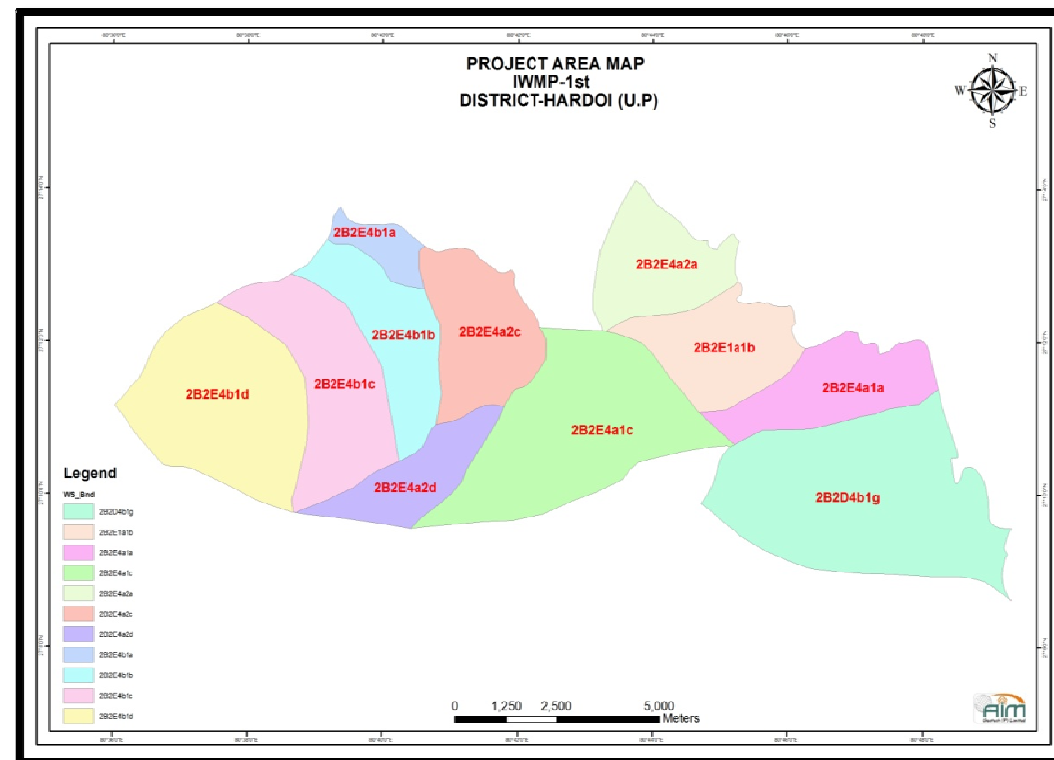


DETAILED PROJECT REPORT (D.P.R.)

(I.W.M.P. 1st - HARDOI)

INTEGRATED WATERSHED MANAGEMENT PROGRAMME, R.B.GOMTI RIVER, BLOCK-BHARAWAN
DISTRICT - HARDOI (UTTAR PRADESH)



Submitted to: -

Department of Land Development &
Water Resources, Lucknow (U.P.)



Prepared By:-

Bhoomi Sanrakshan Adhikari
Department of Land Development
& Water Resources, HarDOI

Land Development & Water Resources Government of U. P. Lucknow

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PROJECT AT A GLANCE

1.	Name of Project	-	I.W.M.P.1 st HARDOI
2.	Name of Block	-	BHARAWAN
3.	Name of District	-	HARDOI
4.	Name of State	-	UTTAR PRADESH
5.	Name of watershed	-	R.B. GOMTI RIVER
6.	Name of Concern villages	-	Alampur, Andhpur, Atrauly, Baheriya, Banjara, Bany, Bastapur, Bharawan, Bhatpur, Chawan, Chhula, Danda, Dera Kakemau, Dula Nagar, Gaundwa Patti, Gauny, Gherwa, Gondwa, Hajipur, Hayatganj, Jajupur, Jakhwa, Jalalpur, Janigaon, Jhanjholy, Kaudiya, Kourondh, Lalpur, Laudhora, Mahmdapur, Mahuwa Danda, Majhgawan, Manghgaon, Mohiuddin Pur, Parsa, Pipri Narayanpur, Ram Madarpur, Rani Khera, Sagar Garhi, Seayapur, Shyam Das Pur, Sikandarpur, Terwa
7.	Code of Micro Watershed	-	2B2E4b1d, 2B2E4b1c, 2B2E4a2d, 2B2E4b1b, 2B2E4b1a, 2B2E4a2c, 2B2E4a2a, 2B2E1a1b, 2B2E4a1a, 2B2E4b1g, 2B2E4a1c
8.	Total area of Project.	-	8008.00 Ha.
9.	Proposed area for treatment-	-	5766.00 Ha.
10.	Cost per hectare	-	Rs. 12000.00
11.	Project period	-	2009-10 to 2013-14
12.	Total Cost of Project	-	Rs. 769.12 Lacs
13.	Proposed Man days	-	267500Nos.

EXECUTIVE SUMMARY

Planning and development of watersheds calls for a rigorous understanding of the occurrence and movement of water in the surface and sub-surface systems along with soil and nutrient losses in a watershed as the need arises for a proper watershed management of that area. In our country, where a lot of running water goes waste, it becomes very important to apply the technology of watershed management to solve its annual problems of droughts and floods.

The Project area comprises villages Alampur, Andhpur, Atrauly, Baheriya, Banjara, Bany, Bastapur, Bharawan, Bhatpur, Chawan, Chhula, Danda, Dera Kakemau, Dula Nagar, Gaundwa Patti, Gauny, Gherwa, Gondwa, Hajipur, Hayatganj, Jajupur, Jakhwa, Jalalpur, Janigaon, Jhanjholy, Kaudiya, Kourondh, Lalpur, Laudhora, Mahmdapur, Mahuwa Danda, Majhgawan, Manghgaon, Mohiuddin Pur, Parsa, Pipri Narayanpur, Ram Madarpur, Rani Khera, Sagar Garhi, Seayapur, Shyam Das Pur, Sikandarpur, Terw ,namely Bharawan block of Hardoi district of Uttar Pradesh. The nearest town is Atrauli which is center place of the project area and it is well connected by pucca road. This watershed has been identified by the state department under NWDPRA scheme by proper prioritization of different parameters for watershed selection criteria. The watershed is located along right bank of The Gomti River. It lies between the longitude of 80°36' to 80°48' and latitudes 27°10' to 27°15', having watershed code no 2B2E4b1d, 2B2E4b1c, 2B2E4a2d, 2B2E4b1b, 2B2E4b1a, 2B2E4a2c, 2B2E4a2a, 2B2E1a1b, 2B2E4a1a, 2B2E4b1g, 2B2E4a1c. Its altitude ranges from 75 to 135 m above mean sea Level (MSL). The total area of watershed is 8008.00 Ha. Out of which 5766.00 Ha has been undertaken to be treated under Integrated Watershed Management Programme (IWMP) starting from 2009-10.

The climate of the region is characterized as Central Plane Zone with average annual rainfall ranges from 1211 to 1470 mm annually, out of which about 90 percent is received during the monsoon season from July to September. Temperature ranges from high as 43°C in the May-June to as low as 5°C during December-January. The trend of rainfall is highly erratic and maximum (62%) water goes as runoff. The soils are mainly Loamy, Sandy.

Agriculture is the main source of income of the farmers of the watershed. Kharif is the main crop consist of Sugarcane, , Paddy and Wheat.

Natural vegetation of the watershed area is very poor. Occasionally Mango, Neem, Sheesham, tree are found in this area. There is no reserve pasture in the wasteland area. Due to Lack of the Irrigation water the rate of mortality of planted trees is very high. P.R.A. exercises conducted in the villages of watershed area revealed that inadequate irrigation facilities, low production of field crops.

Fodder shortage, lack of inputs and market facility are some of the major constraints being experienced by the farmers. For this area Amla, Guava, Ber, Bel fruit plants are suitable. is proposed in the selected area to motivate the farmers to adopt the agro horticulture in practice because of inadequate irrigation water.

It is expected that the implementation of different watershed management activities will bring down the run off and soil loss by 70% and 80% of their present level respectively. It is envisaged to increase the water and land utilization index though adoption of bio-engineering measures and improve the eco-development index. The proposed plan will improve the crop diversification index, productivity of existing crops and thereby will lead to self-sufficiency in food with nutritional security. The different enterprises of various sectors and the project as a whole have been found to be economically viable with sound rate of internal return and less payback period.

The agricultural land will be treated with banding along with minor levelling. Waste land will be treated with the engineering measures like staggered trenches and a forestation etc.

YEAR WISE PHASING (PHYSICAL & FINANCIAL) OF 1.W.M.P. WORKS-HARDOI

S. No.	Item	1 st Year (2009-10)		IInd Year (2010-11)		IIIrd Year (2011-12)		IVth Year (2012-13)		Vth Year (2013-14)		Total	
		Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.
1	Administrative 10%	13.84		13.84		20.75		10.00		10.77		69.19	
2	Monitoring 1%	0.69		1.38		1.73		2.00		1.12		6.92	
3	Evaluation 1%	0.69		1.38		1.73		1.00		2.12		6.92	
4	Entry Point Activity 4%	13.00	8	14.68	8	-		-		-		27.68	16
5	Institutional and Capacity building 5%	6.92		6.38		6.92		6.37		8.00		34.59	
6	D.P.R Preparation 1%	3.00		3.92		-		-		-		6.92	
7	Watershed Dev. Works 50%	-		-		103.80	2075	94.44	1574	147.71	2117	345.96	5766
8	Livelihood & Income Generating 10%	38.74		15.57		14.87		0.02		-		69.20	
9	Production System development 13%	22.90		13.86		17.64		15.55		20.00		89.95	
10	Consolidation Phase 5%	-		13.83		13.86		3.00		3.90		34.59	
	Total	99.78		84.84		181.30		132.38		193.62		691.92	5782

YEAR WISE WATERSHED DEVELOPMENT WORK & COSTING (50%)

S. No.	Proposed Work	1 st Year (2009-10)		IInd Year (2010-11)		IIIrd Year (2011-12)		IVth Year (2012-13)		Vth Year (2013-14)		Total	
		Length in Meter/No.	Amount in Lac	Length in Meter/No.	Amount in Lac	Length in Meter/No.	Amount in Lac	Length in Meter/No.	Amount in Lac	Length in Meter/No	Amount in Lac	Length in Meter/No.	Amount in Lac
1	C.B.	-	-	-	-	16000	4.16	15385	4.00	30770	8.00	62155	16.16
2	M.B.	-	-	-	-	16353	11.12	13412	9.12	28118	19.12	57883	39.36
3	P.F.B.	-	-	-	-	25828	20.92	23358	18.92	38173	30.92	87359	70.76
4	C.K.B./CHUCK BUND	-	-	-	-	26445	47.60	25334	45.60	36490	65.68	88269	158.88
5	POND	-	-	-	-	14 No.	20.00	11	16.80	16	24.00	41	60.80
	GRAND TOTAL	-	-	-	-	-	103.80	-	94.44	-	147.72	-	345.96

CHAPTER-1

INTRODUCTION & BACKGROUND

PROJECT BACKGROUND

The watershed, with code No. 2B2E4b1d, 2B2E4b1c, 2B2E4a2d, 2B2E4b1b, 2B2E4b1a, 2B2E4a2c, 2B2E4a2a, 2B2E1a1b, 2B2E4a1a, 2B2E4b1g, 2B2E4a1c, having area of 6390.00 Ha, It is located in South –East corner Of the Hardoi district of U.P. The area of watersheds is proposed to be taken by Bhoomi Sanrakshan Adhikari, Department of land development & water resources Hardoi for integrated watershed management programme (IWMP) starting from the year 2009-10. The project will be completed by 2013-14.

Most of the land comes under agriculture. The area in the watershed is relatively flat plain with shallow river-valleys. The soils are mainly sandy, loamy.

NEED AND SCOPE FOR WATERSHED DEVELOPMENT

The main objectives are

- (a) To control damage by run-off
- (b) To manage and utilize run-off for useful purpose or soil conservation
- (c) To increase infiltration of rain water

Main problem in watershed Area

The main problem in a watershed is the soil erosion by rainfall. The run off water transport the sediments which may block the channel head, dam, reservoir and storage structures are the major problems faced in the project area and attempts made so far to overcome them. Following are the main problem in the selected watershed.

- (a) Lack of awareness amongst the villagers about the deteriorating environmental condition of the area.

- (b) 75% of the run off water makes it away to way towards saryu and ghaghra rivers carrying fertile soil with has nutrients and this decreases soil fertility, there is a decline in the productivity of cereals,pulses and vegetable crops.
- (c) Due to over grazing, vegetative cover is declining on community land. There is no grasses and even shrub. Vegetation is vanishing, River carry a huge silt every year
- (d) Due to continuous cutting of trees, overgrazing bushes and shrubs ecological balance of the area has been hardly disturbed.
- (e) Due to increasing population pressure of man and animal there is competition for collection of food, fodder and fuel resources.
- (f) The ground water of the watershed area is smelly and oily hence irrigation is not possible by this ground water. farmers depends on the rain water., which flows directly of Gomati river. Therefore it is an urgent need, that rainwater should be harvested for crops and re-charged to improve the quality of the water.

1.1.3 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 flat topography hence highly prone to soil erosion. Lack of irrigation water is the greatest problem experienced by the people followed by low function of field crops, lack of fodder availability and low animal productivity.

Problems identified and prioritized during the transect walk and PRA exercises in all villages were pooled and a list of nine problems representing the whole watershed was prepared (Table 1.3). Problems were ranked as per their total weightage in these villages.

PROBLEM IDENTIFICATION AND PRIORITIZATION FOR WATERSHED

S. No.	Problem	Rank
1.	Low production of field crops	3
2.	Lack of drinking water	4
3.	Lack of irrigation water	1
4.	Lack of fodder availability	7
5.	Non-availability of fuel wood	6
6.	Lack of inputs like quality seeds, fertilizer, pesticides etc.	2
7.	Lack of market facility	9
8.	Lack of medical, educational and transportation facilities	8
9.	Medical and Health care facilities for and low animal productivity.	5

Weightage of the project

Project name	Project Type	Weightage													
IWMP Hardoi 1 st	IWMP	i	ii	iii	iv	v	vi	vii	viii	ix	x	xi	xii	xiii	xiv
		7.5	5	5	10	0	0	15	5	10	10	5	15	0	82.5

Criteria and weightage for selection of watershed

Criteria	Maximum Score	Ranges & Scores			
Poverty index (% of poor to population)	10	Above 80 % (10)	80 to 50 % (7.5)	50 to 20 % (5)	Below 20 % (2.5)
% of SC/ ST population	10	More than 40 % (10)	20 to 40 % (5)	Less than 20 % (3)	
Actual wages	5	Actual wages are significantly lower than minimum wages (5)	Actual wages are equal to or higher than minimum wages (0)		
% of small and marginal farmers	15	More than 80 % (10)	50 to 80 % (5)	Less than 50 % (3)	
Ground water status	15	Over exploited (5)	Critical (3)	Sub critical (2)	Safe (0)
Moisture index/ DPAP/ DDP Block	10	-66.7 & below (15) DDP Block	-33.3 to -66.6 (10) DPAP Block	0 to -33.2 (0) Non DPAP/ DDP Block	
Area under rain-fed agriculture	15	More than 90 % (15)	80 to 90 % (10)	70 to 80% (5)	Above 70 % (Reject)
Drinking water	15	No source (10)	Problematic village (7.5)	Partially covered (5)	Fully covered (0)

Degraded land	10	High – above 20 % (15)	Medium – 10 to 20 % (10)	Low- less than 10 % of TGA (5)	
Productivity potential of the land	15	Lands with low production & where productivity can be significantly enhanced with reasonable efforts (15)	Lands with moderate production & where productivity can be enhanced with reasonable efforts (10)	Lands with high production & where productivity can be marginally enhanced with reasonable efforts (5)	
Contiguity to another watershed that has already been developed/ treated		Contiguous to previously treated watershed & contiguity within the micro watersheds in the project (10)	Contiguity within the micro watersheds in the project but non contiguous to previously treated watershed (5)	Neither contiguous to previously treated watershed nor contiguity within the micro watersheds in the project (0)	
Cluster approach in the plains (more than one contiguous micro- watersheds in the project)		Above 6 micro- watersheds in cluster (15)	4 to 6 micro watersheds in cluster (10)	2 to 4 micro watersheds in cluster (5)	
Cluster		Above 5 micro-	3 to 5 micro	2 to 3 micro	

approach in the hills (more than one contiguous micro-watersheds in the project)		watersheds in cluster (15)	watersheds in cluster (10)	watersheds in cluster (5)	
	120	150	90	41	2.5

WATERSHED INFORMATION

Name Of the Project	No. of water sheds to be treated	Watershed Code	Watershed regime/type/order
IWMP I st Hardoi	11	2B2E4b1d, 2B2E4b1c, 2B2E4a2d, 2B2E4b1b, 2B2E4b1a, 2B2E4a2c, 2B2E4a2a, 2B2E1a1b, 2B2E4a1a, 2B2E4b1g, 2B2E4a1c	MicroWatershed

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

SWOT analysis of the watershed

<p style="text-align: center;">Strengths (S)</p> <ul style="list-style-type: none"> i. Cooperative work culture in traditional activities ii. Close ethnic ties iii. Road at the top as well as outlet of the watershed iv. Hard working v. Resource pool of crop genetics diversity vi. Awareness of farmers about watershed management programme vii. Well established CPR maintaining and sharing system viii. Good productivity of soil ix. Social outlook of the community towards land less 	<p style="text-align: center;">Weakness (W)</p> <ul style="list-style-type: none"> i. Poor water management ii. Resource poor farmers iii. Out migration of youth iv. Low and erratic rainfall v. Fragile geography vi. Fragmented land holding vii. Heavy infestation of wild animals viii. Problem of fuel and fodder
<p style="text-align: center;">Opportunities (O)</p> <ul style="list-style-type: none"> i. Wide range of annual and perennial crops ii. Scope of regular employment opportunities to check out migration iii. Strengthening of existing irrigation system iv. Conducive climate for rainfed crop diversification v. Good scope for Agro forestry and dry land horticulture vi. Potential for collective action and management of CPR 	<p style="text-align: center;">Threats (T)</p> <ul style="list-style-type: none"> i. Prone to adverse climate like Flood ii. High market risk iii. Social conflicts owing to PRI and WSM policies and local politics iv. Weak coordination among line departments v. Lack of expertise of implementing agency in different aspects of WSM

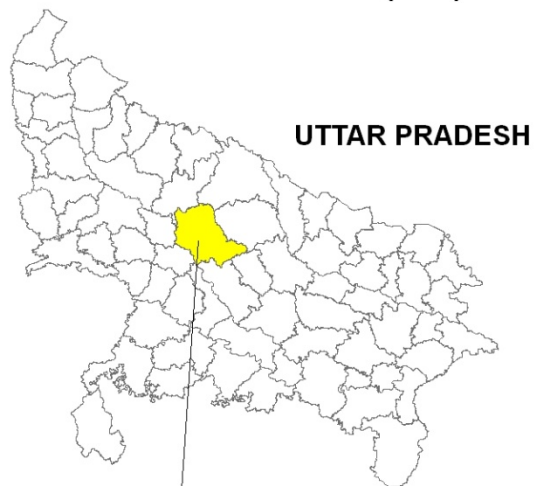
Total human population in the watershed is 25650. Agriculture is the main source of income of the farmers of the watershed. Geological strata in the area vary between 22 and 80 meter. Depth to Ground Water in the area varies from 50 to 70 feet. Ground water in the area is sweet and fit for drinking.

CHAPTER – 2

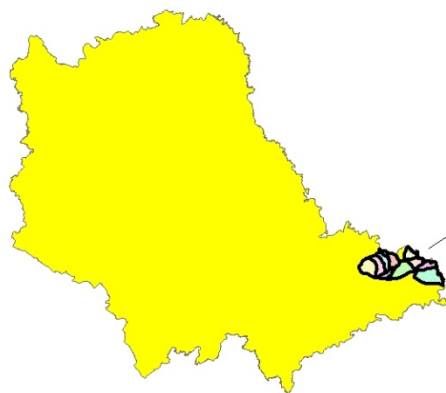
GENERAL DESCRIPTION OF PROJECT AREA

LOCATION MAP OF THE PROJECT AREA IWMP-1

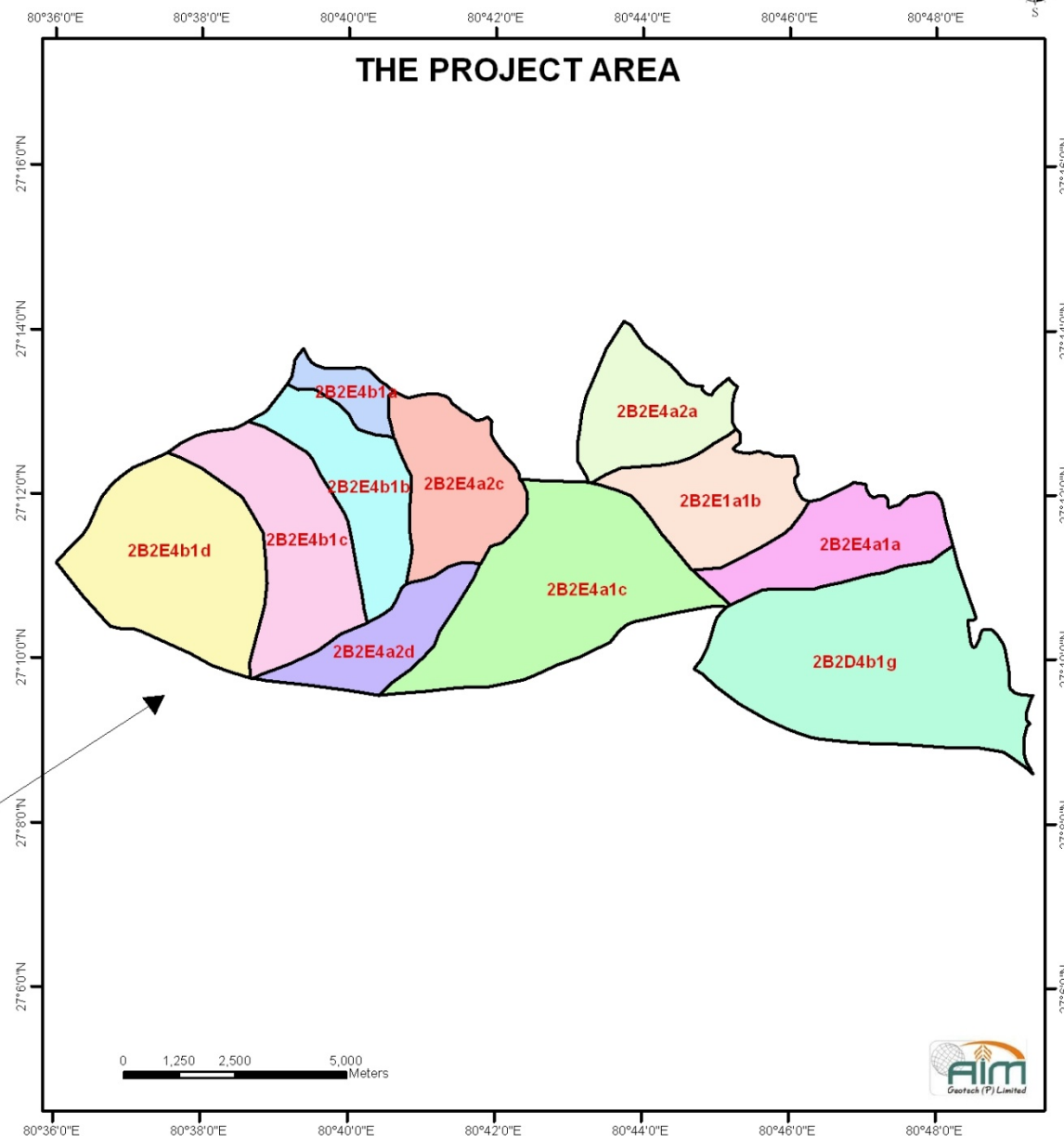
DISTRICT - HARDOI (U.P)



DISTRICT HARDOI



THE PROJECT AREA



LOCATION

The selected watershed IWMP-1st of Hardoi (U.P.) is located in the right bank of the Gomti River about 60 – 65 km away from district headquarter. It lies between the longitude of 80°36' to 80°48' and latitudes 27°10' to 27°15'. The project is a cluster of eleven(11) micro- watersheds with code No. 2B2E4b1d, 2B2E4b1c, 2B2E4a2d, 2B2E4b1b, 2B2E4b1a, 2B2E4a2c, 2B2E4a2a, 2B2E1a1b, 2B2E4a1a, 2B2E4b1g, 2B2E4a1c having an area of 8008.00 Ha, Out of which 5766.00 Ha, has been undertaken for treated under Integrated Watershed Management Programme (IWMP) starting year 2009-2010. There are 16 gram panchayat and 25 revenue villages in the project.

