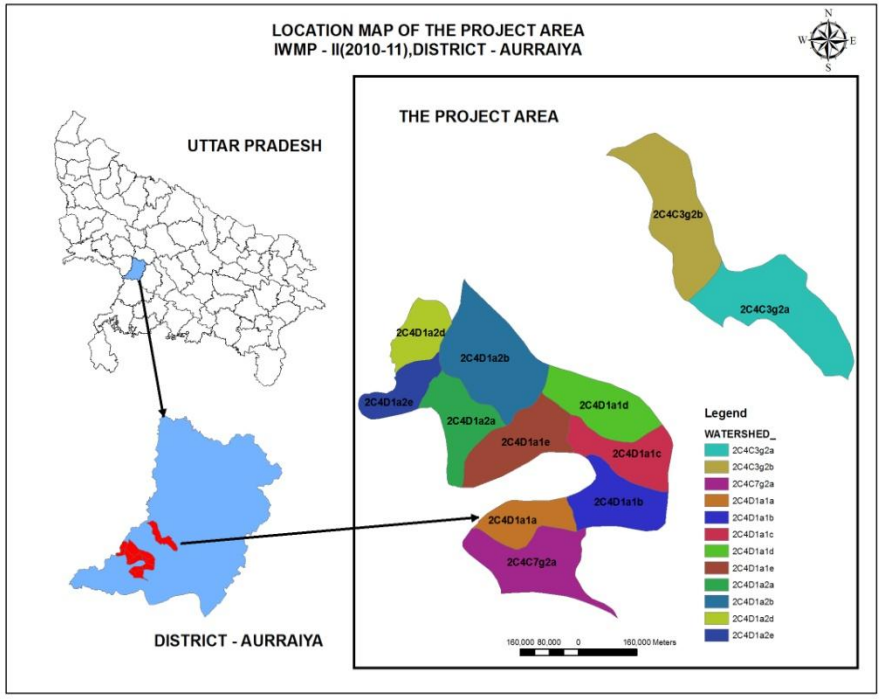
DETAILED PROJECT REPORT
IWMP II (2010-11) AURAIYA



SUBMITTED TO,

Department of Land Development and Water Resourses

Govt. of UP, Lucknow

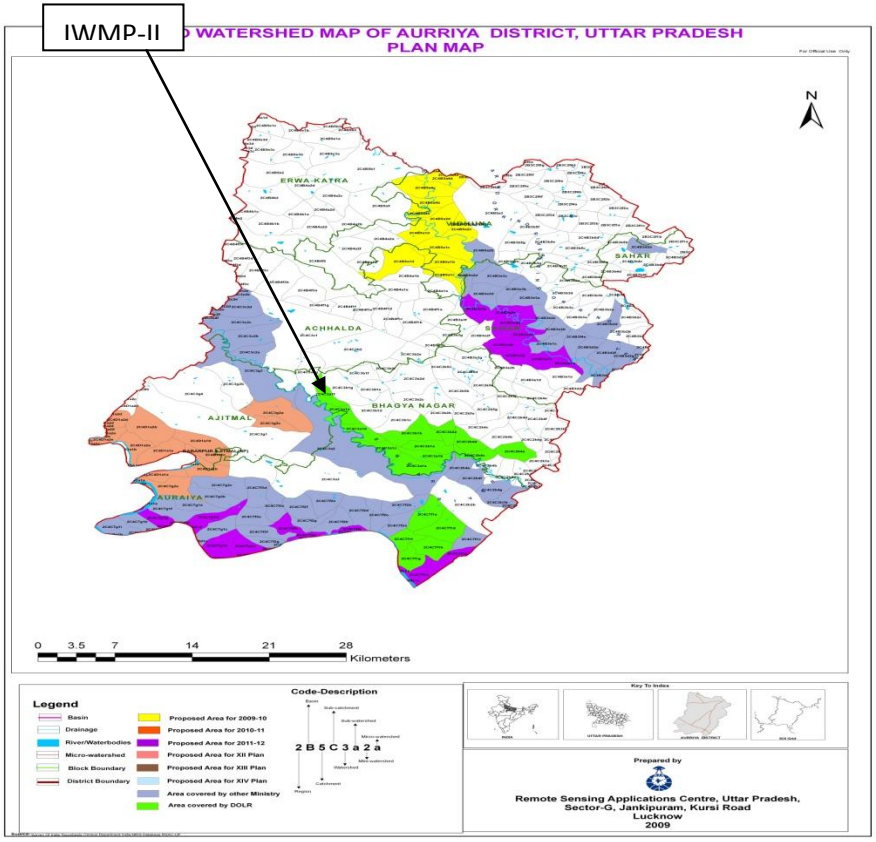
SUBMITTED BY,

Bhoomi Saraskshan Adhikari, LDWR

Block-Ajeetmal, Auriya

TABLE OF CONTENTS

Name of the project	Weigh-tage	No.of MWS	Geographial Area (ha)	Rainfed Area (ha)	Treatable area (ha)
I.W.M.P.II	90	12	7580.00	-	5460.00



1.	Name of Block	Ajeetmal
2.	No. of Gram Panchayats	18
3.	Four reasons for selection of Watershed	i. Degraded Land ii. Drinking Water iii. Less Productivity iv. lower Rate of Wages
4.	Date of approval of watershed Development Plan by DRDA/DPC	
5.	Area proposed to be treated (ha.)	5460.00
6.	Date of sanction of PPR & Date of release of Ist Instalment	-
7.	Project duration	2010-2011 to 2014-2015
8.	Project Cost (in lac.)	**655.20**
9.	Proposed mandays	32760

EXECUTIVE SUMMARY

1. Breif about area

The L.B. Yamuna/Sangar River watershed comprises of Thirty(30) villages namely simar, Gayanpur Pratapsingh, Sikrori, Pachdevra , Khukhupur, Bedera, Niyamatpur, shahpur, Jajpur, Bhurepur Kala, Nakhatpur, Gohani kala, Malgawan, Gohani Khurd, Ramnager, Bisalpur, Halepur, kakraiya, Surjanpur, Alichinagr ,Muhiuddinpur, Birohni, SaraiTadva,Amaota, Haidarpur, Phoolpur, RampurPratap Singh, Asewta, Kathali, Asawa.

block- Ajeetmal of district Auraiya of Uttar Pradesh. This watershed has been identified by the state department under NWDPRA scheme by proper prioritization of different parameters for watershed selection criteria (Annexure VI). The watershed is located in the North of Auraiya district. It lies between 28^0 to 35^0 latitude and 44^0 to 52^0 longitude **(CodeNo.**2C4D1a2d,2C4d1a2b,2C4D1a2e,2c4D1a1d,2C4D1a2a,2C4D1a1e, 2C4D1a1c, 2C4d1a1b, 2c4d1a1a,2c4c7g2a Sangar River-2C4C3g2a,2C4C3g2c (Total-12)

Its altitude ranges from 144 to 151m above the mean sea level (MSL). The total area of watershed is 7580.00 ha. It is bothe side of the arind river .The climate of the region is characterized as arid to semi-arid with average annual rainfall less 500 mm annually with an average of 37 rainy days. Out of which about 85 percent is received during the monsoon season from July to September. The area receives very less rainfall in the winter season. Temperature ranges from as high as 47^0C in the May-June to as low as 5^0C during December-January. The trend of rainfall is highly erratic and maximum 45% water goes as run off.

Area of watershed is situeted bothe side of the river.These soils are derived from the solopy an undulated area located at some height of around 146 mts. from ground level. The soils of the maximam area are sandy loam and to Sand with occasional thin layers of silt in small patches. The whole portion of watershed is

relatively sloppy land with fine soil texture. These soils are broun in colour and are inherently high in fertility status. Soil texture is sandy loam in whole watershed area ..

Agriculture is the main occupation of the dwellers of the watershed. The main crops raised are wheat, bajra, mustard, gram, tur, sesame and pearl millet. Most of the lands are kept fallow during the *kharif* season. Mustard and wheat are the most preferred crops grown during the *rabi* season. About 44% area under agriculture is cropped during *kharif* season in the watershed. Among various crops bajra shares maximum area (25%), followed by sesame (12%), jowar (5%) and pulses *i.e.* black gram and green gram (10-12%).

Natural vegetation of the watershed area is very poor. The forest vegetation is predominant with Vilayati Babul (*Prosopis juliflora*) followed by Babul (*Acacia nilotica*). There are occasional occurrence of Neem plants (*Azadirachta indica*), Shisham (*Dalbergia sissoo*), and pipal.and bargad.There is no grass land in the watershed. Grass patches are seen only on the bunds, road sides and other such places. The principal grasses are Anjna grass, Moonj, Gandher.

The problem of erosion of the watershed is to be tackled by harvesting additional water in existing water harvesting structures, which have lost most of their capacity due to siltation and creating new water bodies. Water stored in the water harvesting structures shall be properly recycled to provide supplemental irrigation at critical growth stages of crops and for the establishment of fruit orchards and forest trees. In agricultural land will treated with buding along with minor leveling. Waste land will be treated with the engineering measures like staggered trenches and a forestation etc.

2. Institutional arrangement

This watershed has been identified by the state department under NWDPRA scheme by proper prioritization of different parameters for watershed selection criteria

The area of watersheds is proposed to be taken by Bhoomi Sanrakshan Adhikari, Department of land development & water resources, Auraiya for integrated watershed management programme (IWMP) starting from the year 2010-11. The project will be completed by 2013-14.

3. Salient project activities

The area is prone to soil degradation due to environmental impact and over exploitation of natural resources therefore it is an urgent need to restore the ecological balance for the sustainability. Fodder shortage, lack of inputs and market facility are some of the major constraints being experienced by the farmers.

It is proposed that the soil conservation and check in run-off water is required urgently. Therefore the certaine measures like contour bund, marginal bunds, and peripheral bunds are urgently required. On the other hand to control the run-off water the water management practices like drainage treatment, check dams and other practices have been propsed according to general geology of the project area.

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

Table – 2 Watershed Development works including proposed engineering structures

Component	Total (Lakhs) Amount	% of the bugdet
(a) Construction of bunds (Field Bund,Contour Bund, Submergence Bund, Marginal Bund and Peripheral Bund)	231.00	50%
(b)Renovation of Existing bunds for in-situ soil moisture conservation	-	
(c) New and renovation of Existing Water Harvesting bunds/Gully plug/Check dam	81.24	
(d) Rainfed Horticulture with Fencing	-	
(e) **Rainfed Horticulture without Fencing**	15.36	
(f) **Aforestation and Development of Silvi-pastoral System**	-	
Total	**327.6**	**50%**

Livelihood Activities (community Based)

Component	Total (Lakhs) Amount	% of the bugdet
(a) Establishment of Nadef-Compost Units.	65.52	10%
(b)Dairy Work		
(c) Goating Keeping		
(d) Genaral Merchant Shop		
(e) Live Stock Activities		
Total	**65.52**	10%

Table – 3: YEAR WISE PHASING (PHYSICAL & FINANCIAL) OF I.W.M.P. II,AURAIYA (U.P.)

S. No.	Item	Physical Year wise (Area in a.)						Financial Year wise (Rs. In lakh)					
		2010-11	2011-12	2012-13	2013-14	2014-15	Total	2010-11	2011-12	2012-13	2013-14	2014-15	Total
1.	Administrative	-	-	-	-		-	13.10	13.10	13.10	13.10	13.12	65.52
2.	D.P.R. Preparation	-	-	-	-		-	4.00	2.55	-	-	-	6.55
3.	Monitoring & Evaluation	-	-	-	-		-	3.29	3.27	3.27	3.27	-	13.10
4.	Entry Point Activity (EPA)	-	-	-	-		-	26.22	-	-	-	-	26.22
5.	Institutional and Capacity building	-	-	-	-		-	8.19	8.19	8.19	8.19	-	32.76
6.	Watershed works	-	2073.10	2073.11	-		4146.20	**-**	**34.65**	**92.40**	**92.40**	**11.55**	**231.00**
7.	Livelihood & Income Generating	-	-	-	-		-	6.55	19.65	19.65	19.65	-	65.52
8.	Production System development	-	-	-	-		-	-	6.55	26.20	26.20	26.22	85.17
9.	Consolidation Phase	-	-	-	-		-	-	-	-	**-**	**32.76**	**32.76**

	Total	-	2073.10	2073.11	-		4146.20	**61.35**	**102.44**	**201.45**	**201.47**	**88.49**	**655.20**

Budget for the various components is given below (I.W.M.P. II,AURAIYA)

Sl.No.	Budget Component	Total (Lakhs)
A	1. Administrative	65.52
	2. Monitoring	6.55
	3. Evaluation	6.55
B.	Preparatory Phases	65.52
C.	Watershed Works	327.60
(i)	Livelihood Programme	65.52
(ii)	Production System and Micro Enterprises	85.17
D.	Consolidation Phase	32.76
	Grand Total	**655.20**

5. Treatment area and details

- **The main objectives of the project area are:** To control damage by run-off, to manage and utilize run-off for useful purpose or soil conservation and to increase infiltration of rain water.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.

- **The other main problems in the selected watershed are:** Lack of awareness amongst the villagers about the deteriorating environmental condition of the area, 75% of the run off water makes it away to way towards Mala river carrying fertile soil which has nutrients and this decreases soil fertility, there is a decline in the productivity of cereals, pulses and vegetable crops, dependency of farmers on the rain water. Therfore it is an urgent need, that rainwater should be harvested for crops and re-charged to improve the quality of the water.

Table – 4 : WATERSHED WISE AREA

S. No.	Watershed Code	Total Area (ha)
1	Sikrori 2C4D1a2d	440.389
2	Pachdevara 2C4D1a2b	621.631
3	Basera 2C4D1a2e	414.939
4	Amauta 2C4D1a1d	811.519
5	Gohani	672.479

	2C4D1a2a	
6	Makganva 2C4D1a1e	732.549
7	Kaithauli 2C4D1a1a	455.4
8	Ramnagar 2C4D1a1c	665.257
9	Makganva 2C4D1a1b	731.631
10	Asevta 2C4C7g2a	648.198
11	Aseva 2C4C3g2a	910.662
12	Sikrori 2C4D1a2d	440.389
13	Pachdevara 2C4D1a2b	621.631
	Total	**7580.00**

6. Fact sheet about benchmark indicators

Gradually increasing soil erosion, poor harvesting management,single cropping pattern,non treated land and water resources have been required to take immediate action for conservation of soil and moistures various type earthen bunds in the watershed field, necessity has been observed, Stabilize Disturbed Areas immediately. Permanentstructures, temporary or permanent vegetation, and mulch, or a combination of these measures, should be employed as quickly as possible after the land is disturbed. Retain or Accommodate Runoff. Runoff from the development should be safely conveyed to a stable outlet using storm drains.

Table – 5: Area under Various LCC Classes

Land Capability Class	Area (ha)
II	5323.56
III	2256.44
Total	**7580.00**

7. Action plan at a glance

The preparation of detailed project report (DPR) has been carried out by applying different steps for its compilation. A brief detail has been given below:-

- Secondory or co-lateral data collection – During the field visit programme all available data spatial and non- spatial has been collected through village lavel from gram panchayat office and community block lavel office.
- Paticipatry rural appraisal (PRA) has been conducted for detail survey of the village resource information.
- Formation of User'group and self help group and different committees for the social awareness among the people of the study area have been formed.
- Conducted watershed committee meetings at gram panchyat lavel, for the discussion of different problems and their appropriate solution according to need in the project area.
- After gathering all required information compiled thoroughly discussed and finalized the expected out-comes and benefits specialy in the respect of livelihood for different segments.These are the target and and performers, indicators for the project area,
- The draft of the detailed project report has been prepared for the approvel of the project. Following activities are taken up for implementation in the project area.

CHAPTER-1

INTRODUCTION & BACKGROUND

1. PROJECT BACKGROUND:-

The broad objective was the promotion of the overall economic development and improvement of the socio-economic conditions of the resource poor sections of people inhabiting the programme areas. A comprehensive programme named Integrated Watershed Management Programme (I.W.M.P.) has been implemented under Common Guidelines on Watershed Development in 2008.

The main objectives of the IWMP are to restore the ecological balance by harnessing, conserving and developing degraded natural resources such as soil, vegetative cover and water. The outcomes are prevention of soil run-off, regeneration of natural vegetation, rain water harvesting and recharging of the ground water table. This enables multi-cropping and the introduction of diverse agro-based activities, which help to provide sustainable livelihoods to the people residing in the watershed area. In addition, there is a Scheme of Technology Development, Extension and Training (TDET) is also being implemented to promote development of cost effective and proven technologies to support watershed management.

The watershed with **(CodeNo.**2C4D1a2d, 2C4d1a2b, 2C4D1a2e, 2c4D1a1d, 2C4D1a2a, 2C4D1a1e, 2C4D1a1c, 2C4d1a1b, 2c4d1a1a, 2c4c7g2a Sangar River-2C4C3g2a, 2C4C3g2c (Total-12)) having area 7580.00 ha located in west of Auraiya district of Uttar Pradesh has been taken up by Bhoomi Sanrakshan Adhikari, Land Daplopment & Water Resours Ajeetmal Auraiya (UP) for development under I.W.M.P. for Rain-fed Areas (NWDPRA) scheme funded by Ministry of Rural Development, Government of India. The watershed

has been also taken up programm implementation comprising of development and management plan during next five years (2010-11 to 14-15). The project will be completed by 2014-15.

Most of the land comes under agriculture. The livelihood of these people is primarily based on rainfed agriculture, animal husbandry, wage labour and goat keeping.The area in the watershed is relatively flat plain with shallow river-valleys. The soils are mainly sandy, loamy and clayey.

Table 1.1: Basic Project Information

S. No.	Name of the Project	Villages	Block	District	Total area of The Project	Area proposed to be treated	Total Project cost (Rs. in Lacs)	PIA
1.	**I.W.M.P.-II Auraiya**	Simar, Gayanpur Pratapsingh, Sikrori, Pachdevra ,Khukhupur, Bedera, Niyamatpur, shahpur, Jajpur, Bhurepur Kala, Nakhatpur, Gohani kala, Malgawan, Gohani Khurd, Ramnager, Bisalpur, Halepur, kakraiya, Surjanpur, Alichinagr ,Muhiuddinpur, Birohni, SaraiTadva,Amaota,	Ajeetmal	Auraiya	7580.00	5460.00	655.20	Bhoomi Sanrakshan Adhikari, RamGanga command Project, Auraiya (UP) for development under I.W.M.P. for Rain-fed Areas (NWDPRA) scheme funded by Ministry of Rural Development, Government of India.

		Haidarpur, Phoolpur, RampurPratap Singh, Asewta, Kathali, Asawa.						

2. NEED AND SCOPE FOR WATERSHED DEVELOPMENT

The main objectives are:

(a) Conservation, development and sustainable management of natural resources including their uses.

(b) Enhancement of agricultural production and productivity in a sustainable manner.

(c) Restoration of ecological balance in the degraded and fragile rain-fed ecosystem.

(d) Reduction in regional disparity between rain-fed and irrigated areas.

(e) Creation of sustainable employment opportunities for the rural community for livelihood.

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 Yamuna & Chambal River 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. Vegtation 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 distrubed.

(e) Due to increasing population pressure of man and animal there is camptition 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. A farmer depends on the rain water, which flows directly of Yamuna & Chambal River river. Ther fore it is an urgent need, that rainwater should be harvested for crops and re-charged to improve the quality of the water.

3. WEIGHTAGE FOR SELECTION OF WATERSHED

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 transact walk and PRA exercises in all villages Mitral, Chakarnagar, Nimri , Dibhauli, Rampuraghar, Tejpura, Barecha, Bachedi, Bindvakala, Jagtauli, Dadara, Sirsa, and

Dhakara were pooled and a list of nine problems representing the whole watershed was prepared. Problems were ranked as per their total weightage in these villages.

Problem identification and prioritization for watershed

S.N	Problem	Rank
1.	Low production of field crops	5
2.	Lack of drinking water	6
3.	Lack of irrigation water	1
4.	Lack of fodder availability and low annual productivity	8
5.	Non-availability of fuel wood	8
6.	Lack of inputs like quality seeds, fertilizer, pesticides etc.	4
7.	Lack of market facility	7
8.	Lack of medical, educational and transportation facilities	2
9.	Medical and Health care facilities for milching animals and low productivity.	6

Strength, Weakness, Opportunity and Threat (Swot) Analysis Is a Useful Decision Support Tool

A SWOT analysis of watershed is presented as below:

Strengths (S)	**Weakness (W)**
i. Cooperative work culture in traditional activities ii. Close ethic 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. Stall feeding of animals ix. Well maintained seasonal water bodies x. Social outlook of the community towards land less	i. Poor water management ii. Resource poor farmers iii. Out migration of youth iv. Low and erratic rainfall v. Fragile geology vi. Fragmented land holding vii. Heavy infestation of wild animals viii. Problem of fuel and fodder Shallow soil depth and with high percentage of gravel
Opportunities (O)	**Threats (T)**
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	i. Prone to adverse climate like drought ii. High market risk iii. Social conflicts owing to PRI and WSM polices and local politics iv. Weak coordination among line departments v. Lack of expertise of implementing agency in different aspects of WSM

Table 1.2: Weightage of the project

Project Name	Project Type	Weightage												
IWMP II , Auraiya	IWMP	i	Ii	iii	Iv	v	vi	vii	viii	ix	x	xi	xii	xiii	xiv
		7.5	5	5	10	5	0	5	7.5	10	10	10	15	0	90.00

Table – 1.3: Criteria and weightage for selection of watershed

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

viii	Drinking water	10	No source (10)	Problematic village (7.5)	Partially covered (5)	Fully covered (0)
ix	Degraded land	15	High – above 20 % (15)	Medium – 10 to 20 % (10)	Low- less than 10 % of TGA (5)	
x	Productivity potential of the land	15	Lands with low production & where productivity can be significantly enhanced with reasonable efforts (15)	Lands with moderate production & where productivity can be enhanced with reasonable efforts (10)	Lands with high production & where productivity can be marginally enhanced with reasonable efforts (5)	
xi	Contiguity to another watershed that has already been developed/ treated	10	Contiguous to previously treated watershed & contiguity within the micro watersheds in the project (10)	Contiguity within the micro watersheds in the project but non contiguous to previously treated watershed (5)	Neither contiguous to previously treated watershed nor contiguity within the micro watersheds in the project (0)	
xii	Cluster approach in the plains (more than one contiguous micro-watersheds in the project)	15	Above 6 micro-watersheds in cluster (15)	4 to 6 micro watersheds in cluster (10)	2 to 4 micro watersheds in cluster (5)	
xiii	Cluster approach in the hills (more than one contiguous micro-watersheds in the project)	15	Above 5 micro-watersheds in cluster (15)	3 to 5 micro watersheds in cluster (10)	2 to 3 micro watersheds in cluster (5)	
	Total	**150**	**150**	**90**	**41**	**2.5**

Table – 1.4: WATERSHED INFORMATION

Name of the Project	No. of water sheds to be treated	Watershed Code	Watershed regime/type/order
IWMP-II, Auraiya	12	2C4D1a2d, 2C4d1a2b, 2C4D1a2e, 2c4D1a1d, 2C4D1a2a, 2C4D1a1e, 2C4D1a1c, 2C4d1a1b, 2c4d1a1a, 2c4c7g2a, 2C4C3g2a, 2C4C3g2c	Micro Watershed

4. OTHER DEVELOPMENTAL PROJECTS/SCHEMES RUNNING IN THE VILLAGES:

These villages of the project area being very backward therefore have been on top priority for a number of developmental projects. These programmes are Swarnajayanti Gram Swarojgar Yojana (SGSY) and Indira Awas Yojana (IAY). Integrated Watershed Management Programme in other areas of the district is under operation in the department of Agriculture DPAP Programme is also running in the project area.

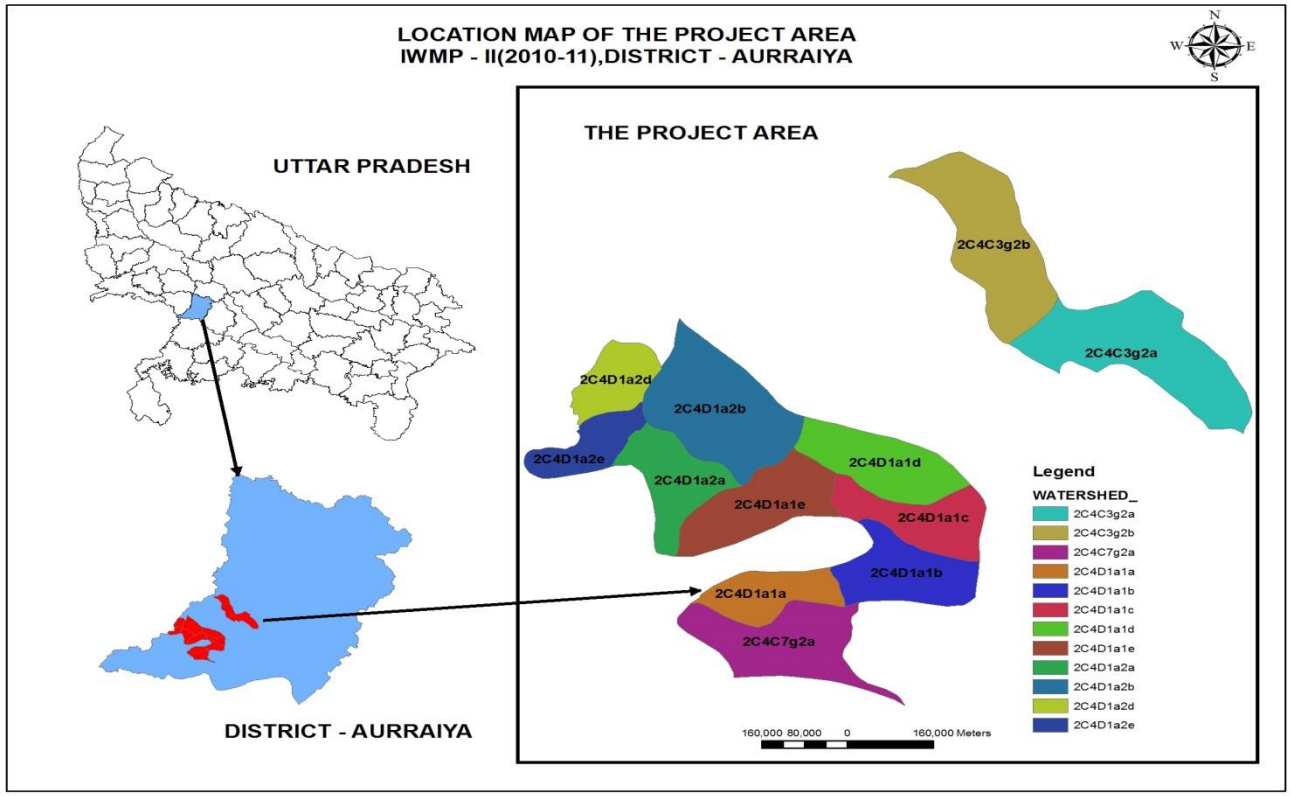
CHAPTER – 2

GENERAL DESCRIPTION OF PROJECT AREA

1. LOCATION

The L.B. Yamuna watershed in Ajeetmal block of district Auraiya (U.P.) is located Ajeetmal NH-2 to road about 19-22 Km from Auraiya 3 to 8 km. from Ajeetmal block between 29^0 to 33^0 latitude and 45^0 to 53^0 longitude.

LOCATION MAP OF THE PROJECT AREA



2. AREA

Table- 2.1: LANDUSE PATTERN OF THE PROJECT AREA

S. No	Name of District	No. of Micro-watershed	No. of Villages	Geographical Area (ha)	Rainfed Area (ha)	Forest	Land under agricultural use (ha)	Plantation (ha)	Wasteland (ha)	Fallow Land (ha)
1	Auraiya-IInd	12	30	7580.00	6065.00	258.00	5680.00	-	1235.70	-

3. AGRO-CLIMATE CONDITIONS

The Agro-Climate condition of the project area including the Agro-Climate Zone of the project area, soil type, rainfall, major crops etc., of Auraiya district is briefly describe below.

Table- 2.2: DETAILS OF AGRO-CLIMATE CONDITIONS

S. No.	Name of Project	Name of Agro-climate Zone covered	Area (Ha)	Major Soil Type (Ha)		Topography	Average Rainfall (mm)	Major crops	
				Type	Area (ha)			Name	Area (ha)

1	Auraiya-IInd	Central Plain	6065	Sandy Loam	5140	Undulating with	843 mm	Wheat, mustard Bajara Rice	5320

4. PHYSIOGRAPHY

The watershed is in the mid of the Yamuna & Chambal River steep having mortared slopes and drains in to river Yamuna & Chambal River 1 % and 40 % area has slopes from 3 to 8 %. A number of streams join the main perennial stream of Yamuna. Total 67 numbers of streams (21 Yamuna & 46 Chambal River) of different order are found in watershed, with total length 71600 meters. The watersheds are having precipitous slopes and drains into the river Yamuna & Chambal. The top of the watershed exhibits extremely precipitous and manifesting moderate to severe erosion class. The lower portion of the watershed has moderate slopes. At the outlet of the watershed small gullies are noticed, covered with sparse vegetation. Most of the agricultural land is dependent on monsoon. The plains form a level tract which slopes gently from west to south-east. The height above sea-level ranges from 155 meters in north-west to 100 meters in the south-east. Higher elevations appear at places where the general flat surface is broken by irregular ranges of sandhills.

Table- 2.3: ELEVATION RANGE, LONGITUDE LATITUDE, RELIEF HEIGHT DIFFERENCE ETC.

S. No.	Watershed Code	Location		Elevation of watershed from Mean Sea level		
		Latitude (N)	Longitude (E)	Highest in Meters	Lowest in Meters	Relief Height Difference
1	2C4D1a2d,	29^0 to 33^0	45^0 to 53^0	144	151	07
2	2C4d1a2b,					
3	2C4D1a2e,					
4	2c4D1a1d,					
5	2C4D1a2a,					
6	2C4D1a1e,					
7	2C4D1a1c,					
8	2C4d1a1b,					
9	2c4d1a1a,					
10	2c4c7g2a					
11	2C4C3g2a,					
12	2C4C3g2c					

5. CLIMATE

The watershed falls under the semi-arid region of tropical climate. The average annual precipitation is 600 mm spreading over 38 rainy days. Most of the rainfall (about 85 %) is received during July to September. The rainfall is of moderate to high intensity. The area receives no or scanty rainfall in the winter season. The temperature variation ranges from as high as 49^0C in the month of May - June to as low as 5^0 C in December - January.

DISTRICT RAINFALL (MM.) FOR LAST FIVE YEARS

Note: (1) The District Rainfall (mm.) (R/F) shown below are the arithmetic averages of Rainfall of Stations under the District.
(2) % Dep. are the Departures of rainfall from the long period averages of rainfall for the District.
(3) Blank Spaces show non-availability of Data.

