

DETAIL PROJECT REPORT OF MICRO WATERSHED PROJECT UNDER



INTEGRATED WATERSHED MANAGEMENT PROGRAMME (IWMP BULANDSHAHAH – II)

BLOCK – PAHASU, DISTT – BULANDSHAHAH (U.P.)

LAND DEVELOPMENT AND WATER RESOURCES DEPTT. (U.P.)



Prepared by :

**PIA – Bhoomi Sanrakshan Adhikari
LDWR – Khurja (Bulandshahar) U.P.**

CERTIFICATE

This is to be certified that the proposed all micro-watersheds of IWMP-II distt. Bulandshahar, Uttar Pradesh has been selected for its sustainable development on watershed basis under Integrated Watershed Management Programme. The land is physically available for proposed interventions and is not overlapping with any other schemes. It will be developed as per Common Guidelines for Watershed Development Project-2008, GOI, New Delhi.

The significant results will be achieved through proposed interventions on soil and water conservation, ground water recharge, availability of drinking and irrigation water, agricultural production systems, live stock, fodder availability, livelihoods of asset less, capacity building, etc. The proposed **Detailed Project Report of all micro-watershed of IWMP-II, Khurja, Bulandshahar** is approved for its implementation.

Soil Conservation Officer

Dept. of LDWR, Khurja, Bulandshahar

Deputy Director

LDWR, Meerut, UP

Project Director

DRDA, Bulandshahar, UP

Chief Development Officer

Distt.- Bulandshahar, UP

TABLE OF CONTENT

CHAPTER	CONTENT	PAGE No.
1	EXECUTIVE SUMMARY	5
2	INTRODUCTION AND BACKGROUND	6-7
3	YEAR WISE PHYSICAL AND FINANCIAL PHASING	8
4	PROJECT AT A GLANCE	10
5	MICROWATER SHED WISE BASELINE SURVEY & DETAIL PROJECT REPORT	11-405
6	MAPS & PHOTOGRAPHS	406-416
7	DETAIL ESTIMATE	417-433
8	EXPECTED OUTCOME	434

PROJECT AT A GLANCE

IWMP-II (Bulandshahar)

1	State	Uttar Pradesh
2	Distt.	Bulandshahar
3	Block	Pahasu
4	M.W.S. Code	2B3E3c3f, 2B3E4d3e, 2B3E4d3d, 2B3E3c3e, 2B3E3c3d, 2B3E4d3c, 2B3E3c3c, 2B3E3c3b, 2B3E3c2e
5	Name of M.W.S. Project	Dalpatpur, Utrawali, N. Amarpur, Khandar, Urdami, Surjawali, Pahasu, Nagalia Laxmanpur, Vedrampur
6	Involved Village	33
7	Geographical Area of M.W.S.	5900 Ha.
8	Rainfed Area	5550
9	Treatable Area	5275
10	Weightage	77.50
11	Cost of Project	633.00
12	For the year	2010-11

Budget Components

S. No.	Components	Area (Ha.)	Cost (in Lacs)
1	2	3	4
1	Management Cost 12%	-	75.96
2	Preparatory Phase 10%	-	63.30
3	Watershed Work Phase	-	
	A- Watershed Development Works 50%	5275	316.50
	B- Livelihood Programme (Community Base) 10%	-	63.30
	C- Production System & Micro Enterprises 13%	-	82.29
4	Consolidation Phase 5%	-	31.65
	Total	575	633.00

Executive Summary of the Project

Identified selected micro watershed project Dalpatpur, Utrawali, N. Amarpur, Khandar, Urdami, Surjawali, Pahasu, Nagalia Laxmanpur, Vedrampur is coded as 2B3E3c3f, 2B3E4d3e, 2B3E4d3d, 2B3E3c3e, 2B3E3c3d, 2B3E4d3c, 2B3E3c3c, 2B3E3c3b, 2B3E3c2e has been proposed from cluster of I.W.M.P. Bulandshahar – II project in Pahasu Block district Bulandshahar in the micro watershed which is located in the east of district Bulandshahar on the east bank of River Kali Nadi and upper kali border. It lies between 28° -15' and 15° E Latitudes and 78° -E and 78° -5 N Longitudes Covering area. Its altitudes ranges from 187 meter to 190 meter above the mean sea level. Khurja Railway Station 184.11 m, Bulandshahar Railway station is 201.18 m above mean sea level is displayed. Project area of I.W.M.P. BSR-II is lied in the Pahasu Block of Bulandshahar District which is come in the western plan zone under semi arid area. The annual average rainfall is near to 397 mm which an average of 35 rainy days. Out of which about 85% is received during the mansoon season from July to September and very less rainfall is received in the winter season.

Temperature ranges from as high as 42°C in the May-June to as 3°-4°C during December – January. The Trend of rain fall is highly eratic and maximum water goes as runoff.

Main occupation of the dwellers is agriculture in the watershed. Some part of the lands are shown during the Kharif season. Cane sugar are preferred crops in the project area. The main Crops raised are Wheat, Pea & Mustered and maze.

The topmost portion of the watershed is sloppy flat land. Other than topmost portion of the watershed is under soil erotic portion and depreciative. The soil of the land are sandy loam Soil. The middle agricultural position of watershed relatively smooth sloppy flat land with sandy loam soil texture. These soil is yellow in colour and are inherently good in fertility status.

Natural vegetation of the watershed is very poor. Somewhere forest vegetation is seen which are predominant with Vilayati Babool (*Prosopis Juliflora*), followed by Babool (*Accasia nilotica*), somewhere Neem Plants (*Azadirachta Indica*), Shisham (*Dolbergia Sisson*) and Karanj (*Pongamia Glabra*) are seen in occasional occurrence. There is no grass land in the watershed. Somewhere grass patches are seen only on the bunds, road sides and other such places. Coverage of massive green belt is in poor percentage for environment which is envisaged. That watershed is very poor climate area.

There is normal condition of animal physics and for their fodder arrangement is the watershed and creative possibility would be expected by the implementations of the project.

Due to Aerial soil erosion poor harvesting managements, cropping pattern, non treated watershed etc. are very anti effective causes for the watershed. Problem of the watershed is to be tackled by harvesting structures which have lost most of their capacity new water bodies for the prevention of erosion and conservation of soil and moisture various type of earthen bunds in the watershed field, necessity has been observed. Wasteland will be treated with staggered Trenches, afforestation and bunding for the changing of characteristics.

The detail project report has been prepared by the applying of nine process steps for the micro watershed as follows.

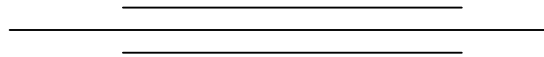
- STEP-1 Secondary data collection:-** During the five days visit programme in the micro watershed project with of all available documents of village label by approaching the Gram panchayat collected secondary data.
- STEP-2 Village meeting & conducting PRA exercise:-** Community meeting conducted on fix days for the consultation with villagers for the PRA Exercise. Participatory mode of the villages was positive indicated for the success of programme. With good in testing participation has been drawn social & resource map on ground & paper & discussed on various topics of problematic thoughts in the micro watershed.
- STEP-3 Socio economic survey:-** The resource organization of village label volunteers identified to conduct house hold socio economic survey/states.
- STEP-4 Problem typology analysis:-** Thoroughly analyzed the data & identified problem type as soil & moisture conservation, crop rotation, crop coverage, productivity, livelihoods, social issues & capacity building gaps etc. Problems discussed with the watershed committee & came up with alternative solution.
- STEP-5 Conduct of net participatory planning (NPP):-** The planning team visited together in the planning blocks on the scheduled date along with the beneficiaries of the villages & data gathered as for the participatory net planning.
- STEP-6 Productivity & livelihood planning exercise:-** For the product livelihood exercise, group discussion on various livelihood as Agriculture, Animal husbandry enterprise development held discussion with the villagers in the micro watershed.
- STEP-7 Institutional & capacity building :-** This plan is prepared based on the data available in the field and auscultations with the watershed committee.
- STEP-8 Data consolidation & documentation of DPR :-** After gathering all required information compiled collected data. Thoroughly discussed and finalized the expected outcomes and benefits specially in the respect of livelihood for different segments. These are the target and performers indicators for the micro watershed.

STEP-9 Conduct of Gram Sabha obtaining approvals submissions of DPR:-After preparation of the draft DPR convened to Gram sabha and activities proposed expected outcomes benefits of implementing the programm are explained in case of any changes are proposed in the Gram sabha approval obtained by the Gram sabha and already singed of Mau paper.

STEP-9A Attachment of detail estimate, cost and design:-Estimating, Costing and design prepared technically According to plan in the micro watershed project. And attached with the DPR.