PHYSIOGRAPHY

The project area falls under the central Ganga alluvial plain of Uttar Pradesh, which is a level plain densely populated and most parts of the land is available for cultivation. The watershed having moderate slopes into river R.B. Gomti,. About 60% of the watershed area has 1 to 3 % slope, 20% area has 3 to 5% slope and remaining area has slopes varying from 5 to 18 %. All the streams of the project area finally join the main perennial river the Gomti. Most of the agricultural land is dependent on monsoon. The plains form a level tract which slopes gently from North - West to South-East. The height above sea-level ranges from 85 meters in north-west to 132 meters in the south-east.. The valleys of the larger rivers are not only depressed well below the general level of the country but are of considerable breadth. Thus there is a wide area of low land which is inundated in years of heavy rainfall.

CLIMATE

The watershed lies in the sub tropical climate. The average annual rainfall ranges from 1211 to 1470 mm. Most of the annual rain fall (about 90%) is received during the rainy season (July to September) accompanied with high intensity storm. The temperature in the area rarely goes up to 43°C during summer and reaches 5°C in winter.

The year may be divided into four seasons. The cold season from mid November to February is followed by the summer season from March to mid June. The period from mid June to the end of September is the south-west monsoon season and the October and the first half of November constitute the post-monsoon season.

TEMPERATURE

The data of Hardoi raingauge centre may be taken as representative of the meteorological conditions in the district. From mid November there is a rapid fall in temperature. January is the coldest month with the mean daily maximum temperature at 22.8° C and the mean daily minimum temperature at 9.3° C. In association with cold waves in the wake of the western disturbances passing eastwards in the winter season, temperature tends to go down to a degree or two above the freezing point. Day temperature begins to rise rapidly after February. May is the hottest with mean daily maximum temperature at 38.4 C and the mean daily minimum at 25.1° C. With the advent of the monsoon by about the middle of June there is appreciable drop in the day temperature, however, the nights continue to be warm. In September there is a slight increase again in the day temperature but the night temperature decreases after September. With the withdrawal of monsoon by the beginning of October it decreases progressively.

HUMIDITY

During the monsoon and the post monsoon seasons the relative humidity are high ranging between 70 and 85 per cent. In the winter months humidity decreases and in summer the air is comparatively drier.

WATER QUALITY

The ground water quality of the project area is normal to good, the average Ph value is 6.7 to 7.8, the Electric conductivity of the ground water is about 957 to 1125 μ . The overall analysis of the ground water shows that the water is good for the drinking purpose. The water level in the project area ranges from 8 to 10 metre.

WATERSHED

All the eleven watersheds of the project area are unidentical in shape. The largest watershed is bharawan in the project area as per their size. The direction of the slope in the project area is west to south east.

S. No.	Code of the watershed	Settlement	Location		Elevation of watershed from Mean Sea level		
			Latitude (N)	Longitude (E)	Highest in Meters	Lowest in Meters	Relief Height Difference
1	2B2E4b1d	BAHERIYA	27° 09' 43" to 27° 12' 30"	80° 36' 01" to 80° 38' 50"	134	112	22
2	2B2E4b1c	ATARAULI	27° 09' 44" to 27° 12' 54"	80° 37' 31" to 80° 39' 57"	133	110	23
3	2B2E4a2d	SIKANDARPUR	27° 09' 36" to 27° 11' 10"	80° 38' 41" to 80° 41' 46"	134	122	12
4	2B2E4b1b	JAJUPUR	27° 10' 26" to 27° 13' 20"	80° 38' 38" to 80° 40' 51"	126	109	17
5	2B2E4b1a	RAMMADARP[UR	27° 13' 46" to 27° 12' 41"	80° 39' 25" to 80° 40' 36"	122	106	16
6	2B2E4a2c	MAJHGAON	27° 13' 14" to 27° 11' 8"	80° 40' 35" to 80° 41' 48"	125	102	23
7	2B2E4a2a	KAURIA	27° 14' 8" to 27° 12' 48"	80° 43' 45" to 80° 45' 15"	119	98	21
8	2B2E1a1b	TERWA	27° 12' 8" to 27° 11' 54"	80° 43' 19" to 80° 46' 15"	118	103	15
9	2B2E4a1a	CHAWAN	27° 11' 5" to 27° 11' 22"	80° 44' 40" to 80° 48' 13"	119	101	18
10	2B2E4b1g	BHATPUR	27° 10' 38" to 27° 8' 37"	80° 45' 8" to 80° 49' 19"	117	91	26
11	2B2E4a1c	BHARAWAN	27° 12' 11" to 27° 10' 38"	80° 42' 19" to 80° 45' 12"	122	92	30

GEOMORPHOLOGY

The area lies in the South-West of the District- Hardoi of The R.B.Gomti Basin. The soil is mainly sandy loam soil which is easily transportable after detaching causing soil erosion by water erosion and wind erosion.

SOILS

In the watershed area mainly Loamy sand soil, which are the main soil type of project area. The depth of soil is deep about 45 to 75 cm. The predominant texture of soil is Loamy sand and the soil fertility is poor with low nitrogen, phosphorus.

DRAINAGE

Due to moderate to steep slopes and presence of a number of drainage lines, drainage is adequate. The watershed forms part of R.B. Gomti River.,

NATURAL VEGETATION

Natural vegetation of the watershed is good. The vegetation is predominant with Mango, Guava followed by babool there are occasional occurrence of Neem, Lemon, Mahua and Shisham. There is no reserve pasture land in the watershed. Grass patches are seen only on the bunds, road sides and other such places. The principal grasses are Doob & Munj motha.

AGRICULTURE

Various agriculture land uses in the watershed are extended to diversified land capabilities starting from marginal to good class IInd lands. The watershed distinctly has three types of land i.e. leveled, sloping and degraded and undulating. The water (both for irrigation and drinking) is most scarce natural resource in the watershed. The operation of tube wells for irrigation of agricultural crops frequently leads to the drinking water problem to the farmers for watershed.

The agricultural soils in the watershed have diversified texture i.e. mixed with gravel and loam which are located in patches throughout the watershed.. The heavy soils are almost kept fallow during rainy season. The irrigation water is

conveyed in earthen channels and surface irrigation methods following mainly border method of free flooding method of irrigation by farmers in the watershed. The factors substantially reduce the water use efficiency of limited available and valuable irrigation water in the watershed. To test the quality of irrigation water samples of water of each selected village has sent to laboratory for testing.

Rehabilitation of waste lands with appropriate drought hardy species like *Prosopis juliflora*, introduction of suitable multipurpose tree, promoting agro foresting 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 uplift of farmers in the watershed.

One Year Crop Rotation

Single Cropping: Sugarcane Fallow, Paddy (**Area under single Crop is 4851 Ha**)

Double Cropping: Sugarcane, wheat, Maize, Potato (**Area under double Crop is 1830 Ha**)

Irrigated Agriculture

One Year Crop Rotation: Sugarcane-fallow, Urad/Moong-Vegetables, Paddy-Gram, Paddy-Lentil, Maize-Potato.

CROP PRODUCTIVITY

Food crop production is a major land based activity in the watershed. Traditional cultivation practices, coupled with poor quality seeds and long duration crops varieties result in low crop yields. Crops are taken under rainfed as well as irrigated conditions. The yield levels of rainfed crops are particularly very poor. Large variation has been noticed in productivity of wheat (26.26Qu./ha) and rice (23.48 Qu/ha.) under rainfed and irrigation, condition respectively. At present level of rainfed farming. The total produce from Rabi and Kharif crops obtained by a medium size of holding owning family can meet food requirements for upto 6 to 7 months only.

The farmers also do not have suitable cropping systems to deal aberrant weather. Weeds impose considerable constraint in producing of both Kharif and rabi crops under irrigation as well as rain-fed production system. Use of weedicide is rare in the watershed.

The mixed cropping is in practice in limited area with Kharif crops like Sugarcane, Maize+Arhar but it is not only irrational but also unscientific and beset with low productivity. Subsequent rabi crops in general are raised on residual soil moisture under rain-fed production system during past 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 ploughing for enhanced in situ residual soil moisture conservation and higher production is also not followed in the watershed. The shallow ploughing tractors 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 specially with legumes, use of FYM/compost, vermi-compost , biofertilizers , 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 ploughing across the slope, weed mulching, agro-forestry, vegetative barriers etc. also completely lack in the watershed.

implement crop selection, storage of produce and value condition. Seed drill, seed comfort drills are used with tractor and Nai/chonga with indigenous plough. These ITKs are eco-friendly, cost effective and involve use of local materials with farmers own wisdom. These techniques equip farmers with skills and strength to adopt to the prevailing adverse conditions.

HORTICULTURE

Though no organized orchards are present in the watershed, homestead planting of fruit trees of mango, papaya, and guava etc. has been practiced by farmers.

AGRO-FORESTRY

The agriculture fields of the village do not have any forest or horticultural plantation. At some places isolated trees of Mango, Guava, Ber, can be seen, whose frequency is less than one tree per running length of 100 m.

CHAPTER-3

BASELINE SURVEY

A DETAILED BASELINE SURVEY OF THE PROJECT AREA WAS CONDUCTED TO THE STUDY MAJOR SOCIO-ECONOMIC AND BIOPHYSICAL CONSTRAINTS TO SUSTAINABLE CROP PRODUCTION. THE FOLLOWING INFORMATION WAS COLLECTED

SOCIO-ECONOMIC ANALYSIS OF THE PROJECT

In the proposed watershed management plan of Right bank Gomati river, proper blending of bio- engineering measures will be applied. Based on the results of studies conducted in this region, it is estimated that more than 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.

ECONOMIC ANALYSIS

Economic analysis of the project is carried out by taking direct benefits and costs, considering 30 year project life at 10% discount rate. For the purpose of economic analysis, whole watershed development plan is divided into four sectors namely agriculture (rainfed and irrigated), pure horticulture, agro-horticulture and silvi pastoral (Silvi-Pastoral + sericulture). Net present value (NPV), Benefit Cost Ratio (BCR) , Payback Period (PBR) and internal rate of return (IRR) criteria is employed to judge the economic efficiency of each enterprise, sector and project as a whole.

DETAIL OF PRESENT CROP ROTATION

S.N.	Name of Distt.	Name of Block	Name of Project	Name of Crops											
				Rabi				Kharif				Zaid			Av. Production (Qt. /Ha)
				Wheat	Sugarcane	Gram	Masur	Paddy	Makka	Til	Jowar	Urd	Bajra	Mong	
1	Hardoi	Bharawan	I.W.M.P.-1	3250	535	65	62	1795	1450	119	75	550	150	92	22.91

CROP PRODUCTIVITY

Watershed area has low productivity because of the following reasons:

1) Dependence on Monsoon

Watershed is dependent on monsoon. Water is essential input in agriculture. Due to the absence of proper irrigation facility, 80% of the total cultivation area depends on the uncertain monsoon. The rainfall is unreliable due to two factors viz. untimely and inadequate.

2) Low use of fertilizer per unit cropped area

Farmers do not use sufficient fertilizer due to lack of water, scarcity of fertilizer on market and insufficient money for fertilizer. Many a times they don't get fertilizer at the right time.

3) Traditional farming methods

This also leads to low productivity. There is a lot of ignorance about the use of new farming methods and technologies such as multiply cropping. They don't use FYM and other input in a proper way, that is why they don't get 100% output. So these factors contribute to low productivity.

4) Lack of Adequate Farm Machinery

Even today a large number of farmers in water shade area use wooden ploughs and bullocks. They don't have adequate machinery like seed drill. So, old machineries take more time in tillage practices.

5) Lack of Finances For Farmers

Most of the farmers are marginal and small. They do not have enough money to buy good quality seeds, machinery and other inputs.

6) Lack of Good Quality Seeds And Fertilizers

Good quality seed, fertilizer and pesticide are important factor in agriculture productivity. The use of good quality leads to higher land productivity. In watershed, however, there are two limitations in the use of fertilizer. First these fertilizers are most useful in irrigated condition. But in watershed 100 per cent of land depend on rainfall. mostly farmers use nitrogenous fertilizers especially urea. This has resulted in disproportionate use of fertilizer depleting the quality of land.

7) Lack of Other Facilities Such As Storage And Marketing

5-10% of agriculture product damage after harvesting due to scarcity of proper storage and proper market for sale. So he sells to local traders at the low prices. Farmers mainly face proper means of transportation and roads. And second problem is farmers don't have proper storage facilities.

INDIGENOUS TECHNOLOGICAL KNOWLEDGE: (I.T.K.)

Agriculture is an old age occupation which farmers have practiced and improved in their own manner to earn livelihood under the condition of area. The villagers have their traditional village ponds, practice of field bunding, production of Arhar crop on the bunds in paddy area which typically constitute agriculture related ITKs in the watershed.

The indigenous farming technology in the watershed is observed to cover a vast spectrum of activities involving tillage, implement crop selection, storage of produce and value condition. Seed drill, seed comfort drills are used with tractor and Nai/chonga with indigenous plough. These ITKs are eco-friendly, cost effective and involve use of local materials with farmers own wisdom. These techniques equip farmers with skills and strength to adopt to the prevailing adverse conditions.

EMPLOYMENT MIGRATION

Labour migration in search of gainful employment is one of the major problems in the remote watershed in particular. People migrate during summer season to different parts of the state like Lucknow, Kanpur and Delhi as daily wagers, agricultural labours and construction workers. Lack of employment opportunity the toatal migration during last year was 417. The details is given below.

DETAILS OF MIGRATION (I.W.M.P.-1) HARDOI

S.No.	No. Of persons migrating	No. Of days per year of migration	Major reason(s) for migrating	Distance of destination of migration from the village(km)	Occupation during migration	Income from such occupation (in Rs.)
1	417	90	Unemployment & for better employment	100 to 400	Labour	Rs. 200 per day

PRESENT LAND USE IN THE WATERSHED

Spatial information on land use/land cover is a necessary prerequisite in planning, utilizing and management of natural resources. In the current days context of development planning, information on land use/land cover and the changes over a period of time attain prominence because of its primary requirement in all the planning activities. The present watershed have varied land/use land cover categories as shown in table below. One such map of land use/ land cover of the watershed is shown in Annexure Map.

THE LAND UNDER DIFFERENT CATEGORIES WITHIN WATERSHED

S. N.	Watershed Code	Settlement	Built-Up Land	Wasteland all types	Agriculture	Water Bodies	Plantation	Total
1	2B2E4b1d	BAHERIYA	47.90	47.82	600.48	55.82	239.61	991.63
2	2B2E4b1c	ATARAULI	33.07	27.68	736.15	11.12	227.12	1035.14
3	2B2E4a2d	SIKANDARPUR	26.58	20.15	377.55	10.96	118.39	553.63
4	2B2E4b1b	JAJUPUR	18.75	35.35	278.07	8.20	246.94	587.31
5	2B2E4b1a	RAMMADARPUR	1.32	13.91	161.03	0.07	37.23	213.56
6	2B2E4a2c	MAJHGAON	21.04	114.29	515.74	6.77	80.72	738.56
7	2B2E4a2a	KAURIA	21.07	70.13	415.88	22.12	44.23	573.43
8	2B2E1a1b	TERWA	19.26	30.62	420.34	16.23	89.62	576.07
9	2B2E4a1a	CHAWAN	7.16	80.22	520.34	17.34	132.98	758.04
10	2B2E4b1g	BHATPUR	44.12	192.21	1000.45	35.99	211.34	1484.11
11	2B2E4a1c	BHARAWAN	67.81	31.87	178.06	37.26	181.52	496.52

PRESENT LANDUSE/LANDCOVER OF THE PROJECT AREA

S. No	Landuse	Area (ha)	%
1	Built-up land	308.08	3.83
2	Waste Land	664.25	8.3
3	Water Bodies	221.88	2.77
4	Plantation	1609.7	20.10
5	Agricultural Land	5204.09	64.996
Total		8008	100

DESCRIPTION

The present LU/LC map has been depicted through the satellite data of January, 2010 (Google). A total no. of 5 major categories of LU/LC has been mapped.

BUILT-UP LAND

All the major settlement areas have been mapped under this category and the total area under category is 308.08 Hectare. The main settlements are Atarauli, Lodhaura, Sikandarpur, Rammadarpur, Jajupur, Bharawan, etc, which is 3.83 % of the total mapped area. Under this category road network and other built-up area has also been included.

WASTE LAND

Land which is deteriorating for lack of appropriate water and soil on account of natural causes comes under this category. The total area under this category comes about 664.25 Hectare which is 8.3% of the total mapped area. The sub categories are like Salt affected land, Gullied/Ravenous Land, Scrub Land etc.

WATER BODIES

This category comprises area with surface water either impounded in the form of ponds, lake & reservoirs. The total area under this category comes about 221.88 Hectare which is 2.77% of the total mapped area.

PLANTATION

These areas are separable from crop land especially with the data acquired during rabi/zaid season. Plantations appear with different size and regular and sharp edges indicating the presence of a fence around it. Depending on the location, they exhibit a dispersed or contiguous pattern. The total area under this category comes about 1609.7 Hectare which is 20.10% of the total mapped area.

AGRICULTURAL LAND

These are the lands primarily used for farming and for production of food; it includes land under the (irrigated and un-irrigated). Areas with standing crop as on the date of satellite overpass. Cropped areas are in varying shape and size in a contiguous and non contiguous pattern. They are widely distributed in different terrains; prominently appear in the irrigated areas irrespective of the source of irrigation. The study area is predominantly paddy producing area being its flatness in 2007-08 maximum production of paddy recorded in this region under the double crop area, sugarcane belt capture 561 Hectare total agriculture land. It is important to know that the project area has maximum **two crop areas** i.e. **Kharif and Rabi**. The average size of the agricultural field is less than 0.5 Hectare. The total area under this category comes about 5204.09 Hectare which is 64.996% of the total mapped area.

SOIL AND LAND CAPABILITY CLASSIFICATION

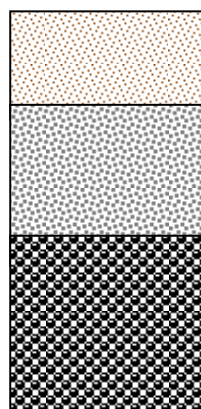
Soil Morphology:

The study area is situated in the South-East of District-Hardoi. The entire watershed is topographically divided into three major land forms. Accordingly, the soils of watershed have been grouped in the three major categories.

- 1- Plain land
- 2- Moderate sloppy land

3- Strong

Soil Profile: A Representative Soil Profile



1-1.5 (Heavy texture clay-soil yellowish Brown in color)

5 -8m (Locally called “Clay”)

7 –8 m(Sandy Clay)

MORPHOLOGY OF TYPICAL SOLID PROFILE OF WATERSHED

Horizon	Depth(Cm)	Morphology
A	0-150	Yellowish brown in colour, clay content > 80%, soft and easily erodible when moist, hard when dry, high elasticity, Cracks occur when dried.
B	150-800	whitish brown in colour, very hard when dry, clay content > 60%
C	>800	(Black and sandy)

Soil Characteristics and Fertility Status:

Four types of soils are in the watershed area. The fertility status is about normal range due to production of major pulses crops. There is scarcity of phosphorus due to continuous growing of pulses. The four soil samples of each village, three for nutrients analysis and one for sulphur and micro nutrients analysis have been send to laboratory. After receiving the analysis report effort will be made to motivate the farmers to use nutrients and micronutrients according to the any analysis report. For this demonstration of crop in Kharif and Rabi both seasons have been proposed under agriculture production activity.

DETAILS OF THE SOIL EROSION

Name of District	Name of Projects	Cause	Type of erosion	Area affected(ha)	Rain off (mm\year)	Average soil loss(Tom\Ha\Year)
Hardoi	IWMP 1 st Hardoi	Soil Erosion			70 %	20
		a	Sheet	4106.50		
		b	Rill	1085.00		
		c	Gully	574.50		
		Sub- Total		2763.00		
		Wind erosion		-		
Total for project				5766.00	NA	

LAND CAPABILITY CLASSIFICATION (LCC)

Land capability classification is an interpretative grouping of lands made to show their relative suitabilities for various crops, pasture, forestry and wildlife and recreation. The inherent characteristics, limitations and risk of damage to the soils and also their response to management are taken into consideration for classifying them under various land capability classes.

Land capability class is the broadest category in the land capability classification system. Class codes I, II, III, IV, V, VI, VII, and VIII are used to represent arable and non-arable land as defined below.

Class I lands have slight limitations that restrict their use.

Class II lands have moderate limitations that reduce the choice of plants or require Land capability classification is an interpretative grouping of lands made to show their relative suitabilities for various crops, pasture, forestry and wildlife and recreation. The inherent characteristics, limitations and risk of damage to the soils and also their response to management are taken into consideration for classifying them under various land capability classes.

Land capability class is the broadest category in the land capability classification system. Class codes I, II, III, IV, V, VI, VII, and VIII are used to represent arable and non-arable land as defined below.

Class I lands have slight limitations that restrict their use.

Class II lands have moderate limitations that reduce the choice of plants or require moderate conservation practices

Class III lands have severe limitations that reduce the choice of plants or require special conservation practices, or both.

Class IV lands have very severe limitations that restrict the choice of plants or require very careful management, or both.

Classes V to VII cover lands that are unsuitable for agriculture but suitable for pasture.

Class VIII lands are suitable neither for agriculture nor for forestry and are best left for wildlife and recreation.

Land capability classes are divided into land capability subclasses, groupings of soils that have the same kind of limitations for agricultural use. Subclass codes used are e, w, s and c.

‘e’ represents susceptibility to erosion by water or wind,

‘w’ represents drainage difficulties including wetness or overflow,

‘s’ represents soil limitations for plant growth and

‘c’ represents climatic limitations.

Land capability subclasses are subdivided into land capability units that are groupings of one or more individual soil map units having similar limitations or hazards. They are denoted by appending a numeral from 0 to 9 to the land capability subclass to specify the kind of limitation. The specific limitations are

- Stony or rocky (0),
- Erosion hazard/slope (1),
- Coarse texture (2),
- Fine texture (3),
- Slowly permeable subsoil (4),

Land capability classification(LCC) is crucial for appropriate land use planning consisting of practiced like choice of vegetation /crops, tillage practices, use of scientific method of cultivation and desirous conservation practices, Detailed LCC Survey carried out in the watershed brought out the prevailing LCC classes as I,II,III,IV

CONCLUSION

The land capability classification of the watershed provides reasonable good information with regard to capability of soil, that could be used for agriculture, agri-horticulture, silvi-culture and pasture development. The majority of land form is coming under class II, which give an insight of good agriculture production potential of these watersheds. The productivity of these lands could be further enhanced by adoption of simple soil & water conservation measures like contour bunding *in-situ* moisture conservation practices. In class III submergence bund,

marginal and peripheral bund are planned and in class IV, gully plugging structures, earthen check dam and water harvesting bunds are proposed with permanent Pucca Drop Spill Way structures.

SLOPE ANALYSIS

The Project area an uneven terrain with higher elevations on the north- West side of the watershed. Since slope is the most important terrain characteristic and plays a vital role in geomorphological and runoff processes, soil erosion and land use planning, it is very important to have an understanding of the spatial distribution for the development and management of both land and water resources. The general slope of the watershed is towards south - East. In the present study Seven (7) Slope classes were identified through the analysis of Aster Digital Elevation Model. One such map of Slope of the watershed is shown in Annexure Map.

HUMAN AND LIVESTOCK POPULATION

HUMAN POPULATION

The I.W.M.P watershed project has a total of 1110 household with a population of 25650 (as base- line survey) out of which 13601 are male and 12049 are female. The sex ratio is 12049 female to 13601male. The average family size is 5. The literacy rate is very low 1.e. 17.7 percent, male literacy rate is 29.7 percent (out of male population) and female literzcy rate is as low as 3.75 percent (out of female population). Majority of population is involved in agricultural and animal husbandry.

Detail of Human Population (I.W.M.P-1) Hardoi

S. No.	Village No.	Total No. of House Hold	Total Population	Male	Female	Total SC Population	SC	ST	Remark
1	2B2C4g3b	1110	25650	13601	12049	9125	9125	-	

LIVESTOCK POPULATION

The watershed I.W.M.P-1 has 2347 cows, 2662 Buffaloes, 226 Bullocks, 3965 Goats. The majority of the landless villagers are depended on Goats and sheep rearing for their livelihood. Cows and buffaloes are of local breed. Lack of rain and surface water has reduced the fodder and pasture availability for their animals. This leads to heavy migration to other parts of the state. The micro-watershed wise detail of the Livestock is given below.

Detail of Live Stock (I.W.M.P-1) Hardoi

S.No.	Type of animal	Existing No.	Milk production (ltr/day)	Milk quantity sold(ltr/day)	Income generated per annum(in lakh)
1.	Cows	2347	4225	2150	102.00
2.	Buffaloes	2662	7320	4425	242.00
3.	Goat	3965	-	-	-
4.	Ox	2939	-	-	-
5.	Poultry	1620	-	-	-
6.	Piggery	1135	-	-	-
7.	Other animals (specify Poultry)	-	-	-	-
8.	Fodder Availability Dry(Abundant/Sufficient/Scarce)	Sufficient	-	-	-
9	Green (Abundant/Sufficient/Scarce)	Scarce	-	-	-
10	Fuel wood Availability (Abundant/Sufficient/Scarce)	Scarce	-	-	-

LIVELIHOOD PATTERN

People earn their livelihood from animal husbandry and agriculture and during lean seasons they migrate for daily wage labourers as well as agricultural labourers in neighbouring district and in other parts of the State. Another major occupation of the people is as industrial workers. The detail of livelihood pattern is given below.

