DETAILED PROJECT REPORT (D.P.R.)

(I.W.M.P. Ist – BAHARAICH)

INTEGRATED WATERSHED MANAGEMENT PROGRAMME, BLOCK- MIHIPURWA

DISTRICT - BAHARAICH (UTTAR PRADESH)

Submitted to: -

Department of Land Development &

Water Resources. Lucknow (U.P.)

Prepared By:-

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Department of Land Development & Water Resources, Baharaich

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

INDEX

PROJECT AT A GLANCE

1.	Name of Project	-	I.W.M.P.-Ist
2.	Name of Block	-	Mihipurva
3.	Name of District	-	Bahraich
4.	Name of State	-	Uttar Pradesh
5.	Name of watershed	-	Ghaghra
6.	Name of Concern villages	-	SemriGhathi, Amritpur, Semrimalmala, Puraina, Bojhiya, Lalbojha, Bejha, Dharampur, Kakraharange, Raghwapur, Majhra
7.	Code of Micro Watershed	-	2BIG4b2d, 2BIG4f1c, 2BIG4f1b
8.	Total area of Project.	-	7,051.00 Hect.
9.	Proposed area for treatment.	-	4,000.00 Hect
10.	Cost per hectare	-	Rs. 12,000.00
11.	Project period	–	2009-10 to 2012-13
12.	Total Cost of Project	-	Rs. 480.00 Lacs
13.	Proposed Mandays	-	2,88,000Nos.

14. Year wise Phasing Physical & Financial item wise.-

S. No.	Item	Physical Year wise (area in ha.)					Financial Year wise (Rs.in Lacs.)				
		2009-10	2010-11	2011-12	2012-13	Total	2009-10	2010-11	2011-12	2012-13	Total
1	Administrative	-	-	-	-	-	9.600	12.000	16.800	9.600	48.000
2	D.P.R Preparation	-	-	-	-	-	4.800	-	-	-	4.800
3	Monitoring & Evaluation	-	-	-	-	-	4.800	2.400	2.400	-	9.600
4	Entry Point Activity	-	-	-	-	-	19.200	-	-	-	19.200
5	Institutional and Capacity building	-	-	-	-	-	9.600	9.600	4.800	-	24.000
6	Watershed works	-	2000	2000	-	4000	-	120.000	120.000	-	240.000
7	Livelihood & Income Generating	-	-	-	-	-	48.000	-	-	-	48.000
8	Production System development	-	-	-	-	-	-	24.000	24.000	14.400	62.400
9	Consolidation Phase	-	-	-	-	-	-	-	-	24.000	24.000
	Total		**2000**	**2000**		**4000**	**96.000**	**168.000**	**168.000**	**48.000**	**480.000**

RESOURCE CONSERVATION AND WATER MANAGEMENT IN GHAGHRA WATERSHED, BLOCK-MIHIPURVA, DISTRICT BAHRAICH
(UTTAR PRADESH)

EXECUTIVE SUMMARY

The Ghaghra river watershed comprises of Eleven villages namely SemriGhathi,Amritpur, Semrimalmala, Puraina, Bojhiya, Lalbojha, Bejha, Dharampur, Kakraharange, Girgitti, Raghwapur,Majhra block- mihipurva of Bahraich district 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 The watershed is located in the North-West of Bahraich district. It lies between 28° 0' 50.73" to 28° 9' 10.45" N latitude and 81° 11' 4.00" to 81° 16' 28.45" E longitude . **(Code No. 2BIG4b2d, 2BIG4f1c, 2BIG4f1b.)**.Its altitude ranges from 120 to 130m above the mean sea level (MSL). The total area of watershed is 7051.00 ha. It is surrounded by the catchment of river Ghaghra.

The climate of the region is characterized as arid to semi-arid with average annual rainfall less than 800 mm annually with an average of 45 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 45□C in the May-June to as low as 3.6^0C during December-January. The trend of rainfall is highly erratic and maximum (68%) water goes as runoff.

The top most portion (South to West) of the watershed is ravenous catchment of river Ghaghra of flat land interlocked between the hillocks. The soils of the area loamy sand to sand loam. The middle portion of watershed is relatively flat land with light soil texture. These soils are black to yellow in colour and are inherently high in fertility status. Soil texture is clay loam particularly in depressions and loam in the elevated portion.

Agriculture is the main source of income of the farmers of the watershed. In Kharif the main crops are Maize & Paddy. Most of the lands are kept fallow because maximum areas are rainfed and the main Rabi crop is taken with the conserved moisture of rainfall. In Rabi the main crops are Masoor, wheat and Pea. The wheat and Pea crops are taken in the irrigated fields while the other crops are mostly taken in the rainfed conditions. In Zaid season there is no cropping due to hot weather and ANNA PRATHA. Horticultural crops are taken is very less area. Only some vegetable crops are taken for domestic purpose and some fruit trees in scattered manner.

The condition of Animal is not so good because their breeds are poor & Local feeding standerd is not proper & disease management is also in poor condition.

Natural vegetation of the watershed area is very poor. The forest vegetation is predominant with Sagaun,Seesam & Semal. There are occasional occurrence of Neem plants (*Azadirachta indica*), Pipal, 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 grass is Moonj.

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

Budget for the various components is given as below

S. No.	Budget Component	Total (Lakhs)
A	**1. Administrative** **2. Monitoring** **3. Evaluation**	**48.00** **4.80** **4.80**
B	**Preparatory Phases**	**48.00**
C.	**WATERSHED WORKS**	**240.00**
(i)	**Livelihood Programm**	**48.00**
(ii)	**Production System and microenterprises**	**6.40**
D.	**CONSOLIDATION PHASE**	**24.00**
	GRAND TOTAL	**480.00**

CHAPTER-1

PROJECT BACKGROUND

Project background

The watershed, with code No. **2BIG4b2d, 2BIG4f1c, 2BIG4f1b** having area of 7051.00 ha is located in North East Part of Bahraich district of U.P. The area of watersheds is proposed to be taken up by Bhoomi Sanrakshan Adhikari, Department of land development & water resources Bahraich for integrated watershed management programme (IWMP) starting from the year 2009-10. The project will be completed by 2012-13.

The Ghaghra watershed in Mihipurva Block of Bahraich district (U.P.) is Located about 80Km from Bahraich and 20 Km from Mihipurva Block .the watershed comprises of 10 village namely **SemriGhathi,Amritpur,Semrimalmala,Puraina, Bojhiya, Lalbojha , Bejha, Dharampur, Girgitti, Raghwapur, Majhra** block- mihipurva of Bahraich district. The Area lies between 28° 0’ 50.73” to 28° 9’ 10.45” N latitude and 81° 11‘ 4.00” to 81° 16’ 28.45” E longitude .

Total Area of the watershed is 7051.00 ha (Tretable area 4000 ha) Elavation ranges from 120 to 130 m above mean sea level Catchment of river Ghaghra . The soil of the area are loamy sand to Sandy loam . Middle portion of the watershed is relatively flat with light soil texture . These soil are black to yellow in texture and low in fertility status .

Table 1.1 Basic Project Information

S No	Name of the project	Villages	Gram panchayat	Tehsil	District	Total are of the project	Area proposed to be treated	Total project cost(Rs in Lakhs)	PIA
1	I.W.M.P 1ST	SemriGhathi, Amritpur, ,Semrimalmala, Puraina,Bojhiya , Lalbojha,Bejha,Dharampur,Girgitti, Raghwapur, Majhra	SemriGhathi,Puraina, Bojhiya, Lalbojha, Semrimalmala, Bejha, Majhra	Nanpara	Bahraich	7051ha	4000 ha	480.00	Bhoomi Sanrakshan Adhikari Department of land Development and water resource Bahraich

1.2 Need of Watershed Development Programme:

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 villages SemriGhathi,Amritpur, ,Semrimalmala,Puraina,Bojhiya,Lalbojha,Bejha,Dharampur,Girgitti,Raghwapur, Majhra were pooled and a list of problems representing the whole watershed was prepared. Problems were ranked as per their total weight age in these villages. Lack of irrigation water was the greatest problem experienced by the people followed by low production of field crops, lack of fodder availability and low animal productivity is low.

Strength, weakness, opportunity and threat (SWOT) analysis is a useful decision support tool, A SWOT analysis of the watershed is presented in Table 1.3.

Table 1.2 Problem identification and prioritization for watershed

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

Total number of families in the watershed is 3186 of 121 families belong to schedule caste. Agriculture is the main source of income of the farmers of the watershed. Ground water strata in the area varies between 18 to 23 meter in the month of April to June . Ground water is sweet and fit for drinking .

The watershed falls under the semi – arid region of Tropical climate The average annual railfall is 520 mm spreading over 35 rainy days Most of the rainfall (about 85 %)is received during July to September rainfall is of moderate to high intensity. The Area receives no or Scanty rainfall in winter seasons .The Temperature ranges from as high as 49°c in the month of May – June to as low as 4°c in December - January.

Table no. 2: Weightage of the project

1	2	3	4	5	6	7	8													
S. No.	District	Name of the project	No. of micro-watersheds proposed to be covered	Proposed project area (ha)	Type of project (Hilly/ Desert/ Others)	Proposed cost (Rs. in lakh)	Weightage under the criteria#													
							i	ii	iii	iv	v	vi	vii	viii	ix	x	xi	xii	xiii	Total
1	Bahraich	IWMP 1A	3	7051.00	Other	480.00	10	5	5	5	0	10	10	7.5	5	10	0	5	0	72.50

Table no. 2.1 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 %	Low- less than 10	

				(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 microwatersheds in the project (10)	Contiguity within the microwatersheds in the project but non contiguous to previously treated watershed (5)	Neither contiguous to previously treated watershed nor contiguity within the microwatersheds 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 microwatersheds in cluster (10)	2 to 4 microwatersheds 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 microwatersheds in cluster (10)	2 to 3 microwatersheds in cluster (5)	
	Total	**150**	**150**	**90**	**41**	**2.5**

Table no. 3 Watershed information

Name Of the Project	No. of micro water sheds to be treated	Watershed Code	Watershed regime/type/order
I.W.M.P. 1st,**Bahraich**	3	**2BIG4b2d, 2BIG4f1c, 2BIG4f1b**	MicroWatershed

1.3 Other developmental projects/schemes running in these villages

These villages being very back ward, has been on top priority of a number of developmental projects. These programmes are

- Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS),
- Indira Awas Yojana (IAY).
- Intrigrated Watershed Management Program me in other areas of the district are under operation in the department of Agriculture.

WATER RESOURCE DEVELOPMENT AND SOIL CONSERVATION MEASURES

1-STATUS OF PRESENT WATER RESOURCES UTILIZATION: There is no natural water body in the selected area which may used for irrigation. Present assured/Partial irrigation is done by private tub wells,lifting from nala and season river.

2- PROPOSED PLAN FOR IRRIGATION IN WATER RESOURCE SECTER: Sprinkler sets for irrigation from private tubewell are distributed by Agriculture Department to Tube well holders on the basis of & Irrigation group. Effort will made to help themiximum tube well holders of selected area to form group and to get sprinkler sets. Therefore, more area will be irrigated by the available irrigation water.

3- NEW WATER HARVESTING STRUCTURES: In the 487.00 ha area new and 175.00 ha area renovation of existing watershed harvesting structure / Gully Plug / Earthen C.D. will be constructed for water harvesting.

4- GROUND WATER RECHARGE: In order to augment the flow in the drainage line, it is necessary to undertake moisture and water recharge measure in the watershed area. For the purpose of ground water recharge 13 Nos of recharge filters and 49 nos of soak pits are planned in the selected area. Detail is given in detail estimate enclosed .

5- CROP PRODUCTION:- In the light of the land capability classification of the watershed and need of the farmers, the reallocation of watershed area rainfed and irrigated lands has been done for improving productivity, income generation and maintaining ecological balance. The production crop management plan has the following salient features:

6- ORGANIC FARMING SYSTEM: Organic Farming System will be encouraged in the following manner:

1 Maximum use of crop residues in the Integrate plant Nutrients System(IPNS)
2 Prevision of legumes composed in the cropping system.
3 Green manuring with appropriate legumes.
4 Rapid compost using crop residue, domestic and farm waste material and animal dung.

mulching and Crop Residue Management: Sources of milch material includes weeds, pruning from agro-foresting trees and in situ grown legumes and green manure crops. The concept of live milching is based on the principle of mixed cropping whereby a fast growing legumes is established before or simultaneously along with a widely spaced seasonal grain crops such maize, and is incorporated into the soil at an appropriate stage to act on as a milch. Application of organic milch material 4-5 t / ha is recommended.

GREEN MANURING: To improve the organic matter and physical condition of the soils , green manuring crops like Dhaincha and sun hemp which supply 20-30 t / ha of green mutter and 85-125 kg/ha of Nitrogen shall be raised and incorporated in to the soil. In 1400 ha area green manuring is planned.

7- **SEED TREATMENT WITH RHYZOBIUM CULTURE:** The seed of leguminous crop like black gram, soybean, pea, etc. should be treated with Rhyzobium culture before sowing.

8- **TILLAGE OPERATION:** It is advisable to carry out tillage operation like ploughing by plank just after the harvest of Rabi crops. This will be helpful in conserving moisture for sowing and germinating of next crop in addition.

9- **INTRODUCTION OF IMPROVED SEEDS/VARIETIES:** Short duration and high yielding varieties suitable for this region have been proposed in long duration varieties. Demonstrations of High Yielding Varieties (HYVs) of different crops in 560.00 ha is planned in the watershed however for enough quality in seed requirement farmers of the watershed will be involved to produce required quanStity of seed of the recommended crop varieties.

10- **SOWING METHODS:** Agronomical practices like contour cultivation, strip or inter-cropping, optimum time of sowing , optimum plant population by keeping proper distance from line to line and plants to plants sowing and placement of fertilizer below the seed will help enhancing the crop yields without involving monetary inputs.

11-**CONTROL OF INSECTS PEST ,AND DISEASES**: Pod borer in gram is the major insect in the watershed area leading to markable loss in crop productivity. Similarly white blister is also a common disease in the mustard crop the management strategies of these insects, pests and diseases will also be demonstrated in the watershed for benefit of the growers and traind in farming programme in such way that they will stand to checkup in primary stage.

12- **DRY LAND HORTICULTURE:** In the selected area 180.73 ha land is planned for horticulture and agro horticulture. Species like awala, guava, ber, bel, lemon will be planted at suitable site in the watershed.

Chapter – 2

PROJECT IMPLEMENTING AGENCY

2.1 PROJECT IMPLEMENTING AGENCY (PIA)

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

Table No. 6&7 Detail Staffing Pattern of PIA :

S.No.	Name	Designation	Qualification
1	**2**	**3**	**4**
1-	Sri L.M.P Singh	Bhoomi Sanrakshan Adhikari	Intermediate,Civil. Engg. Diploma.
2-	" R.N. Singh	Junior Engineer	Intermediate, Civil Engg. Diploma.
3-	" Mohammad Ashfaque Khan	Junior Engineer	Intermediate, Civil Engg. Diploma.
4-	" Sohil	Draughtsman	Intermediate Diploma in Draughtsman
5-	" Maroof Ahmad	Accountant	M.Com/ LLB
6-	" Guru Prasad Verma	Accountant	B.Com
7-	" Ram Pratap Sharma	Ziledar	High School
8-	" Patirakhan Lak	Senior clerk	B.A.
9-	" Shri Prakash Rawat	Junior clerk	M.Sc. ,LLB, B.com
10-	" Bechan Singh Yadav	A.S.C.I.	Intermediate ,Agri. Diploma.
11-	" Dadhi Ram Trivedi	A.S.C.I	B.Sc (Ag)
12-	Divakar Singh	Tracer	Intermediate
13-	Sant Baksh Singh	Seenchpal	Intermediate
14-	Kamla Prasad	Seenchpal	High school
15-	Kamta Prasad Mishra	Seenchpal	B.A.
16-	Ram Pher	Munshi	Intermediate
17-	Ramesh Chandra	Munshi	M.A.
18-	Yogendra kumar	Munshi	B.Sc.
19-	Ram Chandra Ram	IVth Class	Intermediate
20-	Ram Gulam	IVth Class	Intermediate
21-	Veer Pal	IVth Class	M.A.
22-	Subhash chandra	IVth Class	Literate
23-	Kailash Singh	IVth Class	Class -9
24-	Paras nath	Driver	Class 8

Institutional Arrangement at Project level:

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 programmes, such as MNREGS, Indira Awas Yojana (IAY) etc.

2.2 ABOUT DISTRICT RURAL DEVELOPMENT UNIT (DRDU) BAHARAICH

2.2.1 THE ORGANIZATION AND ITS OBJECTIVES:

PROJECT IANAGEMENTING 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:-

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 DRDA/District Level Committee as referred in para 29 that will spell out well –defined annual outcomes, against whicg 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 DRDA. 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.

2.2.2 PROGRAMMES/PROJECTS OF IWMP-I, BAHARAICH:

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 DRDA and other arrangements. The PIA shall submit the periodical progress report to DRDA. 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 programmes, such as NREGA, BRGF, SGRY, National Horticulture Mission, Tribal, Welfare Schemes, Artificial Ground Water Recharging, Greening India, etc.

2.3 SWOT ANALYSIS OF THE PIA:-

STRENGTH:

(1) Dedicated and experienced staff and a multidisciplinary team
(2) Independent District Level Nodal Agency.
(3) Strong linkages with national and state level institutions, agricultural universities, and NGOs for capacity building and technical guidance .
(4) Scientific planning in watershed projects with the help of D. D.U.G.V.Institute Baxi Tal Lucknow.
(5) District level monitoring, coordination & Co-operation Committee

WEAKNESS:

(1) No permanent office building.
(2) Project area low productivity.

OPPORTUNITIES:

(1) A number of different other development schemes of the government are running; so, there can be horizontal integration and convergence of Programmes
(2) Better financial provision under IWMP.
(3) Usage of new ICT tools like GIS, GPS

THREATS:

(1) Rainfall being very scarce and unreliable in the project area, the activities planned to be taken up may yield limited impact
(2) Irregularities in fund flow can derail the smooth functioning.
(3) Lack of contribution and cooperation from local people
(4) Low literacy rate in the project area .

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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.

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 redamation 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.

