd</sup>

- Alternative Land Use Plan
- Scientific technique of Soil and Moisture conservation
- Improved and Scientific agriculture practices
- Fodder development and Management
- Afforestation
- Meteorological Information
- Dairy Development and Management
- Rural Craft
- Income Generation Activities
- Stitching
- Food Processing
- Post Harvest management practices
- Fish Production

Capacity building and training are the most important components of watershed management programme both for the field level project staff/ officers and functionaries of people institutions i.e. watershed community. Apart from enhancing technical skill of the project staff, this would also provide opportunities to community members to develop their capacity as the future custodians of the programmes after project's withdrawal. IWMP IInd Moradabad financial outlay for capacity buildings is 5% (Rs. 30.96) of the total project cost, out of which Rs 0.96 will be expended for initiation of village level institution.

**Table no 70 : Capacity Building activities in the project**

S.No.	Project Stakeholders	Total no. of persons	No. of persons trained so far	No. of persons of be trained during current financial year	Sources of funding for training		Name and Address of the Institute where Trained
					a) DOLR	b) any other (pl. specify)	
1	PIAs	10	10	-	DOLR		1-Central Soil and Water Conservation research and training centre, Challeshar Agra. 2-Din Dayal Upadhyaya Rajya Gram vikas sansthan, Bakshi ka Talab, Lucknow 3-Smartking education Pvt Ltd, Kanpur
2	WDTs	6	6	-	DOLR		
3	UGs	1100	244	856	DOLR		
4	SHGs	620	138	482	DOLR		
5	WCs	54	12	42	DOLR		
6	GPs	27	6	21	DOLR		
7	Community	200	-	200	DOLR		

**Table no 70.1: Detail of activities undertaken**

Strategy	Proposed activity	No. of Units	Unit cost	Total Cost
Capacity building Activities	Stakeholders - Scientists Interaction,	10	0.10	1.00
	Training (2 days)	100	0.05	5.00
	Vocational/employment Generation Training (5-10 days)	60	0.10	6.00
	In-service Training. (3 days)	20	0.10	2.00
	Exposure visit within State	5	0.20	1.00
	Exposure visit out of State	6	0.50	3.00
	Field days	25	0.20	5.00
	Workshop	5	0.60	3.00
	<b>Total</b>			<b>26.00</b>

**Table no 70.2 : Information, Education & Communication (IEC) activities in the project area**

S.no.	Activity	Executing agency	Estimated expenditure (Rs.)	Expected Outcome (may quantify wherever possible)
1	Street plays	Local Drama Groups	100000.00	Awareness about importance of watershed project
2	Video Shows	IWMP, Moradabad	100000.00	
3	Pamphlets and Poster	IWMP, Moradabad	100000.00	
4	Banners and Hoardings	IWMP, Moradabad	100000.00	
		<b>Total</b>	<b>400000.00</b>	

## 7. PHASING OF PROGRAMMES AND BUDGETING

### 7.1 FUNDING OF THE PROJECT

Table no. 72 : Funding for the IWMP Project \* (All financial figures in lakh Rs.)

S.No.	Names of Project	IWMP fund		Funds from other sources in addition to IWMP funds										Total
		Central share	State share	Convergence funds		PPP		Community		Institutional finance		Others (pl. specify)		
				Name of Scheme	Amount	Name of Private sector	Financial contribution	Name	Financial contribution	Name	Financial contribution	Name	Financial contribution	
1	IWMP 2 <sup>nd</sup>	619.20	-	*	114.65	-	-	-	-	-	-	-	-	733.85

\*For detail please see table no. 69 it is additional budget and not included in fund budget (Rs. 12000.00). this budget will be use in watershed area according requirement and need during work phase by PIA.

### 7.2 YEAR WISE PHASING OF WORK (Physical and Financial)

Phasing of various works/ activities during different year of the project for treatable area 6710.00 ha out of proposed area 7455.00 ha presented in table

Table no. 73: COMPONENT WISE AND YEAR WISE PHASING OF PHYSICAL AND FINANCIAL OUTLAY(All financial figures in lakh Rs.)

S.N.	Particulars	I <sup>st</sup> Year (2010-11)		2 <sup>nd</sup> Year (2011-12)		3 <sup>rd</sup> Year (2012-13)		4 <sup>th</sup> Year (2013-14)		5 <sup>th</sup> Year (2014-15)		Total	
		Financial lac	Phy. Hc	Financial lac	Phy. Hc	Financial lac	Phy. Hc	Financial lac	Phy. Hc	Financial lac	Phy. Hc	Financial lac	Phy. Hc
1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	Administration Cost 10%	3.096	To meet out the administrative works/charges	9.288	As per column 4	16.7184	As per column 4	16.7184	As per column 4	16.0992	As per column 4	61.92	As per column 4
2	Monitoring 1%	-	monitoring of the project	1.2384	As per column 4	1.2384	As per column 4	1.2384	As per column 4	2.4768	As per column 4	6.192	As per column 4
3	Evaluation 1%	-	Evaluation of the project	1.8576	As per column 4	1.0836	As per column 4	1.0836	As per column 4	2.1672	As per column 4	6.192	As per column 4
4	Entry point Activities 4%	24.76	Renovation of Culvert, well soaking pit	-	As per column 4	-	As per column 4	-	As per column 4	-	As per column 4	24.76	As per column 4

			kishan vikas manch etc.										
1	2	3	4	5	6	7	8	9	10	11	12	13	14
5	Institution & Capacity Building 5%	3.096	Training Of DPR	15.48	As per column 4	4.644	As per column 4	4.644	As per column 4	3.096	As per column 4	30.96	As per column 4
6	DPR 1%	6.192	Preparation of DPR	-	As per column 4	-	As per column 4	-	As per column 4	-	As per column 4	6.192	As per column 4
7	Watershed Dev. Works 50%	-	Construction of Soil and water recharging structure Agro forestry horticulture etc.	46.44	744	95.976	1599.60	89.784	1496.40	77.40	1290	309.60	5160.00
8	Livelihood Activities 10%	-	Nadef compost unit, Dairy/Goat,Poultry General merchant etc.	6.192	As per column 4	24.768	As per column 4	18.576	As per column 4	12.384	As per column 4	61.92	As per column 4
9	Production System & micro Enterprises 13%	-	farming system approach animal husbandry activates, horticulture, vegetables growing, medicinal plants, Floriculture etc.	6.4392	As per column 4	24.147	As per column 4	30.5862	As per column 4	19.3176	As per column 4	80.49	As per column 4
10	Consolidation Phase	-	Consolidation activites	-	As per column 4	-	As per column 4	-	As per column 4	30.96	As per column 4	30.96	As per column 4
	<b>Total</b>	<b>37.144</b>	<b>0</b>	<b>86.9352</b>	<b>744</b>	<b>168.5754</b>	<b>1599.6</b>	<b>162.6306</b>	<b>1496.4</b>	<b>163.9008</b>	<b>1290</b>	<b>619.20</b>	<b>5160</b>

**Table no. 74: ABSTARACT OF COMPONENT WISE WORK AND FINANCIAL OUTLAY OF THE SELECTED 9 WATERSHED**

(All financial figures in lakh Rs.)

S.No.	Component	Total
<b>1</b>	<b>MANAGEMENT COSTS</b>	
<b>A</b>	Administrative cost-TA&DA, POL/Hiring of vehicles/office and payment of electricity and phone bill etc. computer, stationary and office consumable and Contingency	61.92
<b>B</b>	Monitoring	6.192
<b>C</b>	Evaluation	6.192
	<b>Sub Total</b>	<b>74.304</b>
<b>2</b>	<b>PREPARATORY PHSES</b>	-
<b>A</b>	Entry Point Activities like improvement in drinking water system, school, temple etc	24.76
<b>B</b>	Capacity Building	30.96
<b>C</b>	DPR	6.192
	<b>Sub Total</b>	<b>61.92</b>
<b>3</b>	<b>WATERSHED WORKS</b>	
<b>A</b>	Soil and Moisture Conservation	203.851
<b>B</b>	Water Resource Development	93.745
<b>C</b>	Agro-Silvi	12.004
	<b>Sub Total</b>	<b>309.60</b>
<b>4</b>	<b>LIVILIHOD PROGRAMME (Community based)</b>	-
	Income generating activities through SHG are for landless and marginal farmers. Establishment of Vermi compost units Mushroom cultivation Block plantation of Aonla Bael Ber for fire wood	61.92
	<b>Sub Total</b>	<b>61.92</b>
<b>5</b>	<b>PRODUCTION SYATEM AND MICRO ENTERPRISES</b>	
	<u>Demonstrations and Assessment</u> Seed, Biofertilizer, Pest control, Advance agril. Equipment, Production of Compost	80.496
	<b>Sub Total</b>	<b>80.496</b>
<b>6</b>	<b>CONSOLIDATION PHASE</b>	<b>30.96</b>
	<b>GRAND TOTAL</b>	<b>619.20</b>

## 8. CONSOLIDATION/EXIT STRATEGY

### 8.1 Quality and Sustainability Issues

#### 8.1.1 Plans for Monitoring and Evaluation

A Web-based GIS System is being developed for monitoring and evaluating the project in its planning & implementation phases. The system would be available on a public domain and can be accessed by all the stakeholders of the project. The system shows the entire state of Uttarpratesh and all of those areas selected over the next 18 years. Filtering allows the user to zoom onto one particular project. Details related to soil type, Land-use classification, inhabitation etc., can be obtained village-wise. Furthermore, survey-number wise details related to ownership, irrigation source, yield etc., can also be accessed by the users of the system. This system is being used for pooling up the details obtained from the DPR. In other words, the DPR is made available online in the form of a database which will help the stakeholders know areas of importance viz., already treated areas/historical works in the area, proposed areas for treatment etc., for further treatment and planning. The system would also show the satellite imageries of various years from the project inception stage to the project closing stages. This allows the user to evaluate the effectiveness of the treatment and thereby plan corrective measures for the project area. The system would serve as an aiding tool to the planners and evaluators for judging the efficacy of the project.

Yet another component of the Web-based GIS system is the Mobile based Monitoring & Evaluation System, which will help the ground staff alias WDTs (Watershed Development Team) to transmit information from the ground level to the central server. Also, any higher-up official in charge of the project can obtain information regarding the project area on their mobile phone by means of an SMS. The system works in the following manner. The WDT equipped with a GPS instrument marks the latitude-longitude information of various treatment areas during the DPR. The probable sites are then transferred onto the central server. During the works phase, any progress in the treatment areas is reported to the server by means of an SMS by the WDT. Similarly, any nodal officer or higher-up official can view the progress in a project by means of summarized reports generated over frequent periods of time.

#### 8.1.2 Plans for Project management:

The Project management of any watershed programme is very important. It mainly depends upon the community organization and the village level institutes in IWMP IInd Moradabad watershed committee and various user group have been formulated for post project operation and maintenance of assets created during project period. Major emphasis will be on equity and sustainable benefit of the project even after implementation stage. A proper link-up will be built during project period with various institutes and capacity building organization. They will act as a major kingpin during post implementation for scaling up the successful experience during project.

#### 8.1.3 Watershed Development Fund:

The major source of financial assistance after post implementation period is watershed Development Fund. The contribution of it will comes mainly fund the following: Attention:



### 8.1.4 User Charges:

Various user groups will be formed in village. These user groups will collect user charges according to the designated rules formed during the formation of user group. These funds will be transferred to the WDF funds as per these formulated rules. The secretary of watershed committee (WC) shall maintain the records of the following.

### 8.2 Activities in the CPRs in the project area

**Table no. 75: Details of activities in the CPRs in the Project areas**

S.no	Name (s) of the villages	CPR particulars	Activity Proposed	Target				
				Target area under the activity (ha)	Estimated expenditure (laks.)	Expected no. of beneficiaries	Estimated contribution to WDF (Rs.)	Expected month & year of completion (mm/yyyy)
1	2B5A6e1d	Wasteland	Engineering work	102.00	6.12	350	31000.00	March, 2015
		Forest	Afforestation	22.00	1.32	88	7000.00	July, 2012
		Pasture	Land development	3.00	0.18	70	1000.00	July, 2012
		Orchard	Horticulture	10.00	0.60	180	3000.00	July, 2012
		Village Pond	Moisture Conservation	2 no	2.00	140	10000.00	March, 2011
		<b>Total</b>		<b>137.00</b>	<b>10.22</b>	<b>828</b>	<b>52000.00</b>	
2	2B5A6e1c	Wasteland	Engineering work	107.00	6.42	410	32100.00	March, 2015
		Forest	Afforestation	45.00	2.70	188	13500.00	July, 2012
		Pasture	Land development	4.00	0.24	82	1200.00	July, 2012
		Orchard	Horticulture	10.00	0.60	192	3000.00	July, 2012
		Village Pond	Moisture Conservation	2 no	2.00	140	10000.00	March, 2011
		<b>Total</b>		<b>166.00</b>	<b>11.96</b>	<b>1012</b>	<b>59800.00</b>	
3	2B5A6e1b	Wasteland	Engineering work	223.00	13.38	1092	66900.00	March, 2015
		Forest	Afforestation	90.00	5.40	375	27000.00	July, 2012
		Pasture	Land development	5.00	0.30	75	1500.00	July, 2012
		Orchard	Horticulture	20.00	1.20	315	6000.00	July, 2012
		Village Pond	Moisture Conservation	2 no	2.00	140	10000.00	March, 2011
		Temple	EPA	2 no	2.00	-	10000.00	March, 2011
<b>Total</b>		<b>338.00</b>	<b>24.28</b>	<b>1997</b>	<b>121400.00</b>			
4	2B5A6d2e	Wasteland	Engineering work	82.50	4.95	290	24750.00	March, 2015
		Forest	Afforestation	22.00	1.32	82	7000.00	July, 2012
		Pasture	Land development	3.00	0.18	92	1000.00	July, 2012
		Orchard	Horticulture	10.00	0.60	170	3000.00	July, 2012
		Village Pond	Moisture Conservation	3 no	3.00	152	10000.00	March, 2011
		<b>Total</b>		<b>120.50</b>	<b>10.23</b>	<b>786</b>	<b>51150.00</b>	
5	2B5A6d2d	Wasteland	Engineering work	42.70	2.56	295	12800.00	March, 2015
		Forest	Afforestation	5.00	0.30	78	1500.00	July, 2012
		Orchard	Horticulture	3.00	0.18	70	1000.00	July, 2012
		Village Pond	Moisture Conservation	3 no	3.00	152	10000.00	March, 2011
		<b>Total</b>		<b>50.70</b>	<b>6.04</b>	<b>595</b>	<b>30200.00</b>	

S.no	Name (s) of the villages	CPR particulars	Activity Proposed	Target				
				Target area under the activity (ha)	Estimated expenditure (laks.)	Expected no. of beneficiaries	Estimated contribution to WDF (Rs.)	Expected month & year of completion (mm/yyyy)
6	<b>2B5A6d2c</b>	Wasteland	Engineering work	102.00	6.12	350	24750.00	March, 2015
		Forest	Afforestation	22.00	1.32	88	7000.00	July, 2012
		Pasture	Land development	3.00	0.18	70	1000.00	July, 2012
		Orchard	Horticulture	10.00	0.60	180	3000.00	July, 2012
		Village Pond	Moisture Conservation	3 no	3.00	140	15000.00	March, 2011
		<b>Total</b>		<b>137.00</b>	<b>11.22</b>	<b>828</b>	<b>56150.00</b>	
7	<b>2B5A4d1d</b>	Wasteland	Engineering work	107.00	6.42	410	32100.00	March, 2015
		Forest	Afforestation	45.00	2.70	188	13500.00	July, 2012
		Pasture	Land development	4.00	0.24	82	1200.00	July, 2012
		Orchard	Horticulture	10.00	0.60	192	3000.00	July, 2012
		Village Pond	Moisture Conservation	2 no	2.00	140	10000.00	March, 2011
		<b>Total</b>		<b>166.00</b>	<b>11.96</b>	<b>1012</b>	<b>59800.00</b>	
8	<b>2B5A6d1f</b>	Wasteland	Engineering work	223.00	13.38	1092	66900.00	March, 2015
		Forest	Afforestation	90.00	5.40	375	27000.00	July, 2012
		Pasture	Land development	5.00	0.30	75	1500.00	July, 2012
		Orchard	Horticulture	20.00	1.20	315	6000.00	July, 2012
		Village Pond	Moisture Conservation	5 no	5.00	280	25000.00	March, 2011
		Temple	EPA	2 no	2.00	-	10000.00	March, 2011
		<b>Total</b>		<b>338.00</b>	<b>24.28</b>	<b>2137</b>	<b>136400.00</b>	
9	<b>2B5A4b5</b>	Wasteland	Engineering work	42.70	2.56	295	12800.00	March, 2015
		Forest	Afforestation	5.00	0.30	78	1500.00	July, 2012
		<b>Total</b>		<b>47.70</b>	<b>2.86</b>	<b>373</b>	<b>14300.00</b>	

### **8.3 Sustainability and environment security**

In the proposed watershed management plan of IWMP-II<sup>nd</sup> watershed, proper blending of bio engineering measures will be applied on 60% of the total watershed area. Based on the results of studies conducted in this region, it is estimated that more 50% of the watershed area will be treated and consequently the soil loss and runoff from the area is expected to be reduced by 70% and 65% respectively. The proposed land use plan will improve the land utilization index and crop diversification index significantly as compared to the existing one. It will help in maintaining ecosystem integrity on sustained basis along with improving the livelihood security of the farming community.

### **8.4 Economic Analysis**

Economic analysis of the project was carried by taking direct benefits and costs considering 25 year project life at 10 per cent discount rate. For this purpose of economic analysis, whole watershed development plan was divided into three sectors namely,

agriculture, horticulture and forest/fuel wood plantation. Net present value (NPV), Benefit cost ratio (BC) ratio criteria were employed to judge the economic efficiency of each enterprise and sector.