Detail of Livelihood Pattern (I.W.M.P-1) Hardoi

S.No.	Name of activity	No. Of beneficiaries					Pre-project average income per HH (in Rs.)
		SC	ST	Others	Total	Women	
1	Dairy	55	--	395	450	60	5000.00 per year
2	Piggery	40	--	--	40	5	6000.00 per year
3	Poultry	12	--	90	102	15	4050.00 per year
4	Goat	70		105	175	78	3000.00 per year
5	Black smith	--		50	50	20	6000.00 per year
6	Carpenter	20		55	75	--	8000.00 per year
7	Barber	--		62	62	5	7000.00 per year
8	Washerman	63		10	73	35	8000.00 per year
9	Tailoring	45		77	122	53	4050.00 per year
10	Masonry work	25		55	80	--	10000.00 per year
		22		26	48	15	6000.00 per year

LAND HOLDINGS

Lack of surface water source of ground water has limited the sufficient base for irrigation as well as for drinking purpose. Lack of irrigation source force the majority of the farmers to migrate to ensure their livelihood. This effects directly the demographic profile of the watershed. The major crops cultivated by the farmers are Wheat and Paddy. The detail of Land Holding Capacity is given below

Detail of Land Holding Capacity (I.W.M.P-1) Hardoi

s.No.	Name of District	Name of the project	Type of farmer	No. of Households	No. of BPL households	Land holding (ha)		
						Irrigate	Rain fed	Total
1	HARDOI	IWMP HARDOI 1 st	Large Farmer	613	-	-	2149.40	2149.40
			Small farmer	741	-	-	1321.27	1321.27
			Marginal farmer	3744	1230	-	2805.58	2805.58
			Landless person	312	271	-	-	-
			Sub Total	5410	1501	-	6276.25	6276.25

INFRASTRUCTURE SOCIAL FEATURES

The watershed has moderate communication facilities and all 25 villages are approachable through motorable road. Literacy rate in the watershed is very low because except some village all villages are having education facilities up to Junior High School. All the villages are electrified and have telephonic connection. Nearest market is in Kurwar and district headquarter is at Hardoi. Small land holdings with large family size and more than 50% of the labour force of the total population living below poverty line indicate poor socio-economic status of the watershed community, however a strong community spirit among the village show a positive indication for the success of any programme implemented in a participatory mode. Traditionally, the entire village community participates in the individual's work needing labor such as sowing, harvesting, house construction works etc.

Details of Utilities (I.W.M.P-1st) Hardoi

S.No.	Infrastructure type	No./ Quantity	Status(Description)
1	Educational Institution		
	i. Anganwadi	15	In working
	ii. Primary school	25	Sufficient
	iii. Secondary school	05	Not Sufficient
	iv. Govt. College	--	--
	v.Vocational institution	--	--
2	Service Institution		
	i. Bank	04	Sufficient
	ii.Post office	10	Sufficient
	iii.Primary Health Care Centre	01	Not Sufficient
	iv.Veterinary Institution	01	Not Sufficient
	v.Mark/Shandies	12	Working well
3	No. of Bore/pump sets (Functional)	590	Working well
4	No. of milk collection centres (union/society/pvt. Agency/others)	02	Insufficient
5	Total Quantity of surplus milk	NA	
6	Road connectivity (to main road by an all weather road)	Yes	

	(Yes/No)		
7	Bus facility (Yes/No)	Yes	
8	No. of households Provided Electricity	970	Insufficient
9	Others (Specify_____)		
10	No. of Household with access to drinking water	--	
11	Access to agro industries(Yes/No)	No	
12	Any other facility (Specify_____)		



SOCIAL MAP OF VILLAGE KAUDIYA



SOCIAL MAP OF VILLAGE KAROUND



SOCIAL MAP OF VILLAGE BHARAWAN



SOCIAL MAP OF VILLAGE MAJHGAWAN

CHAPTER - 4

INSTITUTION BUILDING & PROJECT MANAGEMENT

PARTICIPATORY RURAL APPRAISAL (PRA)

The past experience of watershed has given tremendous input to focus on creating accountability of the stakeholders towards the program. 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.

USE OF GIS AND REMOTE SENSING FOR PLANNING

Use of various GIS and Remote Sensing Technologies has been promoted at various stages of watershed development.

a) Prioritization

Geographical Information System (GIS) has been used for prioritization process. Various maps were created using spatial and non spatial data like Geo-morphological maps, Soil data, Crop productivity data, Meteorological data, BPL Population, SC/ST population, Ground water Status, Drinking water situation, Slope percent. These were all given proper weightage according to the DoLR specification. This will be helpful for effective dissemination of information on land and water resources to the users.

b) Planning

An 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 0.3 meter at a scale of 1:4000 was used for identifying various locations for soil and water conservation structures. GIS study is used to identify the area require the degree of concentration for the implementation of Watershed Plan.

a) Hydrological modeling

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

WATERSHED ACTIVITIES

Watershed management as a strategy has been adopted by Government of India especially in the rain-fed regions of semi-arid tropics. These regions 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 watershed development. The common guidelines generate a fresh and flexible framework for the next generation watershed development.

SCIENTIFIC PLANNING

1. Cluster Approach :-

This envisages integrated development of Geo-hydrological unit i.e. Treatment of cluster of micro –watershed. The IWMP Hardoi Project consist of 6 micro watersheds

2. Base line Survey

To access the impact of any watershed development programmed 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 Talati – cum mantri. Household census survey includes a detailed questionnaire which has 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 and net consumption rate in the village, 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, wells in the area, crop taken in the field, Cropping pattern, fertilizer used and various sources of irrigation in the field.

Details of Scientific Planning and Inputs in IWMP projects

Scientific criteria / input used	Whether scientific criteria was used
(A) Planning	
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	Yes
Cadastral map	Yes
Village boundaries	Yes
Drainage	Yes
Soil (Soil nutrient status)	Yes
Land use	Yes
Ground water status	Yes
Watershed boundaries	Yes
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) Inputs	NO
Bio-pesticides	No
Organic manures	No
Vermi compost	Yes
Bio-fertilizer	Yes
Water saving devices	Yes
Mechanized tools/ implements	Yes
Bio-fencing	Yes
Nutrient budgeting	Yes
Automatic water level recorders & sediment samplers	NO
Any other (please specify)	NO

WATERSHED DEVELOPMENT TEAM

The WDT is an integral part of the PIA and will be set up by the PIA. Each WDT should have at least four members, broadly with knowledge and experience in agriculture, soil science, water management, social mobilization and institutional building. At least one of the WDT members should be a woman. The WDT members should preferably have a professional degree. However, the qualification can be relaxed by the DWDU with the approval of SNLA in deserving cases keeping in view the practical field experience of the candidate. The WDT should be located as close as possible to the watershed project. At the same time, it must be ensured that the WDT should function in close collaboration with the team of experts at the district and state level. The expenses towards the salaries of the WDT members shall be charged from the administrative support to the PIA. DWDU will facilitate the training of the WDT members.

As per new common guideline direction/instruction given in Para 5.3 point 40 P. I. A. has been constituted Watershed Development Team as given in table below:

S. No.	Name of the District	Names of Project	Name of Member of WDT	Sex (M/F)	Qualification	Experience	Role
1	Hardoi	IWMP Hardoi 1st	Shri Kunwar Bahadur Singh	M	Civil Engineer	30 Years	Team Leader
2			Shri Ram Murti Mishra	M	Civil Engineer	30 Years	Technical Expert
3			Dr. Surendra Nath Ram	M	Civil Engineer	30 Years	Technical Expert
4			Smt. Ram Sakhi	F	Graduate in Sociology	07 Years	Social Mobilization Expert
5			Sri Awadhesh Pandey	M	B.Sc. Ag.	25 Years	Agriculture Expert
6			Mr.Akhil Singh	M	Graduate	29 Year	Agricultura Expert

Details of Watershed Committee (WC) in District

S.N.	Name Of District	Name of Projects	Name Of WCs	Date of Registration As a Society	Designation	Name	Father's Name	Sex (M/F)	Category	Remark
1	Hardoi	IWMP Hardoi I st	Beharia	Under progress	President	Mr. Ramnugrah	Mr. Gigrashanker	M	SC	
					Secretary	Mr. Ram Das	Mr. Bhusan	M	BC	
					Member	Ms. Ramrati	Mr. Sripal	F	SC	
					Member	Mr. Kamlakant	Mr. Ram Velas	M	SC	LL
					Member	Mr. Ramesh	Mr. Suratram	M	BC	
					Member	Mr. Puranlal	Mr. Gayadin	M	SC	SHG
					Member	Mr. Ganga	Mr. Parsede	M	SC	
					Member	Mr. Bhorse	Mr. Mangli	M	BC	
					Member	Mr. Gaya Prasad	Mr. Ram Prasad	M	SC	SHG
2	Hardoi	IWMP Hardoi I st	Bhatpur	Under progress	President	Mr. Chabile	Mr. Ram Prasad	M		
					Secretary	Mr. Kamlesh	Mr. Mahipal	M		
					Member	Mr. Ram Jeevan	Mr. Maiku	M		
					Member	Mr. Chhotelal	Mr. Kallu	M		LL
					Member	Mr. Sri Prakash	Mr. Haricharan	M		
					Member	Mr. Ram Dhar	Mr. Prabhu	M		
					Member	Mr. Ram Naresh	Mr. Kallu	M	SC	
					Member	Mr. Babulal	Mr. Bechan	M		
					Member	Mr. Ayodhaya	Mr. Bhagwan Deen	M		

					Member	Mr. Dinesh	Mr. Mahipal	M		
3	Hardoi	IWMP Hardoi 1 st	Chawan	Under progress	President	Mr. Jagdish Kumar	Mr. Shyamlal	M	BC	
					Secretary	Mr. Buddhalal	Mr. Chutkau	M	BC	
					Member	Mr. Ramshri	Late Jagannath	M	SC	
					Member	Mr. Nageshwar Prasad	Mr. Bhabhooti	M	BC	
					Member	Mr. Vijay Kr. Kashyap	Mr. Lauwa	M	BC	LL
					Member	Mr. Verendar	Mr. Khageshwar	M	SC	SHG
					Member	Mr. Krishan Pal	Mr. Jagannath	M	GN	SHG
					Member	Mr. Munnalal	Mr. Chhotelal	M	BC	SHG
					Member	Mr. Sundarlal	Mr. Sitaram	M	SC	SHG
					Member	Mr. Awadesh	Mr. Shiv Prasad	M	SC	
					Member	Mr. Gaya Prasad	Mr. Biraju	M	BC	
4	Hardoi	IWMP Hardoi 1 st	Sayeapur	Under progress	President	Mr. Chhotelal	Mr. Puranlal	M		
					Secretary	Mr. Mohanlal	Mr. Puranlal	M		

					Member	Mr. Brahma	Mr. Ramlal	M		
					Member	Mr. Ram singh	Mr. Neelkanth	M		
					Member	Mr. Haribaksh	Mr. Sundar	M		
					Member	Mr. Ramsevak	Mr. Jagannath	M	SC	
					Member	Mr. Ramkhilawan	Mr. Umrao	M		
					Member	Mr. Shatrughn	Mr. Umrao	M		
					Member	Mr. Ramchandra	Mr. Gurudayal	M		LL
					Member	Mr. Ambar	Mr. Sundar	M		
5	Hardoi	IWMP Hardoi I st	Dula nagar	Under progress	President	Mr. Nanhelal	Mr. Chhotelal	F		
					Secretary	Mr. Siyaram	Mr. Kadhile	M		
					Member	Mr. Harihar	Mr. Khoob Ram	M		
					Member	Mr. Moti	Mr. Madari	M		

					Member	Mr. Khayala	W\O Medilal	M		
					Member	Mr. Umashankar	Mr. Kallu	M	SC	
					Member	Mr. Ramlal	Mr. Parmeshwar	M		
					Member	Ms. Santa	W\O Ramdas	M		LL
					Member	Mr. Santosh	Mr. Sadashiv	M		LL
					Member	Mr. Rajaram	Mr. Dalai	M		
6	Hardoi	IWMP Hardoi 1 st	Bharawan	Under progress	President	Mr. Mulchand Bajpai	Mr. T.N. Bajpai	M	GN	
					Secretary	Ms. Rekha Devi	Mr. Sumesh Chandra	F	GN	
					Member	Mr. Ram Prakash	Mr. Parmeshwar	M	SC	LL
					Member	Ms. Srimati	W\O Misrilal	F	SC	
					Member	Mr. Ram Chandra Bajpai	Mr. T.N. Bajpai	M	GN	
					Member	Mr. Ashwani Kumar	Late Mr. Ram Ashre	M	SC	SHG

					Member	Mr. Kamaria Lal	Mr. Shekhar	M	SC	SHG
					Member	Mr. Bachelal	Mr. Khagga	M	SC	SHG
					Member	Mr. Raju	Mr. Puttilal	M	SC	SHG
					Member	Mr. Bhaiya Lal	Mr. Khagga	M	SC	SHG
7	Hardoi	IWMP Hardoi 1 st	Atarauli	Under progress	President	Mr. Brijesh Singh	Late Mr. Jagdev Singh	M	GN	
					Secretary	Ms. Purushottam Kumar	Mr. Krishan Kumar	M	GN	
					Member	Mrs. Lalli Devi	W\O Lala	F	SC	
					Member	Mr. Chandu	Mr. Lalta	M	SC	LL
					Member	Mr. Suresh Singh	Mr. Ram Pal Singh	M	GN	
					Member	Mr. Dharmendar	Mr. Putan Singh	M	GN	SHG
					Member	Mr. Chhunu	Mr. Ram Sahary	M	BC	SHG
					Member	Mr. Sharda Singh	Mr. Chavi Nath	M	GN	SHG

					Member	Mr. Raghubir	Mr. Laksnman	M	SC	SHG
					Member	Mr. Bhaiya Lal	Mr. Khagga	M	SC	SHG
8	Hardoi	IWMP Hardoi 1 st	Sikandarpur	Under progress	President	Mr. Ashish Awasthi	Mr. Rajesh Awasthi	M	GN	
					Secretary	Ms. Kamlesh Kumar	Mr. Biharilal	M		
					Member	Mr. Suresh	Mr. Parmeshwar	M		
					Member	Mr. Nanhke	Mr. Shiv Dutt	M		
					Member	Mr. Ram Swaroop	Mr. Lekhan	M		
					Member	Mr. Bhikkhu	Mr. Changa	M	SC	
					Member	Mr. Shivshankar	Mr. Brijlal	M		
					Member	Mr. Bhagauti	Mr. Shiv Dutt	M		SHG
					Member	Mr. Dunna	Mr. Bhagwant	M		
					Member	Mr. Ram Swaroop	Mr. Pyarelal	M		

9	Hardoi	IWMP Hardoi I st	Mahamdap ur	Under progress	President	Mr.Motilal	Mr. Sheetla Prasad	M	BC	
					Secretary	Ms. Bhagirath	Mr. Ramlal	M	SC	
					Member	Mrs. Ram Kali	W\O LBhagirath	F	SC	
					Member	Mr. Ram Bharat	Mr.Natha	M		LL
					Member	Mr.Bacchulal	Mr. Kalika Prasad	M	GN	SHG
					Member	Mr. Mevalal	Mr. Kadhely	M	SC	
					Member	Mr. Santosh	Mr. Sheetal	M	BC	
					Member	Mr. Mohanlal	Mr. Mathura	M	BC	
					Member	Mr. Habeeb	Mr. Sadhu	M	BC	
					Member	Mr. Badri Prasad	Mr. Bhikari	M	BC	
10	Hardoi	IWMP Hardoi I st	Manghgoa n	Under progress	President	Mr.Ram Vilas	Gokarn Singh	M	GN	
					Secretary	Ms. Pramod Kumar	Mr. Chhutkan	M	BC	

					Member	Mrs. Munilal	Mr. Lakhen	M	BC	SHG
					Member	Mr. Bharat	Mr. Heera	M	BC	SHG
					Member	Mrs. Bhula	Mr. Guljari	F	SC	
					Member	Mr. Siyaram	Mr. Umraye	M	SC	LL
					Member	Mr. Bharose	Mr. Puran	M	BC	SHG
					Member	Mr. Tapo	Mr. Puran	M	BC	SHG
					Member	Mr. Shushil	Mr. Munilal	M	BC	SHG
					Member	Mr. Ramashankar	Mr. Ishwar Deen	M	SC	
11	Hardoi	IWMP Hardoi I st	Rammadar Pur	Under progress	President	Mr. Ghura	Mr. Gajodhar	M	SC	
					Secretary	Mr. Surendar Kumar	Mr. Phalwan	M	BC	
					Member	Mrs. Bhanumati	Mr. Kalesh	F	SC	
					Member	Mr. Ram Kumar	Mr. Gayari	M	SC	LL

					Member	Mr. Ashok Kumar	Mr. Sheetla Prasad	M	GN	
					Member	Mr. Ashwani Bajpai	Mr. Arun Bajpai	M	GN	SHG
					Member	Mr. Gopal sharma	Mr. Chhotkan	M	BC	SHG
					Member	Mr. Shaib Lal	Mr. Mahngu	M	SC	SHG
					Member	Mr. Ramautar	Mr. Mohan	M	BC	SHG
					Member	Mr. Krishan Kumar	Mr. Ghauni	M	BC	SHG
12	Hardoi	IWMP Hardoi 1 st	Jajupur	Under progress	President	Mr. Trilok Kumar	Mr. Prabhu pd.	M	BC	
					Secretary	Mr. Ramlakhan	Mr. Bhagwandas	M	BC	
					Member	Mrs. Darshini	Mr. Chhotke	F	SC	
					Member	Mr. Makhan singh	Mr. Lala Singh	M	GN	LL
					Member	Mr. Munna	Mr. Jagdish pd.	M	GN	
					Member	Mr. Mahabir	Mr. Jali	M	SC	SHG

					Member	Mr. Ramlakhan	Mr. Bhagwandas	M	BC	SHG
					Member	Mr. Patti	Mr. Nagewshwar	M	BC	SHG
					Member	Mr. Munsilal	Mr. Sumer	M	BC	SHG
					Member	Mr. Sripal	Mr. Ramdas	M	SC	SHG
13	Hardoi	IWMP Hardoi 1 st	Kourondh	Under progress	President	Mr. Bhayen	Mr. Makko	M	SC	
					Secretary	Ms. Supriya singh	Mr. Sanjay singh	F	GN	
					Member	Mr. Raghunath	Mr. Ramashrey	M	SC	
					Member	Mr. Rambali	Mr. Kundal	M	SC	LL
					Member	Mr. Ramashrey	Mr. Chokhy	M	SC	
					Member	Mrs. Urmila	Mr. Sarvesh singh	F	GN	SHG
					Member	Mr. Ramautar	Mr. Bhogey	M	BC	SHG
					Member	Mr. Umesh	Mr. Neelkanth	M	BC	SHG

					Member	Mr. Rajendar	Mr. Mathura	M	BC	SHG
					Member	Mr. Ramgopal	Mr. Munnilal	M	BC	SHG
14	Hardoi	IWMP Hardoi 1 st	Koriya	Under progress	President	Mr. Shiv Kumar	Ramdayal	M	BC	
					Secretary	Ms. Ramnaresh	Mr. Bacchelal	M	BC	
					Member	Mr. Mulchand	Mr. Pakheri	M	BC	SHG
					Member	Mr. Girish	Mr. Mulchand	M	BC	SHG
					Member	Mr. Mahendar	Mr. Ram Swaroop	M	BC	SHG
					Member	Mr. Prem	Mr. Mulchand	M	BC	SHG
					Member	Mr. Tuney	Mr. Cheddu	M	BC	LL
					Member	Mr. Ramsri	Mr. Puran	M		
					Member	Mr. Budha	Mr. Babu	M		
					Member	Mr. Santosh	Mr. Baburam	M	BC	

15	Hardoi	IWMP Hardoi I st	Shyamdas pur	Under progress	President	Mrs. Sundari devi	Mr. Sundarlal	F		
					Secretary	Mr. Suresh	Mr. Duber Singh	M		
					Member	Mr. Jeetpal Singh	Mr. Madhaw Singh	M		
					Member	Mrs. Guddi	Mr. Puttilal	F	SC	SHG
					Member	Mrs. Shivkali	Mr. Ram Vilas	F	SC	
					Member	Mr. Lallu	Mr. Kunwar	M		
					Member	Mr. Shyamlal	Mr. Sheetal	M		
					Member	Mr. Ramprasad	Mr. Mangu	M		
					Member	Mr. Rajkumar	Mr. Badlu	M		
					Member	Mr. Rajesh	Mr. Matadeen	M		
16	Hardoi	IWMP Hardoi I st	Sonikpur	Under progress	President	Mr. Chuttny	Late Mr. Jagdev Singh	M	SC	LL
					Secretary	Ms. Manoj Kr. Singh	Mr. Rampal Singh	M	GN	

					Member	Mr. Sundar	Mr. Fakery	M	SC	
					Member	Mrs. Rajani	Mr. Kahdely	M	BC	
					Member	Mrs. Kamla	Mr. Basnto	F	SC	LL
					Member	Mr. Shailndar singh	Mr. Rampal singh	M	GN	
					Member	Mr. Phoolmati	Mr. Sripal	F	SC	SHG
					Member	Mr. Sabir Ali	Mr. Md. Saffi	M	BC	

ROLES AND RESPONSIBILITIES OF WDT

The WDT will guide the watershed committee (WC) in the formulation of the watershed action plan. An indicative list of the roles and responsibilities of the WDT would include among other s, the following.

- Assist Gram Panchayat /Gram Sabha in constitution of the watershed committee and their functioning.
- Organizing and nurturing User Groups and Self-Help Groups.
- Mobilizing women to ensure that the perspectives and interests of women are adequately related in the watershed action plan.
- Conducting the participatory base –line surveys, training and capacity building.
- Preparing detailed resource development plans including water and soil conservation or reclamation etc. to promote sustainable livelihood at household level.
- Common property resource management and equitable sharing.
- Preparing Detailed Project Report (DPR) for the consideration of Gram Sabha.
- Undertake engineering surveys, prepare engineering drawing and cost estimates for any structure to be built.
- Monitoring, checking, accessing, and undertaking physical verification and measurement of work done.
- Facilitating the development of livelihood opportunities for the landless.

- k. Maintaining project accounts.
- l. Arranging physical, financial and social audit of the work undertaken.
- m. Setting up suitable arrangements for post-project operation, maintenance and future development of the assets created during the project period.

SELF HELP GROUP

Self Help Groups are motivated, small homogenous groups organized together through credit and thrift activities. Self help group initiative especially for women, help uplift their livelihood. Generally self help groups include landless and poor women. Before formation of the SHGs, during PRA activities, Focused Group Discussions (FGDs) were held with the women, which came up with the following observations:

- a) Lack of proper credit facilities due to low intervention of formal financial credit institution.
- b) Excessive exploitation of weaker section by money lenders
- c) Lack of attitude for saving among poor people
- d) Lack of knowledge on credit and thrift activity and banking.

Details of Self Help Group in Project Area IWMP Hardoi-1st

S. No.	VILLAGE (M.W.S.)	Name of S.H.G.	Occupation of S.H.G.	Name of Chairman & No. Members
1	ATARAULI	Jai Sitaram SHG	Stiching & Nitting	Shri Ram Rajan s/o Shri Krishan Kr. Dixit 8 other
2	SIKANDARPUR	Maha Lakshmi SHG	Stiching & Nitting, Animal farming	Shri Suresh s/o Shri Parmeshwar & 8 other member
3	RAMMADARPUR	Jai Bhole SHG	Hen Farming	Shri Vinod Kumar s/o Rajbahadur & 8 other members
4	KAURIA	Jai Bir Baba SHG	Stiching & Nitting	Smt. Sarla Devi w/o Indrapal & 7 other members
5	TERWA	Jai Bhole SHG	Goat Farming	Shri Mahesh s/o Rajaram & 8 other members
6	CHAWAN	Jai Shankar Bhole SHG	Stiching & Nitting	Smt. Chandra kali w/o Shri Rajaram & 8 other
7	BHATPUR	Shri Shankar ji Bholenath SHG	Stiching & Nitting & Goat Farming	Shri Chandra Bhal/oJagan & 9 other members

8	BHARAWAN	Jai Durge SHG	Stiching & Nitting	Smt. Suman Devi w/o Shri Mulchand & 8 other
9	MOHAMMADPUR	Jai Shri Ram SHG	Stiching & Nitting	Shri Bacchu lal Tripathi s\o Kalika Prasad & 3 other members
10	KAURODH	Jai Maa Parvati SHG	Stiching & Nitting	Smt. Arti w/o Rajkumar & 8 other members
11	DULANAGAR	Tigida Baba SHG	Stiching & Nitting	Smt. Sunita w/o Kamlesh & 8 other members
12	SHYAMDASPUR	Maa Pawati SHG	Stiching & Nitting	Smt. Guddiw/oRamesh Singh & 8 other members
13	SAIYAPUR	Jai Maha Lakshmi Maa SHG	Stiching & Nitting, Animal farming	Shri Chhotelal s\o Puranlal & 8 other members

USER GROUP

User Groups are normally formed to manage an activity or asset created under the programme on a long term basis. The user group collects user charges from their members, oversee the works and manage the benefits.