STEP-9B Various type of mapping :- DPR prepared in the support of micro watershed project using various type of maps is as follows :

- | | |
|--------------------------------------|-----------------------------|
| 1.Index Map of Watershed | 2. Watershed Map |
| 3. Relief/ Drainage Map | 4. Slop Map |
| 5.Soil and Land Capability class map | 6. Land use/ Land Cover Map |
| 7. Cadastral map | 8. Proposed Action Plan map |
| 9. Social Map | |



**Consolidation of Components : for the Nine Micro watershed Phasing
IWMP- II (2010-11) DISTRICT- BULANDSHAHAR
YEAR WISE PHASING OF IWMP WORKS**

Area – Ha & Rs.in Lac

Sl · No	Particular s	1 st year (2010-11)		2 st year (2011-12)		3 st year (2012-13)		4 st year (2013-14)		5 st year (2014-15)		Total	
		Fin.	Phy	Fin.	Phy	Fin.	Phy	Fin.	Phy.	Fin.	Phy	Fin.	Phy
1	Administrati ve cost 10%	12.66	-	12.66	-	12.66	-	12.66	-	12.6 6	-	63.30	-
2	Monitoring 1%	1.90	-	1.90	-	2.53	-	-	-	-	-	6.33	-
3	Evaluation 1%	-	-	3.165	-	-	-	3.165	-	-	-	6.33	-
4	Entry point activity 4%	25.32	-	-	-	-	-	-	-	-	-	25.32	-
5	Institution & capacity building 5%	12.66	-	12.66	-	6.33	-	-	-	-	-	31.65	-
6	DPR 1%	6.33	-	-	-	-	-	-	-	-	-	6.33	-
7	Watershed Dev.Works 50%	23.737 5	396	79.12 5	131 9	110.77 5	184 6	102.862 5	171 4	-	-	316.5 0	527 5
8	Livelihood activities 10%	6.33	-	12.66	-	18.99	-	25.32	-	-	-	63.30	-
9	Production System & micro Enterprises 13%	6.33	-	12.66	-	25.32	-	25.32	-	12.6 6	-	82.29	-
10	Consolidatio n phase 5%	-	-	-	-	-	-	-	-	31.6 5	-	31.65	-
11	TOTAL 100%	95.267 5	396	134.8 3	131 9	176.60 5	184 6	169.327 5	1714	56.9 7	-	633.0 0	527 5

[illegible]

PROJECT AT A GLANCE

IWMP-II (Bulandshahar)

1	State	Uttar Pradesh
2	Distt.	Bulandshahar
3	Block	Pahasu
4	M.W.S. Code	2B3E3c3f
5	Name of M.W.S. Project	Dalpatpur
6	Involved Village	04
7	Geographical Area of M.W.S.	574
8	Rainfed Area	487.00
9	Treatable Area	510
10	Weightage	
11	Cost of Project	61.200
12	For the year	2010-11

Budget Components

S. No.	Components	Area (Ha.)	Cost (in Lacs)
1	2	3	4
1	Management Cost 12%	-	7.344
2	Preparatory Phase 10%	-	6.120
3	Watershed Work Phase	-	-
	A- Watershed Development Works 50%	510	30.600
	B- Livelihood Programme (Community Base) 10%	-	6.120
	C- Production System & Micro Enterprises 13%	-	7.956
4	Consolidation Phase 5%	-	3.060
	Total	510	61.200

Executive Summary of the Project

Identified selected micro watershed project Nagla Dalpatpur is coded as 2B3E3c3f has been proposed from cluster of I.W.M.P. Bulandshahar – I project in Pahasu Block district Bulandshahar four villages namely Ranayach Narendrapur, Nagla Dalpatpur, Rampur and Kado is comprised in the micro watershed which is located in the east of district Bulandshahar on the east bank of River Kali Nadi and upper kali border. It lies between 28° -15' and 15° E Latitudes and 78° -E and 78° -5 N Longitudes Covering area. Its altitudes ranges from 187 meter to 190 meter above the mean sea level. Khurja Railway Station 184.11 m, Bulandshahar Railway station is 201.18 m above mean sea level is displayed. Project area of I.W.M.P. BSR-II is lied in the Pahasu Block of Bulandshahar District which is come in the western plan zone under semi arid area. The annual average rainfall is near to 397 mm which an average of 35 rainy days. Out of which about 85% is received during the mansoon season from July to September and very less rainfall is received in the winter season.

Temperature ranges from as high as 42⁰C in the May-June to as 3⁰-4⁰C during December – January. The Trend of rain fall is highly eratic and maximum water goes as runoff.

Main occupation of the dwellers is agriculture in the watershed. Some part of the lands are shown during the Kharif season. Cane sugar are preferred crops in the project area. The main Crops raised are Wheat, Pea & Mustered and maze.

The topmost portion of the watershed is sloppy flat land. Other than topmost portion of the watershed is under soil erotic portion and depreciative. The soil of the land are sandy loam Soil. The middle agricultural position of watershed relatively smooth sloppy flat land with sandy loam soil texture. These soil is yellow in colour and are inherently good in fertility status.

Natural vegetation of the watershed is very poor. Somewhere forest vegetation is seen which are predominant with Vilayati Babool (*Prosopis Juliflora*), followed by Babool (*Accasia nilotica*), somewhere Neem Plants (*Azadirachta Indica*), Shisham (*Dolbergia Sisson*) and Karanj (*Pongamia Glabra*) are seen in occasional occurrence. There is no grass land in the watershed. Somewhere grass patches are seen only on the bunds, road sides and other such places. Coverage of massive green belt is in poor percentage for environment which is envisaged. That watershed is very poor climate area.

There is normal condition of animal physics and for their fodder arrangement is the watershed and creative possibility would be expected by the implementations of the project.

Due to Arial soil erosion poor harvesting managements, cropping pattern, non treated watershed etc. are very anti effective causes for the watershed. Problem of the watershed is to be

tackled by harvesting structures which have lost most of their capacity new water bodies for the prevention of erosion and conservation of soil and moisture various type of earthen bunds in the watershed field, necessity has been observed. Wasteland will be treated with staggered Trenches, afforestation and bunding for the changing of characteristics.

The detail project report has been prepared by the applying of nine process steps for the micro watershed code no. 2B3E3c3f brief is as follows.

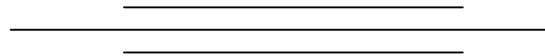
- STEP-1 Secondary data collection:-** During the five days visit programme in the micro watershed project with all available documents of village label by approaching the Gram panchayat collected secondary data.
- STEP-2 Village meeting & conducting PRA exercise:-** Community meeting conducted on five days for the consultation with villagers for the PRA Exercise. Participatory mode of the villages was positive indicated for the success of programme. With good in testing participation has been drawn social & resource map on ground & paper & discussed various topics of problematic thoughts in the micro watershed.
- STEP-3 Socio economic survey:-** The resource organization of village label volunteers identified to conduct house hold socio economic survey/states.
- STEP-4 Problem typology analysis:-** Thoroughly analyzed the data & identified problem type as soil & moisture conservation, crop rotation, crop coverage, productivity, livelihoods, social issues & capacity building gaps etc. Problems discussed with the watershed committee & came up with alternative solution.
- STEP-5 Conduct of net participatory planning (NPP):-** The planning team visited together in the planning blocks on the scheduled date along with the beneficiaries of the villages & data gathered as for the participatory net planning.
- STEP-6 Productivity & livelihood planning exercise:-** For the product livelihood exercise, group discussion on various livelihood as Agriculture, Animal husbandry enterprise development held discussion with the villagers in the micro watershed.
- STEP-7 Institutional & capacity building :-** This plan is prepared based on the data available in the field and consultations with the watershed committee.
- STEP-8 Data consolidation & documentation of DPR :-** After gathering all required information compiled collected data. Thoroughly discussed and finalized the expected outcomes and benefits specially in the respect of livelihood for different segments. These are the target and performers indicators for the micro watershed.
- STEP-9 Conduct of Gram Sabha obtaining approvals submissions of DPR:-** After preparation of the draft DPR convened to Gram sabha and activities proposed expected

outcomes benefits of implementing the programm are explained in case of any changes are proposed in the Gram sabha approval obtained by the Gram sabha and already singed of Mau paper.

STEP-9A Attachment of detail estimate, cost and design:-Estimating, Costing and design prepared technically According to plan in the micro watershed project. And attached with the DPR.

STEP-9B Various type of mapping :- DPR prepared in the support of micro watershed project using various type of maps is as follows :

- | | |
|--------------------------------------|-----------------------------|
| 1.Index Map of Watershed | 2. Watershed Map |
| 3. Relief/ Drainage Map | 4. Slop Map |
| 5.Soil and Land Capability class map | 6. Land use/ Land Cover Map |
| 7. Cadastral map | 8. Proposed Action Plan map |
| 9. Social Map | |



Project Report

Table – 1 : Micro watershed project brief : -

1	State	U.P.
2	District	Bulandshahar
3	Block	Pahasu
4	Comprised Villages (Nos.)	04
5	Name of Watershed	Nagla Dalpatpur
6	Name of MWS Project	Nagla Dalpatpur
7	MWS Code No.	2B3E3c3f
8	Geographical Area of MWS	574.00
9	Treatable Area	510

1- Project Objectives :- The aim and objectives of the Project are :

- a- Conservation, development and sustainable management of natural resources including their users.
- b- Enhancement of agriculture production and productivity in a sustainable manner.
- c- Restoration of ecological balance in the degraded and fragile rain fed ecosystem.
- d- Reduction in regional disparity between rains fed and irrigated area.
- e- Creation of sustainable employment opportunities for the rural community for livelihood security.
- f- Generation of massive employment.
- g- Reduce migration from rural employment.

2- Mazor Problem of Project Area :

- a- Actual shortage of drinking water.
- b- Near to nil activated water bodies and water harvesting structures.
- c- Low depth of ground water table.
- d- Undulated and generally sloppy rainfed area.
- e- Large number of Small, Marginal and S.C. farmer land holding.
- f- Lower wages of agriculture labour and also migration of labour due to shortage of employment in the watershed.

3- General Description :

(3.1) Location :-

Nagla Dalpatpur Watershed has been taken with MWS Code No. 2B3E3c3f in Pahasu Block of Distt. Bulandshahar is located on Bulandshahar via Khurja to Shikarpur Via Pahasu road about 30 Km. between 28°15' and 28° E Latitudes and 78°0' and 78°5' N Longitudes. Location and delineation of watershed has been located on watershed map **Fig. 2** and on top sheet **Fig. 3**.

(3.2) Area and Elevation :

Elevation ranges from 181 to 208 mtr. above the mean sea level(MSL) altogether comprised villages and their's area is described as follows. (Comprises village map Fig. 3)

Table – 2 : Area and Elevation

Sl. No.	MWS Code	Block	Name of Village	Geographical Area	Treatable Area
1	2	3	4	5	6
1	2B3E3c3f	Pahasu	Nagla Dalpatpur	95.00	58.00
			Ranayach Narendrapur	241.85	235.00
			Kado	210.15	208.00
			Rampur	27.00	9.00
				574	510

(3.3) Shape of the Micro Watershed:

The shape of watershed is Elongated and as Rectangular. The maximum length and width of the watershed are 5000 Mtr. and 1814 Mtr. respectively with the Length: Width ratio of 2.76:1.