#### 8.4.1 Agriculture

In rainfed agriculture the development cost can be recovered within one year as the present rainfed agriculture is being done on well maintained field, therefore, does not require much investment. In irrigated agriculture, investment of Rs. 414.33 lacs is proposed to made. The BC ratio of this sector is 1.6: 1 with in three years pay back period. (Table 18)

**Table no. 76: Economics of agriculture sector**

S.No.	Sector	Area (ha)	NPV (Rs.)	BC ratio
1	Irrigated agriculture	3400.00	94755630	1.6:1
2	Rainfed agriculture	1640.00	16642810	1.2:1
3	Total	5040.00	111398440	1.4:1

#### 8.4.2 Horticulture

Economic analysis of horticulture plantation in agri-horti system at IWMP-II<sup>nd</sup> watershed Project life is considered to be 25 years and discount rate for NPV estimation is 10%

**Table no. 77: Economics of Horticulture sector**

S.No.	Common Name	Scientific name	Area (ha)	NPV of net venefit (Rs.)	BC ratio
1	Aonla	<i>Embelica officinalis</i>	60.00	1057725	3.97:1
2	Ber	<i>Zyziphus Moradabadritiana</i>	30.00	251962	2.81:1
3	Bael	<i>Aegle marmelos</i>	31.00	169887	2.84:1
	Total		121.00	1,47,9574	3.512

### 8.4.3 Forest/ Fuel wood plantation

Economic analysis of fuel wood plantation at IWMP-II<sup>nd</sup> watershed. Project life is considered to be 25 years and discount rate for NPV estimation is 10%

**Table no. 78: Economics of afforestation sector**

S.No.	Common Name	Scientific name	Area (ha)	NPV of net benefit (Rs.)	BC ratio
1	Vilayati Babul	Prosopis juliflora	550.00	384482	2.11:1

### 8.4.4 Food sufficiency

Achieving self sufficiency in food production is one of the prime objectives of the project. The status of food requirement and production before and after the project is presented in Table.

**Table no 79: Status of food requirement and availability per annum in IWMP-II<sup>nd</sup> watershed**

S.No.	Items	Requirement (q/yr)	Before project		Proposed	
			Availability (q/yr)	Deficit or surplus (q/yr)	Availability (q/yr)	Deficit or surplus (q/yr)
1	Cereals	55000	49850	-6150	79460	+24460
2	Pulses	16000	12340	-3660	28936	+12936
3	Oil seeds	22000	17750	-4250	29972	+7972
4	Vegetable	33000	25330	-8670	38540	+5540

## 9. EXPECTED OUTCOMES

### 9.1 Employment

Employment has always been a problem in the village. The principal occupations of the people are dry land agriculture, animal husbandry and casual labour work. However, rain fall being very limited and erratic, agriculture suffers, i.e. at best they can take only a single crop, which keeps them partially engaged for about 4 months. Lack of fodder makes animal husbandry very difficult too. So, animal husbandry does not keep them engaged full time. Thus the people mainly depend upon casual labour, either in the village itself or outside it.

The project plans for creation of both wage employment and self employment opportunities. Wage employment would be created by engaging people in watershed physical works like construction of earthen bunds, farm bunds, village pond, plantation, etc. Self employment would be created by providing the people with cash support in the form of direct livelihood activities like agriculture, animal husbandry and enterprise development.

**Table no. 80: Employment in Project area**

S.no.	No. of the villages	Wage employment										Self employment				
		No. of man days					No. of beneficiaries					No. of beneficiaries				
		SC	ST	Others	Women	Total	SC	ST	Others	Women	Total	SC	ST	Others	Women	Total
1	41 (IWMP 2 <sup>nd</sup> )	1.615	-	1.295	0.323	3.230	1312	-	2042	192	3546	210	-	190	30	430

### 9.2. Migration

Low rainfall results in very little fodder availability in the locality. On account of agriculture and animal husbandry providing only part time employment for some part of the year, the people migrate for a better half of the year for wage labour. Employment opportunities in the local area as mentioned above will ensure lessening seasonal migration from the area.

**Table no. 81: Details of seasonal migration from Project area**

S.no.	Names of villages	No. of persons migration	No. of days per year of migration	Major reason(s) for migration	For reduced migration identify major activities of IWMP responsible		Expected reduction in No. of persons migration
					(a) Structures	(b) Livelihoods	
1	IWMP 2 <sup>nd</sup> (41 village)	4087	160	Due to employment	Structure	Livelihood	3200

### 9.3 Drinking water

As a result of the watershed activities, it is expected that the quantity and quality of drinking water would improve.

**Table no. 82: Status of Drinking water**

S. No.	Names of Villages	Availability of drinking water (no. of months in a year)		Quality of drinking water		Comments
		Pre-project	Expected Post project	Pre-project	Expected Post-project	
1	IWMP 2 <sup>nd</sup> (41 village)	10 month	12 month	General water	Good water	-

### 9.4 Vegetative cover

There is negligible area under tree cover. The village has a negligible forest area which consists of only *Prosopis Juliflora* (babool). Trees like Neem and *Alianthus* are seen just here and there, not concentrated in any area. It is planned that 681.00 ha land to be covered under new plantation.

**Table no. 83: Forest/vegetative cover**

S. No.	Name of Village	Existing area under tree cover (ha)	Area under tree cover proposed
1	IWMP 2 <sup>nd</sup> (41 village)	-	-

### 9.5 Livestock

The village has quite a good of livestock population. These include cows, bullocks, buffaloes, goats, sheep and camels. The interventions like provision of good quality cows and buffaloes, the establishment of a fodder bank and other such related activities would spur up the dairy development in the village. It is expected that the post project period would see a substantial increase in livestock population and yield from them.

**Table no. 84: Details of livestock in the project areas (for fluids please mention in litres, for solids please mention in kgs. and income in Rs.)**

S. no.	Name of MW	Type of animal	Pre Projected			Expected Post Projected			
			No	Yield	Income	No	Yield	Income	
1	IWMP 2 <sup>nd</sup> (41 village)	Buffalow	11786	2.33lit/animal	20.00/day	11786	4.00lit/animal	30.00/day	
		Cow	7668	1.84lit/animal	16.00/day	7668	3.004lit/animal	25.00/day	
		Sheep	7681	10kg/animal	2000.00/animal	7681	20kg/animal	4000.00/animal	
		Goats	405	8 kg/animal	1600.00/animal	405	16 kg/animal	3200.00/animal	
		Pigs	710	20.0 kg/ha	2000.00/animal	710	50.0 kg/ha	10000.00/animal	
		Poultry	-	0.75kg/bird	150.00/bird	-	0.75kg/bird	300.00/bird	
		Fish	-	10.73 q/ha	15000.00/ha	-	50.00 q/ha	75000.00/ha	

### 9.6 Vegetation/ crop related outcomes:

**Table no. 85: Details of karif crop area and yield in the project areas**

S. No	Names of villages	Name of crops	Pre-project						Expected Post-project					
			Area (ha)		Average Yield (Qtl) per ha.		Total Production (Qtl)		Area (ha)		Average Yield (Qtl) per ha.		Total Production (Qtl)	
			Irri	Rf.	Irri	Rf.	Irri	Rf.	Irri	Rf.	Irri	Rf.	Irri	Rf.
1	2B5A6e1d	Urd	10	60	10.00	8.00	100	480	15	60	12.00	9.00	180	540
		Others*	-	200	-	8.00	-	1600	-	300	-	15.00	-	4500
2	2B5A6e1c	Urd	12	70	10.00	8.00	120	560	18	70	12.00	9.00	216	630
		Others*	-	250	-	8.00	-	2000	-	400	-	15.00	-	6000
3	2B5A6e1b	Urd	9	50	10.00	8.00	90	400	14	50	12.00	9.00	168	450
		Others*	-	400	-	8.00	-	3200	-	700	-	15.00	-	10500
4	2B5A6d2e	Urd	9	50	10.00	8.00	90	400	14	50	12.00	9.00	168	450
		Others*	-	150	-	8.00	-	1120	-	300	-	15.00	-	4500
5	2B5A6d2d	Urd	6	40	10.00	8.00	60	320	10	40	12.00	9.00	120	360
		Others*	-	90	-	8.00	-	720	-	200	-	15.00	-	3000
6	2B5A6d2c	Urd	3	16	10.00	8.00	30	128	5	16	12.00	9.00	45	144
		Others*	-	170	-	8.00	-	1360	-	300	-	15.00	-	4500
7	2B5A4d1d	Urd	18	100	10.00	8.00	180	800	25	100	12.00	9.00	300	900
		Others*	-	180	-	8.00	-	1440	-	300	-	15.00	-	4500
8	2B5A6d1f	Urd	8	40	10.00	8.00	80	320	12	40	12.00	9.00	144	360
		Others*	-	400	-	8.00	-	3200	-	500	-	15.00	-	7500
9	2B5A4b5	Urd	25	125	10.00	8.00	250	1000	40	125	12.00	9.00	480	1125
		Others*	-	90	-	8.00	-	720	-	200	-	15.00	-	3000

Irri.- Irrigated

Rf.- Rainfed

Others: Pigeon pea, moong urd, jwar, etc

**Table no. 86: Details of Rabi drop area and yield in the project areas \***

S.No.	Names of villages	Name of crops	Pre-project						Expected Post-project					
			Area (ha)		Average Yield (Qtl) per ha.		Total Production (Qtl)		Area (ha)		Average Yield (Qtl) per ha.		Total Production (Qtl)	
			Irri	Rf.	Irri	Rf.	Irri	Rf.	Irri	Rf.	Irri	Rf.	Irri	Rf.
1	<b>2B5A6e1d</b>	Wheat	60	160	25.00	20.00	1500	1600	268	200	30.00	25.00	8040	5000
		Others*	-	90	-	10.00	-	900	-	78	-	15.00	-	1170
2	<b>2B5A6e1c</b>	Wheat	100	250	25.00	20.00	2500	5000	290	300	30.00	25.00	8700	7500
		Others*	-	100	-	10.00	-	1000	-	110	-	15.00	-	1650
3	<b>2B5A6e1b</b>	Wheat	200	400	25.00	20.00	5000	8000	524	600	30.00	25.00	15720	15000
		Others*	-	150	-	10.00	-	1500	-	212	-	15.00	-	3180
4	<b>2B5A6d2e</b>	Wheat	50	180	25.00	20.00	900	800	251	200	30.00	25.00	7530	5000
		Others*	-	80	-	10.00	-	1120	-	102	-	15.00	-	1530
5	<b>2B5A6d2d</b>	Wheat	30	90	25.00	20.00	540	200	238	200	30.00	25.00	7140	5000
		Others*	-	20	-	10.00	-	720	-	50	-	15.00	-	750
6	<b>2B5A6d2c</b>	Wheat	50	200	25.00	20.00	900	400	283	200	30.00	25.00	8490	5000
		Others*	-	50	-	10.00	-	1360	-	90	-	15.00	-	1350
7	<b>2B5A4d1d</b>	Wheat	40	200	25.00	20.00	720	400	257	200	30.00	25.00	7710	5000
		Others*	-	40	-	10.00	-	1440	-	80	-	15.00	-	1200
8	<b>2B5A6d1f</b>	Wheat	200	400	25.00	20.00	3600	1000	471	400	30.00	25.00	15230	10000
		Others*	-	110	-	10.00	-	3200	-	150	-	15.00	-	2250
9	<b>2B5A4b5</b>	Wheat	30	90	25.00	20.00	540	200	238	200	30.00	25.00	7140	5000
		Others*	-	20	-	10.00	-	720	-	50	-	15.00	-	750
<b>Total</b>			<b>660</b>	<b>3300</b>	<b>25.00</b>	<b>15.00</b>	<b>16290</b>	<b>48770</b>	<b>2820</b>	<b>2718</b>	<b>30.00</b>	<b>20.00</b>	<b>84600</b>	<b>55110</b>

Irri.- Irrigated

Rf.-

Rainfed

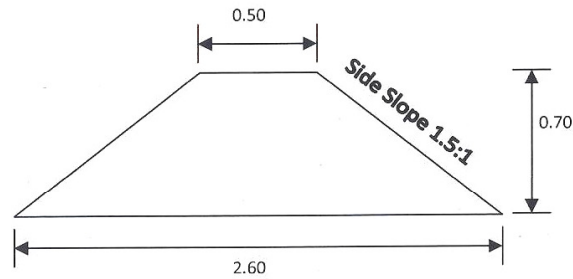
\* Others crop: chick pea, pea, mustard, potato etc



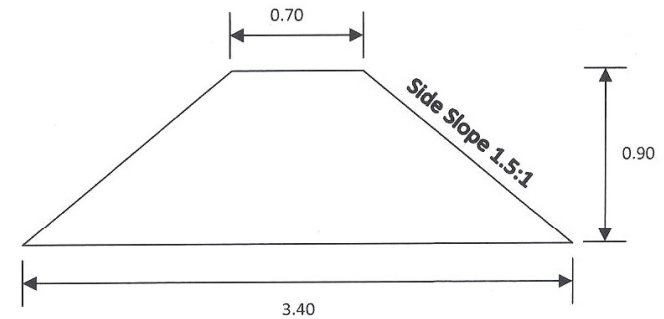
# 10- DETAILS ESTIMATE OF WATERSHED DEVELOPMENT WORK PHASES (ANNEXURE-1)

DRAWING OF C.B., S.B., P.B., AND M.B.

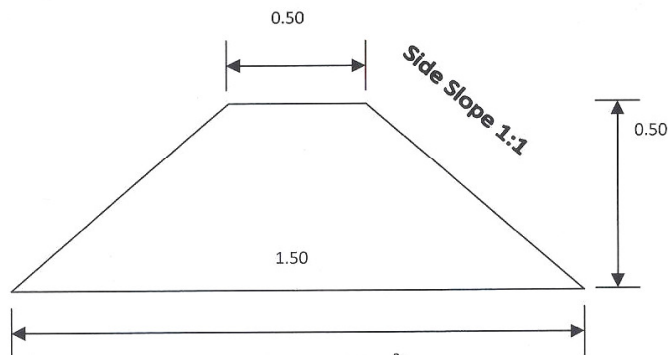
(All dimensions in Metre) (Not to Scale)



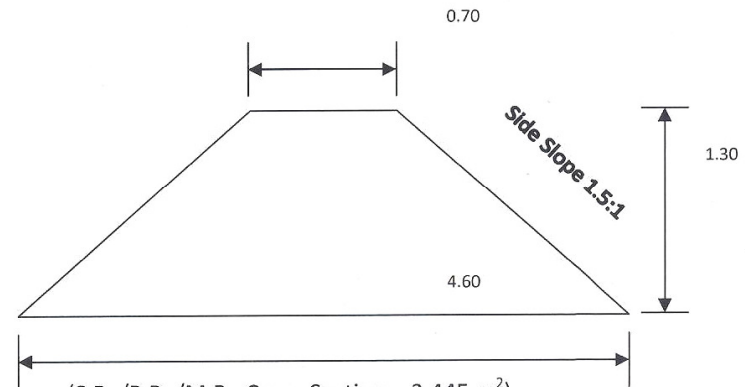
(C.B., Cross-Section – 1.085 m<sup>2</sup>)



(S.B., Cross-Section – 1.845m<sup>2</sup>)



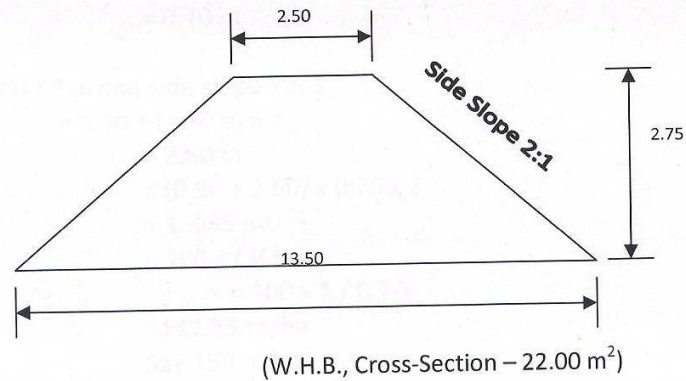
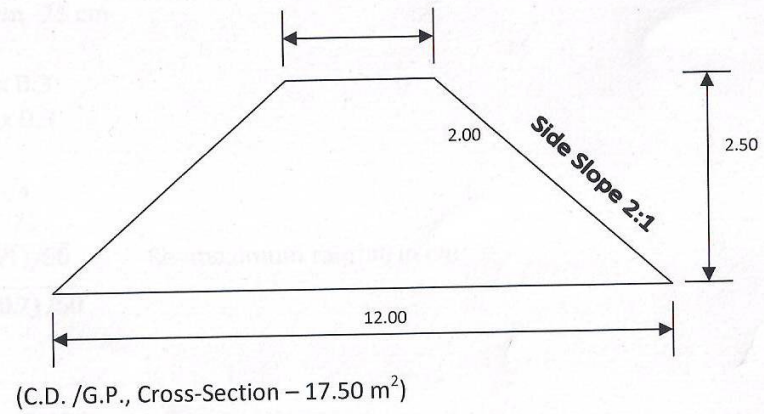
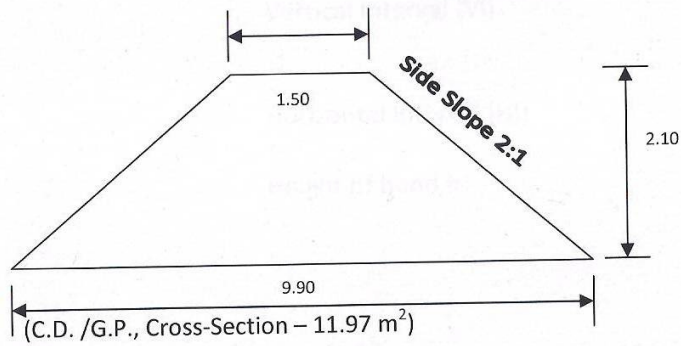
(Field Bund, Cross-Section – 0.50 m<sup>2</sup>)



(S.B. /P.B. /M.B., Cross-Section – 3.445 m<sup>2</sup>)

## DRAWING OF EARTHEN CHEKDAM / GULLY PLUG

(Not to Scale)



(All dimensions in Metre)

## DESIGN OF CONTOUR BUND

Type of Soil	- Clay
Rain fall	- 24 hr in cm -25 cm
Fied Stop -1%	
Virtical interval (Vi)	$= [s/3+2]$ $= [1/3+2]$
Horizontal interval (HI)	$= 0.70 \text{ m}$ $= 100 \times V.I/s$
Heidht of Bond h	$= (Rex \text{ vi})/50$ $= (25 \times 0.7) /50$ $0.35$ $0.59$ Say 0.6 m
Ferr bord	= 15% of high mimimum -10 cm
Hight	$= 0.60+0.10$ $= 0.70\text{m}$
Taking top width of bond 0.50 m and side slopee 1.5:1	
Then base of bond	$= 0.50+(1.10d) \times 2$ $= 2.60 \text{ m}$
Coress-Section of bond	$= (2.50+ 2.60) \times 0.70/2$ $= 1.085\text{m}^2$
Length of bond	$= 100s/V.I.$ $= 100 \times 1/0.70$ $= \mathbf{142.85 \text{ m/ha}}$ Say 120 m/ha
Earth work /ha	$= 250 \times 1.085$ $= 162.75 \text{ cum}$ $= 162.75 \text{ cum}$
Cort Rs./ ha	$= 162.7 \times 39.16 = 6373.29$ Say <b>6375.00</b>