It was decided that each group would formulate certain internal rules and have a feeling of ownership with community spirit.

Users Group Details in Project Area – IWMP Hardoi+

S. No.	Name of Districts	Name of Projects	Total No. of UGs				No. of members				No of SC/ST in each category			No of BPL in each category		
1	Hardoi	16	Men	Women	Both	Total	Categories	M	F	Total	M	F	Total	M	F	Total
			148	11	02	161	Landless	80	26	106	28	08	36	32	14	46
							SF	1222	112	1334	304	18	322	370	28	398
							MF	236	08	244	05	-	05	-	-	-
							LF	62	02	64	-	-	-	-	-	-
	Total						1600	148	1748	337	26	363	402	42	444	

INSTITUTIONAL ARRANGEMENT AT PROJECT LEVEL

Project Implementing Agency (PIA)

The SLNA would evolve appropriate mechanisms for selecting and approving the PIAs, who would be responsible for implementation of watershed projects in different districts. These PIAs may include relevant line departments, Autonomous organizations under State/Central Governments, Government Institutes/Research bodies, Intermediate Panchayats, Voluntary Organizations (VOS).

However, the following criteria may be observed in the selection of these PIAs:

- 1- They should preferably have prior experience in watershed related aspects or management of watershed development projects.
- 2- They should be prepared to constitute dedicated Watershed Development Teams.

Selected PIAs will sign a contract/MOU with the concerned DWSUs/District Level Committee as referred in para29 that will spell out well –defined annual outcomes, against which the performance of each PIA will be monitored each year and evaluated on a regular basis by institutional evaluators from a panel approved by the SLNA/Departmental Nodal Agency at the central level.

Each PIA must put in position a dedicated watershed development team (WDT) with the approval of DWDU. The WDT will be hired on contract/deputation. Transfer etc for a term not exceeding the project period. The composition of the WDT will be indicated in the contract/MOU. No programme funds for DPR and watershed works under any circumstances should be released to either the PIA or Watershed Committee (WC) unless the composition of the WDT has been clearly indicated in the MOU/contract and the team members are fully in place.

Roles and Responsibilities of the PIA

The project Implementing Agency(PIA) will provide necessary technical guidance to the Gram Panchayat for preparation of development plans for the watershed through Participatory Rural Appraisal(PRA) exercise, undertake community organization and training for the village communities, supervise watershed development activities, inspect and authenticate project accounts, encourage adoption of low cost technologies and build upon indigenous technical knowledge, monitor and review the overall project implementation and set up institutional arrangements for post-project operation and maintenance and further development of the assets created during the project period.

The PIA, after careful scrutiny, shall submit the action plan for watershed development project for approval of the DWDU/DRDA and other arrangements. The PIA shall submit the periodical progress report to DWDU. The PIA shall also arrange physical, financial and

social audit of the work undertaken. It will facilitate the mobilization of additional financial resource from other government programs, such as NREGA, BRGF, SGRY, National Horticulture Mission, Tribal Welfare Schemes, Artificial Ground Water Recharging, Greening India, etc.

Project Implementing Agency (PIA)

U.P. Government, Land Development And Water Resources Department section -1 Lucknow has nominated as PIA to Bhoomi Sanrakshan Unit, Land development and water resources Department Dist - Hardoi for IWMP.

Staff at PIA level

S. No.	Name	Designation	Age	Sex	Qualification	Experience (Year)
1	Mr. Kunwar Bahadur Singh	Bhoomi Sanrakshan Adhikari	55	M	Civil engineer	30
2	Mr. R.M. Mishra	Jr. Engineer	55	M	Civil engineer	30
3	Mr. S.N. Ram	Jr. Engineer	51	M	Civil engineer	30
4	Mr. S.K. Nigam	Accountant	51	M	M.com	29
5	Mr. R.K. Rastogi	Accountant	52	M	M.com	29
6	Mr. K.D. Marwaha	Draughts Man	51	M	Intermediate,ITI	29
7	Mr. B.P. Singh	S.Clerk	54	M	B.A	29
8	Mr. R.S. Mishra	J.Clerk	50	M	B.A	29
9	Mr. S.P.Bajpai	J.Clerk	52	M	B.A	29
10	Mr. R.K.Seth	J.Clerk	53	M	B.A	29
11	Mr.A.K.Srivatava	Trasser	52	M	Intermediate	29
12	Mrs.Devpari	Trasser	42	F	High school	15
13	Mrs. R.S. Rawat	Trasser	35	F	M.a	7
14	Mr.R.Dayal	Jiledar	54	M	Graduate	29
15	Mr.R.P. Bajpai	Work Supervisor	52	M	Graduate	30
16	Mr.A.K.Panday	Work Supervisor	54	M	Graduate	29
17	Mr.K.D.Panday	Work Supervisor	51	M	Graduate	29
18	Mr.Akhil Singh	Work Supervisor	50	M	Graduate	29
19	Mr.M.Salim	Work Supervisor	52	M	Graduate	29
20	Mr.R.C.Sharma	Work Supervisor	51	M	Graduate	29
21	Mr.Roop Kishor	Work Supervisor	25	M	Graduate	3
22	Mr.V.D.Yadav	Work Supervisor	52	M	Graduate	29
23	Mr.Om Prakash	Work Supervisor	35	M	Graduate	7
24	Mr.R.P.Katiyar	Fourth Class	51	M	Intermediate	-

25	Mr.Duli Chand	Fourth Class	52	M	8 th Class	-
26	Mr. Hem Singh	Fourth Class	28	M	B.A	-
29	Mr.Pankaj Kumar	Fourth Class	30	M	B.A	-
30	Mr.S.Prakash	Fourth Class	32	M	Intermediate	-

Expected /Estimated Outcomes (MIS table-M (PO)F1)

S.No.	Name of the Distict	Item	Unit of Measurement	Pre-project Status	Expected Post-project Status	Remakrs
1	2	3	4	5	6	7
1.	Hardoi	Status of water table	Meter	6.40	5.90	
2.		Grand water sturcture repaired/ rejuvenated	—	-	-	
3.		Quality of drinking water		Smelly	Pure	
4.		Availability of drining water	Meter	10 months	12 Months	
5.		Increase in irrigation potential				
6.		Change in cropping/land use pattern		Sugarcane, Paddy, Single	Double Crooping	Sugarcne wheat maize - wheat
7.		Area under agriculture crop	Hector	7658	3250	
8.		i- Area under single crop	Hector	3829	4229	
9.		II- Area under double crop	Hector	1914	2014	
10.		iii- Area under multiple crop	Hector	1915	2015	
11.		Net increase in crop production area	Hector	-	600	
12.		Increase in area under vegetation	Hector	275	300	
13.		Increase in area under horticulture	Hector	280	300	
14.		Increase in area under fuel & fodder	Hector	3.50	9.0	
15.		Increase in milk production	Letter	20 Lit./Village	30 Lit./ Village	
16.		No. of SHGs	No.			
17.		Increase in no. of livelihoods	No.			
18.		Increase in income				
19.		Migration	No.	750	450	
20.		SHG Federation formed	No.	26	30	
21.		Credit Linkage with banks				
22.		Resource use agreements				
23.		WDF collection & management				
24.		Summary fo lessons learnt				

CHAPTER – 5

MANAGEMENT / ACTION PLAN

PREPARATORY PHASE

Entry Point activity (EPA)

EPA activities are taken up under watershed projects to build a rapport with the village community at the beginning of the project; generally, certain important works which are in urgent demand of the local community are taken up. A group Discussion was conducted with watershed Development Committee regarding the EPA activity, It was conveyed to the WC that an amount of Rs. 17.64 960 Lakh was allotted for EPA activity, which was 4 per cent of total allocated budget. The villagers discussed various activities which they felt is important but after a brief discussion it was conveyed to them that only those activities can be taken, which revive the common natural resources. It was also taken into priority that there should be an instrument of convergence which will result in sustainability of activities

5.0.1 Entry point activities (EPA) IWMP-I(2009-10) HARDOI

S. No.	Name of Villages	Amount earmarked for EPA (in lac)	Entry point Activities Planned	Per Unit Cost (in Lac)	Estimated Total cost (in lac)	Expected month & year of completion	Remarks
1	Bhatt Pur	3.06	Well maintainance, Pakki Drainage, Chabootra Const.	1130/m 850/m	3.06	March 2010	
2	Hazipur	0.85	Chabootra Cont. Kharanja maintainance	850/m	0.85	March 2010	
3	Chhawan	2.10	Pacca Chabootra, Pakki Drainage	1130/m 850/m	2.10	March 2010	
4	Sayapur	1.70	School building, Chabootra Const.	850/m	1.70	March 2010	
5	Karaudh	2.20	Pacca Chabootra, Ladies bathroom	1130/m	2.20	March 2010	
6	Shyamdasapur	1.44	Pacca Chabootra, Ladies bathroom	850/m	1.44	March 2010	
7	Majhgawan	2.17	Hand Pipe, Pacca Chabootra, Kharanja, Pakki Drainage	850/m 1130/m	2.17	March 2010	
8	Dula Nagar	1.17	Hand Pipe, Pacca Chabootra, Pakki Drainage	1130/m	1.17	March 2010	

⁹	Sikandarpur	1.70	Hand Pipe, Pacca Chabootra, Kharanja Work	850/m	1.70	March 2010	
¹⁰	Bharawan	1.85	Hand Pipe, Pacca Chabootra, Kharanja, Pakki Drainage	850/m	1.85	March 2010	
¹¹	Lalpur	1.44	Hand Pipe, Pacca Chabootra, Kharanja Work	850/m	1.44	March 2010	
¹²	Banjara	2.10	Kharanja, Pakki Drainage, Pacca Chabootra	850/m 1130/m	2.10	March 2010	
¹³	Gherwa	1.70	Kharanja Work, Pulia const.	850/m	1.70	March 2010	
¹⁴	Jakhwa	1.00	Kharanja Work	850/m	1.00	March 2010	
¹⁵	Baheriya	1.40	Ladies bathroom, Hand Pipe Chabootra	50000/No. 10000/No.	1.40	March 2010	
¹⁶	Atrauli	1.80	Ladies bathroom, Hand Pipe Chabootra	50000/No. 10000/No.	1.80	March 2010	
	Total	27.68			27.68		

WATERSHED DEVELOPMENT WORK

Watershed Development works is proposed to be taken up from 2nd year of the initiation of the project. These works are proposed to be taken up from village to village. And allocation of Rs 345.06 Lakh & 50% of the total cost has been made for watershed development works.

Area Treatment Plan

Integrated watershed development program envisage treatment of proposed area with soil & water conservation works along with development of Horticulture, Afforestation & development of silvi pastoral system in denuded land unfit for cultivation, following works are proposed under watershed Development works.

1. Constructions of bunds (Field bund, contour bund, submergence bund, Marginal & peripheral).
2. Renovation of Existing Bund for in-situ moisture conservation.
3. Rain fed Horticulture with and without fencing.
4. Construction of recharge Filter.
5. Construction of new & renovation of Existing structures/ gully plugs/Check dams.
6. Afforestation and development of silvi– pastoral system.
7. Drainage line treatment (pucca structures, gully plug, check dams).

Treatment area and details of Micro-Watershed Code-2B1F7b3b3, 2B1F8a2a, 2B1F7b3a, 2B1F6b1a

S.N.	Village Name	Village Census code	Total Area (h)	Total ProjectArea (h)	Total Treatable Area (h)	Total Cost (Lac)	Water shed committe
1	3	2	4	5	6	7	8 7
1	Kathauli, Chandraria, Masaulia Danapur, Budwalia	06802100, 06802200, 06802300, 06802400, 06802500	1157.40	1000.00	500.00	60.00	Kathauli
2	Chatauni, Kanhta, Kamalpur, Mohamadpur, Bholiayapur, Ahroua	06802600, 06802700, 06802900, 06803000, 06803200, 06803100	621.00	500.00	500.00	60.00	Bholiapur
3	Duda, Pachmari, Phatepur, Basharia, Dula pur	06801800, 06803300, 06803900, 06804000, 06804100	437.00	100.00	100.00	12.00	Duda
4	Bargadia, Gurdaseel	06804500, 06804600	276.43	100.00	100.00	12.00	Bargadia

5	Gaurasinhapur, Atersuea, Gumdha, Vedpur	06804700, 06806400, 06806000, 06806300	617.00	500.00	500.00	60.00	Atersuea
6	Para, Rudhailia, Akhtiyarpur, Ullaha	06801400, 06801500, 06801900, 06802000	619.20	500.00	500.00	60.00	Akhtiyarpur
7	Ramwapur, Nainwa jagannath, Nakraha, Kasipur, Chandraharia	06804800, 06804900, 06805000, 06805100, 06806200	1053.00	690.00	551.00	66.12	Kasipur
8	Lalemau	06805700	747.0	500.0	500.0	60.00	Lalemau
9	Chandrabhanpur, Palahpur, Bibiayapur, Awdhootnagar, Chatarauli	06805800, 06805900, 06805600, 06805500	815.0	500.0	500.0	60.0	Bibiayapur Awadhootnagar
10	Chamari, Babhuwa, Bibiyapur Ggosai, Dinkaria, Teri, Nakar	06801600, 06801700, 06805200, 06805300, 06805400, 06806100	529.34	500.0	500.0	60.0	Bibiayapur Gosai
11	Gharkuena, Md.Garwar, Devali, Bhatpurwa	06806600, 06806800, 06806900, 06806700	701.50	500.0	500.0	60.0	Bhatpurwa
12	Bahalry, Gudwalia, Tarahta, Pure Baijnath, Ramgarh	06802800, 06803500, 06803600, 06803700, 06804400	572.97	500.0	500.0	60.0	Tarahta
13	Reksadia, PureAngad, Pure Ajab	06807000, 06807100,	1241.80	500.0	500.0	60.0	Reksadia

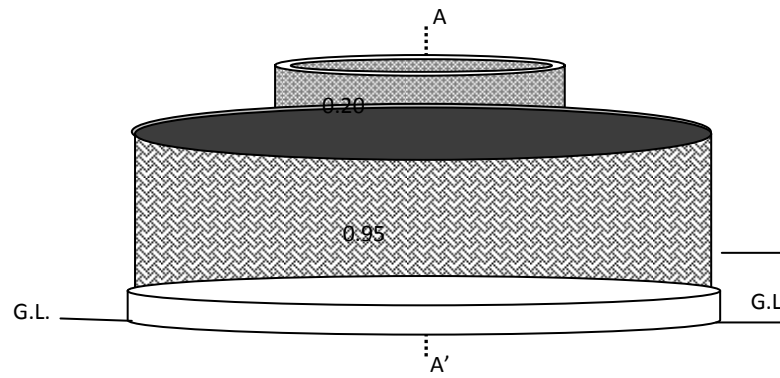
		06807200					
Total				6390.00	5751.00	690.12	

Project work cost- 690.12 Lakh

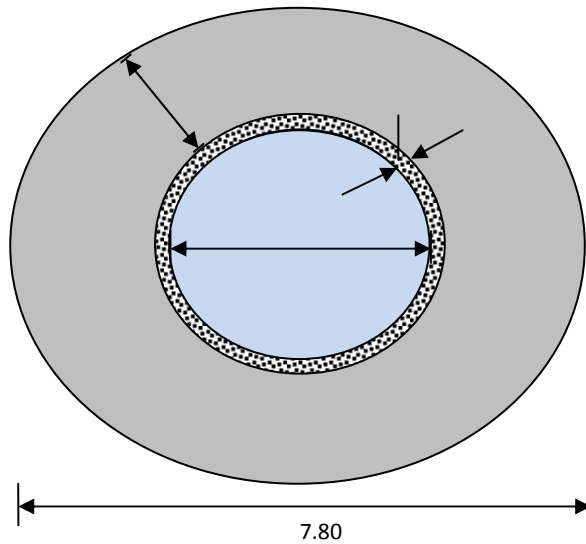
Activity related to livelihood by self help groups (SHGS) in the Project area

S.No	Name Of Village	Occupation of S.H.G	Per unit cost (Rs. In lacs)	Total cost (Rs. In lacs)
1	Chandra Bhanpur	Fishrees	0.20	30
2	Palhapur	Fishrees	0.20	30
3	Chandraharia	Goat keeping	0.20	30
4	Atar Suea	Buffalow, Bee keeping	0.38	65
5	Gumdaha	Buffalow	0.38	65
6	Bibiapur Awadhoot nagar	Fishrees	0.20	30
7	Teri, Chatarauli	Buffalow	0.38	65
8	Nakar	Buffalow	0.38	65
9	Dhema	Buffalow	0.38	65
10	Bhatpurwa Devli	Buffalow	0.38	65
11	Reksadhia	Buffalow	0.38	65
12	Pure Ajab	Fishrees	0.20	30
13	Pure Angad	Buffalow	0.38	65
14	Basria	Buffalow	0.38	65
15	Lalemau	Fishrees	0.20	30
16	Paro	Fishrees	0.20	30
17	Rudhaulia	Goat	0.20	30
18	Duda	General Merchant	0.25	30
19	Kashipur	General Merchant	0.25	30
20	Budhwalia	Buffalow	0.38	65
21	Bhaliyapur	Buffalow	0.38	65
22	Gudwalia	Fishrees	0.20	30
23	Kamalpur	Goat	0.20	30
24	Udaypur	Fishrees	0.20	30
25	Ramgarh	Fishrees	0.20	30

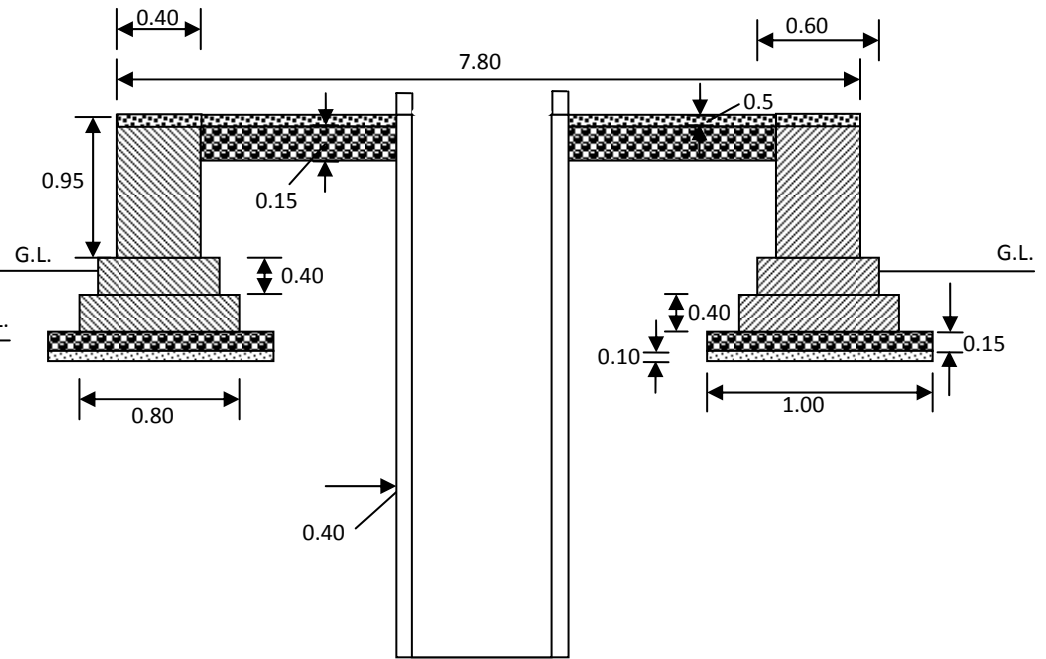
DRAWING OF WELL



ISOMETRIC VIEW OF WELL



PLAN



SECTION AT A-A'

DESCRIPTION

1. C.C.W. - 1:4:8.
2. Brick Work- 1:4
3. Plastering- 1:4
4. Raised Pointing- 1:3.

DETAIL ESTIMATE OF JAGAT OF WELL

S.No.	Description of Work	No.	L	B	D/H	Quantity
1.	Earth work in foundation	1	3.14 × 7.4	1.20	1.00	27.88
2.	Laying of sand	1	3.14 × 7.4	1.00	0.10	2.32
3.	C.C.W. 1:4:8	1	3.14 × 7.4	1.00	0.15	3.48
4.	Brick Work 1:4	1	3.14 × 7.4	0.80	0.40	7.43
			3.14 × 7.4	0.60	0.40	5.57
			3.14 × 7.4	0.40	0.90	8.36
			3.14 × 3.4	0.40	0.20	0.85
						22.21
5.	Filling of earth work	1	3.14 × 5.4	1.60	0.75	20.34
6.	C.C.W. 1:4:8	1	3.14 × 5.4	1.60	0.15	4.06
7.	C.C.W. 1:2:4	1	$\{(3.14 \times 7.8 \times 7.8)/4 - (3.14 \times 3.8 \times 3.8)/4\} \times 0.05$			1.821
8.	Raised pointing	1	3.14 × 7.8	-	0.90	22.04

CONSUMPTION OF MATERIALS

S. No.	Description of Work	Quantity	Cement Bags	Coarse Sand (cum)	Brick (cum)	G.S.B. 25-40 mm (cum)	Grit 10-20 mm (cum)
1.	Sand Laying	2.32 cum	-	2.320	-	-	-
2.	C.C.W. 1:4:8 (4.06 + 3.48)	7.54 cum	25.63	3.393	-	7.012	-
3.	Brick Work 1:4	22.21 cum	53.30	7.551	22.21	-	-
4.	C.E.W. 1:2:4	1.821 cum	11.10	0.764	-	-	1.547
5.	Raised Pointing	22.04 m ²	1.01	0.103	-	-	-
Total			91.04	14.131	22.21	7.012	1.547
Say			91 bags	14.13 cum	22.20	7.01	1.55

COST OF MATERIALS

S.No.	Particulars	Quantity	Rate	Amount
1.	Cement	91 Bags	285.00/bag	25935.00
2.	Coarse Sand	14.13 cum	2500.00/cum	35325.00
3.	Coarse	20.20 cum	950.00/cum	19190.00
4.	Brick Ballast 25-40 mm	7.01 cum	855/cum	5993.55
Total				Rs. 86443.00

LABOUR CHARGES

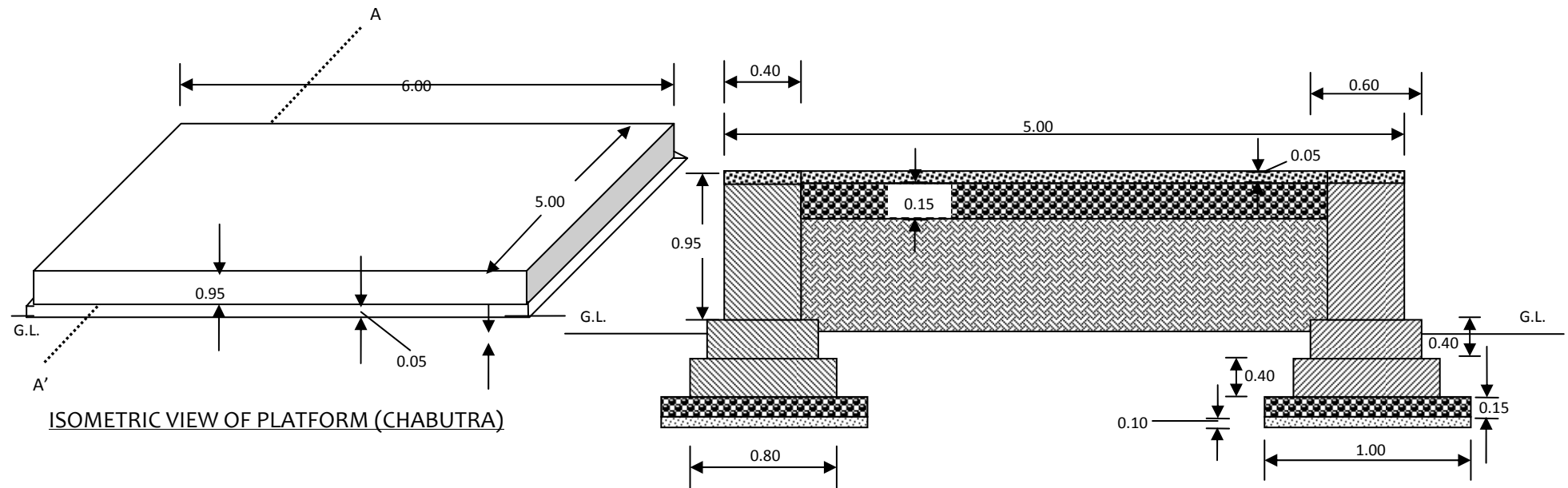
S.No.	Particulars	Quantity	Rate	Amount
1.	Earth Work	48.22 cum	36.66/cum	1769.01
2.	Sand Laying	2.32 cum	33.33/cum	77.32
3.	C.C.W. 1:4:8	7.54 cum	492.00/cum	3709.68
4.	C.C.W. 1:2:4	1.821 cum	492.00/cum	894.11
5.	Brick Work	22.210 cum	370.00/cum	8217.70
6.	Raised Pointing	22.04 m ²	51.61/m ²	7.48
7.	Curing 22.21	22.210 cum	25.00/cum	555.25
8.	Chowkidar	13 Man days	100.00/man day	1300.00
9.	Head load & transportation charges 10% of cost of materials			6674.90
Total				Rs. 24,335.45

TOTAL EXPENDITURE	
1. Cost of materials	65,914.00
2. Labour charges & transportation	24,335.45
Total	Rs. 90,249.45
Say Rs. 90,250.00 only	

DETAIL ESTIMATE OF INDIA MARK-II HAND PUMP FOR WATER SHED AREA, DISTRICT - HARDOI U.P.