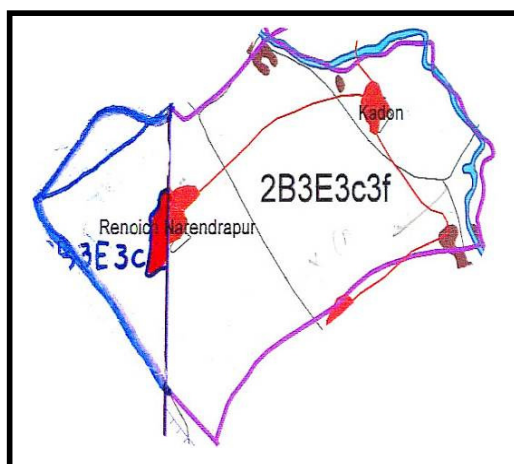


Fig. 1 (Shape of Micro Watershed)

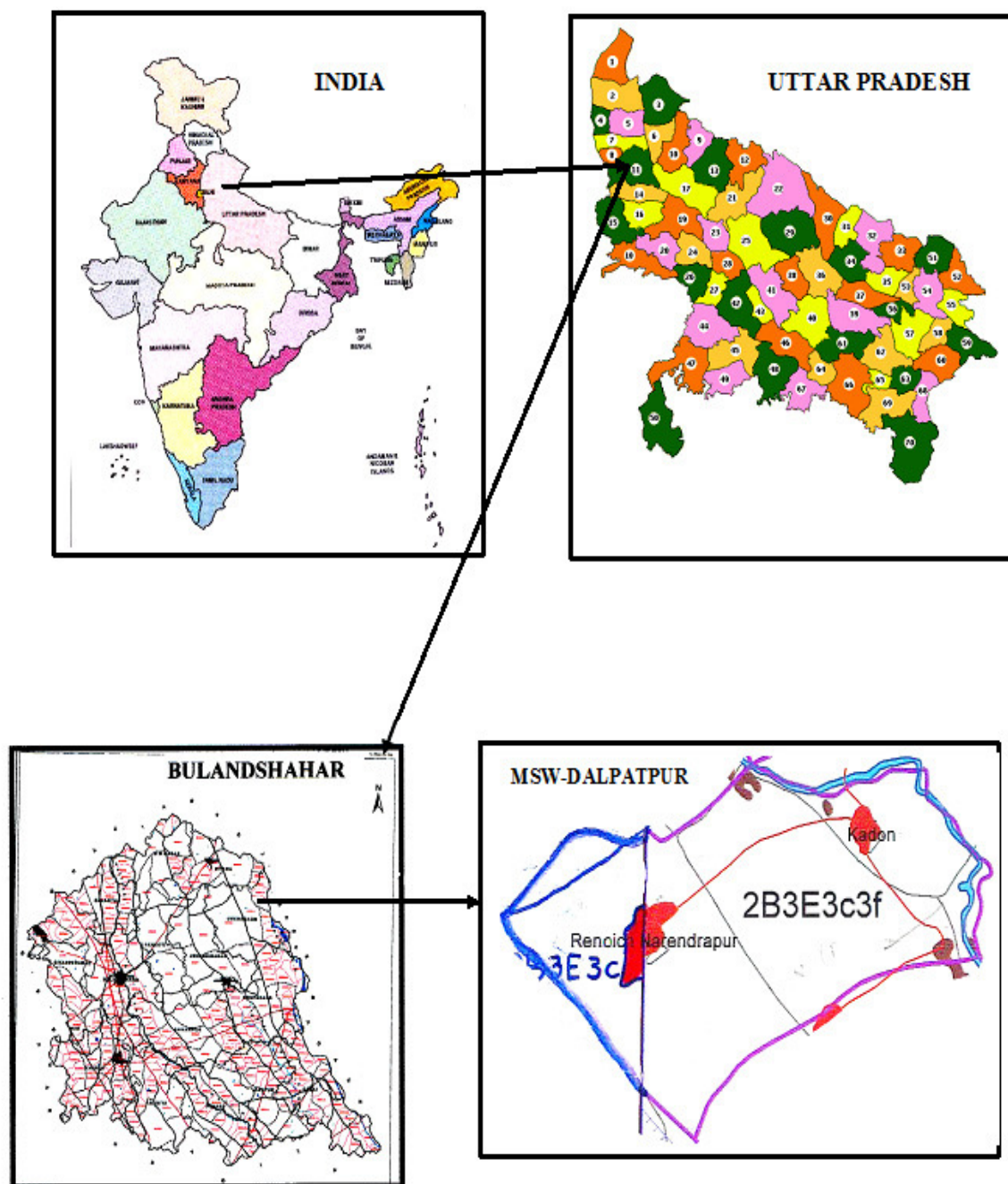
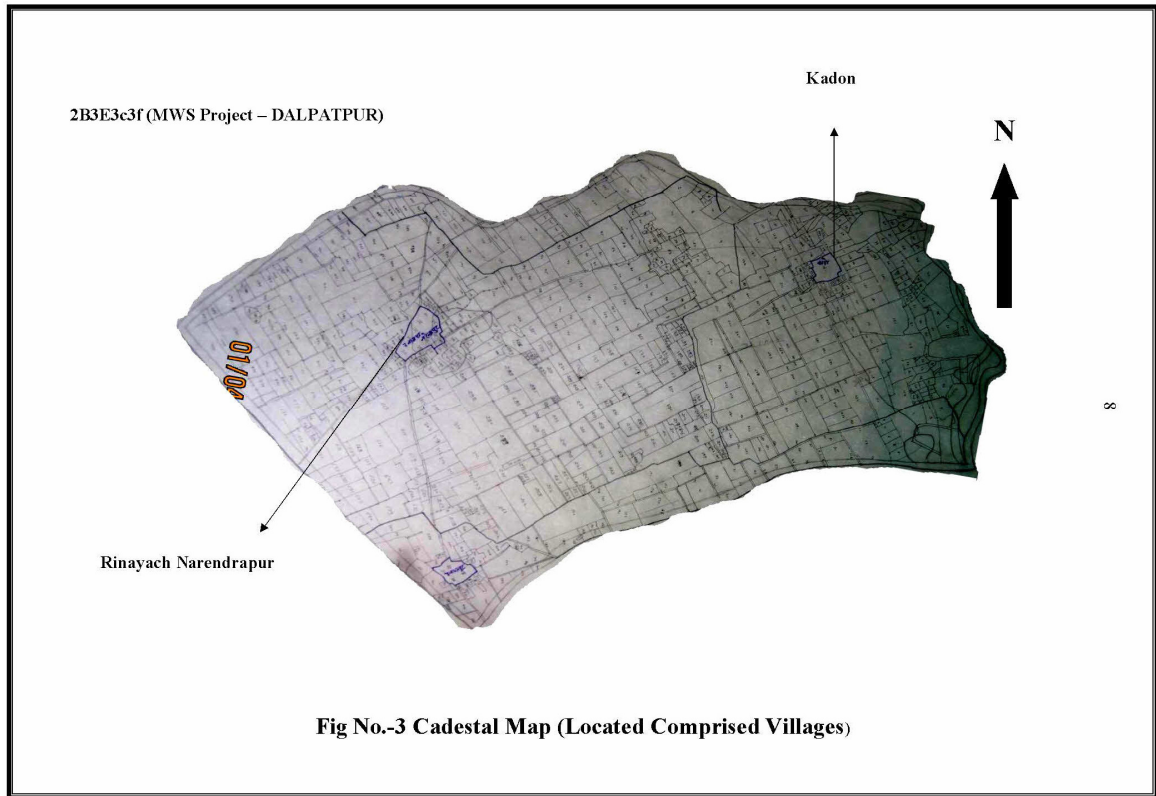


Fig.- 2 Location of the Micro Watershed



Sl. No.	Name of Project	Name of Village	Geograph ical Area (in ha.)	Raifed Area (in ha.)	Treatable Area	Agri. Land
1	2	3	4	5	6	7
1	Dalpat pur	Nagla Dalpatpur	95.00	80.75	58.00	80.75
2		Ranayach Narendrapur	241.85	205.00	235.00	205.57
3		Kado	210.15	188.50	208.00	178.62
4		Rampur	27.00	12.75	9.00	22.95
Total			574.00	487.00	510	487.89

(3.4) Climate :

The Watershed falls under semi arid region of tropical climate inclined in Western Plan Zone. The average annual precipitation is about approx. is 397 mm. spreading over 35 rainy days. Most of the rain fall (about 85%) is received during July to September. The rain fall of moderate intensity. Nothing the area receives of scarcity rainfall in the winter season. The temperator variation ranges from as high as 43⁰c in the month of May-June to as low as 4⁰c in December-January.

(3.5) Geomorphology and Soils :

Geomorphology :

The entire watershed is topographically divided into major landforms. Accordingly the soils of watershed can be grouped into various categories such plane land, undulated land, sloppy land and erosic ravenous land.

Soil :**(a) Fine textured soil :**

The soil are the most extensive soil group found in the watershed. Some portion of the watershed is relatively sloppy flat land with fine soil texture as sandy sandy lome. The soils are in color and are inherently good high in fertility status. Soil texture is sandy lome loam particularly in depressions and loam in the elevated portion. The soil characteristic texture is dispersive and smooth. Therefore without impeded the downward movement of water productive layer of soil are easily by high runoff.

a- Coarsed Textured Soil :

These soil are lying mostly in downward portion, along with erosic gully and drainage line upto end of watershed outlet. These soils are coarser in texture and are relatively poor in fertility status. The soils are lomy sand in texture. Rill and gully formation in same parts particularly near the outlet of watershed can be seen.