CHAPTER-3

BASIC INFORMATION OF THE PROJECT

3.0 PRESENT LAND USE IN THE WATERSHED

The watershed has diversified land uses namely agriculture, waste land (open scrub), seasonal water bodies etc. The varied present land use and area under different categories in watershed is shown in Table 3.1 &3.2. The mixed land use followed in the watershed is almost similar in other parts of the UP. During PRA exercise, the villagers prepared land use. One such map of village of the watershed is shown in Annexure Map.

Table 8 Present land under different categories in the watershed

S. No.	Name of watershed/ Code no.	Name of Concern villages	Land Use					
			Agriculture	Wasteland all type	Pasture	Forest	Others	Total
1	Semrighathi/2B1G4b2d	1- Semrighathi 2- Amritpur 3- Puraina 4- Semrimalmala 5- Bojhiya 6- Lalbojha	2178.00	2341.00	-	-	1276.00	5795.00
2	Majhra I/2B1G4f1b	1- Majhra 2- Raghwapur	1550.00	211.00	-	-	73.00	1034.00
3	Bejha/2B1G4f1c	1- Bejha 2- Dharampur	558.00	165.00	-	-	18.00	222.00
	Total		**4286.00**	**2717.00**	**-**	**-**	**1367.00**	**7051.00**

Table 9 Present land use of the watershed

S.No.	Land use	Present (ha)
1	Agriculture	4286.00
A	Rainfed	4870.00
	I Crops	1352.00
	II Agro-forestry	-
B	Irrigated	434.00
	I Assured	230.00
	II Partial	204.00
2	Waste land	1017.00
A	Afforestation	-
B	Pasture	800.00
C	Untreatable	-
3	Village land	406.00
	Total	**7051.00**

3.1 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 7051 ha out of which 4000 ha is under rain-fed agriculture. The water (both irrigated and drinking) is most scarce natural resource in the watershed. The operation of tube wells for irrigation of agricultural crops frequently leads to the drinking water problem to the farmers of watershed forcing them to carry drinking water from outside the watershed area. The agricultural field bunds are common in the watershed, however, they frequently breach on heavy rains adversely affecting the *in situ* percolation of rain water in the soils.

The agriculture soils in the watershed have diversified texture i.e. loam sand which is located in patches throughout the watershed. The heavy soils are almost kept fallow during rainy season. The agricultural soils also have hard calcium pan at variable depths. The irrigation water is conveyed in earthen channels and surface irrigation methods following mainly 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/Pea/ lentil/ winter vegetables, Arhar.

Double cropping

jowar/ sesame/ black gram/ green gram- Pea/ wheat/ gram/ lentil/ winter vegetables

Irrigated agriculture

One year rotation

Bajra/ jowar/ sesame/ black gram/ green gram- Pea/ wheat/ winter vegetables

Crop productivity

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

The mixed cropping is in practice in limited area with kharif crops like Arhar and jowar but it is not only irrational but also unscientific and beset with low productivity. Imbalanced use of fertilizers is common in rabi and kharif crops both it in rain-fed and irrigated production system. The recommended deep Ploughing for enhanced in situ residual soil moisture conservation and higher production is also not followed in the watershed. The shallow plowing tractor drawn tillage implements 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 measures created by the state Govt. agencies. Conservation agronomical measures like seeding and plowing across the slope, weed mulching, agro-forestry, vegetative barriers etc also completely lack in the watershed.

3.2 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.

3.3 Forest and Other Vegetation

Forests

There is no considerable forest area in the watershed.

Horticulture /Agro-forestry

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

3.4 Agro forestry

The agro-forestry practices are highly lacking in the watershed though it has good potential under existing dispositions and may play a vital role particularly with respect to minimization of cropping risk, build up soil fertility and productivity, soil

conservation, partly meeting out the fire wood demand of rural community and moreover, optimizing the economical return from system as a whole under typical semi arid climate in the watershed. The other agro-forestry systems like agri-silvi,agri-horti silvi-pastoral, and bund and boundary plantations also have good potential to cater the fire wood and fodder demands of the rural community in the watershed. The existing area under agro-forestry is almost negligible. Prosopis juliflora may be planted as block or sole plantation specifically on marginal and degraded lands in the watershed. The agro-forestry interventions comprising of ber, bail, aonla, guava, popular etc may be applied for benefit of the farmers under rain-fed to irrigated production systems on leveled to sloping and marginal agricultural using proper planting techniques and termite control measures. The multipurpose trees may also help in supplementing fire wood and fodder demands of the rural community in the watershed and may be planted as hedge rows on rain-fed, marginal and degraded lands.

3.5 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 cucurbits, okra, radish, tomato, cauliflower, cabbage, garlic, onion, brinjal, chilly but they are found surviving well in the watershed villages. Organized orchards, commercial vegetable cultivation, horti-agri and other systems of agro-forestry etc are lacking but have good potential in the watershed.

3.6 SOIL AND LAND CAPABILITY CLASSIFICATION

3.7 Soil morphology

The watershed is located north west corner of the Bahraich district. The entire watershed is topographically divided into three major landforms. Accordingly, the soils of watershed have been grouped in three major categories.

i) Plain land
ii) Undulated land
iii)

3.8 Soil characteristics and fertility status

Soil characteristics pertaining to soil fertility of various classes occurring around different villages are given in Table **Table Table No.10 Soil Characteristics and Fertility Status**

Soil properties	LCC II	LCC IV	LCC VII/VIII
Sand (%)	27.90	53.00	72.90
Silt (%)	24.10	18.60	20.30
Clay (%)	46.30	25.18	6.68
Texture	Clay Loam	Loamy Sand	Sandy Loam
pH (1: 2)	7.30	7.25	7.15
EC (dS m^{-1})	0.17	0.12	0.15
Organic carbon (%)	0.38	0.31	0.20
Available N (kg ha^{-1})	370	308	238
Available P (kg ha^{-1})	11	9.00	7.95
Available K (kg ha^{-1})	308.10	291.80	264

*Values correspond to soil fraction < 2mm

3.1.2 - SOIL AND TOPOGRAPHY:

The selected area lies in the last border of District- Baharaich & Kanpur.The soil is mainly Mar Padawa soil which is easily transportable after detaching causing to several soil erosion. In the watershed area mainly four types of soil are found named as - Mar, Padawa, Kaber, & Rocker which are also the main soil of plainly Region. There is main showing crop in the area are pulses which consume more phosphorous. Therefore, serious deficiency of phosphorous is in this area.

TABLE NO. 11: SOIL TYPE AND TOPOGRAPHY:

Sl. No.	Name of the Agro-climatic zone covers project area	Area in ha	Names of Watershed	Major soil types		Topography
				a)Type	b) Area to be treated in ha	
1.	Tropical Climate	7051.00	IWMP Ist Baharaich	Mar Padwa Soil	4000.00	Flat to severe slope

TABLE NO. 12: FLOOD AND DROUGHT CONDITION:

Sl.No	Names of Watershed	Flood (Incidence)	Drought (Incidence)
1.	IWMP Ist Baharaich	Nil	Once in 3 Years

TABLE NO. 13: SOIL EROSION

Cause	Type of erosion	Area affected (ha)	Run off (mm/ year)	Average soil loss (Tonne
	Water erosion			
A	Sheet	3887.00	393.00	17.00
B	Rill	1395.00		
C	Gully	698.00		
Sub-Total		5980.00		
Wind erosion		-	NA	
Total		5980.00	393.00	17.00

TABLE NO.14: CLIMATIC CONDITIONS-

Sl. No.	Year	Rainfall (in mm)	Temperature (˚C)		Highest intensity of Rainfall (mm in a day)
			Max.	Min.	
1.	2008	880.00	45*c.	6* c.	100 MM
2	2009	782.00	46*c.	5* c.	105 MM
3	2010	930.00	48*c.	4* c.	110 MM

The rainfall is scanty which has resulted in recurrent phenomenon of drought in every two to three years. The average rainfall of this area is about 459 mm (from past five year data) with a highest intensity of 88 mm within span of a day. This uneven distribution is leading to run off of soil every year to the streams, rivulets and depressed area of IWMP Ist Baharaich.

3.9 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. Three classes of land capability namely II, IV, and VII were demarcated in the watershed. The areas under different classes are sown in table 12 and Annexure map.

Table 15. Area under different land capability class under watershed

Land Capability Class	Type of land	Area (ha.)
II	Agriculture land	2786.00
III	Agriculture land & Horticulture	1717.00
IV	Gullide land	-
VII	Forest land & Others	367.00
Total		**4870.00**

3.9.2 Land capability class II (Orenge)

This group is one of the most extensive LCC class of the watershed. This group of soil is occupying around 4967.00 ha of the watershed area. The soils are shall be loam or loam in texture. The land under this class is nearly level to mild sloping (1-3%). The soils are deep and erosion hazard is slight. Most of the productive agriculture land comes under class II. The lands are almost flat, or sandy loam in texture, deep and very mild slopping. The mapping unit for this class is given as under:

Land capability class II_e = scl-d_5/B-e_1

3.9.3 Land capability class III (Blue)

It is noted that at area of 3620 ha. Is occupied by class III in the watershed area. Almost entire area under this class occurring over lower, moderate and higher Slopes has been converted in to terrace for agriculture. Erosion hazard is moderate, since the terraces are nearly level and well bunded in general. At Several points water from natural springs is diverted to the terraces for irrigation. Annexure map LCC.

3.9.4 Land capability class IV (Green)

A considerable area of watershed *i.e.* 528 ha is under class IV. This class is found in lower portion i.e. near the outlet of watershed. The soils are coarser in texture (loamy sand/sand), deep, susceptible to erosion hazard and undulating in topography. Rill and initiation of gully can be seen near the outlet of the watershed. The mapping unit for this class is as follows:

Land capability class IV_e = ls-d_5/C-e_3, IV_{es} = ls-d_3/D-e_3 (Foot hill soil)

3.9.5 Land capability class VII (Brenzil)

These lands are occupying an area of 708 ha of the watershed. This class of land is mostly found in ravinous area of watershed. The soils are un productive with steep slope (>15%) and coarser in texture. Mostly red soils are found under this class.

Annexure for Land capabilities classification map of the watershed

3.9.6 Mapping units symbol

Soil depth (cm) d_5- > 90 cm; d_3- 22.5-45.0; d_1<7.5 cm

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

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

Erosion e_1- 25% of A horizon lost; e_2- 50-75% of A horizon lost e_4- 50-75% B horizon lost.

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 VII 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

Historical time line of villages of the project

village – Lalbojha

S.N.	Activities	Year
1	Established	1720
2	Construction Bandhi (water harvesting structure)	-
3	Opening up Primary school	1999
4	Introduction of Tractor	1992
5	Establishment of P.H.C.	-
6	Kacha road	2001
7	Introduction of thresher	1993
8	First Tube well /Diesel pump set	1993
9	First Motorcycle	1995
10	TV and DVD player	2000
11	Over head water tank	-
012	Electricity in the village	1998
13	Bituminous road	2007
14	Temple renovation	1975
15	Planning for watershed project	2009-10

Historical time line of villages of the project

Table 3.10.2 village – Bejha

S.N.	Activities	Year
1	Established	1900
2	Construction Bandhi (water harvesting structure)	-
3	Opening up Primary school	1998
4	Introduction of Tractor	1995
5	Establishment of P.H.C.	-
6	Kacha road	2002
7	Introduction of thresher	1995
8	First Tube well /Diesel pump set	1994
9	First Motorcycle	2000
10	TV and DVD player	1998
11	Over head water tank	-
12	Electricity in the village	2005
13	Bituminous road	-
14	Temple renovation	2006
15	Planning for watershed project	2009-10

Historical time line of villages of the project

Table 3.10.3 village – Dharampur

S.N.	Activities	Year
1	Established	1905
2	Construction Bandhi (water harvesting structure)	-
3	Opening up Primary school	2006
4	Introduction of Tractor	2006
5	Establishment of P.H.C.	-
6	Kacha road	2005
7	Introduction of thresher	2005
8	First Tube well /Diesel pump set	1995
9	First Motorcycle	2003
10	TV and DVD player	2004
11	Over head water tank	-
12	Electricity in the village	-
13	Bituminous road	-
14	Temple renovation	2007
15	Planning for watershed project	2009-10

Historical time line of villages of the project

Table 3.10.4 village – Puraina

S.N.	Activities	Year
1	Established	1850
2	Construction Bandhi (water harvesting structure)	-
3	Opening up Primary school	2003
4	Introduction of Tractor	2006
5	Establishment of P.H.C.	-
6	Kacha road	2005
7	Introduction of thresher	2008
8	First Tube well /Diesel pump set	2005
9	First Motorcycle	2008
10	TV and DVD player	2006
11	Over head water tank	-
12	Electricity in the village	2006
13	Bituminous road	2005
14	Temple renovation	2001
15	Planning for watershed project	2009-10

Historical time line of villages of the project

Table 3.10.5 village – Bujhiya

S.N.	Activities	Year
1	Established	1710
2	Construction Bandhi (water harvesting structure)	-
3	Opening up Primary school	1984

4	Introduction of Tractor	1990
5	Establishment of P.H.C.	-
6	Kacha road	2002
7	Introduction of thresher	1992
8	First Tube well /Diesel pump set	1993
9	First Motorcycle	1990
10	TV and DVD player	2001
11	Over head water tank	-
12	Electricity in the village	1995
13	Bituminous road	-
14	Temple renovation	1975
15	Planning for watershed project	2009-10

Historical time line of villages of the project

Table 3.10.7 village – Majhara

S.N.	Activities	Year
1	Established	1810
2	Construction Bandhi (water harvesting structure)	-
3	Opening up Primary school	1998
4	Introduction of Tractor	2006
5	Establishment of P.H.C.	-
6	Kacha road	2004

7	Introduction of thresher	2008
8	First Tube well /Diesel pump set	2003
9	First Motorcycle	2007
10	TV and DVD player	2006
11	Over head water tank	-
12	Electricity in the village	2007
13	Bituminous road	2008
14	Temple renovation	2001
15	Planning for watershed project	2010

Historical time line of villages of the project

Table 3.10.8 village –Semri ghati

S.N.	Activities	Year
1	Established	1892
2	Construction Bandhi (water harvesting structure)	-
3	Opening up Primary school	2001
4	Introduction of Tractor	2003
5	Establishment of P.H.C.	-
6	Kacha road	2004
7	Introduction of thresher	2004
8	First Tube well /Diesel pump set	2001

9	First Motorcycle	2004
10	TV and DVD player	2006
11	Over head water tank	-
12	Electricity in the village	2005
13	Bituminous road	-
14	Temple renovation	2003
15	Planning for watershed project	2010

Historical time line of villages of the project

Table 3.10.9 village –Amritpur

S.N.	Activities	Year
1	Established	1948
2	Construction Bandhi (water harvesting structure)	-
3	Opening up Primary school	1998
4	Introduction of Tractor	2001
5	Establishment of P.H.C.	-
6	Kacha road	2003
7	Introduction of thresher	2003
8	First Tube well /Diesel pump set	1998
9	First Motorcycle	2005

10	TV and DVD player	2008
11	Over head water tank	-
12	Electricity in the village	2006
13	Bituminous road	1970
14	Temple renovation	2003
15	Planning for watershed project	2010

Historical time line of villages of the project

Table 3.10.10 village – Semri malmala

S.N.	Activities	Year
1	Established	1980
2	Construction Bandhi (water harvesting structure)	-
3	Opening up Primary school	-
4	Introduction of Tractor	2007
5	Establishment of P.H.C.	-
6	Kacha road	2006
7	Introduction of thresher	2008
8	First Tube well /Diesel pump set	2003
9	First Motorcycle	2005
10	TV and DVD player	2007
11	Over head water tank	-
12	Electricity in the village	-
13	Bituminous road	2008

14	Temple renovation	-
15	Planning for watershed project	2010

SOCIO ECONOMIC ANALYSIS OF THE PROJECT

1-SUSTAINABILITY AND ENVIRONMENTAL SECURITY:

In the proposed watershed management plan of Ghaghra, proper blending of bio engineering measures will be applied. The proposed land use plan will improve the land utilization index and crop diversification index significantly as compared to existing one. It will help in maintaining ecosystem integrity on sustained basis.

2-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 as 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 Applied to judge the economic efficiency of each enterprise, sector and project as a whole.

3.2.1 BENEFIT COST RATIO OF I.W.M.P.-Ist BAHARAICH

Year	Construction cost(00,000 Rs.)	Operation and maintenance cost(00,000 Rs.)	Benefit(00,000 Rs.)
1	131.904	06.35	15.89
2	197.856	15.89	63.59
3	131.904	22.25	97.37
4	197.856	31.80	318.00
5	0	31.80	318.00
6	0	31.80	318.00
7	0	31.80	318.00
8	0	31.80	318.00
9	0	31.80	318.00
10	0	31.80	318.00

BY BENEFIT, COST RATIO METHOD

S.No.	Item	1	2	3	4	5	6	7	8	9	10	
1	Discount factor 10%	0.909	0.826	0.751	0.683	0.621	0.564	0.513	0.467	0.424	0.386	
2	Total cost (00,000 Rs.)	165.326	254.354	181.226	270.264	31.80	31.80	31.80	31.80	31.80	31.80	
3	Benefit (00,000 Rs.)	15.89	63.59	97.37	318.00	318.00	318.00	318.00	318.00	318.00	318.00	
4	$\sum$ Cost	150.28	210.09	136.09	184.59	19.74	17.93	16.31	14.85	13.48	12.27	**775.63**
5	$\sum$ Benefit	14.44	52.52	73.12	217.19	197.47	129.35	163.13	148.50	134.83	122.74	**1303.29**

Benefit cost ratio $= \frac{\sum Benefit}{\sum Cost}$

$= \frac{1303.29}{775.63}$

=1.68:1

Hence OK

24-STATUS OF FOOD REQUIREMENT AND AVAILABILITY PER ANNUM IN

GHAGHRA WATERSHED

Sl.No.	Item	Requirement Q / yr.	Before Project		Proposed	
			Availability Q / yr.	Deficit or Surplus Q / yr.	Availability Q / yr.	Deficit or Surplus Q / yr.
1.	Cereals	50725	40580	- 10145	51740	+ 1015
2.	Pulses	25362	20290	- 5072	26882	+ 1520
3.	Oil Seeds	4227	3380	- 847	4437	+ 210
4.	Vegetables	25362	13950	-11472	26208	+ 846

SEASONAL ANALYSIS:-

Seasonal analysis has done with the helf of farmers about rainfall pattern, cultivated crops, employment income availability of fuel, fodder migration transport &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				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												
Migration												

3.11 Human and Livestock population

3.11.1 Human population

Total population of eleven villages under the watershed is 32940 with average family size of 9 persons (Table 2).