S.No.	Description of work	Unit	Quantity	Rate	Amount
1	Transportation of rig machine, hand Pump material, P.V.C. Pipe, strainer and cement from store to work site.	work	1	3000.00	3000.00
2	Supply of material to install Hand Pump	No.	1	5380.00	5380.00
	i- Lowering and installation of India mark-II Hand Pump with G.I. Pipe & connecting rods.				
	ii- 140 mm P.V.C. Pipe 8kg/cm ² .	metre	20	240.00	4800.00
	iii- medium G.I. Pipe of the 32 mm Ø.	metre	30	202.90	6087.00
3	Boring work by D.T.H. Rig machine and lowering of P.V.C. assembling	meter	50	396.00	19800.00
4	Development of Hand Pump after installation	work	1	100.00	100.00
5	work after development with material	work	1	50.00	50.00
6	construction of Platform of 1.86 m Ø with all material and cement	work	1	2525.00	2525.00
7	construction of channel with all material and labour	meter	3	125.00	375.00
8	Embossing work	work	1	50.00	50.00
9	Water testing work	work	1	400.00	400.00
				Total	Rs. 42,567.00
				Says	Rs. 42,600.00

DRAWING OF PANCHAYATI CHABUTARA



SECTION AT A-A'

DESCRIPTION

1. C.C.W. - 1:4:8.
2. Brick Work - 1:4
3. Plastering- 1:4
4. Raised Pointing- 1:3.

DETAIL ESTIMATE OF WATER SHED VILLAGE CHABUTARA

S.No.	Description of Work	No.	L.	B.	D/H	Quantity
1.	Earth work in foundation					
	Long Wall	2	8.00	1.20	1.15 1.15	22.08
	Short Wall	2	4.00	1.20		11.04
Total						33.12 cum
2.	Laying of Sand					
	Long Wall	2	6.60	1.00	0.10	1.32
	Short Wall	2	3.60	1.00	0.10	0.72
Total						2.04 cum
3.	C.C.W. 1:4:8					
	Long Wall	2	6.60	1.00	0.15	1.98
	Short Wall	2	3.60	1.00	0.15	1.08
Total						3.06 cum
4.	Brick masonry work 1:4 in foundation & super structure					
	1st Footing.					
	Long Wall	2	6.40	0.80	0.40	4.096
	Short Wall	2	3.80	0.80	0.40	2.432
	2nd Footing					
	Long Wall	2	6.20	0.60	0.40	2.976
	Short Wall	2	4.00	0.60	0.40	1.920
	Super Structure					

	Long Wall	2	6.00	0.40	0.90	4.320
	Short Wall	2	4.20	0.40	0.90	3.024
Total						18.768 cum
5.	Earth work in filling	1	5.20	4.20	0.75	16.38 cum
6.	C.C.W. 1:4:8	1	5.20	4.20	0.15	3.276 cum
7.	C.C.W. 1:2:4	1	6.00	5.00	0.05	1.500 cum
8.	Raised Pointing 1:3					
	Long Wall	2	6.00	-	0.90	10.80
	Short Wall	2	5.00	-	0.90	9.00
Total						19.80 m²

ABSTRACT OF WORK

1.	Earth Work	33.12 + 16.38	49.50 cum
2.	Sand Laying		2.040 cum
3.	C.C.W. 1:4:8	3.060 + 3.276	6.336 cum
4.	Brick Work 1:4		18.568 cum
5.	C.C.W. 1:2:4		1.500 cum
6.	Raised Pointing 1:3		19.80 m ²

CONSUMPTION OF MATERIALS

S.No.	Particulars	Quantity	Cement (cum)	Coarse Sand (cum)	Brick (cum)	G.S.B. 25-40 mm (cum)	Brick Grit 10-20 mm (cum)
1.	Sand Laying	2.040 cum	-	2.040	-	-	-
2.	C.C.W 1:4:8	6.336 cum	21.54	2.851	-	5.892	-
3.	Brick Work	18.768 cum	45.04	6.381	18.768	-	-
4.	C.C.W. 1:2:4	1.500 cum	9.15	0.630	-	-	1.275
5.	Raised Pointing	19.800 m ²	0.91	0.093	-	-	-
Total			76.64	11.995	18.768	5.892	1.275
Say			77 Bags	12.000	18.768	5.900	1.280

COST OF MATERIALS

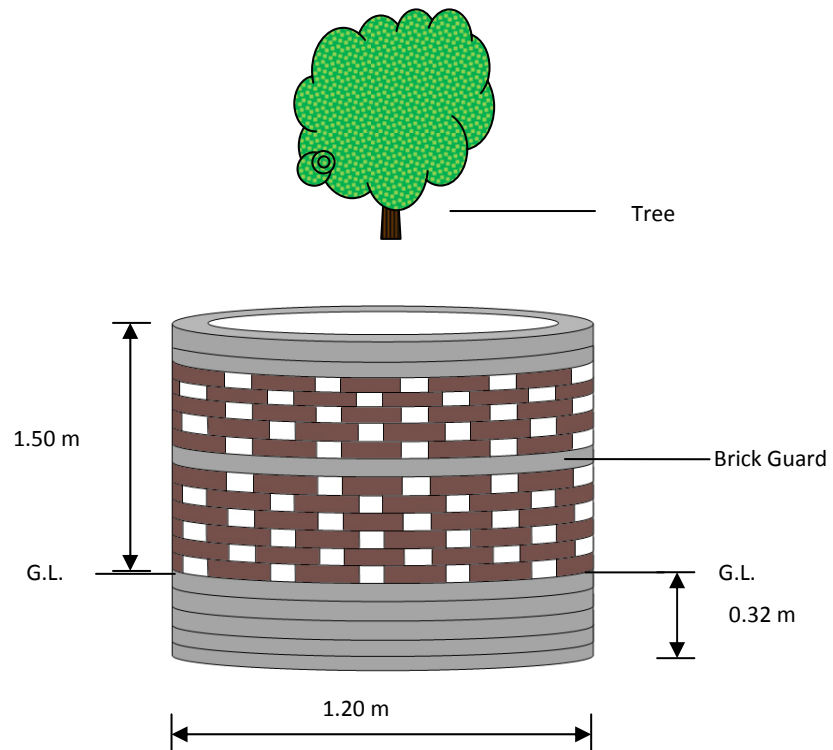
S.No.	Particulars	Quantity	Rate	Amount
1.	Cement	77 Bags	285/Bag	21945.00
2.	Coarse Sand	12.00 cum	910.00/cum	10920.00
3.	Coarse	11.04 cum	950.00/cum	10490.40
4.	G.S.B. 25-40 mm	5.900 cum	855.00/cum	5044.00
5.	G.S. Grit 10-20 mm	1.280 cum	1250.00/cum	1600.00
Total				Rs. 50000.00

LABOUR CHARGES

S.No.	Particulars	Quantity	Rate	Amount
1.	Earth Work	49.50 cum	36.66/cum	1814.67
2.	Sand Laying	2.060 cum	33.33/cum	68.65
3.	C.C.W. 1:4:8	6.336 cum	494.00/cum	3129.98
4.	C.C.W. 1:2:4	1.500 cum	494.00/cum	741.00
5.	Brick Work 1:4	18.768 cum	370.00/cum	6944.16
6.	Raised Pointing 1:3	19.800 m ²	51.61/cum	1021.87
7.	Curing Charges	18.768 cum	25.00/cum	469.20
8.	Chowkidar	6 Man Days	100.00/Man Day	600.00
Total				Rs. 14,789.53

Total Expenditure	
1. Cost of Materials	57,338.60
2. Labour Charges	14,789.53
Total	Rs. 72,128.13
Say	Rs. 72,130 only

DRAWING OF BRICK GUARD



DESCRIPTION.

1. Brick work = 1:4.
2. Plastering = 1:4.
3. Thickness of wall = 0.11 m.
4. Total height of brick guard = $0.32 + 1.50 = 1.82$ m.
5. Diameter = 1.2 m.

DETAIL ESTIMATE OF BRICK GUARD

S.No.	Description of work	No.	L	B	D/H	Quantity	
1.	Earthwork for tree	1	0.60	0.60	0.60	0.216	
	In foundation	1	3.14x1.09	0.20	0.30	0.205	
Total						0.421	
2.	Brick work 1:4					Solid	Glazed
	In foundation	1	3.14x1.09	0.11	0.40	0.151	-
	In super structure with glazed	1	3.14x1.09	0.11	0.48	-	0.181
	Solid	1	3.14x1.09	0.11	0.08	-	0.030
	Glazed	1	3.14x1.09	0.11	0.40	-	0.151
	Solid	1	3.14x1.09	0.11	0.16	0.060	-
	Total						0.211
3.	Plastering 1:4	1	3.14x1.20	-	0.07	0.264	
		1	3.14x1.20	-	0.15	0.565	
		1	3.14x1.09	-	0.07	0.239	
Total						1.068 m ²	

CONSUMPTION OF MATERIALS

S.No.	Description of work	Quantity	Brick Nos.	Cement Bags	Coarse Sand
1.	Brick work 11 cm thick 1:4	0.211 cum	100	0.29	0.050
	Brick work glazed	0.362 cum	86	0.25	0.043
2.	Plastering 1:4	1.068 m ²	-	0.11	0.016
Total			186	0.65	0.109
Say			190	0.65	0.110 cum

COST OF MATERIALS

S.No.	Particulars	Quantity	Rate	Amount
1.	Brick I st class	190 nos.	3650.00	693.50
2.	Cement	0.65 Bags	255.00	165.75
3.	Coarse sand	0.110 cum	910.00	100.10
Total				Rs. 959.35

LABOUR CHARGES

S.No.	Particulars	Quantity	Rate	Amount
1.	Earth work	0.421 cum	39.16/cum	16.48
2.	Brick work	0.391 cum	370.00/cum	144.67
3.	Plastering	1.068 m ²	40.00/m ²	42.72
Total				Rs. 203.87

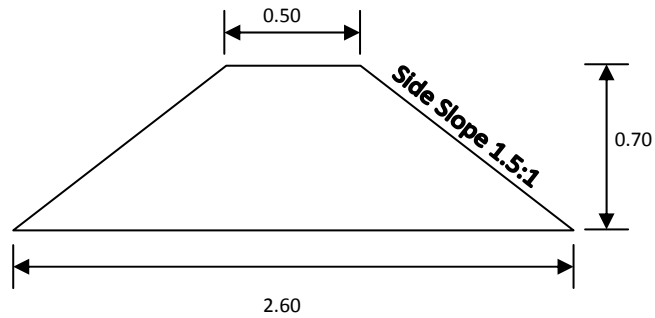
Head load and transportation 20% of material cost - Rs. 191.87

Total Expenditure		
1.	Material	2822.50
2.	Labour	1093.87
3.	Head load and transportation	1083.63
Total		Rs. 5000.00
Say Rs. 5000.00 only.		

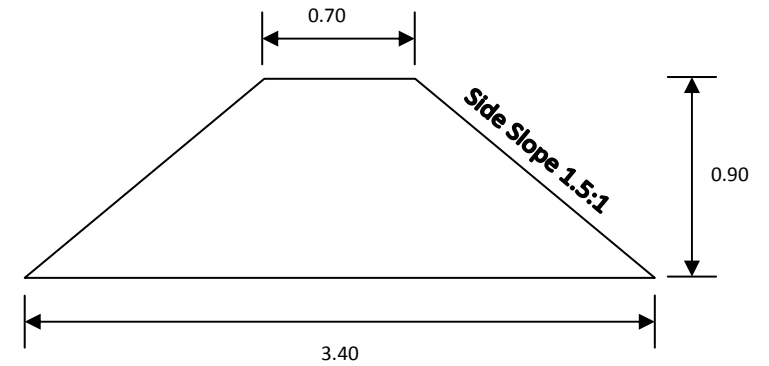
DETAILS ESTIMATE OF WATERSHED DEVELOPMENT WORK PHASE

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

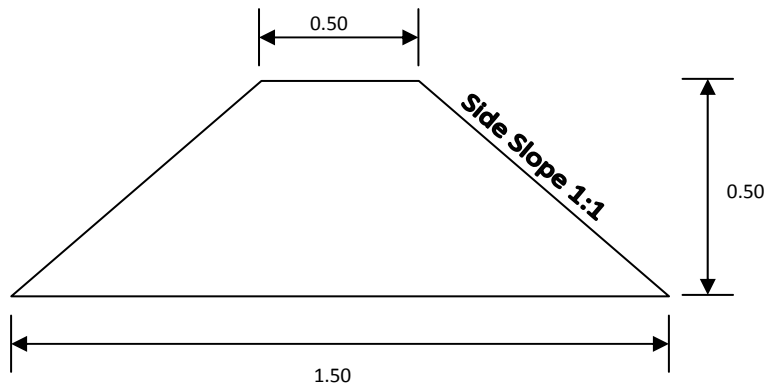
(Not to Scale)



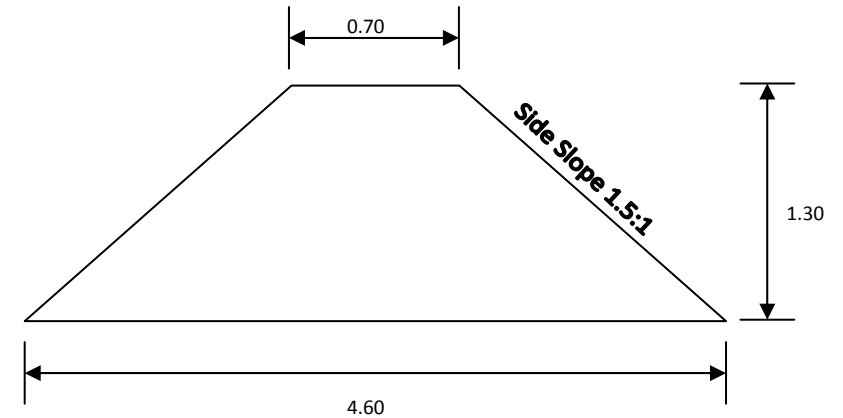
(C.B., Cross-Section – 1.085 m²)



(S.B., Cross-Section – 1.845m²)



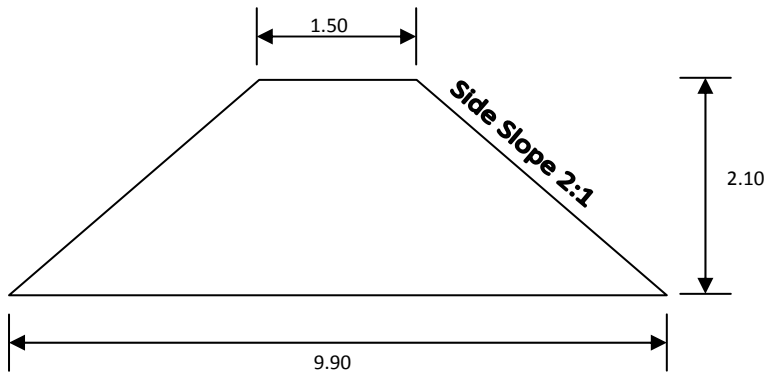
(Field Bund, Cross-Section – 0.50 m²)



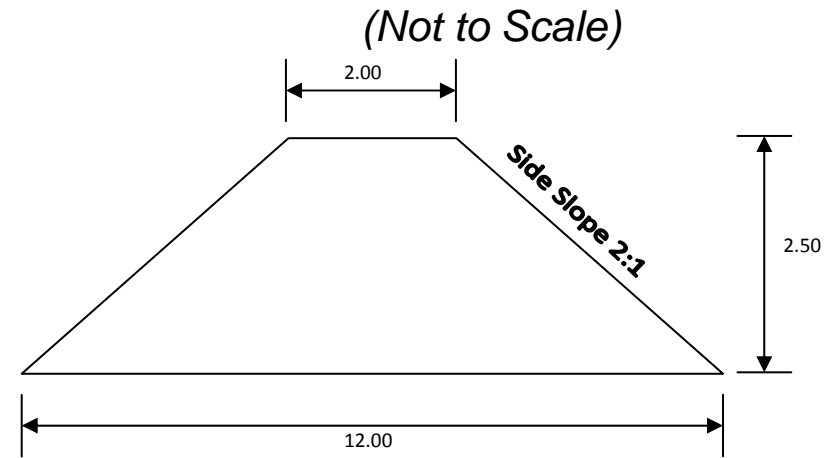
(S.B. /P.B. /M.B., Cross-Section – 3.445 m²)

(All dimensions in Metre)

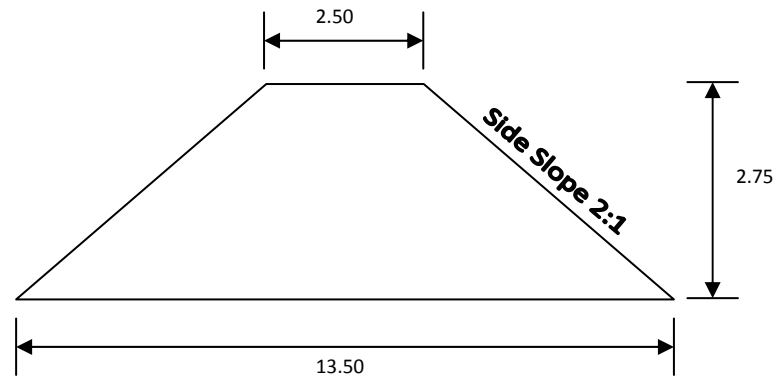
DRAWING OF EARTHEN CHEKDAM / GULLY PLUG



(C.D. /G.P., Cross-Section – 11.97 m²)



(C.D. /G.P., Cross-Section – 17.50 m²)



(W.H.B., Cross-Section – 22.00 m²)

(All dimensions in Metre)

DESIGN OF CONTOUR BUND

Type of Soil	-Loam,Sandy Loam
Rain fall	-24 hr in cm -25 cm
Field Slope -1%	
Vertical Interval (VI)	$= [s/3+2] \times 0.3$ $= [1/3+2] \times 0.3$ $= 0.70 \text{ m}$
Horizontal Interval (HI)	$= 100 \times V.I/s$ $= 100 \times 0.7/1$
Height of bund h	$= \sqrt{(Re \times VI)/50}$ Re=maximum rainfall in cm $= \sqrt{(25 \times 0.7)/50}$ $= \sqrt{0.35}$ $= 0.59$ Say 0.60 m
Free board	=15% of height minimum -10 cm
Height	$= 0.60 + 0.10$ $= 0.70 \text{ m}$
Taking top width of bund 0.50 m and side slope 1.5:1	
Then base of Bund	$= 0.50 + (1.50 \text{ d}) \times 2$ $= 2.60 \text{ m}$
Cross-Section of bund	$= (0.50 + 2.60) \times 0.70 / 2$ $= 1.085 \text{ m}^2$
Length of bund	$= 100 \text{ s} / V.I.$ $= 100 \times 1 / 0.70$ $= 142.85 \text{ m/ha}$ Say 150 m/ha
Earth work/ha	$= 150 \times 1.085$ $= 162.75 \text{ cum}$
Cost Rs. / ha	$= 162.75 \times 39.16 = 6373.29$ Say 6375.00

DESIGN OF SUBMERGENCE BUND

Types of soil – -Loam,Sandy Loam

Rainfall intensity for 24 hrs – 25cm

Field slope 3%

$$V.I. = [s/3+2] \times 0.30$$

$$= 0.90 \text{ m}$$

Horizontal Interval = $(100 \times V.I.) / s$

$$= (100 \times 0.90) / 3$$

$$= 30 \text{ m}$$

Height of bund $h = \sqrt{(Re \times V.I.) / 50}$

$$= \sqrt{(25 \times 0.90) / 50} = \sqrt{0.45} = 0.67 \text{ m. Say } \mathbf{0.70m}$$

Free board 20% of height minimum 20cm

Total Height

$$= 0.90m$$

Taking top width of bund 0.70m and side slope 1.5:1

Bottom of bund

$$= 0.70 + 2 \times 1.5d$$

$$= 0.70 + 2.70$$

$$= 3.40$$

Cross Section of Submergence Bund

$$= (0.70 + 3.40) \times 0.90 / 2$$

$$= 1.845 \text{ m}^2$$

Length of bund

$$= 100 \text{ s} / V.I.$$

$$= (100 \times 3) / 0.90$$

$$= 333 \text{ m}$$

Feasible length

$$100 + 25 + 25$$

$$= 150 \text{ m}$$

Earth work/ha

$$= 150 \times 1.845$$

$$= 276.75$$

Cost per ha

$$= 276.75 \times 39.16$$

$$= 10,837.53$$

$$\mathbf{\text{Say } 10,850=00}$$

TYPICAL SECTION OF FIELD BUND

Top width	= 0.50 m
Side slope	= 1:1
Height of bound	= 0.50 m
Bottom Width	= 1.50 m
Cross section	= $(0.50+1.50) \times 0.50 / 2 = 0.50 \text{ m}^2$
Length per hectare	= 200 m
Earthwork	= $200 \times 0.50 = 100 \text{ cum}$
Cost 39.16/cum	= Rs. 3916.00
Cost per hectare	= Rs. 3916.00

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

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

TYPICAL SECTION OF EARTHEN CHECK DAM / GULLY PLUG

Top width	= 1.50 m
Side slope	= 2:1
Height	= 2.10m
Bottom Width	= 9.90 m
Cross section	= $(1.50 + 9.90) \times 2.10 / 2$ = 11.97 m ²
Cost per meter	= Rs. 551.45

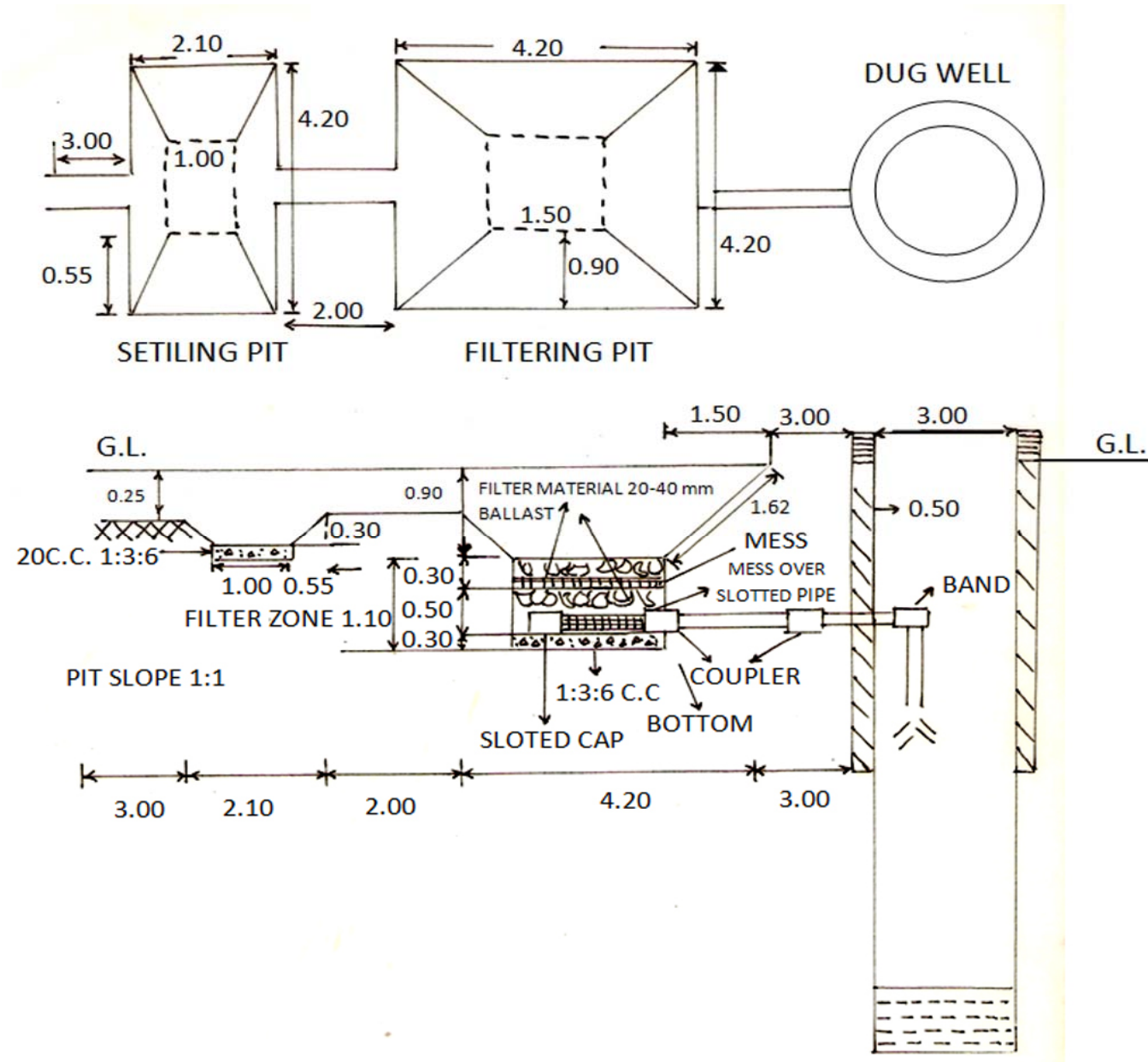
TYPICAL SECTION OF CHECK DAM / GULLY PLUG