(3.6) Drainage and Slope:

Due to prevalence of mild steep slope and presence of a number of drainage lines in the watershed the drainage system is adequate. The watershed from part of Ganga Basin and watershed. Under mild to steep topographical slope of MWS as divided as follow : (Drainage and slope map fig.-4)

Table - 4 : Drainage and Slope

S. No.	Grade	Slope Percent	Area in Ha.	Remark
1	A	0-0.5	105	-
2	B	05-1	189	-
3	C	1-2	145	-
4	D	2-3	75	-
5	E	3-4	-	-
6	F	4-5	-	-
7	G	5-6	-	-
			514	-

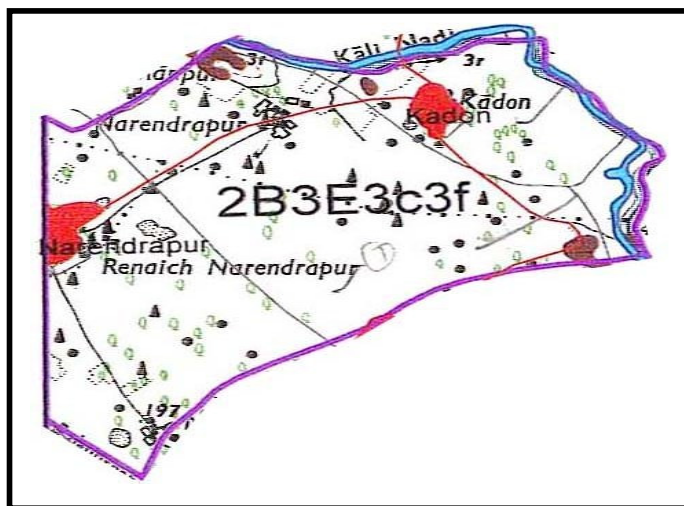


Fig-4 (Drainage & Scrub Map)

(3.7) Vegetation :

a- Natural Vegetation :

Natural vegetation is very poor in the watershed. The forest vegetation is predominant with Vilayti Babool (*Prosopis Juliflora*). There are occasional occurrence of Neem Plants (*Azadirochta Indica*), Shisham (*Dalbergia Sissoo*) and Karanj (*Pangamia Glabra*) and anywhere some scrubs are seen. There are no grass land in the watershed. Somewhere grass patches are seen only on the bunds, roadside and other such places. Poor percentage of massive green trees has been not seen in the watershed except Horticulture backyard.

b- Horticulture :

There is no backyards or commercial horticulture plantation in villages are been in some part of watershed.

c- Agroforestry :

The agriculture fields of the villages have some horticulture plantation at places isolated trees whose frequency is seen as under agroforestry and some where in where in backyards.

(3.8) Human Population:

a- Human Population:

Total Population of involved villages in watershed is 8936 with average family size of six persons as detailed as follows

Table – 5 : Human Population

S. No.	Name of village	Nos. of families	Human Population			Total
			Male	Female	Children	
1	Nagla Dalpatpur	155	662	526	238	1426
2	Ranayach Narendrapur	92	1083	984	485	2552
3	Kado	207	599	472	271	1342
4	Rampur	304	1072	967	395	2434
		758	3416	2949	1389	7754

b- Categorization of Human Population :

In the total population of watershed villages, categories are defined as below :

Table – 6 : Population Categories

S. No.	Particulars	Unit	Number of families in population in the villages		
			Population	Family	Remark
1	2	3	4	5	6
1	Agri Farmer	No.	1185	392	
2	Landless	No.	115	40	
3	Agri. Labour	No.	190	64	
4	Land less Labour	No.	280	52	
5	BPL Family	No.	297	65	
6	SC Family	No.	485	81	
7	ST Family	No.	-	-	

(3.9) Land Holding :

All the categories of farmers as small, marginal, medium and large are involved in land holding average of about 1-18 ha. Small land holding farmers are further scattered at different places which makes cultivation very difficult. Distribution of farm families according to the size of the land holdings are given as below :

Table – 7 : Distribution of farm families according to their size of land holdings

S. No.	Name of Village	Total Agri. Land in MWS	Land Holding Family (Nos.)					Percentage
			Marginal (< - 1Ha.)	Small (1-2 Ha.)	Medium (2-4 Ha.)	Large (4-7 Ha.)	Total	
1	Nagla Dalpatpur		68	30	4	-	102	
2	Ranayach Narendrapur		181	85	23	2	291	
3	Kado		78	12	5	-	95	
4	Rampur		10	5	-	-	15	
Total			337	132	32	2	503	

(3.10) Live Stock Population :

Total live stock population of the watershed is 3848 Nos. Buffalos is preferred as mulch animal compared to Cow. But milk yield is poor. Goats are also kept for milk as well as for meat purpose. The breakup of livestock population is as follows :

Table – 8 : Live Stock Position

S. No.	Name of Village	Unit	Live Stock Position				Total
			Buffaloes	Cows	Bullocks	Goats	
1	Nagla Dalpatpur		540	190	46	29	805
2	Ranayach Narendrapur		486	258	34	204	982
3	Kado		703	264	17	-	984
4	Rampur		805	209	30	80	1124
Total			2534	921	127	313	3895

(3.11) Infrastructure Social Feature :

- a- Comprised villages in the micro watershed has moderate communication facilities. Watershed linked with metaled road and approachable through motarable road.
- b- All the villages are electrified and have T.V. and Telephone connection.
- c- Literacy rate in the watershed is very low all villages are having education upto Junior High School.
- d- Nearest small market is at Sayana 13 Km. Nearest big market Bulandshahar is about 55 Km. from watershed. Religious and ritual features are almost common as in other parts af U.P. small land holding with large family size and more than 25% of the labour force of the total population living below poverty line indicate poor socio economic status of the watershed community.

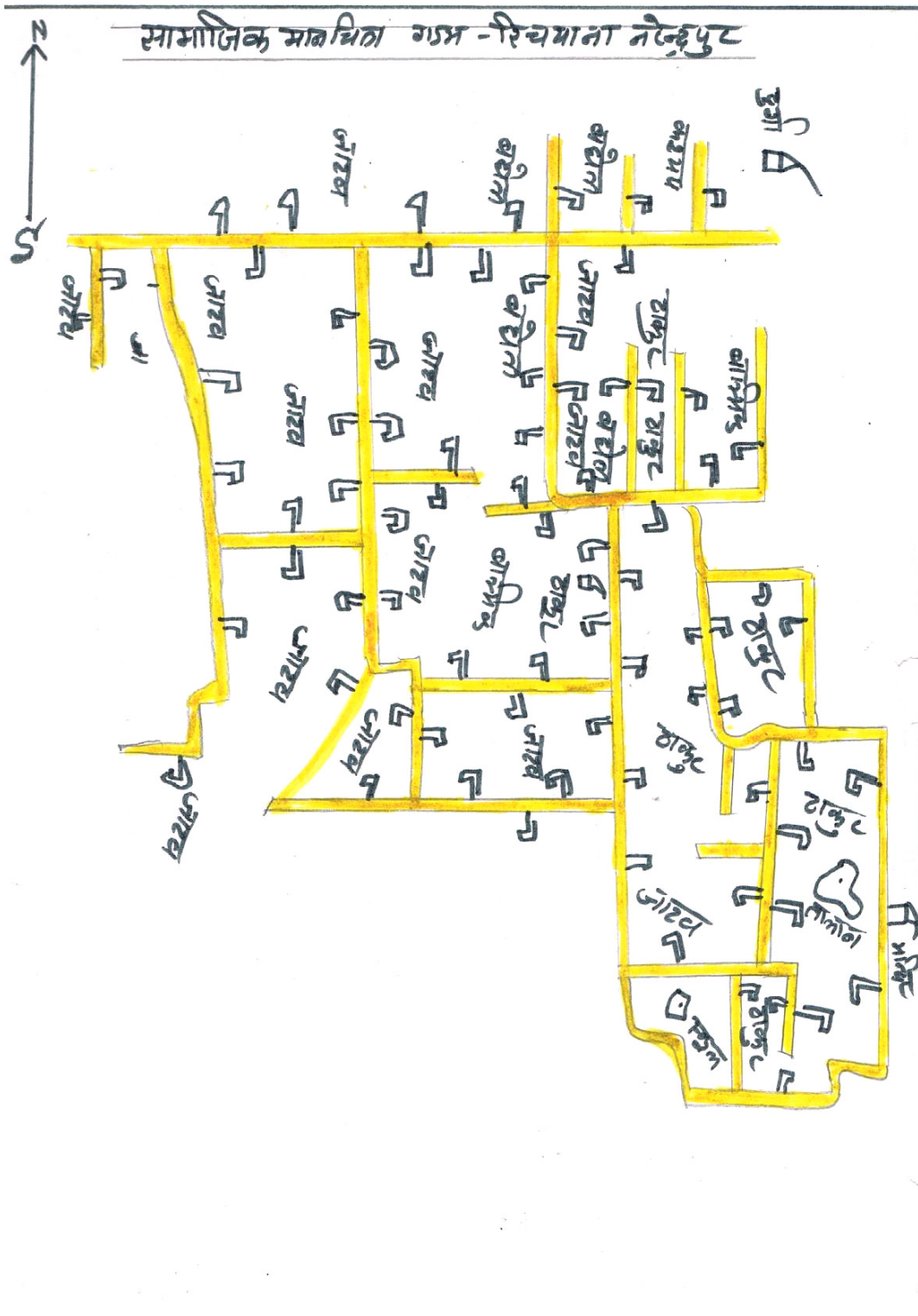
Participatory Rural Appraisal

Participatory mode of the villagers shows positive indication for the success of the programme. Traditionally the entire village community participate in the individual works. Social map of one of the watershed village drawn by villagers themselves, depicting various village figures is shown in sketched map in Fig.-4 & 5. Infrastructures position of the village recorded as follows :

Table – 9 : MW.S. Project – Dalpatpur

S. No.	Infrastructure	Unit	Qty.
1	2	3	4
1	Primary School	No.	1
2	Junior High School	No.	1
3	Kanya Pathshala	No.	-
4	Public Health Center	No.	-
5	Vet nary Hospital	No.	-
6	Panchayat Ghar	No.	1
7	Post Office	No.	-
8	Agan Bari Center	No.	1
9	Electricity	-	Yes
10	Road	-	No
11	Pond	No.	1
12	Hand Pump	No.	41
13	Irrigation Well	No.	2
14	Canal	No.	-
15	Temple	No.	4
16	Well (Drinking Water)	No.	4
17	Pumping Set	No.	98
18	Toilet	No.	21
19	Market	No.	No