YEAR	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
	F %DEP.	R/F %DEP.	R/F %DEP.	R/F %DEP.	R/F %DEP.	R/F %DEP.	R/F %DEP.	R/F %DEP.	R/F %DEP.	R/F %DEP.		R/F %DEP.
2006	0.0 -100	0.0 -100	2.6 -73	0.0 -100	2.0 -82	26.9 -56	228.7 -3	31.5 -90	*32.6 -79*	0.0 -100	0.0 -100	0.0 -100
2007	0.0 -100	44.2 235	16.0 68	0.0 -100	0.0 -100	54.6 -10	42.3 -82	76.1 -75	25.9 -84	0.0 -100	------	0.0 -100
2008	0.0 -100	0.0 -100	0.0 -100	12.6 186	16.0 45	101.2 67	293.9 25	256.8 -15	74.3 -53	0.0 -100	0.0 -100	0.0 -100
2009	0.0 -100	0.0 -100	-	-	2.1 -81	0.0 -100	96.0 -59	133.2 -56	106.0 -33	42.6 6	3.0 -3	18.0 233
2010	0.0 -100	0.0 -100	0.0 -100	0.0 -100	3.0 -73	6.0 -90	162.1 -31	155.1 -49	201.1 28	37.8 1119	37.8 1119	2.3 -57

Monsoon winds blowing from the south India are a welcome relief in mid of June, bringing with them showers in July, August. The area receives excessive rainfall in the month of August & September, with an annual rainfall of 550 mm, mainly between June and September as the result of southwest monsoon. August is the wettest month of the year. The spells of continuous rainfall may stretch to many days or even a few weeks.

As the monsoon winds recede, the day temperatures starts decline in October with cooler nights signalling the onset of winter. The project area experiences winter from November to February. It experience pleasant windy days, clear skies and cool nights in the month of November till February ends, which makes it the most enjoyable time of the year. The day temperature hovers around 14 °C while night temperature is below 7 °C for most of December and January, often dropping to 3 °C or 4 °C. On particularly cold days, wind may appear to be very chilly due to the dryness of air. Rain is very expected in month of February. 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.

6. WIND VELOCITY

The Wind velocity of the Project area ranges from 4-17 Km/hr.

7. WATERSHED CHARACTERISTICS

Shape and Size

The watershed shape is **Hyper Gola type.** The maximum length and width of the watershed are 18500 m and 6350 m, respectively with the length: width ratio of 2.76: 1

Table- 2.4: SHAPE AND SIZE OF WATERSHED

S. No.	Micro watershed Code	Area (ha)	Shape	Approximate size in meter	
				Length	Width
1	2C4D1a2d,	440.389	Rectangular	2911	3693
2	2C4d1a2b,	621.631	Elongate	3482	3622
3	2C4D1a2e,	414.939	Rectangular	5343	4369
4	2c4D1a1d,	811.519	Elongate	3912	3775
5	2C4D1a2a,	672.479	Rectangular	2850	5016
6	2C4D1a1e,	732.549	Rectangular	2635	3984
7	2C4D1a1c,	455.4	Square	3191	3613
8	2C4d1a1b,	665.257	Elongate	3688	2883
9	2c4d1a1a,	731.631	Square	3740	3740
10	2c4c7g2a	648.198	Elongate	4643	3878
11	2C4C3g2a,	910.662	Elongate	5066	2948
12	2C4C3g2c	440.389	Rectangular	2374	4155

8. GEOMORPHOLOGY

The watershed is located West of the Auraiya district. The entire watershed is topographically divided into two major landforms. Accordingly, the soils of watershed can be grouped into two major categories. Such as:

i) Plain land
ii) Undulated land

Table- 2.5: DETAIL OF SOIL EROSION (I.W.M.P-II), AURAIYA

S. No.	Name of the Project	Water Erosion (Ha)				Run-Off (mm/yr)	Average Soil Loss in tons/ha/yr	Wind Erosion
		Sheet	Rill	Gully	Total			
1	IWMP - II	1299.00	1870.00	2896.00	6065	500	18.80	N.A.

9. SOILS

The topmost portion of the watershed is Undulated and one side sloppy of the river. The soils of the watershed area are loamy sand to sand with occasional thin layers of silt in small patches.The soils are brown in colour with ferruginous concretions with slightly acidic to neutral in reaction.

Fine textured alluvial soils

These soils are the most extensive soil group found in the watershed. The whole portion of watershed is relatively sloppy land with fine soil texture. These soils are brown in colour and are inherently high in fertility status. Soil texture is sandy loam particularly in depressions and loam in the elevated portion.

10. DRAINAGE

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

11. VEGETATION

11.1 Natural Vegetation-

Natural vegetation of the watershed is very poor. The forest vegetation is predominant with Vilayati Babul ((Prosopis juliflora) followed by Babul (Acacia nilotica). There are occasional occurrence of Neem plants (Azadirachta indica), Papdi (Holopteila integrifolia), Shisham (Dalbergia sissoo), Karanj (Pongamia glabra) and Chonkra (Prosopis cineraria). There is no grass land in the watershed. Grass patches are seen only on the bunds, road sides and other such places. The principal grasses are Anjna grass, Moonj, Gandher & Aswagandha.

11.2 Horticulture

There is no pack yard Horticulture or commercial Horticulture plantation in the villages expect few scattered fruit plants.

11.3 Agroforestry

The agriculture fields of the villages do not have any forest or Horticulture plantation. At places, some isolated trees of Acecia nilotica can be seen, whose frequency is less then one tree per running length of 85 m.

11.4 Agriculture, Horticulture and Agro-forestry

The agriculture Land use constitutes about 58 % of the total watershed area. Both rain-fed and irrigated agriculture are practiced in the watershed. Mono cropping is dominant in the rain-fed production system while double cropping is limited to the irrigated lands which constitute about 5 % of the total area under agriculture.

Rain-fed agriculture mostly mono cropping with invariably low productivity. These ares constitute about 70 % of total agriculture area. The food and livelihood security is primarily driven by the natural weather factors of rain and its distribution specifically across the cropping season. Only about 37 % area under agriculture is cropped during *Kharif* season in the watershed. Among various crops bajra shares maximum area (20 %), followed by sesam (10 %), jowar (5 %) and pulses i.e. black gram and green gram (2 %). Farmers uses high yielding varieties of bajra (JK, Pioneer,Ariti, Boss, PAC 9444, Mahyco Bajra) and sesame (Nitya) which are mostly truthfully lebelled seed from private seed companies. The productivity of khrif crops is low and fluctuates depending upon rainfall pattern, use of fertilizer and incidence of diseases and insect pets. Low yielding local varieties of jowar are grown without fertilization for grain and fodder production.

The local jowar varieties are one of the various constraints in fodder production in the watershed. The green fodder production through various source like crops, grasses and limited forest trees is clearly inadequate for maintaining proper health of existing animals. Also no use of manure and fertilizer in sesame, no seed treatment with Rhizobium culture in pulses are the other salient production constraints in the watershed. Watershed has good scope for lowland and semi deep water rice cultivation in seasonally submerged area, which remain unutilized during Kharif season. Almost in all thirteen villages of watershed, no compost pits exists and fresh to semi decomposed farm yard manure is applied directly to the agriculture fields. The green manures like dhaincha, sun-hemp, neel have good potential in the watershed however the practice of green manure is meager and unpopular in the watershed, in spite of the fact then organic matter status as well as fertility of the agriculture soils are poor to fairly good. The cultivated fallow land dominate in the watershed which contributes to accelerate soil erosion as well as runoff yields in the watershed.

Among rabi crops, mustard occupies the largest area under agriculture (65 to 70 %) followed by the wheat (10 %) and pulses like gram and lentil(10 %). Farmers are using high yielding varieties of rabi crops like Karan, Krishna, Kranti, Sharda, Moti, Chambal, Nath, Sona, Raj Luxmi, Pioneer, T-59, Rohini, AK-47 in

mustard and UP343, UP 2329, UP 2338, HD 2009 and even very old varieties like Loke-1 in wheat crop. Beside this, desi varieties of gram and lentil are also used by the farmers. Imbalanced fertilizer use in the rabi crops both under rain-fed and irrigated areas, absence of S containing fertilizer and inadequate pest control measures with respect to aphid and white blister in mustard and poor borer in gram are some of the reason of low productivity of these crops.

The majority of farmers of the watershed are facing considerable problem of fire wood, fodder due to meager or almost negligible forest area, lack of traditional agro-forestry practices and pastures. Cow dung, stover of mustard, sesame and dhaincha and scattered trees of Prosopis juliflora are mean sources of five wood specifically to small, marginal and landless farmers in the watershed. The organized orchards as well as forest area are widely lacking in the watershed. The watershed has a good potential of fruit and forest tree species like ber, bail, aonla, papaya, guava, citrus species, lasoda, karonda, ramda, chhokra, shisam, gular, tamarind, neem, popular, Acacia, Palash, Prosopis, juliflora as agro-forestry systems both under rain-fed and irrigated production system on leveled to sloping agriculture lands as well as on degraded lands provided proper planting techniques involving appropriate termite control measures are used.

The multipurpose trees have also very good potential for supplementing fuel and fodder demands in the watershed and may be included in appropriate land use options. Sole forestry plantation of Prosopis juliflora on degraded and marginal lands also have good potential in the watershed to cater the need of firewood demand. The main source of green fodder for animals is limited to jowar, berseem and grasses in the watershed. Though the vegetables have good potential in the watershed however, their cultivation is limited mostly to kitchen gardens. Almost all tropical/sub tropical vegetable may be successfully grown in the watershed. The vegetables grown in the watershed are cucurbits, okra, radish, tomato, cauliflower, cabbage, garlic, onion, brinjal and chilly.

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 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.

DEMOGRAPHIC INFORMATION

HUMAN AND LIVESTOCK POPULATION

Total population of thirty villages under the watershed is 45629 with Total family 5385 & S.C.family 1588. (Table 3.1)

Table- 3.1: HUMAN POPULATION in the WATERSHED

S.No.	Name of village	Population				Percentage			Total Family no.	SC Family no.
		Male	Female	Children	Total	Male	Female	Children		
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
1	simar	836	637	450	1923	43.47	33.12	23.4	236	28
2	Gayanpur Pratapsingh	149	130	75	354	42.09	36.72	21.18	43	35
3	Sikrori	332	268	400	1000	33.2	26.8	40	200	100
4	Pachdevra	548	461	300	1309	41.8	35.21	22.91	160	30
5	Khukhupur	123	103	40	266	46.24	38.72	15.03	30	05
6	Bedera	720	480	1200	2400	30.01	20.03	49.96	200	28

7	Niyamatpur	325	242	140	707	45.96	34.22	19.80	90	33
8	shahpur	708	619	127	1454	48.70	42.57	8.73	209	57
9	Jajpur	352	277	629	1258	43.24	33.97	23.36	118	19
10	Bhurepur Kala	1094	936	470	2500	43.79	37.47	12.75	328	29
11	Nakhatpur	10	12	04	26	38.46	46.15	15.38	04	02
12	Gohani kala	944	751	400	2095	45.05	35.84	19.09	275	35
13	Malgawan	1305	1091	577	2973	43.92	36.73	19.44	301	55
14	Gohani Khurd	377	304	150	831	45.36	36.58	18.05	79	30
15	Ramnager	275	191	70	536	51.3	35.63	13.00	70	05
17	Bisalpur	1047	737	265	2049	51.09	35.96	12.93	305	89
16	Halepur	641	610	158	1409	45.49	32.29	11.21	209	72
18	kakraiya	338	266	210	814	41.27	32.67	25.79	99	32
19	Surjanpur	532	409	296	1237	43.00	33.06	18.60	151	62
20	Alichinagr	621	528	230	1379	45.00	38.28	16.67	187	58

21	Muhiuddinpur	103	105	78	286	36.01	36.71	27.27	31	06
22	Birohni	2200	1800	2000	6000	36.66	30.01	33.33	510	400
23	SaraiTadva	353	321	180	854	41.33	37.58	21.00	111	69
24	Amaota	950	700	950	2600	36.53	26.92	36.53	200	55
25	Haidarpur	1269	1027	450	2791	45.46	38.40	16.12	402	97
26	Phoolpur	839	709	400	1948	43.06	36.40	20.53	256	51
27	RampurPratap Singh	543	445	776	1755	30.42	25.35	44.21	146	42
28	Asewta	482	397	224	1103	43.69	35.99	20.3	120	15
29	Kathali	296	198	142	636	46.54	31.13	22.32	116	18
30	Asawa	678	568	333	1579	42.95	35.98	21.05	201	32
	Total	**18990**	**15367**	**11724**	**45629**	**41.70**	**33.67**	**25.69**	**5385**	**1588**

LIVESTOCK POPULATION

Total livestock population of the watershed is 29651. Buffalo is preferred as milch animal compared to cow, but milk yield is very low. Goats are also kept for milk as well as for meat purpose. The breakup of livestock population is as follows: (Table 3.2).

Table 3.2 Livestock Population in watershed

S. No.	Name of Village	Name of Concern villages	livestock Resolution					
			Buffaloes	Cows	Bullocks	Goat	Other	Total
1	Simar	Simar	200	20	6	400	-	**626**
2	Gayanpur P.singh	Gayanpur Pratapsingh	30	4	-	250	-	**284**
3	Sikrori	Sikrori	80	15	4	300	-	**399**
4	Pachdevra	Pachdevra	150	20	20	500	-	**690**
5	Khukhupur	Khukhupur	45	23	4	90	35	**197**
6	Bedera	Bedera	211	50	12	1100	208	**1581**
7	Niyamatpur	Niyamatpur	168	22	10	512	18	**927**
8	shahpur	Shahpur	70	06	2	300	12	**390**

9	Jajpur	Jajpur	204	48	10	570	19	**851**
10	Bhurepur Kala	Bhurepur Kala	62	14	4	200	-	**280**
11	Nakhatpur	Nakhatpur	57	18	4	250	26	**355**
12	Gohani kala	Gohani kala	590	112	14	885	29	**1630**
13	Malgawan	Malgawan	729	184	26	1012	42	**1993**
14	Gohani Khurd	Gohani Khurd	426	84	12	672	12	**1206**
15	Ramnager	Ramnager	183	23	8	1130	9	**1353**
17	Bisalpur	Bisalpur	63	25	5	507	2	**602**
16	Halepur	Halepur	78	13	3	157	36	**287**
18	kakraiya	Kakraiya	80	87	4	630	-	**801**
19	Surjanpur	Surjanpur	69	60	5	173	-	**307**
20	Alichinagr	Alichinagr	173	142	56	598	32	**1001**
21	Muhiuddinpur	Muhiuddinpur	165	107	10	1200	20	**1502**
22	Birohni	Birohni	425	54	10	1050	30	**1569**

23	SaraiTadva	SaraiTadva	177	17	6	201	38	**439**
24	Amaota	Amaota	200	30	8	1000	280	**1518**
25	Haidarpur	Haidarpur	450	30	12	2100	8	**2600**
26	Phoolpur	Phoolpur	367	25	8	603	-	**1003**
27	RampurPratap S	RampurPratap Singh	204	79	12	715	-	**1010**
28	Asewta	Asewta	234	70	63	700	3	**1070**
29	Kathali	Kathali	90	430	40	1200	-	**1760**
30	Asawa	Asawa	204	12	4	1120	25	**1420**
	Total		**6184**	**1824**	**382**	**20125**	**884**	**29651**

EMPLOYMENT GENERATION

Labor migration in search of gainful employment is one of the major problems in the remote watershed in particular. Causal employment opportunities will be generated during the implementation of the project activities. However, the changes in land use pattern and adoption of other subsidiary enterprises will generate employment opportunities for persons in the watershed.

MIGRATION PATTERN

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 as daily wagers, agricultural labours and construction workers. The detail is given below.

Table- 3.2: DETAILS OF MIGRATION (I.W.M.P-II) AURAIYA

S.No.	No. of the villages	No. of persons migrating	No. of days per year of migration	Main reason for migration	Expected reduction in no. of persons migrating
1	30	210	180	Poverty & Unemployment	100

SOIL AND LAND CAPABILITY CLASSIFICATION

SOIL MORPHOLOGY

The watershed is located west of the Auraiya district. The entire watershed is topographically divided into two major landforms. Accordingly, the soils of watershed have been grouped in two major categories.

i) Plain land
ii) Undulated land

Soil profile- A representative soil profile (Dominant soil-Table 8)

1-1.5 m (Heavy texture soil- braun in colour)

5-6 m Locally called "*Padua*"-Clay

Sandy layars with clay (Kankar)

Morphology of a typical soil profile of the watershed (dominant soil)

Horizon	Depth (cm)	Morphology
A	0-150	Braun in color, clay content 23%, with free $CaCO_3$, soft when moist, soft when dry. Medium elasticity.
B	150-600	Whitish-silver in colour, low effervescence with dilute HCl, medium hard when dry, compact & indurate hard pan no, restricting development of root and downward water transmission (locally called as *padua* soil)
C	> 600	Fine to coarse layer with kankar

SOIL CHARACTERISTIC AND FERTILITY STATUS:

Soil characteristics pertaining to soil fertility of various classes occurring around different villages are given in Table below:

Soil characteristics and fertility status

Soil proterties	LCC II	LCC IV	LCC VII/VIII
Sand (%)	47.04	75.04	73.04
Silt (%)	24.6	18.6	20.3
Clay (%)	28.36	6.36	6.66
Texture	Sandy clay loan	Loamy sand	Loamy sand
pH (1:2)	8.41	8.67	6.85
EC (ds m-1)	0.47	0.12	0.16
Organic carbon (%)	0.37	0.12	0.19
Available N (kg ha-1)	316	173	224
Available P (kg ha-1)	29	15	5-8
Available K (kg ha-1)	189	325	230

Values correspond to soil fraction <2mm

Land Capability Classification (LCC)

Land capability classification was done to classify the soils in different groups based upon the limitations and to emphasize the hazards prevailing in the watershed under different kinds of soils. Initially reconnaissance survey was carried out for entire watershed in order to find out the different topo-sequences, landforms, soil depth and erosion hazards. This was followed by the detailed investigation of selected landforms to bring out

the LCC classes of the Watershed. Two classes of land capability namely III, IV, and V were demarcated in the watershed. The areas under different classes are sown in table 12. and Annexure map.

Area under different land capability class under watershed

Land Capability Class	Area (ha)
II	5323.56
III	2256.44
Total	**7580.00**

Land capability class II (sky blue)

This group is one of the most extensive LCC class of the watershed. This group of soil is occupying around 5323.56 ha of the watershed area. The soils are coarse loamy in texture. The land under this class is nearly level to mild sloping (1-3%). The soils are deep and erosion simler is slight. Most of the productive agriculture land comes under class II. A considerable area of watershed is seasonally waterlogged comes under this LCC class, primarily found near the earthen check. These areas are subject to water logging in most part of the year. The lands are almost flat,coarse loamy in texture, deep and very mild slopping. These lands have no major limitations other than occasional water logging. During *rabi* season, the water is drained out and cultivation is carried out. These lands potentially very productive.

Land capability class IV (Pink)

A considerable area of watershed *i.e.*2256.44 ha is under class IV. This class is found in lower and upper portion i.e. near the outlet of watershed. The soils are coarser in texture (loamy sand/sand), deep, susceptible to erosion hazard and undulating in topography. Rill and initiation of gully can be seen near the outlet of the watershed. where soils are coarser in texture and shallow in depth, is also coming under this class.

Annexure map.

Conclusions

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

PRESENT AND PROPOSED LAND USE IN THE WATERSHED

Watershed management plan for the watershed prepared with specific objectives of food sufficiency and income and employment generation with environment security. In plan preparation due importance was given to topographic, land suitability, irrigation potentially prevailing farming systems, microfarming situation, farming, farmer preferences and priorities along with economic and environment securities. Crop and tree selection and area distribution was done as per famers priorities revealed through PRA exercise.

Technological options were blended with the ITK based on the latest available research experiment findings for this reason. Due action was given to the resource of the farmers and adjustment were made in capital intensive high resource demanding technological outputs while making them adoptable to the resource poor farmers. Imphasis was given on maximum use of farm yard manure. The proposed land use plan of the watershed is shown in Table 3.3.

Table3.3 Present and proposed land use plan of the watershed

S.No.	Land use	Present (ha)	Proposed area (ha)
1	Agriculture	7224.67	7350.880
a	Rainfed	6065.00	5784.710
	I - Crops	6065.00	5352.21
	II - Agro-forestry, Agro-Horticulture	-	556.49
b	Irrigated	246.620	549.00
	I - Assured	-	-

	II- Partial	246.620	549.00
2	Waste land	271.75	138.10
a	Afforestation / Reserve forest	207.21	195.00
b	Pasture	73.97	73.97
3	Village land and others	462.81	462.81
	Total	**8182.653**	**8182.653**

Present Landuse/Landcover of the project area

S.No.	**Land use**	**Present (ha)**
1	Agriculture	7224.67
a	Rainfed	6065.00
	I Crops	6065.00
	II Agro-forestry	-
b	Irrigated	246.620
	I Assured	-
	II Partial	246.620
2	Waste land	271.75

a	Afforestation	207.21
b	Pasture	73.97
c	Untreatable	-
3	Village land	462.81
	Total	**8182.653**

DESCRIPTION

The present LU/LC map has been depicted through the satellite data of January, 2010 (Google). A total no. of 4 major categories of LU/LC has been mapped.

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 271.75 Hectare of the total mapped area. The sub categories are like Salt affected land, Gullied/Ravenous Land, Scrub Land etc.

AGRICULTRAL 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. 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 7224.67 Hectare of the total mapped area.

FOREST

These are the areas bearing an association predominantly of trees and other vegetation types (within the notified forest boundaries) capable of producing timber and other forest produce.

AGRICULTURE

Various agricultural land uses in the watershed are extended to diversified land capabilities starting from marginal to good class II lands. The watershed distinctly has three types of lands i.e. leveled, sloping and degraded and undulating. The agriculture is practiced on all these soil types though the productivity considerably varies. The total area under agriculture in the watershed is about 7224.67 ha out of which 7224.67 ha is under rain-fed agriculture. The water (both irrigated and drinking) is most scarce natural resource in the watershed. No Problem for drinking water in watershed area.The agricultural field bunds are common in the watershed, however, they frequently breach on heavy rains adversely affecting the *in situ* percolation of rain water in the soils.

The agriculture soils in the watershed have diversified texture i.e. loam sand, The irrigation water is conveyed in earthen channels and surface irrigation methods following mainly border method or flood method of irrigation by the farmers in the watershed. These factors substantially reduce the water use efficiency of limited available and valuable irrigation water in the watershed. The quality of irrigation water needs to be tested for assessing fitness of the quality for irrigation and other purposes.

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

One year rotation

Rainfed Agricuture

Single cropping

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

Double cropping

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

Irrigated agriculture

One year rotation

Bajra/jowar/sesame/black gram/green gram-mustard/water/winter vegetables

Crop productivity

The agricultural productivity is primarily driven by the amount and distribution if rain water specifically during two cropping seasons i.e. rabi and kharif. Productivity of kharif crops is also affected by the late onset or early withdrawal of monsoon as well as intermittent droughts of variable duration and intensity. The farmers also do not have suitable cropping systems to deal aberrant weather. Weeds impose considerable constraint in productivity of both

Kharif and rabi crops under irrigated as well as rain-fed production system. Farmers undertake normally one manual weeding in mustard and other valuable crops however, practice is energy and time consuming. Use of weedicide is rare in the watershed.

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

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

MAJOR CROPS GROWN AND THEIR PRODUCTIVITY IN THE PROJECT AREA

1	2	3		4	
S. No.	**Name of the Crop**	**Current status**		**Expected post project status**	
		Area (ha)	Productivity (kg/ ha)	Area (ha)	Productivity (kg/ ha)
1	**Kharif**				
	Paddy	60	2130	116	2513
	Bajra	2657	1093	4081	1328
2	**Rabi**				
	Wheat	2588	2106	4252	2325
	Pulses	923	758	1501	887
3	Zaid/Other season	-	-	50	650

INDIGENOUS TECHNOLOGICAL KNOWLEDGE (ITK)

The agriculture is an old traditional practice of farmers in the watershed who have improved themselves with passage of the time according to their domestic need and technological reforms in the nearby areas. The villagers have their traditional village ponds, practice of field bunding which typically constitute agriculture related ITKs in the watershed. The mustard being a cash/fire wood crop of the watershed is being cultivated in self designed manner by the farmers. However, limited fertilizer application specifically the DAP came in to practice since about 22 years.

FOREST AND OTHER VEGETATION

FORESTS

The watershed has vast tract of denuded boulder and rock watershed. These wastelands do not have any tree vegetation. It typically falls under "Northern tropical thron forest" according to Champion and Seth classification of forest type of India.

HORTICULTURE/AGRO-FORESTRY

No horticulture and agro-forestry practices were observed in the watershed.

AGRO FORESTRY

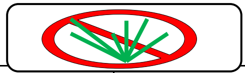
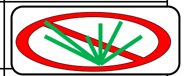
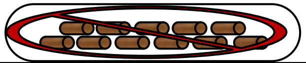
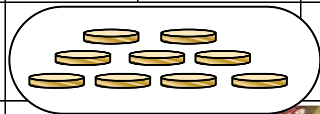
The agro-forestry practices are highly lacking in the watershed though it has good potential under existing this dispositions and may play a vital role particularly with respect to minimization of cropping risk, build up soil fertility and productivity, soil conservation, partly meeting out the fire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

HORTICULTURE

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

SEASONAL ANALYSIS

Seasonal analysis has done with the help of farmers about rainfall patterns, cultivated crops, employment, income, availability of fuel, fodder, migration, transport and health hazards, etc. with respect to seasonal variation in a year which is shown as below:

Month Item	January	February	March	April	May	June	July	August	September	October	November	December
Festivals			Holi	Baisakhi			Rakshabandhan			Dashara	Diwali	Guru Parv
Sowing crops/ harvesting			Mustard			Maize, Paddy, Arhar				Wheat		
				Wheat, Arhar					Maize, Paddy			
Disease	Cough & Cold					Gastro Intestinal/ Loose-motion.			Fever			
Purchase/ Expending					☺☺☺☺☺						☺☺☺☺☺☺☺☺☺☺	
Rains							,,					
Fodder Scarcity												
Fuel/ wood scarcity												
Loaning period (required)												
Marriage Period												
Drinking Water Scarcity												
Irrigation Water Scarcity												

LAND HOLDING PATTERN

Majority of the farmers are in the category of marginal (< 1 ha) and small (1-2 ha) with average land holding of about 0.91 ha. These small land holding are further scattered at different places, which makes cultivation very difficult. Distribution of farm families according to the size of the land holdings are given in the Table below:

Table- 3.4: LAND HOLDING POSITION

S.No.	Name of No.Code microwatershed	Name of Concern village	Land holding classification				Percentage		
			Marginal	Small	Others	Total	Marginal	Small	Others
1	Sikrori 2C4D1a2d	Simar, Sikrori.	80	30	4	114	70.00	26.3	3.5
2	Pachdevara 2C4D1a2b	Pachdevara, Gyanpur Pratap Singh, Jajpur, Gohani Khurd, Gohani, Bansepur, Malgawan.	135	10	7	152	88.81	6.57	4.60
3	Basera 2C4D1a2e	Basera	120	50	30	200	60.00	25.00	15.00

4	Amauta 2C4D1a1d	Amauta, Khukhupur, Malgawan, Niyamatpur, Shahpur.	1900	800	300	3000	63.33	26.67	10.00
5	Gohani 2C4D1a2a	Gohani, Nakhatpur, Gohani Khurd, Basepur, Jajpur.	450	150	200	800	56.5	18.75	25.00
6	Makg anva 2C4D1a1e	Makganva, Gohani Kala, Asava Kaithauli.	315	130	170	615	51.21	21.13	28.00
7	Kaithauli 2C4D1a1a	Kaithauli, Rampur Pratap Singh, Asevta.	200	125	89	414	48.00	30.00	22.00
8	Ramnagar 2C4D1a1c	Ramnagar.	30	20	10	60	50.00	33.00	16.6
9	Malganva 2C4D1a1b	Malganva	100	30	20	150	66.67	20.00	13.33

10	Asevta 2C4C7g2a	Asevta, Kaithauli, Aseva.	300	30	5	335	89.55	8.95	1.50
11	Aseva 2C4C3g2a	Aseva, Bisalpur, Kakraiya, Haidarpur, Biroohuni, Kaithauli, Surjanpur, Shohari Gadiya	330	15	3	348	94.82	4.3	-
12	Biroohuni 2C4C3g2c	Biroohuni, Elchinagar, Halepur, Haidarpur.	301	97	17	415	72.53	23.37	4.00
	Total		**4261**	**1487**	**855**	**6603**	**64.53**	**22.52**	**12.94**

LIVELIHOOD ACTIVITIES

Out of the total population of 45629 in the watershed, a majority *i.e.* more than 80 % has farming as their major source of livelihood followed by 17 % laborers and 3 % service + business class.

Income generating activities through Self Help Group, landless and marginal farmers like farming, Animal husbandry, Fisheries, Carpentary, Barberry & Self-Help Group, Carpet etc.

SUMMARY OF LIVLIHOOD

No. of Villages	Existing livelihood activities	Possible livelihood intervention under the project	Current status of migration(No. of people)	Main reason of migration
30	Agriculture	Animal husbandry, Fisheries, Agriculture labour, Horticulture	210	Due to Unemployment in village & Poverity

INFRASTRUCTURE SOCIAL FEATURES

The watershed has moderate communication facilities and all Thirty villages Concer majra are approachable through motorable road. Literacy rate in the watershed is Satisfactry because all villages are having education upto Inter college. Mostly villages are electrified and have TV & telephonic connection. Nearest small market is at Ajeetmal about 0-1 km and nearest big market Auraiya District Hedquater is about 32 km from the watershed. Religious and ritual features are almost common as in other part of the U.P. Small land holding (average less than 2 ha) with large family size (average 6 person) and more than 46 % of the labour force of the total population living below poverty line indicate poor socio economic status of the watershed community. However, strong community spirit among the villager's show positive indication for the success of

any programmed to be implemented in participatory mode. Traditionally the entire village community participates in the individual works. Map of the watershed villages drawn by villagers themselves, depicting various village features is shown in Table as below.