## DESIGN OF SUMBERGENCE BOND

Types soil – Caly	Rainfall intensiy for 24 hrs – 25 cm
Fild slopee 3%	V.I. = $[\frac{s}{3}+2] \times 0.30$
	= 0.909 m
Horizontal Interval = $(100 \times V.I.) / s$	= $(100 \times 0.909) / 3$
	= 30m
Height of bond h = $(Re \times V.I.) / 50$	= $(25 \times 0.909) / 50 = 0.45 = 0.67m$ . Say 0.70m
Ferec bord 20% of hight minimum 20 cm	=
Total Hight	= 0.90 m
Takingh top wigth of bond 0.70 m and side slopee 1.5:1	
Bottom of bund	= $0.70 + 2 \times 1.5d$
	= $0.70 + 2.70$
	= 3.40
Cross section of Submergence Bond	= $(0.70 + 3.40) \times 0.90 / 2$
	= 1.845 m <sup>2</sup>
Lengh of bond	= $100s / V.I.$
	= $(100 \times 3) / 0.90$
	= 333 m
Feasible length	= 100 + 25 + 25
	= 150m
Earth work/ha	= $150 \times 1.845$
	= 276.75
	= $276.75 \times 39.16$
Cost per has	= 10,837.53
	<b>Say 10,850=00</b>

### TYPICAL SECAION OF FILED BUND

Top widht	= 0.50m
Side slopee	=1:1
Height of bound	= 0.50m
Bottom Widht	= 1.50m
Cross section	= $(0.580+1.50) \times 0.50 / 2 = 100 \text{cum}$
Length per hectare	= 200 m
Earhwork	= $200 \times 0.50 = 100 \text{cum}$
Cost 39.16/cum	= Rs.3916.00
Cost per hectare	=Rs. 3916.00

### TYPICAL SECTION OF P.B., M.B. S.B0.

Top width	= 0.70m
Side slopee	= 1.5: 1
Height	= 1.30 m
Bottom	=4.60 m
Cross section	= $(0.70+4.60) \times 1.30 / 2 = 3.445 \text{m}^2$
Cost/meter	= Rs. 142.00

### TYPICAL SECTION OF EARTHEN CHECK DAM / GULLY PLUG

Top width	=1.50 m
Side slopee	= 2:1
Height	= 2.10m
Bottom Width	=9.90 m
Cross section	= (1.50 + 9.90) x2.10 / 2 =11.97 m <sup>2</sup>
Cost per meter	= Rs. 551.45

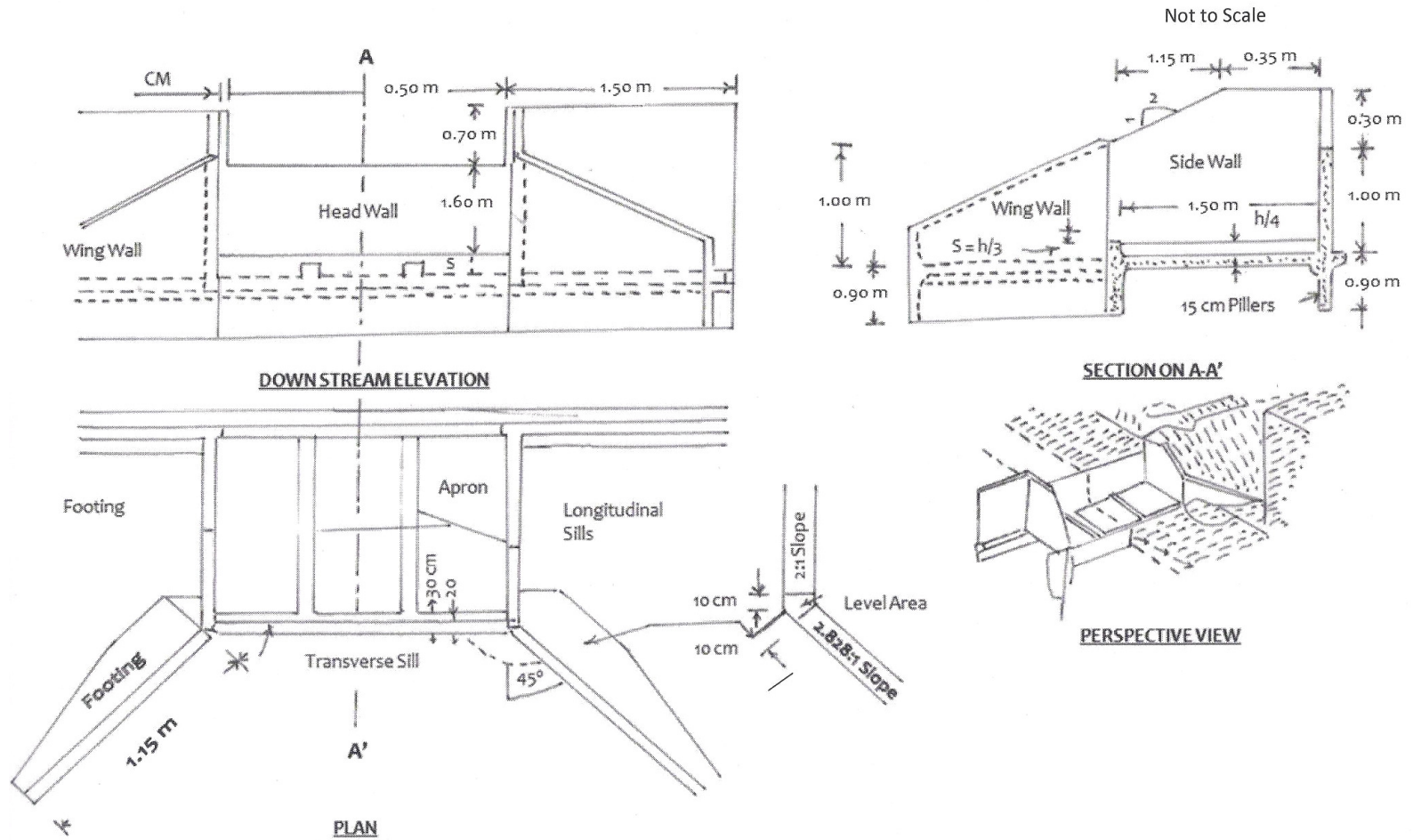
### TYPICAL SECION OF CHEK DAM / GULLY PLUG

Top Width	= 2.00m
Side slopee	=2:1
Height	= 2.50 m
Bottom Width	= 12.00 m
Cross Section	= (2.00 + 12.00 ) x 2.50 / 2 = 17.50 m <sup>2</sup>
Cost/meter	= Rs. 839.12

### TYPICAL SECTIOON OF W.H.B

Top width	= 2.50 m
Side slopee	= 2:1
Height	= 2.75 m
Bottom Width	= 13.50 m
Cross section	= ( 2.50 + 13.50 ) x 2.75/2 = 22.00 m <sup>2</sup>
Per meter cost	= Rs. 1085.92

DRAWING OF SPILLWAY OF CREST LENGTH 0.5 m



Design of Drop Spillway to be constructed at a place in a gully having width of 1.0 m and catchment area 1.00 and net drop 0.50 m Taking rainfall intensity for duration equal to time of concentration of watershed and design return period of 25 years , as 120 mm/hr . The coefficient of runoff for the watershed is 0.3.

**1. Hydrologic design** – The design peak runoff rate( $m^3/s$ ) for the watershed form Rational formula is given as :

$$Q = \frac{C.I.A.}{360} = \frac{0.3 \times 120 \times 1.00}{360} = \frac{36}{360} = 0.10 \text{ cum /second}$$

**2. Hydraulic design-** The maximum discharge capacity of the rectangular weir given by

$$Q = \frac{1.711LH^{3/2}}{(1.1+0.01f)} = \text{o find suitable value of L\&H}$$

Let us assume  $L = 0.50$  m (since width of gully is 1.00m)

$$0.10 = \frac{1.711LH^{3/2}}{(1.1+0.01 \times 0.5)} = \frac{1.711L H^{3/2}}{(1.105)}$$

$$L H^{3/2} = \frac{1.105 \times 0.10}{1.711} = \frac{0.1105}{1.711} = 0.064$$

$$H^{3/2} = \frac{0.064}{0.50} = 0.128$$

$$H = (0.128)^{2/3} = 0.25 \text{ m}$$

$$\text{Test } L/h = 0.50 = 2. \geq 2.0 \text{ hence O.K.}; \quad 0.25 \text{ h / f} = \frac{0.25}{0.50} = 0.50 \leq 0.5 \text{ hence O.K.}$$



### 3. Structural design -

1. Minimum headwall extension ,  $E = (3h + 0.6)$  or  $1.5 f$  whichever is greater  $E = 3 \times 0.5 + 0.6$  or  $1.5 \times 0.50$

$$E = 2.10\text{m} \quad \text{or} \quad 0.75 + m = \text{Adopted } 2.10\text{m}$$

2. Length of apron basin  $L_B = (2.28 h/f + 0.54) = 0.50 (2.20 \times 0.5 + 0.54) - 0.5$

$$= 0.50 \times 2.74 = 1.37 \text{ m says } 1.40\text{m}$$

3. Height of end sill,  $S = h = 0.50 = 0.16\text{m}$  says  $0.20\text{m}$

4. Height of wing wall and side wall at Junction:

$$J = 2h \text{ or } [f + h + S - (L_B + 0.10)/2] \text{ whichever is greater} = 2 \times 0.20 \text{ or } [0.50 + 0.50 + 0.16 -$$

$$(1.37 + 0.10/2)]$$

$$= 1.0 \text{ or } [1.16 - 0.735] = 1.0 \text{ or } 0.425 \text{ (adopt } J = 1.00 \text{ m)}$$

5.  $M = 2(f + 1.33 h - J) = 2(0.050 + 1.16 - 0.733 \times 0.25 - 1.00) = 2 \times (-0.167) = -0.335$

6.  $K = (L_B + 0.1) - M = (1.037 + 0.1) - 0.335 = 1.47 - 0.335 = 1.135 \text{ m}$

Toe and cut off walls

$$\text{Normal scour depth (N S D)} = 0.473 \times (Q/f)^{1/3} = 0.473 \times (0.1/1)^{1/3} = 0.473 \times 0.464 = 0.219$$

$$\text{Maximum Scour depth (M S D)} = 1.5 \times \text{N S D} = 1.5 \times 0.219 = 0.328\text{m} \text{ Says } 0.35 \text{ m}$$

$$\text{Depth of cutoff / Toe wall} = 0.35 \text{ m}$$

**Apron thickness :** For an over fall of  $0.5 \text{ m}$  .The apron thickness in concrete construction is  $0.20\text{m}$  since structure is constructed in masonry ,the Apron thickness will be  $0.20 \times 1.50 = 0.30\text{m}$

**Wall thickness :** The thickness of wall of the structure ( masonry construction ) is given below . :

Description	Thickness of wall	
	T op width	Bottom width
Head wall	0.40	1.00
Side wall	0.30	0.80
Wing all and head wall extension	0.30	0.60

**DETAIL ESTIMATE OF DROP SPILLWAY OF CREST LENGTH 0.5 METRE**

**1. Earth work in cutting in foundation**

S.No.	Description of work	No.	L	B	D/H	Quantity
1	Side wall	2	1.50	1.00	1.15	3.45
2	Head wall	1	0.50	1.20	1.15	0.69
3	Head wall extension	2	2.20	0.80	1.15	4.04
4	Wing wall	2	1.15	0.80	1.15	2.11
5	Tow wall	1	0.50	0.80	0.60	0.24
6	Cut off wall	1	4.70	0.80	0.60	2.25
7	Apron	1	0.50	1.50	0.60	0.45
Total						13.23 cum

**2 Laying of sand in the bed of foundation**

S.No.	Description of work	No.	L	B	D/H	Quantity
1	Side wall	2	1.50	1.00	0.10	0.300
2	Head wall	1	0.50	0.40	0.10	0.020
3	Wing wall	2	1.15	0.80	0.10	0.184
4	Toe wall	2	0.50	0.80	0.10	0.040
5	Cut off wall	1	4.70	0.80	0.10	0.376
6	Apron	1	0.50	1.50	0.10	0.075
Total						0.995 cum

**3 C.C.W. 1 :3: 6 in foundation**

S.No.	Description of work	No.	L	B	D/H	Quantity
1	Cut off wall	1	4.70	0.80	0.15	0.564
2	Head wall	1	0.50	0.40	0.15	0.030
3	Side wall	2	1.50	1.00	0.15	0.450
4	Wing wall	2	1.15	0.80	0.15	0.276
5	Toe wall	1	0.50	0.80	0.15	0.060
6	Apron	1	0.50	1.50	0.15	0.112
Total						1.492 cum

**4 Brick masonry 1:4**

S.No.	Description of work	No.	L	B	D/H	Quantity
1	Cut off wall	1	4.70	0.80	0.45	1.692
		1	4.70	0.60	0.45	1.269
2	Head wall	1	0.50	1.10	0.45	0.247
		1	0.50	1.00	0.45	0.225
		1	0.50	(0.40+1.00)/2	0.60	0.180
3	Head wall extension	2	2.10	0.80	0.45	1.512
		2	2.10	0.60	0.45	1.134
		2	2.10	0.60	0.60	1.512
		2	2.10	0.40	0.70	1.176
4	Side wall	2	1.50	1.00	0.45	1.350
		2	1.50	0.80	0.45	1.080
		2	1.50	0.80	0.60	1.440
		2	1.50	0.60	0.40	0.720
		2	(0.35+1.50)/2	0.40	0.30	0.222
5	Wing wall	2	1.15	0.80	0.45	0.828
		2	1.15	0.60	0.45	0.621
		2	1.15	0.40	(1.00+0)/2	0.460
6	Tow wall	1	0.50	0.80	0.45	0.180
		1	0.50	0.60	0.45	0.135
		1	0.50	0.40	0.20	0.040
7	Apron	1	0.50	1.50	0.45	0.337
Total						16.360cum

**5. C.C.W. 1:2:4 in the wall**

S.No.	Description of work	No.	L	B	D/H	Quantity
1	Head wall	1	0.50	0.40	0.025	0.005
2	Side wall	2	0.35	0.40	0.025	0.007
		2	0.18	0.40	0.025	0.023
3	Head wall extension	2	2.10	0.40	0.025	0.042
4	Wing wall	2	1.52	0.40	0.025	0.030
5	Toe wall	1	0.50	0.40	0.025	0.005
6	Apron	1	0.50	1.50	0.025	0.018
Total						0.130cum

**6. Tuck Pointing 1:3**

S.No.	Description of work	No.	L	B	D/H	Quantity
1	Head wall	1	0.50	-	0.60	0.30
		1	0.50	-	0.84	0.42
2	Side wall	2	1.50	-	1.00	3.00
		2	(0.30+1.50)/2	-	0.30	0.55
3	Head wall extension	2	2.10	-	1.00	4.20
4	Wing wall	2	1.15	-	(1.00+0)/2	1.15
Total						9.62m <sup>2</sup>

**CONSUMPTION OF MATERIALS**

S.No.	Particulars	Quantity	Cement (Bags)	Coarse Sand (cum)	Brick (No.)	G.S.B. 25-40 mm (cum)	G.S. Grit 10-20 mm (cum)
1	Sand laying	0.995cum	-	0.995	-	-	-
2	C.C.W. 1:3:6	1.492 cum	6.61	0.671	-	1.342	-
3	Brick Masonry	16.360 cum	29.26	5.562	1880	-	-
4	C.C.W. 1:2:4	0.130 cum	0.79	0.045	-	-	0.110
5	Tuck Pointing 1:3	9.62 m <sup>2</sup>	0.44	0.045	-	-	-
	Total		46.90	7.327	8180	1.342	0.110
	Say	47 Bags					

### Cost of Materials

S.No.	Name of Materials	Quantity	Rate	Amount
1	Cement	47 Bags	255.00/bag	11985.00
2	Coarse sand	7.327 cum	910.00/cum	6667.57
3	Brick	8180	4500.00/th	36810.00
4	G.S.B. 25-40 mm	1.342 cum	855.00/cum	1147.52
5	Grit 10-20 mm	0.110 cum	1250.00/cum	137.50
	<b>Total</b>			<b>Rs.56747.48</b>

### LABOUR CHARGE

S.No.	Name of Materials	Quantity	Rate	Amount
1	Earth Work	13.23cum	36.66/cum	485.01
2	Sand Laying	0.995cum	33.33/cum	33.16
3	C.C.W. 1:3:6	1.495cum	494/cum	337.04
4	Brick masonry	16.36cum	400/cum	6544.00
5	C.C.W. 1:2:4	0.130cum	494/cum	64.22
6	Tuck Pointing	9.62m <sup>2</sup>	51.61/m <sup>2</sup>	496.48
7	Curing	16.36cum	25.00/cum	409.00
8	Chowkidar	6 Man days	100.00/Man day	600.00
9	Head Load & local taion cost 10% cost of material	-	-	3670.64
	Total			<b>Rs. 13039.55</b>

Total Expenditure	
1. Cost of Materials	56747.48
2. Labour Charges	13039.55
<b>Total</b>	<b>Rs. 69787.03</b>
	<b>Says Rs. 69800.00 only</b>

Design of Drop Spillway to be constructed at a place in a gully having width of 1.0 m and Catchments area 1.00 and net drop 0.50 m Taking rainfall intensity for duration equal to time of concentration of watershed and design return period of 25 years , as 120 mm/hr . The coefficient of runoff for the watershed is 0.3.