SOCIAL MAP



Recorded importance of development institution

Farmers perception recorded for importance and role of different development institution in relation to infrastructure. Importance has been depicted with size of circle and role with distance from village circle. (Fig 8)

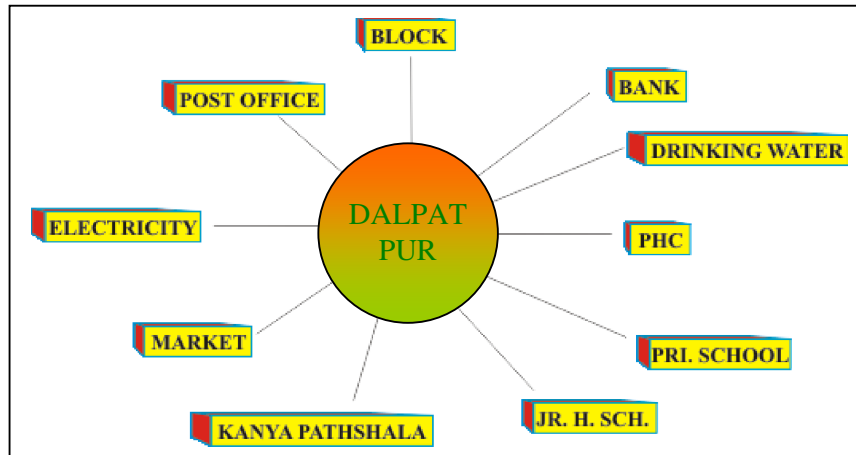


Fig. -8 (Venn diagram of Micro watershed)

(3.12) Communication :

Watershed can approached from Distt Headquarter Bulandshahar to Project area 35 km. by Road.

(3.13) Natural Resource Base :

Transact of watershed showed typical land use profile consisting of plain agriculture land, erodic area and medium ravenous ridge. Main source of the irrigation are the canal for pre showing irrigation only. The total geographical area of the watershed is 574.00 Ha. classification.

Approach roads for the micro watershed is shown for the communication is shown on topo sheet map Fig 9 as next page.

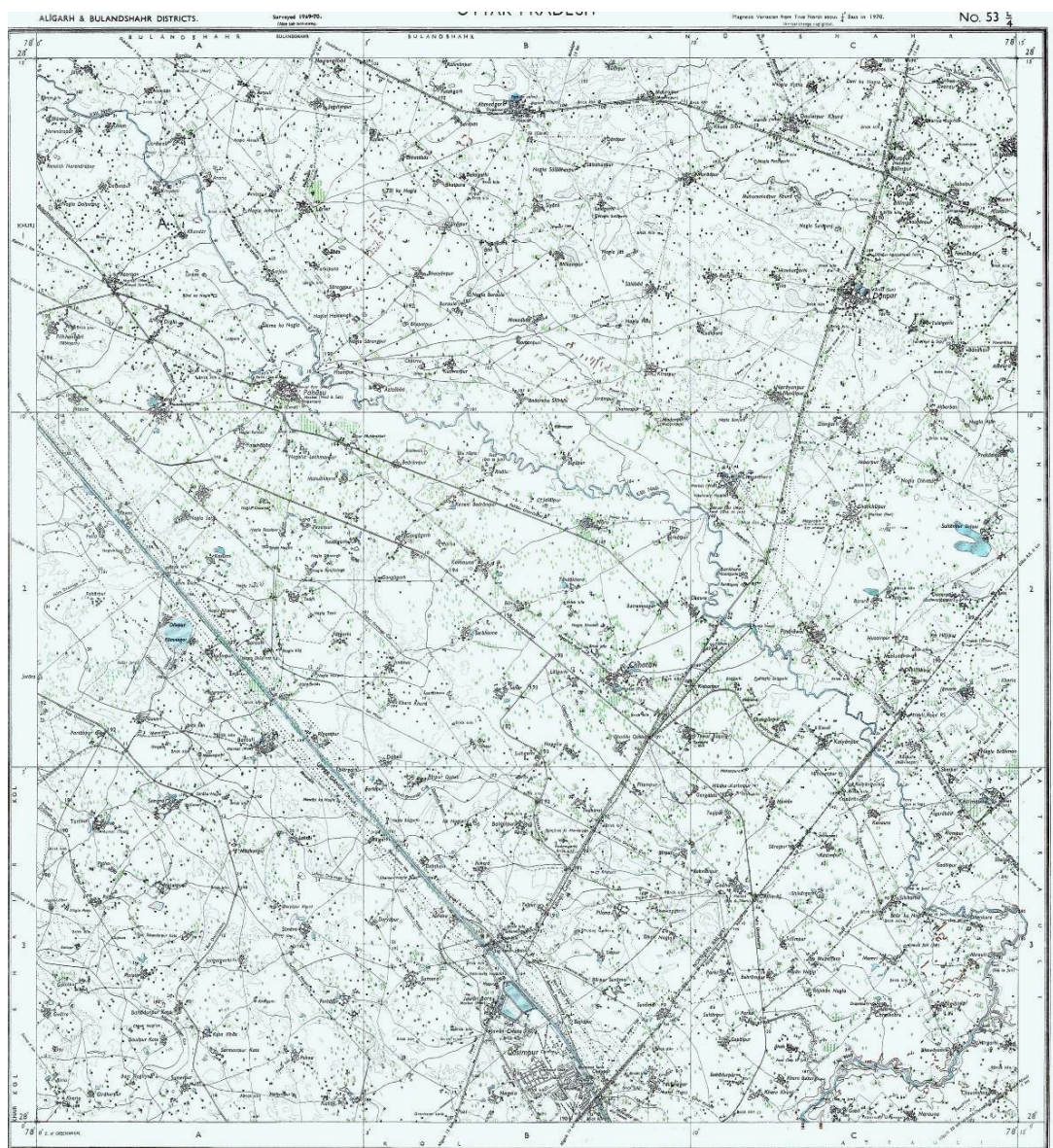


Fig.- 7 Communication Map on Toposheet

Table – 10 : Classification of area(Hect.)

S.N o.	Name of Village	Unit	Total Geographical Area	Rainfed Area	Wasteland	Village Land and Road	Irrigation Resource	
							Water Bodies	Borewell
1	2	3	4	5	6	7	8	9
1	Nagla Dalpatpur	Ha.	95.00	80.75	11.12	3.09	-	32.26
2	Ranayach Narendrapur	Ha.	241.85	205.00	16.24	7.26	-	48.96
3	Kado	Ha.	210.15	188.50	9.06	2.21	-	16.17
	Rampur		27.00	12.75	1.02	.50	-	2.15
Total			574.00	487	37.44	13.06		99.54

(3.14) Livelihood :

Total Population of the watershed is 8936 and out of the total population a majority more than 80% has farming as their major source of livelihood followed by labours, serviceman and small business class. Classified livelihood given in form as fallows :

Table – 11 : Livelihood Classification in population :

S. No.	Name of Village	Farmer	Labour	In Service	In Local small business	Others
1	2	3	4	5	6	7
1.	Nagla Dalpatpur	102	104	85	8	
2.	Ranayach Narendrapur	240	136	29	16	
3.	Kado	108	105	38	14	
4.	Rampur	15	240	26	25	
	Total	465	585	178	63	

(3.15) Dependency of forest fuel wood and fodder :

- a. **Fuel wood :-** The main source of fuel is from cow dung cake, woody stem of crops. About 70% of the climactic energy requirement is met from the agriculture by product and cow dung cake. Rest is met out from the forest outside the village and watershed boundary, most preferred fuel wood is Juliflora fuel wood Juliflora obtained from standing along and between watershed.
- b- **Fodder :-** Villages have not any sufficient signified dependency on forest based fodder as these resource are nothing availability in the forest.

(3.16) Labour requirement :

Labour requirements was found to be maximum at the time of October, November and December when the sowing of Rabi crops are done. The crucial periods are March and April coinciding harvesting and threshing of Rabi crops and July/August is sowing Kharif Crops take a little place. Other income generating enterprises having potential during the remaining.

(3.17) Crop Rotation :

Present Crop rotation in the watershed comprise of :

Kharif	-	Bajra	-	Rare
		Maize	-	Rare
		Jwar	-	Rare
Rabi	-	Fallow Wheat	-	Major
		Fallow Barly	-	Major
		Fallow Sugarcane	-	Major
		Fallow Mustard	-	Major
Zayad	-	Urad, Moong, Makka		

The above said Rabi Crops is the most prevailing crop rotation on the agriculture lands both in the rainfed and irrigated conditions.

Organized vegetable cultivation fruit plantation and traditional agro forestry systems are lacking as per requirement in the watershed the limited vegetable cultivation in the watershed is confined as kitchen gardens and field to the irrigated condition in a scattered manner. The cultivation of cash crops other than the sugarcane, wheat and mustard also in the watershed.

(3.18) Historical Events :

Chronological record of important events of the watershed village is prepared through participatory rural appraisal (PRA) which is very useful in understanding of its background and chronology is given as follows :

Table – 12 : Historical Events

S. No.	Events/Activities	Year	Rem.
1	2	3	4
1	Established	1651	
2	Opening of Primary School	1971	
3	Opening of Junior School	2003	
4	Opening of Kanya Pathshala	-	
5	Opening of PHC	-	
6	Opening of Vet. Hospital	-	
7	Panchayat Ghar	2005	
8	Introduction of Tractor	1981	
9	Gobar Gas Plant	-	
10	Thresher	1985	
11	First Tube well/Pumpset	1982	
12	First Motorcycle	1986	
13	T.V. & D.V.D. Players	1994	
14	Electricity in Village	1997	
15	Bituminous Road	2003	
16	First Hand Pump	1963	
17	Templo Renovation	1997	
18	First Land Line Telephone	2002	
19	Planning for Watershed Project	2010-11	

(3.19) Present Land Use in the Watershed :-

The watershed has diversified land uses. The varied present land use under different use in the watershed. The mixed land use followed in the watershed is almost similar in other parts of U.P. During P.R.A. Exercise prepared land has been shown in Table No. 13, 14 & 15.