Table – 3.6: Details of infrastructure in the Project Area

S.No.	Name of vill	Pakka Road	Electric city	Primary School	Jun. high School	Inter college	Panchayat Bhavan	Post Offi.	P.H.C.	Bank	Vetnary hospital	Co-op. Society	Market	Agri. Service centre.
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**
1	Sikrori 2C4D1a2d	½ km	√	0 km	√	-	0 km	-	-	-	-	-	10 km	-
2	Pachdevara 2C4D1a2b	√	√	√	√	-	√	-	-	-	-	-	5 km	-
3	Basera 2C4D1a2e	0 km	0 km	0 km	0 km	2 km	0 km	0 km	8 km	15 km	15 km	15 km	12 km	18 km
4	Amauta 2C4D1a1d	0 km	0 km	0 km	2 km	0 km	0 km	0 km	0 km	3 km	0 km	0 km	0 km	5 km
5	Gohani 2C4D1a2a	0 km	0 km	0 km	0 km	6 km	1.5 km	0 km	2 km	10 km	6 km	6.2 km	10 km	10 km
6	Makganva 2C4D1a1e	0 km	0 km	0 km	0 km	3 km	0 km	2 km	4 km	4 km	2 km	2 km	4 km	4.2 km

7	Kaithauli 2C4D1a1a	0 km	-	0 km	7 km	7 km	-	7 km	7 km	12 km	15 km	4 km	7 km	3 km
8	Ramnagar 2C4D1a1c	0 km	0 km	0 km	0 km	5 km	-	5 km	5 km	5 km	5 km	8 km	5 km	5 km
9	Makganva 2C4D1a1b	0 km	0 km	0 km	0 km	2 km	0 km	2 km	4 km	2 km	2 km	2 km	4 km	4 km
10	Asevta 2C4C7g2a	10 km	-	1 km	1 km	7 km	-	7 km	7 km	12 km	-	15 km	7 km	33 km
11	Aseva 2C4C3g2a	0 km	0 km	0 km	0 km	7 km	0 km	7 km	7 km	12 km	16 km	5 km	12 km	26 km
12	Biroohuni 2C4C3g2c	0 km	0 km	0 km	0 km	0 km	0 km	0 km	0 km	7 km	4 km	0 km	0 km	11 km

HISTORICAL TIME LINE OF VILLAGES OF THE PROJECT

Historical time line for village Sikrori.

S.No.	Activities	Year
1	Established	300
2	Construction Bandhi (water harvesting structure)	-
3	Opening up Primary school	1995
4	Introduction of Tractor	1990
5	Establishment of P.H.C.	-
6	Kacha road	1985
7	Introduction of Chemical fertilizer	1984
8	First Tube well /Diesel pump set	1985
9	First Motorcycle	1990
10	TV and DVD player	1999
11	Over head water tank/Hand pump	-
12	Electricity in the village	2010
13	Bituminous road	1985
14	Mobile phone	2005
15	Planning for watershed project	-

Village Pachdevara.

S.No.	Activities	Year
1	Established	400
2	Construction Bandhi (water harvesting structure)	15
3	Opening up Primary school	1990
4	Introduction of Tractor	1975
5	Establishment of P.H.C.	-
6	Kacha road	1985
7	Introduction of Chemical fertilizer	1970
8	First Tube well /Diesel pump set	1980
9	First Motorcycle	1985
10	TV and DVD player	1999
11	Over head water tank/Hand pump	-
12	Electricity in the village	2005
13	Bituminous road	2004
14	Mobile phone	2006
15	Planning for watershed project	-

Village Badera.

S.No.	Activities	Year
1	Established	1300
2	Construction Bandhi (water harvesting structure)	2007
3	Opening up Primary school	1910
4	Introduction of Tractor	1980
5	Establishment of P.H.C.	-
6	Kacha road	1980
7	Introduction of Chemical fertilizer	1970
8	First Tube well /Diesel pump set	1980
9	First Motorcycle	1950
10	TV and DVD player	1995
11	Over head water tank/Hand pump	-
12	Electricity in the village	1980
13	Bituminous road	1999
14	Mobile phone	2002
15	Planning for watershed project	2007

Village Amauta.

S.No.	Activities	Year
1	Established	1200
2	Construction Bandhi (water harvesting structure)	2007
3	Opening up Primary school	1950
4	Introduction of Tractor	1970
5	Establishment of P.H.C.	2009
6	Kacha road	1980
7	Introduction of Chemical fertilizer	1985
8	First Tube well /Diesel pump set	1960
9	First Motorcycle	1980
10	TV and DVD player	1989
11	Over head water tank/Hand pump	-
12	Electricity in the village	1990
13	Bituminous road	1995
14	Mobile phone	2003
15	Planning for watershed project	2007

Village Gohani Kala.

S.No.	Activities	Year
1	Established	1697
2	Construction Bandhi (water harvesting structure)	1992
3	Opening up Primary school	1991
4	Introduction of Tractor	1985
5	Establishment of P.H.C.	-
6	Kacha road	1979
7	Introduction of Chemical fertilizer	1987
8	First Tube well /Diesel pump set	1957
9	First Motorcycle	1975
10	TV and DVD player	1980
11	Over head water tank/Hand pump	1979
12	Electricity in the village	2000
13	Bituminous road	2001
14	Mobile phone	2003
15	Planning for watershed project	1993

Village Makganva .

S.No.	Activities	Year
1	Established	1700
2	Construction Bandhi (water harvesting structure)	1990
3	Opening up Primary school	1960
4	Introduction of Tractor	1980
5	Establishment of P.H.C.	-
6	Kacha road	1980
7	Introduction of Chemical fertilizer	1980
8	First Tube well /Diesel pump set	1991
9	First Motorcycle	1975
10	TV and DVD player	1990
11	Over head water tank/Hand pump	-
12	Electricity in the village	1995
13	Bituminous road	2000
14	Mobile phone	1995
15	Planning for watershed project	1996

Village Kaithauli.

S.No.	Activities	Year
1	Established	1400
2	Construction Bandhi (water harvesting structure)	2000
3	Opening up Primary school	1952
4	Introduction of Tractor	1990
5	Establishment of P.H.C.	-
6	Kacha road	1989
7	Introduction of Chemical fertilizer	1986
8	First Tube well /Diesel pump set	-
9	First Motorcycle	1991
10	TV and DVD player	2003
11	Over head water tank/Hand pump	1988
12	Electricity in the village	2006
13	Bituminous road	1995
14	Mobile phone	2006
15	Planning for watershed project	1999

Village Ramnagar .

S.No.	Activities	Year
1	Established	1600
2	Construction Bandhi (water harvesting structure)	1996
3	Opening up Primary school	1995
4	Introduction of Tractor	1970
5	Establishment of P.H.C.	-
6	Kacha road	1995
7	Introduction of Chemical fertilizer	1985
8	First Tube well /Diesel pump set	1995
9	First Motorcycle	1990
10	TV and DVD player	2000
11	Over head water tank/Hand pump	-
12	Electricity in the village	2003
13	Bituminous road	1995
14	Mobile phone	2006
15	Planning for watershed project	-

Village Malgawna.

S.No.	Activities	Year
1	Established	1700
2	Construction Bandhi (water harvesting structure)	1990
3	Opening up Primary school	1960
4	Introduction of Tractor	1980
5	Establishment of P.H.C.	-
6	Kacha road	1980
7	Introduction of Chemical fertilizer	1980
8	First Tube well /Diesel pump set	1991
9	First Motorcycle	1975
10	TV and DVD player	1990
11	Over head water tank/Hand pump	-
12	Electricity in the village	1995
13	Bituminous road	2001
14	Mobile phone	2005
15	Planning for watershed project	1996

Village Asewta .

S.No.	Activities	Year
1	Established	1600
2	Construction Bandhi (water harvesting structure)	12
3	Opening up Primary school	1952
4	Introduction of Tractor	1989
5	Establishment of P.H.C.	-
6	Kacha road	1989
7	Introduction of Chemical fertilizer	1985
8	First Tube well /Diesel pump set	1977
9	First Motorcycle	1990
10	TV and DVD player	2000
11	Over head water tank/Hand pump	1987
12	Electricity in the village	-
13	Bituminous road	1995
14	Mobile phone	2005
15	Planning for watershed project	12

Village Asewa.

S.No.	Activities	Year
1	Established	1300
2	Construction Bandhi (water harvesting structure)	1995
3	Opening up Primary school	1998
4	Introduction of Tractor	1981
5	Establishment of P.H.C.	-
6	Kacha road	2000
7	Introduction of Chemical fertilizer	1995
8	First Tube well /Diesel pump set	1990
9	First Motorcycle	1988
10	TV and DVD player	2004
11	Over head water tank/Hand pump	1995
12	Electricity in the village	2000
13	Bituminous road	2004
14	Mobile phone	2006
15	Planning for watershed project	-

Village Biroohuni .

S.No.	Activities	Year
1	Established	1400
2	Construction Bandhi (water harvesting structure)	-
3	Opening up Primary school	1955
4	Introduction of Tractor	1969
5	Establishment of P.H.C.	1989
6	Kacha road	1970
7	Introduction of Chemical fertilizer	1970
8	First Tube well /Diesel pump set	1968
9	First Motorcycle	1968
10	TV and DVD player	1985
11	Over head water tank/Hand pump	2005
12	Electricity in the village	1973
13	Bituminous road	1991
14	Mobile phone	2000
15	Planning for watershed project	2005

MEANS OF COMMUNICATION

The watershed can approached from Ajeetmal Twoun Area 8 km. All villages are also interconnected by village Pakka road. One side of the watershed (ridge) is having Madhya Pradesh State boundary.

NATURAL RESOURCE BASE

Out of total area 7580.00 ha area of watershed, an area of 5460.00 ha (89.74%) is under rainfed agriculture and 271.75 ha (3.57 %) under waste land occupying forest area 207.21 ha (2.74%) And pasture land 73.97 ha (0.97 %) and village land and road etc. is 462.81 ha (6.13%). Main sources of irrigation are the seasonal water bodies for pre sowing irrigation only. Transact of the watershed showed plain agricultural land and ravenous lower ridge.

IMPORTANCE OF DEVELOPMENT INSTITUTIONS

In the *venn* diagram, farmers perception was recorded for importance and role of different development intuition in relation to infrastructure in the villages. Importance has been depicted with size of the circle and role with distance from village circle.

LIVELIHOOD

Out of the total population of 45629 in the watershed, a majority *i.e.* more than 80 % has farming as their major source of livelihood followed by 17 % laborers and 3 % service + business class.

DEPENDENCY ON FOREST FOR FUEL WOOD AND FODDER

(a) Fuel wood

Villagers in the village do not use LPG to meet their cooking energy requirements. The main source of fuel is from cow dung cake, wood stem of Arhar crop and mustard. About 60 to 65 present of the domestic energy requirements is met from the agro-by product and cow dung cake. Rest is met out from the forest outside the village and watershed boundary. Most preferred fuel wood is Arhar Fuel wood is obtained from yhe forest of the prosopis Arhar standing along the river Yamuna & Chambal River situated outside the watershed boundary.

(b) Fodder:

Villagers do not have any significant dependency on forest based fodder as these resources are not available in the forests.

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.

LACK OF FINANCES FOR FARMERS

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

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.

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.

HYDROLOGY AND WATER RESOURCE CATEGORIES

Water resources are divisible into two distinct categories: the surface-water resources & the ground-water resources. Each of these categories is a part of the earth's water circulatory system,called the hydrologic cycle, & is ultimately derived from precipitation,which is rainfall plus snow. They are interdependent & frequently the loss of one is the gain of the other. The brief description of the run-off cycle,which is a part of the hydrologic cycle,will help us to understand the origin & the interdependence of these two categories of water resources.

The precipitation that falls upon land & is the ultimate source for both the categories of water resources is dispersed in several ways. A sizeable portion is intercepted by the vegetal cover or temporarily detained in surface depressions.Most of it is later lost through evaporation. When the available interception or the depression storage are completely exhausted & when the rainfall intensity at the soil surface exceeds the

infiltration capacity of the soils, the overland flow begins.Once the overland flow reaches a stream channel, it is called surface run-off, which together with other components of flow, forms the total run-off.

Part of the water that infiltrates into the surface soil may continue to move laterally at shallow depth as interflow owing to the presence of relatively impervious lenses just below the soil surface & may eventually reach the stream channel when it is called the sub-surface runoff. A part of the sub-surface run-off may enter the stream promptly, whereas the remaining part may take a long time before joining the stream flow.

A second part of the precipitation which infiltrates is lost through evapo-transpiration via plant roots & thermal gradients just below the soil surface. A third part may remain above the water table in the zone of unsaturated flow.A fourth remaining part percolates deeply into the ground-water.Part of this ground-water may eventually reach the stream channel & become the base flow of the stream. This portion is termed ground-water run-off or ground-water flow.

Apart from infiltrated rain-water, the seepage from canals,ponds,tanks,lakes,irrigated fields,etc.is also dispersed & accounted for in the same manner.

The total run-off in the stream channel includes the snow-melt, the surface run-off the sub-surface run-off, the ground-water run-off & the channel precipitation, i.e. the precipitation falling directly on the water surface of streams,lakes,etc. It constitutes what is known as the surface-water resources. The portion of the precipitation which, after infiltration,reaches the ground-water-table, together with the contribution made to ground water from a neighbouring basin, influent rivers,natural lakes,ponds,artificial storage reservoirs,canals,irrigation,& constitutes the ground-water resources.That quantity of water in the ground-water reservoir, which is not annually replenishable, is not taken into account, as it is a sort of dead storage which cannot be used on a continuing basis from year to year.

The above phase of the run-off cycle pinpoints the inflow components for the surface-as well as for the ground-water resources. It has to be appreciated that there is always a balance between the inflow factors making up water resources of a region, whether surface or ground, & the outflow components. The surface water resource of a given basin in excess of the withdrawal use is accounted for on the outflow side by one or more of the following factors:

(i) Stream outflow from the basin;

(ii) Loss through evaporation;and

(iii) The influent recharge to the ground water.

Similarly, the unutilised ground-water resource of a basin is accounted for by the following outflow factors:

(i) Evapo-transpiration from the ground-water-table;
(ii) Outflow to the neighbouring ground-water basin;
(iii) The effluent discharge to the streams;and
(iv) The addition to the ground-water storage.

The interrelationship between the surface-water & the ground-water resources is evident from the above analysis.The surface-water resources contribute to the ground-water recharge in various ways:

(i) By influent recharge from the streams;

(ii) By seepage from natural lakes, ponds, etc;

(iii) Seepage from artificial storage reservoirs, canal systems, etc, &

(iv) Return flow from irrigation. These factors presently contribute to about 25 percent of the country's total ground-water resources.

On the other hand, the bulk of the base-flow in the rivers, which represents the sustained fair-weather run-off is contributed by the ground-water resources. This contribution,presently, is roughly assessed at about 25 percent of the total surface-water resources of the country.

Factors Affecting Water Resources

The water resources of a region,conceived as a dynamic phase of the hydrologic cycle, are influenced by the following three major groups of factors:

1. **Climatic Factors**
   A. Rainfall: its intensity, duration & distribution.
   B. Snow
   C. Evapo-transpiration
2. **Physiographic Factors**
   A. Basic characteristics.
      1. Geometric factors: drainage area,shape,slope & stream density.
      2. Physical factors: land use, surface infiltration conditions,soil types,etc.
   B. Channel characteristics: carrying capacity & storage capacity.
3. **Geological Factors**
   A. Lithologic including composition, texture, sequenceof rock types & the thickness of rock formations.

B. Structural, including chief faults & folds that interrupt the uniformity of occurence of rock types or sequence of rock types also beds, joints, fissures, cracks, etc.

C. Hydrologic characteristics of the aquifers permeability, porosity, transmissivity, storability,etc

The physiographic features (including geological factors) not only influence the occurence & distribution of water resources within a region but these, particularly the orography, play a significant role in influencing rainfall & other climatic factors, such as temperature, humidity & wind. However, within a geographical location & physiographic framework, it is primarily the rainfall (its intensity, duration & distribution) & the climatic factors affecting evapo-transpiration that determine the totality of water resources in the region.

SOIL AND MOISTURE CONVERSATION AND EFFICIENT USE OF WATER

Water is essential for all life and is used in many different ways - for food production, drinking and domestic uses and industrial use. It is also part of the larger ecosystem on which bio diversity depends. Precipitation, converted to soil and groundwater and thus accessible to vegetation and people, is the dominant pre-condition for biomass production and social development in drylands. The amount of available water is equivalent to the water moving through the landscape. It also fluctuates between the wet and dry periods. Fresh water scarcity is not limited to the arid climatic regions only. Even in areas with good supply, the access to safe water is becoming a critical problem. Lack of water is caused by low water storage capacity, low infiltration capacity, large inter-annual and annual fluctuations of precipitation and high evaporative demand.

A variety of essential soil moisture and water conservation technologies must be adopted to reduce the cost of irrigation, extend it throughout and promote sustainable small-scale irrigation on a watershed basis. These technologies are essential especially in drought-prone areas. Even though drought is a purely natural calamity caused by the failure of (monsoon) rain, it can be minimized by careful planning and operation.

During good rainy years, excess rainwater should be stored in the soil and also underground using suitable soil moisture conservation measures and water harvesting structures on a watershed basis. This stored water can subsequently be used for irrigation.

Conceptual approach

Watershed development and management implies an integration of technologies within the natural boundary of a drainage area for optimum development of land, water and plant resources, to meet the people's basic needs in a sustained manner. A watershed is an area from which runoff resulting from precipitation flows past a single point into a large stream, river, lake or pond. Each watershed is an independent hydrological unit. It has become an acceptable unit of planning for optimum use and conservation of soil and water resources.

The concept of integrated watershed development refers to the development and management of the resources in the watershed to achieve higher sustainable production without deterioration in the resource base and any ecological imbalances. This concept requires the formulation and implementation of a package of programmes with activities for optimum resource use in the watershed without adversely affecting the soil and water base or life supporting system. The concept assumes more importance in the context of planning for sustained development. Watershed development aims at preventing watershed degradation resulting from the interaction of physiographic features. It eliminates unscientific land use, inappropriate cropping patterns and soil erosion, thereby improving and sustaining productivity of resources leading to higher income and living standards for the inhabitants in the watershed area. It therefore involves restoration of the ecosystem, protecting and utilizing the locally available resources within a watershed to achieve sustainable development.

Rainfall failure occurs once every 3 to 5 years and is usually below 50% of the average annual rainfall of the region. During periods of rainfall failure, the groundwater level lowers since fluctuations in the water table levels depend on the rainfall when both surface and groundwater availability becomes critical. Drought begins to prevail and there is difficulty to cope up with the water demand during this period. Similarly, in some locations or areas water shortage is observed just before the rainy season commences. These two situations can be managed if suitable soil and moisture conservation measures are systematically implemented on a small watershed basis.

There are always strong links between soil conservation and water conservation measures. Many actions are directed primarily to one or the other, but most contain an element of both. Reduction of surface runoff can be achieved by constructing suitable structures or by changes in land management. Further, this reduction of surface runoff will increase infiltration and help in water conservation.

Appropriate structures and their functions

To increase the period of water availability and overcome water scarcity in drought years, the following activities can be implemented in the field for a compact, viable watershed of about 200 - 500 ha.

Soil and water conservation can be approached through agronomic and engineering procedures. Agronomic measures include contour farming, off season tillage, deep tillage, mulching and providing vegetative barriers on the contour. These measures mainly prevent soil erosion but will also help in improving soil moisture availability in the watershed.

Soil and water conservation measures on a watershed basis

The engineering measures adopted differ with location, slope of the land, soil type, amount and intensity of rainfall. Depending on these parameters, the methods commonly used are contour trenching, contour stone walls, construction of temporary and permanent check dams and gully plugging structures. Additionally, percolation ponds, silt detention tanks and irrigation tanks are constructed to harvest water and recharge it to the groundwater for use in agriculture (irrigation). Farm ponds can also be constructed for every 4-5 ha in the watershed to provide protective/supplemental irrigation.

The above soil and water conservation management and water harvesting programme should be implemented in an integrated manner on a catchment/watershed basis.

Functions of the structures

Contour bunds, contour barriers (vegetative and stone), contour trenches and contour stone walls will not only prevent soil erosion but also obstruct the flow of runoff water. Consequently, the obstructed water will increase the soil moisture and recharge the groundwater in the area.

Check dams: This may be a temporary structure constructed with locally available materials. The various types are: Brush wood dam, loose rock dam and woven wire dam. The main function of the check dam is to impede the soil and water removed from the watershed. This structure is cheap, but lasts about 2-5 years. The cost of the structure depends on the materials used, the size of the gully and the height of the obstruction (dam). A permanent check dam can be constructed using stones, bricks and cement. Small earth work is also needed on both sides. This water recharges the groundwater.

Percolation Pond: The percolation pond is a multipurpose conservation structure depending on its location and size. It stores water for livestock and recharges the groundwater. It is constructed by excavating a

depression, forming a small reservoir or by constructing an embankment in a natural ravine or gully to form an impounded type of reservoir. The capacity of these ponds or tanks varies from 0.3 to 0.5 mcft (10 000 - 15 000 m^3). Normally 2 or 3 fillings are expected in a year (season) and hence the amount of water available in one year in such a tank is about 1 mcft to 1.5 mcft (30 000 - 45 000 m^3). This quantity of water, if it is used for irrigation, is sufficient to irrigate 4-6 hectares of irrigated dry crops (maize, cotton, pulse, etc.) and 2-3 hectares of paddy crop.

Irrigation Tank: The main function of this storage structure is irrigating crops. It is constructed below the above-mentioned structures in a watershed. Each tank can irrigates from 10 to 5 000 hectares. Earthen bunds are reinforced with masonry to collect and store rainwater for irrigation. The cost of this tank (dam) depends upon the size, location and site condition. Water from the tanks is normally used to grow paddy crop.

Apart from the above, to increase moisture availability to agricultural and tree crops, in situ moisture conservation techniques must be adopted in addition to the large scale soil and moisture conservation and water harvesting structures in the watershed.

The following are some of the *in situ* moisture conservation measures which can be practised in the watershed to increase production.

For agricultural crops, the measures adopted are forming ridges and furrows, broad bed and furrows, basins, tie ridging (random tie ridges) and water spreading.

For tree crops micro catchment, saucer basin, semi-circular bund, crescent shaped bunds, V ditch technology, catch pits and deep pitting can be practised.

In addition to the above measures and structures, small storage structures with a water storage capacity for an area of about 0.4 to 0.5 ha can be constructed in large numbers one for every 10 to 20 ha catchment or watershed at the foot hills slopes and hilly areas. These storage facilities would attenuate the floods during storms. These measures will also ensure soil moisture for good growth of trees grown down stream recharging the groundwater in the region and making available more water for drinking and irrigation water.

PROBLEMS AND NEEDS

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

Problems identified and prioritized during the transact walk and PRA exercises in all Thirty villages. simar, Gayanpur Pratapsingh, Sikrori, Pachdevra , Khukhupur, Bedera, Niyamatpur, shahpur, Jajpur, Bhurepur Kala, Nakhatpur, Gohani kala, Malgawan, Gohani Khurd, Ramnager, Bisalpur, Halepur, kakraiya, Surjanpur, Alichinagr ,Muhiuddinpur, Birohni, SaraiTadva,Amaota, Haidarpur, Phoolpur, Rampur Pratap Singh, Asewta, Kathali, Asawa were pooled and a list of Nine problems representing the whole watershed was prepared. Problems were ranked as per their total weight age in the Thirty villages. Lack of irrigation water was the greatest problem experienced by the people followed by low production of filed crops, lack of fodder availability and low animal.

CHAPTER - 4

INSTITUTION BUILDING & PROJECT MANAGEMENT

1. BRIEF DESCRIPTION ABOUT PIA:

PROJECT MANAGEMENT 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.

STAFF AT PROJECT IMPLEMENTING AGENCY (PIA)

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

Table 4.1: Details Staffing Pattern of PIA

S.No.	Name	Desingnation	Qualification
1	2	3	4
1	Shri Shob Nath	Bhoomi Sanrakshan Adhikari	Intermediate Civil Engg. (Diploma)
2	" ShivGopal Goswami	Junior Engineer	Intermediate Agriculture Engg. (Diploma)
3	" Vibhooti Prasad Dabgar	Accountant	B.Com.
4	" Chandra Shekhar Kushvaha	Draughtsman	Diploma in (Civil)
5	" Anil Kumar Shrivastava	Trecer	Intermediate
6	" Anil Kumar	Jr. Clerk	B.Sc.
7	" Balkishun Ram	A.S.C.I.	M.Sc. (Ag) Agronomy
8	" Bateshvar Pandey	Irrigation Sup.	B.A.
9	" Nabab Ahmad Siddikee	Irrigation Sup.	Intermediate
10	" Vijay Bahadur Yadav	Munshi	Intermediate(Ag)
11	" Divjendra Nath Pandey	Irrigation Sup.	Intermediate

12	" Sukhveer Singh	Irrigation Sup.	Intermediate
13	" Santosh Kumar Sharma	Irrigation Sup.	M.Com.
14	" Ramsuchit Vishvkarma	Irrigation Sup.	Intermediate
15	" Chandresh Kumar Rawat	Irrigation Sup.	M.A.
16	" Narmeshvar Upadhyay	IVth Class	Intermediate
17	" Jameer Ahamad Rijvee	IVth Class	High School
18	" Ramvilas	IVth Class	High School
19	" Ram Achal Yadav	Dak Rannar	High School

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 points 40 P. I. A. has been constituted Watershed Development Team as given below.

आदेश

भारत सरकार ग्रामीण विकास मंत्रालय, नई दिल्ली द्वारा वाटरषेड विकास परियोजना आदि के लिये समान मार्गदर्षी सिद्धान्त–2008 के पैरा 5.3 के आदेषानुसार जनपद औरैया में स्वीकृत परियोजना आई0डब्लू0एम0पी0 औरैया के समान मार्गदर्षी सिद्धान्त के अनुसार कियान्वयन हेतु निम्न प्रकार से जल संग्रहण विकास दल (W.D.T) का गठन किया जाता है एवं आदेषित किया जाता है कि समान मार्गदर्षी सिद्धान्त के पैरा 5–4 के अनुसार कार्यवाही सुनिष्चित करें।

क0 सं0	सदस्य का नाम	पद नाम	योग्यता	व्यवहारिक अनुभव	सम्बन्धित कार्य
1	श्री शोभनाथ	भूमि संरक्षण अधिकारी	Intermediate Diploma in civil Engg.	जल संग्रहण परियोजनाओ के कियान्वयन में 32 वर्ष का अनुभव	भूमि एंव जल प्रबन्ध
2	श्री षिवगोपाल गोस्वामी	अबर अभियन्ता	Intermediate Ag.Engg. (Diploma)	जल संग्रहण परियोजनाओ के कियान्वयन में 29 वर्ष का अनुभव	भूमि एंव जल प्रबन्ध
3	श्री बालकिषुन राम	स0भू0स0नि0	M.Sc. (Ag)	जल संग्रहण के संचालन में 4 वर्ष का अनुभव	कृषि एंव मृदा विज्ञान
4	प्रीती देवी w/o प्रवीण कुमार	सामान्य कार्यकर्ती	Graduation	3 वर्ष का सामाजिक कार्य का अनुभाव	सामाजिक संगठन

भूमि संरक्षण अधिकारी (पी0आई0ए0)
भूमि विकास एवं जल संसाधन विभाग
अजीतमल–औरैया

कार्यालय – भूमि संरक्षण अधिकारी, भूमि विकास एंव जल संसाधन विभाग अजीतमल (औरैया)।

पत्रॉकः भू0सं0अ0 / / प्रा0अनु0 / आई0डब्लू0एम0पी0 / 2010–11 दिनॉकः

प्रतिलिपि– निम्नलिखित को उपरोक्तानुसार सूचनार्थ एंव आवष्यक कार्यवाही हेतु सादर प्रेशित।

1- वाटरषेड विकास दल (W.D.T) के समस्त सदस्यों को।
2. उपनिदेषक, भूमि विकास एंव जल संसाधन विभाग 118 / 432 कौषल पुरी (बलवन्त भवन) कानपुर मण्डल कानपुर।
3. परियोजना निदेषक, जिला ग्राम्य विकास विकास अभिकरण, औरैया।
4. मुख्य विकास अधिकारी, औरैया।
5. जिलाधिकारी, औरैया।
6. अध्यक्ष एवं प्रषासक, रामगंगा कमाण्ड परियोजना 117 / एच–2 / 193 पाण्डुनगर कानपुर।
7. विषेश सचिव, भूमि विकास एवं जल संसाधन विभाग, उ0प्र0 षासन,लखनऊ।

भूमि संरक्षण अधिकारी (पी0आई0ए0)

भूमि विकास एवं जल संसाधन विभाग

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.

a. Assist Gram Panchayat /Gram Sabha in constitution of the watershed committee and their functioning.
b. Organizing and nurturing User Groups and Self-Help Groups.
c. Mobilizing women to ensure that the perspectives and interests of women are adequately related in the watershed action plan.
d. Conducting the participatory base –line surveys, training and capacity building.
e. Preparing detailed resource development plans including water and soil conservation or reclamation etc. to promote sustainable livelihood at household level.
f. Common property resource management and equitable sharing.
g. Preparing Detailed Project Report (DPR) for the consideration of Gram Sabha.
h. Undertake engineering surveys, prepare engineering drawing and cost estimates for any structure to be built.
i. Monitoring, checking, accessing, and undertaking physical verification and measurement of work done.
j. Facilitating the development of livelihood opportunities for the landless.
k. Maintaining project accounts.
l. Arranging physical, financial and social audit of the work undertaken.
m. Setting up suitable arrangements for post-project operation, maintenance and future development of the assets created during the project period.

WATERSHED COMMITTEE (WC)

It is committee that is constituted by Gram Sabha to implement the watershed with technical support of WDT in the village. This committee is registered under society Registration Act 1860. The Gram Sabha of the village select the chairman of the watershed committee with the secretary who will be a paid functionary. A watershed committee was formed accordingly in I.W.M.P-I, Auraiya . The watershed include 25 villages has 03 separate micro-watershed committee was formed in the village. Capacity building training to the watershed committee is given by WDT.

The watershed committee has a pivotal role to play during and after the project implementation period.