Top width	= 2.00m
Side slope	= 2:1
Height	= 2.50 m
Bottom Width	= 12.00 m
Cross Section	= $(2.00 + 12.00) \times 2.50 / 2$ = 17.50 m ²
Cost /meter	= Rs. 839.12

TYPICAL SECTION OF W.H.B

Top width	= 2.50 m
Side slope	= 2:1
Height	= 2.75 m
Bottom Width	= 13.50 m
Cross section	$= (2.50 + 13.50) \times 2.75 / 2$ $= 22.00 \text{ m}^2$
Per meter cost	= Rs. 1085.92

DUG WELL RECHARGING STRUCTURE



ABSTRACT OF COST BRICK WORK JAGAT

S.No.	Name of Work	Quantity	Unit	Rate	Amount
1.	Earth Work	25.84	M ³	36.36	947.29
2.	C.C.W. Work in 1:3:6	1.49	M ³	2766.00	4121.34
3.	Laying Brick Supply & fixing	1.16	M ³	4000.00	4640.00
4.	Plaster work in 1:2	9.00	M ³	81.98	737.80
5.	S/F of 110 mm P.V.C. pipe	6.00	R.M	150.00	900.00
6.	Slotted Cap 110 mm P.V.C	1	No.	150.00	150.00
7.	P.V.C. bend 10 mm	1	No.	130.00	130.00
8.	P.V.C. Coupler 110 mm	2	No.	100.00	200.00
9.	Mesh ss S/F between	2	Job	100.00	200.00
10.	S/O fixing of sign board	1	Job	1850.00	1850.00
11.	Filter material 20-40 mm blast	1.8	M ³	855.00	1539.00
12.	Slotted P.V.C. pipe 110 mm	1	R.M.	250.00	250.00
Total					Rs. 15,665.43
Say					Rs.15,670.00 only

DETAILS OF MEASUREMENT (DUG WELLS RECHARGING)

S.No.	Name of Work	No.	L B D/H	Unit	Quantity
1.	Earth work in excavation hard soil mixed with <i>kanker</i> gravel, etc. in foundation.				
a	Settling pit (i) Long Wall	4	0.65 x 1.75 x 0.10/2	M ³	0.09
		2	1.50 x 0.62 x 0.75	M ³	1.39
	(ii) Short Wall	4	0.55 x 0.75/2 x 0.10	M ³	0.08
		2	1.00 x 0.55 x 0.75	M ³	0.82
b	Filtering pit	8	1.85 x 1.00 x 1.00 x /2 x 0.10	M ³	1.19
		2	1.50 x 1.62 x 0.90	M ³	4.37
c	Drain-Filter zone	1	1.50 x 1.50 x 1.10	M ³	2.47
		1	7.10 x 0.75 x 0.25	M ³	1.86
d	Excavation for laying of P.V.C. pipe & filling after laying of P.V.C. pipe				
		1	4.35 x 2.00 x 0.80	M ³	6.96
		1	1.35 x 0.90 x 2.00/2	M ³	1.21
		1	3.00 x 2.00 x 0.90	M ³	5.40
	Total				25.84
2	C.C. in 1:3:6 settling pit	1	1.00 x 1.50 x 0.20	M ³	0.30
	Filtering pit filter zone	1	1.50 x 1.50 x 0.30	M ³	0.67
	Drain –Filter Zone	1	7.00 x 0.75 x 0.10	M ³	0.52
				M ³	1.49
3	Cut- Brick work 1:4				
a	Settling pit Long wall	4	1.05 x 0.55 x 0.10/2		0.11
		2	1.50 x 0.62 x 0.05		0.09
	Settling pit Short wall	4	0.55 x 0.55 x 0.10/2		0.06
		2	1.00 x 0.62 x 0.05		0.06
b	Filtering pit	8	1.85 x 1.62 x 0.05/2		0.60
		2	1.50 x 1.62 x 0.05		0.24
				M ³	1.16

4	Plaster work 1:2				
	Drain-Bottom	1	7.00 x 0.25	M ²	1.75
	Drain-Side	2	7.00 x 0.25	M ²	3.50
	Selting base	1	1.50 x 1.00	M ²	1.50
	Filtering base	1	1.50 x 1.50	M ²	2.25
	Total			M ²	9.00
5	Supply & Fixing of 110 mm P.V.C. Pipe	1	6.00	M	6.00
6	Slotted cap of 110 mm P.V.C.	1		No.	1.00
7	P.V.C. Bend 110 mm	1		No.	1.00
8	P.V.C. coupler 110 mm	1x2		No.	2.00
9	Mesh ss S/F between	1x2		Job	2.00
10	S/O Brick sign board	1		Job	1.00
11	Filter Material of 20-40 mm blast	1	1.50 x 1.50 x 0.80	M ³	1.80
12	Slotted pipe P.V.C. 110 mm	1	1 x 1	M	1.00

DESIGN OF DROP SPILLWAY FOR 50.00 HA CATCHMENT AREA

Design of Drop Spillway to be constructed at a place in a gully having width of 5.0 m and catchment area 50.00 ha and net drop 2.0m Taking rainfall intensity for duration equal to time of concentration of watershed and design return period of 25 years, as 120mm/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 from Rational formula is given as:

$$Q = \frac{C.I.A.}{360} = \frac{0.3 \times 120 \times 50}{360} = 5.00 \text{ m}^3/\text{second}$$

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

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

To find suitable value of land L and H

Let us assume $L = 4.0 \text{ m}$ (since width of gulley is 5.0 m)

$$\begin{aligned} 5 &= \frac{1.711 \times 4.0 \times h^{3/2}}{(1.10 + 0.01 \times 2)} \\ h^{3/2} &= \frac{5.0 \times 1.12}{6.844} = \frac{5.60}{6.844} = 0.818 \\ h &= (0.818)^{2/3} \\ &= 0.874 \text{ m says } 0.90 \text{ m.} \end{aligned}$$

Test: $L/h = 4/0.9 = 4.44 \geq 2.0$ hence, O.K.

$h/f = 0.9/2.0 = 0.45 \leq 0.5$ hence, O.K

Hence the designed hydraulic dimensions of the Spillway are:

$$\text{Crest Length (L)} = 4.0 \text{ m}$$

$$\text{Weir depth (h)} = 0.90 \text{ m}$$

3. Structural design –

- 1- Minimum headwall extension , $E = (3h + 0.6)$ or $1.5 f$ which ever is greater

$$E = 3 \times 0.9 + 0.6 = 3.3 \text{ or } 1.5 \times 2 = 3.00 \text{ m}$$

$$E = 3.30 \text{ m}$$

- 2- Length of apron basin $L_B = f (2.28 h/f + 0.54) = 2(2.20 \times 0.9/2.0 + 0.54)$

$$= 2 (0.99 + 0.54) = 2 \times 1.53 = 3.06 \text{ m Says } 3.10$$

- 3- Height of end sill, $S = \frac{h}{3} = 0.9/3 = 0.3 \text{ m}$

3

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

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

$$= 2 \times 0.9 \text{ or } [2 + 0.9 + 0.30 - (3.06 + 0.10)/2]$$

$$= 1.8 \text{ or } [3.20 - 1.58]$$

$$= 1.8 \text{ or } 1.62 \text{ hence adopt } J = 1.8 \text{ m}$$

- 5- $M = 2 (f + 1.33 h - J) = 2 (2 + 1.33 \times 0.9 - 1.8)$

$$= 2 \times 1.397 = 2.794 \text{ Says } 2.80 \text{ m}$$

- 6- $K = (L_B + 0.1) - M = (3.06 + 0.1) - 2.80$

$$= 0.36 \text{ m}$$

Toe and cut off walls

$$\begin{aligned}\text{Normal scour depth (N S D)} &= 0.473 \times (Q/f)^{1/3} \\ &= 0.473 \times (5/1)^{1/3} \\ &= 0.473 \times 1.7099 \\ &= 0.808\end{aligned}$$

$$\begin{aligned}\text{Maximum Scour depth (M S D)} &= 1.5 \times \text{N S D} \\ &= 1.5 \times 0.808 \\ &= 1.212 \text{ says } 1.21 \text{ m}\end{aligned}$$

$$\text{Depth of cutoff /Toe wall} = 1.21 \text{ m}$$

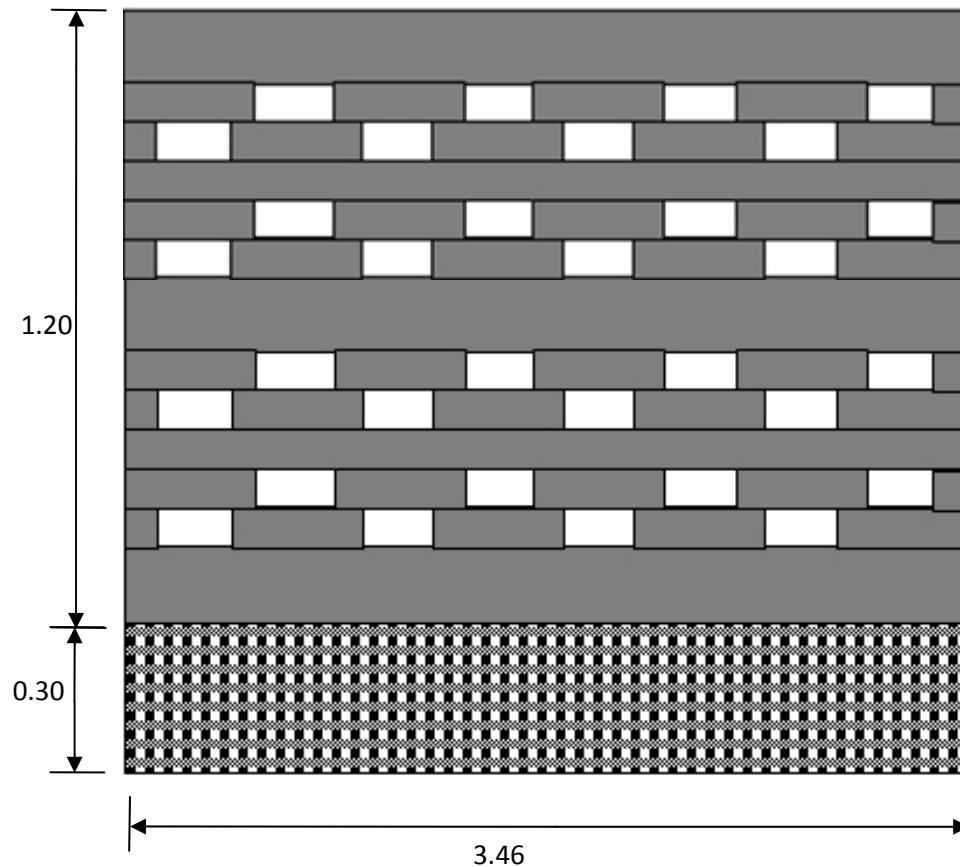
Apron Thickness : For an over fall of 2.0 m in concrete construction is 0.3 m, since the structure is constructed in masonry , the Apron thickness will be $1.5 \times 0.30 = 0.45 \text{ m}$

Wall Thickness : The thickness of different wall of the structure (masonry construction) is given below:

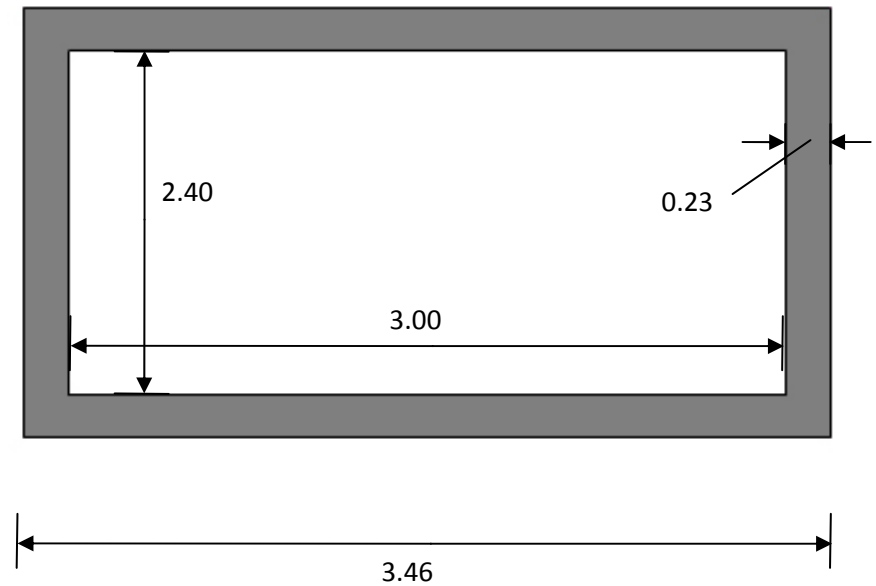
Description	Thickness of wall	
	Top width	Bottom width
Head wall	0.45	1.33
Side wall	0.30	1.10
Wing wall and head wall extension	0.30	0.80

DRAWING AND DETAIL ESTIMATE OF LIVELIHOOD PROGRAMME IN WATERSHED WORK PHASE

DRAWING OF NADEF COMPOST STRUCTURE



ELEVATION



PLAN

DESCRIPTION.

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)

PREPARATION OF COMPOST BY NADEF METHOD

Nadef is the name of inventor of this 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 dung, and crop residue, leaf of trees, straw and other organic materials. The method of filling up the pit is below.

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 it and on this layer the liquid made of cow dung is spread to wet the crop residue, straw etc. this method is repeated until the pit is net completely filled up. On the top layer of this material a bulk is made and then the 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 becomes compost khad.

ESTIMATE OF COMPOST BY NADEF METHOD

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	0.419
	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
	Long Wall Glazed	2	3.46	0.23	0.60	0.954
	Short Wall Glazed	2	2.40	0.23	0.60	0.662

	Total					1.616 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 m²

ABSTRACT OF WORK

S.No.	Particulars	Quantity
1.	Earth Work	1.06 cum
2.	Brick Work 1:4 $2.425 + 1.616 / 2$	3.233 cum
3.	Plastering 1:4	9.727 m ²

CONSUMPTION OF MATERIALS

S.No.	Particulars	Quantity	Cement (Bags)	Coarse Sand (cum)	Bricks (nos.)
1.	Brick work 1:4	3.233 cum	5.82	0.873	1487
2.	Plastering 1:4	9.727 m ²	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	285.00/ Bag	1995.00
2.	Coarse Sand	1.02 cum	2500.00/ cum	2550.00
3.	1 st class Brick Work 1:4	1500 nos.	4500.00/ Thousand	6750.00
	Total			Rs. 10795.00

LABOUR CHARGES

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

Total Expenditure	
1. Cost of Materials	10795.00
2. Labour Charges	1616.14
Total	Rs. 12411.14
Say Rs. 12411.00 only	

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 Units for S.H.G.'s formed in I.W.M.P. IInd Project

District Hardoi is situated in Eastern U.P. region where the number of sheep is very less and they are small in nature. Goat population is appreciable and in 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, there 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 farmers to goat farming with the formation of more S.H.G.'s and in turn availability of goats for processing units.

Goat excreta shall be of immense help in enrichment of soil fertility.

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

In Eastern U.P. 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. Keeping in view the above facts, goat units shall be formed in the area in intensive way.

16 Goat Units are proposed in I.W.M.P. IInd 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 units, 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 goats of improved breed (not less than 6 months of age) @ Rs. 3000.00 each	30000.00
2.	Cost of 1 buck of improved breed @ Rs. 5000.00	5000.00
3.	Cost of insurance @ 11.63 / unit	4070.00
4.	Feed cost for 3 months @ 250 gm/ day for goats @ Rs. 11.84/ 250 gm	2930.40
5.	Provision of deworming, mineral and vitamin supplement, treatment, vaccination @ Rs.160/ animal	1760.00
6.	The expense including monitoring expenses, register and records @ Rs. 170.00/ unit	170.00
	Total	Rs. 43,930.40
		Say Rs. 43,950.00

Estimate of Livestock Development Activities

Total number of female animals:	Buffalo	-	3665
	Cow	-	5006
	Total	-	86,71

1. Artificial Insemination (A.I.): 33% of total animals per year, i.e., 2894

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

Total Amount - **Rs. 2,89,400.00**

2. Vaccination: Total number of animals in I.W.M.P. IInd - 10372 nos.

	1. H.S. + B.Q.	@ 5.50	57046.00
	2. F.M.D.	@10.50	217812.00
	(Twice in a year)		
	Total Amount		- Rs. 274858.00
3. Deworming:	Adult animals - 9335		
	Child animals - 1037		
	Albendazole for 9335 animals	@ 40.56	3,78,627.60
	1037 child animals	@20.28	21,036.36
	Total Amount		- Rs. 3,99,663.96
4. Mineral Mixture:	Agrimine Forte Chelated for 7015 animals	@ 115.00	Rs. 8,06,725.00
	GRAND TOTAL	-	Rs. 17,70,646.96
	Say	-	Rs. 17,70,600.00

DRAWING OF DETAIL ESTIMATE OF PRODUCTION SYSTEM AND MICRO- ENTERPRISES IN WATERSHED WORK PHASE

DEMONSTRATION OF WHEAT

- 1- Variety recommended for District-Hardoi
 Irrigated-RR-21
 Unirrigated –HD2285, K68
- 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	Remark
1	Tillage operation or preparation of field for sowing	1.0ha	1000.00/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	100.00kg	18.00/kg	1800.00	
3	Sowing by seed drill	1.0ha	1000.00/ha	1000.00	
4	D.A.P. 18:46	160kg	573.00/ 50 kg	1833.60	
5	Urea	210kg	270.00/ 50 kg	1134.00	
6	Potash(M.O.P.)	150kg	300.00/50kg	900.00	
7	Irrigation(three irrigation)	1.00ha	650.00/ha	650.00	
8	Harvesting	1.00ha	2000.00/ha	2000.00	
Total				5667.60	
Say				5700.00	

Hence demonstration cost of wheat /ha is Rs. 5700.00

DEMONSTRATION OF GRAM IN WATERSHED AREA (per ha)

- 1- Variety - Kabuli, Local (Desi)
- 2- Seed rate/ha -50-55kg
- 3- Fertilizer requirement/ha N-25.0 kg, P-80 kg, K-30 kg

ESTIMATE FOR DEMONSTRATION OF GRAM(PER ha)

S.No.	Particulars	Quantity	Rate	Amount	Remark
1	Tillage operation in preparation of field and seed sowing	1.0ha (twice)	1000.00/ha	2000.00	Since the project is to be operated in participatory Mode, contribution by the farmer in the form of tillage, sowing operation, sowing and harvesting is not included in the estimates.
2	Cost of seed	55kg	90/kg	4950.00	
3	D.A.P	175kg	573.00/ 50 kg	2005.50	
4	M.O.P.	65kg	300.00/50kg	390.00	
5	Medicine	1.00ha	Lump sum	1250.00	
6	Harvesting	1.00ha	700.00/ha	700	
Total				8595.50	
Say				Rs. 8600.00	

Hence per hectare of demonstration –Rs. 8600.00

DEMONSTRATION OF ARHAR IN WATERSHED AREA(PER ha)

- 1- Variety - Malviya-13, narendra-1, Amar
- 2- Seed rate/ha -30 kg
- 3- Requirement of fertilizers/ha N-20.0 kg, P-50 kg, K-40 kg

ESTIMATE FOR DEMONSTRATION OF ARHAR (PER ha)

S.No.	Particulars	Quantity	Rate	Amount	Remark
1	Tillage operation in preparation of field and seed sowing	1.0ha	1000.00/ha	2000.00	Since the project is to be operated in participatory Mode, contribution by the farmer in the form of tillage, operation, sowing and harvesting provided by participating farmers, hence this cost is not included in the estimates.
2	Cost of seed	30.0kg	120.00/kg	3600.00	
3	Nitrogen N.P.K 16:32:16	190.0kg	470.00/50kg	1786.00	
4	Urea	-	-	-	
5	M.O.P.	-	-	-	
6	Harvesting	1.00 ha	650.00	650.00	
7	Medicine	1.00 ha	Lump sum	1000.00	
Total				6386.00	
Say				Rs. 6400.00	

Hence per hectare of demonstration –Rs. 6400.00

DEMONSTRATION OF HYBRID BAJRA IN WATERSHES (per ha)

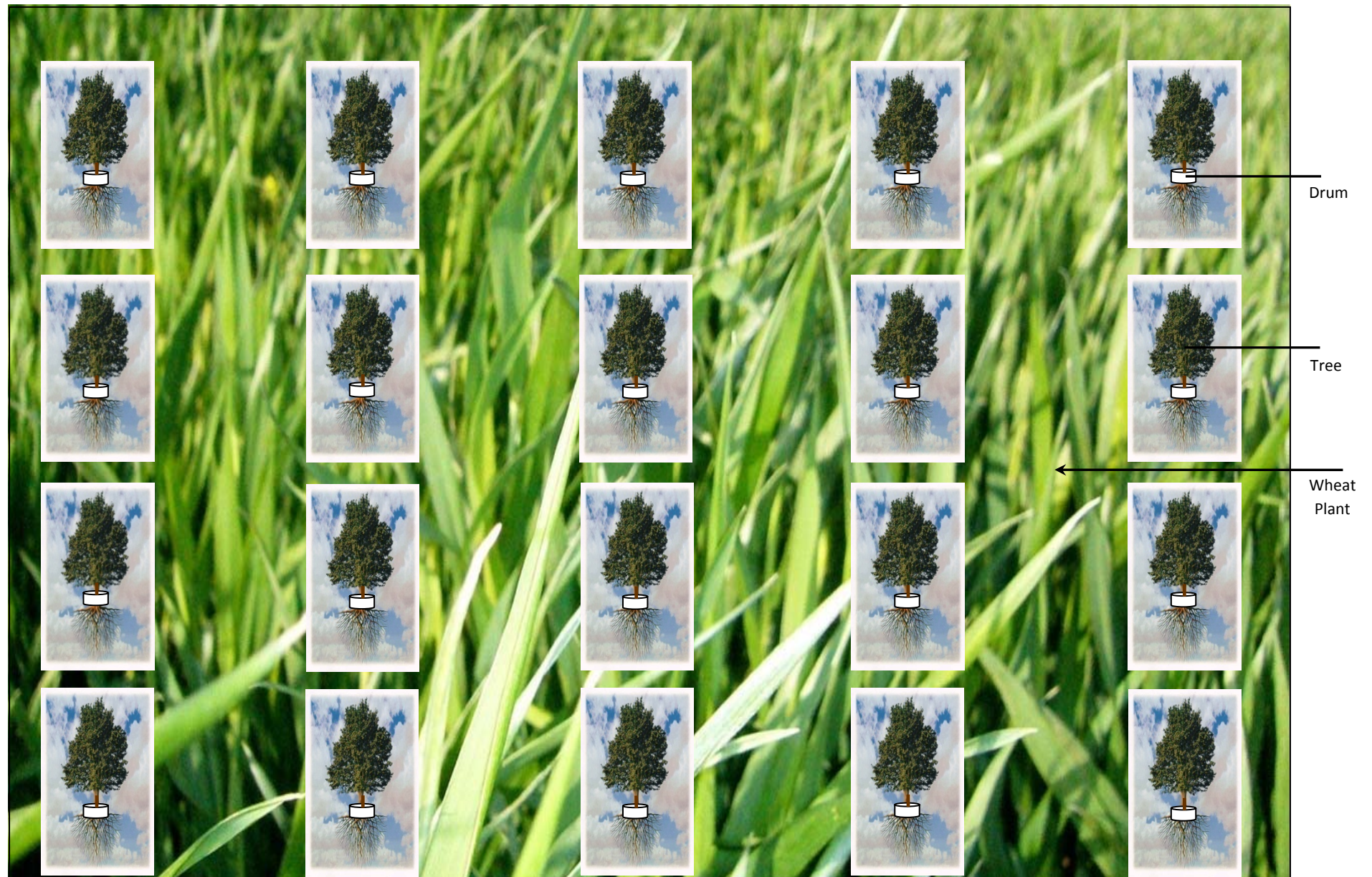
- 1- Requirement of Seed / ha -10kg
- 2- Requirement of fertilizers/ ha N- 60.00 kg, P- 40.00 kg, K-40.00 kg
- 3-

ESTIMATE FOR DEMONSTRATION OF BAJRA (per ha) RAINFED

S.No.	Particulars	Quantity	Rate	Amount	Remark
1	Tillage operation in preparation of field and for sowing	1.0ha	1000.00/ha	2000.00	Since the project is to be operated in participatory Mode, contribution of tillage operation, and harvesting cost
2	Cost of seed	10.0kg	130.00/kg	1300.00	
3	Nitrogen N.P.K 16:32:16	125.0kg	470.00/50kg	1175.00	
4	Urea	90kg	270.00/50 kg	486.00	
5	M.O.P.	40kg	300.00/50kg	240.00	
6	Harvesting	1.00Ha	650.00/ha	600.00	
Total				3201.00	
Say				Rs. 3200.00	

Hence per hectare of demonstration of Bajra is Rs. 3200.00/ha

DEMONSTRATION OF AGRO-FORESTRY / HORTICULTURE



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

District Hardoi is situated in Eastern U.P., where there is water problem and in summer temperature rises up to 48°C 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 Anna Pratha and 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 be able to take nutrients from upper layer of fields and there will be 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 go 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 by Anna Pratha.