Table – 13 : (Ownership)

S. No.	Name of Village	Pvt. Agri. Land		Govt. Revenu Land	Forest Land	Other Land
		S.C./S.T.	Others			
1	2	3	4	5	6	7
1	Nagla Dalpatpur	17	65	-	-	11.68
2	Ranayach Narendrapur	36	204	6.366	-	26.745
3	Kado	5	26	-	-	15.434
4	Rampur	2	10	-	-	3.00
Total		60	305	6.366	-	56.859

Table –14 : (Present Land under different categories)

S. No.	Name of Village	Land Use (Ha.)				
		Agricultural	Wasteland (All Types)	Seasonal waterbodies	Village/Road Etc.	Total
1	2	3	4	5	6	7
1	Nagla Dalpatpur		11.12		3.09	
2	Ranayach Narendrapur		16.24		7.26	
3	Kado		9.06		2.21	
4	Rampur		7.02		0.50	
Total			37.44		13.06	

Table – 15 : (Present land use classified)

S. No.	Land Use Under	Unit (ha.)	Area (Ha.)	Percentage
1	2	3	4	5
1	Under Agriculture			
	A- Rainfed-			
	I- Crops		319.126	
	II- Agro forestry		8.092	
	B- Irrigated-			
	I- Assured		32.400	
	II- Portial		59.270	
2	Wasteland			
	A- Aforestation			
	B- Pasture			
	C- Untreatable			
	D- Treatable		58.134	

Proposed Post Land Use has been given on Page No. 32

4- Focus on Present Land Use :

(4.1) Agriculture :

The total area under agriculture in the watershed is about 487.89 ha. out of which 574.00 ha. is under rainfed agriculture. Agriculture land uses in the watershed extended to diversified land capabilities starting marginal to good class II land. The irrigated and drinking water is most scarce natural resource in the watershed. The operation of tube well 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 of the watershed area. The agricultural field bund are common in the watersheds however they frequently breach on heavy rains.

Various mixed texture of soils are located in patches through out the watershed. The heavy soils are almost kept fallow during rainy season. the agricultural soils also have

some as share calcium pan at variable depths. The irrigation water is conveyed by the earthen channels. Surface irrigation methods following mainly border method of flood method by the formers in the watershed. These factors reduce the water use efficiency of limited and valuable irrigation water.

Drought hardy species like Juliflora suitable multi purpose trees is suitable for rehabilitation of the wasteland. Rehabilitation of waste lands promoting agro forestry with appropriate fruit and forest species suitable vegetative barriers on sloppy lands can be high future value and by these adoption would be meet out many demands of fire wood and fodder in the wasteland. Except above but also for soil and water conservation, rehabilitation of wasteland and sustainable income generation for socio-economic upliftment of farmers.

Crop Productivity :

The farmers also do not have suitable cropping system to deal aberrant weather. Weeds impose considerable constraint in productivity of both Karif and Rabi crops under irrigated as well as rainfed production system farmer undertake normally one manual weeding in mustard and other valuable crops however, practices is energy and time consuming. Use of we decide is rare in the watershed.

In the watershed area, limited cropping in the Kharif with mixed cropping practices is not only irrigational but also unscientific and best for low productivity. Subsequent Rabi crops in general. Sugarcane & Mustard crop in particular are raised on residual soil moisture under rainfed production system during post monsoon season.

(4.2) Indigenous Technological Knowledge (ITK) :

Under process of PRA tracked out rural applying technology in various field of local technology and some technology is very popular in village. In which the agriculture is an old traditional practices of farmers who have improved themselves with passage of the time according to their domestic needs and technological reforms in the nearby areas. The villages have their traditional village ponds, practice of field bunding which typically constitute agricultural related ITKs in the watershed. The Mustard & sugarcane being a cash and firewood crop of the watershed and also sugarcane crop is being. Cultivated in self designed manner by the farmers. Its carried out that the area is totally depend on rain and under the rainfed area technology is applied by the farmers. However limited fertilizer application specifically the DAP came in the practices since about 15-20 years.

(4.3) Forest and Other Vegetation :

Forest :

The watershed have a tract of wasteland area which are under uncultivable position is liesed in the watershed. These wasteland have not any tree vegetation or very less than real requirement for the wasteland use.

Horticulture/Agro forestry :

Horticulture and agro forestry practices were observed in the watershed.

(4.4) Agro forestry :

Agro forestry practices are lacking in the watershed. Though it has good potential under existing disposition and may a role particularly with respect to minimization of cropping risk, built up soil fertility and productivity, protection of soil erosion, soil conservation partly meeting out the fire wood demand of rural community and more over optimizing the economical return from system as whole under typical semi arid climate in the watershed. Bund and boundary plantation also have good potential to care the fire wood and fodder demands of the rural community in the watershed. The existing area under agro forestry is almost negligible. Prosopis Jhliflora may be planted as block or sole plantation specifically on marginal and degraded land in the watershed.

The agro forestry interventions comprising of ber, bail, aonla, guava, papular etc. may be applied for benefit of the farmers under rainfed to irrigation production system on leveled to slopping and marginal agricultural using proper planting techniques and term it control measures.

The multipurpose trees may be also help in supplementing fire wood and fodder demands of the rural community in the watershed and my be planted as hedge rows on rainfed, marginal and degraded lands.

(4.5) Horticulture :

Fruits and vegetables practices are lacking in the watershed area. Its practices may be sustainable very good potential for the formers of watershed. There are a limited lack fruit trees in number like mango, guava, lime, ber, aonla and papaya fruit trees well as vegetables like radish, okra, tomato, cabbage, garlic, onion, chilly, bringer and cucurbits but they are found surviving well in the watershed villages. Organized orchards (vatika) commercial vegetable cultivation horti-agri and other systems of agro forestry etc. are lacking but have good agriculture.

5. Soil and land capability classification :

(5.1) Soil Morphology :

Watershed is located North East corner of Bulandshahr Distt. near about 55 Km. away. The entire terrain of watershed is topographically divided into various land forms. Accordingly the soils of watershed have been grouped major categories is given as follow :

Hill Terrain	Plane Land Sloppy	Undulated Land	Rill Erosic Land	Moderate ravenous
-	35%	32%	18%	15%

Given categories in the blocks is located the soil morphology in the watershed areas. Representation of soil characteristics by soil profile is represented as follows :

Soil Profile :

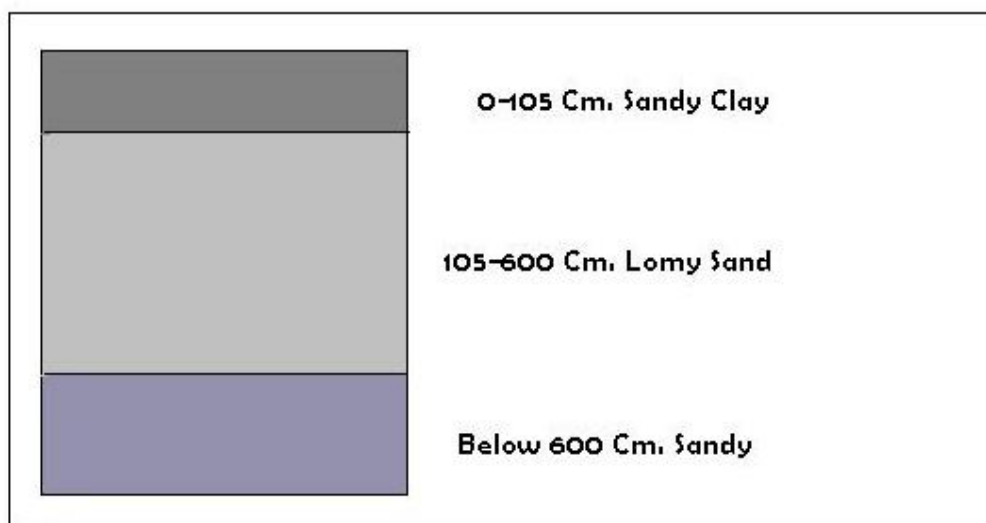


Fig. – 9 (Soil Profile)

Table – 16 : (Morphology of a Typical Soil Profile) :

Horizone	Depth in Cm.	Morphology
1	2	3
A V & H	0-150	Silky when moist, Hard when dry quick soluble, high elasticity, fissures, and cracks, occasional occurrence of free calcium carbonate granules black in colour, clay content 29%, PH- 8 to 8.7
B V & H	150-160	Whitish yellow in colour, very fine mixed with free cacaos and gravels, Hard when dry compact and indurate hard pan restricting development of root and down ward water transmission.
C V & H	7600	Red and white sand stone

(5.2) Soil and Characteristic and Fertility Status :

Soil characteristic pertaining to soil fertility of various classes accruing around villages in the watershed are given as follows :

Table – 17 : Soil Characteristic & Fertility Status :

Sl. No.	Soil Properties	LCC-II	LCC-III & IV
1	2	3	4
1	Sand %	47.04	74.04
2	Silt %	24.60	18.60
3	Clay %	28.36	3.6
4	Texture	Sandy Clay	Lomy Sand
5	PH (1:2)	8.41	8.67
6	Organic Carbon %	0.37	0.12
7	Available N Kg ha ⁻¹	310	173
8	Available P Kg ha ⁻¹	29	15
9	Available K Kg ha ⁻¹	129	325
10	EC (dS m ⁻¹)	0.47	0.12

(5.3) Land Capability Classification (LCC) :

Land capability classification (LCC) was done to classification the soils in different groups based upon the limitations and to emphasize the hazards prevailing in the 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. Classes of land capability namely II, III, IV and V are demarcated in the watershed. The areas under different classes are sown as follows :

Table – 18 : Land Capability Classification (LCC) :

S. No.	Land capability class	Area in Ha.	Colour
1	2	3	4
1	I Class	-	-
2	II Class	63.014	
3	III Class	428.127	
4	IV Class	58.242	
5	V Class	44.614	
6	VI Class	-	
7	VII Class	-	
8	VIII Class	-	

Land capability classification of various agricultural practices under land use can be classified as groups, class, sub class and units. Utilization of various land class is given as follows :

Table – 19 : Utilization of various land uses

S. N.	LCC	Forestry	Ltd. Grazing	Light Grazing	Dense Grazing	Limited Agriculture	Light Agriculture	Dense Agriculture	More Dense Agriculture
1	I								
2	II								
3	III								
4	IV								
5	V								
6	VI								
7	VII								
8	VIII								

(5.4) Land Capability Class II & III :

This group is one of the most extensive LCC watershed. and also near to class III for the agricultural practices. The soils are sandy & sandy 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 & III. These lands potentially very productive but due to rainfed a single cropping pattern is in habitation.