Table 4.3: DETAILS OF WATERSHED COMMITTEE, I.W.M.P-II, AURAIYA

जल संग्रहण समिति का गठन ग्राम पंचायत– असेवटा

क0सं0	चयनित सदस्य का नाम	आयु वर्ष में	चयन का आधार	पद	ग्राम
1	2	3	4	5	6
1	श्री बलभद्र सिंह उ0 श्री सोहन सिंह	46	प्रयोक्ता समूह	अध्यक्ष	असेवटा
2	यदुनन्दन सिंह उ0 जगत सिंह	45	"	सदस्य	"
3	राजेश पटेल उ0 श्याम सिंह	32	"	"	"
4			स्वयं सहायता समूह	"	"
5	जगदीश सिंह उ0 मोतीलाल	48	"	"	"
6	अभिलाषा पुत्री सुरेन्द्र	26	"	"	"
7	रत्नेश सिंह उ0 केदारलाल	32	"	"	"
8	महेश सिंह उ0 शिवप्रसाद	30	भूमि हीन	"	"
9	श्रीमती लालदेवी ज0 रमाकान्त	48	ग्राम सभा म0	"	"
10	शशी देवी उ0 सुरेश सिंह	37	एस0सी0 महिला	"	"
11	[illegible]		परियोजना प्रभारी	"	"
12					

उपरोक्त समिति के समस्त सदस्यों का चयन ग्राम सभा की बैठक में सर्व सम्मति से किया गया है।

बलभद्र सिंह यादव
प्रधान
ग्राम पचायत असेवटा
विकास खण्ड व जनपद औरैया
नाम–
पदनाम–
दिनॉक–

जल संग्रहण समिति का गठन ग्राम पंचायत– कचनी

क0सं0	चयनित सदस्य का नाम	आयु वर्ष में	चयन का आधार	पद	ग्राम
1	2	3	4	5	6
1	श्री बलभद्र सिंह पु० श्री रतनवर सिंह	46	प्रयोक्ता समूह	अध्यक्ष	कचनी
2	,, रमाकांत दुबे पु० रामाधीन	55	,,	सदस्य	,,
3	,, शिव कुमार पु० रघु पाल	54	,,	प्रयोक्ता समूह	,,
4	,, भगन लाल पु० महँगीर	44	स्वयं सहायता समूह	,,	,,
5	,, कल्ला बिहारी पु० घंटा लाल	30	,,	,,	,,
6	,, महंगा राम पु० मुन्नी लाल	47	,,	,,	,,
7	,, पवन कुमार पु० ईश्वर दयाल	28	,,	स्वयं सहायता समूह	,,
8	श्री घंटे लाल पु० मातादीन	30	भूमि हीन	,,	,,
9	,, सती माला देवी पत्नी पु० लक्ष्मी शंकर	50	ग्राम सभा म0	,,	,,
10	,, सती उर्मिला पत्नी राजा बाबू	42	एस0सी0 महिला	,,	,,
11	आर० एस० विश्वकर्मा	9-8-1960	परियोजना प्रभारी	सचिव	अजीविका कार्यालय
12					

उपरोक्त समिति के समस्त सदस्यों का चयन ग्राम सभा की बैठक में सर्व सम्मति से किया गया है।

आर० एस० विश्वकर्मा
परि० प्रभारी

बलभद्र सिंह
प्रधान
ग्राम पंचायत कचनी
विकास खण्ड व जनपद औरैया
नाम–
पदनाम–
दिनॉक–

जल संग्रहण समिति का गठन ग्राम पंचायत– धूरेपुर कला

क0सं0	चयनित सदस्य का नाम	आयु वर्ष में	चयन का आधार	पद	ग्राम
1	2	3	4	5	6
1	शिवकीर सिंह S/o पुरन सिंह	42	प्रयोक्ता समूह	अध्यक्ष	धूरेपुर कला
2	सन्तोष S/o भारत सिंह	25वर्ष	"	सदस्य	"
3	सुनील S/o महादेव पुलाट	30वर्ष	"	"	"
4	सन्तोष S/o जयदीन पुलाट	40वर्ष	स्वयं सहायता समूह	"	"
5	विनोद शुक्ला S/o जगदीश प्रसाद	40वर्ष	"	"	"
6	सुनीता W/o वीरेन्द्र सिंह	25वर्ष	"	"	"
7	माधवेन्द्री W/o बाल कृष्ण	25	"	"	"
8	रामश्रेष्ठी S/o सिद्धू लाल	60	भूमि हीन	"	"
9	चमेली देवी W/o सतीश	35	ग्राम सभा म0	"	"
10	मनीषा देवी W/o हरिश चन्द्र	22	एस0सी0 महिला	"	"
11	बालकिशन S/o श्री सुखनन्दन	35	परियोजना प्रभारी	"	"
12					

उपरोक्त समिति के समस्त सदस्यों का चयन ग्राम सभा की बैठक में सर्व सम्मति से किया गया है।

नाम–
पदनाम– पुष्पा देवी
दिनॉक–

ग्राम पंचायत धूरेपुर कला
ब्लॉक ...जीतमऊ (अमेठी)

जल संग्रहण समिति का गठन ग्राम पंचायत– विरुहनी

क0सं0	चयनित सदस्य का नाम	आयु वर्ष में	चयन का आधार	पद	ग्राम
1		3	4	5	6
1	श्रीमती राजेश्वरी देवी पत्नी श्री देवीदयाल	51	प्रयोक्ता समूह	अध्यक्ष	विरुहनी
2	श्री मुंशीलाल क0 श्री छोटेलाल	61	"	सदस्य	"
3	" हरीशरन क0 " रामस्वरूप	42	"	"	"
4	प्रमोद कुमार क0 लालाराम	35	स्वयं सहायता समूह	"	"
5	वीरेन्द्र कुमार क0 बाबूराम	37	"	"	"
6	प्रेमनारायन क0 गंगाराम	41	"	"	"
7	प्रयाग नारायन हरिबल्लभ	43	"	"	"
8	बालजीत क0 बाबूराम	36	भूमि हीन	"	"
9	श्रीमती शिवकान्ती देवी प0 विश्रामदत्त	37	ग्राम सभा म0	"	"
10	" बीना पत्नी जयभगवान कुमार	31	एस0सी0 महिला	"	"
11	सन्तोष कुमार शर्मा पुत्र श्री रामदयाल	52	परियोजना प्रभारी	"	"
12					

उपरोक्त समिति के समस्त सदस्यों का चयन ग्राम सभा की बैठक में सर्व सम्मति से किया गया है।

राजेश्वरी देवी

नाम–
पदनाम–
दिनांक–

प्रधान
ग्राम पंचायत विरुहनी
वि0 खं0 अजीतमल (औरैया)

जल संग्रहण समिति का गठन ग्राम पंचायत– असेवा

क0सं0	चयनित सदस्य का नाम	आयु वर्ष में	चयन का आधार	पद	ग्राम
1		3	4	5	6
1	श्रीमती राजेश्वरी देवी प0श्री देवीदयाल	51	प्रयोक्ता समूह	अध्यक्ष	असेवा
2	श्री सेवालाल क0श्री रामसुरे ले	60	"	सदस्य	"
3	" राजेन्द्र सिंह क0" मेहर सिंह	59	"	"	"
4	" अमृत सिंह क0 रामसनेहे	37	स्वयं सहायता समूह	"	"
5	" जसवंत सिंह क0 गेंदा राम	34	"	"	"
6	" प्रेमनारायन क0 बैजनाथ	40	"	"	"
7	" जयकरन क0 शिवनारायन	23	"	"	"
8	" वीरेन्द्र क0 हनुमान	52	भूमि हीन	"	"
9	" श्रीमती रजनी प0 अमृत सिंह	33	ग्राम सभा म0	"	"
10	" " अरुण कुमारी प0 श्री सेवक	29	एस0सी0 महिला	"	"
11	सन्तोष कुमार शर्मा क0 श्री रामदयाल	52	परियोजना प्रभारी	"	"
12					

उपरोक्त समिति के समस्त सदस्यों का चयन ग्राम सभा की बैठक में सर्व सम्मति से किया गया है।

राजेश्वरी देवी
नाम
ग्राम प्रधान/सचिव
वि0 ख0 दिबियापुर (औरैया)

जल संग्रहण समिति का गठन ग्राम पंचायत– मलगवाँ

क0सं0	चयनित सदस्य का नाम	आयु वर्ष में	चयन का आधार	पद	ग्राम
1	2	3	4	5	6
1	आशाराम ब0 श्रीजानकीप्रसाद	57वर्ष	प्रयोक्ता समूह	अध्यक्ष	मलगवाँ
2	शिवकुमार ब0 रामबहादुर सिंह	15वर्ष	"	सदस्य	"
3	इन्द्रपाल ब0 दशरथ सिंह	38वर्ष	"	"	"
4	शिवकुमार ब0 देशराज	45वर्ष	स्वयं सहायता समूह अध्यक्ष	"	"
5	अवधनारायण ब0 गुलाब	42वर्ष	" सचिव	"	"
6	कल्लू ब0 जगन्नाथ	38वर्ष	" सदस्य	"	"
7	नेकसे ब0 बाबूखाँ	36वर्ष	" "	"	"
8	अल्लू ब0 कल्लू कोरी	38वर्ष	भूमि हीन	"	"
9	जमीला ब0 बादशाह	47वर्ष	ग्राम सभा म0	"	"
10	हीरादेवी ब0 हीरालाल	50वर्ष	एस0सी0 महिला	"	"
11	सुरवीर सिंह ब0 दुर्गपाल सिंह	50वर्ष	परियोजना प्रभारी	"	"
12					

उपरोक्त समिति के समस्त सदस्यों का चयन ग्राम सभा की बैठक में सर्व सम्मति से किया गया है।

सुरवीर सिंह
परि0/प्रभारी
मलगवाँ

हस्ताक्षर
नाम– आशाराम
पदनाम– प्रधान
दिनाँक–
ग्राम पंचायत मलगवाँ
विकास खण्ड अजीतमल (औरैया)

जल संग्रहण समिति का गठन ग्राम पंचायत– रामनगर

क0सं0	चयनित सदस्य का नाम	आयु वर्ष में	चयन का आधार	पद	ग्राम
1	2	3	4	5	6
1	आशाराम प0 जानकी प्रसाद	57वर्ष	प्रयोक्ता समूह	अध्यक्ष	रामनगर
2	छोटे राजा प0 जानकी	43वर्ष	"	सदस्य	
3	ठाकुर प्रसाद प0 दोरेलाल	80वर्ष	"	"	"
4	विपिन प0 श्याम सिंह	29वर्ष	स्वयं सहायता समूह अध्यक्ष	"	"
5	देवेन्द्र प0 मुलायम सिंह	27वर्ष	"	"	"
6	राजा सिंह प0 लखन सिंह	51वर्ष	"	"	"
7	देवेन्द्र प0 लखन सिंह	36वर्ष	"	"	"
8	शैलेन्द्र प0 राजा सिंह	35वर्ष	भूमि हीन	"	"
9	बेटी राजा प0 राजराज सिंह	39वर्ष	ग्राम सभा म0	"	"
10	हीरावती प0 हीरालाल	50वर्ष	एस0सी0 महिला	"	"
11	सुरवीर सिंह प0 गुरपाल सिंह	50वर्ष	परियोजना प्रभारी	"	"
12					

उपरोक्त समिति के समस्त सदस्यों का चयन ग्राम सभा की बैठक में सर्व सम्मति से किया गया है।

सुरवीर सिंह
परियोजना प्रभारी रामनगर

30/12/2014
नाम–
पदनाम–
दिनॉक–

ग्राम पंचायत मलगवां
विकास खण्ड अजीतमल (औरैया)

जल संग्रहण समिति का गठन ग्राम पंचायत– अमावता

क0सं0	चयनित सदस्य का नाम	आयु वर्ष में	चयन का आधार	पद	ग्राम
1	2	3	4	5	6
1	श्री जितेन्द्र सिंह ब0श्री रामचुमार सिंह	34	प्रयोक्ता समूह	अध्यक्ष	अमावता
2	दुर्गा सिंह, ब0 कान सिंह	46	"	सदस्य	"
3	राकेश सिंह ब0 हाकिम सिंह	39	"	"	"
4	सुरेश ब0 घोरे	48	स्वयं सहायता समूह	"	"
5	गोविन्द ब0 श्री राम	47	"	"	"
6	मनोहर ब0 सीता राम	37	"	"	"
7	रामप्रकाश ब0 दिलसुख	55	"	"	"
8	उजागर ब0 मिलोकी	49	भूमि हीन	"	"
9	निर्मी सिंह ब0 रामबाबू	50	ग्राम सभा म0	"	"
10	सैलानी देवी ब0 शंकर लाल दोहरे	49	एस0सी0 महिला	"	"
11	जितेन्द्र नाथ पाण्डेय ब0 रामशंकर पाण्डेय	58	परियोजना प्रभारी	"	"
12					

उपरोक्त समिति के समस्त सदस्यों का चयन ग्राम सभा की बैठक में सर्व सम्मति से किया गया है।

परि0 प्रभारी

नाम– जितेन्द्र सिंह
पदनाम– प्रधान
दिनॉक– 01-04-2011

जितेन्द्र सिंह
प्रधान
ग्राम पंचायत अमावता
वि0ख0 [illegible] जसपद-औरैया

जल संग्रहण समिति का गठन ग्राम पंचायत– गोहनीकला

क0सं0	चयनित सदस्य का नाम	आयु वर्ष में	चयन का आधार	पद	ग्राम
1	2	3	4	5	6
1	श्री ओम नरायन प0 रामरतन वर्मा	36	प्रयोक्ता समूह	अध्यक्ष	गोहनीकला
2	" बाबूराम प0 सुखवासी लाल	75	"	सदस्य	"
3	" नाथूराम प0 श्याम बिंधसि	50	"	"	"
4	" रामकुमार प0 बाबूराम	50	स्वयं सहायता समूह	"	"
5	" रामऔतार प0 रामदयाल	60	"	"	"
6	" बलीसिंह प0 देवालाल	35	"	"	"
7	" सेवाराम प0 बलन्नू	50	"	"	"
8	" प्रवीन कुमार प0 शिवाराम	30	भूमि हीन	"	"
9	" लोठमिला देवी प0 बृजमोहन	35	ग्राम सभा म0	"	"
10	" " प्रीतिदेवी प0 प्रवीन कुमार	27	एस0सी0 महिला	"	"
11	" चन्द्रेश कुमार प0 रामदुलारे	30	परियोजना प्रभारी	सचिव	ग्रा0वि0अ0 अजीतमल
12					

उपरोक्त समिति के समस्त सदस्यों का चयन ग्राम सभा की बैठक में सर्व सम्मति से किया गया है।

चन्द्रेश कुमार
(चन्द्रेश कुमार)
परियोजना प्रभारी

ग्राम पंचायत गोहनी कला
सुमन
प्रधान
विकास0अजीतमल - औरैया

नाम–
पदनाम–
दिनॉक–

जल संग्रहण समिति का गठन ग्राम पंचायत– पंचदेवरा

क0सं0	चयनित सदस्य का नाम	आयु वर्ष में	चयन का आधार	पद	ग्राम
1	2	3	4	5	6
1	जयराम सिह S/o श्री कालीचरन	54	प्रयोक्ता समूह	अध्यक्ष	पंचदेवरा
2	गजाधरS/oरघुनाथ सिह	60	"	सदस्य	"
3	लालीदेवी W/o रनवीर सिह	45	"	"	"
4	लालारामS/o सुन्दरलाल	60	स्वयं सहायता समूह	"	"
5	अशोक कुमारS/o गीरधेलाल	36	"	"	"
6	रघुवीर सिहS/oजयवीर	46	"	"	"
7	दशरथS/oरामेश्वर	65	"	"	"
8	नरेशS/o सरदार	50	भूमि हीन	"	"
9	शैलेशा कुमारी W/o संन्तोषकुमार	35	ग्राम सभा म0	"	"
10	सावित्रीदेवीW/o सुरेश	45	एस0सी0 महिला	"	"
11	बालकिशन S/o श्रीसुखनन्दन	35	परियोजना प्रभारी	"	"
12					

उपरोक्त समिति के समस्त सदस्यों का चयन ग्राम सभा की बैठक में सर्व सम्मति से किया गया है।

नाम–
पदनाम–
ग्राम पंचायत अधिकारी–पंचदेवरा
क्षेत्र पंचायत अधिकारी–औरैया

जल संग्रहण समिति का गठन ग्राम पंचायत– बडेरा

क0सं0	चयनित सदस्य का नाम	आयु वर्ष में	चयन का आधार	पद	ग्राम
1	2	3	4	5	6
1	श्री शिवबली सिंह प0 श्री राम सिंह	60	प्रयोक्ता समूह	अध्यक्ष	बडेरा
2	" अखिलेश सिंह प0 बृज किशोर सिंह	35	"	सदस्य	"
3	" राघवेन्द्र सिंह प0 अजीत सिंह	60	"	"	"
4	" श्रीमती नन्दनादेवी प0 भूपेन्द्र सिंह	32	स्वयं सहायता समूह	"	"
5	" " गुड्डी देवी प0 मनोज	22	"	"	"
6	" ममता प0 अशोक	35	"	"	"
7	" किरनदेवी प0 चन्दन	55	"	"	"
8	श्री गंगा राम प0 सीताराम	80 वर्ष	भूमि हीन	"	"
9	पुष्पा देवी प0 राघवेन्द्र सिंह	50	ग्राम सभा म0	"	"
10	सुखरानी प0 राम प्रकाश	47	एस0सी0 महिला	"	"
11	दिनेन्द्र नाथ पाण्डेय प0 रामशंकर पाण्डेय	58	परियोजना प्रभारी	"	"
12					

उपरोक्त समिति के समस्त सदस्यों का चयन ग्राम सभा की बैठक में सर्व सम्मति से किया गया है।

परि0 प्रभारी

ग्राम पंचायत बडेरा
वि0 ख0 अजीतमल (औरैया)
नाम– शिवबली सिंह
पदनाम– ग्रामप्रधान
दिनॉक–

जल संग्रहण समिति का गठन ग्राम पंचायत– भलगावॉ

क0सं0	चयनित सदस्य का नाम	आयु वर्ष में	चयन का आधार	पद	ग्राम
1	2	3	4	5	6
1	श्री राम् प0 शिवराम	52	प्रयोक्ता समूह	अध्यक्ष	भलगावॉ
2	" सुरेन्द्र पाल प0 मोहनलाल	43	"	सदस्य	
3	" सन्तोष कुमार प0 राजाबाबू	40	"	"	"
4	" सुघर सिंह प0 माता दीन	48	स्वयं सहायता समूह	"	"
5	" फूल सिंह प0 माता दीन	42	"	"	"
6	" राजेश कैथिया प0 कुलकिशोर	35	"	"	"
7	" श्याम सुन्दर प0 राम सनई		"	"	"
8	श्री रमेश प0 कल्लर	45	भूमि हीन	"	"
9	श्रीमती रेखा देवी प0 गुरूवचन	40	ग्राम सभा म0	"	"
10	" रन्जर प0 सुरेन्द्र कुमार	32	एस0सी0 महिला	"	"
11	श्री चन्द्रेश कुमार प0 राम दुलारे	30	परियोजना प्रभारी	सचिव	भूमि संरक्षण सहायक अमीलाल
12					

उपरोक्त समिति के समस्त सदस्यों का चयन ग्राम सभा की बैठक में सर्व सम्मति से किया गया है।

Kumar
(चन्द्रेश कुमार)
परियोजना प्रभारी

नाम [illegible]/अध्यक्ष
ग्राम पंचायत भलगावॉ
विकास खण्ड अमीलाल (औरैया)
दिनांक

जल संग्रहण समिति का गठन ग्राम पंचायत– भलगावॉ

क0सं0	चयनित सदस्य का नाम	आयु वर्ष में	चयन का आधार	पद	ग्राम
1	2	3	4	5	6
1	श्री राम् प0 शिवराम	52	प्रयोक्ता समूह	अध्यक्ष	भलगावॉ
2	" सुरेन्द्र पाल प0 मोहनलाल	43	"	सदस्य	
3	" सन्तोष कुमार प0 राजाबाबू	40	"	"	"
4	" सुखसिंह प0 माता दीन	48	स्वयं सहायता समूह	"	"
5	" फूलसिंह प0 माता दीन	42	"	"	"
6	" राजेश कैनिया प0 मुंशीकिशोर	35	"	"	"
7	" श्याम सुन्दर प0 राम सनेही		"	"	"
8	श्री रमेश प0 कल्लू	45	भूमि हीन	"	"
9	श्रीमती रेखा देवी प0 गुरूबचन	40	ग्राम सभा म0	"	"
10	" रन्जू प0 सुरेन्द्र कुमार	32	एस0सी0 महिला	"	"
11	श्री चन्द्रेश कुमार प0 राजदुलारे	30	परियोजना प्रभारी	सचिव	भूमि संरक्षण समिति अजीतमल
12					

उपरोक्त समिति के समस्त सदस्यों का चयन ग्राम सभा की बैठक में सर्व सम्मति से किया गया है।

Sumar
(चन्द्रेश कुमार)
परियोजना प्रभारी

नाम ग्राम/अध्यक्ष
ग्राम पंचायत भलगवॉ
विकास खण्ड अजीतमल (औरैया)

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.

The details of the self help groups of the project area is given below:

Table 4.4 : Details of Self Help Group in Project Area, IWMP –II, AURAIYA

S. No.	Name of Project (M.W.S.)	Code No. (M.W.S.)	Name of S.H.G.	Occupation of S.H.G.	Name of Leader & No of Member
1	**2**	**3**	**4**	**5**	**6**
1.	Sikrauri	2C4D1a2d	Jai Durge	Dairy	1- Sntosh s/o Gayadeen 2- Vinod s/o Jalved 3- Sunita w/o Veerendra singh 4- Maya devi w/o Balbadan
2	Pachdevara	2C4D1a2b	Ma Veshno Devi	Goat farming	1- Lala ram s/o Sundar lal 2- Ashok Kumar s/o Bhikhe lal 3- Rahul s/o Jayveer 4- Dashrath s/o Rameswar
3	Badera	2C4D1a2e	Maa Durga	Dairy	1- Bandna devi w/o Bhopendra singh 2- Guddi devi w/o Manoj 3- Mamta devi w/o Ashok 4- Kiran dev w/o Chandan

4	Amauta	2C4D1a1d	Rani Ahilyabai Holkar	Dairy	1- Suresh s/o Chhote lal 2- Govind s/o Shri ram 3- Manohar /o Sita ram 4- Ram prakash s/o Dil shukh
5	Gohani Kala	2C4D1a2a	Ekta	Goat farming	1- Ram kumar s/o Baburam 2- Ram veer s/o Asharam 3- Bali singh s/o Cheda lal 4- Shishendra singh s/o Badan singh 5- Ram avtar s/o Ram dayal 6- Kishun s/o Ram Chandra 7- Amrat singh s/o Babu ram 8- Ram singh s/o Jaysiram 9- Shyam singh s/o Badalu 10- Sevaram s/o Lallu
6	Malgawna	2C4D1a1e	Vikas	Dairy	1- Sugar singh s/o Matadeen 2- Vinod s/o sumit Narayan 3- Chote Lal s/o Gulab 4- Rajesh s/o Jugul Kishor 5- Badan Lal s/o Sobran 6- Shyam Sundar s/o Ram sanehi

					7- Jayram s/o Change lal 8- Gore lal s/o Middu lal 9- Kall s/o Dilsu 10- Fool singh s/o Matadeen
7	Kaitholi	2C4D1a1a	Jai Maa Durge	Dairy	1- Shiv kumar s/o Indra datt 2- Pawan kumar s/o Prahlad 3- Krashna bihari s/o Beta lal 4- Jay karan s/o Sardari lal 5- Vijay kumar s/o Radhe shyam 6- Afsar lal s/o Guljari lal 7- Rati kant s/o Ramadheen
8	Ramnagar	2C4D1a1c	Ma Sharada	Goat farming	1- Vipin s/o Shyam singh 2- Devendra s/o Mulayam singh 3- Raja singh s/o Lakhan singh 4- Devendra s/o Lakhan singh
9	Malgawna	2C4D1a1b	Jai Ma Bhavani	Goat farming	1- Shiv kumar s/o Deshraj 2- Awadh narayan s/o Gulab 3- Kallu s/o Jagannath

					4- Nekse s/o Babu khan
10	Asewta	2C4C7g2a	Dr.Ambedkar	Dairy	1- Jagdeesh singh s/o Chote lal 2- Dinesh singh s/o Balveer singh 3- Shiv kesh singh s/o Digvijay singh
11	Asewa	2C4C3g2a	Jai Ma Durga	Goat farming	1- Amrat singh s/o Ram bharose 2- Jasvant s/o Gangaram 3- Jay karan s/o Shiv narayan 4- Prem narayan s/o Baijnath
12	Biroohuni	2C4C3g2c	Jay Sai	Dairy	1- Veerendra kumar s/o Nathu ram 2- Prayag narayan s/o Harsukh lal 3- Prem narayan s/o Gangaram 4- Pramod kumar s/o Lala ram

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. The detail of the user groups of the project area is given below.

Table 4.5 : USERS GROUP DETAILS IN PROJECT AREA –IWMP-II, AURAIYA

S. No.	Name of Project (M.W.S.)	Cod No. (M.W.S.)	Area in Hect.	Name of U.G.	Name of Group leader
1	2	3	4	5	6
1.	Sikrauri	2C4D1a2d	440.389	Jai Durga	1- Sivveer s/o Suraj singh 2- Santosh s/o Bharat 3- Sunil s/o Mahadev
2	Pachdevara	2C4D1a2b	621.631	Maa Sharda	1- Jasram s/o Kali charan 2- Mahaveer s/o Raghunath 3- Lali devi w/o Ranveer
3	Badera	2C4D1a2e	414.939	Nav Yug	1- Shiv bali s/o Shivram 2- Akhilesh s/o Braj kishor 3- Raghvendra s/o Ajeet singh
4	Amauta	2C4D1a1d	811.419	Maa Veshno	1- Jitendra s/o Ram kumar 2- Durga singh s/o Karan singh 3- Rakesh s/o Hakim singh
5	Gohani Kala	2C4D1a2a	672.479	Maa Bindhya vasini	11- Om narayan s/o Ram rattan 12- Babu ram s/o Shukh vasi lal

					13- Nathu ram s/o Shyam bihari
6	Malgawna	2C4D1a1e	732.549	Jeevan	1- Ramu s/o Shivram 2- Surendra pal s/o Mohan lal 3- Sanntosh kumar s/o Raja Babu
7	Kaitholi	2C4D1a1a	455.400	Dr. Ambedkar	1- Bal bhadra singh s/o Sovran singh 2- Ramakant s/o rama dheen 3- Shiv kumar s/o Indra datt
8	Ramnagar	2C4D1a1c	665.257	Sangharsha	1- Asharam s/o Janki Prasad 2- Chhote raja s/o Janki 3- Takur Prasad s/o Bare lal
9	Malgawna	2C4D1a1b	731.631	Vikas	5- Asharam s/o Janki Prasad 6- Shiv kumar s/o Ram bahdur 7- Indrapal s/o Dashrath singh
10	Asewta	2C4C7g2a	648.198	Yug	1- Bal bhadra slingh s/o Sobran singh 2- Yatendra singh s/o Jagat singh 3- Rajesh singh s/o Gyan singh
11	Asewa	2C4C3g2a	910.662	Yuvak	1- Rajeswari devi w/o Devi dayal 2- Sewa lal s/o Ram bharose

					3- Rajesh singh s/o Munnu singh
12	Biroohuni	2C4C3g2c	475.346	Jai Sai	1- Rajeswari devi w/o Devi dayal 2- Munshi lal s/o Chhote lal 3- Hari sharan s/o Rameshwar dayal

INSTITUTIONAL ARRANGEMENT AT PROJECT LEVEL

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:

3- They should preferably have prior experience in watershed related aspects or management of watershed development projects.
4- 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.

CHAPTER – 5

MANAGEMENT / ACTION PLAN

1. PROBLEM & NEED OF THE AREA:

The major crop in kharif is rice grown in the project area with productivity of 16.96 q/ Ha which is very low which is due todelay in rice transplantation, poor seed & variety replacement rate.Decreasing factor productivity in rice, wheat cropping system is a major challenge to accelerate the economy of farmer.Infestation of pod borer & poor varirty replacement rate in pulses is a major factor in low productivity of pulses & oil seeds.Broad coasting of seed & fertilizer in kharif pulses affect the yield of pulse.Most of the milch animal is local breed with low milk potential affect the milk productivity in the study area.

2. PROBLEM OF AGRICULTURAL LAND:

Low yield of rice and wheat crop,Infestation of pod borer, small size of agricultural fields, soil erosion and uneven character of serface of the land require better variety of seed,Deficiency of multy nutrient specially sulphur,iron,zink,cheking the wheat yield.Breed improvement of animal and training to the farmers of the study area are the fundamental need.

To deal with these problems A two-fold approach- physical and social,as they are complementaty to each other should be adopted because physical reclamation of land is achieved through chemical treatment of water logged soils and is followed with scientific rotation of crops. Social approach on the other hand is reflected through overall rural reconstruction, promoting agriculture and its productivity in particular.

Consolidation of land holdigs is one of the measures among many.

Soil erosion has become now one of the major environmental problems and a serious constraint for aricultural production. There are many physical and socialfactors which determine the extent and severity of soil erosion.the principal physical factor are erosivity of rainfall, erodibility of soil, severity of periodic floods, length and steepness of the slope. The important social factors are deforestation, over grazing, nature of land

use and mathods of cultivation.On the other hand, sheet erosion cause by rains and erosion due to winds are least visible but eqully serious as the too take a heavy toll of presious top soils.

Soil conservation:-

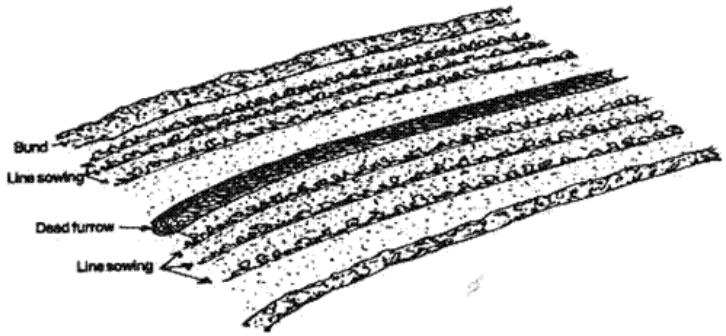
Soil and water conservation measures consist of agronomical and mechanical methods. Agronomic methods are supported with mechanical measures where land slope exceeds permissible limits and runoff gains erosive velocities.

The following boxes explain the nature of agronomic measures which are essential in inter-bunded or terraced areas. These practices enhance the utility value of all kinds of mechanical structures.

Contour Tillage

All agricultural operations such as ridging, ploughing, harrowing, sowing, trenching, etc., are recommended to be done on the contour wherever possible or at least generally across the direction of the slope where holdings are very small. Even though the operation is very simple, it plays a major role in retarding the process of soil erosion through runoff. It also conserves soil, and due to increased time of concentration, more rainwater seeps through the soil profile to recharge ground water. Summer ploughing leaves the soil highly absorbent of initial rains.

Contour cultivation in inter-bunded area



DeaFurrows

When all tillage operations are complete; it is advisable to leave a deep dead furrow at every 10 m interval. This should remain in position until the crop is harvested. Dead furrows aid in reducing the runoff velocity and they also conserve water.

Organic Matter

The study area soils are very poor in organic matter, especially in deob areas. This can be improved by leaving the crop residue in situ (on the fields).

Adding organic manures such as farmyard manure and compost every year as basal application to the soil improves the physical condition of the soil considerably. Soil – Air, Soil – Temperature, and Soil – Moisture relationships are well balanced with the presence of organic matter. Organic matter improves the activities of soil microorganisms and also provides the much needed micro plant nutrients of all kinds, besides nitrogen, phosphorus and potash.

Addition of large amounts of chemical fertilizers to study area crops should be discouraged as it damages the soil due to:

- excessive depletion of scarce soil moisture for its own transformation;
- reduction in all soil microorganism activity; and
- destruction of soil structure

Strip Cropping

Raising Erosion Permitting Crops (EPC) with Erosion Resistant Crops (ERC) having abundant adventitious root system and providing high percentage of canopy in strips in a ratio of 2:1 or 3:1 (i.e. 20 to 10 rows or 30 to 10 rows) helps in trapping soil from EPC strips to ERC strips

The increased resistance to runoff in ERC results in higher volume of water percolating through soil profile, due to increased time of (on-ground) concentration.

The close-growing ERC strips are generally legumes which fix nitrogen in the soil and enrich it.

The canopy of the ERC also protects the soil from beating action of rain drops. Strip cropping also helps in stabilizing crop production.