Table 16 Human population in the watershed

S.No	Name of village	Population				Total Family no.	SC Family no.
		Male	Female	Children	Total		
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
1	**Semrighathi**	1880	1495	602	3375	311	103
2	**Bejha Dharampur**	1908	1781	548	3689	442	87
3	**Dharampur**	965	786	168	1751	150	03
4	**Puraina**	1523	1362	449	2885	341	76
5	**Amritpur**	782	547	172	1329	98	44
6	**Majhara**	3341	3000	1000	6341	1086	58
7	**Semri Malmala**	1980	1640	732	3620	349	127
8	**Bojhiya**	1990	1689	700	3679	348	138
9	**Lalbojha**	2123	1614	772	3737	356	117
10	**Raghwapur**	0	0	0	0	0	0
	Total	**17993**	**14947**	**5788**	**32940**	**3613**	**858**

3.11.2 Livestock population

Total livestock population of the watershed is 7009. Cows are preferred as milk animal, 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 3.11.2)

Table 17 Livestock population in watershed

S. No.	Name of Village	livestock Resolution					
		Buffaloes	Cows	Bullocks	Goat	Other	Total
1	**Amritpur**	140	150	80	300	150	820
2	**Bejha**	47	273	46	250	-	616
3	**Dharampur**	50	60	12	200	-	322
4	**Puraina**	240	130	210	450	200	1230
5	**Semri Ghathi**	80	125	75	200	150	630
6	**Lalbojha**	48	210	50	300	160	768
7	**Semri malmala**	55	200	150	130	50	585
8	**Bojhiya**	36	186	32	130	20	404
9	**Majhara**	260	250	150	300	75	1035
10	**Raghwapur**	0	0	0	0	0	0

3.12 Hydrological Data in the watershed area.

Table 18 Ground water strata in the month of April to June in the villages of the project area

S.no.	**Name of village**	Ground water strata in month April to June	**Particular place**
1	**Amritpur**	60’	Near School
2	**Bejha**	58’	Near School
3	**Dharampur**	58’	Near School
4	**Puraina**	65’	Near School
5	**Semri Ghathi**	60’	Near School
6	**Lalbojha**	65’	Near School

7	**Semri malmala**	68’	Near School
8	**Bojhiya**	65’	Near School
9	**Majhara**	70’	Near School
10	**Raghwapur**	75’	Near School

Table 19 Distribution of farm families according to their size of land holding .

S. No.	Name of Villages	Land holding classification				
		Marginal	Small	Others	Landless	Total
1	**Amritpur**	90	60	10	12	172
2	**Bejha**	335	31	2	3	371
3	**Dharampur**	182	18	5	11	216
4	**Puraina**	250	160	4	10	424
5	**Semri Ghathi**	273	90	22	35	420
6	**Lalbojha**	120	70	10	7	207
7	**Semri malmala**	211	52	12	16	291
8	**Bojhiya**	186	48	7	12	253
9	**Majhara**	450	370	11	50	881
10	**Raghwapur**	100	60	3	5	168

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. Casual employment opportunities to the tune of more than 1.28 lakhs will be generated.

INFRASTRUCTURE FACILITIES:

IWMP-5 watershed is well connected with Baharaich Kanpur roads. The village has electricity connectivity under *Jyotigram Yojana* of the State Government. Nearly 75 per cent of households in the village have their personal electric meters. IWMP-Ivillage has a primary school with all facilities. For middle and higher secondary education, the students have to go to Baharaich which is about 20 kilometres away.and higher education students go to Baharaich & Kanpur. This also contributes to lower education level of the people. The village do not have a Primary Health Centre for Mihipurva which is 20 Km. away.

IWMP-Ist watershed project has a total of 3660 households with a population of 32940 (*as per base-line survey)* out of which 17953 are male and 14987 female .The sex ratio is 912 female to 1000 male. There are 2442 BPL families. The average family size is 9. The literacy rate is Mediam *i.e.* 60.14 %; male literacy rate is 60.14% (of total male population) and female literacy rate is as low as 31.67% (of total female population). The major castes in the village are Kol, Yadav,Patel,Brahmin,Chatri & Lodhi Caste . Majority of population is involved in agriculture and animal husbandry.

TABLE NO. 20: LITERACY RATE

Sl No	Project/Village	Literacy					
		Total	%	Male	%	Female	%
01	IWMP-I	22791.00	60.14 %	15573.00	68.33 %	7218.00	31.67 %

MIGRATION PATTERN:

People migrate during summer season to different parts of the state., agricultural labours and construction workers. Lack of fodder availability and grazing land for smaller ruminant force these people to migrate to other places.

TABLE NO. 21: MIGRATION DETAILS

Sl. No.	Project/Village	Total population	Migration			Migration by months			Main reason for migration	Income during migration / month
			Total	Male	Female	Up to 3 months	3-6 months	More than 6 months		
01	IWMP-I	32940.00	3112.00	1929.00	1183.00	912.00	1364.00	836.00	Lack of fodder	3500.00/month

TABLE NO. 22: POVERTY-

Sl. No.	Project/Village	Total BPL Household	BPL			% of BPL HH	Total Land less HH	% of land less HH
			0-16	16-20	Total			
01	IWMP-Ist	2225.00	597.00	1628.00	2225.00	35.01 %	1792.00	28.20

3.14 Infrastructure social features

The watershed has moderate communication facilities and all 11 villages and Concern majra are approachable through motorable road.Mostly villages are electrified and have TV & telephonic connection. Nearest small market is at Mihipurwa about 15-30 km and nearest big market Nanpara is about 30-45 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 45 % of the labour force of the total population living below poverty line indicate poor socio economic status of the watershed community. However, strong community spirit among the villager's show positive indication for the success of any programmed to be implemented in participatory mode. Traditionally the entire village community participates in the individual works. map of the watershed villages drawn by villagers themselves, depicting various village features is shown in Table as below.

S No.	Name of vill	Pakka	Electric	Primar	Jun.	Inter	Post Offi	P.H.C.	Bank	Vetnary	Co-op.	Market	Agri.
	2	3	4	5	6	7	8	9	10	11	12	13	14
1	**Amritpur**	-	√	√	√	25km	2km	25km	5km	25km	25km	25km	25km
2	**Bejha**	-	√	√	√	25km	1km	25km	7km	25km	25km	60km	25km
3	**Dharampur**	-	√	√	√	25km	1km	25km	7km	25km	25km	60km	25km
4	**Puraina**	2km	√	√	8km	25km	8km	25km	8km	25km	25km	25km	25km
5	**Semri Ghathi**	-	√	√	√	28km	1km	28km	10km	28km	28km	28km	28km
6	**Lalbojha**	1km	√	√	√	30km	1km	30km	15km	30km	30km	30km	30km
7	**Semri malmala**	-	√	√	√	28km	1km	28km	10km	28km	28km	28km	28km
8	**Bojhiya**	3km	√	√	√	22km	4km	22km	7km	22km	22km	3km	22km
9	**Majhara**	2km	√	√	√	25km	4km	25	9km	25	25	0	25m
10	**Raghwapur**	-	-	-	-	-	-	-	-	-	-	-	-

3.15 Livelihood Pattern

Out of the total population of 32940 in the watershed, a majority *i.e.* more than 80 % has farming as their major source of livelihood followed by 18 % laborers and 2 % service + business class.

TABLE NO. 24: PER CAPITA INCOME

Sl. No.	Project Name	Agriculture (in Rs.)	Animal husbandry (in Rs.)	Casual labour (in Rs.)	Others (in Rs.)	Total (in Rs.)
01	IWMP-I	5765.00	975.00	2392.00	997.00	10129.00

3.16 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 woody stem. About 70 to 75 percent of the domestic energy requirement is met from the agro-byproduct and cow dung cake. Rest is met out from the forest outside the village and watershed boundary.

Fodder:

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

ii) Low use of fertilizer per unit cropped area:

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

iv) Traditional farming methods:

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

v) 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.

vi) Lack of finances for farmers:

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

vi) 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.

vii) 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.

Chapter -4

WATERSHED ACTIVITIES

4.0 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.

4.1 Scientific Planning :-

1. **Cluster Approach :-**

This envisages integrated development of Geo-hydrological unit ie. Treatment of cluster of micro –watershed The IWMP-1 ,Bahraich Project consist of 3 micro watershed namely 2B1G4b1b, 2B1G4b2a, 2B1G4b1c.

2. **Base line Survey**

To access the impact of any watershed development programme a detailed baseline survey has to be conducted. This acts a benchmark for any intervention during and post implementation of any development programme. A detailed baseline survey was undertaken which involved household census survey, Bio-physical survey and Village level data collection from *Talati* –cum *mantri*. Household census survey includes a detailed questionnaire which has been filled by visiting each and every household in the village. This gave in the details of the demographic profile of the village, the literacy percentage, SC/ST population, number of BPL household, cattle population, net consumption rate in the village, average milk production of the cattle and various schemes running and their benefits

Bio-physical survey was undertaken to identify various natural resources available in the village. It included the soil typology, well in the area, crop taken in the field, Cropping pattern, fertilizer used and various sources of irrigation in the field.,

3 Participatory Rural Appraisal (PRA)

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

the village in general and watershed in specific. These tools put the villagers in ease than the complicated questionnaires.

4. 2 Use of GIS and Remote sensing for planning

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

a) Prioritization

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

b) Planning

A action plan matrix was formulated by State Level Nodal Agency (SLNA) taking into account various features like the slope percent, soil Depth, Soil Texture, Soil erosion in the area for wasteland, forest land and agricultural land. Global positioning System (GPS) was used to identify each and every water conservation structures available in the project area. This was used to create a map. Contour Map of vertical interval of 0.3 meter at a scale of 1:4000 was used for identifying various locations for soil and water conservation structures.

c) Hydrological modelling

Hydrology modelling technique was used for locating drainage, stream length, flow direction, sink, 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 No.25: Details of Scientific Planning and Inputs in IWMP projects

Scientific criteria / input used	Whether scientific criteria was used
(A) Planning	
Cluster approach	Yes
Whether technical back-stopping for the project has been arranged? If yes, mention the name of the Institute	-

Baseline survey	Yes
Hydro-geological survey	Yes
Contour mapping	Yes
Participatory Net Planning (PNP)	Yes
Remote sensing data-especially soil/ crop/ run-off cover	-
Ridge to Valley treatment	-
Online IT connectivity between	-
(1) Project and DRDA cell/ZP	Yes
(2) DRDA and SLNA	Yes
(3) SLNA and DoLR	Yes
Availability of GIS layers	-
Cadastral map	Yes
Village boundaries	Yes
Drainage	Yes
Soil (Soil nutrient status)	Yes
Land use	Yes
Ground water status	Yes
Watershed boundaries	Yes
Activity	Yes
Crop simulation models#	No
Integrated coupled analyzer/ near infrared visible spectroscopy/ medium spectroscopy for high speed soil nutrient analysis	No
Normalized difference vegetation index (NDVI)#	No

Weather Station	-
(B) Inputs	NO
Bio-pesticides	No
Organic manures	No
Vermicompost	Yes
Bio-fertilizer	Yes
Water saving devices	Yes
Mechanized tools/ implements	Yes
Bio-fencing	Yes
Nutrient budgeting	Yes
Automatic water level recorders & sediment samplers	NO
Any other (please specify)	NO

4.3 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.

4.3.1 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 redamation 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.

4.3.2 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.

Table No.26: Details of Self Help Group in Project Area IWMP.1- Bahraich

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 Chairman & secretary No. Members
1	**2**	**3**	**4**	**5**	**6**
1.	Bojhiya	2B1G4b2d	1.Devi S.H.G.	Goat Farming	Shri Ram Chander s/o Ram Prasad-10
			2. Mamta, S.H.G	Dairy	Smt.Meena s/o Ram Suresh-12
			3 Bhole nath, S.H.G	Dairy	Shri Om Prakash s/o Swam Dayal-10
			4 Nivas, S.H.G	Dairy	Shri Ram Nivas s/oBalak Ram-10
			5 Mazdoor, S.H.G	Agri. Farming	Shri Saktooo s/o Jhagdoo-13
			6.Sushila,S.H.G.	Dairy	Smt.Shusila Devi w/oLal Bahadur-10
			7.Bahadur,S.H.G.	Dairy	Shri Lal Bahadur s/o Kali Charan-10
			8.Indira,S.H.G.	Dairy	Smt.Nirmala Devi w/o Satish-10
2.	Bejha	2B1G4f1c	1. Bajrang S.H.G.	Dairy	Shri Shrikant s/o Ram Vilas-10
			2. Pratap S.H.G.	Goat Farming	Shri Ram Prtap S/oThakur Prasad-10
			3.Shankar S.H.G.	Dairy	Shri Dinesh Kumar s/o Asharam-10
3.	Majhra I	2B1G4f1b	1. Shankar S.H.G.	Dairy	Shri Jagdish S/o Rm Naresh -11
			2. Girbar, S.H.G.	Dairy	Shri Bramha s/o Ram Harakh-10

4.3.3 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 collect 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.

Table No.27: Users Group Details in Project Area – IWMP 1 Bahraich

S. No.	Name of Project (M.W.S.)	Cod No. (M.W.S.)	Name of U.G.	Name of Group leader & No. of Cultivators.
1	2	3	5	6
1	SemriGhathi.	2B1G4b2d	No. 1	Shri Chabile S/o BBihari-9
			No. 2	Shri Swami S/o Bechan-7
			No. 3	Shri Durga Prasad S/oRama Kant- 10
			No. 4	Shri JVijay S/o Banwari-8
			No. 5	Shri Om Prakash S/o Ishwar Dayal-10
			No.6	Shri Radhe S/oDashrath-12
			No.7	Shri Teerath S/oDhani Ram-10
			No.8	Shri Agnu S/oJagdhari-9
			No.9	Shri Phool Chanda S/oMaiku-9
			No.10	Shri Shiv Sagar S/oMuni Lal-16
			No.11	Shri SriBhagwan S/o Sita ram -14
2	Bejha	2B1G4f1c	No. 1	Shri Amar Singh S/o Gokaran-12
			No. 2	Shri Baijnath S/oMahadev-8
			No.3	Shri Shiya Ram S/oShiv Charan-10
			No. 4	Shri Jagtaar Singh S/oAmar Singh-7
			No. 5	Shri Manoj Kumar S/o Nankau-8
			No. 6	Shri Birla Kumar S/oBadri Prasad-12

			No.7	Shri Hans Ram S/oSukai-15
3.	Majhra I	2B1G4f1b	No. 1	Shri Sohan S/oHoli-12
			No. 2	Shri Vinod Kumar S/oNaresh-8
			No. 3	Shri Ibrahim S/oBalli-11

4.4 Entry Point activity (EPA)

EPA activities are taken up under watershed projects to build a rapport with the village community at the beginning of the project; generally, certain important works which are in urgent demand of the local community are taken up. A group Discussion was conducted with watershed Development Committee regarding the EPA activity, It was conveyed to the WC that an amount of Rs. 19.20 Lakh was allotted for EPA activity, which was 4 per cent of total allocated budget. The villagers discussed various activities which they felt is important but after a brief discussion it was conveyed to them that only those activities can be taken, which revive the common natural resources. It was also taken into priority that there should be an instrument of convergence which will result in sustainability of activities

4.4.1 Entry point activities (EPA) (All financial figures in lakh Rs.)

S.No.	Name of Villages	Amount earmarked for EPA	Entry Point Activities Planned	Estimated Cost (Rs.in Lakh)

	1SemriGhathi, 2.Amritpur, 3. lalbojha 4.Semrimalmala, 5.Puraina, 6.Bojhiya, 7.Majhara 8.Bejha, 9.Dharampur, 10. Raghwapur	19.20	(A) Well Repairing	12.80
			(B) Krishak Vikas Manch	0.50
			(C) HandPump , chabutara	0.65
			(D) Drainage (E) Panchayat Bhawan (F) SOB	0.88 0.60 3.77

4.5 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. 240.00 Lakhs & 50% of the total cost has been made for watershed development works .