(5.5) Land Capability Class IV :

This class is found in lower portion near the outlets of watershed. The soils are coarser in texture, deep, erosion hazard and undulating in topography. Rill and initiation of gully can be seen near the outlet of the watershed.

(5.6) Land Capability Class VII & VIII :

This class of land is not found in watershed. Somewhere lack of soil are found with admixture gravels fragments in these classes of lands.

(5.7) Conclusions :

The majority of land form is coming under class II, which give an insight of good agriculture production potential of the watershed.

The land capability classification provides reasonable good information with regard to capability of soil, that could be used for agriculture, agrihorticulture, silviculture and posture development.

The productivity of these lands could be further enhanced by adoption of simple soil & water conservation measures like bunding practices.

The reasonable area is under watershed of wasteland and other wasteland including grater potential of this watershed for forestry and pasture development. Rare places namely water body of low portion of land area under seasonally works as water harvesting structures and these harvested water is used or can use for some other beneficial activities during the crop season also.

6. Problems and needs of the watershed indentified during the PRA

(6.1) Problem Identification and prioritization :

- a- The are has undulating topography, steep unstable slopes, gradient of excessive branches of rills and hence highly prone to soil erosion.
- b- Major issues addressed to food sufficiency economic growth and environmental security in the watershed area.
- c- Effective soil depth is limited and highly variable hampering good crop growth.

- d- The watershed have low productive cropping due to tradition single cropping pattern and over all average crop production percentage not sufficient against requirement.
- e- Identified that there is no assured irrigation system has been development capacity of water bodies are reduced due to silt ration which are utilized to store of rainy water and they are renovatable.

(6.2) Transact walk during the PRA :

Problems identified and prioritized during the transact walk and PRA exercises in all comprised villages of watershed. There were pooled and a list of problems representing the whole watershed was prepared. Problems were ranked as per their total weight age in the watershed village.

Table – 20 : Ranking of Problem identification and prioritization of watershed

S.No.	Problem	Rank
1	2	3
1	Lack of irrigation	3
2	Lack of drinking water	3
3	Low production of field crops	4
4	Lack of fodder availability and low productivity	7
5	Lack of availability of fuel wood	4
6	Lack of market facility	3
7	Lack of quality seeds, fertilizer, pesticides etc.	5
8.	Medical and Health care facilities for milching animals and low productivity.	6
9	Lack of medical, educational and transportation facilities	7
10	Lack of water bodies renovation	8
11	Lack of run of earthen check bunds	1
12	Lack of water harvesting structures	1
13	Lack of livelihoods opportunity	2

Prioritized ranking (Upto four Numbers) :-

- 1- Lack of earthen check bunds.
- 2- Lack of livelihood opportunities.
- 3- Lack of irrigation water was the greatest problem. Lack of irrigation water problem experienced by the people followed by low crop production.

(6.3) Analysis of SWOT of the watershed :

Strength (S), Weakness (W), Opportunity (O) and Threat (T) analysis is a useful decision support tool. A SWOT analysis of watershed is presented as follows :

SWOT analysis of the watershed

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

7. Proposed land use for the watershed :

Watershed management plan preparation due importance is given to topographic, land suitability, irrigation potentially, prevailing farming systems, micro farming situation, farming, farmers preferences and priorities along with economic and environment securities.

Crop and tree selection and area distribution was done as per farmers priorities revealed through PRA exercise.

The watershed management plan for watershed is prepared with specific objectives of food sufficiency, income and employment generation with environment security.

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

Table – 21 : Present and proposed land use plan of the watershed

S.No.	Land use	Present (ha)	Proposed area (ha)
1	2	3	4
1	Agriculture		
a	Rainfed		
	I Crops	319.126	445.256
	II Agro-forestry	8.092	65.190
b	Irrigated		
	I Assured	32.400	32.400
	II Partial	59.270	75.134
2	Waste land		
a	Aforestation		
b	Pasture		10.40
c	Untreatable		2.50
d	Treatable	58.134	24.240
3	Village land	40.840	40.810

(7.1) Status of Present Water Resources Utilization :

Watershed is having some canal system. Management and maintenance of these canal are required. Before sowing of Rabi crops, water from these canal is issued as supplementary irrigation for Rabi sowing ar allowed to go as waste. After releasing water from canal, submergence area also put under cultivation.

Some where bore well irrigation applied by the farmers in the watershed.

(7.2) Proposed Plan for Irrigation Development :

- a- Present system of irrigation and wastage of water during October–November need to be made more efficient from water management point of view by minimizing conveyance losses in the existing water courses.
- b- Present irrigation canal capacity have to build up by the reform. Which are lack capacity of water.
- c- Construction of new water harvesting earthen structures, Pucca Check Dem, Series Gully Plugging, etc. has been sloppy portion to increase irrigation potential and for recharging of ground water, soil and moisture conservation maximum field irrigation, best production and expected change of crop rotation.
- d- The up gradation of the exciting system of irrigation will result in :
 - i- Minimization of conveyance losses.
 - ii- Increase in frequency of irrigation.
 - iii- Adoption of high yielding varieties of crops.
 - iv- Assured cultivation of cash crops.
 - v- Capacity buildup by the planning of new water harvesting structures.

(7.3) Ground Water Recharge :

For the purpose of ground water recharge, the area of the upper side of watershed is recommended for Field Bunds, Contour Bunds, Peripheral Bunds and Submergence Bunds and in the lower portion Contour Staggered Trenches, Gully Plugs, Earthen Check Dem and Pacca Outlets. In the undulated sloppy portion of the watershed recommended water harvesting structure for dual purpose as ground water storage and under ground water recharge.

(7.4) Crop Production :

Practices proposed in the watershed is given as follows :-

- a- Mulching and crop residue management.
- b- Application of green manuring.
- c- Vermi Composting.
- d- Crop rotation and inter cropping.
- e- Biofertilizers.

(7.5) Tillage Operation :

Deep tillage technology is proposed to apply to be demonstrated for benefit of farmers in the watershed.

(7.6) Improved Seeds of High Yielding Verities (H.Y.V.) :

Recommendation of improved varieties is necessary for improving the productivity and farm income. Through replacement of low yielding traditional varieties of seeds in villages of watershed.

(7.7) Balanced Fertilizer Use :-

Demonstration of use of fertilizer in various crops of watershed recommended balance fertilizer use in different crops will be benefited of forming community.

(7.8) Control of insects and diseases :

Aphid in the mustard are the major insects in the watershed areas leading to loss in crop productivity. Similarly white blister is also a common disease in the mustard crop.

The management strategies of these insect pest and diseased will also be demonstrated in the watershed for benefit of the growers.

(7.9) Dry Land Horticulture :

Such portion of dry land in which proposed horticulture development planning recommended species like Ber, Bel and Aonla will be planted at suitable spacing in the watershed.

(7.10) Agri Horticulture :

Aonla and Sahjan would be suitable horticultural crops to the locality. Therefore, a part of land in the farmer field shall be selected and brought under Agri-horticulture system. The cropping system followed will be Jwar and Wheat.

(7.11) Plantation (Fuel wood) :

Such a portion which are under wasteland will be taken falling in the class-IV category in the watershed. These lands will be planted with species like Vilayati Babool (Prosopis Juliflora), Babool (Acacia Nilotica), Karanj (Pangamia Glabra).

9. Socio Economic Analysis of the of the Project :

(9.1) Sustainability and environment security :

The proposed land use plan will improve the land utilization index and crop diversification index significantly as compared to the existing one. in the proposed watershed management plan proper blending of the bio engineering measures will be applied on above 80% of the total area of watershed. It is estimated that more than above 70% of the watershed area will be treated and consequently the soil loss and runoff from the area is expected to be reduced by 70% respectively.

It will help in maintaining ecosystem integrity on sustained basis along with improving the livelihood security of the farming community.