HORTICULTURE DEVELOPMENT

As per the current senerio of the country under the yellow revolution, 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).

Mango, 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 / aldrex) for prevention of white ant. Planting of the fruits plants should be done with the onset of monsoon.

3-Use of Root Stokes:

Budding and grafting on the wild root stock gives benefit of the establishment root and in turn provides better quality fruits with high field potential. For example, Ziziphun 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 is 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 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 dryfarrming 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 mare 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 Nakshtra. The people should planted the tree of their Nakshtra, And they should be never destroyed.

The name of Nakshtra and their tree are as follows:

S.No.	Name of Nakshatras	Name of Tree
1.	Ashwini	Kuchila
2.	Bharini	Aamla
3.	Kritika	Goolar
4.	Rohini	Jaamun
5.	Mrigshira	Khair
6.	Aadra	Agar
7.	Punarvasu	Baans
8.	Pushya	Peepal
9.	Ashalekha	Chameli
10.	Magha	Bar (Banyan)

11.	Purvafalguni	Dhak
12.	Uttarafalguni	Pilkhen
13.	Hasta	Jaai
14.	Chitra	Bel
15.	Swati	Arjun
16.	Vishakha	Babool (Acacia)
17.	Anuradha	Naagkeshwar
18.	Jyeshtha	Shambhal
19.	Mool	Raal Vriksha (Bitumen)
20.	Purvaashadha	Bait (Cane)
21.	Uttaraashadha	Panash
22.	Shrawan	Aak
23.	Ghanishtha	Jaanthi
24.	Shatbhisha	Kandab
25.	Purvaabhadrapad	Aam (mango)
26.	Uttaraabhadrapad	Nimbu (Lemon)
27.	Revati	Mahua

PANCHVATI

"Vriksho Rakshati Rakshatah"

Moolan Brahmaa, Twachaa Vishnu:, Shakha Rudro Maheshwarah: I

Patre – Patre Tu Devanaam, Vriksha Raajo Namostute II

Panchvati: Panch means 'five' and Vati means 'tree'. The place where five types of plants are available is called PANCHVATI. These five type of plants are: Banyan, Peepal, Bel, Amla and Ashok. The importance of Panchvati is shown in Ramayana. That is, Lord Ram gained most power by living between Panchvati and defeated most powerful king *Lankadhish Raavan*.

BANYAN/ BARGAD: One drop of milk of Banyan tree has energy equal to 1 litre of common milk.

PEEPAL: There is an old tradition of worshipping the Peepal tree by womens and to tie a thread around it because this is an only tree which releases OZONE gas along with OXYGEN gas. The Ozone gas helps to enhance the power of generation of child and the new born babies are more healthier. Deficiency of Ozone gas results in increasing SKIN CANCER.

BEL: Bel helps to decrease the hotness of our stomach and other parts of our body, that is why people worship Lord Shiva with BEL PATRA.

AMLA: Amla is also called KALPVRIKSHA. It is the best source of VITAMIN C, which increases the resistance power of our body. The Vitamins of Amla are not destroyed, even though after heating it also, thus, it is used in CHYAWANPRASH.

ASHOK: Ashok is the best tree of the world. The canopy of this tree destroys all the tension and nervousness. Its canopy also cures many diseases of womens

DETAIL ESTIMATE OF PANCHVATI PLACE

S.No.	Particulars	Unit	Quantity	Cost / Unit	Total
1.	Demonstration of Panchvati Place and Horticulture with Brick Guard	nos.	6	1355.00	8130.00
2.	Cost of Plants with Earth Work, Digging and Filling with FYM	nos.	6	172.00	1032.00
3.	Construction of Krishak Vikas Manch	nos.	1	71200.00	71200.00
4.	India Mark-II Hand Pump	nos.	1	42600.00	42600.00
5.	Renovation of Jagat of Well	nos.	1	91000.00	91000.00
6.	Soaking Pit for Hand Pump or Well	nos.	1	3845.00	3845.00
	Sub Total with Hand Pump's Cost				**Rs. 1,26,807.00**
	or				**Say Rs. 1,26,800.00 only**
	Sub Total with Jagat of Well's Cost				**Rs. 1,75,307.00**
					Say Rs. 1,75.300.00 only

APPEAL TO THE PEOPLE OF I.W.M.P.-II, AURAIYA

We want to give a message to the people of all the villages situated in the Project Area of I.W.M.P.-I, that, to avoid Flood & Hunger, they should plant at least one Panchvati in each village. They should plant PEEPAL tree in the EAST, BANYAN tree in the WEST, tree of BEL in the NORTH, AMLA tree in the SOUTH & the tree of ASHOK in the SOUTH-EAST. Then, in the middle of Panchvati, a Worship Place (i.e. a temple) should be made and a Hand Pump should be installed. In this hand Pump, water will be available for thousands of years. The roots of these Panchvati trees makes the existing source of water between them pure and capable to cure many diseases.

There should a house by name of each women and there, they should plant at least three plants.

1). Tree of God Vishnu- Amaltash.,

2). Tree of Goddess Lakshmi- Kachnar.,

3). Plant of Basil (Tulsi), which is able to cure all the diseases.

For purification of environment, at least one plant of NEEM should be planted in front of each house because it has efficiency of absorbing harmful gases (Carbon-mono-oxide, Hydrogen Sulphide, Sulphur-di-oxide, Nitrous Oxide, Ammonia, etc.) and releases gases which are useful for us, same as when Lord Shiva absorbed all the poison which was released during *SAMUDRAMANTHAN.*

Therefore, to live a healthy life, at least one plant of Neem should be planted near the residence.

Agro-horticulture

Marginal lands do not produce good annual crop returns even in normal season. These kinds of soils are best used for raising trees of economic value and creating permanent assets. Some of these lands are also very good for raising horticultural crops such as mango, ber, pomegranate, tamarind etc. A part of the land could be earmarked specially for planting mixed tree species known in the area for providing fuel, fodder and timber for household needs and agricultural implements. Trees provide stable and sustained income every year, especially in drought years.

Role of Vegetation

Vegetation is crucial in preserving productive soil and conserving rain water for sustaining life. Soil and water need to be preserved for crop production (both annual and plantation crops) as well as plants that give fuel, fodder, fruits, industrial raw materials, medicinal and aromatic plants and the like.

Minor vegetation such as creepers, shrubs, various kind of grasses, legumes and plants like Agave, which yield fibre have an important role when grown in gullies of various kinds and also on upstream and downstream sides of mechanical structures such as gully checks, water harvesting structures, etc. These provide reinforcement and extend the life span of the structures by binding the soil through the network of their root systems. These plants also provide fodder to animals in the area.

Seed Rates

Normal season: Sowing is done with the normal seed rate. However, if there is a drought during the plant's growth period and wilting is likely to occur, selective thinning is recommended to reduce the plant population to effectively use the scarce soil moisture among fewer plants.

Late season : Where the monsoon is moderately delayed, normal cropping with reduced seed rate is advised.

Line Sowing

Line-sowing on contours is essential. It arrests runoff and conserves soil being eroded. It helps in the use of labour-efficient implements in weeding (i.e., removal of unwanted vegetation through use of different sizes of blade harrows between the rows).

Wider Spacing

In all drought-prone areas, the most important objective is to raise a successful crop under scarce soil moisture conditions. One of the recommended practices is wider spacing between rows and between plants within the row. This reduces plant population and competition between plants for scarce soil moisture. Fewer plants have greater access to limited available soil moisture.

Weeding

Frequent weeding is an important part of dryland agriculture. Line sowing and mechanical weeding, with appropriate size of blade harrows, remove unwanted vegetation which competes with the main crop. It is not

uncommon to see the dryland farmer hitching several blade harrows to one yoke and a pair of bullocks. Weeding within rows can be done using hand hoes. Removal of unwanted vegetation helps the main crop obtain greater accessibility to soil moisture and plant nutrients for its own growth.

Mixed/Inter Cropping

Mixed cropping of different crops along with the main crops, such as millets and different legumes, is an insurance against the vagaries of the monsoon. The different root systems of mixed crop feed at different depths of the soil. Moreover, mixing cropping provides small quantities of grain of different kinds for home consumption at different times.

Mulching

Mulches are ground covers that prevent the soil from being washed away, reduce evaporation, increase infiltration, and control growth of unwanted weeds. Mulch can be organic crop residue, pebbles, or materials such as polythene sheets. Mulching prevents the formation of hard crust after each rain. Organic mulches add plant nutrients to soil upon decomposition. Use of blade harrows between rows also creates "dust mulch" by breaking the continuity of capillary tubes of soil moisture.

Contingent Planning

With every care taken to undertake timely agricultural operations, it is still possible that the whole operation becomes a gamble due to unpredictable monsoons. The main crop could fall in the early part of its life cycle. In such cases, the farmer should come up with an alternate crop that can mature in a very short time and under hard conditions to take advantage of what is left of the rainy season. Contingent planning helps

catch and make the best use of late rains. Advance planning is necessary in selecting a contingent crop. And all the requisites for its sowing should be ready within the main season itself. Credit for farmers must be made available at the right time.

Mechanical Methods

Where the slope of the soil is more than permissible, mechanical measures such as bunding, terracing and trenching are recommended in addition to agronomic methods. Agronomic methods are used in inter-bunded areas and mechanical practices complement to help boost crop yields in rainfed drylands.

Indigenous technical knowledge

Local technologies evolved by people over generations of experience should be used before any new recommendation is made.

FOOD SUFFICIENCY

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

STATUS OF FOOD REQUIREMENT AND AVAILABILITY PER ANNUM IN WATERSHED

Sr. No.	Items	Requirement (q/yr)	Before project		Proposed	
			Availability (q/yr)	Deficit or surplus (q/yr)	Availability (q/yr)	Deficit or surplus (q/yr)
1	Cereals	47485	41500	-5985	48200	+ 715
2	Pulses	12208	11300	-908	12390	+ 182
3	Oil seeds	2035	2146	+111	2185	+ 150

WATERSHED DEVELOPMENT WORK

Watershed Development works are proposed to be taken up from 2nd year of the initiation of the project. These work are proposed to be taken up from ridge to village .And allocation of Rs. 327.60 & 50% of the total cost has been made for watershed development works.

AREA TREATMENT PLAN

Integrated watershed development program enyisage treatment of proposed area with soil & water conserversion works along with development of Horticulture, Aforestation & development of silvi pastosal system in denuded land unfit for curtivstion, following works are proposed under watershed Development works.

1. Contractions of bunds (Field bund, contour bund, Marginal & peripheral).
2. Renovation of Existing Bund for in-situ moisture conservation.
3. Rain fed Horticulture with and w'thout fencing.

4. Construction of new & renovation of Existing talab and water bodies.
5. Aforestation and development or silvi- pastoral system.
6. Drainage line treatment (pucca structures, Inlet, outlet and spillway).

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 26.22 Lakhs was allotted for EPA activity, which was 4 per cent of total allocated budget. The villagers discussed various activities which they fell 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.

Table 5.1: Entry point activities (EPA) (All financial figures in lakh Rs.)

Sl.No.	Name of Watershed	Amount Earmarked for EPA	Entry Point Acitivies Planned	Estimated Cost (Rs. in Lakh)
1.	2C4D1a2d, 2C4d1a2b, 2C4D1a2e, 2c4D1a1d, 2C4D1a2a, 2C4D1a1e, 2C4D1a1c, 2C4d1a1b, 2c4d1a1a, 2c4c7g2a, 2C4C3g2a, 2C4C3g2c	26.22	Preparatory Phases Fresh & Repairing of Khranja ect.	26.22
Total		26.22 **Lakh**		26.22 **Lakh**

Table 5.2 : Details of activities of preparatory phase :

Name of villages	Institutional and capacity buildings	Detailed Project Report	Total estimated cost
30	32.76	6.55	39.31

Table 5.3 : Other Activities of watershed works phase - Proposed Target

Name of Villages, Watersheds	Construction of bunds (Field bund, contour bund, Marginal bund & Peripheral Bund)		Renovation of Existing bund or un-sites soil moisture conservation		Rainfed Horticulture with fencing		Rain fed Horticulture without fencing	
	Area (ha)	Cost Rs. in Lakh	Area (ha)	Cost Rs. in Lakh	Area (ha)	Cost Rs. in Lakh	Area (ha)	Cost Rs. in Lakh
1	2	3	4	5	6	7	8	9
2C4D1a2d,2C4d1a2b, 2C4D1a2e,2c4D1a1d, 2C4D1a2a,2C4D1a1e, 2C4D1a1c, C4d1a1b, 2c4d1a1a, 2c4c7g2a 2C4C3g2a, 2C4C3g2c	3850	231.00	1354	81.24	256	15.36	-	-

New and renovation of existing water harvesting structures such as talab and water bodies etc.		Aforestation and development of Silvi Pastoral		Drainage Line Treatment Pucca Structure Inlet, Outlet and Spillway	
Area Ha	Cost in Lacs	Area Ha	Cost in Lacs	Area Ha	Cost in Lacs
-	-	-	-	-	-

Table 5.3: Other Activities of watershed works phase - Proposed Target

Name of Villages, Watersheds	Construction of bunds (Field bund, contour bund, Marginal bund & Peripheral Bund)	Renovation of Existing bund or un-sites soil moisture conservation	Rainfed Horticulture with fencing	Rain fed Horticulture without fencing
	Cost Rs. in Lakh	Cost Rs. in Lakh	Cost Rs. in Lakh	Cost Rs. in Lakh
1	2	3	4	5
2C4D1a2d,2C4d1a2b, 2C4D1a2e,2C4D1a1d, 2C4D1a2a,2C4D1a1e, 2C4D1a1c, C4d1a1b, 2C4d1a1a, 2C4c7g2a 2C4C3g2a, 2C4C3g2c	**231.00**	**81.24**		**15.36**

New and renovation of existing water harvesting structures such as talab and water bodies etc.	Aforestation and development of Silvi Pastoral	Drainage Line Treatment Pucca Structure Inlet, Outlet and Spillway
Cost in Lacs	Cost in Lacs	Cost in Lacs
-	-	-

Production System - : Vermi-compost unit for Auraiya-1 watershed

One of the important occupations of the villagers is animal husbandry. At present, the animal waste is not used by the villagers as agricultural input. If the farmers start realising the benefits of compost and vermicompost in particular, the productivity of their land can increase manifold. As part of direct livelihood support, the villagers (mainly land less) are going to receive cows, buffaloes and small ruminants. These animals in turn are going to produce more waste, which can be used to prepare vermicompost.

It is planned that a vermicompost unit by another SHG would be supported by the project. The SHG members, with the help of hired manpower, can collect animal-dung. They would process this dung to prepare vermicompost and sell it to the farmers in the village or outside, as per demand.

The process of composting crop residues using earthworms comprise spreading the agricultural wastes and cow dung in layers of 1.5 m wide and 0.9 m high beds of required length. Earthworms are introduced in between the layers @ 350 worms per m3 of bed volume. The beds are maintained at about 40 - 50% moisture content and a temperature of 20 - 30o C by sprinkling water over the beds. The earthworms being voracious eaters consume the biodegradable matter and give out a part of the matter as excreta or vermi-castings. The vermi-casting containing nutrients are rich manure for the plants.

About The Worms

Eisenia fetida, Eudrilus eugeniae, and Perionyx excavatius are some of the species for rearing to convert organic wastes into manure. The worms feed on any biodegradable matter ranging from coir waste to kitchen garbage and Vermicomposting units are ideally suited to locations / units with generation of considerable

quantities of organic wastes. One earthworm reaching reproductive age of about six weeks lays one egg capsule (containing 7 embryos) every 7 - 10 days. Three to seven worms emerge out of each capsule. Thus, the multiplication of worms under optimum growth conditions is very fast. The worms live for about 2 years. Fully grown worms could be separated and dried in an oven to make 'worm meal' which is a rich source of protein (70%) for use in animal feed.

Use

Vermi compost has more nutrient compare to other manures and fertilizer; so, by the use of vermin-compost we can reduce use of chemical fertilizer. Vermi-compost not only supply nutrient but also improve quantity of hormones for plant growth, improves the soil structure leading to increase in water and nutrient holding capacities of soil.

Components of a commercial unit

Sheds

Umreth-1 watershed has high temperature in summer; so, a shed structure is needed for the vermin-compost unit. It can be made by the use of concrete pillars. While designing the sheds adequate room has to be left around the beds for easy movement of the labourers attending to the filling and harvesting the beds.

Vermi-beds

Scientific bed side is 75 cm - 90 cm thick depending on the provision of filter for drainage of excess water. The whole bed area should be above the ground. The bed should have a uniform height over the entire width to the extent possible to avoid low production owing to low bed volumes. The proper bed width should not be more that 1.5 m to allow easy access to the centre of the bed.

Land

About 125 square meter of land will be required to set up a vermin compost production unit in Umreth-1 watershed. It should have at least 2-3 sheds each of about 180-200 sq.ft. It should have a good watering arrangement and other equipments as required because moisture is very essential for vermin-compost production.

Seed Stock

This is very important thing because worms multiply at the rate of 350 worms per m3 of bed space over a period of 6 month to a year.

Fencing

The entire area has to be fenced to prevent the animals and other unwanted elements. These could be estimated based on the length of the periphery of the farm.

Water Supply System

50% moisture content has to be maintained all the time. Water for the purpose would come from a well nearby.

Machinery

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

Estimate for a vermin-compost unit:

- Requirement of nitrogen for 1 hectare sorghum fodder production=90 kg.
- 1.6% N available in vermin compost.
- 90 kg N fulfill by the use of 90/1.6*100= 5625 kg vermicompost (5.5 ton).
- Need of vermicompost to fulfill the requirement of nitrogen for 15 hectare 5.5*15 =82.5 (80 ton).
- 45 kg phosphorus required for 1 hectare sorghum fodder production.
- Requirement of phosphorus for 15 hectare fodder production 15*45=675 kg.
- Supply of phosphorus through vermin compost 0.7/100*80000=560 kg.
- Remaining requirement of phosphorus 675-560=115 kg.
- Remaining dose of phosphorus will be supplied by rock phosphate.

One compost cycle need 45 days so we need 8 cycles for 80 ton vermin compost production.

Table: Model for a Vermi-compost Unit

S. No.	Particulars	Quantity	Rate (Rs.)	Amount (Rs.)
1	Wooden ballies (3 m long)	20	50	1000
2	Wooden (4 m long)	25	60	1500
3	Shade mats for covering the roof	125	25	3125
4	Binding wire for tying wooden ballies & mats	20 Kg	50	1000

5	Labour charges for erection of sheds	20	100	2000
6	Shovels, spades, crowbars, iron baskets,			2500
7	Weighing scale (100 kg capacity)	1	2000	2000
8	Cow dung	10 ton	800	8000
9	Worms @ 3 kg per ton	30 kg	80	2400
10	Formation of vermin bed with agro-waste, cow dung and worms	20 bed	250	5000
11	Miscellaneous			
	Total Cost			**28,525 Rs.**

Returns from vermin-composting

Benefits	
1. Sale of vermin compost of 80 tones @ Rs.3500/- per ton	80*3500=2,80,000 Rs
2. Sale of worms @ 5 kg per ton of compost and Rs. 50 per kg	400*50=20,000 Rs
Total	3,00,000 Rs/-
Net benefit	**3,00,000-28,200=2,71,800 Rs/-**

A **micro-enterprise** (or **microenterprise**) is a type of small business, often registered, having five or fewer employees and requiring seed capital of not more than 15, 00,000. The term is often used in to refer to a business with a single owner-operator, and and having up to 20 employees. fewer than 20 employees

- balance sheet total below 40000,000
- turnover below 40000,000

The term *microenterprise* connotes different entities and sectors depending on the country.

Generally speaking,

- in *developed* countries, **microenterprises** comprise the smallest end (by size) of the small business sector, whereas
- in *developing* countries, **microenterprises** comprise the vast majority of the small business sector—a result of the relative lack of formal sector jobs available for the poor. These micro entrepreneurs operate microenterprises not by choice, but out of necessity.

Microenterprises add value to a country's economy by creating jobs, enhancing income, strengthening purchasing power, lowering costs and adding business convenience.

Because microenterprises typically have little to no access to the commercial banking sector, they often rely on "micro-loans" or microcredit in order to be financed. Microfinance institutions often finance these small loans, particularly in the Third World. Those who found microenterprises are usually referred to as entrepreneurs.

The terms microenterprise and **microbusiness** have the same meaning, though traditionally when referring to a small business financed by microcredit the term microenterprise is used. Similarly when referring to a small, usually legal business that isn't financed by microcredit, the term microbusiness is used.

Overview

Concept in disability recovery

Utilized as a therapeutic tool within Person centered planning Microenterprise has become valuable to persons who for many reasons cannot efficiently participate in typically rigid work environments, i.e. 9 to 5 / 40 hours per week.

Microenterprise gives persons whom have a disability flexibility to attend doctor’s appointments or treatments that normally occur in the 9–5 time frame of the day and would eventually conflict with the norm of most typical work environments.

Microenterprise presents persons with a disability, business networking avenues into the community that differ greatly from the medical or treatment mode that they may have become confined to.

Persons with a disability who own their own business often report an increased feeling of worth or an emotional equity that becomes an enhancement to their present treatment.

Micro-loans

Micro-loans are a way for organizations and entrepreneurs to make small loans to those in poverty often in third world countries. The term "micro-loans" is more commonly referred to as Microcredit.

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

Table 6.1: DETAILS OF CAPACITY BUILDING OF THE PROJECT AREA

S.No.	Project Stake Holders	No. of Stake Holders	Total No of Persons	No of Persons trained so far	No of Persons to be Trained	Source of Funding for Training, BSA unit or DOLR or Other		Name & Address of Training Instute
						DOLR	BSA unit or Other	
1	District other Centre	-	-	-	-	-	BSA unit	
2	PIA	-	-	-	-	-	BSA unit	
3	WDTS	-	-	-	-	-	BSA unit	
4	WCS	-	-	-	-	-	BSA unit	
5	PGS	-	-	-	-	-	BSA unit	
6	SHG	-	-	-	-	-	BSA unit	
7	UG	-	-	-	-	-	BSA unit	
8	Community	-	-	-	-	-	BSA unit	
9	Any Other	-	-	-	-	-	BSA unit	

CHAPTER -7
PHASING OF PROGRAMME & BUDGETING

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

Cluster Approach

This enversages intregrated development of Geo-hydrological unit ie. Treatment of cluster of micro - watershed The IWMP-II, Auraiya, 2C4D1a2d, 2C4d1a2b, 2C4D1a2e, 2c4D1a1d, 2C4D1a2a, 2C4D1a1e, 2C4D1a1c , 2C4d1a1b, 2c4d1a1a, 2c4c7g2a, 2C4C3g2a,2C4C3g2c.

Base line Survey

To access the impact of any watershed development programme a detailed baseline survey has to be conducted. This acts a benchmark for any intervention during and pest 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 Gram Panchayate AdhikarL 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, 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 type, well in the area, crop under taken in the field. Cropping pattern, fertilizer used and various sources of irrigation in the field.

Participatory Rural Appraisal (PRA)

The past experience of watershed has given tremendous input to focus on creating accountability of the stakeholders towards the programme. This has created an emphasis to include all the stakeholder communities and their local and Indigenous Technological Knowledge *(YTK)* while planning for any activity. Participatory approach provides a new path for planning, implementing, monitoring and post- withdrawal activities with a complete accountability of the stakeholders. Various PRA techniques like resource mapping, social mapping, and season calendars were used to understand the physical and social orientation of the villagp 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 high science tools has been promoted at various stages of watershed development.

Prioritization

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

Planning

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 position ng System (GPS) was used to identify each and every water conservation structures available in the project area. Thi: was used to create a map. Contour Map of vertical interval of 0.5 meter at a scale of 1:4000 was used for identifying various locations for soil and water conservation structures.

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.

Table 7.1: Details of Scientific Planning and Inputs in IWMP projects

Scientific Criteria /Input Used	Whether Scientific Criteria was Used
(A) **(A) Planning**	
Cluster approach	Yes
Whether technical back-stopping for the project ha; been arranged? If yes, mention the name of the Institute	-
Baseline survey	Yes

Hydro-geological survey	Yes
Contour mapping	Yes
Participatory Net Planning (PNPj	Yes
Remote sensing data-especially soil/ crop/ run-off cover	Yes
Ridge to Valley treatment	Yes
Online IT connectivity between	Yes
(1] Project and DRDA cell/ZP	Yes
(2)DRDA and SLNA	Yes
(3) SLNA and DoLR	Yes
Availability of GIS layers	--
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
Integrated coupled analyzer/ near infrared visible spectroscopy/ medium spectroscopy for high speed soil nutrient analysis	Yes
Normalized difference vegetation index (NDVT)#	Yes
Weather Station	--
(B) Inputs	Yes
Bio-pesticides	Yes
Organic manures	Yes
Vermicompost	Yes
Bio-fertilizer	Yes
Water saving devices	Yes
Mechanized tools/ implements	Yes
Bio-fencing	Yes
Nutrient budgeting	Yes
Automatic water level recorders & sediment samp ers	Yes
Any other (please specify)	Yes

Table 7.2: PHASING OF WORK- (PHYSICAL & FINANCIAL) I.W.M.P- I, AURAIYA

Phasing of various works/activities during different years of the project period for treatable area 5292.00 ha out of total area 5880.00 ha in year 2010-11 to 2013-14 is presented in Table Component wise & Year wise Phasing of Physical & Financial Outlay

YEAR WISE FINANCIAL OUTLAYS (LAKH RS.)

S. No.	Component	Unit	Unit cost (per ha) (Rs.)	1st year Rs.	2nd year Rs.	3rd year Rs.	4th year Rs.	5th year Rs.	Total Rs.
A	**ADMINISTRATIVE COSTS**								
	Administrative cost- TA&DA, POL / Hiring of vehicles/office and payment of electricity and phone bill etc. computer, stationary and office consumable and Contingency	-	-	13.10	13.10	13.10	13.10	13.12	65.52
	D.P.R. PREPRATION	-	-	4.00	2.55	-	-	-	6.55
	Expert for monitoring and evaluation	-	-	3.29	3.27	3.27	3.27	-	13.10
	Sub Total	**-**	**-**	**20.39**	**18.92**	**16.37**	**16.37**	**13.12**	**85.17**
B	**PREPARATORY PHASES**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	
	Entry Point Activities like improvement in drinking water system, school, water harvesting & approach road etc.	**-**	**-**	26.22	-	-	-	-	26.22

	Institutional and capacity building	-	-	8.19	8.19	8.19	8.19	-	32.76
	Sub Total	**-**	**-**	**34.41**	**8.19**	**8.19**	**8.19**	**-**	**58.98**
C	**WATERSHED WORKS**	-	-	-	-	-	-	-	-
a	**Soil & water conservation works**	-	-	-	-	-	-	-	-
1.	Contour & field bunding , Marginal Buuds, Periferal Bunds	**3850**	**4000**	**-**	**34.65**	**92.40**	**92.40**	**11.55**	**231.00**
2.	Gully plug	-	-	-	-	-	-	-	
	Sub Total	**3850**	**4000**	**-**	**34.65**	**92.4**	**92.4**	**11.55**	**231**
b.	**Water harvesting & water resources works**	-	-	-	-	-	-	-	
1.	Water harvesting bund / Earthen check dam/ Ponds	1354	0.06	-	12.18	32.5	32.5	4.06	81.24
c.	**Afforestation works**	-		-	-	-	-	-	
1.	Horticulture works & Agroforestry works	256	0.06	-	2.3	6.14	6.14	0.78	15.36
	Sub Total (a+b+c)	**5460**	**4000.12**		**49.13**	**131.04**	**131.04**	**16.39**	**327.6**
D.	**LIVILIHOOD PROGRAMME(Community based)**	-	-	-	-	-	-	-	
	Income generating activities through SHG's for landless and marginal farmers and livestrocks development works.	-	-	6.55	19.65	19.65	19.65	-	65.52
E	**PRODUCTION SYSTEM AND MICRO ENTERPRISES**	-	-	-	-	-	-	-	

	Crop production, diversification of agriculture and introduction of agro-forestry and Demonstration of improved composting system	-	-	-	6.55	26.20	26.20	26.22	85.17
	Sub Total	-	-	-	**6.55**	**26.20**	**26.20**	**26.22**	**85.17**
F	**CONSOLIDATION PHASE**	-	-	-	-	-	-	**32.76**	**32.76**
	GRAND TOTAL	-	-	**61.35**	**102.44**	**201.45**	**201.47**	**88.49**	**655.20**

PHYSICAL PLAN PHASING

Phasing of various works / activities during different years of the project period is presented in Table

Activities related to	1st year (quantity)	2nd year (quantity)	3rd year (quantity)	4th year (quantity)	5th year (quantity)	Total Rs.
ADMINISTRATIVE COSTS	√	√	√	√	√	√
TA&DA, POL / Hiring of vehicles/office and payment of electricity and phone bill etc. computer, stationary and office consumable and Contingency	√	√	√	√	√	√
Expert for monitoring and evaluation	√	√	√	√	√	√
PREPARATORY PHSES	√	-	-	-	-	-

Entry Point Activities like improvement in drinking water system, Construction of road for community place like ponds, school, temple, Panchayat Bhavan etc	-	-	-	-	-	-
Institutional and capacity building	√	√	√	√		
WATERSHED WORKS						
Watershed development works						
Contour bund (ha)	-	2073.10	2073.11	-	-	-
Submergence bund (ha)	-	390.00	390.00	-	-	-
Periferral bund (ha)	-	160.00	160.00	-	-	-
Water harvesting works (W.H.B.) area in ha.	-	160.206	160.00	-	-	-
Farm pond (No/ha.)	-	6/28	7/28	-	-	-
Recharge pit (No.)	-	-	-			
Agroforestry works (ha)		260.50	260.50			
Agro Horticulture (ha)	-	-	-	-	-	-
LIVILIHOOD PROGRAMME(Community based)	√	√	-	-	-	-
Income generating activities through SHG's for landless and marginal farmers	√	√	√	√	√	√
Livestock development activities						

PRODUCTION SYATEM AND MICRO ENTERPRISES	-	-	-	-	-	-
Demonstration and assessment of improved composting system using alternate materials (167ermin compost) and nutrient analysis (Nos.)	-	12	12	-	-	
Introduction of improved crop production practices ii) for *kharif* crops (ha) ii) for *rabi* crops (ha)	- -	23 18	23 18	8 5		
CONSOLIDATION PHASE						

CHAPTER -8
QUALITATIVE ISSUES

PLAN FOR MONITORING OF THE PROJECT

The above project would be monitored regularly by the Watershed Development Team as per the norms of common guideline 2008. There will be every fortnight monitoring schedule have been proposed by the PIA of the project. 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.

PLAN FOR EVALUATION OF THE PROJECT

The evaluation of the project would be done by the state and central agency as proposed by the SLNA of the state. The evaluation of the project would also be done by the expert of the respective field like Water Management and Land Resources Management after the completion of the project.

PLAN FOR 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.

CHAPTER -9
CONSOLIDATION / EXIT STRATEGY

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 come mainly from the fund generated.

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 records.