Area Treat Meant Plan

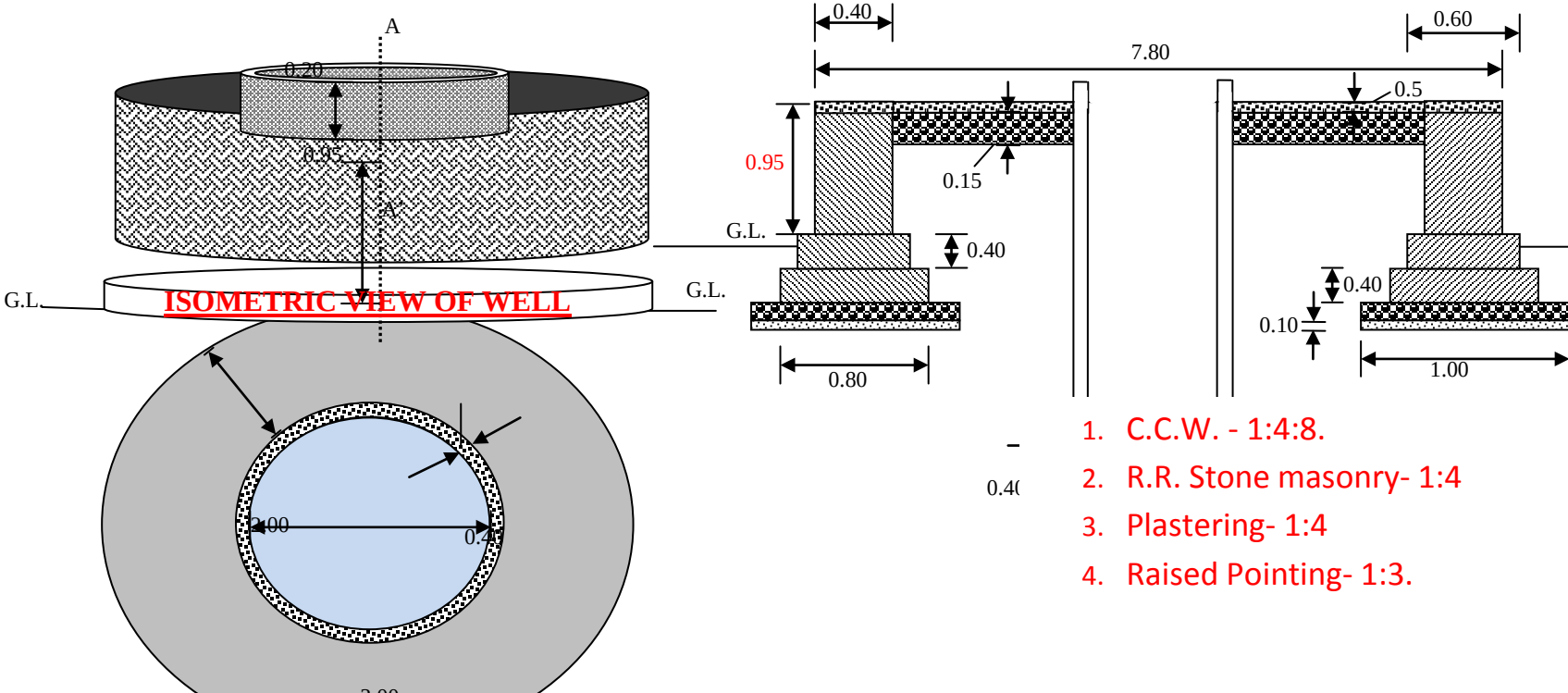
Integrated watershed development program envisage treatment of proposed area with soil & water conservation works along with development of Horticulture, Afforestation & development of silvi pastosal system in denuded land unfit for cultivation, following works are proposed under watershed Development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

1. Contractions of bunds (Field bund, contour bund, submergence bund, Marginal & peripheral.
2. Renovation of Existing Bund for in-situ moisture conservation.
3. Rain fed Horticulture with and without fencing.

TABLE NO.28: ENTRY POINT ACTIVITIES (EPA) (ALL FINANCIAL FIGURES IN LAKH RS.)

Sl.No.	Names of Villages	Amount earmarked for EPA	Entry Point Activities planned	Estimated cost(Rs. in Lakh)
01	IWMP-Ist	28.704	Repair of well	28.704
			Renovation of Chekdam & Ponds	
			Shokpit,	
			Rain water harvesting structure	
			Renovation of village pond	
			India Marka Hand Pump	
			Bilding of animal water trough	

DRAWING OF WELL



DESCRIPTION

PLAN

DETAIL ESTIMATE OF JAGAT OF WELL

S.No.	Descrip			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.	R/R Stone masonary 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)	Khanda (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.	Stone masonary 1:4	22.21 cum	53.30	7.551	22.21	-	-

4.	C.C.W. 1:2:4	1.821 cum	11.10	0.764	-	-	1.547
5.	Raised Pointing	22.04 m^2	1.01	0.103	-	-	-
Total			**91.04**	**14.131**	**22.21**	**7.012**	**1.547**
Say			**91 bags**	**14.13 cum**	**22.20**	**7.01**	**1.55**

COST OF MATERIALS

S.No.	Particulars	Quantity	Rate	Amount
1.	Cement	91 Bags	255.00/bag	23205.00
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. 66,749.00**

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.	Stone Masonary	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 0f Floor of Well	
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 ROCKY AREA

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	7000.00	7000.00

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 30 40	9380.00 240.00 202.90	9380.00 7200.00 8116.00
3	Boring work by D.T.H. Rig machine and lowering of P.V.C. assembling	Meter	60	396.00	23760.00
4	Development of Hand Pump after installation	1 Labour	1	500.00	500.00
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	5500.00	5500.00
7	construction of channel with all material and labour	Meter	3	1200.00	360000
8	Embossing work	Work	1	150.00	150.00
9	Water testing work	Work	1	400.00	400.00
	Total **Says**				**Rs. 65,656.00** **Rs. 65,700.00**

TABLE NO. 29: CAPACITY BUILDING INSTITUTION:

Sl. No.	Name of the Training Institute	Full Address with contact no., website & e-mail	Type of Institute	Area(s) of speciali-zation$	Accreditation details	Trainings		
						Reference Year	No. of trainings assigned	No to
1	Krishi Vigyan Kendra	Kurara Hameerpur	Research Institutes	Agriculture/ Horticulture/ Animal Husbandry	Govt. of UP	2010-2013	3	
2	Chandra Shekhar Azad Univercity	Kanpur	University	Agriculture/ Horticulture/ Animal Husbandry	Govt.of India	2010-2013	3	
3	Deen Dayal Resurch Center Baxi Tal	Lucknow	Research Institutes	Capacity Building	State Govt	2010-2013	3	

4	Traning Centure Beli Kala	Lucknow	Traning Centure	Capacity Building	State Govt	2010-2013	3	
5	Balmi Traning Centure	Lucknow	Traning Centure	Capacity Building	Govt.of India	2010-2013	3	

TABLE NO. 30: CAPACITY BUILDING PLAN:

Sl. No.	Project Name	Project Stakeholders	Total no. of persons	No. of persons to be trained	No. of training programmes	Estimated cost(in lakh)
1	IWMP-I	PIA	08	08	03	35.88
		WDTs	08	08	03	
		UGs	260	260	03	
		SHGs	520	520	03	
		WCs	1300	1300	03	

TABLE NO.31: INFORMATION, EDUCATION AND COMMUNICATION ACTIVITIES:

Sl. No.	Activity	Executing agency	Estimated expenditure (Rs.)	Outcome (may quantify, wherever possible)
01	Street plays	Local Drama Groups	5000.00	Awareness for the importance of watershed projecta
02	Video shows	PIA	3000.00	
03	Pamphlets and posters	PIA	2000.00	
04	Banners, Hoardings	PIA	3000.00	

Table No.32: Detail of activities of preparatory phase

Name of villages	Institutional and capacity buildings	Detailed propies report of	Total estimated cost

1.SemriGhathi, 2.Amritpur, 3. Lalbojha, 4.Semrimalmala, 5.Puraina, 6.Bojhiya, 7.Majhara 8.Bejha, 9.Dharampur, 10.Raghwapur,	3.60 1.20 1.20 1.20 1.80 4.50 7.50 2.10 0.60 0.30	4.8	28.80

Table No.33 Activity related to livelihood by self help groups (SHGS) in the project area

S.No.	No.of Groups			Total Groups	Proposed outlay (Rs. In lakh)	Expected annual income per SHG (Rs. In lakh)	Remark
	Dairy	Animal Husbandry	Goat Farming				
1.Bojhiya 2. Bejha 3.Majhra	6 2 2	1 - -	1 1 -	8 3 2		0.20 to 0.40	
Total	10	1	2	13	14.40	20.50	For project period

Table No.34 Other Activities of watershed works phase – Proposed Target

Name of villages, watersheds	Construction of bunds (Field bund, contour bund, submergence bund, Marginal bund & Peripheral bund.		Renovation of Existing bund for un –sites soil moisture conservation		Rain fed Horticulture without fencing	
	Area (ha)	Cost Rs.in Lakh	Area (ha)	Cost Lakh Rs	Area ha	Cost lakh Rs
1	2	3	4	5	6	7
10 Villages . 2B1G4b2d 2B1G4f1c 2B1G4f1b	3150	195.50	450	20.50	400.00	24.00

Table. 35 Year wise financial outlays (lakh Rs.)

PHASING OF WORK (FINANCIAL & PHYSICAL)

1. Financial Outlays.

S.No.	Component	Unit	Quantity	Unit Cost (Lakhs)	1st Year (Lakhs)	2nd Year (Lakhs)	3rd Year (Lakhs)	4th Year (Lakhs)	Total (Lakhs)
A.	**MANAGEMENT COSTS**								
	Administrative cost- TD & DA, POL/ Hiring of vehicles/ Office and payment of electricity and phone bill, etc. computer, stationary and office consumable and contingency				9.60	12.00	16.80	9.60	**48.00**
	Expert for monitoring and evaluation.	Nos	NA	NA	4.80	2.40	2.40	-	9.60
	Sub Total				**14.40**	**14.40**	**19.20**	**9.60**	**57.60**
B.	**PREPARATORY PHASES**								
	(1.) Entry point Activities								
	(A)Well Repairing	nos	32	0.40	12.80	-	-	-	**12.80**
	(B)Krishak Vikas Manch	nos	1	0.50	0.50	-	-	-	**0.50**
	(C)Hand Pump chabutra repairing	nos	5	0.013	0.65	-	-	-	**0.65**
	(D)Drainage (E) panchyat Bhawan floor repairing (F) Sampark marg SOB repairing	nos Nos Km.	104m 1 2.00	0.84/100m 0.60 -	.65 0.60 3.77	- -	- -	- -	**0.65** **0.60** **3.77**
	Sub Total				**19.20**	**-**	**-**	**-**	**19.20**
	2.Institutioal and Capacity Building				**9.60**	**9.60**	**4.80**	**-**	**24.00**
	3.Detail Project Report				**4.80**	**-**	**-**	**-**	**4.80**
	Sub Total				**33.60**	**9.60**	**4.80**	**-**	**48.00**
C.	**WATERSHED WORKS**								
	(1.) Watershed Development Works								
	a. Construction of Bunds (Field Bund, Contour Bund, Submergence Bund, Marginal Bund and Peripheral Bund)	ha	3150	0.062	-	97.75	97.75	-	**195.50**

	b. Renovation of the Existing Bund for *insitu* soil Moisture Conservation	ha	450	0.04500	-	10.25	10.25	-	**20.50**
	Rainfed Horticulture without Fencing	ha	400	0.06	-	12.00	12.00	-	**24.00**
	Sub Total				-	**120**	**120**	**-**	**240**
	(2.) Livelihood Programme (Community Based)								
	Income Generating Activities through S.H.G.'s for Landless and Marginal Farmers								
	a. Establishment of Nadef-Compost Units	nos	142	0.10400	14.77	-	-	-	**14.77**
	b. Dairy Work	nos	14	0.50000	7.00	-	-	-	**7.00**
	c. Goat-keeping	nos	22	0.44	9.68	-	-	-	**9.68**
	d. General Merchant Shop	nos	10	0.25000	2.50	-	-	-	**2.50**
	e. Livestock Development Activities	Detail Attached			14.05	-	-	-	**14.05**
	Sub Total				**48.00**	**-**	**-**	**-**	**48.00**
	(3.) Production System and Micro-Enterprises								
	a. Crop Production, Diversification of Agriculture	ha	160	0.06	-	3.89	3.89	1.22	**9.60**
	b. Introduction of Agro-forestry / Horticulture	ha	19	2.26	-	16.16	16.16	10.68	**43.00**
	c. Demonstration of Green Manuring	ha	1630	0.006	-	3.95	3.95	1.90	**9.80**
	Sub Total				**-**	**24.00**	**24.00**	**14.40**	**62.40**
D.	**CONSOLIDATION PHASE**	-	-	-	-	-	-	24.00	**24.00**
	GRAND TOTAL				**96.00**	**168.00**	**168.00**	**48.00**	**480.00**

Note: Unit costs of different activities are given in annexure.

4.9 Physical Targets.

Activities Related To	1st Year (quantity)	2nd Year (quantity)	3rd Year (quantity)	4th Year (quantity)	Total (quantity)
ADMINISTRATIVE COSTS					
TD & 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 PHASES					
Entry Point Activities improvement in Drinking Water System, Drainage,Krishak Vikas Manch etc.	√	-	-	-	√
Institutional and capacity building	√	√	√	√	√
WATERSHED WORKS					
Watershed Development Works					
Construction of Bunds (Field Bund, Contour Bund, Submergence Bund, Marginal Bund and Peripheral Bund) Area Ha	-	1575	1575	-	3150
Renovation of the Existing Bund for *insitu* soil Moisture Conservation Area Ha	-	225	225	-	450
Rainfed Horticulture without Fencing Area Ha	-	200	200	-	400
LIVELIHOOD PROGRAMME (community					
Income generating activities through SHG's for landless and marginal farmers.					
a. Goat keeping. (nos)	22	-	-	-	22
b. Establishment of Nadef Compost Unit. (nos)	142	-	-	-	142
c. Dairy Work. (nos)	14	-	-	-	14

d. General Merchant Shop. (nos)	10	-	-	-	10
e. Livestock development activities	√	√	√	√	√
PRODUCTION SYSTEM AND MICRO ENTERPRISES					
Demonstration and assessment of improved composting system using alternate materials (118 Nadef-compost) and 100 nutrient analysis (Nos.)	160 100	- -	- -	- -	160 100
Introduction of improved crop production practices. i). For *Kharif* crops (ha). ii). For *Rabi* crops (ha).	 30.00 32.00	 24.00 22.00	 18.00 20.00	 12.00 15.00	 84.00 89.00
CONSOLIDATION PHASE	-	-	-	√	√

Table No.36 Technical specification of watershed works

Technical Specification of field Bund.

Particular	Value	Unit
Top Width	0.50	M
Height	0.50	M
Bottom width	1.50	M
Cross section	0.50	M^2
Length /Ha	200	M
Earth work	100	CUM
Cost/ Ha	3916	Rs.

Technical Specification of contour bund.(1% slope land)

Particular	Value	Unit
Top Width	0.5	m
Height	0.7	m
Side Slop	1.5:1	-
Base of bund	2.60	m
Cross section	1.085	m^2
Length of bund/ha	150	m
Earth work	162.75	m
Cost/ Ha	6375	cum
		Rs..

Technical Specification of Submergence bund

Particular	Value	Unit
Height of Bund	0.90	m
Top Width	0.70	m
Side Slop 1.5:1	-	-
Base width	3.40	m
Cross section	1.845	m^2
Length of bund/ha	150	m
Earth work	276.75	cum
Cost/ Ha	10837.53 Say 10850	Rs.

Technical Specification of Submergence bund

Particular	Value	Unit
Top Width	0.70	m
Side Slop	1.5:1	-
Height of bund	1.30	m
Bottom width	4.60	m
Cross section	3.445	m^2
Cost/ metre	142.00	Rs..

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

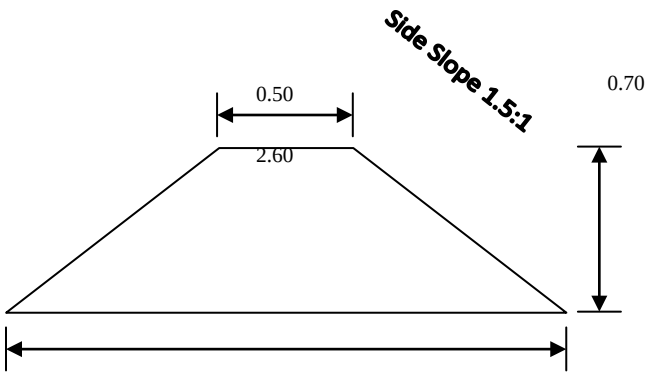
S.No.	Particulars	Quantity	Rate	Amount	Remarks
A. Horticulture					
1.	Soil working 1m x 1m x 1m size pits (270nos.) including cost of refilling	270.00 cum	36.66/cum	9898.20	Since, the project is to be operated in a participatory mode, contribution in the form of labour input for pit digging, FYM and 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**	

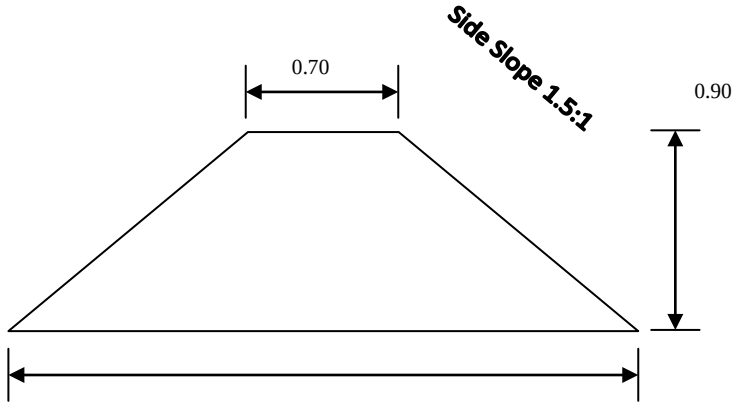
COST IN PLANTING ONE PLANT WITH DIGGING, FILLING MIXED WITH FYM AND COST OF PLANT

S.No.	Particular	No.	L	B	D/H	Quantity	Rate	Amount
1	Earth work in digging	1	1.0	1.0	1.00	1.00	36.66	36.66
2	Cost of FYM, in Kg/pit	1	-	-	-	10Kg	8.00	80.00
3	Filling of pits mixed with FYM and soil	1	1.0	1.0	1.0	1.00	36.66	36.66
4	Cost of plants	1	-	-	-	1	18.00	18.oo
Total								**171.32**
Say								**Rs. 172.00**

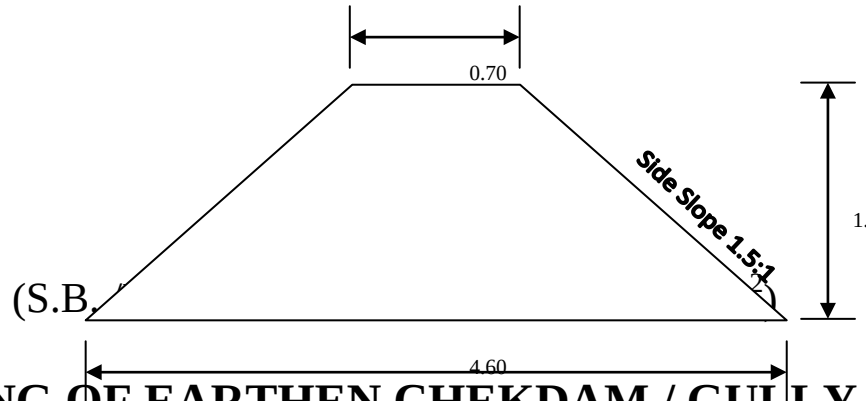
DRAWING OF C.B., S.B., P.B., AND M.B.