**1. Hydrologic design** – The design peak runoff rate( $m^3/s$ ) for the watershed form Rational formula is given as :

$$Q = \frac{C.I.A.}{360} = \frac{0.3 \times 120 \times 5.0}{360} = 0.50 \text{ m}^3/\text{s}$$

**2. Hydraulic design-** The maximum discharge capacity of the rectangular weir given by

$$Q = \frac{1.711LH^{3/2}}{(1.1+0.01f)}$$

To find suitable value of L&H

Let us assume  $L=1.0$  m(since width of gully is 2.00m)

$$0.50 = \frac{1.711LH^{3/2}}{(1.1+0.01 \times 0.5)} = \frac{1.711LH^{3/2}}{1.2}$$

$$LH^{3/2} = \frac{1.20 \times 0.5}{1.711} = 0.350$$

$$H^{3/2} = \frac{0.375}{1.711 \times 4} = 0.35$$

$$H = (0.350)^{2/3} = 0.49 \text{ m says } 0.50\text{m}$$

Test  $L/h = \frac{1.00}{0.25} = 2.00 \geq 2.0$  hence O.K.;

$$h/f = \frac{0.50}{1.00} = 0.5 \leq 0.5 \leq \text{hence O.K.}$$

Heace he designed hydraulic dimensions of the Spilay are :

Crest Length (L) = 1.00 m  
Weir depth (h) = 0.50m

### 3. Structural design -

1. Minimum headwall extension ,  $E = (3h + 0.6)$  or  $1.5 f$  whichever is greater ;  $3 \times 0.50 + 0.6$  or  $1.5 \times 1$   
 $E = (1.5 + 0.60)$  or  $21.50\text{m}$

= 2.10 or 1.50 Adopted = 2.10 m

2. Length of apron basin  $L_B = (2.28 h/f + 0.54)$  =  $1(2.28 \times 0.50 + 0.54) = 1.68\text{m}$

3. Height of end sill,  $S = \frac{h}{3} = \frac{0.50}{3} = 0.16\text{m}$

4. Height of wing wall and side wall at Junction:

$$J = 2h \text{ or } [f + h + S - (L_B + 0.10)/2] \text{ whichever is greater} = 2 \times 0.50 \text{ or } [1.0 + 0.50 + 0.16 - (1.68 + 0.10)/2]$$

$$= 1.0 \text{ or } [1.66 - 0.89] = 1.00 \text{ or } 0.77 (\text{adopt } J = 1.00 \text{ m})$$

5.  $M = 2(f + 1.33 h - J) = 2(1.0 + 1.33 \times 0.50 - 1.00) = 2(-0.1665 - 1.00) = 1.33\text{m}$

6.  $K = (L_B + 0.1) - M = (1.68 + 0.1) - 1.33 = 0.45 \text{ m}$

Toe and cut off walls

$$\text{Normal scour depth (N S D)} = 0.473 \times (Q/f)^{1/3} = 0.473 \times (0.5/1.0)^{1/3} \text{ taking } f = 1$$

$$= 0.473 \times (0.5)^{1/3} = 0.473 \times 0.793 = 0.375 \text{ m}$$

$$\text{Maximum Scour depth (M S D)} = 1.5 \times \text{N S D} = 1.5 \times 0.375 = 0.56\text{m Says}$$

Depth of cutoff / Toe wall 0.56 m say 0.60m

**Apron thickness :** For an over fall of 1.0 m .The apron thickness in concrete construction is 0.30m since structure is constructed in masonry ,the Apron thickness will be  $0.30 \times 1.50 = 0.45\text{m}$

**Wall thickness :** The thickness of wall of the structure ( masonry construction ) is given below . :

Description	Thickness of wall	
	Top width	Bottom width
Head wall	0.45	1.00
Side wall	0.30	0.80
Wing all and head wall extension	0.30	0.60

### DETAIL ESTIMATE OF DROP SPILLWAY CREST LENGTH

#### 1. Earth work n cutting

S.No.	Description of work	No.	L	B	D/H	Quantity
1	Side wall	2	1.70	1.00	1.15	3.91
2	Head all	1	0.80	1.20	1.15	1.10
3	Head wall extension	2	2.20	0.80	1.15	4.04
4	Toe wall	1	0.80	0.70	0.80	0.45
5	Cut off	1	5.20	0.80	0.70	2.91
6	Apron	1	1.70	0.80	0.60	0.81
7	Wing wall	2	1.30	0.80	1.15	2.39
Total						15.60 cum

#### 2. Laying of sand in the bed & foundation

S. No.	Description of work	No.	L	B	D/H	Quantity
1	Side wall	2	1.70	1.00	0.10	0.340
2	Head all	1	1.00	0.40	0.10	0.040
3	Head wall extension	2	2.10	0.80	0.10	0.336
4	Toe wall	1	1.00	0.80	0.10	0.080
5	Cut off	1	5.20	0.80	0.10	0.526
6	Apron	1	1.60	1.00	0.10	0.160
7	Wing wall	2	1.30	0.80	0.10	0.208
Total						1.580 cum



### 3.C.C.W 1:3:6 in foundation

S. No.	Description of work	No.	L	B	D/H	Quantity
1	Side wall	2	1.70	1.00	0.15	0.510
2	Head all	1	1.00	0.40	0.15	0.060
3	Head wall extension	2	2.10	0.80	0.15	0.378
4	Toe wall	1	1.00	0.80	0.15	0.120
5	Cut off	1	5.20	0.80	0.15	0.624
6	Apron	1	1.60	1.00	0.10	0.160
7	Wing wall	2	1.30	0.80	0.15	0.312
	Total					2.164cum

### 4. Brick masonry

S. No.	Description of work	No.	L	B	D/H	Quantity
1	Cut of wall	1	5.20	0.60	0.60	1.8725
2	Head wall	1	1.00	1.00	0.90	0.900
		1	1.00	$(0.40+1.00)/2$	1.00	0.700
3	Side wall	2	1.70	1.00	0.45	1.530
		2	1.70	0.80	0.45	0.918
		2	1.70	0.80	0.60	1.020
		2	1.70	0.60	0.40	0.544
		2	$(1.70+0.45)/2$	0.40	0.50	0.430
4	Head wall extension	2	2.10	0.80	0.65	2.184
		2	2.10	0.60	0.45	1.134
		2	2.10	0.40	1.30	2.184
5	Wing wall	2	1.30	0.80	0.45	0.936
		2	1.30	0.60	0.45	0.702
		2	1.30	0.40	$(1.00+0)/2$	0.520
6	Toe wall	1	1.00	0.80	0.45	0.360
		1	1.00	0.60	0.45	0.270
7	Apron	1	1.70	1.00	0.45	0.765
8	Longitudinal sill	2	1.70	0.20	0.20	0.136
9	Transverse sill	2	1.00	0.20	0.20	0.0440
Total						17.145 cum

### 5. C.C.W. 1;2;4 on the wall and Apron

S. No.	Description of work	No.	L	B	D/H	Quantity
1	Hide wall	1	1.00	0.40	0.025	0.010
2	Side wall	2	0.45	0.40	0.025	0.009
		2	1.35	0.40	0.025	0.027
3	Head wall extension	2	2.10	0.40	0.025	0.042
4	Wing wall	2	1.60	0.40	0.025	0.032
5	Longitudinal	2	1.70	0.20	0.025	0.017
6	Transverse sill	1	1.00	0.20	0.025	0.005
7	Apron	3	1.60	02.	0.025	0.024
<b>Total</b>						<b>0.166 cum</b>

### 6. Tuck Pointing 1:3

S. No.	Description of work	No.	L	B	D/H	Quantity
1	Side wall	1	1.00	-	1.00	1.00
		1	1.00	-	1.165	1.16
2	Side wall	2	0.45	-	1.50	1.35
		2	1.25	-	(1.50+1.00)/2	3.12
3.	Wing wall	2	2.30	-	(1.00+0)/2	1.30
4	Head wall	2	2.10	-	1.00	4.20
<b>Total</b>						<b>12.13m<sup>2</sup></b>

### CONSUMPTION OF MATERIALS

S. No.	Particulars	Quantity	Cement(Bags)	Sand(cum)	Brick (N0)	G.S.Git 25-40mm(cum)	Grit 10-20 mm(cum)
1	Sand laying	1.580cum	-	1.580	-	-	-
2	C.C.W. 1:3:6	2.164 cum	9.95	0.973	-	1.947	-
3	Brick masonry	17.145cum	52.14	5.829	8755	-	-
4	C.C.W 1:2:4	0.166 cum	1.01	0.069	-	-	0.152
5	Tuck Pointing	12.13m <sup>2</sup>	0.55	0.057	-	-	-
	<b>Total</b>		<b>25.65</b>	<b>8.508</b>	<b>8755</b>	<b>1.947</b>	<b>0.152</b>
	<b>Say</b>		<b>53 Bags</b>	<b>8.51 cum</b>	<b>8755</b>	<b>1.95cum</b>	<b>0.14 cum</b>

### COST OF MATERILS

S.No.	Name of materials	Quantity	Rate	Amount
1	Cement	53 ?Bags	255.00	13515.00
2	Course sand	8.51cum	910.00	7744.10
3	Brick	8755	4500/th	39397.50
4	G.S.B. 25-40 mm	1.95 cum	855.00	1667.25
5	G.S.Grit 10-20	0.14 cum	1250.00	175.00
		<b>Total</b>		<b>Rs.62498.85</b>

### LABOUR CHARHGE

S.No.	Particulars	Quantity	Rate	Amount
1	Earth work	15.60 cum	36.66/cum	57189
2	Sand Laying	1.580 cum	33.33/cum	52.66
3	C.C.W 1:3:6:	2.164 cum	494/cum	1.69.0.
4	C.C.W. 1:2:4:	0.166 cum	494/cum	82.00
5	Brick Masonry	17.145 cum	400/cum	6858.00
6	Truck Pointing	12.13m <sup>2</sup>	51.61/m <sup>2</sup>	626.02
7	Curing	170145cum	25.00/cum	428.62
8	Chowkidar	65Man Days	100.00/Man Day	600.00
9	Head Load & local transporation 10% cost of materials			4068.00
			<b>Total</b>	<b>Rs.14356.20</b>

Total Expenditure	
1. Cost of Materials	62498.85
2. Labour Charges	14356.20
<b>Total</b>	<b>Rs. 76855.05</b>
	<b>Say Rs.76900.00</b>

Design of Drop Spillway to be constructed at a place in a gully having width of 1.0 m and Catchments area 1.00 and net drop 0.50 m Taking rainfall intensity for duration equal to time of concentration of watershed and design return period of 25 years , as 120 mm/hr . The coefficient of runoff for the watershed is 0.3.

**1. Hydrologic design** – The design peak runoff rate( $m^3/s$ ) for the watershed form Rational formula is given as :

$$Q = \frac{C.I.A.}{360} = \frac{0.3 \times 120 \times 20.0}{360} = 2.00 \text{ m}^3/s$$

**2. Hydraulic design-** The maximum discharge capacity of the rectangular weir given by

$$Q = \frac{1.711LH^{3/2}}{(1.1+0.01F)} =$$

To find suitable value of L&H

Let us assume  $L = 2.0 \text{ m}$  (since width of gully is 3.00m)

$$2.00 = \frac{1.711LH^{3/2}}{(1.1+0.01 \times 0.5)} = \frac{1.711LH^{3/2}}{(1.10+1.15)}$$

$$LH^{3/2} = \frac{2.0 \times 1.115}{1.711} = 0.350$$

$$H^{3/2} = \frac{2.23}{1.711 \times 4} = 0.65$$

$$H = (0.65)^{2/3} = 0.75 \text{ m}$$

Test  $L/h = \frac{2.00}{0.25} = 2.66 \geq 2.0$  hence O.K.;

$$h/f = \frac{0.75}{1.50} = \leq 0.5$$
 hence O.K.

Heace he designed hydraulic dimensions of the Spilay are :

Crest Length (L) = 2.00 m

Weir depth (h) = 0.81m

### 3. Structural design -

1. Minimum headwall extension ,  $E = (3h + 0.6)$  or  $1.5 f$  whichever is greater

$$E = 3 \times 0.81 + 0.6 \text{ or } 1.5 \times 1.50$$

$$E = 3.03 \text{ m} \quad \text{or } 2.25 \text{ m}$$

$$\text{Adopted} = 3.03 \text{ m}$$

2. Length of apron basin  $L_B = (2.28 h/f + 0.54) = 1.5(2.28 \times 0.08 + 0.54)$

$$= 1.50 (1.20 + 0.54) = 2.61 \text{ m}$$

3. Height of end sill,  $S = \underline{h} = \underline{0.50} = 0.16 \text{ m}$

4. Height of wing wall and side wall at Junction:

$$J = 2h \text{ or } [f + h + S - (L_B + 0.10)/2] \text{ whichever is greater}$$

$$= 2 \times 0.80 \text{ or } [1.50 + 0.81 + 0.27 - (2.61 + 0.10)/2]$$

$$= 1.0 \text{ or } [1.66 - 0.89] = 1.00 \text{ or } 0.77 (\text{adopt } J = 1.00 \text{ m})$$

$$\text{adopt } J = 1.62 \text{ m}$$

5.  $M = 2(f + 1.33 h - J) = 2(1.50 + 1.33 \times 0.81 - 1.62) = 1.90 \text{ m}$

6.  $K = (L_B + 0.1) - M = (2.61 + 0.1) - 1.90 = 0.81 \text{ m}$

Toe and cut off walls

$$\text{Normal scour depth (N S D)} = 0.473 \times (Q/f)^{1/3} = 0.473 \times (2/1)^{1/3} = 0.473 \times 1.259 = 0.595 \text{ m}$$

$$\text{Maximum Scour depth (M S D)} = 1.5 \times \text{N S D} = 1.5 \times 0.595 = 0.89 \text{ m}$$

$$\text{Depth of cutoff / Toe wall} = 0.89 \text{ m say } 0.60 \text{ m}$$

**Apron thickness :** For an over fall of 1.0 m .The apron thickness in concrete construction is 0.30m since structure is constructed in masonry ,the Apron thickness will be  $0.30 \times 1.50 = 0.45 \text{ m}$

**Wall thickness :** The thickness of wall of the structure ( masonry construction ) is given below . :

Description	Thickness of wall	
	T op width	Bottom width
Head wall	0.45	1.33
Side wall	0.30	1.10
Wing all and head wall extension	0.30	0.80

**DETAIL ESTIMATE OF DROP SPILLWAY OF CREST LENGTH 2.00 METRE**

**1. Earth work in cutting in foundation**

S.No.	Description of work	No.	L	B	D/H	Quantity
1	Side wall	2	2.65	1.30	1.15	7.92
2	Head wall	1	2.00	1.60	1.15	3.68
3	Head wall extension	2	3.05	1.00	1.15	7.01
4	Wing wall	2	1.95	1.00	1.15	4.48
5	Tow wall	1	2.00	1.00	1.15	2.30
6	Cut off wall	1	8.40	1.00	1.15	9.66
7	Apron	1	2.60	2.00	0.75	3.90
Total						<b>38.95 cum</b>

**2 Laying of sand in the bed of foundation**

S.No.	Description of work	No.	L	B	D/H	Quantity
1	Cut of wall	2	8.10	0.90	0.10	0.729
2	Side wall	1	2.65	1.20	0.10	0.636
3	Head wall l	2	2.00	0.70	0.10	0.140
4	Head wall extension	2	3.05	0.10	0.10	0.061
5	Wing wall	1	1.95	0.90	0.10	0.351
6	Toe wall	1	2.00	0.90	0.10	0.180
7	Apron	1	2.00	2.65	0.10	0.530
Total						<b>2.627 cum</b>

### 3 C.C.W. 1 :3: 6 in foundation

S.No.	Description of work	No.	L	B	D/H	Quantity
1	Cut off wall	1	8.10	0.90	0.15	1.093
2	Side wall	2	2.65	1.20	0.15	0.954
3	Head wall	1	2.00	0.70	0.15	0.210
4	Head wall extension	2	3.05	0.10	0.15	0.091
5	Wing wall	2	1.95	0.90	0.15	0.526
6	Tow wall	1	2.00	0.90	0.15	0.270
7	Apron	1	2.00	2.65	0.15	0.795
Total						3.939 cum

### 4 Brick masonry 1:4

S.No.	Description of work	No.	L	B	D/H	Quantity
1	Cut off wall	1	8.10	0.90	0.90	6.561
2	Head wall	1	2.00	1.60	0.45	1.440
		1	2.00	1.50	0.45	1.350
		1	2.00	(0.45+1.40)/2	0.85	0.527
3	Head wall extension	2	3.30	0.90	0.45	2.673
		2	3.30	0.80	0.45	2.376
		2	3.30	0.60	0.60	2.376
		2	3.30	0.50	0.60	1.980
		2	3.30	0.40	1.15	3.036
4	Side wall	2	2.65	1.10	0.90	5.247
		2	2.65	1.10	0.45	2.623
		2	2.65	1.10	0.65	3.789
		2	2.65	0.80	0.60	2.544
		2	2.65	0.60	0.45	1.431
		2	(0.80+2.65)/2	0.50	0.70	1.260
5	Wing wall	2	1.90	0.90	0.45	1.539
		2	1.90	0.80	0.45	1.368
		2	1.90	0.60	(1.65+0)/2	1.881
6	Tow wall	1	2.00	0.90	0.45	0.810
		1	2.00	0.80	0.45	0.720
		1	2.00	0.40	0.30	0.240
7	Longitudinal sill	2	2.65	0.20	0.30	0.318
8	Apron	2	2.65	2.00	0.45	4.770
Total						51.806 cum

### 5. C.C.W. 1:2:4 in the wall

S.No.	Description of work	No.	L	B	D/H	Quantity
1	Head wall	1	2.00	0.45	0.025	0.0225
2	Side wall	2	0.80	0.50	0.025	0.0200
		2	1.32	0.50	0.025	0.330
3	Head wall extension	2	3.02	0.40	0.025	0.610
4	Wing wall	2	2.52	0.60	0.025	0.765
5	Longitudinal sill	2	2.65	0.20	0.025	0.265
6	Apron	1	2.65	1.60/3	0.025	0.353
6	Toe Wall	1	2.00	0.40	0.025	0.200
Total						0.2939cum

### 6. Tuck Pointing 1:3

S.No.	Description of work	No.	L	B	D/H	Quantity
1	Head wall	1	2.00	-	0.85	1.70
		1	2.00	-	1.27	2.45
2	Side wall	1	2.65	-	1.65	4.37
		1	(0.80+2.65)/2	-	0.70	
3	Head wall extension	2	3.30	-	1.50	1.20
4	Wing wall	2	1.90	-	(1.665+0)/2	9.90
Total						3.13m <sup>2</sup>

### CONSUMPTAION OF MATERIALS

S.No.	Particulars	Quantity	Cement (Bags)	Coarse Sand (cum)	Brick (No.)	G.S.B. 25-40 mm (cum)	G.S. Grit 10-20 mm (cum)
1	Sand laying	2.627 cum	-	2.227	-	-	-
2	C.C.W. 1:3:6	3.939 cum	16.93	1.772	-	3.545	-
3	Brick Masonry	51.806 cum	124.33	17.614	25903	-	-
4	C.C.W. 1:2:4	0.294 cum	1.79	0.123	-	-	0.249
5	Tuck Pointing 1:3	22.84 m <sup>2</sup>	1.50	0.107	-	-	-
	<b>Total</b>		<b>144.10</b>	<b>22.243</b>	<b>25903</b>	<b>3.545</b>	<b>0.249</b>
	<b>Say</b>		<b>144 Bags</b>	<b>22.243 cum</b>	<b>25903</b>	<b>3.55 cum</b>	<b>0.250 cum</b>



### Cost of Materials

S.No.	Name of Materials	Quantity	Rate	Amount
1	Cement	144 Bags	255.00/bag	36720.00
2	Coarse sand	22.243 cum	910.00/cum	20252.13
3	Brick	25903	4500.00/th	115663.50
4	G.S.B. 25-40 mm	3.55 cum	855.00/cum	3035.25
5	G.S. Grit 10-20 mm	0.250 cum	1250.00/cum	312.50
	Total			Rs.176872.38

### LABOUR CHARGE

S.No.	Particulars	Quantity	Rate	Amount
1	Earth Work	38.95cum	36.66/cum	1427.90
2	Sand Laying	2.627 cum	33.33/cum	87.55
3	C.C.W. 1:3:6	3.939 cum	494/cum	1945.86
4	C.C.W. 1:2:4	0.2939 cum	400/cum	145.18
5	Brick masonry	51.806 cum	494/cum	20722.40
6	Tuck Pointing	22.84 m <sup>2</sup>	51.61/m <sup>2</sup>	1178.77
7	Curing	51.806 cum	25.00/cum	1295.15
8	Chowkidar	13 Man days	100.00/Man day	1300.00
9	Head Load & local taion cost 10% cost of material	-	-	11340.03
Total				<b>Rs. 39442.84</b>
<b>Total Expenditure</b>				
1. Cost of Materials				176872.38
2 Labour Charges				39442.84
<b>Total</b>				<b>Rs. 216315.22</b>
<b>Says Rs. 216315.00 only</b>				

Design of Drop Spillway to be constructed at a place in a gully having width of 1.0 m and Catchments area 1.00 and net drop 0.50 m Taking rainfall intensity for duration equal to time of concentration of watershed and design return period of 25 years , as 120 mm/hr . The coefficient of runoff for the watershed is 0.3.