SUSTAINABILITY AND ENVIRONMENT SECURITY

In the proposed watershed management plan of IWMP-II watershed, proper blending of bio engineering measures will be applied on 60% of the total watershed area. Based on the results of studies conducted in this region, it is estimated that more 50% of the watershed area will be treated and consequently the soil loss and runoff from the area is expected to be reduced by 70% and 65% respectively. The proposed land use plan will

improve the land utilization index and crop diversification index significantly as compared to the existing one. It will help in maintaining ecosystem integrity on sustained basis along with improving the livelihood security of the farming community.

ECONOMIC ANALYSIS

Economic analysis of the project was carried by taking direct benefits and costs considering 25 year project life at 10 per cent discount rate. For this purpose of economic analysis, whole watershed development plan was divided into three sectors namely, agriculture, horticulture and forest/fuel wood plantation. Net present value(NPV), Benefit cost ratio (BC) ratio criteria were employed to judge the economic efficiency of each enterprise and sector.

AGRICULTURE

In rainfed agriculture the development cost can be recovered within one year as the present rainfed agriculture is being done on well maintained field, therefore, does not require much investment.

HORTICULTURE

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

FOREST/ FUEL WOOD PLANTATION

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

FOOD SUFFICIENCY

Achieving self sufficiency in food production is one of the prime objectives of the project.

CHAPTER -10
EXPECTED OUTCOME

EMPLOYMENT RELATED OUTCOMES

Employment has always been a problem in the village. The principal occupations of the people are dry land agriculture, animal husbandry and casual labour work. Animal husbandry does not keep them engaged full time, Thus the people mainly depend upon casual labour, either in the village itself or outside it.

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

Labour migration in search of gainful employment is one of the major problems in the remote watershed in particular. Causal employment opportunities will be generated during the implementation of the project activities. However, the changes in land use pattern and adoption of other subsidiary enterprises will generate employment opportunities for persons in the watershed. The details of the employment generation is given in below.

Table 10.1: EXPECTED EMPLOYMENT RELATED OUTCOMES

SN	No. of the Villages	Wage employment										Self employment				
		No. of mandays (Lakhs)					No. Of beneficiaries					No. Of beneficiaries				
		SC	ST	Others	Women	Total	SC	ST	Others	Women	Total	SC	ST	Others	Women	Total
1	30	1.081	-	2.343	0.180	3.604	1081	-	2343	180	3604	216	-	468	36	720

MIGRATION PATTERN

On account of agriculture and animal husbandry providing only part time employment for some part of the year, the people migrate for a better half of the year for wage labour. Employment opportunities in the local area as mentioned above will ensure lessening seasonal migration from the area. The detail of the migration is given below.

Table 10.2: DETAILS OF MIGRATION (I.W.M.P-II) AURAIYA

S.No.	No. of the villages	No. of persons migrating	No. of days per year of migration	Main reason for migration	Expected reduction in no. of persons migrating
1	30	210	180	Poverty & Unemployment	100

WATER RELATED OUTCOMES

As a result of the watershed activities, it is expected that the quantity and quality of drinking water would be improve. The ground water quality of the project area is normal to good, the average Ph value is 6.7 to 7.8, and the Electric conductivity of the ground water is about 957 to 1125 U. 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 5.5 to 6.0 metre. Status of the drinking water is given in below.

Table 10.3: STATUS OF DRINKING WATER

S. N.	No. of the villages	Availabilty of drinking water (no. of months in a year)		Quality of drinking water	
		Pre-project	Expected Post-Project	Pre-project	Expected Post-Project
1	30	09 months	12 months	Hard/Soft	Soft water

Table 10.4 : DETAILS OF AVERAGE GROUND WATER TABLE DEPTH IN THE PROJECT AREAS (IN METERS)

S. N.	No. of the villages	Sources	Pre-project	Expected Post-Project	Remarks
1	13	Open wells	12-72.00 mtr.	12-60 mtr.	-
		Bore wells	-	-	-

VEGETATION/ CROP RELATED OUTCOMES

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 and Jowar 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 up to 6 to 7 months only.

The farmers also do not have suitable cropping systems to deal aberrant weather. Weeds impose considerable constraints 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. It is expected that the post project period would see a substantial increase in agriculture production and yield from them. It is expected that after compilation of the project, the crop productivity of Rice-Wheat will certainly enhance, It would be around Paddy (24.00 qt/ha), Wheat (28.00 qt/ha). There will be an improvement in soil health of the study area after conservation measures

Table 10.5: MAJOR CROPS GROWN AND THEIR PRODUCTIVITY IN THE PROJECT AREA

1	2	3		4	
S. No.	**Name of the Crop**	**Current status**		**Expected post project status**	
		Area (ha)	Productivity (kg/ ha)	Area (ha)	Productivity (kg/ ha)
1	**Kharif**				
	Paddy	60	2130	116	2513
	Bajra	2657	1093	4081	1328
2	**Rabi**				
	Wheat	2588	2106	4252	2325
	Pulses	923	758	1501	887
3	Zaid/Other season	-	-	50	650

LIVESTOCK

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

FOREST/VEGETATIVE COVER RELATED OUTCOMES

The watershed has vast tract of denuded boulder and rock watershed. These wastelands do not have any tree vegetation. It typically falls under "Northern tropical thron forest" according to Champion and Seth classification of forest type of India.

ABTRACT OF OUTCOMES

The over all assessment of the project certain parameters have been evaluated on the present and future basis. As mentioned in the above the food grain production according to the expenditure has been analysised after the completion of the project.

Table 10.9 : SUMMARY OF EXPECTED/ESTIMATED OUTCOMES (MIS TABLE-M (PO) F1)

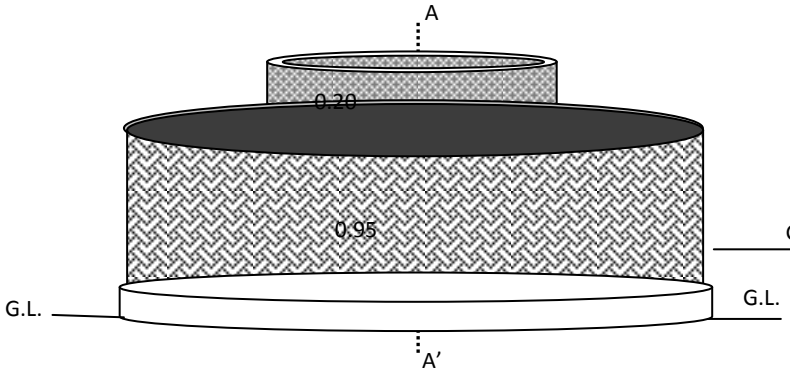
S.No.	Name of District	Item	Unit of Meadurement	Pre-Project Status	Expected Post Project Status	Remarks
1	2	3	4	5	6	7
1	AURAIYA, IWMP – II[nd]	Status of Water Table	Miter	12-72m	12-60m	
2		Ground Water Structures repaired/rejuvenated	No.	--	70	
3		Quality of Drinking water	--	Hard/Soft	Soft	
4		Availability of Drinking Water	Days	09 Month	12 Month	
5		Increase in Irrigation Potential	%	--	5%	
6		Change in Corpping/land use pattern	--	--	--	
7		Area under agricultural crop	Ha.	5680	6055.00	
8		i. Area under single crop.	Ha.	1200.00	1864.00	
9		ii. Area under double crop	Ha.	1650.00	1965.00	
10		iii. Area under multiple crop	Ha.	600.00	850.00	
11		Net increase in crop production area	Ha.	--	--	

12		Increase in area under vegetation	Ha.	30	70	
13		Increase in area under horticulture	Ha.	25	85	
14		Increase in area under fuel & fodder	Ha.	--	--	
15		Increase in milk Production	Av/Lt/Days/Cattle	--	5%	
16		No. of SHGs	No.	--	4	
17		Increase in no. of livelihoods	No.	--	--	
18		Increase in income	Rs.	6230	9130	
19		Migration	No.	210	100	
20		SHG Federations formed	--	--	--	
21		Credit Linkage with banks	--	--	4	
22		Resource use agreements	--	--	Agreed	
23		WDF collection & Management	5% to 10%		5% to 10%	
24		Summary of lessons learnt				

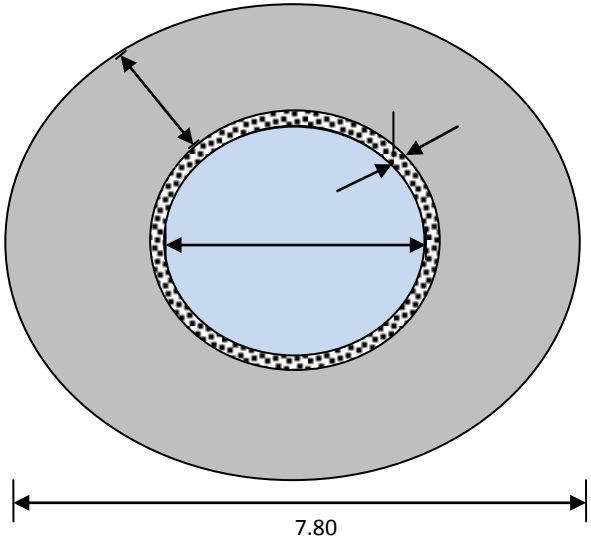
Chapter-11

COST NORMS & DESIGN OF STRUCTURE PROPOSED

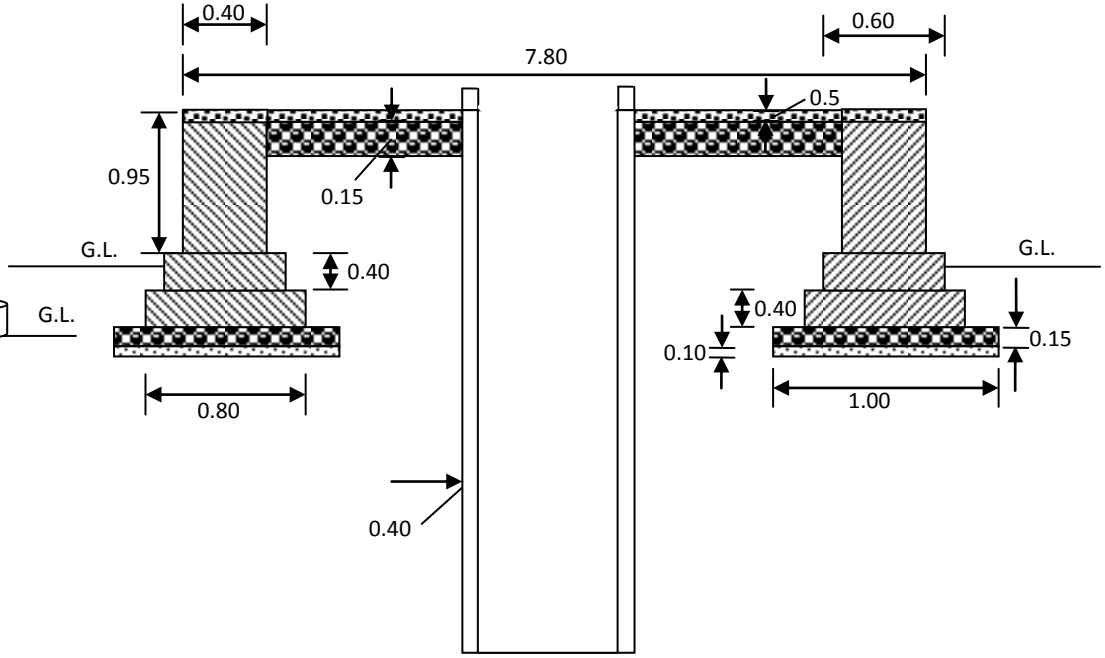
DRAWING OF WELL



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 x 7.4	1.20	1.00	27.88
2.	Laying of sand	1	3.14 x 7.4	1.00	0.10	2.32
3.	C.C.W. 1:4:8	1	3.14 x 7.4	1.00	0.15	3.48
4.	Brick Work 1:4	1	3.14 x 7.4 3.14 x 7.4 3.14 x 7.4 3.14 x 3.4	0.80 0.60 0.40 0.40	0.40 0.40 0.90 0.20	7.43 5.57 8.36 0.85
						22.21
5.	Filling of earth work	1	3.14 x 5.4	1.60	0.75	20.34
6.	C.C.W. 1:4:8	1	3.14 x 5.4	1.60	0.15	4.06
7.	C.C.W. 1:2:4	1	{(3.14 x 7.8 x 7.8)/4 – (3.14 x 3.8 x 3.8)/4} x 0.05			1.821
8.	Raised pointing	1	3.14 x 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	82 Bags	255.00/bag	20219.00
2.	Coarse Sand	14.13 cum	910.00/cum	12858.30
3.	Khanda	20.20 cum	1025.00/cum	22755.00
4.	Granite Stone Ballast 25-40 mm	7.01 cum	855/cum	5993.55
5.	Granite Stone Grit 10-20 mm	1.55 cum	1250.00/cum	1937.50
Total				**Rs. 64,454.00**

LABOUR CHARGES

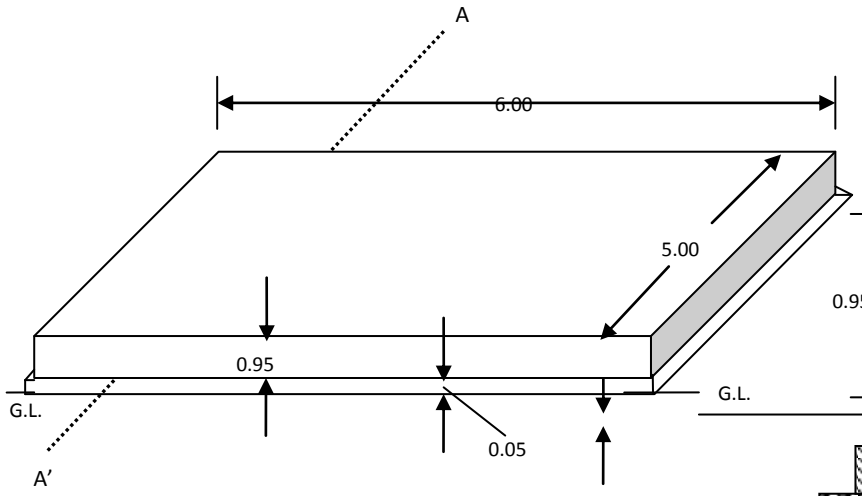
S.No.	Particulars	Quantity	Rate	Amount
1.	Earth Work	48.22 cum	36.66/cum	1769.01
2.	Sand Laying	2.32 cum	33.33/cum	77.32
3.	C.C.W. 1:4:8	7.54 cum	492.00/cum	3709.68
4.	C.C.W. 1:2:4	1.821 cum	492.00/cum	894.11
5.	Brick Work	22.210 cum	370.00/cum	8217.70
6.	Raised Pointing	22.04 m^2	51.61/m^2	7.48
7.	Curing 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	66,749.00
2. Labour charges & transportation	24,335.45
Total	**Rs. 91,084.45**
	Say Rs. 91,100.00 only

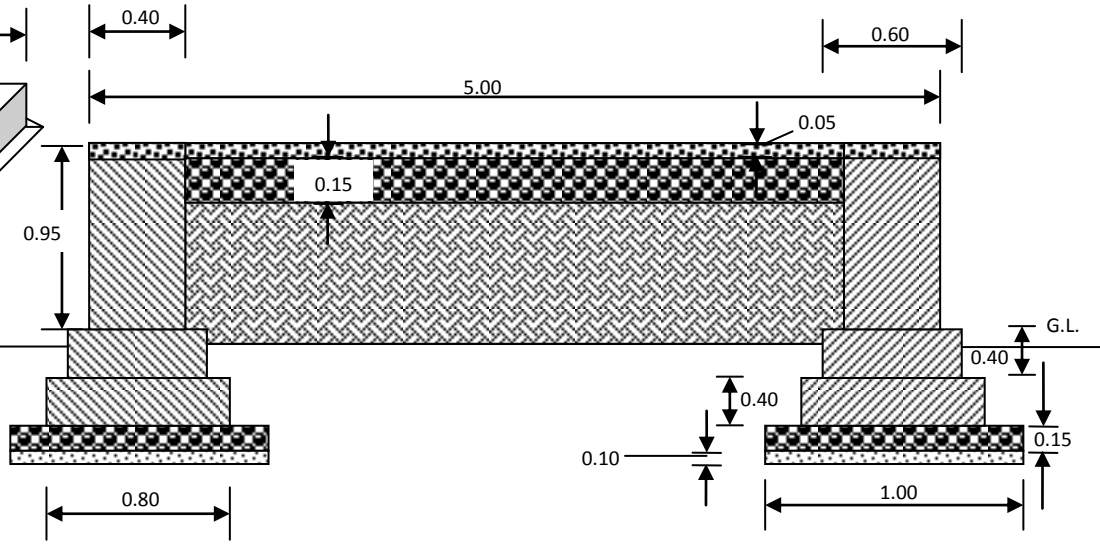
DETAIL ESTIMATE OF INDIA MARK-II HAND PUMP FOR WATER SHED AREA, DISTRICT - PILIBHITU.P.

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 i- Lowering and installation of India mark-II Hand Pump with G.I. Pipe & connecting rods. ii- 140 mm P.V.C. Pipe 8kg/cm2. iii- medium G.I.Pipe of the 32 mm Ø.	No. metre metre	1 20 30	5380.00 240.00 202.90	5380.00 4800.00 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 KRISHAK VIKAS MANCH



ISOMETRIC VIEW OF PLATFORM (CHABUTRA)



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 WATERSHED 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 masonary 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 m^2**

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

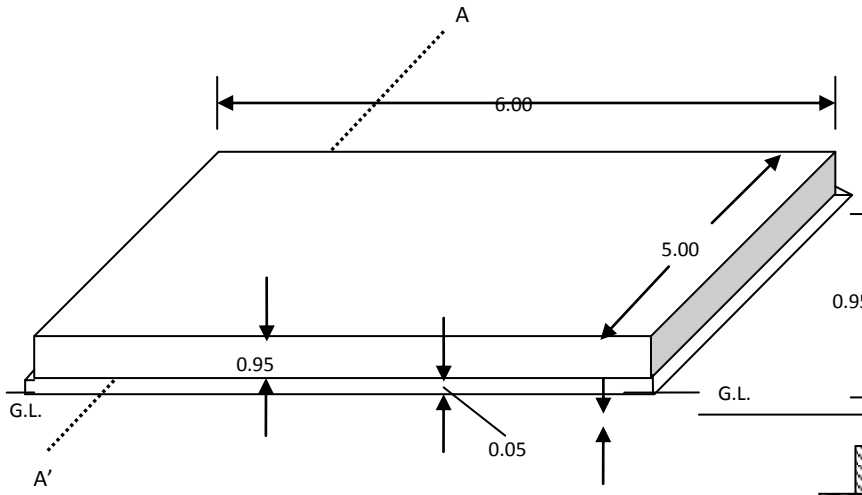
S.No.	Particulars	Quantity	Rate	Amount
1.	Cement	77 Bags	255/Bag	19635.00
2.	Coarse Sand	12.00 cum	910.00/cum	10920.00
3.	Khanda	18.768 cum	1025.00/cum	19237.20
4.	G.S.B. 25-40 mm	5.900 cum	855.00/cum	5044.00
5.	G.S. Grit 10-20 mm	1.280 cum	1250.00/cum	1600.00
Total				**Rs. 56,436.20**

LABOUR CHARGES

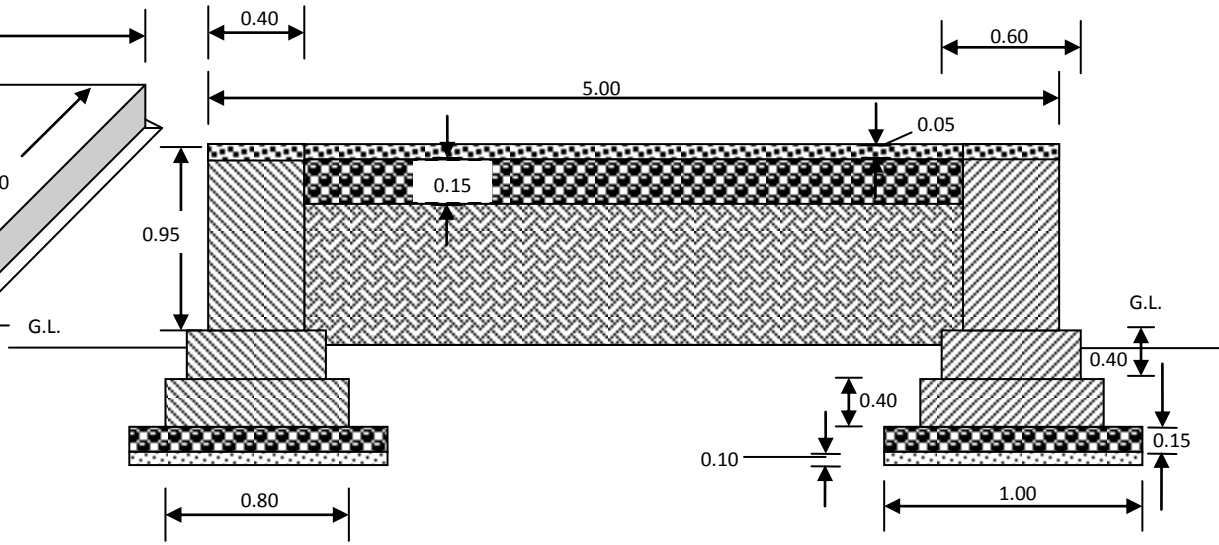
S.No.	Particulars	Quantity	Rate	Amount
1.	Earth Work	48.06 cum	36.66/cum	1761.87
2.	Sand Laying	2.060 cum	33.33/cum	68.65
3.	C.C.W. 1:4:8	6.336 cum	494.00/cum	3129.98
4.	C.C.W. 1:2:4	1.500 cum	494.00/cum	741.00
5.	R/R Brick Masonary 1:4	18.768 cum	370.00/cum	6944.16
6.	Raised Pointing 1:3	19.800 m^2	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. 14,736.73**

Total Expenditure	
1. Cost of Materials	56,436.20
2. Labour Charges	14,736.73
Total	**Rs. 71,172.93**
Say	**Rs. 71,200 only**

DRAWING OF PANCHAYATI CHABUTARA



ISOMETRIC VIEW OF PLATFORM (CHABUTRA)



SECTION AT A-A'

DESCRIPTION

5. C.C.W. - 1:4:8.
6. Brick Work - 1:4
7. Plastering- 1:4
8. Raised Pointing- 1:3.

DETAIL ESTIMATE OF WATERSHED 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 masonary 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 m^2**

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

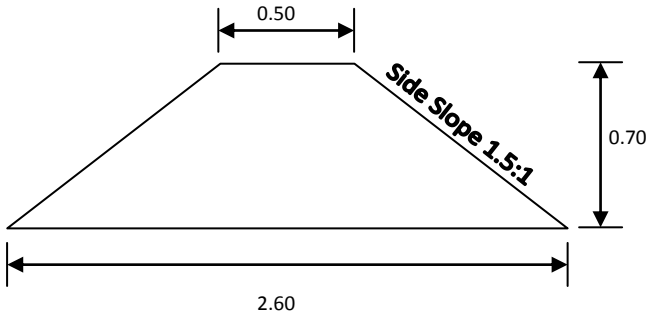
S.No.	Particulars	Quantity	Rate	Amount
1.	Earth Work	49.50 cum	36.66/cum	1814.67
2.	Sand Laying	2.060 cum	33.33/cum	68.65
3.	C.C.W. 1:4:8	6.336 cum	494.00/cum	3129.98
4.	C.C.W. 1:2:4	1.500 cum	494.00/cum	741.00
5.	Brick Work 1:4	18.768 cum	370.00/cum	6944.16
6.	Raised Pointing 1:3	19.800 m^2	51.61/cum	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**

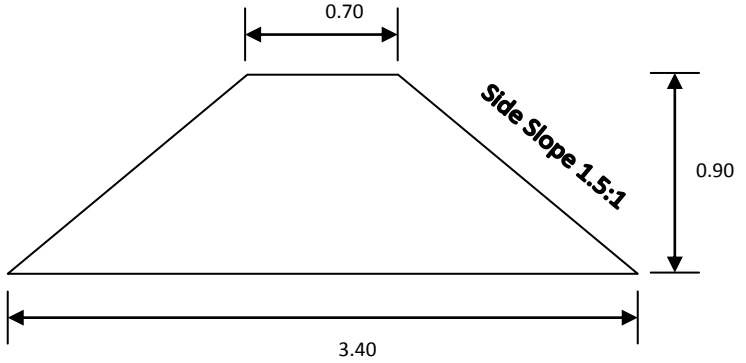
DETAILS ESTIMATE OF WATERSHED DEVELOPMENT WORK PHASE

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

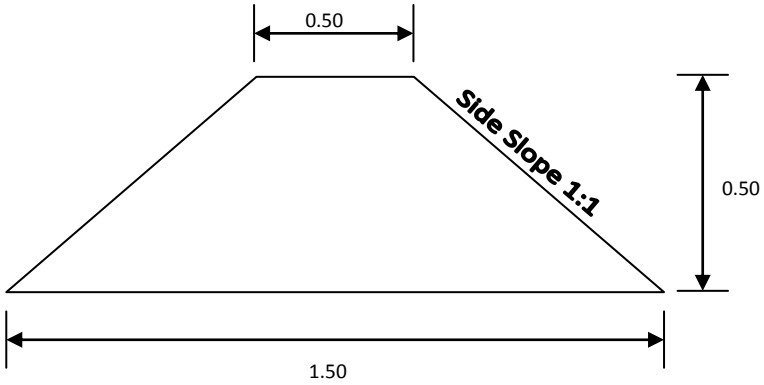
(Not to Scale)



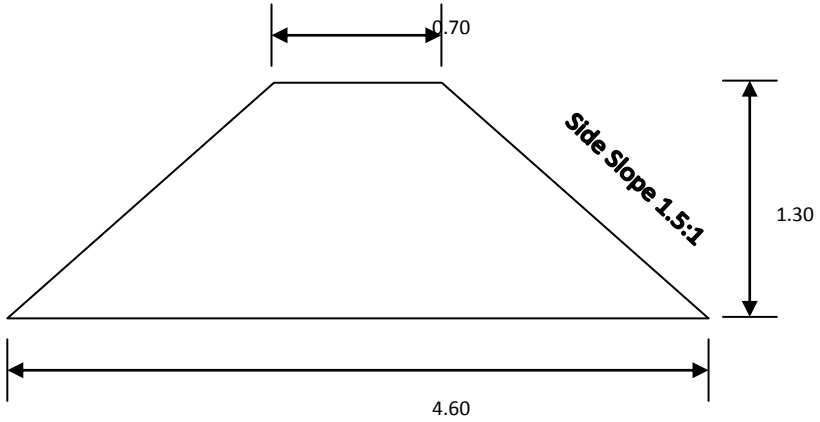
(C.B., Cross-Section – 1.085 m^2)



(S.B., Cross-Section – 1.845m^2)



(Field Bund, Cross-Section – 0.50 m^2)

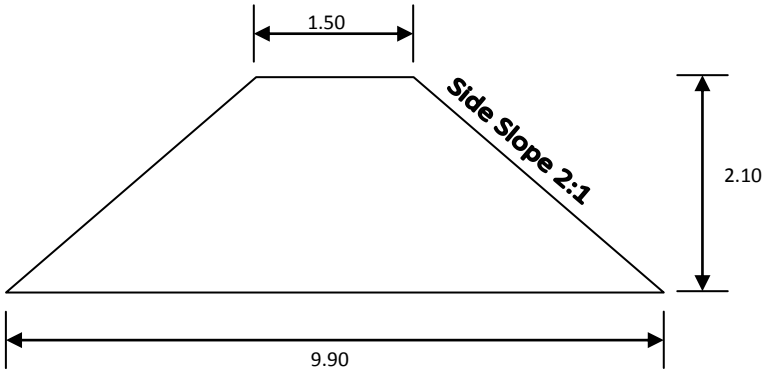


(S.B. /P.B. /M.B., Cross-Section – 3.445 m^2)

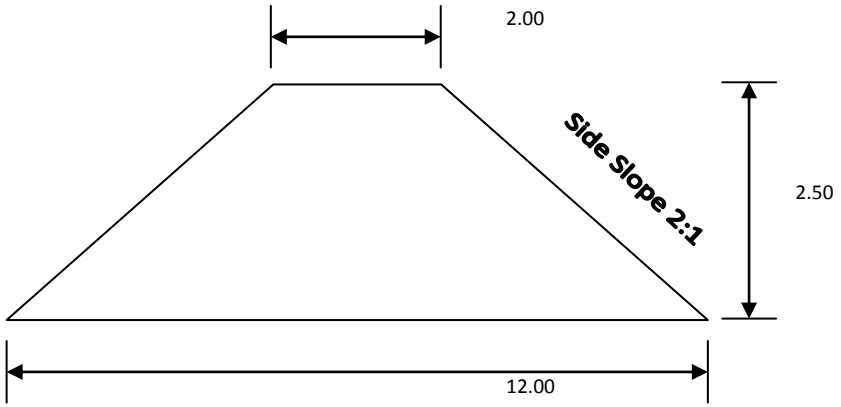
(All dimensions in Metre)

DRAWING OF EARTHEN CHEKDAM / GULLY PLUG

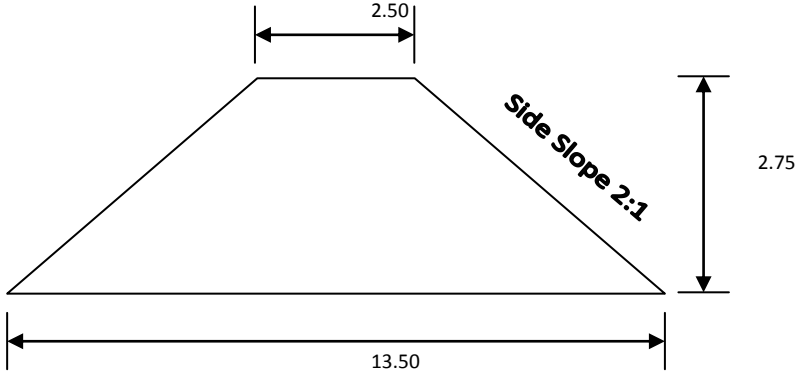
(Not to Scale)



(C.D. /G.P., Cross-Section – 11.97 m^2)



(C.D. /G.P., Cross-Section – 17.50 m^2)



(W.H.B., Cross-Section – 22.00 m^2)

(All dimensions in Metre)

DESIGN OF CONTOUR BUND

Type of Soil	-Loam,Sandy Loam
Rain fall	-24 hr in cm -25 cm
Field Stop -1%	
Vertical Interval (VI)	= [s/3+2] x 0.3
	= [1/3+2] x 0.3
	= 0.70 m
Horizontal Interval (HI)	= 100 x V.I/s
	= 100 x 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 m