(Not to Scale)





(C.B., Cross-Section – 1.085 m^2) (S.B., Cross-Section – 1.845m^2)

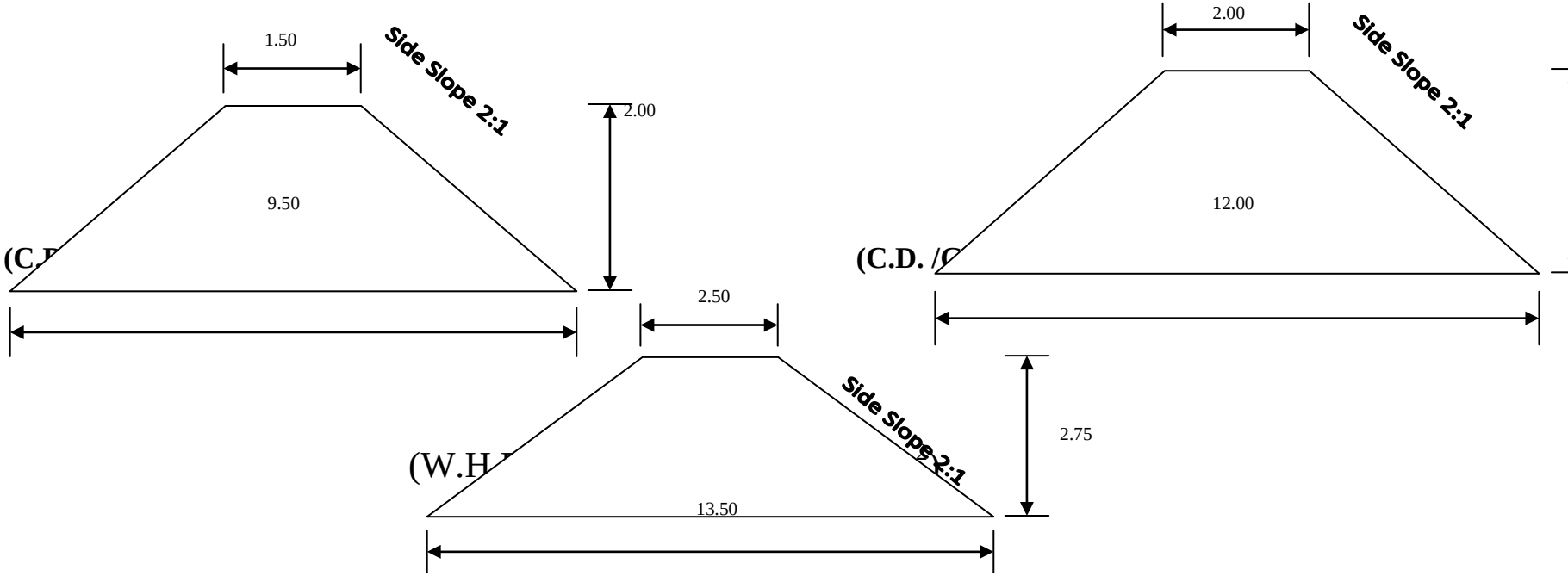


(All dimensions in

(S.B.,

DRAWING OF EARTHEN CHEKDAM / GULLY PLUG

(Not to Scale)



(C.D.

(C.D. /C

(W.H.

DESIGN OF CONTOUR BUND/ FIELD BUND

Type of Soil -Clay

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

Feasible lengh/ha. = 100m

Earth work/ha = 100x 1.085

= 108.50 cum

Cost Rs. / ha = 108.50 @ Rs.39.16 = 4248.86 **Say Rs.4200.00**

DESIGN OF SUBMERGENCE BUND

Types of soil –Clay — 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/ha 100 m

Earth work/ha =100x 1.845

=184.50 cum

Cost per ha =184.50 @ Rs. 39.16

=7225.02 **Say Rs. 7200=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
Feasible length/ha	75m
Earthwork	75x 3.445=258.375 cum
Cost/ ha	= Rs. 258.375@ Rs. 41.22 = Rs.10650.21 **Say Rs. 10500.00**

TYPICAL SECTION OF EARTHEN CHECK DAM / GULLY PLUG

Top width	= 1.50 m
Side slope	= 2:1
Height	= 2.00m
Bottom Width	= 9.50 m
Cross section	= (1.50 + 9.50) x 2.00 / 2 = 11.00 m^2
Feasible length/ha	= 25 m
Earthwork	= 25x 11=275.00cum
Cost / ha	= 275.00@ Rs. 4433= Rs.12190.75 **Say Rs. 12000.00**

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

Feasible length/ha = 20 m

Earthwork = 20x 17.50= 350.00 cum

Cost /ha = 350@Rs. 47.95= Rs.16782.50

Say Rs. 16000./ha

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

Feasible length/ha = 15m

Earthwork = 15x 22= 330.00cum

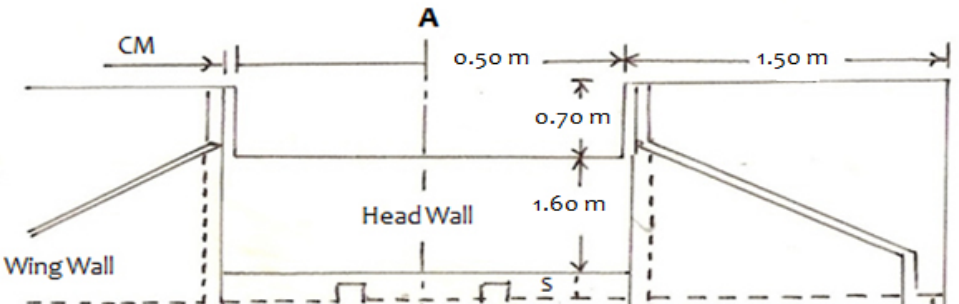
Cost/ha = 330@ Rs. 48.95= Rs.16153.50

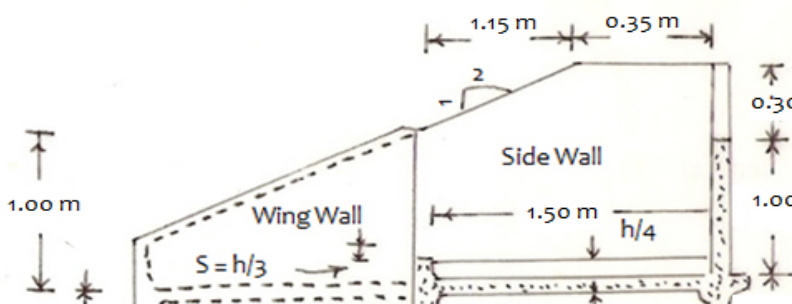
Say Rs. 16000.00

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)

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

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

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

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

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

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

3. STRUCTURAL DESIGN –

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

E = 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 x $\frac{0.5}{0.5}$ + 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 x 0.25 – 1.00)

= 2 x (- 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 x $(Q/f)^{1/3}$

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

= 0.473 x 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

DETAIL ESTIMATE OF DROP SPILLWAY OF CREST LENGTH 0.5 METRE

1. Earth work in cutting in foundation

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

2. LAYING OF SAND IN THE BED OF FOUNDATION

S.No.	Description of work	No.	L	B	D/H	Quantity
1	Side wall	2	1.50	1.00	0.10	0.300
2	Head wall	1	0.50	0.40	0.10	0.020
3	Wing wall	2	1.15	0.80	0.10	0.184
4	Toe wall	1	0.50	0.80	0.10	0.040

5	Cut off wall	1	4.70	0.80	0.10	0.376
6	Apron	1	0.50	1.50	0.10	0.075
Total						0.995 cum

3. C.C.W. 1: 3: 6 IN FOUNDATION

S.No.	Description of work	No.	L	B	D/H	Quantity
1	Cut off wall	1	4.7	0.80	0.15	0.564
2	Head wall	1	0.50	0.40	0.15	0.030
3	Side wall	2	1.50	1.00	0.15	0.450
4	Wing wall	2	1.15	0.80	0.15	0.276
5	Toe wall	1	0.50	0.80	0.15	0.060
6	Apron	1	0.50	1.50	0.15	0.112
Total						1.492 cum

4. R/R STONE MASONRY 1:4

S.No.	Description of work	No.	L	B	D/H	Quantity
1	Cut off wall	1	4.70	0.80	0.45	1.692
		1	4.70	0.60	0.45	1.269
2	Head wall	1	0.50	1.10	0.45	0.247
		1	0.50	1.00	0.45	0.225
		1	0.50	(0.40 + 1.00) /2	0.60	0.180
3	Head wall extension	2	2.10	0.80	0.45	1.512
		2	2.10	0.60	0.45	1.134
		2	2.10	0.60	0.60	1.512
		2	2.10	0.40	0.70	1.176
4	Side wall	2	1.50	1.00	0.45	1.350
		2	1.50	0.80	0.45	1.080
		2	1.50	0.80	0.60	1.440
		2	1.50	0.60	0.40	0.720
		2	(0.35 + 1.50) /2	0.40	0.30	0.222

5	Wing wall	2 2 2	1.15 1.15 1.15	0.80 0.60 0.40	0.45 0.45 (1.00 + 0) /2	0.828 0.621 0.460
6	Toe wall	1 1 1	0.50 0.50 0.50	0.80 0.60 0.40	0.45 0.45 0.20	0.180 0.135 0.040
7	Apron	1	0.50	1.50	0.45	0.337
	Total					16.360 cum

HORTICULTURE DEVELOPMENT FOR WATERSHED MANAGEMENT

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

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

(A) BASIC CONSTRAINTS

1- Lack of suitable agro-techniques for degraded lands

2- Lack of trained resource persons

3- Inadequate dissemination of the technologies

4- Lack of community approach

5- High biotic interference

6- Lack of infrastructure including marketing.

(B) SOIL CONSTRAINTS

1- Poor nutrient status of the soil

2- Physical impediment

3- Moisture stress.

(C) PLANT RELATED CONSTRAINTS

1- Unsurvial zone

2- Problem of plant establishment

3- Physiological disorders

4- Fruit drop and poor productivity

5- 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.

CONSERVATION HORTICULTURE PRACTICES

Some of the important practices are given below

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

CHAPTER – 5

BUDGETING

PHASING OF WORK (FINANCIAL & PHYSICAL)

Table No.37 Budget At a Glance.

S.No.	Component	Unit	Quantity	Unit Cost (Lakhs)	1st Year (Lakhs)	2nd Year (Lakhs)	3rd Year (Lakhs)	4th Year (Lakhs)	Total (Lakhs)
1A.	**MANAGEMENT COSTS**								

	Administrative cost- TD & DA, POL/ Hiring of vehicles/ Office and payment of electricity and phone bill, etc. computer, stationary and office consumable and contingency				9.60	12.00	16.80	9.60	**48.00**
	Expert for monitoring and evaluation.	Nos	NA	NA	4.80	2.40	2.40	-	9.60
	Sub Total				**14.40**	**14.40**	**19.20**	**9.60**	**57.60**
B.	**PREPARATORY PHASES**								
	(1.) Entry point Activities								
	(A)Well Repairing	nos	32	0.40	12.80	-	-	-	**12.80**
	(B)Krishak Vikas Manch	nos	1	0.50	0.50	-	-	-	**0.50**
	(C)Hand Pump chabutra repairing	nos	5	0.013	0.65	-	-	-	**0.65**
	(D)Drainage (E) panchyat Bhawan floor repairing (F) Sampark marg SOB repairing	nos Nos Km.	104m 1 2.00	0.84/100m 0.60 -	.65 0.60 3.77	- -	- -	- -	**0.65** **0.60** **3.77**
	Sub Total				**19.20**	**-**	**-**	**-**	**19.20**
	2.Institutioal and Capacity Building				**9.60**	**9.60**	**4.80**	**-**	**24.00**
	3.Detail Project Report				**4.80**	**-**	**-**	**-**	**4.80**
	Sub Total				**33.60**	**9.60**	**4.80**	**-**	**48.00**
C.	**WATERSHED WORKS**								
	(1.) Watershed Development Works								
	a. Construction of Bunds (Field Bund, Contour Bund, Submergence Bund, Marginal Bund and Peripheral Bund)	ha	3150	0.062	-	97.75	97.75	-	**195.50**
	b. Renovation of the Existing Bund for *insitu* soil Moisture Conservation	ha	450	0.04500	-	10.25	10.25	-	**20.50**
	Rainfed Horticulture without Fencing	ha	400	0.06	-	12.00	12.00	-	**24.00**
	Sub Total				-	**120**	**120**	**-**	**240**
	(2.) Livelihood Programme								

	(Community Based)								
	Income Generating Activities through S.H.G.'s for Landless and Marginal Farmers								
	a. Establishment of Nadef-Compost Units	nos	142	0.10400	14.77	-	-	-	**14.77**
	b. Dairy Work	nos	14	0.50000	7.00	-	-	-	**7.00**
	c. Goat-keeping	nos	22	0.44	9.68	-	-	-	**9.68**
	d. General Merchant Shop	nos	10	0.25000	2.50	-	-	-	**2.50**
	e. Livestock Development Activities	Detail Attached			14.05	-	-	-	**14.05**
	Sub Total				**48.00**	**-**	**-**	**-**	**48.00**
	(3.) Production System and Micro-Enterprises								
	a. Crop Production, Diversification of Agriculture	ha	160	0.06	-	3.89	3.89	1.22	**9.60**
	b. Introduction of Agro-forestry / Horticulture	ha	19	2.26	-	16.16	16.16	10.68	**43.00**
	c. Demonstration of Green Manuring	ha	1630	0.006	-	3.95	3.95	1.90	**9.80**
	Sub Total				**-**	**24.00**	**24.00**	**14.40**	**62.40**
D.	**CONSOLIDATION PHASE**	-	-	-	-	-	-	24.00	**24.00**
	GRAND TOTAL				**96.00**	**168.00**	**168.00**	**48.00**	**480.00**

Note: Unit costs of different activities are given in annexure.

CHAPTER – 6

EXPECTED OUTCOMES

6.1 Sustainability and environment security

In the proposed watershed management plan of watershed, proper blending of bio engineering measures will be applied on 50 % of the total watershed area. 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.

6.2 Economic Analysis

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

6.1.1 EMPLOYMENT

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

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

TABLE NO. 38: EMPLOYMENT IN PROJECT AREA

Sl. NO.	Names of Project	Wage employment										Self employment				
		No. of mandays					No. of beneficiaries					No. of beneficiaries				
		SC	ST	Others	Women	Total	SC	ST	Others	Women	Total	SC	ST	Others	Women	Total

01	IWMP-Ist	6542	-	61157	110250	279865	2452	-	702	1012	3154	307	-	95	205	402

6.1.2.MIGRATION

Low rainfall results in very little fodder availability in the locality. The relatively well off farmers bring fodder from Kanpur (approximately 40 kms away) collectively; but the resource poor cannot afford it. On account of agriculture and animal husbandry providing only part time employment for some part of the year, the people migrate for a better half of the year for wage labour.

Employment opportunities in the local area as mentioned above will ensure lessening seasonal migration from the area.

TABLE NO. 39: DETAILS OF SEASONAL MIGRATION FROM PROJECT AREA

Sl. No.	Names of villages	No. of persons migrating		No. of days per year of migration	
		Pre-project	Expected post project	Pre-project	Expected post project
01	IWMP-Ist	1546.00	337.00	185.00	60.00

6.1.3 GROUND WATER

Rainfall has been scanty but demand for ground water has been increasing all the time. The ground water table thus has depleted over the years. Presently it stands at 7-8 m.

Proper water harvesting structures and percolation tanks would go a long way in increasing water table depth from 7 m in the pre-project level to 6 m in the post project period.

Table.- 40 Source of Income.

S. no	Name of Vill.	Income sources/ no. of family						
		Agriculture	Labour	Pri. Sector Service	Govt. sector Service	Shop	Land less labour	other
1	**Amritpur**	75	12	1	-	-	10	-
2	**Bejha**	370	52	3	2	10	5	-
3	**Dharampur**	120	20	3	1	4	2	-
4	**Puraina**	278	43	6	-	2	12	-
5	**Semri Ghathi**	174	120	3	2	5	7	-
6	**Lalbojha**	190	7	2	1	3	4	-
7	**Semri malmala**	276	58	4	-	2	9	-
8	**Bojhiya**	275	57	5	2	2	7	-
9	**Majhara**	860	200	14	3	7	2	-
10	**Raghwapur**	-	-	-	-	-	-	-

6.3 Agriculture

In rainfed agriculture, the development cost can be recovered within one year as the present rainfed agriculture is being done on well maintained field, therefore, does not require much investment. In irrigated agriculture, investment of Rs. 721.00 lacs is proposed to made. The BC ratio of this sector is 1.6 : 1 with in three years pay back period.

Table 41 Economics of agriculture sector

S.No.	Sector	Area (ha)	BC ratio
1	Irrigated agriculture	973.00	1.8:1
2	Rainfed agriculture	4316.00	1.4:1
3	**Total**	**5289.00**	**1.6:1**

6.4 Food sufficiency

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

Table No.42: 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	42735	30400	-12335	51969	+9234
2	Pulses	6530	3700	-2830	6880	+350
3	Oil seeds	6636	3210	-3426	7740	+1104
4	Vegetable	690	830	+140	980	+290

6.5 Employment Generation

Labour migration in search of gainful employment is one of the major problems in the remote watershed in particular. Causal employment opportunities to the tune of more than 0.44 lacs 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 of 1.60 lacs in the watershed.

6.6 LOGICAL FRAMEWORK ANALYSIS

Components	Activities	Outputs	Effect	Impact
Village Institution Formation	§ Formation of Watershed Committee, User Group	§ One Watershed Committee each village	§ Project can be implemented and managed in a democratic and participatory way ensuring equity.	§ Unity and prosperity in the

				village management.
		§ Number of User group depending on the coverage of particular intervention		§ People's Participation and positive perception towards the programme
Strengthening Village Institutions	§ Organise training and awareness programme for Village institutions	§ awareness camps to be organised.	§ Quality of management of common resources improved.	
	§ Capacity building workshops and exposure visits User Group and Watershed Committee	§ trainings and exposure visits UGs and WCs to be held	§ Quality of distribution of benefits between people improved.	
	§ Failitating and monitoring the functioning of UGs and WCs	§ Capacity building workshops to be organised	§ Increased awareness amongst women about village resources.	
	§ Strengthen linkages between UGs and WCs and Panchayat Institutions.	§ 1 Federations of UGs and WC to be formed.	§ Women participation enhanced in decision-making of GVCs.	
	§ Gender sensitisation of UGs and WCs to increase inclusiveness of samuh decision-making.		§ Involvement of youth and children in village development increased.	
	§ Sensitise village communities to involve children and youth in development.			