**1.Hydrologic design** – The design peak runoff rate( $m^3/s$ ) for the watershed form Rational formula is given as :

$$Q = \frac{C.I.A.}{360} = \frac{0.3 \times 120 \times 20.0}{360} = 2.00 \text{ m}^3/\text{s}$$

**2. Hydraulic design-** The maximum discharge capacity of the rectangular weir given by

$$Q = \frac{1.711LH^{3/2}}{(1.1+0.01F)} =$$

To find suitable value of L&H

Let us assume  $L = 2.0 \text{ m}$  (since width of gully is 3.00m)

$$2.00 = \frac{1.711LH^{3/2}}{(1.1+0.01 \times 0.5)} = \frac{1.711LH^{3/2}}{(1.10+1.15)}$$

$$LH^{3/2} = \frac{2.0 \times 1.115}{1.711} = 0.350$$

$$H^{3/2} = \frac{2.23}{1.711 \times 4} = 0.65$$

$$H = (0.65)^{2/3} = 0.75 \text{ m}$$

Test  $L/h = \frac{2.00}{0.25} = 2.66 \geq 2.0$  hence O.K.;

$h/f = \frac{0.75}{1.50} = \leq 0.5$  hence O.K.

Heence he designed hydraulic dimensions of the Spilay are :

Crest Length (L) = 2.00 m

Weir depth (h) = 0.81m

### 3. Structural design -

1. Minimum headwall extension ,  $E = (3h + 0.6)$  or  $1.5 f$  whichever is greater

$$E = 3 \times 0.81 + 0.6 \text{ or } 1.5 \times 1.50$$

$$E = 3.03 \text{ m} \quad \text{or } 2.25 \text{ m}$$

$$\text{Adopted} = 3.03 \text{ m}$$

2. Length of apron basin  $L_B = (2.28 h/f + 0.54) = 1.5(2.28 \times 0.08 + 0.54)$

$$= 1.50 (1.20 + 0.54) = 2.61 \text{ m}$$

3. Height of end sill,  $S = \underline{h} = \underline{0.50} = 0.16 \text{ m}$

4. Height of wing wall and side wall at Junction:

$$J = 2h \text{ or } [f + h + S - (L_B + 0.10)/2] \text{ whichever is greater}$$

$$= 2 \times 0.80 \text{ or } [1.50 + 0.81 + 0.27 - (2.61 + 0.10)/2]$$

$$= 1.0 \text{ or } [1.66 - 0.89] = 1.00 \text{ or } 0.77 (\text{adopt } J = 1.00 \text{ m})$$

$$\text{adopt } J = 1.62 \text{ m}$$

5.  $M = 2(f + 1.33 h - J) = 2(1.50 + 1.33 \times 0.81 - 1.62) = 1.90 \text{ m}$

6.  $K = (L_B + 0.1) - M = (2.61 + 0.1) - 1.90 = 0.81 \text{ m}$

Toe and cut off walls

$$\text{Normal scour depth (N S D)} = 0.473 \times (Q/f)^{1/3} = 0.473 \times (2/1)^{1/3} = 0.473 \times 1.259 = 0.595 \text{ m}$$

$$\text{Maximum Scour depth (M S D)} = 1.5 \times \text{N S D} = 1.5 \times 0.595 = 0.89 \text{ m}$$

$$\text{Depth of cutoff / Toe wall} = 0.89 \text{ m say } 0.60 \text{ m}$$

**Apron thickness :** For an over fall of 1.0 m .The apron thickness in concrete construction is 0.30m since structure is constructed in masonry ,the Apron thickness will be  $0.30 \times 1.50 = 0.45 \text{ m}$

**Wall thickness :** The thickness of wall of the structure ( masonry construction ) is given below . :

Description	Thickness of wall	
	T op width	Bottom width
Head wall	0.45	1.33
Side wall	0.30	1.10
Wing all and head wall extension	0.30	0.80

**DETAIL ESTIMATE OF DROP SPILLWAY OF CREST LENGTH 2.00 METRE**

**2. Earth work in cutting in foundation**

S.No.	Description of work	No.	L	B	D/H	Quantity
1	Side wall	2	3.40	1.30	1.15	9.38
2	Head wall	1	3.00	1.60	1.15	5.52
3	Head wall extension	2	3.00	1.00	1.15	6.90
4	Wing wall	2	1.80	1.00	1.15	4.96
5	Tow wall	1	3.00	1.00	1.15	3.45
6	Cut off wall	1	9.00	1.00	1.15	10.35
7	Apron	1	3.00	2.00	0.75	5.56
Total						<b>46.12 cum</b>

**2 Laying of sand in the bed of foundation**

S.No.	Description of work	No.	L	B	D/H	Quantity
1	Cut of wall	2	3.40	0.90	0.10	0.680
2	Head wall l	2	3.00	0.70	0.10	0.180
3	Head wall extension	2	1.80	0.10	0.10	3.60
4	Wing wall	1	3.00	0.90	0.10	2.40
5	Toe wall	1	9.00	0.90	0.10	0.900
6	Apron	1	3.00	2.65	0.10	0.795
Total						<b>3.155 cum</b>

**3 C.C.W. 1 :3: 6 in foundation**

S.No.	Description of work	No.	L	B	D/H	Quantity
1	Cut off wall	1	9.00	0.90	0.15	1.35
2	Head wall	1	3.00	0.70	0.15	0.27
3	Head wall extension	2	3.40	0.10	0.15	1.02
4	Wing wall	2	1.80	0.90	0.15	0.54
5	Tow wall	1	3.00	0.90	0.15	0.36
6	Apron	1	3.00	2.65	0.15	1.192
Total						<b>4732 cum</b>

**4. Brick masonry**

S.No.	Description of work	No.	L	B	D/H	Quantity
1	Cut off wall	1	9.00	1.00	0.90	8.100
2	Head wall	1	3.00	1.50	0.90	4.050
		1	3.00	(1.50+0.50)/2	1.50	4.500
3	Head wall extension	2	3.00	0.80	0.45	2.160
		2	3.00	0.60	0.45	1.620
		2	3.00	0.60	0.60	2.160
		2	3.00	0.50	0.60	1.800
		2	3.00	0.40	1.30	2.120
4	Side wall	2	3.40	1.00	0.45	3.060
		2	3.60	0.80	0.45	2.592
		2	3.80	0.60	0.60	2.736
		2	3.90	0.50	1.00	3.900
		2	(4.00+1.40)/2	0.40	1.50	3.240
5	Wing wall	2	1.80	1.00	0.45	1.620
		2	1.80	0.80	0.45	1.296
		2	1.80	0.50	(1.60+0)/2	1.440
6	Toe wall	1	3.00	0.80	0.45	1.080
		1	3.00	0.60	0.45	0.810
		1	3.00	0.40	0.30	0.360
7	Apron	1	3.00	2.65	0.45	0.577
8	Longitudinal sill	2	2.60	2.20	0.45	0.486
Total						<b>53.689 cum</b>

**5. C.C.W. 1:2:4 in the wall**

S.No.	Description of work	No.	L	B	D/H	Quantity
1	Head wall	1	3.00	0.50	0.025	0.037
2	Side wall	2	1.40	0.40	0.025	0.028
		2	3.00	0.40	0.025	0.060
3	Head wall extension	2	3.00	0.40	0.025	0.060
4	Wing wall	2	2.40	0.50	0.025	0.060
5	Longitudinal sill	2	2.65	0.20	0.025	0.026
6	Apron	3	2.65	0.86	0.025	0.170
<b>Total</b>						<b>0.452cum</b>

**6. Tuck Pointing 1:3**

S.No.	Description of work	No.	L	B	D/H	Quantity
1	Head wall	1	3.00	-	1.00	4.56
		1	3.00	-	1.18	5.40
2	Side wall	2	3.40	-	1.60	10.88
		2	(1.40+3.40)/2	-	1.50	7.20
3	Head wall extension	2	3.00	-	1.50	9.00
4	Wing wall	2	1.80	-	(1.60+0)/2	2.88
<b>Total</b>						<b>39.86m<sup>2</sup></b>

**CONSUMPTION OF MATERIALS**

S.No.	Particulars	Quantity	Cement (Bags)	Coarse Sand (cum)	Brick (No.)	G.S.B. 25-40 mm (cum)	G.S. Grit 10-20 mm (cum)
1	Sand laying	3.155 cum	-	3.155	-	-	-
2	C.C.W. 1:3:6	4.732 cum	2.34	2.129	-	4.258	-
3	C.C.W. 1:2:4	0.452 cum	2.69	0.185	26845	-	-
4	B/W 1:4	53.689 cum	128.85	18.254	-	-	0.374
5	Raised Pointing	39.86 m <sup>2</sup>	1.83	0.187	-	-	-
	<b>Total</b>		<b>153.71</b>	<b>23.910</b>	<b>26845</b>	<b>4.258</b>	<b>0.374</b>
	<b>Say</b>		<b>154</b>	<b>23.910</b>	<b>26845</b>	<b>4.26</b>	<b>0.374</b>

**Cost of Materials**

S.No.	Name of Materials	Quantity	Rate	Amount
1	Cement	154 Bags	255.00/bag	39270.00
2	Coarse sand	23.91 cum	910.00/cum	21758.10
3	Brick	26845	4500.00/th	129802.00
4	G.S.B. 25-40 mm	4.26 cum	855.00/cum	3633.75
5	G.S. Grit 10-20 mm	0.374 cum	1250.00/cum	467.50
<b>Total</b>				<b>Rs.192931.35</b>

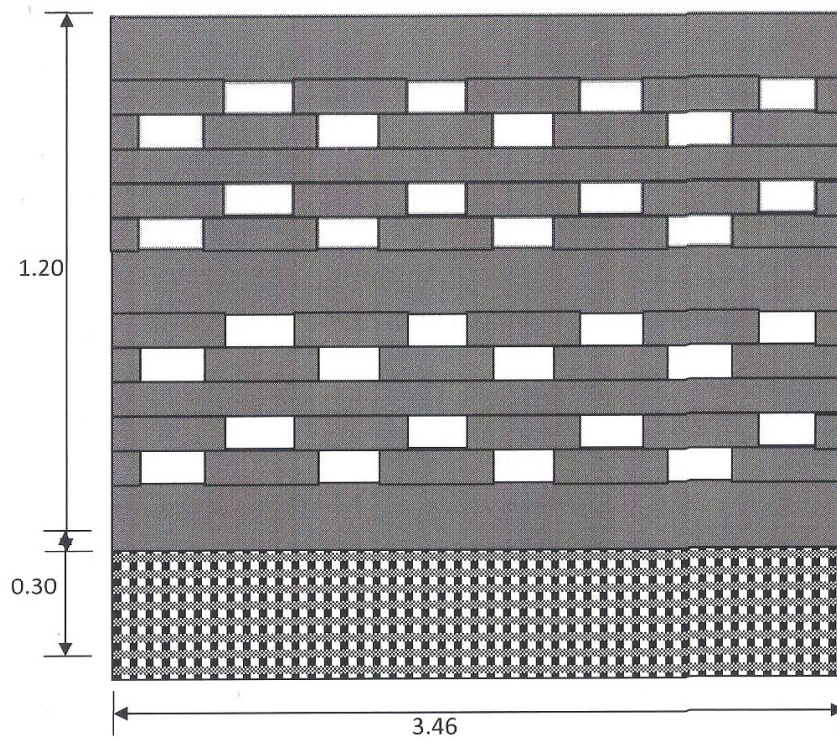
**LABOUR CHARGE**

S.No.	Particulars	Quantity	Rate	Amount
1	Earth Work	46.12 cum	36.66/cum	1690.75
2	Sand Laying	3.155 cum	33.33/cum	105.15
3	C.C.W. 1:3:6	4.732 cum	494/cum	2337.60
4	C.C.W. 1:2:4	1.452 cum	494/cum	217.85
5	B/W 1:4	53.689 cum	400/cum	21475.60
6	Tuck Pointing	39.86 m <sup>2</sup>	51.61/m <sup>2</sup>	2057.17
7	Curing	53.689 cum	25.00/cum	1342.22
8	Chowkidar	13 Man days	100.00/Man day	1300.00
9	Head Load & local taion cost 10% cost of material	-	-	12015.12
<b>Total</b>				<b>Rs. 425452.34</b>

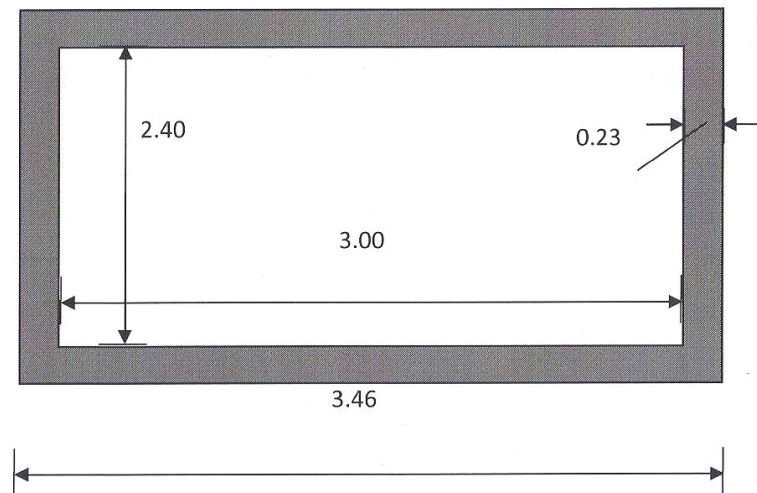
<b>Total Expenditure</b>	
1-Cost of Materials	192931.35
2 Labour Charges	42552.34
<b>Total</b>	<b>Rs. 235472.69</b>
<b>Says Rs. 235500.00 only</b>	

## 11- DRAWING AND DETAILS ESTIMATE OF THE LIVELIHOOD PROGRAMME

**DRAWING OF NADEF COMPOST STRUCTURE**



**ELEVATION**



**DESCRIPTION.**

**PLAN**

1. Brick work = 1:4.
2. Plastering = 1:4.
3. Thickness of wall = 0.23 m.
4. Total height of Structure =  $1.20 + 0.30 = 1.50$  m.

**(Not to Scale)**



## PERPARATION OF COMPOST BY NANDEP METHD

NADEP is the name of the method in this method glazed pit of brick masonry above Ground level is made as shown in the drying. in this method by using a little quantity of cow during, and crop residue, leaf of trees, straw and other organic materials. The method of filling up the pit is – first of all best soil of pond or field is spread in the bottom of pit as least 3” thickness and then one layer of 6” thickness and other agriculture waste is made then best soil is spread on in and on this layer the liquid made of cow dung is spread to wet the crop residue, straw etc. this method is repeated unit the pit is net completely filled up. On the top layer of this material a bulk is made and then pit is closed by earthen gara water is spread on the top of bulk and from glazed side weekly. This process is repeated to moist the filling material always. The decomposition in filling material started and within six month filled material become compost khad.

S.No.	Description of work	No.	L.	B.	D./H.	Quantity
1.	Earth work					
	Long Wall	2	3.60	0.30	0.30	0.648
	Short Wall	2	2.33	0.30	0.30	0.529
	Total					1.067 cum
2.	Brick work 1:4					
	Long wall solid	2	3.46	0.23	0.90	1.432
	Short Wall Solid	2	2.40	0.23	0.90	0.993
	Total					2.425 cum
3.	Plastering Work					
	Long Wall	2	3.46	-	0.60	4.152
	Short Wall	2	2.40	-	0.60	2.880
	Top of Long Wall	2	3.46	0.23	-	1.591
	Top of Short Wall	2	2.40	0.23	-	1.104
	Total					9.727 m <sup>2</sup>

### ABSTRACT OF WORK

S.N.	Particulars	Quantity
1.	Earth Work	1.06 com
2.	Brick Work 1:4 2.425 + 1.616/2	3.233 cum
3.	Plastering 1:4	9.727 m <sup>2</sup>

### CONSUMPTION OF MATERIALS

S.NO.	Particulars	Quantity	Cement (Bags)	Coarse Sand (cum)	Brick (nos.)
1.	Brick work 1:4	3.233 cum	5.82	0.873	1487
2.	Plastering 1:4	9.727 m <sup>2</sup>	1.07	0.146	-
	Total		6.89	1.019	1487
	Say		7 Bags	1.02 cum	1500 nos.