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

For 1.00 Hectare

S.No.	Description of Work	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
	Total					926.22 cum
2.	Farm yard manure	156x10				1560 kg
3.	Filling of earth work with farm yard manure	156	3.14 x 1.00	-	1.20	587.80 cum
4.	C.C.W. 1:2:4 for fencing poll	133	0.20	0.20	0.20	1.064 cum
5.	Angle iron for poll	133	1.80	-	-	239.40 m
6.	Barbed wire	3	400	-	-	1200.00 m
7.	Plants	156	-	-	-	156 nos.
8.	Plastic drums (200 litre)	156	-	-	-	156 nos.

CONSUMPTION OF MATERIALS

S.No.	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	0.446	0.883	-	-	-
2.	Angle iron	239.4 m	-	-	-	-	239.40	-	-
3.	Barbed wire	1200.0 m	-	-	-	-	-	1200.0	-
4.	Farmyard manure	1560.0 kg	1560 kg	-	-	-	-	-	-
5.	Plastic drum	156 nos.	-	-	-	-	-	-	156
Total			1560.0 kg	6.49	0.446	0.883	239.40	1200.0	156
Say			1560.0 kg	6.50 bags	0.450 cum	0.900 cum	239.40	1200.0 m	156

COST OF MATERIALS

S.No.	Particulars	Quantity	Rate	Amount
1.	Farm yard manure	1560.0 kg	10.00/kg	15600.00
2.	Barbed wire	1200.0 m/120.0 kg	60.50/kg	7260.00
3.	Angle iron	239.40 m/785 kg	40.50/kg	31792.50
4.	Plastic drum	156 nos	690.00 each	107640.00
5.	Cement	6.50 bags	285.00/bag	1852.50
6.	Coarse sand	0.450 cum	2500.00/cum	1125.00
7.	G.S.Grit 10-20 mm	0.900 cum	1250.00/cum	1125.00
8.	Plants	156 nos	18.00 each	2808.00
Total				Rs. 1,69,203.50

LABOUR CHARGES

S.No.	Particulars	Quantity	Rate	Amount
1.	Earth work	1514.02 cum	36.66/cum	55503.97
2.	C.C.W. 1:2:4	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
Total				Rs. 58,527.85

Total Expenditure	
1. Cost of materials	1,69,203.50
2. Labour Charges	58,527.85
Total	Rs. 2,27,730.35
Say	Rs. 2,27,730.00 only

HORTICULTURE DEVELOPMENT FOR WATERSHED MANAGEMENT

Horticulture is an important component of land use management. Now India is the second largest producer of fruits in the world after Brazil.

However, 53% of the total geographical area of the country is degraded due to various reasons. Fruit trees and fruit based systems are the viable alternatives for economic utilization of such lands. The basic philosophy behind the conservation horticulture is the use of available resources and skillful choice of fruits. The use of available soil moisture, collection of the runoff water from the catchment area to make up the deficit requirements as well as in situ water harvesting techniques are some of the measures. The in situ water harvesting techniques should be used for growing trees in such a way that each tree has its own micro catchment area. The success of the conservation of horticulture entirely depends on the selection of economically viable hardy varieties of fruit crops resistant to moisture stress or drought and other adverse climate conditions. The fruit crops selected for degraded lands must be such that their maximum growth take place during the period of maximum water availability in the soil and should have low demand.

The main constraints which restrict development of the horticulture land use in degraded lands are enumerated below:

(A) Basic constraints

- 1- Lack of suitable agro-techniques for degraded lands
- 2- Lack of trained resource persons

3- Inadequate dissemination of the technologies

4- Lack of community approach

5- High biotic interference

6- 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 branches, 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 evapotranspiration, 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.

Horticulture Practices (For plantation)

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 ie. 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, Bel, Amla, Lemon, and Phalsa etc. are the plants which fulfill this requirement and all these fruit plants are most suitable for this 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 / aldrin) 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 mauritiana, 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 are other examples of raising the improved cultivation the wild root stock.

4-In Site Water Harvesting:

Since on slopy 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 be 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.

In Vedas, Upanishad and Puran, the importance of trees is said. There are 27 Nakshatras in a year and there is one of each Nakshatra. The people should plant the tree of their Nakshatra, And they should be never destroyed.

The name of Nakshatra and their tree are as follows:

S.No.	Name of Nakshatras	Name of Tree
1.	Bharini	Aamla
2.	Kritika	Goolar
3.	Rohini	Jaamun
4.	Mrigshira	Khair
5.	Aadra	Agar
6.	Punarvasu	Baans
7.	Pushya	Peepal
8.	Ashalekha	Chameli
9.	Magha	Bar (Banyan)
10.	Purvafalguni	Dhak
11.	Chitra	Bel
12.	Swati	Arjun
13.	Vishakha	Babool (Acacia)
14.	Mool	Raal Vriksha (Bitumen)
15.	Purvaabhadrapad	Aam (mango)
16.	Uttaraabhadrapad	Nimbu (Lemon)
17.	Revati	Mahua

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

S.No.	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	80.00
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

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

S.No.	Particulars	Quantity	Rate	Amount	Remarks
A. Horticulture					
1.	Soil working 1m x 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 cost		L.S.	450.00	
3.	Cost of NPK mixture, neemicide @ 250 gm/plant		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 weedings 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 nd year onwards – 15 % of 1 st year cost			900.00	
	For next 5 years i.e., Rs. 900 x 5			4500.00	
	Total Cost			Rs. 10,500.00	
	Say			Rs. 10,500.00	
B. Agro-Horticulture (cost per ha)					
1.	Cost of raising 270 plants up to 5 years @ 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.	Fencing			45300.00	
	Total			Rs. 60,800.00	

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

S.No.	Particulars	Quantity	Rate	Amount	Remarks
A. Horticulture					
1.	Soil working 1m x 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 cost		L.S.	450.00	
3.	Cost of NPK mixture, neemicide @ 250 gm/plant		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 weedings 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 nd year onwards – 15 % of 1 st year cost			900.00	
	For next 5 years i.e., Rs. 900 x 5			4500.00	
	Total Cost			Rs. 10,500.00	
	Say			Rs. 10,500.00	
B. Agro-Horticulture (cost per ha)					
1.	Cost of raising 270 plants up to 5 years @ 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	
	Total			Rs. 15,500.00	

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 *Crotalaria 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 I.W.M.P. Ist Project, efforts will be made to oblige the farmers for Green Manuring.

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

ESTIMATE FOR GREEN MANURING IN THE WATERSHED (PER ha)

S.No.	Particulurs	Rate	Cost	Remark
1	Seed of Sesbania (Dhaincha)25Kg/ha	25.00/Kg	625	Since the project is to be operated in a participatory mode, contribution in the form of tillage will be done by farmers is 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	
Total			Rs. 625.00	

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

PASTURE MANAGEMENT

Introduction: The sound animal industry in any country centers around good quality feed and fodders. The livestock population in India is nearly 15% of the total livestock population of the world, though we have only 2% of the world's geographical area. The project on green and dry fodder requirement in India has been estimated at 1061 and 590 million L.B. Ghaghra, Sarju Branch, Soti Jori by 2010 A-D, while the present feed and fodder resources in the country can meet only 4% of the requirement. The grazing intensity is very high i.e., 26 adult cattle unit (ACU)/ha as against 0.8 ACU in the developing countries.

The importance of grasses for protection and production, the two aspects of soil and water conservation is well known. Grass is unique in that it is the only resource utilized in situ by grazing. A "grassland" or more appropriately, a "range" is defined as "the areas which are predominantly covered with grasses or grass like plants and are primarily utilized as forage for grazing animals or used as hay." The grasslands are the major sources of food to the animals.

Pasture Management: All grazing areas are referred to as pastures, but more specifically the term is applied to cultivated grassland used for grazing. Thus pastures are artificial grasslands with or without non-grass vegetation (such as legumes) that are created with selected high forage-yielding grass and legume species and with inputs like fertilizers and irrigation and carefully managed to exclude all other vegetation. Pastures are usually fenced and used either for grazing, for hay and silage making or for both.

Intensive Fodder Production: In areas where the major enterprise of the farmers centers around the milk production. Continuous supply of green fodder round the year is the basis for success of such an industry. Under the aegis of ICAR's all India coordinated Research Project on Forage Crops, several highly productive fodder cropping systems have been tested and recommendations made for their general use. For central region important intensive crop rotations are presented as given below

Zone wise crop rotations	Green fodder	yield(t / ha)
Central region		
1- Hybrid napier +Cowpea-Berseem+Japanrape		286.3
2- Maize+Cowpea-Jowar-Berseem+Japanrape		197.2
3- Jawar+Cowpea-Berseem+Japanrape-Jawar+Cowpea		168.6

Conservation on of Forages: In order to sustain animal production, it is essential that the optimum feeding should be maintained round the year. In India, we have two seasons, rainy season and winter season, when surplus quantities of green fodder is available-country to this there are 2 to 3 months of lean periods(October-November and April to July) when the fodder availability to animals is at its low. In the summer months, it is difficult even to meet the maintenance requirements of the animals. Stage of maturity to feed the animals adequately during the lean period. The conservation of forages could be done in the form of silage from cultivated fodders (legumes and cereals) and also pasture grasses. Forages could also be conserved in the form of hay when dried to its nutrients. This feed stuff is quantitatively important from both maintenance and nutritional point of view.

Agro-forestry system for fodder production: A number of fodder trees play an important role in human food security through their function as animal food sources, especially as drought services. Agro-forestry systems consisting of such tress and animals and/or pasture are called Silvo-Pastoral system.

Silvi-Pasture (or Silvo-Pastoral system) is the most promising alternate land use system which integrates multipurpose trees, shrubs, legumes and grasses mostly on non-arable, degraded and marginal lands for optimizing land productivity. It helps in conservation of vegetation, soil and nutrients and provides forage, timber and fuel wood on a sustainable basis.

Potentials of Semi-arid region for different forage production systems.

Region	Forge Production Systems
Semi arid	Integration of Agro-Silvi-Pasture, dry land agriculture on cultivated lands. Forage-cum-Copping forming on the marginal and sub marginal lands with intercropping dry lands cereals and legumes

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 slopes.
- 6- Fertility builder for eroded soil.

CHAPTER – 6

CAPACITY BUILDING

CAPACITY BUILDING

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 PROJECT AREA

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

List of approved Training Institute for Capacity Building Institution

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	District training centre Hardoi	Bawan Road Hardoi	Principal	Training centre	Self Help Group and Social Mobilization	-
2	Din Dayal Upadhyay training centre, Bakshi Ka Talab, Lucknow	Bakshi Ka Talab, Lucknow	Director General	Training centre	Watershed Development, SHG	-
4	C.S.W.C. Research and Training Institute Chaleser, Agra	Chaleser, Agra	Director	Research and Training Institute	Watershed Development, SHG	-

Institutional Arrangement & Capacity Building in the Projects

No.	Project Stake holders	No. of Stake holders	Total no. of persons	No. of persons trained so far	No. of Persons to be trained	Sources of funding for training, BSA Unit or DOLR or others		Name & Address of Training institute
						DOLR	BSA unit or others	
1	Distinct Data centre	1	3	-	3	DOLR	BSA unit	UPLDWR Training Centre, Belikala LKO.
2	PIA	1	16	2	14	DOLR	BSA unit	Gram Vikas Training Centre, BKT, LKO.
3	WDTs	1	10	-	10	DOLR	BSA unit	As above
4	W.Cs	11	110	-	110	DOLR	BSA unit	District level
5	GPs	7	70	-	70	DOLR	BSA unit	District level
6	SHG	23	230	-	230	DOLR	BSA unit	District level
7	UG	56	560	-	560	DOLR	BSA unit	District level
8	Community	-	72	-	72	DOLR	BSA unit	District level
9	Any others	-	-	-	-	DOLR	BSA unit	District level

CHAPTER -7

PHASING OF PROGRAMME & BUDGETING

IWMP-I (2009-10) DISTRICT- HARDOI

YEAR WISE PHASING (PHYSICAL & FINANCIAL) OF I.W.M.P. WORKS

Area-Ha & Rs. In Lakh

S. No.	Item	1 st Year (2009-10)		IInd Year (2010-11)		IIIrd Year (2011-12)		IVth Year (2012-13)		Vth Year (2013-14)		Total	
		Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.
1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	Administrative 10%	13.84	To meet out the administrative works/charges	13.84	As per column 4	20.75	As per column 4	10.00	As per column 4	10.77	As per column 4	69.19	-
2	Monitoring 1 %	0.69	Monitoring of the project	1.38	As per column 4	1.73	As per column 4	2.00	As per column 4	1.12	As per column 4	6.92	-
3	Evaluation 1 %	0.69	Evaluation of the project	1.38	As per column 4	1.73	As per column 4	1.00	As per column 4	2.12	As per column 4	6.92	-
4	Entry Point Activity 4%	13.00	Hand pump, Bathroom, Soak pit, Kisan manch, repair well etc.	14.68	-	-	-	-	-	-	-	27.68	-
5	Institutional and Capacity building 5%	6.92	Training and exposure visit	6.38	As per column 4	6.92	As per column 4	6.37	As per column 4	8.00	As per column 4	34.59	-
6	D.P.R Preparation 1%	3.00	Preparation of DPR	3.92	-	-	-	-	-	-	-	6.92	-

7	Watershed Dev. Works 50%	-	Treatment of Soil and Construction of water recharging structures, Agro forestry, horticulture etc	-	-	103.80	2075	94.44	1574	147.71	2117	345.96	5751
	Livelihood & Income Generating 10%	38.74	Diary, Goat keeping, Nadaf Compost, Gen. Merchant, etc.	15.57	As per column 4	14.87	As per column 4	0.02	As per column 4	-	As per column 4	69.20	
8	Production System development 13%	22.90	Farming system approach, Crop production, horticulture, vegetables growing, Crop etc.	13.86	As per column 4	17.64	As per column 4	15.55	As per column 4	20.00	As per column 4	89.95	
9	Consolidation Phase 5%	-	Consolidation activities	13.83	-	13.86	-	3.00	-	3.90	As per column 4	34.59	
	Total	99.78		84.84	-	181.30	-	132.38	-	193.62	-	690.12	5751

IWMP-I (2009-10) DISTRICT- HARDOI

YEAR WISE PHASING OF I.W.M.P. WORKS

QUANTIFICATION OF PROJECT FUND

Installment	Year	Administrative	Monitoring	Evaluation	EPA	Institutional & Capacity building	D.P.R	Watershed Dev. Works	Livelihood	Micro-Interprises	Consolidation
I st Phase 20%	2009-10				4	1	1				
	2010-11	2	0.2	0.3		2		7.5	1	1	
I nd Phase 50%	2011-12	2.7	0.2	0.175		0.75		13.5	4	4	
	2012-13	2.7	0.2	0.175		0.5		12.85	3	5	
III rd Phase 30%	2013-14	2.6	0.4	0.35		5		16.15	2	3	5
Total 100%		10	1	1	4		1	50	10	13	5

CHAPTER -8

CONSOLIDATION / EXIT STRATEGY

I.W.M.P. Hardoi

Ratio of Cost and Profit

Status Before Work:

S. No.	Name of Cereal	Area in hectare	Production /Total hect.	Cost/hect.	Rate/hect.	Net profit/hect.	Total profit/hect.
1.	Millet	1000	6.00	2500.00	1000.00	3500.00	3500000.00
2.	Tur	50	6.00	2500.00	4000.00	21500.00	1075000.00
3.	Paddy	1000	15.00	4000.00	800.00	8000.00	8000000.00
4.	Maize	500	8.00	2500.00	1000.00	5500.00	2750000.00
5.	Wheat	1000	20.00	4000.00	1200.00	20000.00	20000000.00
6.	Gram	50	15.00	3000.00	2500.00	34500.00	1725000.00
7.	Mustard	50	10.00	3000.00	3000.00	27000.00	1350000.00
	Total	3650.00					38400000.00

Status After Work:

S. No.	Name of cereal	Area in hectare	Production /Total hect.	Cost/hect	Rate/hect	Net profit/hect	Total profit/hect
1.	Millet	1500	8.00	2500.00	1000.00	5500.00	8250000.00
2.	Tur	100	7.00	2500.00	4000.00	25500.00	2550000.00
3.	Paddy	1000	18.00	4000.00	800.00	10400.00	10400000.00
4.	Maize	1000	8.00	2500.00	1000.00	5500.00	5500000.00
5.	Wheat	1050	22.00	4000.00	1200.00	22400.00	23520000.00
6.	Gram	100	18.00	3000.00	2500.00	42000.00	4200000.00
7.	Mustard	100	12.00	3000.00	3000.00	33000.00	3300000.00
8.							
	Total	4850.00					57720000.00

Bhoomi sanrakshan after the treatment of Land	—	57720000.00
Bhoomi sanrakshan before the treatment of Land	-	38400000.00
Net Profit	-	19320000.00
Investment on the Project 12.5%	-	8750000.00
Depreciation 4%	-	<u>2800000.00</u>
Total	-	11550000.00
Ratio of cost profit ratio	-	$\frac{19320000}{11550000} = 1:1.67$

The above ratio clearly indicated that the conservation of land is extremely profitable.

CHAPTER -9

EXPECTED OUTCOME

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 stakeholder of the project. The system shows the entire state of Uttar Pradesh 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 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 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.

PLANS AND PROJECT MANAGEMENT

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

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.

USER CHARGES

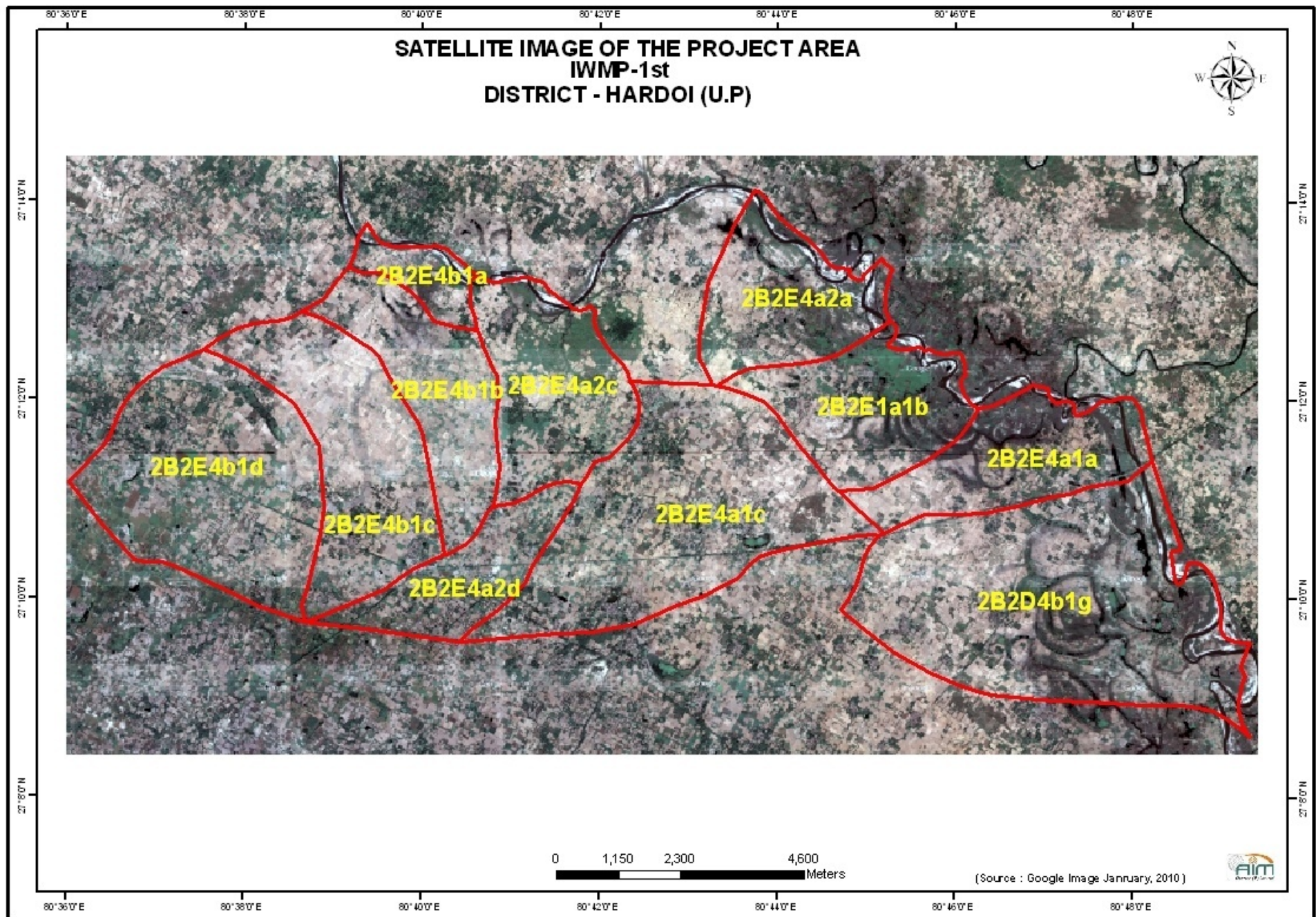
Various user groups will be formed in village. These user groups will collect user according to the designated rules formed during the formation of user group. These funds will be transferred to the WDF funds as per these formulated rules. The secretary of watershed committee (WC) shall maintain the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

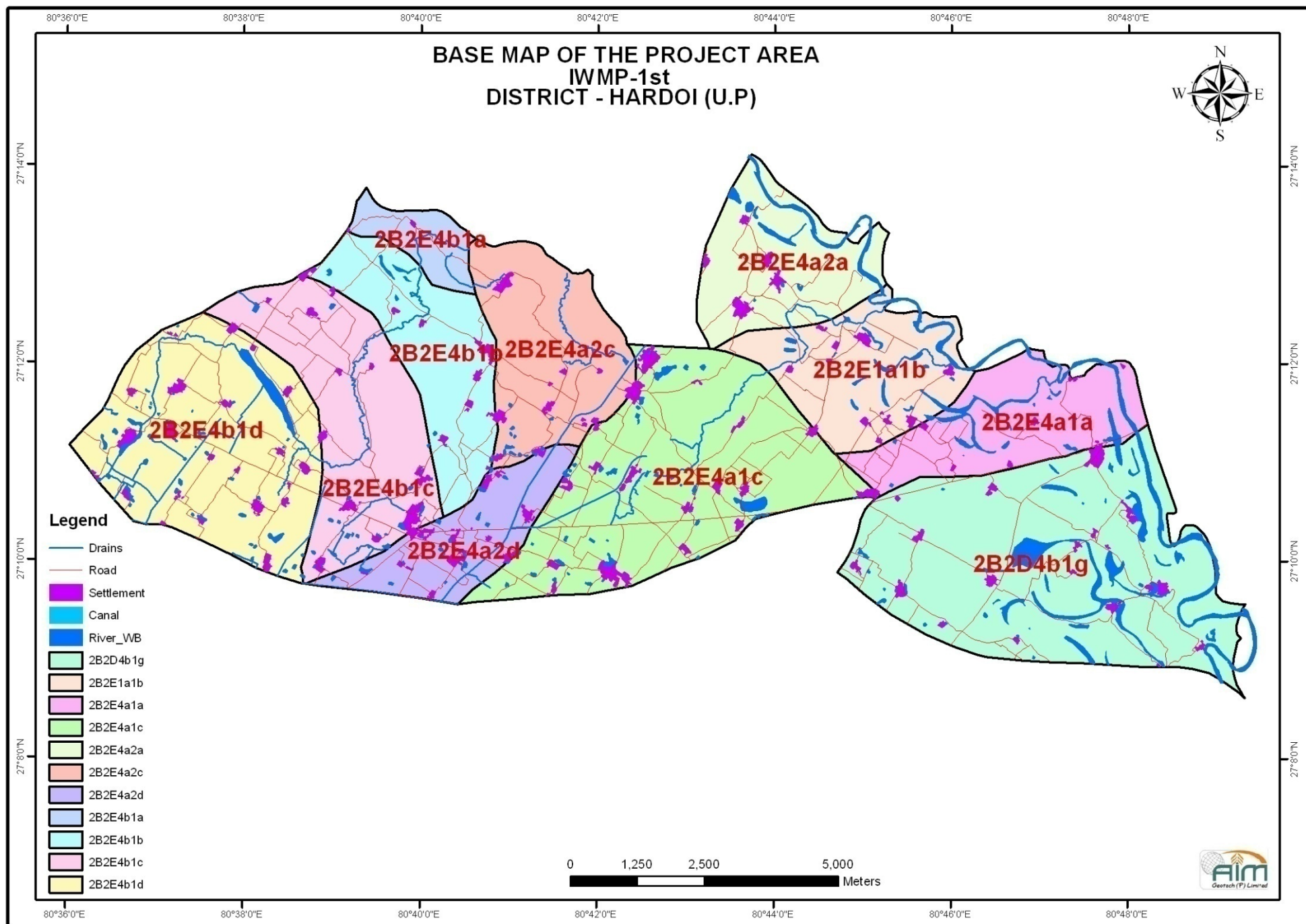
Expected/Estimated Outcomes of Hardoi Ist