Taking top width of bund 0.50 m and side slope 1.5:1

Then base of Bund	= 0.50 + (1.50 d) x 2
	= 2.60 m
Cross-Section of bund	= (0.50 + 2.60) x 0.70 / 2
	= 1 .085 m^2
Length of bund	= 100 s / V.I.
	= 100 x 1 / 0.70
	=142.85 m/ha
	Say 150 m/ha
Earth work/ha	= 150x1.085
	= 162.75 cum
Cost Rs. / ha	= 162.75 x 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]x0.30

=0.90 m

Horizontal Interval = (100xV.I.)/s — = (100x0.90)/3

=30 m

Height of bund $h=\sqrt{(Re \times V.I.)/50}$ — $=\sqrt{(25 \times 0.90)/50}$ $=\sqrt{0.45}$ = 0.67 m. **Say 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 x 1.5d
= 0.70+2.70
= 3.40

Cross Section of Submergence Bund — = (0.70+3.40) x 0.90 / 2
= 1.845 m^2

Length of bund — = 100 s / V.I.
= (100 x 3) /0.90
= 333 m

Feasible length — 100 + 25 + 25
= 150 m

Earth work/ha — =150 x 1.845
=276.75

Cost per ha — =276.75 x 39.16
=10,837.53
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)x0.50/2 = 0.50 m^2
Length per hectare	= 200 m
Earthwork	= 200 x 0.50 = 100 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)x1.30/2
	= 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) x 2.10 / 2
	= 11.97 m^2
Cost per meter	= Rs. 551.45

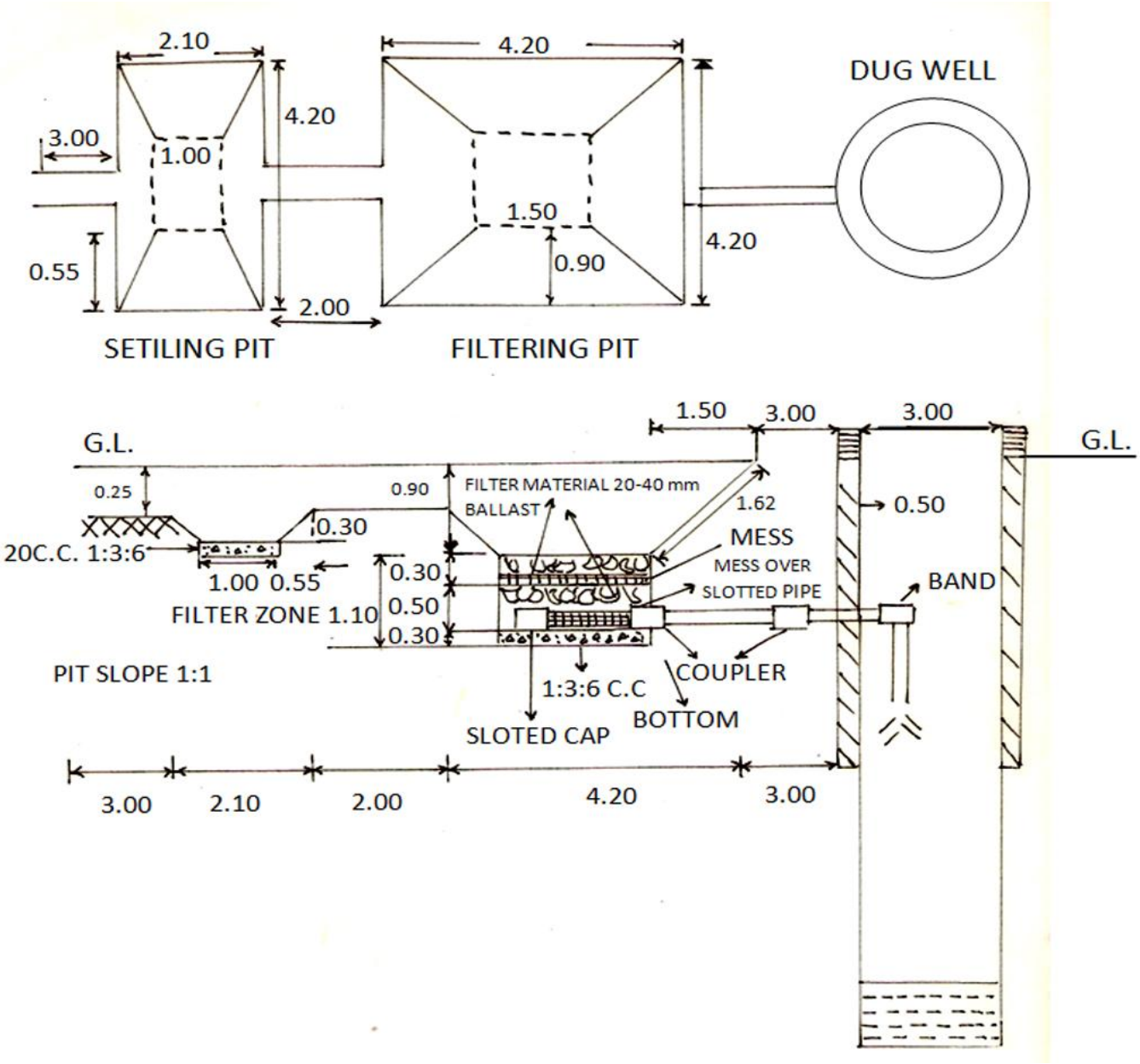
TYPICAL SECTION OF CHECK DAM / GULLY PLUG

Top width	= 2.00m
Side slope	= 2:1
Height	= 2.50 m
Bottom Width	= 12.00 m
Cross Section	= (2.00 + 12.00) x 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) x 2.75 / 2
	= 22.00 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)

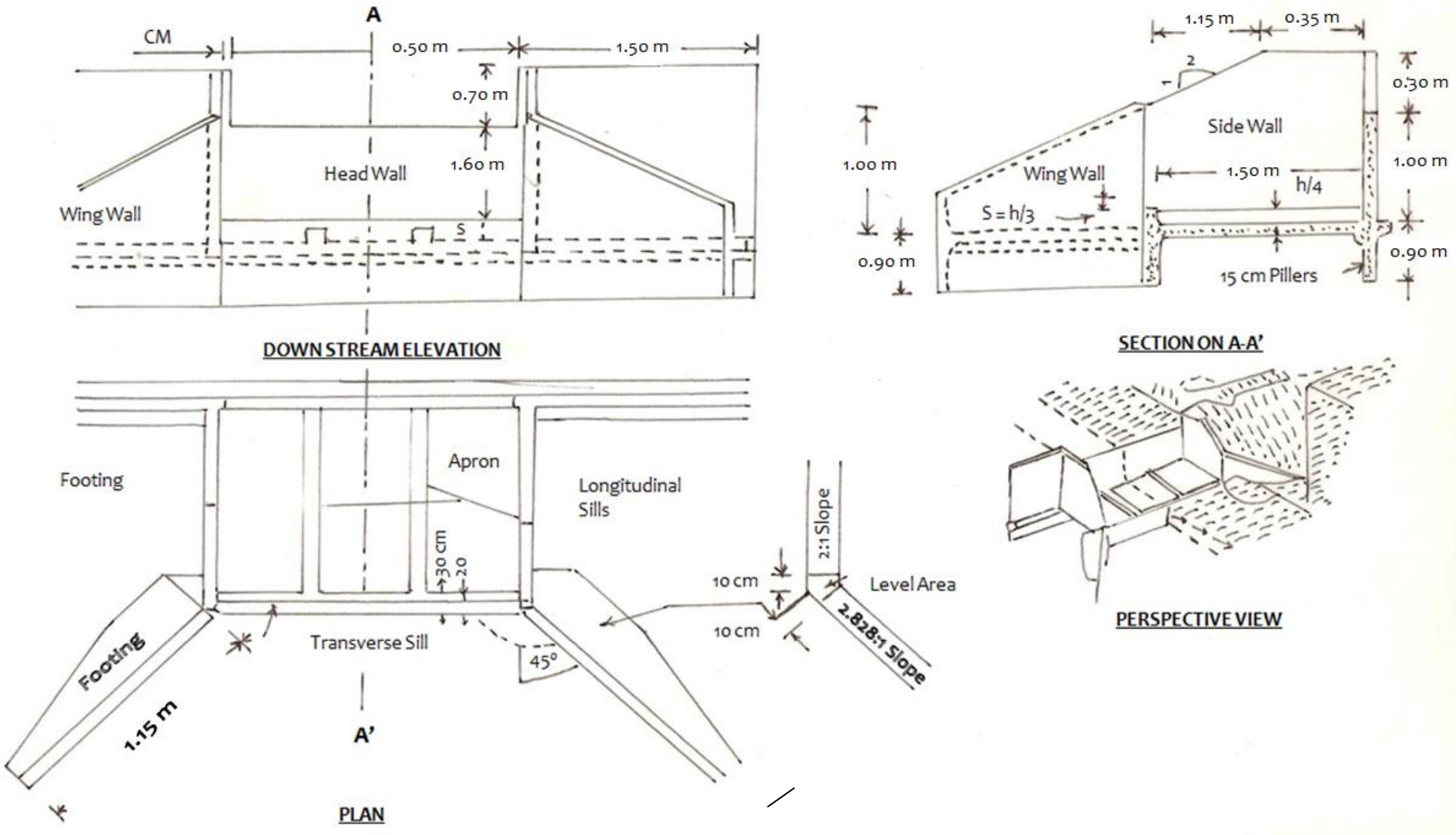
S.No.	Name of Work	No.	L B D/H	Unit	Quantity
1.	Earth work in excavation hard soil mixed with *kanker* gravel, etc. in foundation.				
a	Settling pit (i) Long Wall	4	0.65 x 1.75 x 0.10/2	M^3	0.09
		2	1.50 x 0.62 x 0.75	M^3	1.39
	(ii) Short Wall	4	0.55 x 0.75/2 x 0.10	M^3	0.08
		2	1.00 x 0.55 x 0.75	M^3	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

DRAWING OF SPILLWAY OF CREST LENGTH 0.5 m

All Dimensions in Metre

Not to Scale



Design of Drop Spillway for 1.00 ha Catchment Area

Design of Drop Spillway to be constructed at a place in a gully having width of 1.0 m and catchment area 1.00 ha and net drop 0.50 m Taking rainfall intensity for duration equal to time of concentration of watershed and design return period of 25 years , as 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:

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

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 L & H

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

$$0.10 = \frac{1.711\ L\ H^{3/2}}{(1.10+0.01 \times 0.5)} = \frac{1.711\ L\ H^{3/2}}{(1.105)}$$

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

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

$$H = \frac{0.50}{(0.128)^{2/3}} = 0.25 \text{ m}$$

Test: $L / h = \frac{0.50}{0.25} = 2.0 \geq 2.0$ hence O.K.

$h / f = \frac{0.25}{0.50} = 0.50 \leq 0.5$ hence O.K.

3. Structural design –

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

E = 3x0.5+0.6 or 1.5x0.50

E = 2.10 m or 0.75 m

Adopted 2.10 m

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

= 0.50 x 2.74 = 1.37 m says 1.40 m

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

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

$J = 2h$ or $[f + h + S – (L_B + 0.10)/2]$ whichever is greater

= 2 x 0.50 or [0.50+0.50+0.16 – (1.37+0.10)/2]

= 1.0 or [1.16 – 0.735]

= 1.0 or 0.425

adopt J = 1.00 m

5- $M = 2(f + 1.33\,h - J) = 2(0.50 + 1.33 \times 0.25 - 1.00)$

$= 2 \times (-0.167) = -0.335$ m

6- $K = (L_B + 0.1) - M = (1.37 + 0.1) - 0.335$

$= 1.47 - 0.335$

$= 1.135$ m

Toe and cut off walls

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

$= 0.473 \times (0.1/1)^{1/3}$

$= 0.473 \times 0.464$

$= 0.219$

Maximum Scour depth (M S D) = 1.5x N S D

= 1.5 x 0.219

= 0.328 m

says 0.35 m

Depth of cutoff /Toe wall = 0.35 m

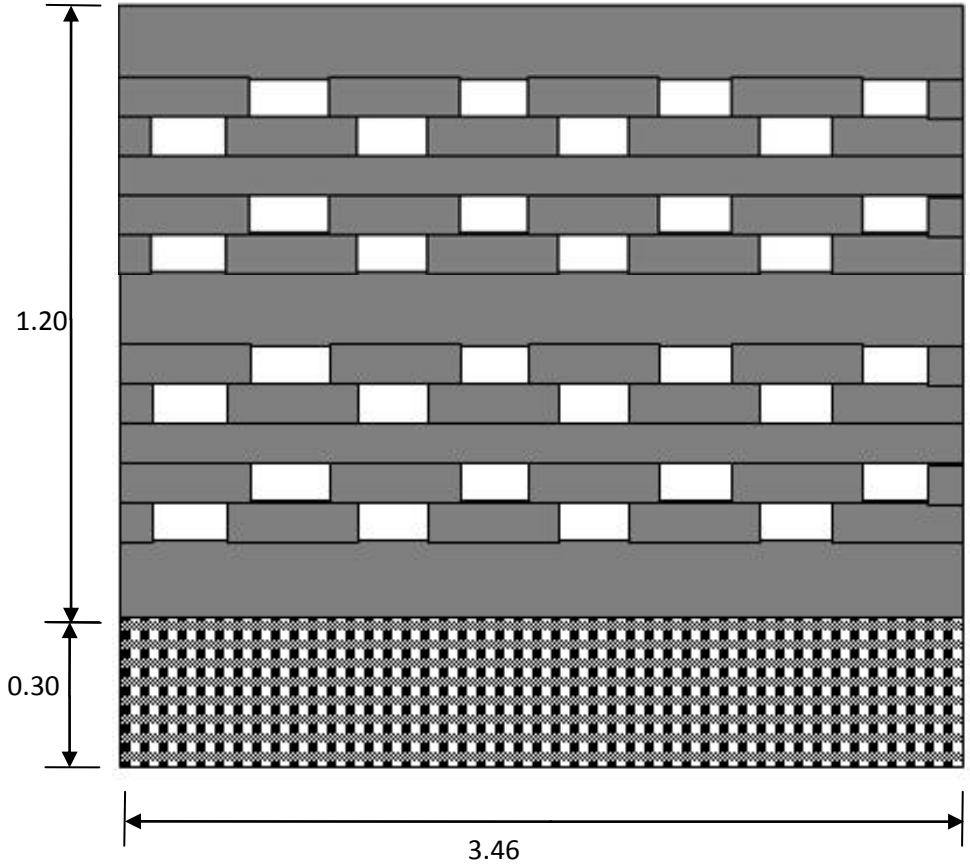
Apron thickness : For an over fall of 0.5 m. The Apron thickness in concrete construction is 0.20 m since the structure is constructed in masonry, the Apron thickness will be 0.20 x 1.50 = 0.30 m

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

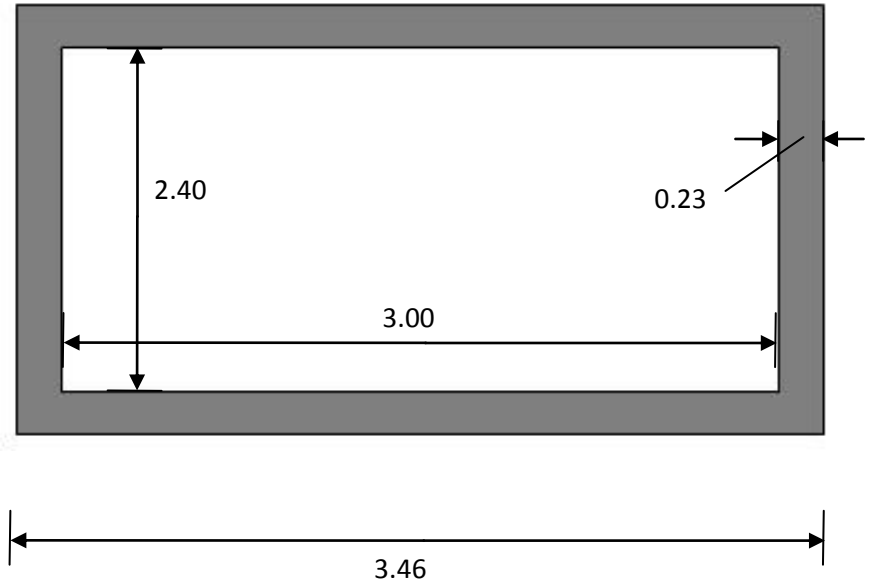
Description	Thickness of wall	
	Top width	Bottom width
Head wall	0.40	1.00
Side wall	0.30	0.80
Wing wall and head wall extension	0.30	0.60

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 during, 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 m^2**

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.	1st 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

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

DEMONSTRATION OF WHEAT

1- Variety recommended for District-Auraiya

Irrigated-W.H-542, PBW-343, K-88, UP-2338, K-9107

Unirrigated –K-8027, k-9465, k-8962 (India)

Malviya-533, k-9644

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	
9	Isoprotoron 75 %	1.00 kg.	240.00	240.00	
Total				**5907.60**	
Say				**5900.00**	

Hence demonstration cost of wheat /ha is Rs. 5900.00

DEMONSTRATION OF GRAM IN WATERSHED AREA (per ha)

1- Variety

Rainfed – J.G-315, Avrodhi, KGB-1168, Part G-114, KWR-108, K-850, Radhey

2- Late Variety – Uday, Poosa-372, Pant G- 186, Poosa-267,1003 (Kabali)

Seed rate/ha -50-55kg

2- 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, Vahar, Malviya-11

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- Variety- shankul-155 (80-100 days), WCC-75, ICPP-8203, Raj-171, Shankar bajra, Poosa-
2- Requirement of fertilizers/ ha N- 60.00 kg, P- 40.00 kg, K-40.00 kg
3- Requirement of Seed / ha -10kg

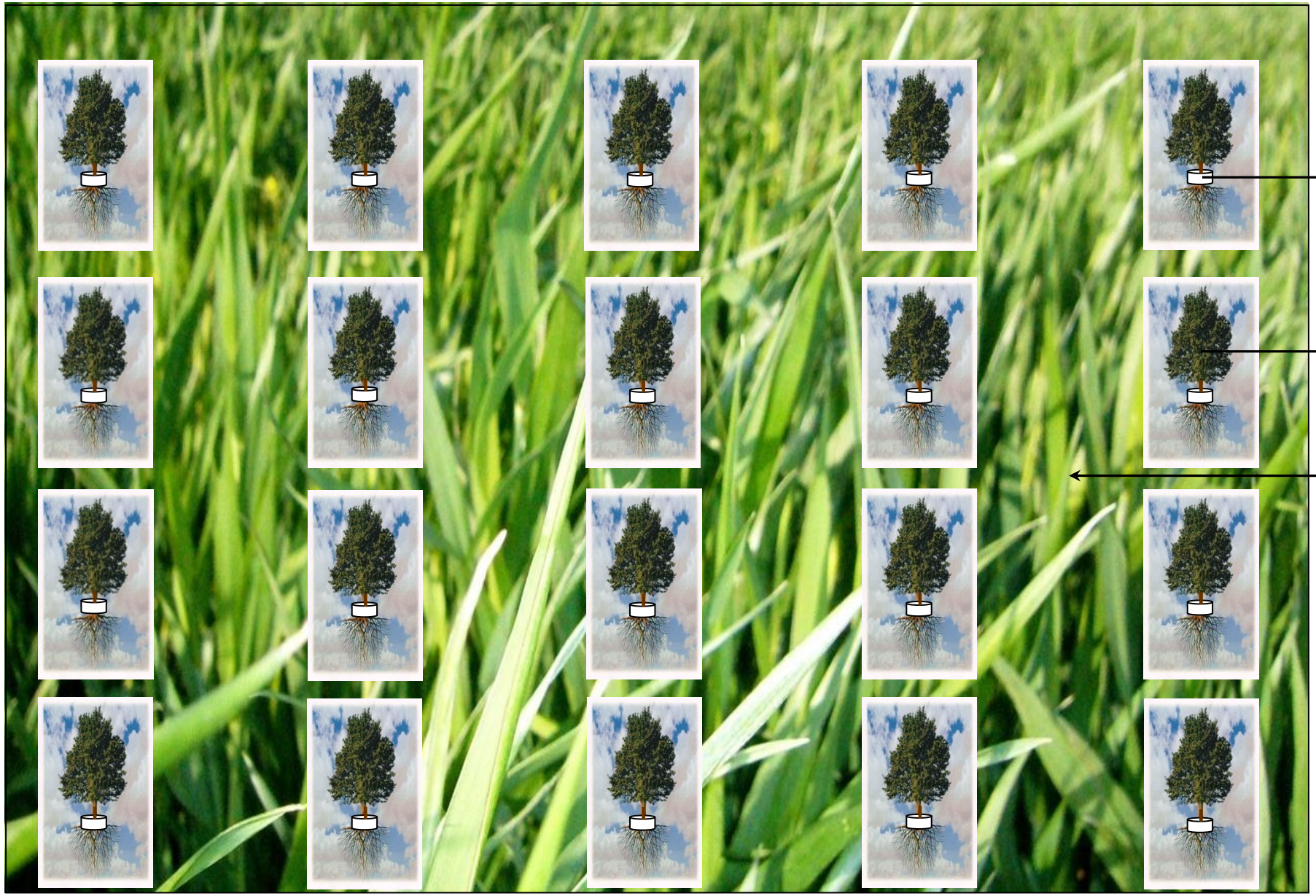
ESTIMATE FOR DEMONSTRATION OF BAJRA (per ha) RAINFED

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 2OO LITRES CAPACITY

District Auraiya is situated in Mid UP where there is scarcity of water and in summer temperature rises up to 51˙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. A mainly crops root goes in to the soil up to "4-5" in cereal crops and "6-9" in pulses. Using plastic drums the plants will be planted 50-60 cm below the ground level which is below the root zone of crops. Therefore trees will not able to take nutrients from upper layer of fields and there will no effect of plants on crops.

In summer season up to 1 to 1.50m depth of soil becomes dry causes more mortality rate of plants, using drums plants are planted below 50-60 from Ground level and in rainy and winter season up to February roots of plants goes below 2.10m below where moisture will be available and plants will be safe in summer also. Using barbed wire fencing the plants will be protected 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	255.00/bag	1657.50
6.	Coarse sand	0.450 cum	910.00/cum	409.50
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. 1,68,292.50**

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	1,68,292.50
2. Labour Charges	58,527.85
Total	**Rs. 2,26,819.50.00**
Say	**Rs. 2,26,820.00 only**

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 2nd year onwards – 15 % of 1st 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 2nd year onwards – 15 % of 1st 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 *Crotolaria Juneea* (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 oblise 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, tough we have only 2% of the world's geographical area. The project on for 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 for age 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 ore 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 gay 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 as industry. Under the aegis of ICAR's all India coordinated Research Project on Forage Crops, several highly productive fodder cropping system 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+Cowper-Jowar-Berseem+Japanrape	197.2
3- Jawar+Cowper-Berseem+Japanrape-Jawer+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:

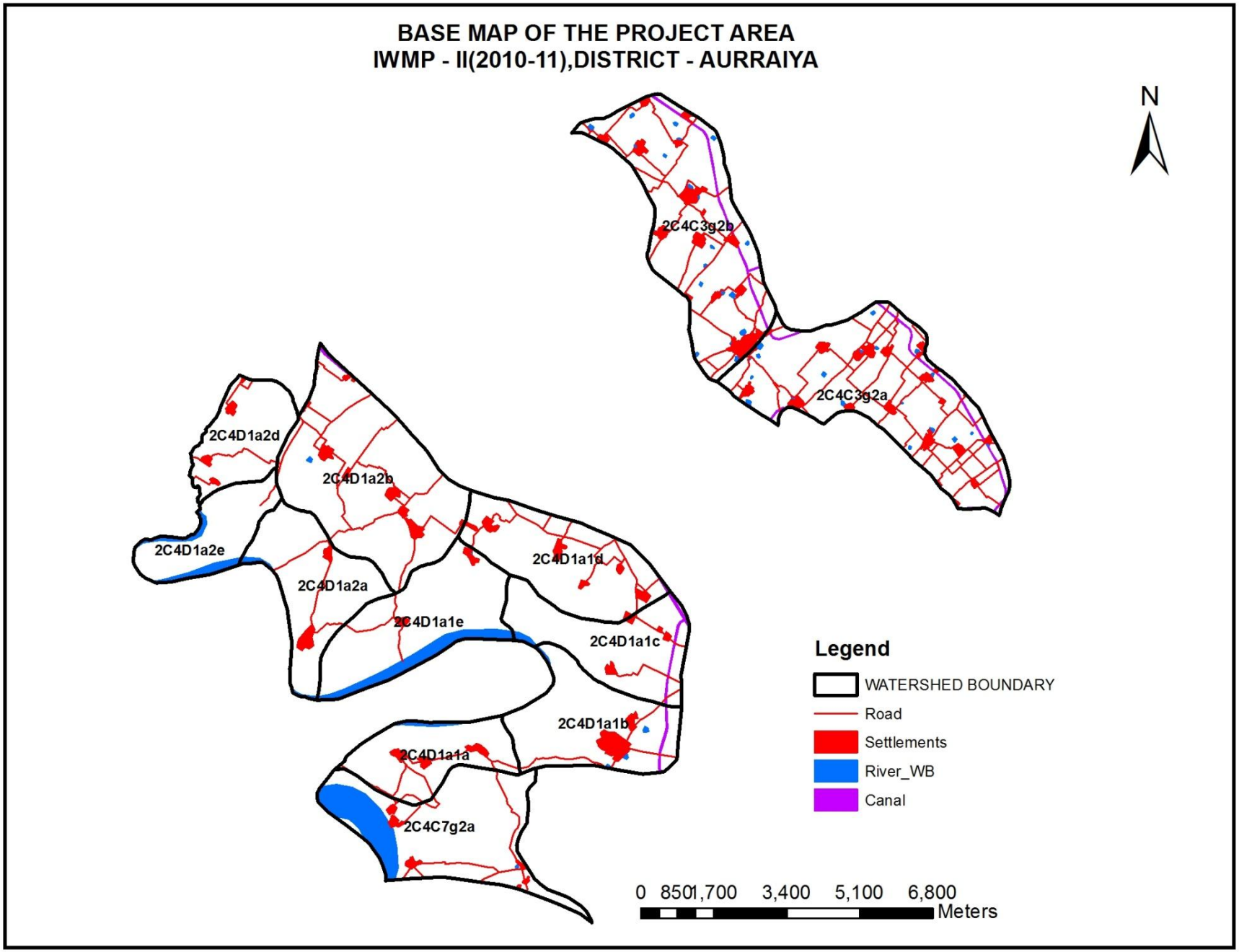
1- Strip cropping, rotational cropping or lay farming.
2- Stabilization of bunds and terraces.
3- Stabilization of gullies, diversion or drainage channels.
4- Stabilization of sand dunes.
5- Meadows and pasture on steep slopes.
6- Fertility builder for eroded soil.

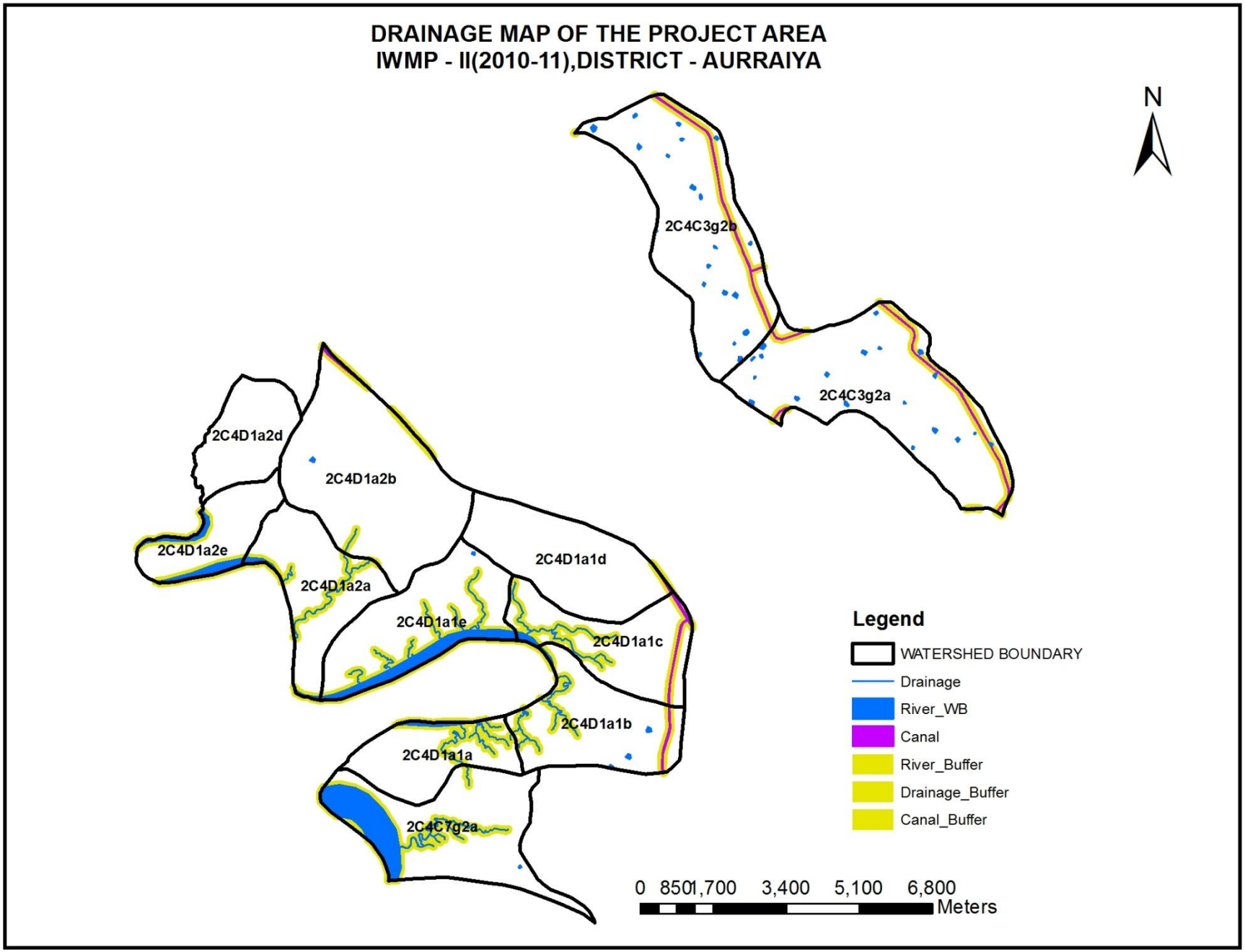
MAPS

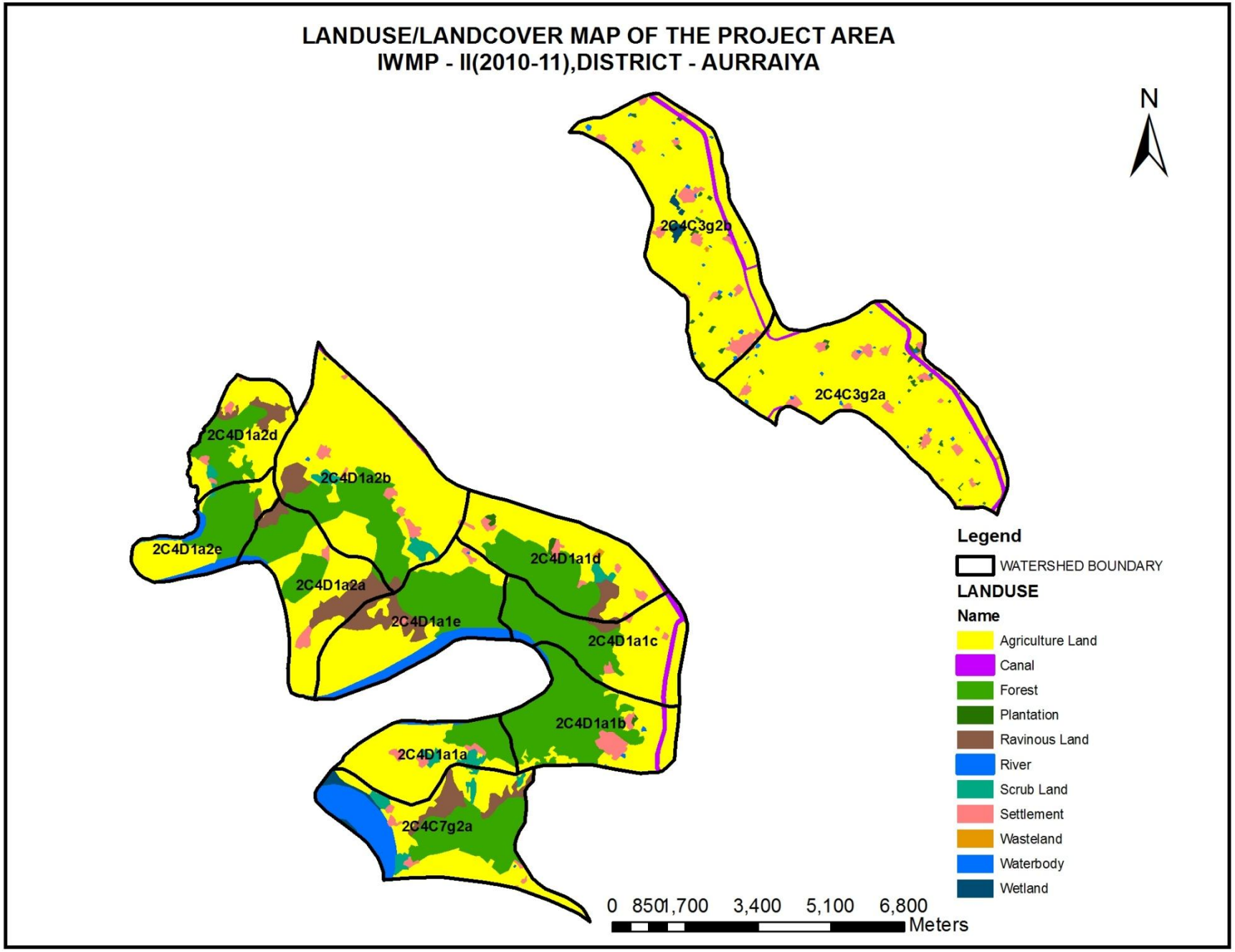
An attempt has been to map the surface details of the project area, as per the instruction of the Common Guide Lines-2008, All the thematic maps of the study area have been prepared through using remote sensing and geographical information system(G.I.S.) technique, following the fundamental norms of the National Map Policy-2006. The details of the thematic maps have been given below.