### COST OF MATERIALS

S.NO.	Particulars	Quantity	Rate	Amount
1.	Cement	7 Bags	255.00/Bag	1785.00
2.	Coarse Sand	1.02 cum	910.00/cum	928.20
3.	IInd Class Brick work 1:4	1500 nos.	4050.00/ Thousand	6075.00
	<b>Total</b>			<b>Rs. 8,788.20</b>

## LABOUR CHARGES

S.NO.	Particulars	Quantity	Rate	Amount
1.	Earth Work	1.06 cum	36.66/cum	30.85
2.	Brick	3.233 cum	370.00/cum	1196.21
3.	Plastering	9.727 m <sup>2</sup>	40.00/m <sup>2</sup>	389.08
<b>Total</b>				<b>Rs. 1616.14</b>

Total Expenditure	
1. Cost of Materials	8788.20
2. Labour Charges	1616.14
<b>Total</b>	<b>Rs.10,404.34</b>
<b>Say Rs. 10,400.00 only</b>	

## DAIRY WORK

In income generating activities through Self Help Group, landless and marginal farmers are advised to use three or four cows of SANKER breed or two or three buffalos of MURRA breed, for their good life.

### **Establishment of Goat Unit for S.H.G.'s formed in I.W.M.P. II<sup>nd</sup> Moradabad**

#### **Project**

District Moradabad IInd is situated in eastern part of state, where the number of goat/sheep is very less and they are small in nature, Goat Population is appreciable and is fact, it is the major source of livelihood for poor people of the district. in the state , on an average, 16 kg of meat is obtained from a goat, if they are dewormmed twice, shall be increment of 4 kg in meat on an average, benefiting the farmers of the state.

Deworming and vitamins, mineral- supplement to the goats shall enhance their productivity and also improve anti-body response and protection level through vaccination, i.e., importance in efficiency of vaccination. More Productivity and assured health and low mortality shall result into adoption of more framers to goat farming with the formation of more S.H.G.'s and in turn availability of goats for processing unit. Goat excreta shall be of immense help in enrichment of soil fertility.

## Establishment of Goat Units for S.H.G.'s

Eastern region, due to the geo-climate conditions and land pattern is favorable for goat husbandry. Goats thrive Well in dry and semi-dry climate with bushes and thorny vegetation. Presently in this area, farmers rear goats for their livelihood. If goat husbandry would be transformed to intensive husbandry, there shall be more economic stability of farmers, more profit sharing and availability of running capital for future expansion. Kepping in view above fact, goat unit shall be formed in the area in intensive way.

16 Goat Unit are Proposed in I.W.M.P. II<sup>nd</sup> Project for S.H.G. one unit constituting 10 goats and 1 buck will be distributed to one S.H.G.

A register Of S.H.G. will be maintained by Secretary Of S.H.G. in the supervision of W.D.T. member. The details of beneficiaries Of S.H.G. including the breed of goat reared, breeding and feeding status, deworming status, deaths, post mortem conducted claim settlement and working status of unit will be maintained in the register.

Preferences shall be given in consecutive years in purchasing the goats and bucks for new unit, from old units for which database maintained shall be of use and it should be assured by buy back arrangement

### Financial Component

S.No.	Component	Amount
1.	Cost Of 10 goat of improved breed (Not less than 6 months of age) @Rs. 3000.00 each	30000.00
2	Cost of 1 back of improved breed @ Rs.5000.00	5000.00
3	Cost of insurance @ 11.63/unit	4070.00
4	Feed cost for 3 months @ 250gm/day for goats @Rs.11.84/250gm	2930.00
5	Provision of deworming, mineral and vitamin supplement, treatment, vaccination @ Rs/160/animal	1760.00
6	The expense including monitoring expenses, register and record @Rs.170.00/unit	170.00
	<b>Total</b>	<b>Rs. 43,930.40</b>
		<b>Say Rs. 43,950.00</b>

### Estimate of Livestock Development Activities

Total number of female animals:	Buffalo	-	4725
	Cow	-	5597
	Total	-	10,322

**1. Artificial Insemination (A.I.):** 33% of total animals per year, i 3406 (say 3400 nos.)

Amount required for A.I. by BAIF @ 100.00/ animal.

**Total Amount - Rs. 3,40,00.00**

**2. Vaccination:** Total number of animals in I.W.M.P II<sup>nd</sup> - 12657 nos.

1. H.S. + B.Q. @ 5.50 69,613.50

2. F.M.D. @10.50 2 (Twice in a year)

**Total Amount - Rs. 3,35,520.00**

**3. Deworming:**

Adult animals - 11472

Child animals - 1185

Albendazole for 11472 animals @ 40.56 4,65,304.00

1185 child animals@20.28 24,032.00

**Total Amount - Rs. 4,89,336.00**

**4. Mineral Mixture: Agnmine Forte Chelated for 8205 animals @ 115.00 Rs. 9,43,575.00**

**GRAND TOTAL - Rs. 21,08,321.00**

## 12- DRWAING AND DETAILS ESTIMATE OF PRODUCTION SYSTEM AND MICRO-ENTERPRISES DEMOSTRATION OF WHEAT

1. Variety recommended for District

Irrigated - W.H.- 542

Unirrigated – K 8027 , K – 5351 (Mandakini)

Kathia – Raj 1555

2- Seed rate – 100 -125 Kg/ hectare

3- Requirement of fertilizers / ha      N- 125 Kg , P- 70 -75 Kg, K-70-75 Kg

### ESTIMATE OF DEMONSTRATION OF WHEAT IN WATERSHED (PER HA)

S.No.	Particulars	Quantity	Rate	Amount	Remarks
1	Tillage operation or preparation of field for sowing	100.00 kg	1000.0/ha	1000.00	Since the project is to be operated in a participatory Mode, contribution in form of the tillage ,sowing, irrigation and harvesting done by farmer is not included in the estimates
2	Cost of seed	1.00ha	18.00/kg	1800.00	
3	Sowing by seed drill	160 Kg	1000.00/ha	1000.00	
4	D.A.P. 18:46	210 Kg	573.00/50 kg	1833.60	
5	Urea	150 Kg	270.00/50 kg	1134.00	
6	Potash (M.O.P.)	1.0 0ha	300.00/50 kg	900.00	
7	Irrigation (three irrigation)	1.00ha	650.00/ha	650.00	
8	Harvesting		2000.00/ha	2000.00	
<b>Total</b>				<b>5657.60</b>	
<b>Say</b>				<b>5700.00</b>	

**Hence demonstration cost of wheat /ha is Rss 5700.00**

## DEMONSTRATION OF HYBRID SORGHUM IN WATERSHED AREA (per ha)

1 Requirement of Seed /ha - 10 kg I

2- Requirement of fertilizers / ha            N- 60.0 Kg , P- 40.00Kg, K- 40.00 Kg

### ESTIMATE OF DEMONSTRATION OF BAJRA (PER ha) RAINFED

S.No.	Particulars	Quantity	Rate	Amount	Remarks
1	Tillage operation in preparation of field for sowing	1.0 ha	1000.0/ha	2000.00	Since the project is to be operated in a participatory Mode, contribution by the former in the form of tillage operation, sowing and and harvesting provided by participating farmers ,hence this cost is not included in the estimates
2	Cost of seed	10.0 kg	130.00/kg	1300.00	
3	Nitrogen N.P.K. 12:21:16	125.0 Kg	470.00/50 kg	1175.00	
4	Urea	90 kg	270.00/50 kg	486.00	
5	M.O.P	40kg	300.00/50 kg	240.00	
6	Harvesting	1.00 ha	650.00 /ha	600.00	
<b>Total</b>				<b>3201.00</b>	
<b>Say</b>				<b>3200.00</b>	

**Hence per hectare of demonstration of Bajra Rs 3200.00**

**ESTIMATE OF DEMONSTRATION OF Urad/Till in Watershed (PER ha)**

<b>(Black Gram)Urd</b>					<b>Urd+Till</b>			
<b>S.No</b>	<b>Particulars</b>	<b>Quantity</b>	<b>Rate</b>	<b>Amount</b>	<b>Quantity</b>	<b>Rate</b>	<b>Amount</b>	<b>Remarks</b>
1	Tillage operation in preparation of field for sowing	-	-	2000.00	-	-	2000.00	Since the project is to be operated in a participatory Mode, contribution by the former in the form of tillage operation, sowing and and harvesting provided by participating farmers ,hence this cost is not included in the estimates
2	Cost of seed	40.00 kg	100.00/kg	4000.00	12.00 kg	120.00	1440.00	
3	Fertilizer	80.00 Kg	10.60/ kg	848.00	-	-	848.00	
4	Plant Protection	-	-	800.00	-	-	800.00	
5	Irrigation Diesel Ps	-	-	800.00	-	-	800.00	
6	Harvesting	-	-	1000.00			1000.00	
<b>Total</b>				<b>9448.00</b>			<b>6888.00</b>	
<b>Say</b>				<b>9500.00</b>			<b>6900.00</b>	



## DEMONSTRATION OF AGRO-HORTICULTURE USING PLASTIC DRUM OF 200 LITRES CAPACITY

District Moradabad is situated in Eastern U.P. region where there is scarcity of water and in summer temperature rises up to 45c causing upper layer of fields dry and therefore mortality rate of plants is very high. Farmers usually like to grow grain crops only. They are not interested in horticulture because of less holding. The production of crops decreases below the tree. Therefore to promote horticulture with crops a demonstration model using plastic drums for horticulture is made. Mainly crops roots go in to the soil up to “4-5” in cereal crops and “6-9” in pulses. Using plastic drums the plants will be planted 50-60 cm below the ground level which is below the root zone of crops. Therefore trees will not able to take nutrients from upper layer of fields and there will no effect of plants on crops

In summer season up to 1 to 1.50m depth of soil becomes dry causes more mortality rate of plants, using drums plants are planted below 50-60 from Ground level and in rainy and winter season up to February roots of plants goes below 2.10m below where moisture will be available and plants will be safe in summer also. Using barbed wire fencing the plants will be protected. Therefore, it is hoped that farmers will adapt this procedure for Agro-forestry and will become prosperous.

### DETAIL ESTIMATE OF DEMONSTRATION OF HORTICULTURE AND MIXED CROPPING

S.No.	Description of Works	No.	L.	B.	D./H.	Quantity
1	Earth work in cutting	156	3.14 x 1.20	-	1.35	793.54
	Trench	156	1.50	0.75	0.75	131.62
	Fencing Poll	133	0.20	0.20	0.20	1.064
	<b>Total</b>					<b>926.22 cum</b>
	Farm yard manure	156x 10		-		1560 kg
	Filling of earth work with farm yard manure	156	3.14 x 1.00	-	1.20	587.80 cum
	C.C.W. 1:2:4 for fencing poll	133	0.20	0.20	0.20	1.064 cum
	Angle iron of poll	133	1.80	-	-	239.40 m
	Barbed wire	3	400	-	-	1200.00 m
	Plants	156	-	-	-	156 nos
	Plastic drum (200 litre)	156	-	-	-	156 nos

### CONSUMPTION OF MATERIAL

S.N.	Description of Work	Quantity	Farmyard Manure (Kg>	Cement Bags (nos)	Coarse Sand ( cum)	G.S. Grit 10-20 mm	Angle Iron (m)	Barbed Wire (Kg)	Planting Drum (nos)
1	C.C.W. 1:2:4	1.064 cum	-	6.49	-	-	-	-	-
2	Angle Iron	239.4 m	-	-	-	-	-	-	-
3	Barbed wire	1200.0m	-	-	-	-	-	-	-
4	Farmyard manure	1560.0 kg	1560 kg	-	-	-	-	-	-
5	Plastic drum	156 nos	-	-	-	-	-	-	-
<b>Total</b>			<b>1560.0 kg</b>	<b>6.49</b>	<b>0.446</b>	<b>0.883</b>	<b>239.40</b>	<b>1200.00</b>	<b>156</b>
<b>Say</b>			<b>1560.0 kg</b>	<b>6.50 bags</b>	<b>0.450 bags</b>	<b>0.900 cum</b>	<b>239.40</b>	<b>1200.0 m</b>	<b>156</b>

### COST OF MATERIALS

S.No.	Particulars	Quantity	Rate	Amount
1.	Fram yard manure	1560.0kg	10,00 kg	15600.00
2.	Barbed wire	1200.0m/120.0kg	60.50/kg	7260.00
3.	Angle Iron	239.40m/785kg	40.50/kg	31792.50
4.	plastick drum	156 nos	690.50each	107640.00
5.	Cement	6.50bags	255.00/bag	1657.50
6.	Coarse Sand	0.450 cum	910.00/cum	409.50
7.	G.S.Grit 10-20mm	0.900 cum	1250.00/cum	1125.00
8.	Plants	156 nos	18.00each	2808.00
		Total		Rs.1,68,292,50

## LABOUR CHARGES

S.NO.	Particulars	Quantity	Rate	Amount
1.	Earth work	1514.02cum	36.66/cum	55503.97
2.	C.C.W 1:2:3:	1.064 cum	492.00 cum	523.88
3.	Fixing of angle iron	10 man days	100/Man Day	1000.00
4.	Fixing of barbed wire	15 man days	100/Man Day	1500.00
<b>Total</b>				<b>Rs, 58,527.85</b>

Total Expenditure	
1. Cost of materials	<b>1,68,292.50</b>
2. Labour Charges	<b>58,527.85</b>
<b>Total</b>	Rs.2,26,819.50.00
<b>say</b>	Rs.2,26,820.00 only

5- Lack of infrastructure including marketing.

### **(B) Soil constraints**

- 1- Poor nutrient status of the soil
- 2- Physical impediment
- 3- Moisture stress / water logging / inadequate drainage.

### **(C) Plant related constraints**

- 1- Problem of plant establishment
- 2- Physiological disorders
- 3- Fruit drop and poor productivity
- 4- Incidence of insects-pests.

However, apart from the above mentioned constraints, the measure bottleneck in horticulture development are poor technological advancements, high initial establishment cost, high input demand , timely operation and seasonal shortage of labours, etc.

## CONCEPTS AND ADVANTAGES OF CONSERVATION HORTICULTURE

Conservation horticulture or horticulture land use based on soil and water conservation principle is a suitable alternative for utilization and management of land under rainfed conditions. Thus horticulture development in watershed management appears to be the most appropriate technique for sustained productivity as well as for restoration of degraded lands. In fact, horticulture system meet all the basic needs-food, fruits, fodder, fuel and timber besides, providing employment and sustaining a number of products for industries.

The fruit trees grown with crops can provide. fuel from pruned-shoots and dried- bra leaf--fodder for animals and leaf litter that can be utilized as mulch material and organic matter the leaf litter of deciduous fruit trees not only protects the top soil from the impact of raindrops but also improve soil structure, reduces évapotranspiration, increases infiltration and add to the nutrient status of soil. Therefore conservation based horticulture land use system assumes great significance as fruit trees on degraded lands provide higher returns and offer alternative opportunity in non-arable areas where cropping may not be possible.

## CONSERVATION HORTICULTURE PRACTICES

Some of the important practices are given below

**1- Selection of Suitable Fruits Types:** For the success of conservation horticulture, selection of hardy varieties resistant to diseases and pests and use of local or other hardy root stocks for raising fruit-trees is of great importance. The major part of the reproductive cycle i.e. Period from flowering to fruiting must also fall during maximum water availability period and the root ripening must be completed before the onset of dry summer (April-May). Ber, Guava, Karonda, Be), Amla, Lemon, and Phalsa etc. are the plants which fulfill this requirement and all these fruit plants are most suitable for Bunde region.

**2- Planting Techniques:**\_ For degraded lands, pits should be dug of 1m x 1m x 1m size, the excavated soil is mixed with Farmyard Manure (FYM) @ 5-10kg/pit with doses of potash and phosphorous and some insecticide / pesticide (numicide / aldrex) for prevention of white ant. Planting of the fruits plants should be done with the onset of monsoon.

**3- Use of Root Stokes:**\_ Budding and grafting on the wild root stock gives benefit of the establishment root and in turn provides better quality fruits with high field potential. For example, Ziziphun Moradabadritiana, a wild ber can be successful budded with scion of improved cultivars, This practice is only successful where sizable patch of wild root stock is available. The budded/grafted stock needs intensive management as it is required to be protected from the wild animals, birds, insects, pests etc. The wild root stock develops efficient top root to provide moisture and nutrients to the scion. Amla. Bel is other examples of raising the improved cultivation the wild root stock.

**4- In Situ Water Harvesting:**\_ Since on slopey lands, runoff water is considerably higher, therefore, it should be harvested and used. The run off can be utilized for growing fruit plants in such a way that each tree in the established plants is at the time of fruit setting and fruiting. Moisture available at this critical period improves the fruit yield.

Runoff water will be harvested and stored in tanks during the rains. The stored water will be utilized at the time when the fruit trees show moisture stress during dry months. Counter trenches will dug between the rows of fruit trees because this is effective in conserving moisture and providing soil erosion.

**5-Mulching:** Mulching is practiced to conserve moisture. It prevents the loss of moisture by evaporation and improve water intake by the soils. Various organic (Straw, hay, manure, tree leaves, dry wads) Mulches are used for mulching. Use of plastic mulch has been taken in rainfed and dryfarming conditions to increase the productivity by minimizing evapotranspiration losses.

**6-Drip Irrigation:** Drip irrigation saves water by 40 to 70 percent and two to three times more area can be irrigated with the same amount of available water. It has the advantages that it ensures uniform distribution of water, provides perfect control over water application and minimizing the losses during convergence and seepage.