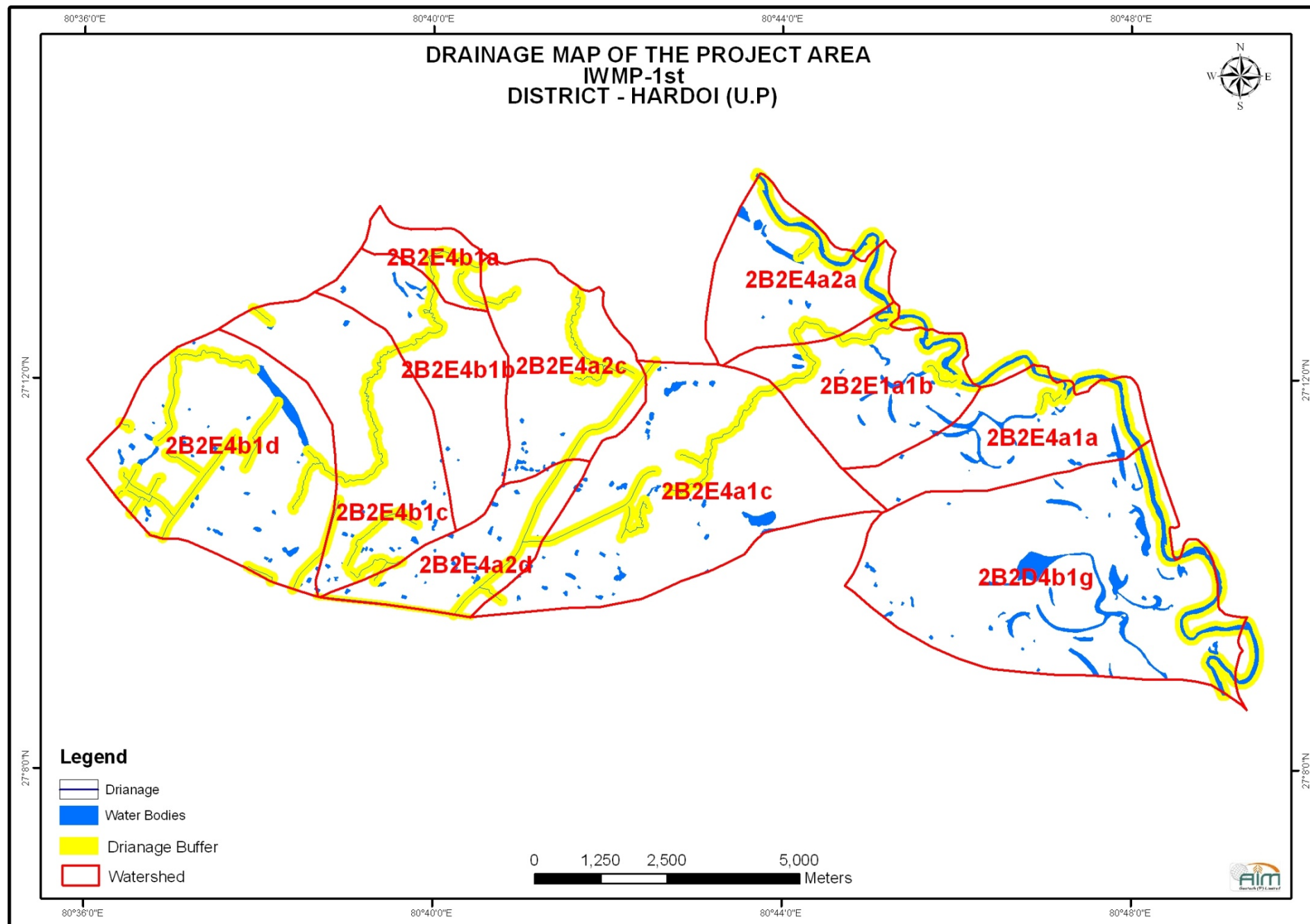
1	2	3	4	5
S.No	Item	Unit	Pre-project Status	Post-project Status
1	Status of water table	mtrs	7-8	6-7
2	Ground water structures repaired/rejuvenated	No	-	45
3	Quality of drinking water	Quality	Poor	Good
4	Availability of drinking water	Days	285	365
5	Increase in irrigated area	%	-	-
Change in cropping/land use pattern				
1	Area under agriculture crop		Single Crop	Double Crop
2	i. Area under single crop	Ha	4851	3785
3	ii. Area under double crop	Ha	1830	2970
4	iii. Area under multiple	Ha	110	250

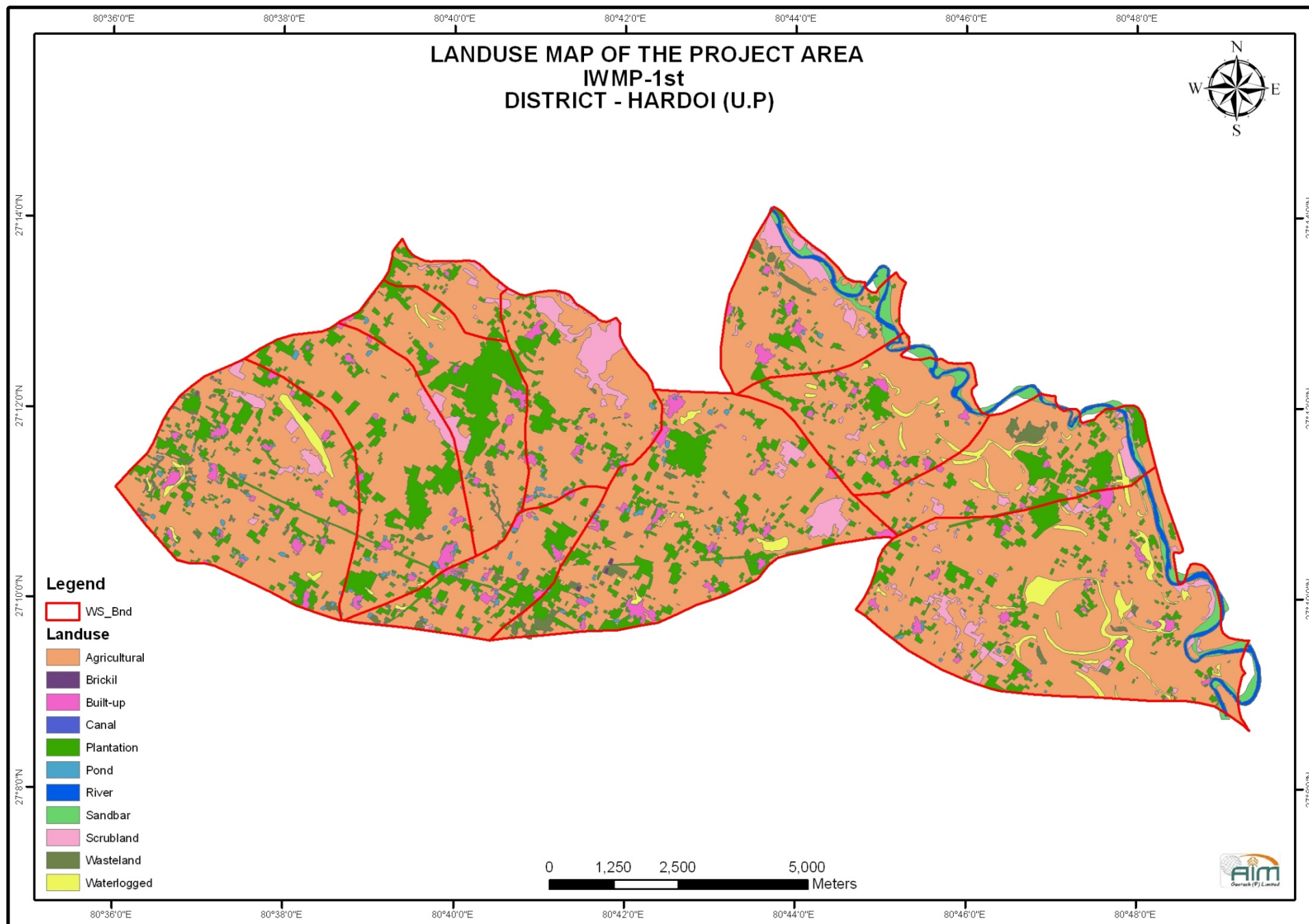
	crop			
5	iv. Cropping Intensity	%	3%	4%
6	Increase in area under vegetation (tree cover)	Ha	-	85
7	Increase in area under horticulture	Ha	5	35
8	Area under fuel & Fodder	Ha	-	85
9	Increase in milk production	%	2.5	3.25
10	No. of SHGs	No	-	28
11	Increase in livelihood	No	-	28
12	Migration	No	417	205
13	SHG Federations formed	No	-	5
14	Credit linkage with banks	No	-	28

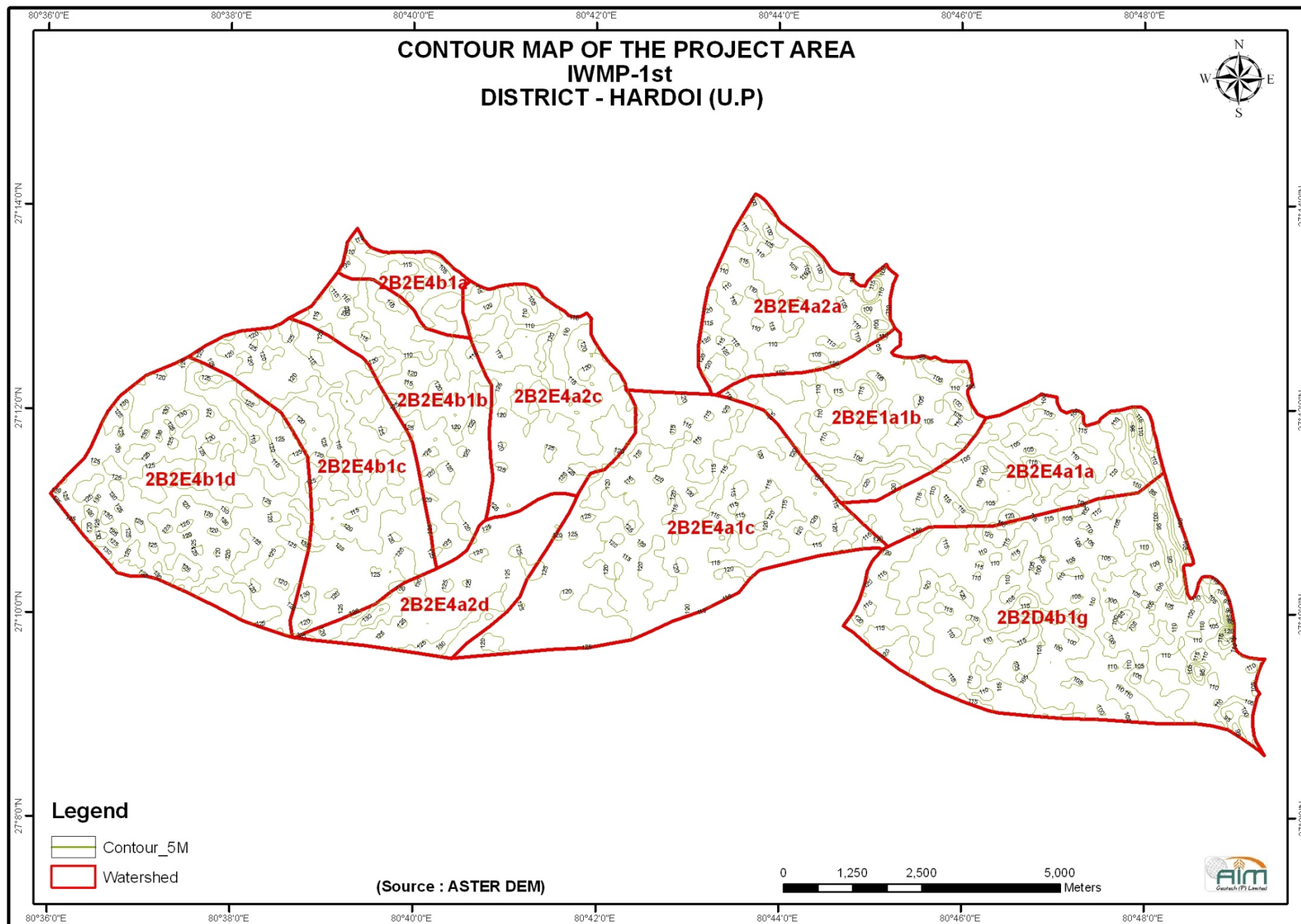
MAPS

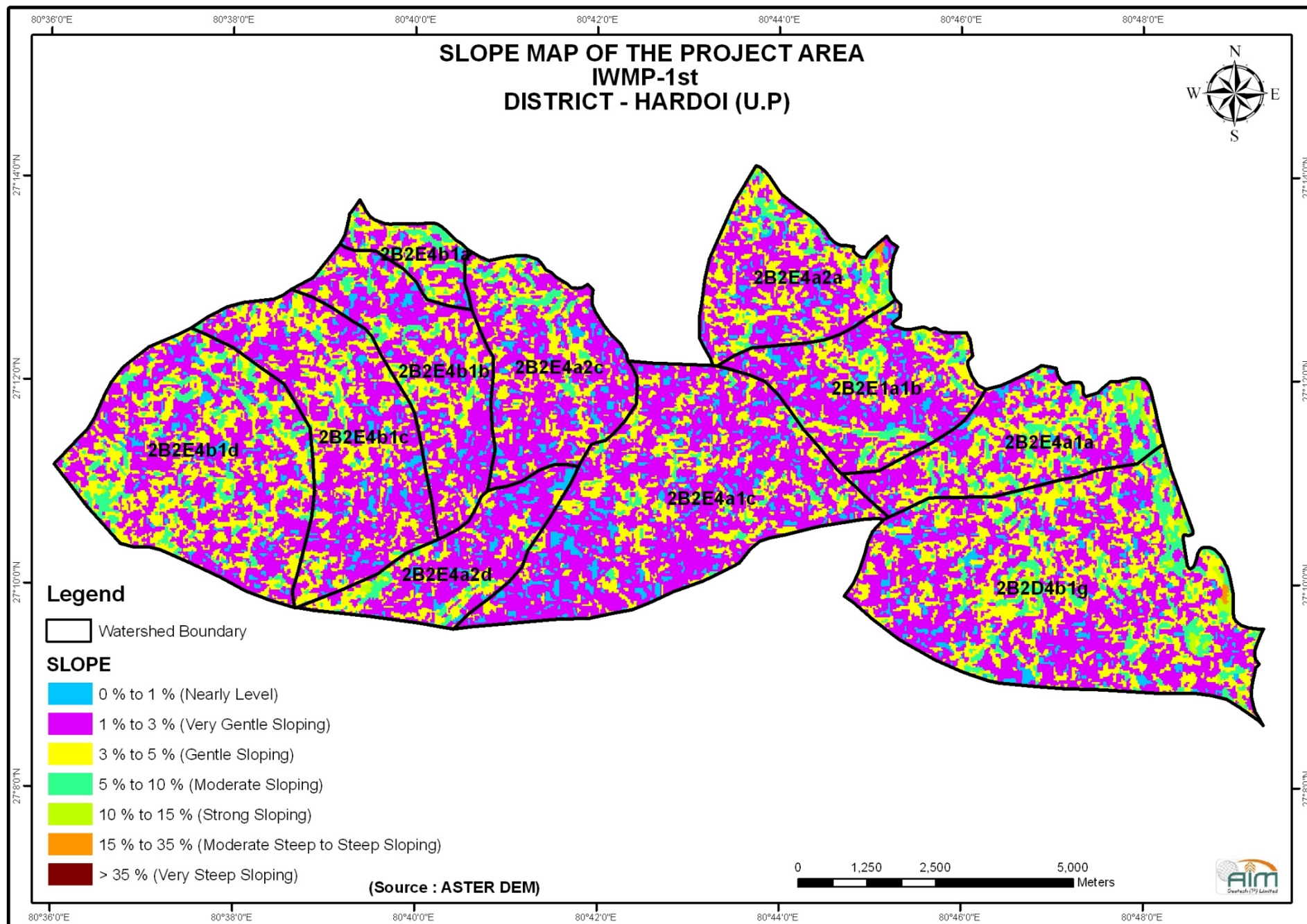


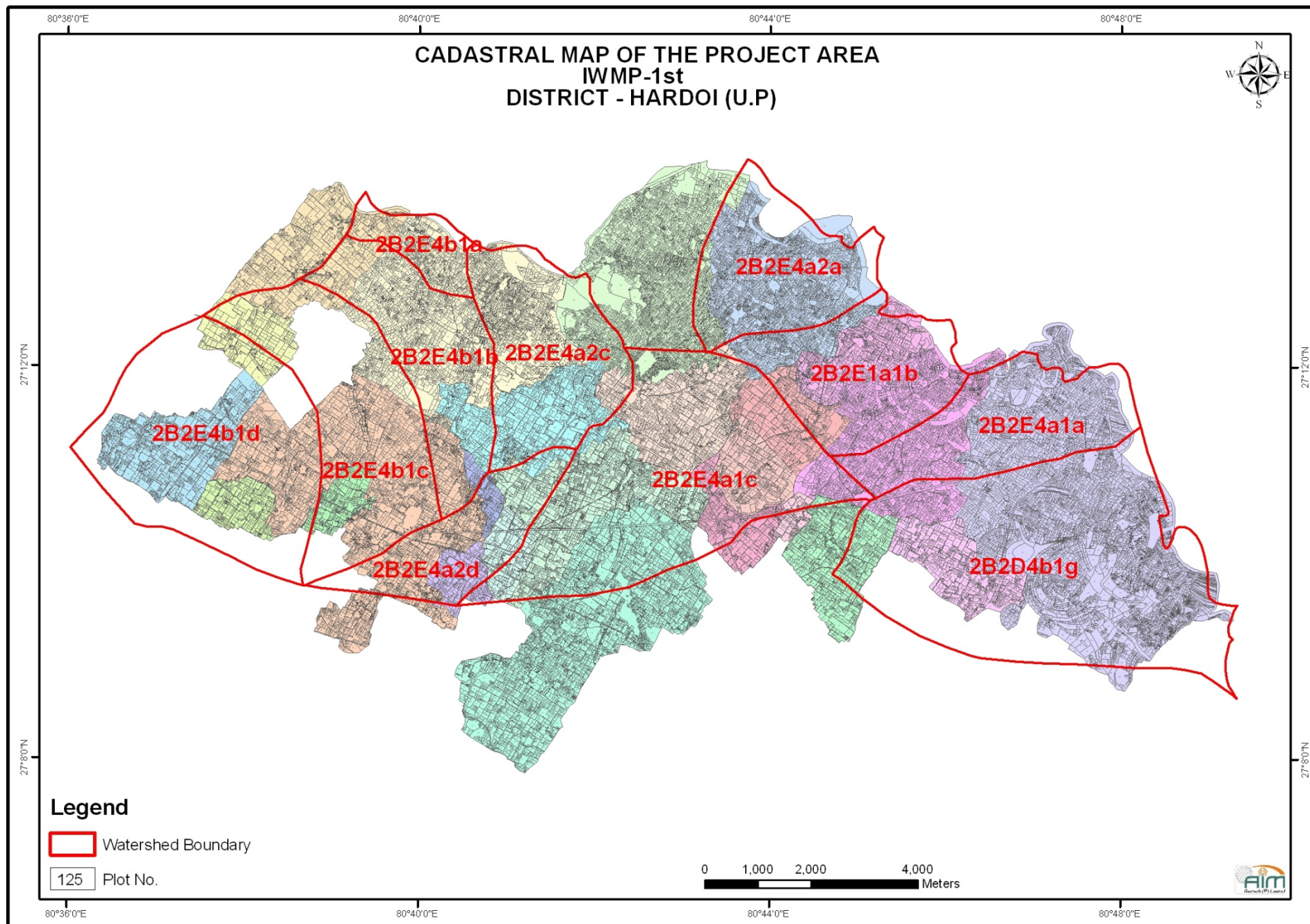












Preparation of DPR

Detail Project Report of Integrated Watershed Management Programme IWMP-1st had been prepared through base line/ bench Mark survey for physiography climate, soil, land use, vegetation, hydrology and socio economic data analysis. PRA have been exercised to collect primary data, secondary data have been collected from Revenue, Statistics department, Statistical Magazine of the district, Hardoi, Topo sheet (1 : 50000) survey of India- Deheradoon and technical & specific input and health with preparation and drafting of detail project report.

S.No.	Name	Designation
1.	Mr. LIM Rao	Sr. Scientist, AIM Geotech (Pvt) Ltd L.G.F. 11 & 12 Swaroop Arcade Kapoorthala, Aliganj, Lucknow
2.	Mr. A.K Srivastava	Scientist, AIM Geotech (Pvt) Ltd L.G.F. 11 & 12 Swaroop Arcade Kapoorthala, Aliganj, Lucknow
3.	Mr. Vikas Gupta	Scientist, AIM Geotech (Pvt) Ltd L.G.F. 11 & 12 Swaroop Arcade Kapoorthala, Aliganj, Lucknow
4.	Dr. Rajiv Kumar	Scientist, AIM Geotech (Pvt) Ltd L.G.F. 11 & 12 Swaroop Arcade Kapoorthala, Aliganj, Lucknow
5.	Dr. Rakesh Jhushwaha	Scientist, AIM Geotech (Pvt) Ltd L.G.F. 11 & 12 Swaroop Arcade Kapoorthala, Aliganj, Lucknow
6.	Mr. Kunwar Bahadur Singh	Bhoomi Sanrakshan Adhikari
7.	Mr. R.M. Mishra	Jr. Engineer
8.	Mr. S.N. Ram	Jr. Engineer
9.	Mr. S.K. Nigam	Accountant
11.	Mr. R.K. Rastogi	Accountant
12.	Mr. K.D. Marwaha	Draughts Man
13.	Mr. B.P. Singh	S.Clerk
14.	Mr. R.S. Mishra	J.Clerk
15.	Mr. S.P.Bajpai	J.Clerk
16.	Mr. R.K.Seth	J.Clerk
17.	Mr.A.K.Srivatava	Trasser
18.	Mrs.Devpari	Trasser
19.	Mrs. R.S. Rawat	Trasser
20.	Mr.R.Dayal	Jiledar
21.	Mr.R.P. Bajpai	Work Supervisor
22.	Mr.A.K.Panday	Work Supervisor
23.	Mr.K.D.Panday	Work Supervisor
24.	Mr.Akhil Singh	Work Supervisor


25.	Mr.M.Salim	Work Supervisor
26.	Mr.R.C.Sharma	Work Supervisor
27.	Mr.Roop Kishor	Work Supervisor
28.	Mr.V.D.Yadav	Work Supervisor
29.	Mr.Om Prakash	Work Supervisor
30.	Mr.R.P.Katiyar	Fourth Class
31.	Mr.Duli Chand	Fourth Class
32.	Mr. Hem Singh	Fourth Class
33.	Mr.Pankaj Kumar	Fourth Class
34.	Mr.S.Prakash	Fourth Class

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 summarized for the DPR plan abstract for 5 years (2009-10 to 2014-15).

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

Prepared By:


भूमि संरक्षण अधिकारी
आई० डब्लू० डी० पी०
हरदोई स्थित सण्डीला
Bhoomi Sanrakshan Adhikari
Dept. of Land Development & Water Resources
District – Hardoi

Technically Approved By:


Deputy Director
Dept. of Land Development & Water Resources
Region – Hardoi

Physically & Financially Approved:


Project Director
District Rural Development Authority
परियोजना निदेशक
जिला ग्राम्य विकास अधिकारी
हरदोई
District – Hardoi


Chief Development Officer
District – Hardoi
मुख्य विकास अधिकारी
हरदोई