Fund Management	§ Improve management and utilisation of UGs and WCs.	§ UGs and WCs operating bank account and managing resources on their own	§ Purpose, frequency and volume of use of the fund enhanced.	

	§ Prepare communities to explore other sources of income for UGs and WCs.		§ Volume of funds generated for UGs and WCs from other sources of income increased.	
Ecological Restoration	§ Protection, treatment and regeneration of common and private lands	§ Common and private lands to be brought under new plantations and agro-horti-forestry like Neem, Adusa, prosopis, Banyan and Peepul	§ Fodder availability from common and private lands increased.	§ Better Ecological order in the area
	§ Protection, treatment and regeneration of forest lands	§ Forest lands to be brought under new plantations and protection	§ Accessibility to common and forest lands increased with removal of encroachments and resolution of conflicts.	§ Increase in the proportion of households having more security of fodder
	§ Plantation of fruits and forest species	§ Trainings, exposure visits and meetings to be organised for communities, village volunteers and staff		§ Reduction in drudgery of fodder and fuel collection, especially women
	§ Impart trainings, conduct meetings and organise exposure visits for communities, village volunteers and staff to effectively plan, execute and monitor activities	§ Income generation intervention promoted		
	§ Identification and promotion of non-timber forest produce based income generation activities			

Rainfed Area Development	§ Treatment of land through improved soil and moisture conservation practices on watershed basis	§ Land to be brought under improved soil moisture conservation practices	§ Improved productivity of treated land	§ Increase in proportion of households

	§ Promotion of good agricultural practices- horticulture, improved crop and vegetable	§ Good agricultural practices to be promoted	§ Increased availability of water in wells	having more security of food
		§ Organic farming to be promoted	§ Increase in annual agriculture production	§ Increase in contribution of agricultural income to the household income
		§ Fodder banksto be established	§ Farmers adopt organic farming practices	
	§ Promotion of organic farming practices	§ Agriculture based livelihood income generation activities to be promoted	§ Fodder security of farmers enhanced.	
	§ Formation of Fodder banks to increase fodder security and promote dairy development among communities	§ Water harvesting structures to be constructed	§ Increase availability of water for 9 to 12 months	
	§ Identification and promotion of agri-produce based income generation activities like grading, processing and packaging.	§ Drip Irrigation facilities to be distributed among farmers	§ Increased availability of water for livestock	
	§ Promotion of better Irrigation practices like drip irrigation	§ Approx 15000 person days of employment to be generated	§ Availability of irrigation water established	
	§ Impart trainings, conduct meetings and organise exposure visits of communities, village volunteers and staff to effectively plan, execute and monitor activities	§ Trainings, exposure visits and meetings to be organized for communities, village volunteers and staff	§ Farmers take two crops in a year	
			agricultural productivity of land	
			§ Availability of drinking water enhanced	

Women's Socio-political and economic empowerment	§ Formation & Strengthening of women's SHG groups	§ Women's SHG groups to be formed	§ Enhanced capacities of leaders of women's group in taking initiatives to solve problems at different levels.	§ Position of women in household, community, society (politically, socially and economically) as perceived by women and community at large
	§ Capacity building of womenfolk	§ Federation of Women's SHGs to be formed	§ Improved access to credit for livelihood purposes.	§ Performance enhancement of SHGs in terms of participation, decision-making, leadership and fund management.
	§ Capacity building of SHG leaders and accountants	§ Trainings to be conducted for preparation of woollen products from sheep and goats	§ Increased household income.	§ Equality & Equity in gender relations at home (decision making, expenditure, children's education,

			health)

CHAPTER -7

QUALITY AND SUSTAINABILITY ISSUES

7-QUALITY & SUSTAINABILITY ISSUES

7.1-PLANS FOR MONITORING & EVAUATION

A Web-based GIS System is being developed for monitoring and evaluating the project in its planning & implementation phases. The system would be available on a public domain and can be accessed by all the stakeholders of the project. The system shows the entire state of Uttar Pradesh and all of those areas selected over the next 20 years. Filtering allows the user to zoom onto one particular project. Details related to soil type, Land-use classification, inhabitation etc., can be obtained village-wise. Furthermore, survey-number wise details related to ownership, irrigation source, yield etc., can also be accessed by the users of the system. This system is being used for pooling up the details obtained from the DPR. In other words, the DPR is made available online in the form of a database which will help the stakeholders know areas of importance viz., already treated areas/historical works in the area, proposed areas for treatment etc., for further treatment and planning. The system would also show the satellite imageries of various years from the project inception stage to the project closing stages. This allows the user to evaluate the effectiveness of the treatment

and thereby plan corrective measures for the project area. The system would serve as an aiding tool to the planners and evaluators for judging the efficacy of the project.

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

7.2 PLANS FOR PROJECT MANAGEMENT:

The Project management of any watershed programme is very important. It mainly depends upon the community organisation and the village level institutes.In Baharaich, watershed committee and various user group have been formulated for post project operation and maintenance of assets created during project period. Major emphasis will be on equity and sustainable benefit of the project even after implementation stage. A proper link-up will be built during project period with various institutes and capacity

building organisation. They will act as a major kingpin during post implementation for scaling up the successful experience during project.

7.3 WATERSHED DEVELOPMENT FUND:

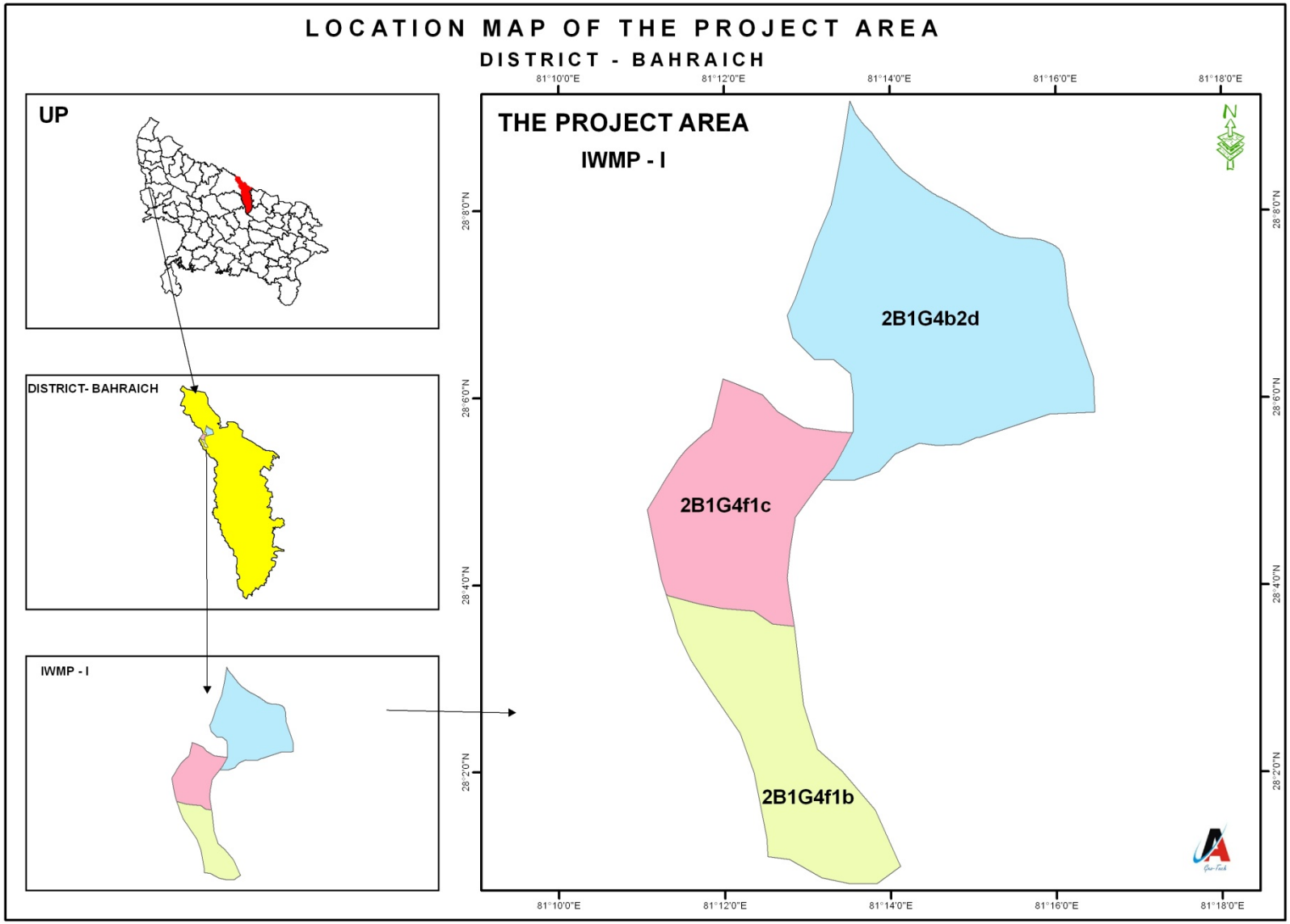
The major source of financial assistance after post implementation period is watershed Development Fund. The contribution of it will comes mainly fund the following:

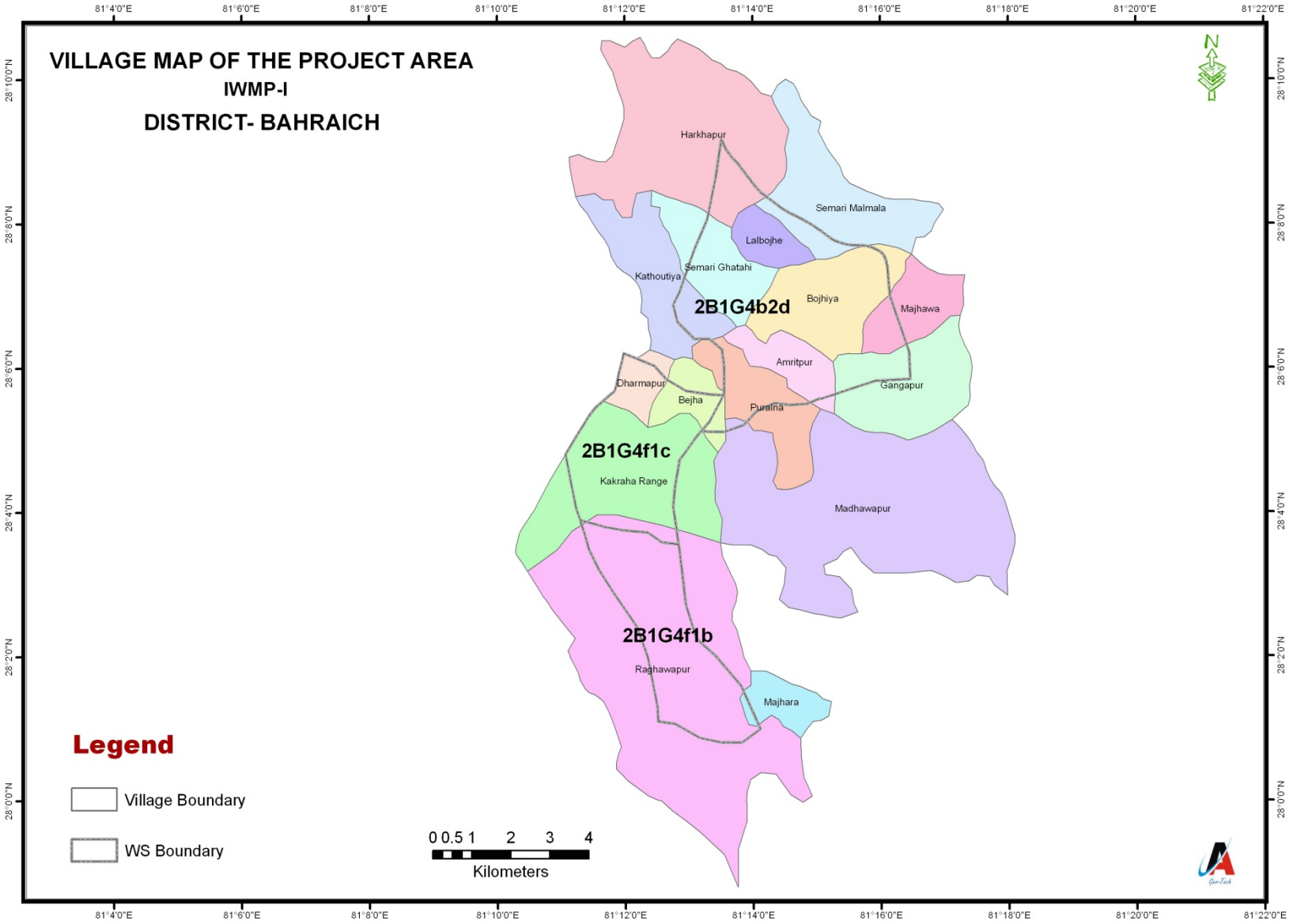
7.4 USER CHARGES:

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

CHAPTER-8

PHOTOGRAPHS AND MAPPING


LOCATION MAP OF THE PROJECT AREA
DISTRICT - BAHRAICH
UP
DISTRICT- BAHRAICH
IWMP - I
THE PROJECT AREA
IWMP - I
2B1G4b2d
2B1G4f1c
2B1G4f1b
N
81°10'0"E
81°12'0"E
81°14'0"E
81°16'0"E
81°18'0"E
28°8'0"N
28°6'0"N
28°4'0"N
28°2'0"N


VILLAGE MAP OF THE PROJECT AREA
IWMP-I
DISTRICT- BAHRAICH
81°4'0"E
81°6'0"E
81°8'0"E
81°10'0"E
81°12'0"E
81°14'0"E
81°16'0"E
81°18'0"E
81°20'0"E
81°22'0"E
28°10'0"N
28°8'0"N
28°6'0"N
28°4'0"N
28°2'0"N
28°0'0"N
N
Harkhapur
Semari Malmala
Lalbojhe
Semari Ghatahi
Kathoutiya
2B1G4b2d
Bojhiya
Majhawa
Amritpur
Dharmapur
Bejha
Puraina
Gangapur
2B1G4f1c
Kakraha Range
Madhawapur
2B1G4f1b
Raghawapur
Majhara
Legend
Village Boundary
WS Boundary
0 0.5 1 2 3 4
Kilometers

BASE MAP OF THE RPOJECT AREA
IWMP-1B
DISTRICT - BAHRAICH (U.P)

Legend

Landuse

- Forest
- Lake/Pond
- Plantation
- Pond
- River
- Scrub
- Settlement
- Wastland
- Wetland
- Buffer
- Drain
- Road_Rail