### Estimate of Orchard Development in the Watersheds Per Hectare (Without Fencing)

S.No.	Particulars	Quantity	Rate	Amount	Remarks
<b>A, Horticulture</b>					
1.	Soil Working 1m x 1m size pits (270nos.) including cost of refilling	270.00 cum	36.66/cum	9898.20	Since,the project is to be operated in a participatory mode,countribution in the form of labour input for pit digging, FYM and its applications, weeding and hoeing are to be provided by the participating farmers, hens the cots are no included in the eastmates,
2.	Aplicetion of Farmyard manure inclnding cast		L.S.	450.00	
3.	Cost of NPK mixture. neemicide @ 250 gm/plants		L.S.	400.00	
4.	Cost of plants (including 15% etc. for mortality) including transportation and planting	310 nos.	15.00/Plant	4650.00	
5.	Casualty replacement @ 10% of item no. 4&5			465.00	
6.	Cost of 2 weeding and hoeing		1.00/Plant	540	
7.	Contingency and unforeseen (3%)			492.00	
	Total			Rs.6,007.00	
	Say			Rs. 6,000.00	
	Maintenance cost 2 <sup>nd</sup> Year onwards – 15% of IInd year cost			900.00	
	For next 5 years i.e.,Rs. 900x5			4500.00	
	Total Cost			Rs. 10,500.00	
	Say			Rs.10,500.00	
<b>B. Agro-Horticulture (Cost per ha)</b>					
1	Cost of raising 270 plants UP to 5 year @ Rs. 10,000.00			10500.00	The remarks mentioned under Horticulture are also applicable for agro Horticulture.
2	Cost of rasing agricultural Crops @ Rs. 5,000 per hectare per year			5000.00	
	<b>Total</b>			<b>Rs.15,500.00</b>	

## Estimate of Orchard Development in the Watersheds Per Hectare (With Fencing)

S.No.	Particulars	Quantity	Rate	Amount	Remarks
<b>A, Horticulture</b>					
1.	Soil Working 1m x 1m size pits (270nos.) including cost of refilling	270.00 cum	36.66/cum	9898.20	Since, the project is to be operated in a participatory mode, contribution in the form of labour input for pit digging, FYM and its applications, weeding and hoeing are to be provided by the participating farmers, hence the costs are not included in the estimates,
2.	Application of Farmyard manure including cast		L.S.	450.00	
3.	Cost of NPK mixture. neemicide @ 250 gm/plants		L.S.	400.00	
4.	Cost of plants (including 15% etc. for mortality) including transportation and planting	310 nos.	15.00/Plant	4650.00	
5.	Casualty replacement @ 10% of item no. 4&5			465.00	
6.	Cost of 2 weeding and hoeing		1.00/Plant	540	
7.	Contingency and unforeseen (3%)			492.00	
	<b>Total</b>			Rs.6,007.00	
	Say			Rs. 6,000.00	
	Maintenance cost 2 <sup>nd</sup> Year onwards – 15% of I <sup>nd</sup> year cost			900.00	
	For next 5 years i.e., Rs. 900x5			4500.00	
	<b>Total Cost</b>			Rs. 10,500.00	
	Say			Rs.10,500.00	
<b>B. Agro-Horticulture (Cost per ha)</b>					
1	Cost of raising 270 plants UP to 5 year @ Rs. 10,000.00			10500.00	The remarks mentioned under Horticulture are also applicable for agro Horticulture.
2	Cost of raising agricultural Crops @ Rs. 5,000 per hectare per year			5000.00	
3.	<b>Fencing</b>			<b>45300.00</b>	
	<b>Total</b>			<b>Rs.60,800.00</b>	

**COST IN PLANTING ONE PLANT WITH DIGGING, FILLING MIXED WITH FYM AND COST OF PLANT**

S. n	Particular	No.	L	B	D/H	Quantity	Rate	Amount	
1	Earth work in digging	1	1.0	1.0	1.00	1.00	36.66	36.66	
2	Cost of FYM,in kg/pit	1	-	-	-	10kg	8.00	8.00	
3	Filling of pits mixed with FYM and soil	1	1.0	1.0	1.0	1.00	36.66	36.66	
4	Cost of plants	1	-	-	-	1	18.00	18.00	
Total									171.32
Say									Rs.172.00

**ESTMATE FOR SILVI-PASTROAL SYSTEM (RS.ha<sup>-1</sup>) PLANTATIONS (800 PLANTS ha<sup>1</sup>)**

S. N	Particulars of work	Rate (Rs.)	Cost (Rs.)	Remarks
1-	Clear felling or bush clearance of area Infected with Lantana etc,including cost of burning	LS	550.00	The area is to be procted through biofencing
2-	Soil working – earth work ,digging of Pits / holes 60 cm deep, 30cm dia -800 Nos.Including cost of refilling and trenching.(400trenches/ha)	LS	6085.00	
3-	Cost of seedlings for 900 nos and grass /legumes seeds and planing.sowing	-	2050.00	Rs.2.00 per seeding
4-	Weeding and hoeing(2 Nos.)	LS	300.00	
Total			8985	
Maintenance <b>2<sup>nd</sup> Years 15% of the IInd year Xpenditure including being up IInd year failure</b>				
<b>Grand total</b>			<b>10.335.00</b>	
<b>say</b>			<b>10.335.00</b>	



## DEMONSTRATION OF GREEN MANURING

Green Manuring is very useful but due to sowing of Kharif season crop, lack of suitable type of seeds, and limitation of moisture, it is not widely practiced. Green Manuring brings immediate advantage because of its quick decomposition where as FYM and compost improves the soil physical condition in the long-run. Benefits of Green Manuring accrue from substitution of chemical fertilizers, enhance soil biological activities and erosion control due to vegetative cover. Sesbania Species (Dhaincha) and Crotonaria Juncea (Sunhemper Sanai) are most common green manure crops. They accumulate about 100 kg N/ha in their biomass and 64-88% of this is derived from atmosphere. Apart from direct benefit of green Manuring as a source of nutrients and organic matter, it has the capacity to mobilize soil phosphorus and other nutrients. It also helps in reclamation of problem of soil, e.g., Sesbania helps in removing exchangeable sodium and reclamation of salt affected soils.

In District Muradabad more fields are kept fallow and only single crop in Rabi is grown. Therefore, this area is suitable for Green Manuring. Therefore, in I.W.M.P.II<sup>nd</sup> Project area, efforts will be made to oblige the farmers for Green Manuring.

4 typical estimate is made for Green Manuring is given below:

### ESTIMATE FOR GREEN MANURING IN THE WATERSHED (PER ha)

S.No.	Particulars	Rate	Cost	Remark
1	Seed of Sesbania (Dhaincha) 25 Kg /ha	25.00 /kg	625	Since the project to be operated in a participatory mode contribution in the form of tillage will be done by farmers in not included in the estimate
2	Tillage operation before sowing and to plough the plants of dhaincha after 40 – 45 days of sowing for Green Manuring	1000/ ha Before and after saring	2000.00	
	<b>Total</b>		<b>Rs . 625.00</b>	

**Therefore cost per hectare of Green Manuring is Rs. 625.00/ha**

## **ROLE OF GRASSLAND IN SOIL CONSERVATION**

The grass plant itself protects the soil from the forces of water erosion including the impact of rain drops and surface flow. Grass acts a spring cushion intercepting and broking up the falling rain drops in their way down. Conducting the water down the blades and stems of the plants and finally allowing it to reach the ground as fine sprays without disturbing the surface. Clamps of grass plants, in a mechanical way, obstruct-flowing water and reduce its rate of flow. In fact to control soil erosion whatever technique is adopted, there are four approaches to deal with the problem:

- 1- To condition the soil to make it resistant to determent and transportation and create more absorptive surface layer.
- 2- To cover the soil so that it is protected from the impact of wind and rain drops.
- 3- To decrease the velocity of wind or runoff water.
- 4- To provide safe disposal outlet for surplus run off.

Grass in the nature highly efficient device to protect the soil from destructive forces like rain, wind etc. Grass and legumes increase the aggregation of soil particles; improve soil structure and water holding capacity of the soil. Grasses gives quicker protection to eroded lands. To establish gully sides, water ways, gully head and check dams. Grass is perhaps the most effective and economical tool. It can put to various uses in soil conservation:

- 1- Strip cropping, rotational cropping or lay farming.
- 2- Stabilization of bunds and terraces.
- 3- Stabilization of gullies, diversion or drainage channels.
- 4- Stabilization of sand dunes.
- 5- Meadows and pasture on steep slopees.
- 6- Fertility builder for eroded soil.

**Expected/Estimated Outcomes (IWMP-2<sup>nd</sup>)-MORADABAD**

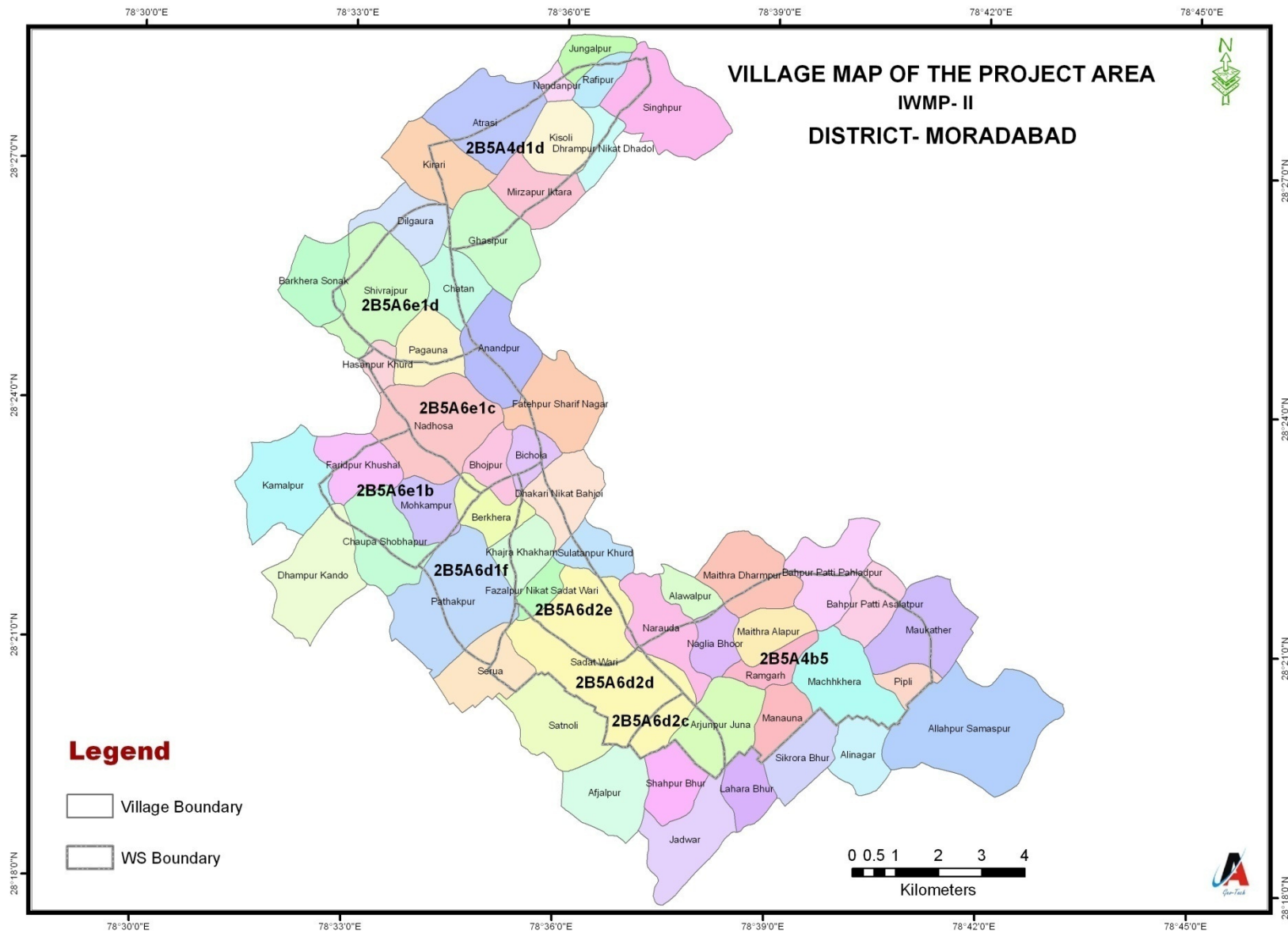
S. No.	Name of the District	Item	Unit of measurement	Pre-project Status	Expected Post-project Status	Remarks
1	Moradabad	Status of water table	Meters	15-16	14-15	
2		Ground water structures repaired/ rejuvenated	No.	-	120	
3		Quality of drinking water	Quality	Poor	Good	
4		Availability of drinking water	Days	320	365	
5		Increase in irrigation potential	%	3	6	
6		Change in cropping/ land use pattern	Cropping pattern	Single/ double	Double/ multiple	
7		Area under agricultural crop	Ha	6820.00	6872.00	
8		i Area under single crop	Ha	3835.00	3120.00	
9		ii Area under double crop	Ha	1145.50	1520.00	
10		iii Area under multiple crop	Ha	688.50	846.00	
11		Net increase in crop production area	Ha	-	751.00	
12		Increase in area under vegetation	Ha	200.00	259.00	
13		Increase in area under horticulture	Ha	25.00	75.00	
14		Increase in area under fuel	Ha	190.00	267.00	
15		Increase in milk production	Av.lit/day/ cattle	1.75	3.10	
16		No. of SHGs	No.	97	194	
17		Increase in no. of livelihoods	No.	5	15	
18		Increase in income	Rs.	19100.50	25100.50	
19		Migration	%	9.00	5.00	
20		SHG Federations formed	No.	-	2	
21		Credit linkage with banks	No.	2	2	
22		Resource use agreements	%	Agreed	100 % as per required	
23		WDF collection & management	%	5-10	100% collection during project period	
		Summary of lessons learnt				

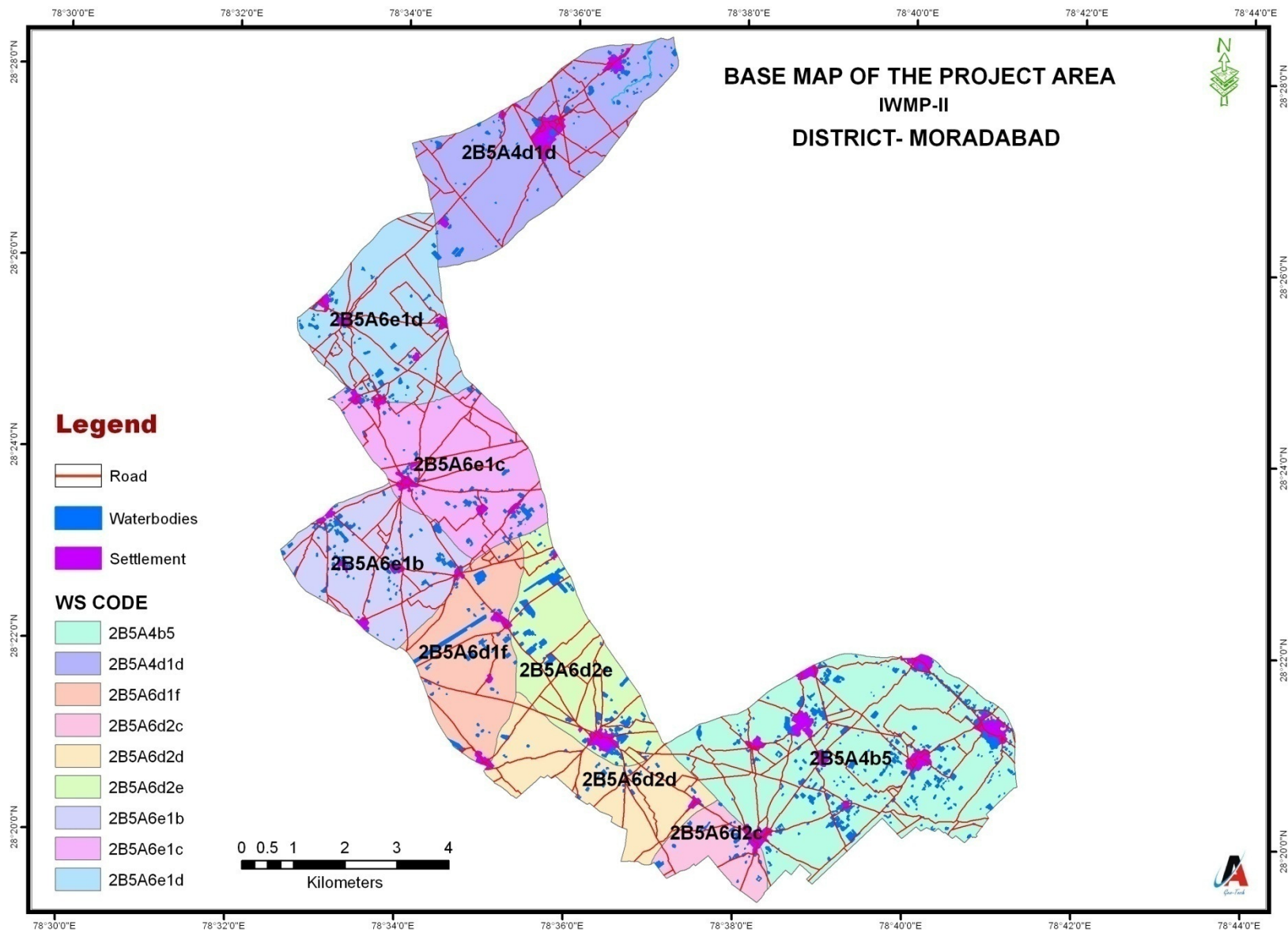
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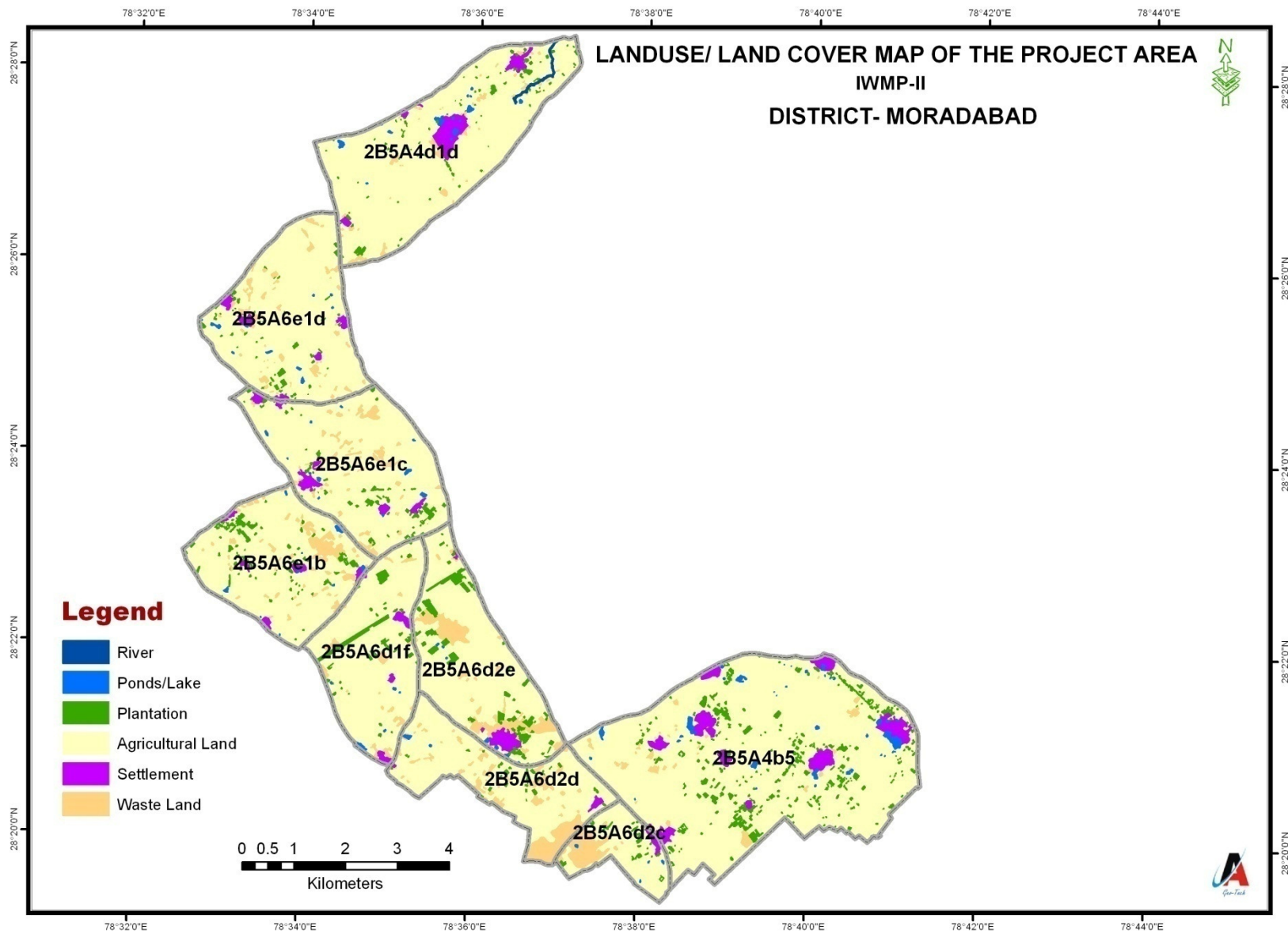
Signature of officers authorized  
by State Govt. with name and Designation