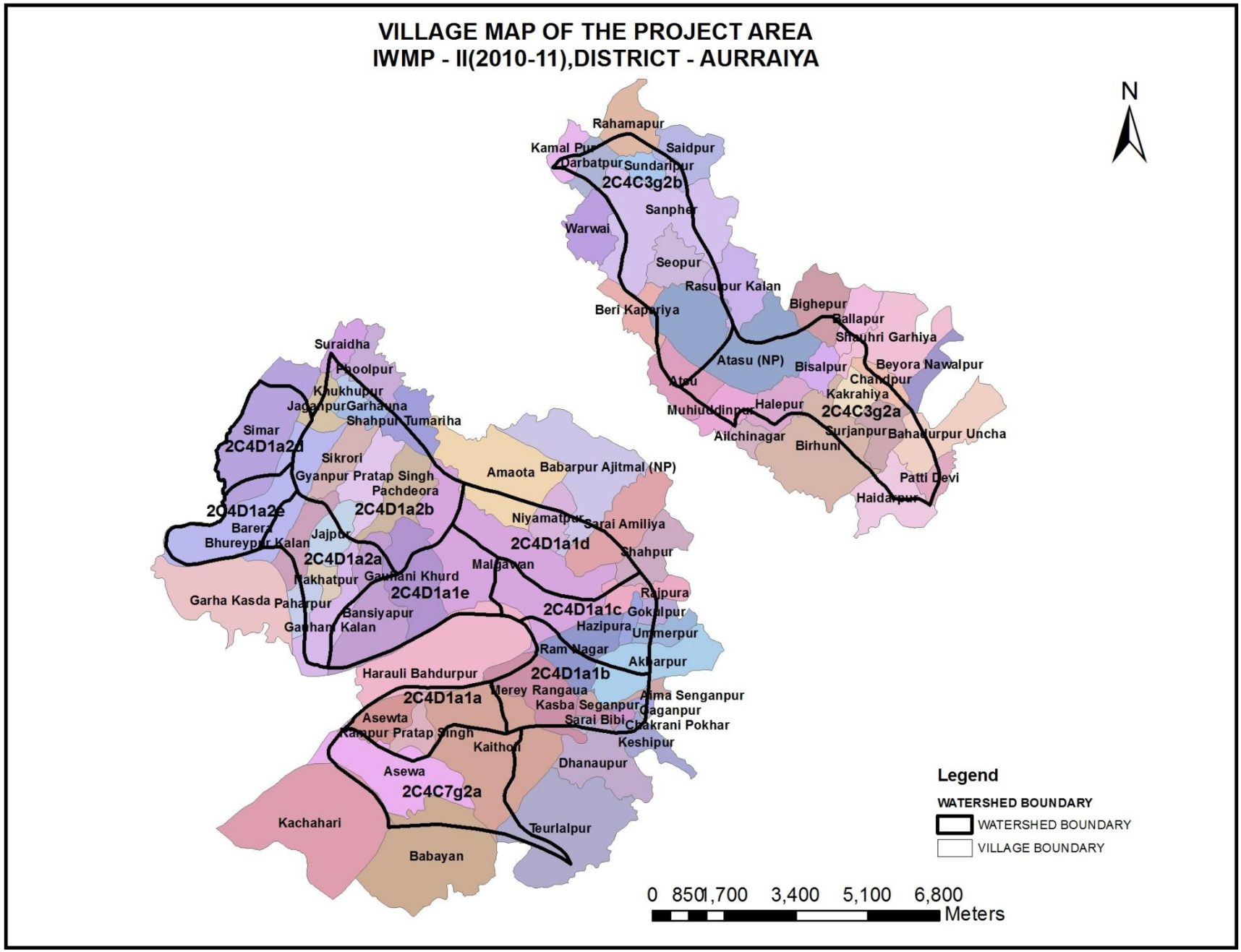
1- Base Map
2- Drainage Map
3- Land use/ Land cover Map
4- Village Map
5- Countor Map
6- Slope Map
7- Soil Map
8- Soil Depth Map
9- Soil Erossion Map

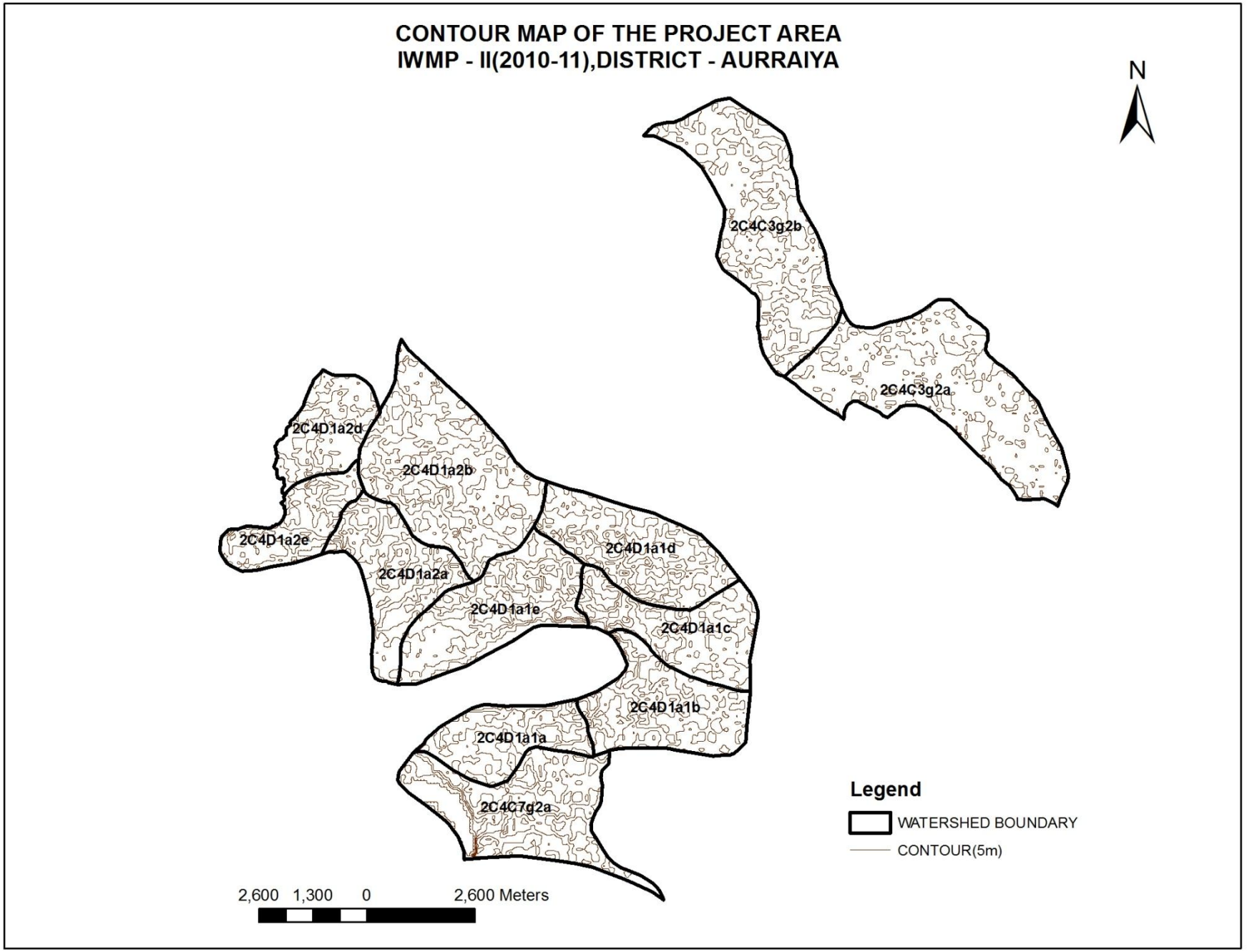
These maps were interpreted from the high resolution satellite dada freely available on internet.

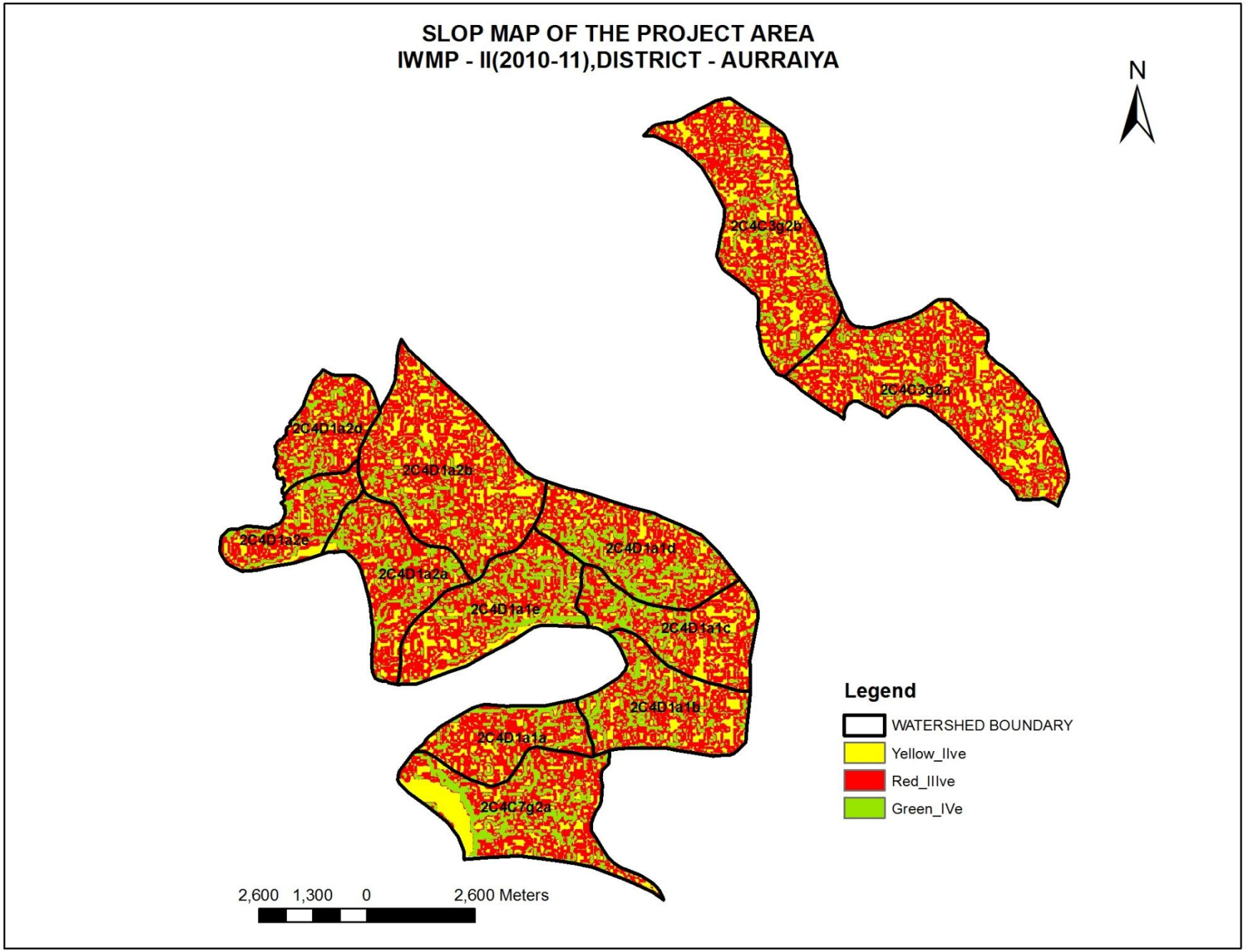

BASE MAP OF THE PROJECT AREA
IWMP - II(2010-11),DISTRICT - AURRAIYA
N
2C4C3g2b
2C4C3g2a
2C4D1a2d
2C4D1a2b
2C4D1a2e
2C4D1a2a
2C4D1a1d
2C4D1a1e
2C4D1a1c
2C4D1a1b
2C4D1a1a
2C4C7g2a
Legend
WATERSHED BOUNDARY
Road
Settlements
River_WB
Canal
0 850 1,700 3,400 5,100 6,800
Meters

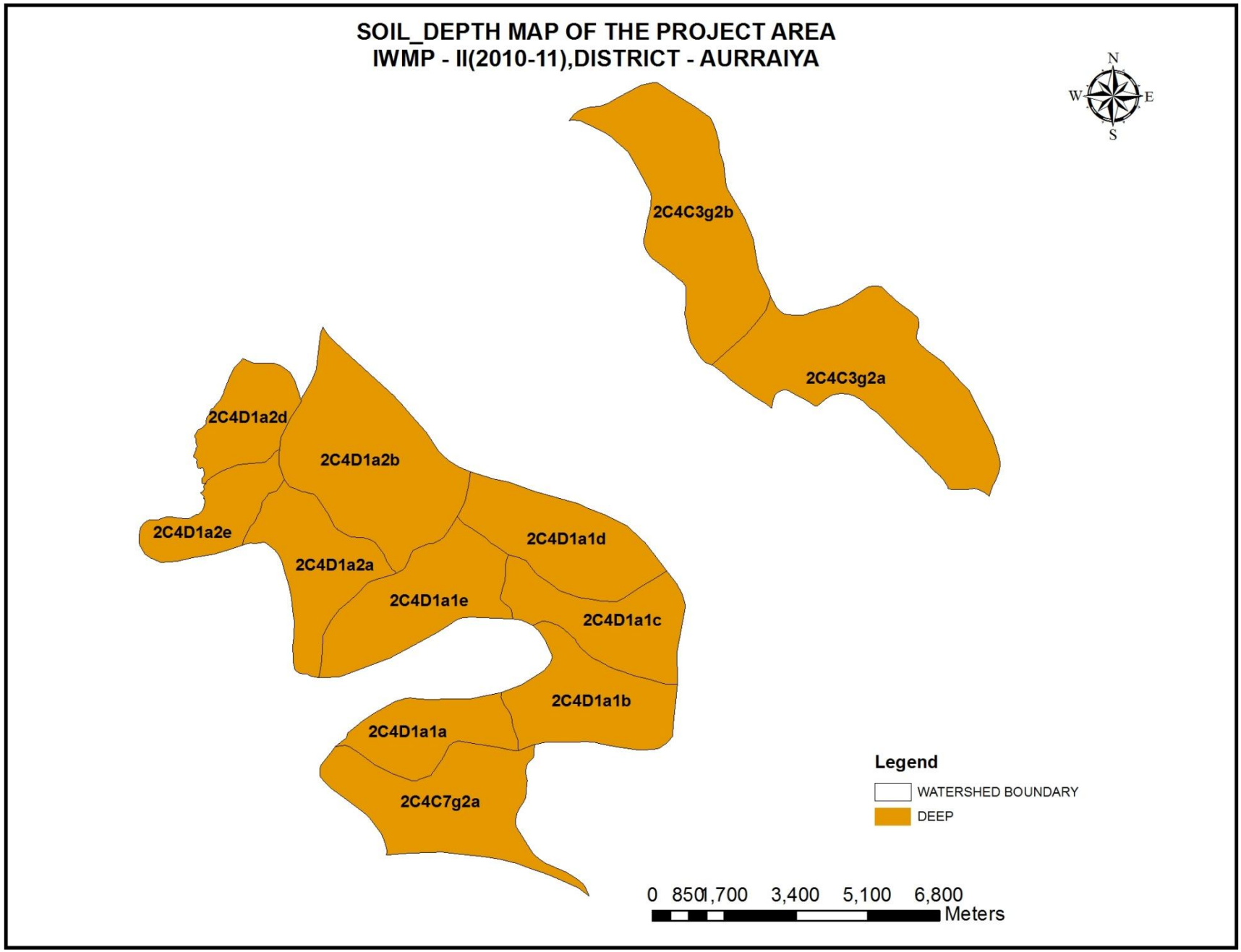

DRAINAGE MAP OF THE PROJECT AREA
IWMP - II(2010-11),DISTRICT - AURRAIYA
N
2C4C3g2b
2C4C3g2a
2C4D1a2d
2C4D1a2b
2C4D1a2e
2C4D1a2a
2C4D1a1d
2C4D1a1e
2C4D1a1c
2C4D1a1b
2C4D1a1a
2C4C7g2a
Legend
WATERSHED BOUNDARY
Drainage
River_WB
Canal
River_Buffer
Drainage_Buffer
Canal_Buffer
0 850 1,700 3,400 5,100 6,800
Meters

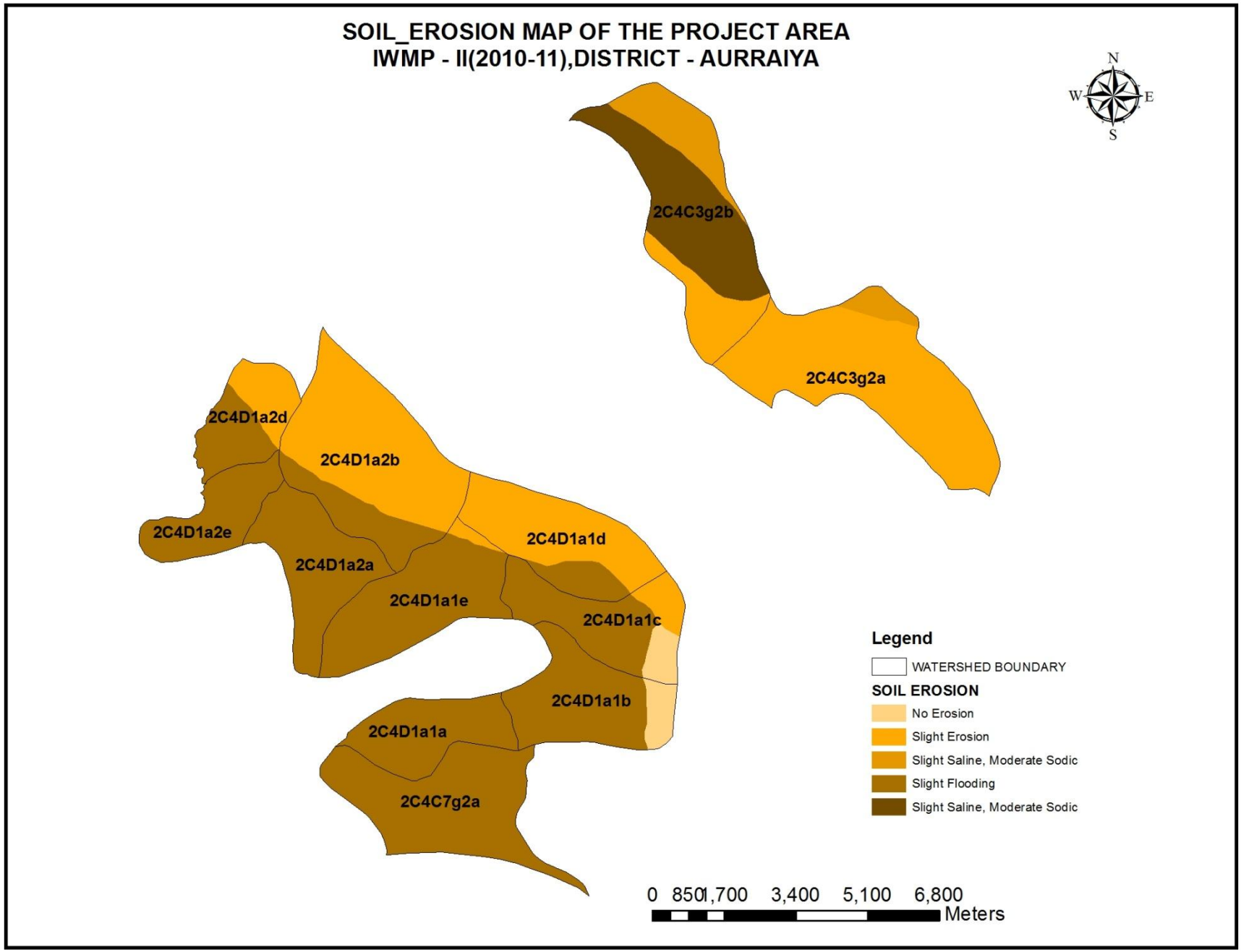

LANDUSE/LANDCOVER MAP OF THE PROJECT AREA
IWMP - II(2010-11),DISTRICT - AURRAIYA
N
2C4C3g2b
2C4C3g2a
2C4D1a2d
2C4D1a2b
2C4D1a2e
2C4D1a2a
2C4D1a1d
2C4D1a1e
2C4D1a1c
2C4D1a1b
2C4D1a1a
2C4C7g2a
Legend
WATERSHED BOUNDARY
LANDUSE
Name
Agriculture Land
Canal
Forest
Plantation
Ravinous Land
River
Scrub Land
Settlement
Wasteland
Waterbody
Wetland
0 850 1,700 3,400 5,100 6,800
Meters


VILLAGE MAP OF THE PROJECT AREA
IWMP - II(2010-11),DISTRICT - AURRAIYA
N
Rahamapur
Kamal Pur
Saidpur
Darbatpur
Sundarpur
2C4C3g2b
Sanpher
Warwai
Seopur
Rasulpur Kalan
Beri Kapariya
Bighepur
Ballapur
Shauhri Garhiya
Atasu (NP)
Bisalpur
Beyora Nawalpur
Chandpur
Atasu
Kakrahiya
Halepur
Muhiuddinpur
2C4C3g2a
Surjanpur
Bahadurpur Uncha
Ailchinagar
Birhuni
Patti Devi
Haidarpur
Suraidha
Phoolpur
Khukhupur
Jagatpur
Garhauna
Shahpur Tumariha
Simar
2C4D1a2d
Sikrori
Gyanpur Pratap Singh
Pachdeora
Amaota
Babarpur Ajitmal (NP)
2C4D1a2e
2C4D1a2b
Barera
Bhureypur Kalan
Jajpur
Niyamatpur
Sarai Amiliya
2C4D1a1d
Shahpur
2C4D1a2a
Malgawan
Makhatpur
Gauhani Khurd
2C4D1a1e
Rajpura
Garha Kasda
Paharpur
Bansiyapur
2C4D1a1c
Gokulpur
Gauhani Kalan
Hazipura
Ummerpur
Ram Nagar
Akbarpur
Harauli Bahdurpur
2C4D1a1b
Merey Rangaua
Alma Senganpur
2C4D1a1a
Kasba Seganpur
Gaganpur
Asewta
Sarai Bibi
Chakrani Pokhar
Kanpur Pratap Singh
Keshipur
Kaithon
Dhanaupur
Asewa
2C4C7g2a
Kachahari
Teurlalpur
Babayan
Legend
WATERSHED BOUNDARY
WATERSHED BOUNDARY
VILLAGE BOUNDARY
0 850 1,700 3,400 5,100 6,800
Meters


CONTOUR MAP OF THE PROJECT AREA
IWMP - II(2010-11),DISTRICT - AURRAIYA
N
2C4C3g2b
2C4C3g2a
2C4D1a2d
2C4D1a2b
2C4D1a2e
2C4D1a2a
2C4D1a1d
2C4D1a1e
2C4D1a1c
2C4D1a1b
2C4D1a1a
2C4C7g2a
Legend
WATERSHED BOUNDARY
CONTOUR(5m)
2,600 1,300 0 2,600 Meters


SLOP MAP OF THE PROJECT AREA
IWMP - II(2010-11),DISTRICT - AURRAIYA
N
2C4C3g2b
2C4C3g2a
2C4D1a2d
2C4D1a2b
2C4D1a2e
2C4D1a1d
2C4D1a2a
2C4D1a1e
2C4D1a1c
2C4D1a1b
2C4D1a1a
2C4C7g2a
Legend
WATERSHED BOUNDARY
Yellow_IIve
Red_IIIve
Green_IVe
2,600 1,300 0 2,600 Meters


SOIL_DEPTH MAP OF THE PROJECT AREA
IWMP - II(2010-11),DISTRICT - AURRAIYA
N
W
E
S
2C4C3g2b
2C4C3g2a
2C4D1a2d
2C4D1a2b
2C4D1a2e
2C4D1a1d
2C4D1a2a
2C4D1a1e
2C4D1a1c
2C4D1a1b
2C4D1a1a
2C4C7g2a
Legend
WATERSHED BOUNDARY
DEEP
0 850 1,700 3,400 5,100 6,800
Meters


SOIL_EROSION MAP OF THE PROJECT AREA
IWMP - II(2010-11),DISTRICT - AURRAIYA
N
W
E
S
2C4C3g2b
2C4C3g2a
2C4D1a2d
2C4D1a2b
2C4D1a2e
2C4D1a1d
2C4D1a2a
2C4D1a1e
2C4D1a1c
2C4D1a1b
2C4D1a1a
2C4C7g2a
Legend
WATERSHED BOUNDARY
SOIL EROSION
No Erosion
Slight Erosion
Slight Saline, Moderate Sodic
Slight Flooding
Slight Saline, Moderate Sodic
0 850 1,700 3,400 5,100 6,800
Meters

CHAPTER -14
ABBRIVIATIONS/REFERENCES

LIST OF ABBRIVIATIONS/REFERENCES

DOLR	Department of Land Resources
IWMP	Integrated Waterhsed Management Programme
SLNA	State Level Nodal Agency
CGL	Common Guidelines
PIA	Project Implementing Agency
BSA	Bhoomi Sangrakshan Adhikari
WDT	Watershed Development Team
WC	Watershed Committee
UC	User Group
SHG	Self Help Group
CB	Countour Bund
MB	Marginal Bund
PFB	Peripheral Bund

REFERENCES

- Common Guideline of watershed development-2008.
- Jila Sankhikiya Patrika
- Census 2001
- santravidasnagar.nic.in

Preparation of DPR

Detail Project Report of Integrated Watershed Management Programme IWMP-II had been prepared through base line/ bench Mark survey for physiography climate, soil, land use, vegetation, and 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, Pilibhit, 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	Shri. A.K. Srivastava	Ex. Scientist, RSAC-UP, Lucknow
3	Shri. S. Singh	Ex. Project Scientist, RSAC-UP, Lucknow
4	Ms. Sunita	GIS-Expert
5	Ms. Sulochana	GIS-Expert
6	Shri. R.K. Singh	System-In-Charge
7	Shri. Shob Nath	Bhoomi Sanrakshan Adhikari
8	" ShivGopal Goswami	Junior Engineer
8	" Vibhooti Prasad Dabgar	Accountant
9	" Chandra Shekhar Kushvaha	Draughtsman
10	" Anil Kumar Shrivastava	Trecer
11	" Anil Kumar	Jr. Clerk
12	" Balkishun Ram	A.S.C.I.
13	" Bateshvar Pandey	Irrigation Sup.
14	" Nabab Ahmad Siddikee	Irrigation Sup.

15	" Vijay Bahadur Yadav	Munshi
16	" Divjendra Nath Pandey	Irrigation Sup.
17	" Sukhveer Singh	Irrigation Sup.
18	" Santosh Kumar Sharma	Irrigation Sup.
19	" Ramsuchit Vishvkarma	Irrigation Sup.
20	" Chandresh Kumar Rawat	Irrigation Sup.
21	" Narmeshvar Upadhyay	IVth Class
22	" Jameer Ahamad Rijvee	IVth Class
23	" Ramvilas	IVth Class
24	" Ram Achal Yadav	Dak Rannar

PHOTOGRAPH

OF

P.R.A. EXERCISE

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 (2010-11 to 2014-15).

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

Physically & Financially Approved:

Prepared By:
Bhoomi Sanrakshan Adhikari
Dept. of Land Development &
Water Resources
AURAIYA

Technically Approved
Deputy Director
Dept. of Land Development & Water Resources,
IWMP-II
AURAIYA

Physically & Financially Approved:

Project Director
District Rural Development
Authority, District – AURAIYA

Chief Development Officer
District – AURAIYA