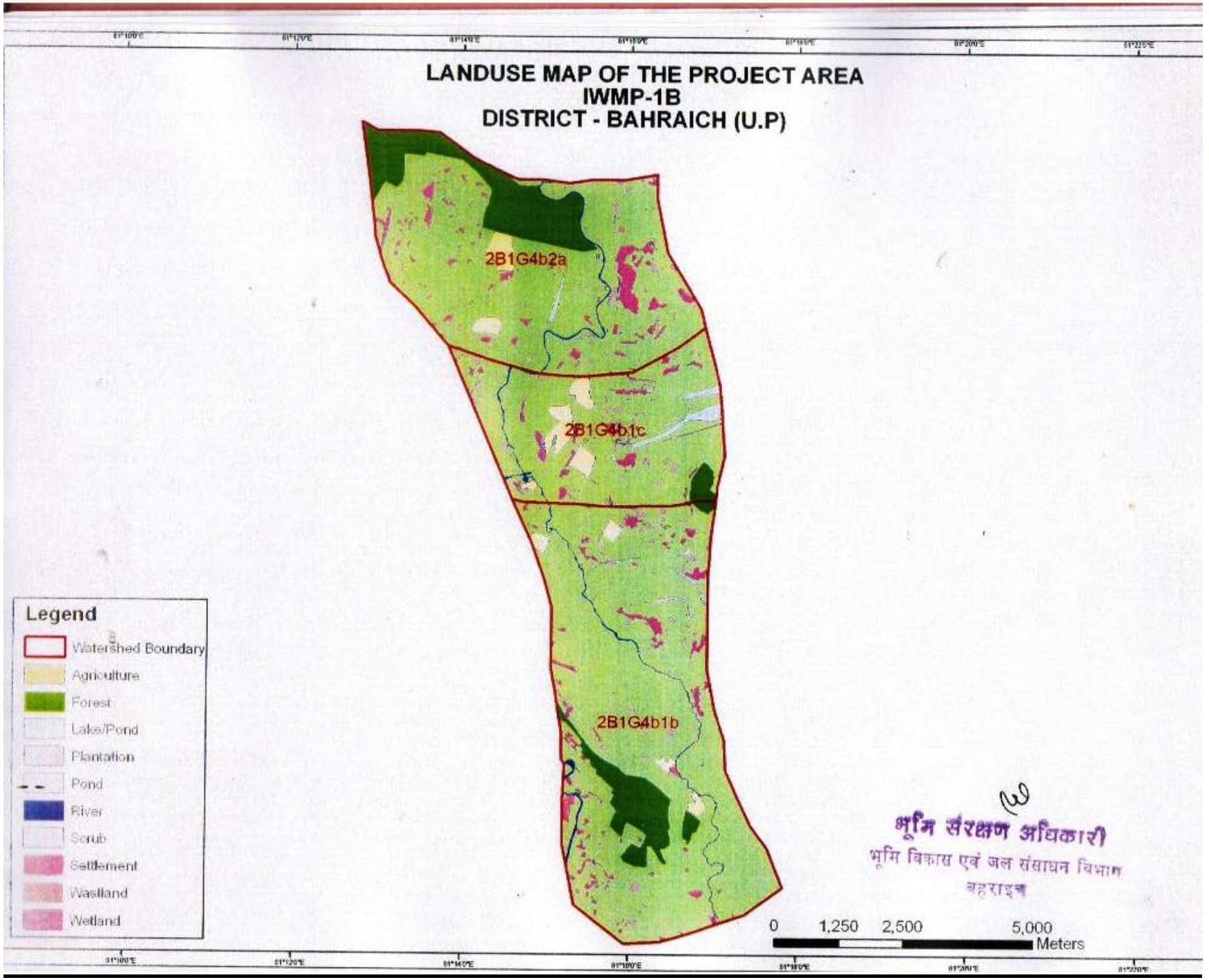
WS_Code

- 2B1G4b1b
- 2B1G4b1c
- 2B1G4b2a

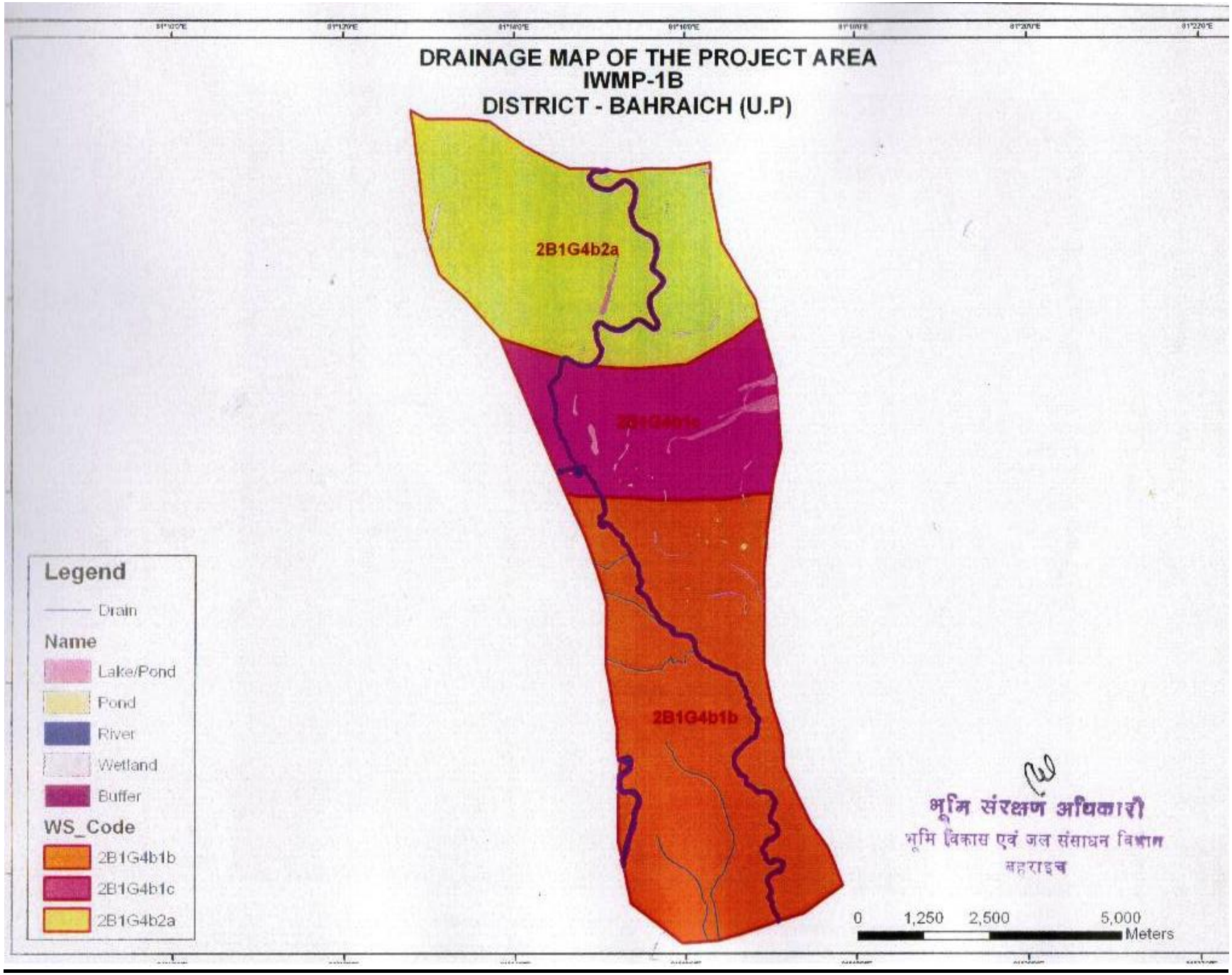
भूमि संरक्षण अधिकारी
भूमि विकास एवं जल संसाधन विभाग
बहराइच

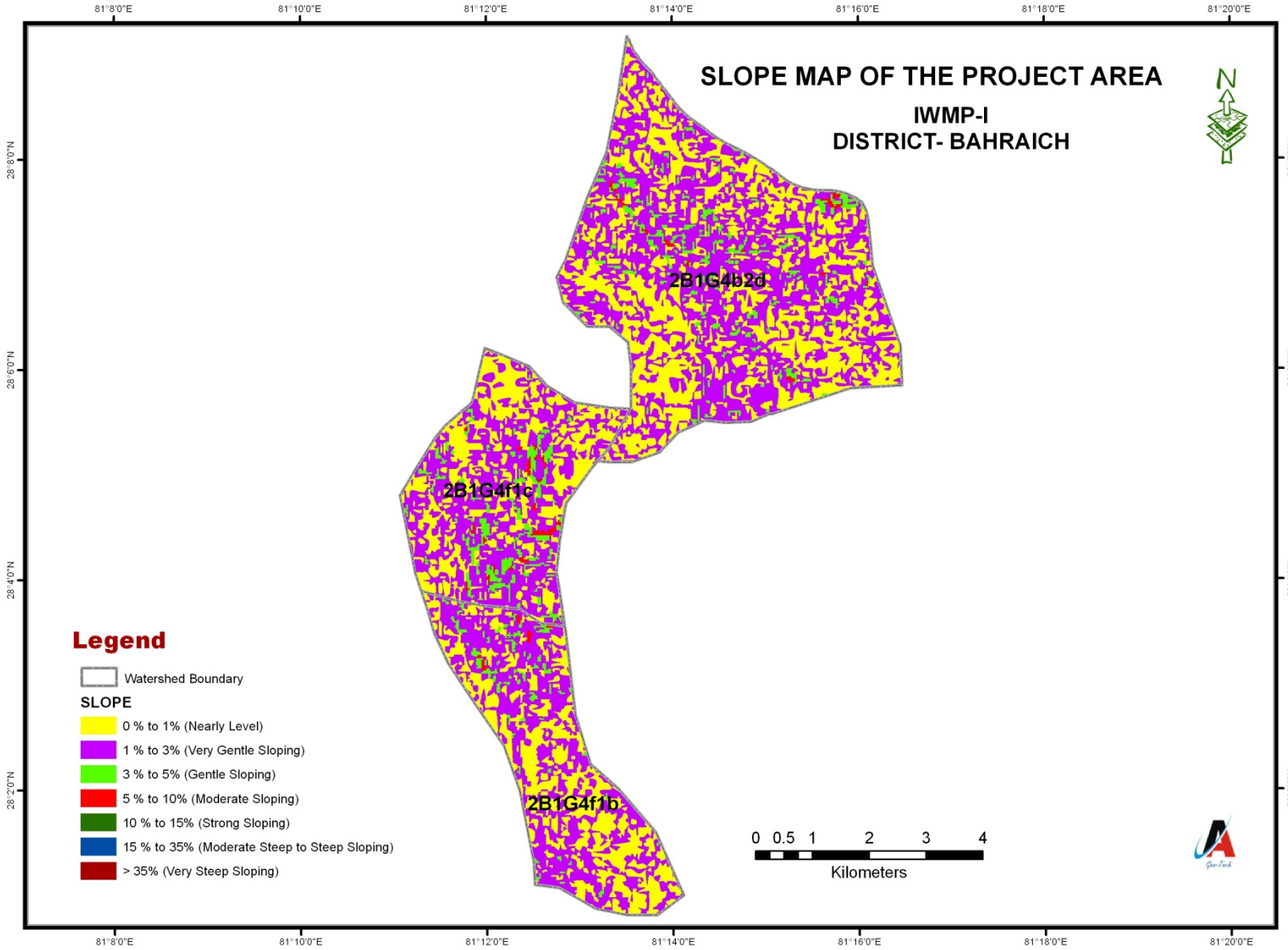
0 1,250 2,500 5,000 Meters

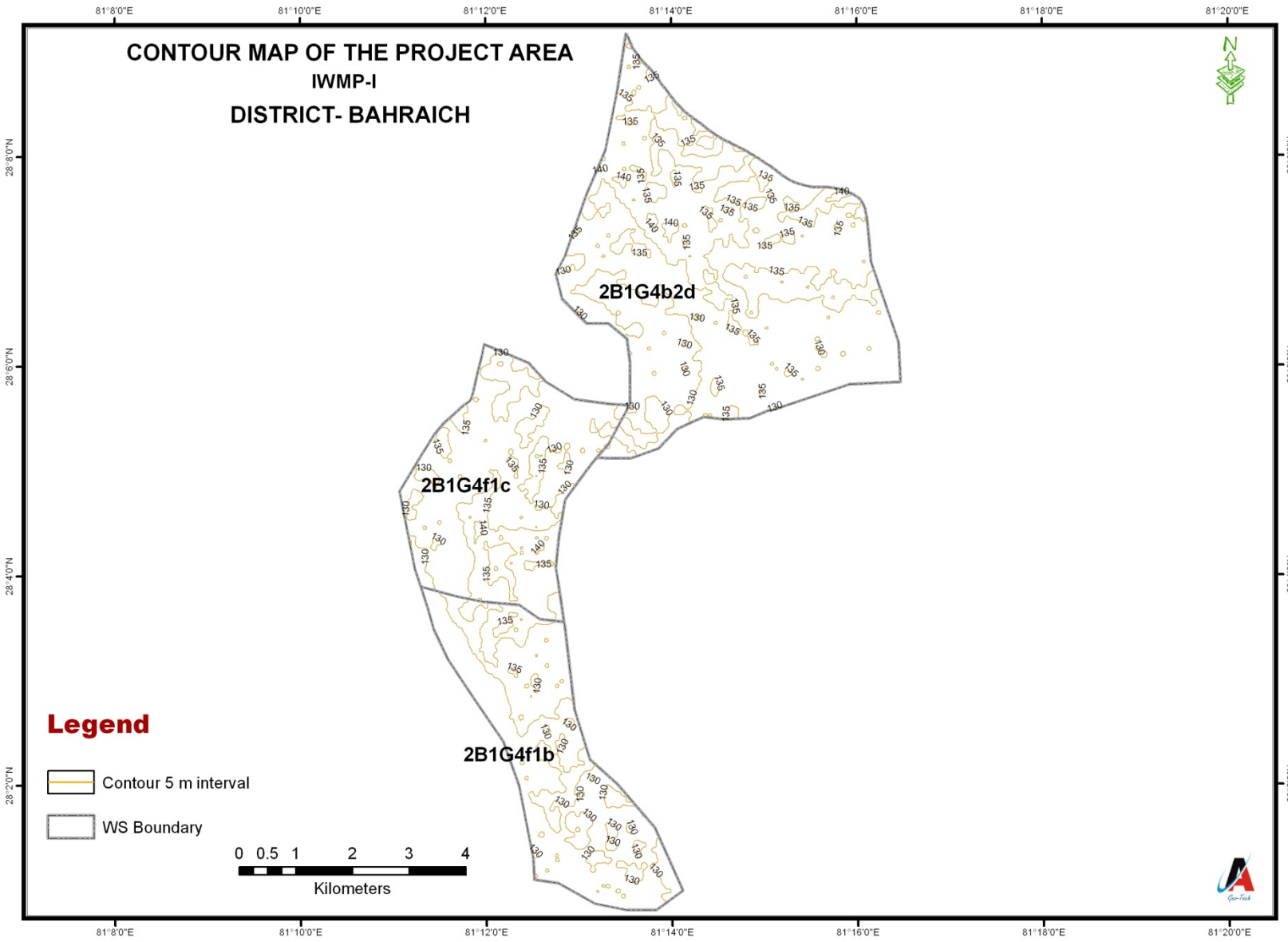
LANDUSE MAP OF THE PROJECT AREA
IWMP-1B
DISTRICT - BAHRAICH (U.P)

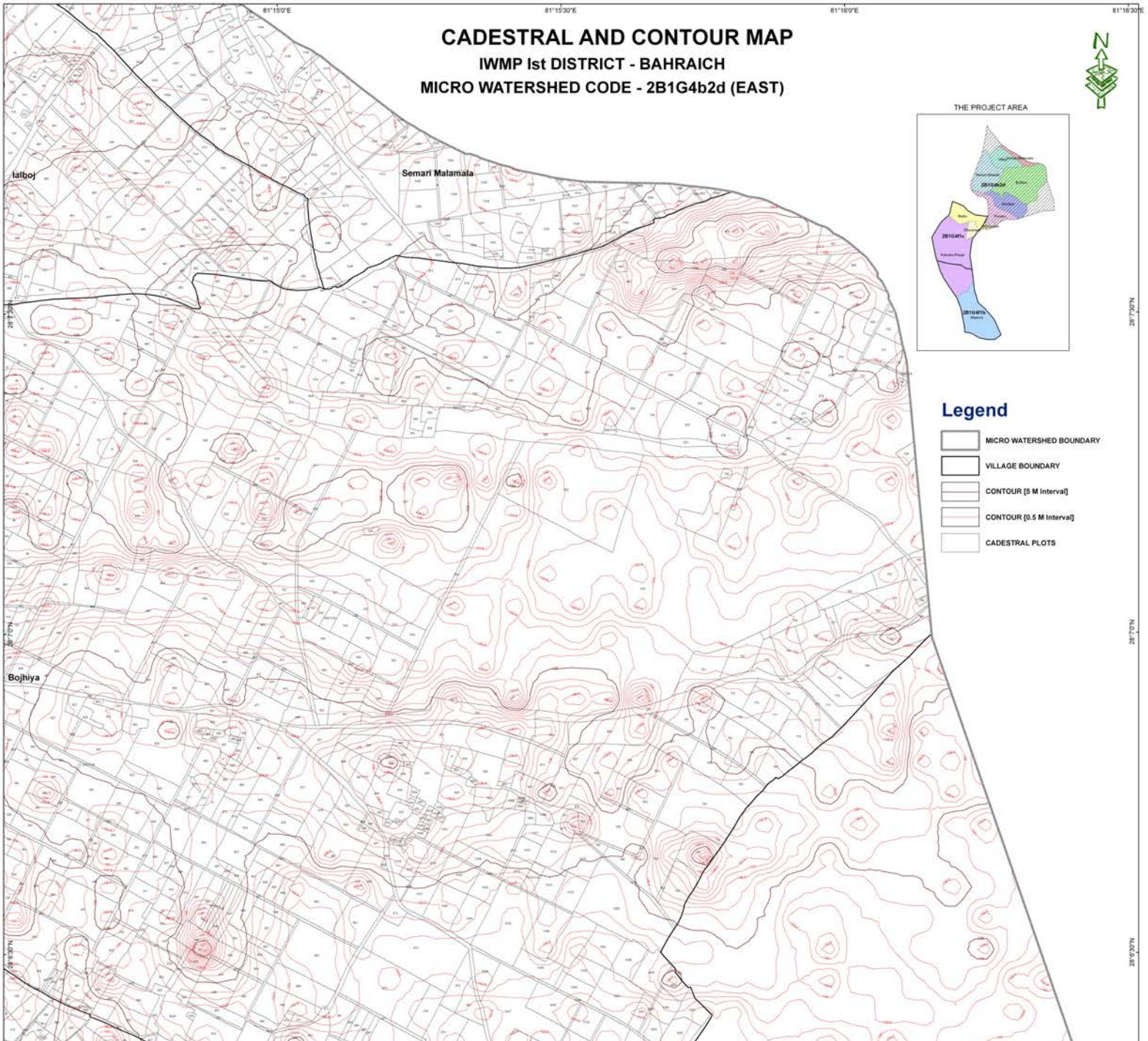


भूमि संरक्षण अधिकारी
भूमि विकास एवं जल संसाधन विभाग
बहराइच


DRAINAGE MAP OF THE PROJECT AREA
IWMP-1B
DISTRICT - BAHRAICH (U.P)
2B1G4b2a
2B1G4b1c
2B1G4b1b
Legend
Drain
Name
Lake/Pond
Pond
River
Wetland
Buffer
WS_Code
2B1G4b1b
2B1G4b1c
2B1G4b2a
भूमि संरक्षण अधिकारी
भूमि विकास एवं जल संसाधन विभाग
बहराइच
0 1,250 2,500 5,000
Meters


SLOPE MAP OF THE PROJECT AREA
IWMP-I
DISTRICT- BAHRAICH
N
81°8'0"E
81°10'0"E
81°12'0"E
81°14'0"E
81°16'0"E
81°18'0"E
81°20'0"E
28°8'0"N
28°6'0"N
28°4'0"N
28°2'0"N
2B1G4b2d
2B1G4f1c
2B1G4f1b
Legend
Watershed Boundary
SLOPE
0 % to 1% (Nearly Level)
1 % to 3% (Very Gentle Sloping)
3 % to 5% (Gentle Sloping)
5 % to 10% (Moderate Sloping)
10 % to 15% (Strong Sloping)
15 % to 35% (Moderate Steep to Steep Sloping)
> 35% (Very Steep Sloping)
0 0.5 1 2 3 4
Kilometers


CONTOUR MAP OF THE PROJECT AREA
IWMP-I
DISTRICT- BAHRAICH
N
2B1G4b2d
2B1G4f1c
2B1G4f1b
Legend
Contour 5 m interval
WS Boundary
0 0.5 1 2 3 4
Kilometers
81°8'0"E
81°10'0"E
81°12'0"E
81°14'0"E
81°16'0"E
81°18'0"E
81°20'0"E
28°8'0"N
28°6'0"N
28°4'0"N
28°2'0"N