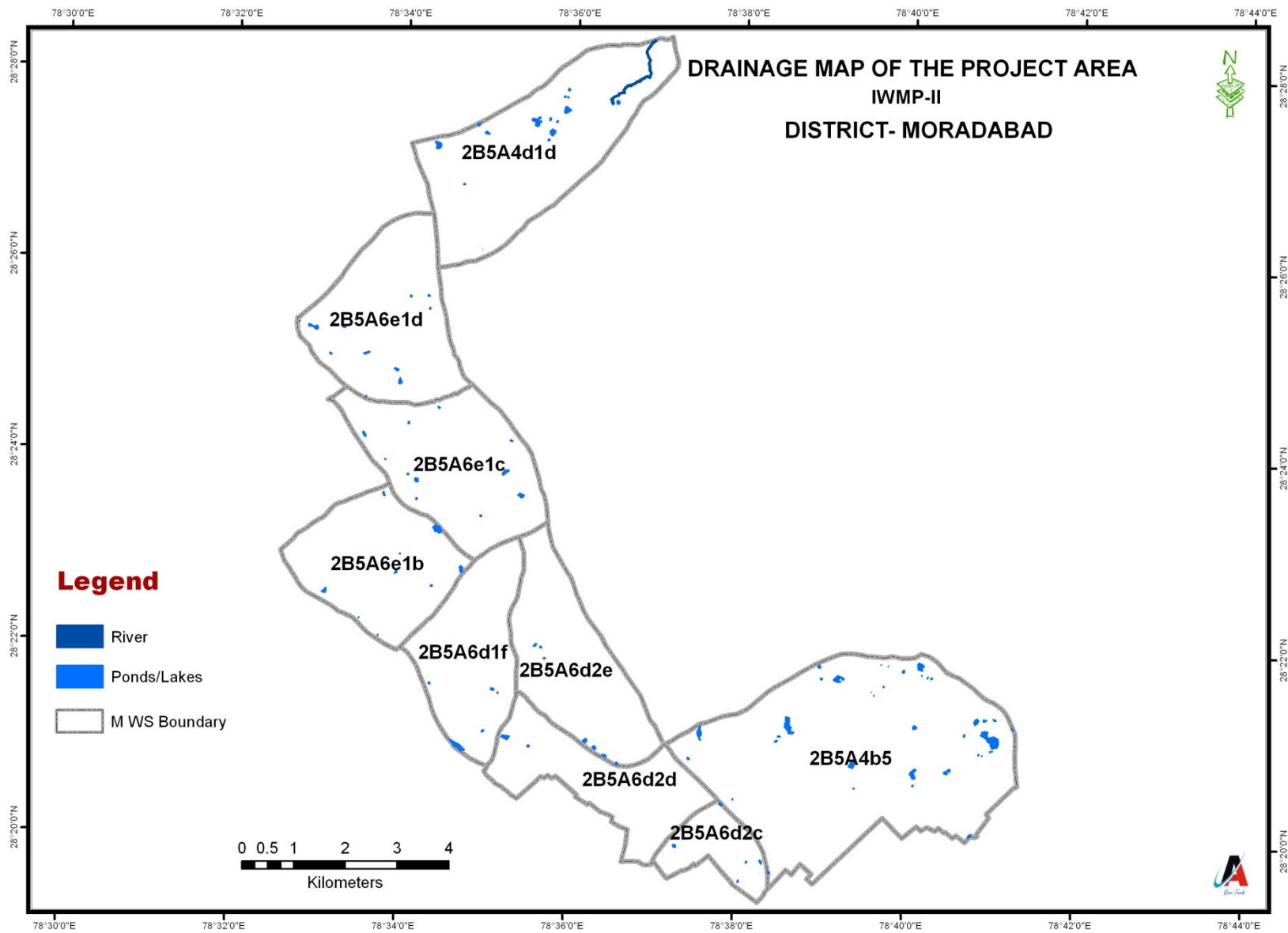
## CHAPTER- 13

# MAPPING

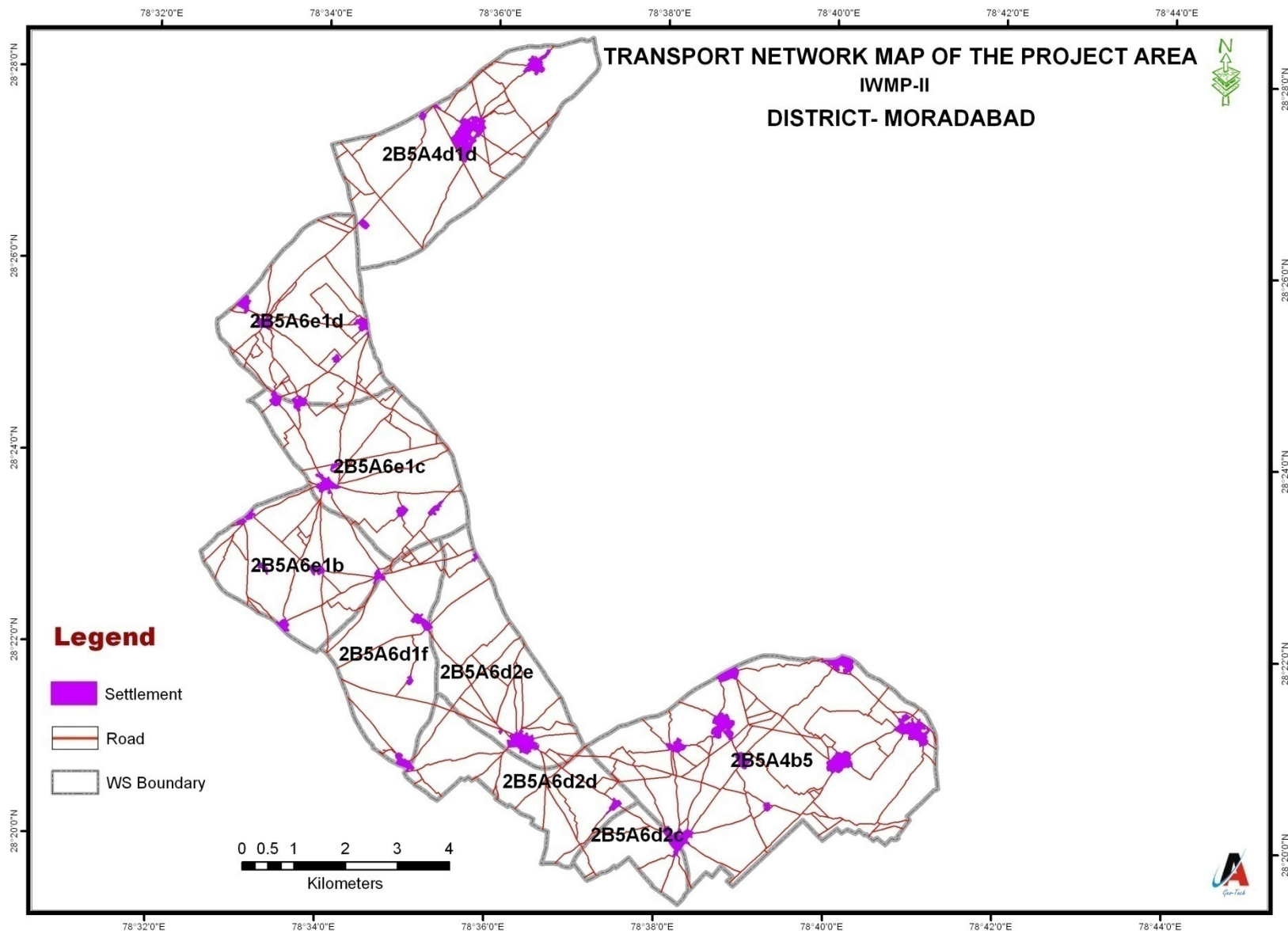


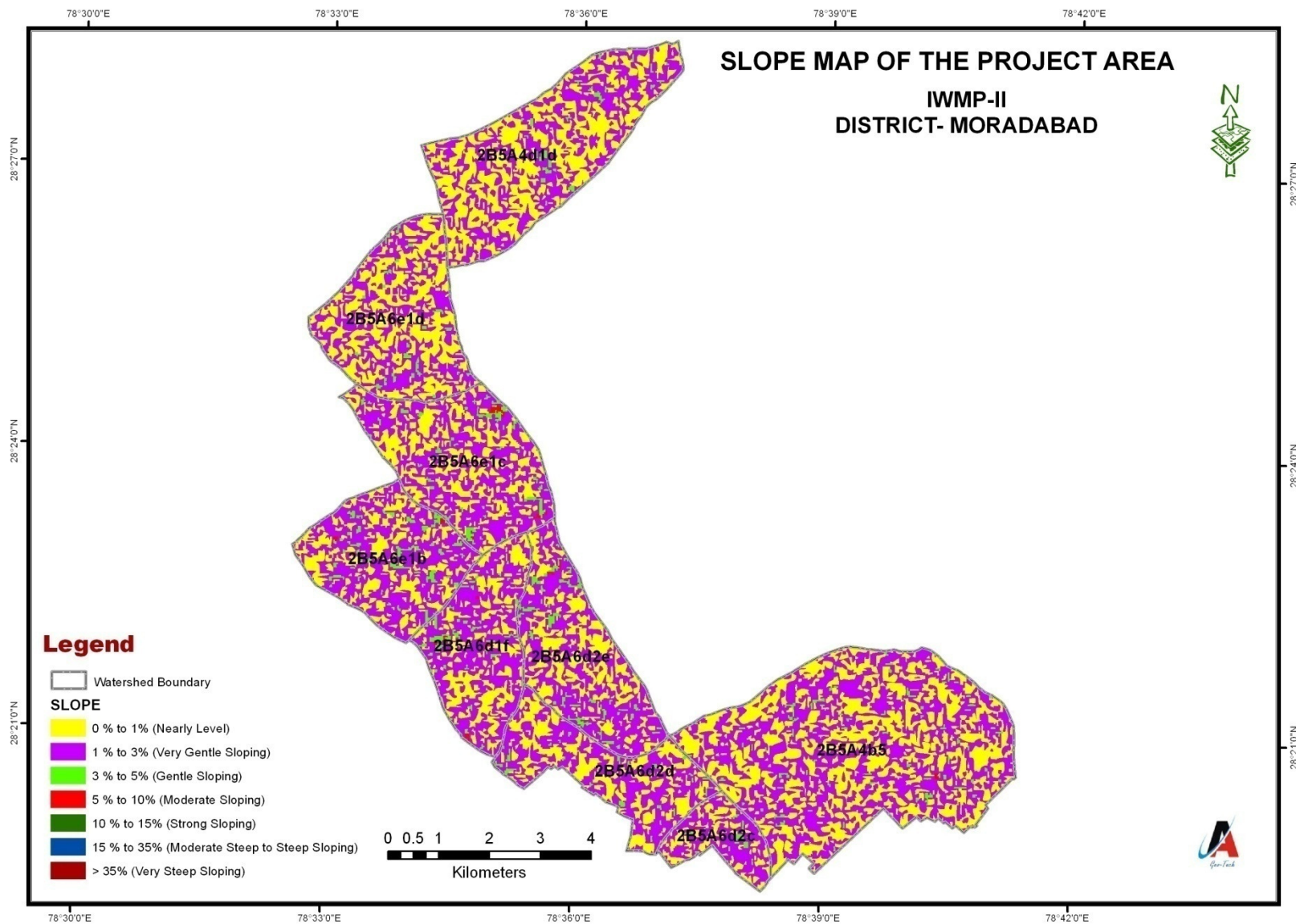


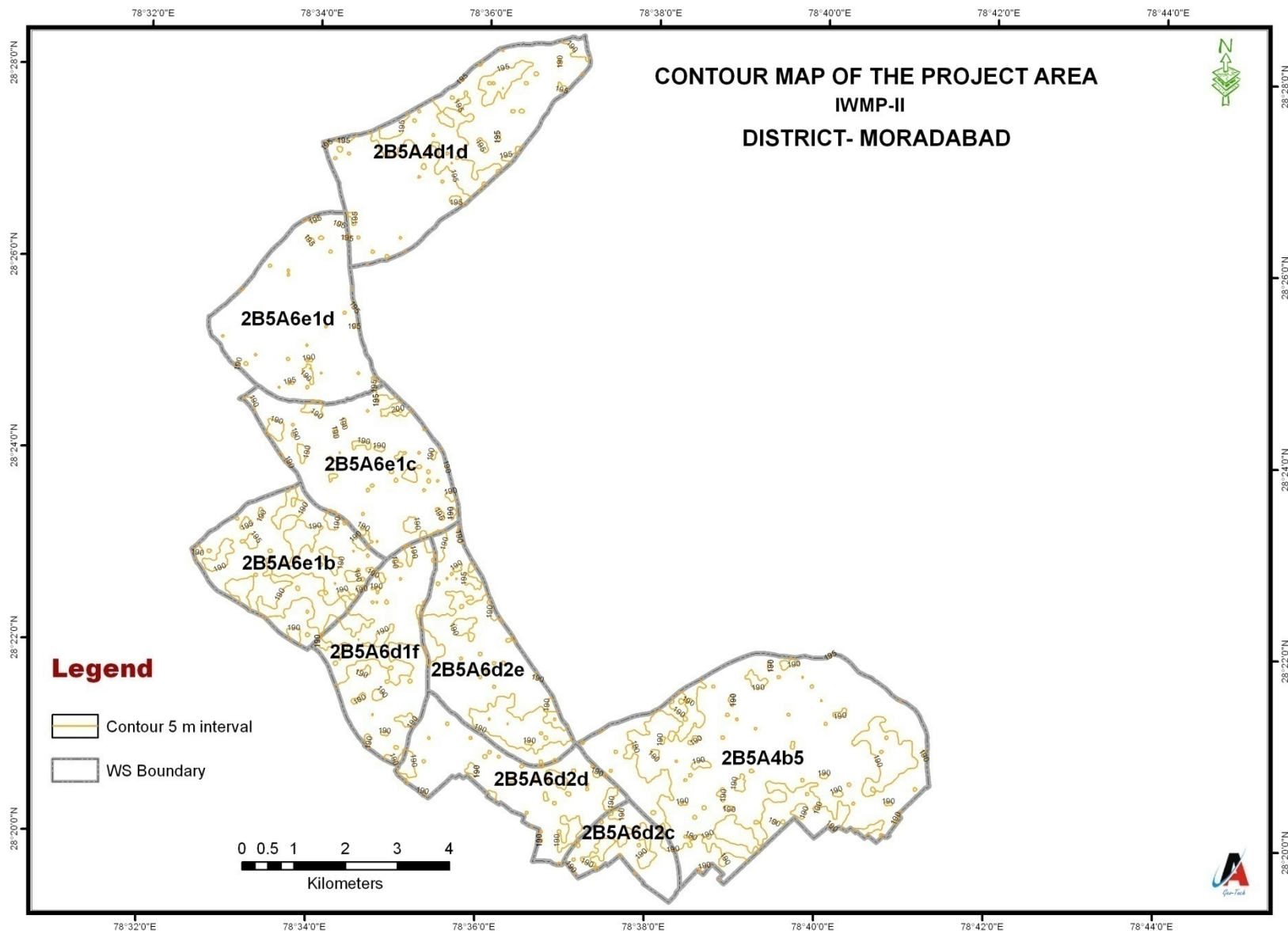












# DPR PLAN ABSTRACT

The collection of all the relevant data of watershed area and the possible option and solution are described with the help of feedback of focused discussion and detailed perspective plan for the watershed area with year wise and activity wise semmarized for the DPR plan abstract for 5 year (2010-11 to 2014-15).

The summary of the above document is verified by the following persons:

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