CADESTRAL AND CONTOUR MAP
IWMP Ist DISTRICT - BAHRAICH
MICRO WATERSHED CODE - 2B1G4b2d (EAST)
81°15'0"E
81°15'30"E
81°16'0"E
81°16'30"E
28°8'30"N
28°7'30"N
28°7'0"N
28°6'30"N
N
THE PROJECT AREA
Ialboj
Semari Malamala
Bojhiya
Legend
MICRO WATERSHED BOUNDARY
VILLAGE BOUNDARY
CONTOUR [5 M Interval]
CONTOUR [0.5 M Interval]
CADESTRAL PLOTS

CADESTRAL AND CONTOUR MAP

IWMP Ist DISTRICT - BAHRAICH

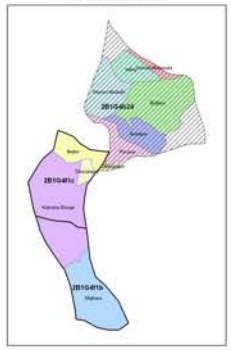
MICRO WATERSHED CODE - 2B1G4b2d (NORTH)

81°13'0"E 81°13'30"E 81°14'0"E 81°14'30"E 81°15'0"E

28°6'0"N 28°5'30"N 28°5'0"N

400 200 0 400
Meters

THE PROJECT AREA

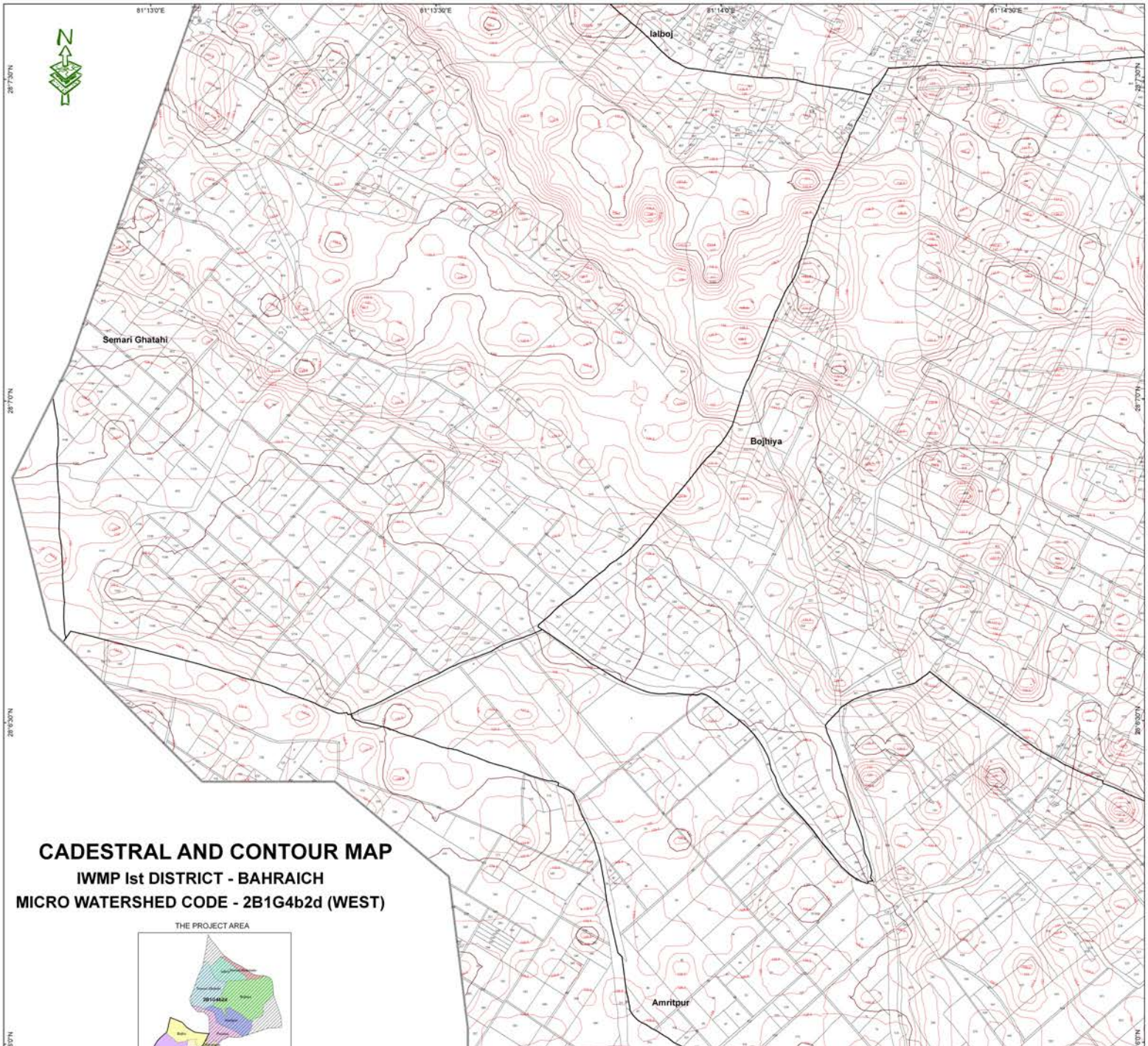


Le

Semari Malamala

Ialboj

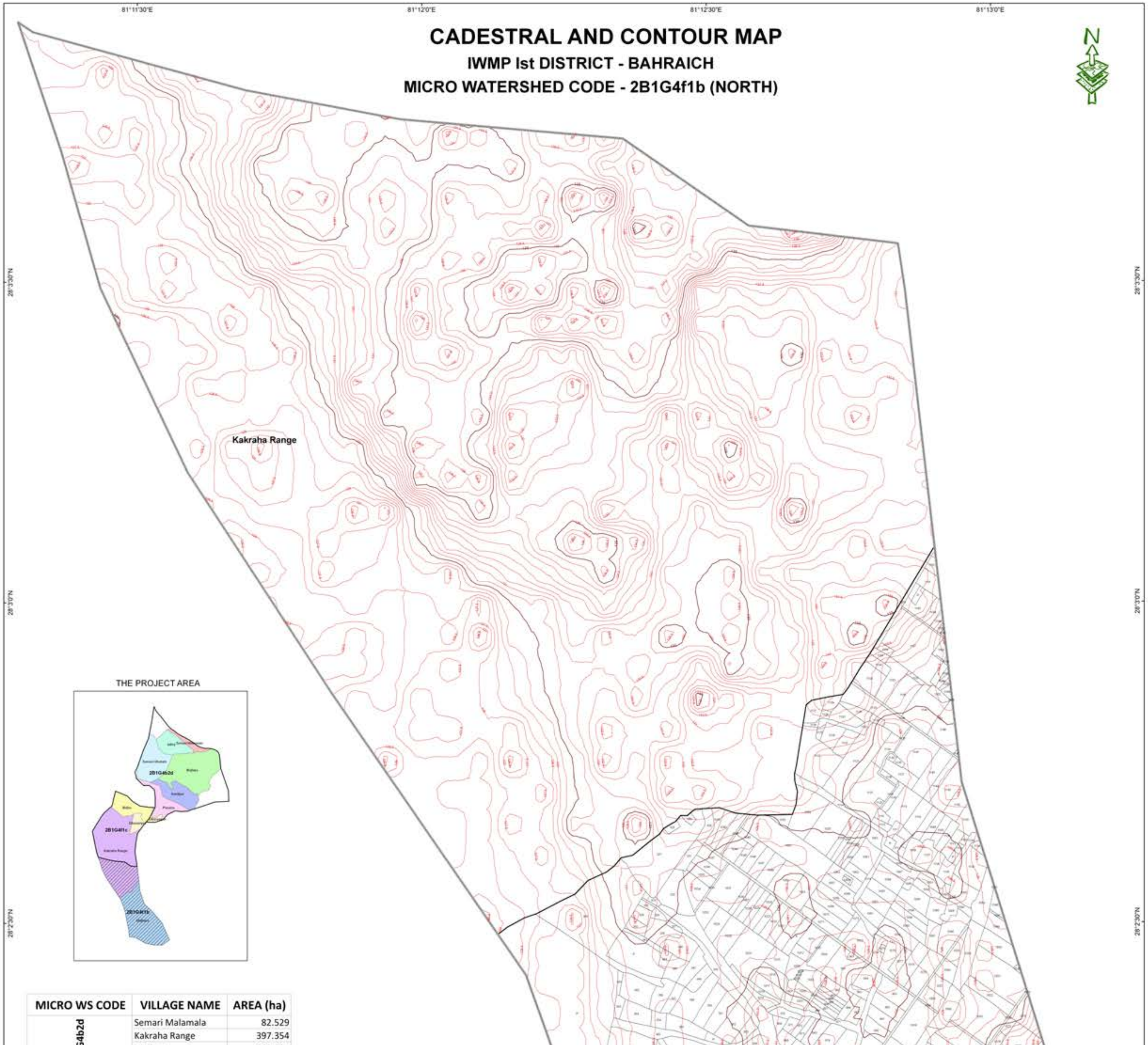
Semari Ghatahi


81°13'0"E
81°13'30"E
81°14'0"E
81°14'30"E
29°7'30"N
29°7'0"N
29°6'30"N
29°6'0"N
N
Ialboj
Semari Ghatahi
Bojhiya
Amritpur
CADESTRAL AND CONTOUR MAP
IWMP Ist DISTRICT - BAHRAICH
MICRO WATERSHED CODE - 2B1G4b2d (WEST)
THE PROJECT AREA

CADESTRAL AND CONTOUR MAP

IWMP Ist DISTRICT - BAHRAICH

MICRO WATERSHED CODE - 2B1G4f1b (NORTH)

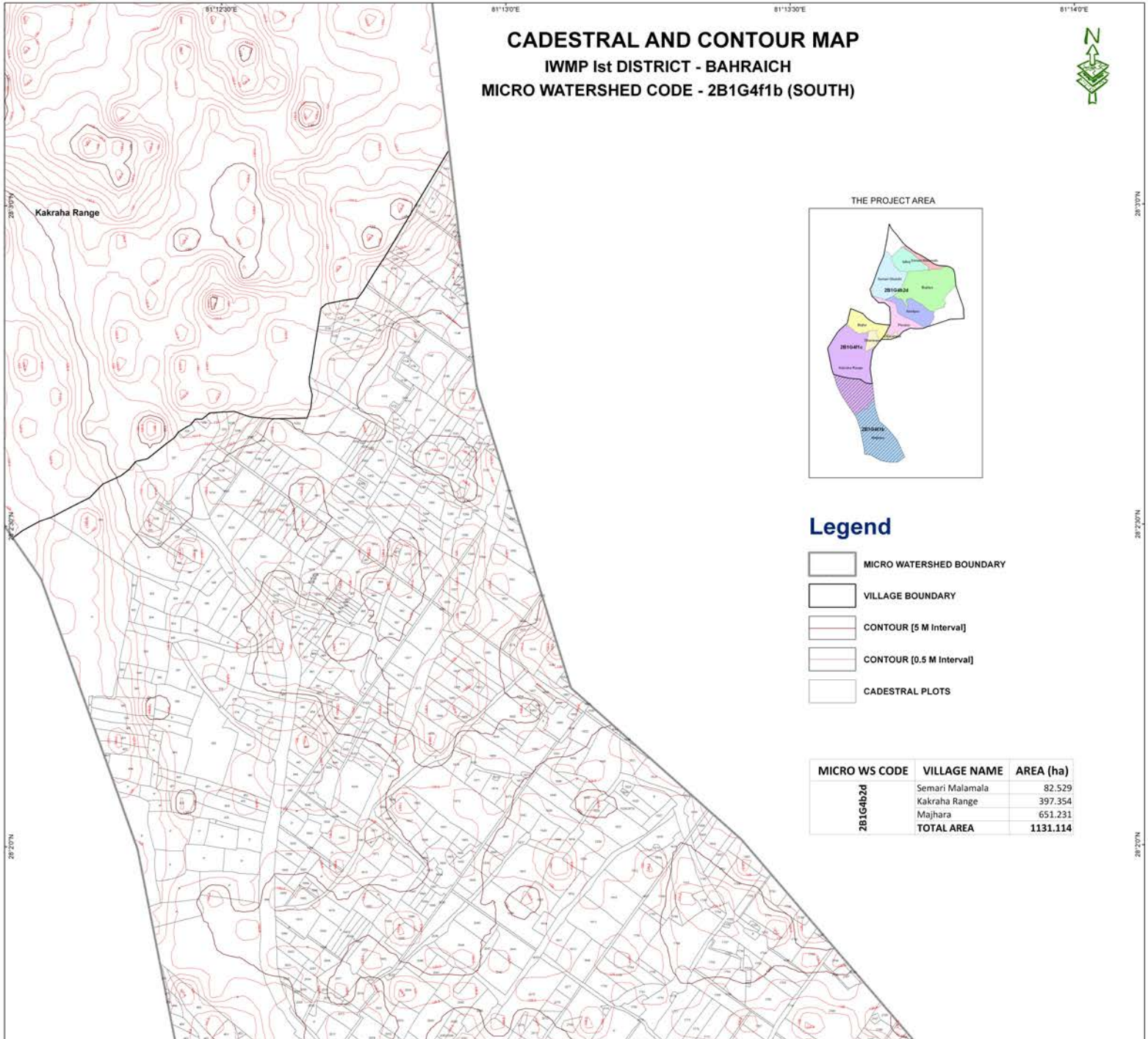


MICRO WS CODE	VILLAGE NAME	AREA (ha)
G4b2d	Semari Malamala	82.529
	Kakraha Range	397.354

CADESTRAL AND CONTOUR MAP

IWMP Ist DISTRICT - BAHRAICH

MICRO WATERSHED CODE - 2B1G4f1b (SOUTH)



N

THE PROJECT AREA

Legend

- MICRO WATERSHED BOUNDARY
- VILLAGE BOUNDARY
- CONTOUR [5 M Interval]
- CONTOUR [0.5 M Interval]
- CADESTRAL PLOTS

MICRO WS CODE	VILLAGE NAME	AREA (ha)
2B1G4b2d	Semari Malamala	82.529
	Kakraha Range	397.354
	Majhara	651.231
	TOTAL AREA	**1131.114**

CADESTRAL AND CONTOUR MAP

IWMP Ist DISTRICT - BAHRAICH

MICRO WATERSHED CODE - 2B1G4f1c (NORTH)

81°11'0"E 81°11'30"E 81°12'0"E 81°12'30"E 81°13'0"E

28°6'0"N 28°5'30"N 28°5'0"N

THE PROJECT AREA

MICRO WS CODE	VILLAGE NAME	AREA (ha)
2B1G4f1c	Bejha	248.256
	Dharampur	78.395
	Kakraha Range	781.021
	Puraina	2.379
	TOTAL AREA	**1110.052**

Bejha

Dharampur

Kakraha Range

Legend

MICR

VILL

CONT

CONT

CADE

81°11'0"E

81°11'30"E

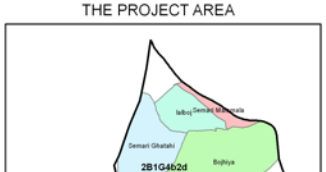
81°12'0"E

28°4'30"N

28°4'0"N

Kakraha Range

THE PROJECT AREA



DETAIL PROJECT REPORT PREPARATION TEAM

Detail Project Report(DPR) of Integrated Watershed Management Programme IWMP-1st had been prepared through base line/ Bench Mark Survey for Physiography Climate, Soil, Land use/Cover, Vegetation, Hydrology and Socio-Economic data analysis. PRA have been exercised to collect primary data, secondary data have been collected from Revenue, Statistics department, Statistical Magazine of the district, Bahraich, Toposheets (1:50000) Survey of India- Deheradoon and technical & specific input and health with preparation and drafting of detail project report.

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1.	**Dr. Naveen Kumar Singh**	Scientist, Advanced Geo-Tech Solutions, 7,Vrindavan Vihar Bahadurpur, Lucknow-226021
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5.	**Mr. Sushil Kumar**	GIS Engineer, Advanced Geo-Tech Solutions, 7,Vrindavan Vihar Bahadurpur, Lucknow-226021
6.	**Mr. Arun Kumar**	GIS Engineer, Advanced Geo-Tech Solutions, 7,Vrindavan Vihar Bahadurpur, Lucknow-226021
7.	**Mr. Rohinish Karan**	Architect, Advanced Geo-Tech Solutions, 7,Vrindavan Vihar Bahadurpur, Lucknow-226021
8.	**Sri L.M.P. Singh**	Bhoomi Sanrakshan Adhikari
9.	**“ R.N. Singh**	Junior Engineer
10.	**“ Mohammad Ashfaque Khan**	Junior Engineer
11.	**“ Sohil**	Draughtsman
12.	**“ Maroof Ahmad**	Accountant
13.	**“ Guru Prasad Verma**	Accountant
14.	**“ Ram Pratap Sharma**	Ziledar

15.	**“ Patirakhan Lak**	Senior clerk
16.	**“ Shri Prakash Rawat**	Junior clerk
17.	**“ Bechan Singh Yadav**	A.S.C.I.
18.	**“ Dadhi Ram Trivedi**	A.S.C.I
19.	**Divakar Singh**	Tracer
20.	**Sant Baksh Singh**	Seenchpal
21.	**Kamla Prasad**	Seenchpal
22.	**Kamta Prasad Mishra**	Seenchpal
23.	**Ram Pher**	Munshi
24.	**Ramesh Chandra**	Munshi
25.	**Yogendra kumar**	Munshi
26.	**Ram Chandra Ram**	IVth Class
27.	**Ram Gulam**	IVth Class
28.	**Veer Pal**	IVth Class
29.	**Subhash chandra**	IVth Class
30.	**Kailash Singh**	IVth Class
31.	**Paras nath**	Driver

DPR PLAN ABSTRACT

The collection of all the relevant data of watershed area and the possible option and solution are described with the help of feedback of focused discussion and detailed perspective plan for the watershed area with year wise and activity wise summarized for the DPR plan abstract for 5 years (2009-10 to 2013-14).

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

Prepared By:
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Dept. of Land Development & Water Resources
District – Bahraich

Technically Approved By:
Deputy Director
Dept. of Land Development & Water Resources
Region – Bahraich

Physically & Financially Approved:

Project Director
District Rural Development Authority
District – Bahraich

Chief Development Officer
District – Bahraich