(9.2) Economic Analysis :

Economic analysis of the project was carried by taking direct benefits and costs considering 10 years for project life at 10% discount rate. Whole watershed development plan was divided into three sector as agriculture, horticulture and forest/Fuel wood plantation. Net Present Value (NPV) and Benefit Cost ratio criteria were applied judge the economic efficiency of each enterprises and sector. Net present value (NPV) of the project life is considered to be 10 years and discount rate for NPV estimation is 10% is given NPV and benefits as follows :-

Table – 22 : Present productivity income analysis :

S. No.	Name of Sector	Name of Crops	Produ- ction/ha.	Rate/ Qtl.	Cost of Production	Expend. of cultivation	Net income	B.C. Ratio between Col. 8 & 7
1	2	3	4	5	6	7	8	9
A	Agriculture	Urad	3.00	4300.00	12900.00	6450.00	6450.00	1:1
		Moong	3.00	4500.00	13500.00	6075.00	7425.00	1.22:1
		Jwar	4.80	600.00	2880.00	1584.00	1296.00	0.82:1
		Wheat	18.50	1000.00	15725.00	8650.00	7075.00	0.82:1
		Pea	7.50	2250.00	16875.00	10970.00	5905.00	0.54:1
		Mustard	3.50	1850.00	6475.00	3235.00	3240.00	1:1
Total		-			105105.00	54105.00	51000.00	0.94:1
Average		-			13138.00	6763.00	6375.00	0.94:1
B	Forestry	Vilayati Babool				15000.00	-	Nil
C	Horticulture	Ber				20000.00	-	Nil
		Aonla				20000.00	-	Nil
		Bel				20000.00	-	Nil
Total		-				60000.00	-	Nil
Average		-				20000.00	-	Nil
Grand Total								

Table –23 : Post productivity and income analysis for Post Productivity**Value and B.C.:**

S. No.	Name of Sector	Name of Crops	Production/ha.	Rate/Qtl.	Cost of Production	Expend. of cultivation	Net income	B.C. Ratio between Col. 8 & 7
1	2	3	4	5	6	7	8	9
A	Agriculture	Urad	4.00	5000.00	20000.00	8325.00	11615.00	1.39:1
		Moong	4.00	5000.00	20000.00	8200.00	11800.00	1.44:1
		Jwar	5.50	800.00	4400.00	1900.00	2500.00	1.32:1
		Wheat	25.00	1000.00	25000.00	11680.00	13320.00	1.14:1
		Pea	9.50	3300.00	31350.00	14810.00	18540.00	1.12:1
		Mustard	5.00	2500.00	12500.00	4370.00	8130.00	1.86:1
Total		-	-	-	172250.00	72845.00	99765.00	1.38:1
Average		-	-	-	21531.00	9061.00	12471.00	1.38:1
B	Forestry	Vilayati Babool	80.00	500.00	40000.00	15000.00	25000.00	1.67:1
C	Horticulture	Ber	35.00	1500.00	52500.00	20000.00	32500.00	1.63:1
		Aonla	35.00	2000.00	70000.00	20000.00	50000.00	2.50:1
		Bel	40.00	1500.00	80000.00	20000.00	40000.00	2:1
Total		-	-	-	182500.00	60000.00	122500.00	2.04:1
Average		-	-	-	60833.00	20000.00	40833.00	2.04:1
Grand Total		-	-	-	1394750.00	147485.00	247265.00	1.68:1

Table –24 : Summary of NPV, PPV and B.C. Ratio (Sector wise) :

S. No.	Name of Sector	NPV		PPV		B.C. Ratio
		Expend.	Net Income	Expend.	Net Income	
1	2	3	4	5	6	7
1	Rain fed Agriculture	54105.00	51000.00	72485.00	99765.00	1.38:1
2	Forest/Fuel wood Plantation	15000.00	-	15000.00	25000.00	1.67 : 1
3	Horticulture	60000.00	-	60000.00	122500.00	2.04:1
Total		129105.00	51000.00	147485.00	247265.00	1.68:1

(9.3) Economics of Agriculture Sector :

The development cost can be recovered by the adoption of plan in present rain fed agriculture is being done on well maintained field, therefore does not require much investment. In rain fed agriculture, investment of Rs. 44.50 lacs is proposed to made is given as fallows :

Table – 25 : Economics of Agriculture Sector :

S. No.	Name of sector	Name of Activities / Plan	Treatble Area (Ha.)	NPV (Lacs)	Post Productivity Value (Lacs)	Benifit / Income	B.C. Ratio
1	2	3	4	5	6	7	8
1.	Rainfed	Soil, moisture and water cons works	510	223.43	656.65	308.33	1.38:1

(9.4) Economics of forest fuel wood plantation :

Economic analysis of fuel wood plantation in the watershed. Project life is considered to be 20 years and discount rate for NPV estimation is 10 % is followed and as is given follows :

Table –26 : Economics of forest fuel wood Plantation :

S. No.	Name of sector	Comman Name of Plant	Area (Ha.)	NPV (Lacs)	Post Productivity Value (Lacs)	Benifit / Income	B.C. Ratio
1	2	3	4	5	6	7	8
1.	Forest Fuel wood sector	Vilayati Babool (Prasopis Juliflora)	25.00	2.50	6.675	4.175	1.67 : 1

(9.5) Economics of Horticulture Sector :

Economic analysis of Horticulture Plantation in agri-horti system and on wasteland patches of watershed project, life is considered about 15-20 years and discount factor rate for NPV estimation is 10% is follows :

Table – 27 : Economics of Horticulture system :

S. No.	Name of Sector	Common name of Plants	Area (Ha.)	NPV (Lacs)	Post Productive Value (Lacs)	Benefit Lacs	B.C. Ratio
1	2	3	4	5	6	7	8
1	Horticulture	Ber (zyziphus mouritana)	4.00	0.80	2.104	1.304	1.63: 1
		Aonla (Embelica officianalis)	3.80	0.76	2.660	1.90	2.5 : 1
		Bel (Aegle marmelos)	2.20	0.44	1.320	0.88	2 : 1
Total			10.00	2.00	6.084	4.084	2.04 : 1

(9.6) Food requirement and sufficiency :

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

Table – 28 : Status of food requirement and availability of per annual :

S. No.	Name of Foods	Requirement Q./Yr.	Present Status		Expected Post Status	
			Availability Q./Yr.	Deficit or surplus Q./Yr.	Availability Q./Yr.	Deficit or surplus Q./Yr.
1	2	3	4	5	6	7
1	Cereals 110 Kg.	8529	7250	-1229	4499	5970
2	Pulses 36.50	2830	1556	-1274	5094	2264
3	Oil Seeds 29.20	2264	906	-1358	3622	1358
4	Vegetable 71 kg	7076	1415	-5661	12737	12737

(9.7) Employment generation :

One of the major problem of the labour migration in watershed project. By the implementation of the project activities employment opportunities will be generated. However the changes in land use pattern and adoption of other subsidiary enterprise will generate employment opportunities in the watershed as given in table follows :

Table – 29 : Employment generation under proposed works :

S. No.	Employment activities/works	Area under work	Cost	Mandays generation (Nos.)			
				Unskilled	Skill	Total	Person
1	2	3	4	5	6	7	8
2	Graded Contour Bund	57	1.70	1710	-	1710	57
3	Gully Plug, C.D.	95	7.125	4987	366	5353	178
4	Submergence Bund	81	3.240	3240	-	3240	108
1	Peripheral Bund	80	2.80	2800	-	2800	93
5	W.H.B.	100	9.00	5400	306	5706	190
6	Renovation of Bund	62	1.860	1860	-	1860	62
7	Reno. of W.H.B.	-	-		-	-	-
8	Community Pond	-	-		-	-	-
9	Afforestation	25	2.865	537	-	573	19
10	Horticulture	10	2.00	400	-	400	13
Total		510	30.60	20970	672	21642	720

10. Formation of watershed committee :

Under compliance of common guideline Para (6.3) is followed and by the help of watershed development team, watershed committee is organized in the micro watershed village Ranayach Narendrapur with 10 members as prescribed in common guide line. List for organization of W.C. village details given as follows :

Table – 30 : Details of comprised village W.C. organization in M.W.S. :

S. No.	Particulars	Details	Block	Geographical Area
1	2	3	4	5
1	Micro watershed code	3B3E3c3f	Pahasu	574
2	Name of Gram Panchayat in M.W.S.	Ranayach Narendrapur		

Table – 31 : List of organized W.C. for the Gram Panchyat Dalpatpur in watershed.

S. No.	Name of selected members	Age	Representation Members from	Post	Qualification	Village
1	2	3	4	5	6	7
1	Ramesh Chand	47	From – U.G	President	High School	Nizampur
2	Than Singh	57	From – U.G	Secretary	Intermediate	Nizampur
3	Charan Singh	35	From – U.G	Member	Sakhar	Nizampur
4	Jay Prakash	38	From – U.G	Member	8	Nizampur
5	Chandrapal	48	From – U.G	Member	10 th	Nizampur
6	Ranveer	35	From – S.H.G.	Member	Sakhar	Nizampur
7	Sanjeev	38	From – S.H.G.	Member	5	Nizampur
8	Rakesh Kumar	43	Landless	Member	Sakhar	Nizampur
9	Km. Rajni Devi	19	From – Female	Member	Sakhar	Nizampur
10	Sanjay	28	From – Landless	Member	8	Nizampur
11	Hem Pal	26	From – P.L.A.	Work	Intermediate	Khurja

(10.1) Formation of Self Help Groups in M.W.S.

By the help of watershed committee and watershed development team self help group are formatted / organized. Families and persons are selected from poor, small and marginal farmers families, landless poor families, agriculture labour families, women, herdsman and shepherd and S.C. families in the formatted self help groups are given as follow :

Table – 32 : Baghel Self help group – Dalpatpur .

S. No.	Name of member in formatted SHG's	Age	From represented family	Name of proposed activities	Activation Position
1	2	3	4	5	6
1	Sanjay	26	OBC	Poultry	New
2	Sahab Singh	19	OBC	Livestock	New
3	Than Singh	48	OBC		New
4	Chatrapal	41	OBC		New
5	Chandpal	48	OBC		New
6	Sonpal	50	OBC		New
7	Mahipal	26	OBC		New
8	Malkhan	35	OBC		New
9	Mahabir	35	OBC		New
10	Manvir	52	OBC		New

Table – 33 : Self help group Narendrapur

S. No.	Name of member in formed SHG's	Age	From represented family	Name of proposed activities	Activation Position
1	2	3	4	5	6
1	Rajendra	40	Pal	Kadai, Bunai	New
2	Rajpal	35	Pal		New
3	Cheetar	29	Lodhi		New
4	Kamal Singh	36	Lodhi		New
5	Veer Singh	28	Lodhi		New
6	Chuttan	22	Pal		New
7	Yashveer	40	Pal		New
8	Munidev	42	Pal		New
9	Sompal	41	Pal		New
10	Rakesh	22	Pal		New

Table – 34 : Self help group in Dalpatpur village of watershed.

S. No.	Name of member in farmated SHG's	Age	From represented family	Name of proposed activities	Activation Position
1	2	3	4	5	6
1	Prem Singh	36	Pal	President Live Stock	New
2	Kalawati	34	Pal		New
3	Banti	21	Lodhi		New
4	Smt. Kamlesh	20	Lodhi		New
5	Chaman	28	Lodhi		New
6	Km. Daya	20	Lodhi		New
7	Sonu	22	Lodhi		New
8	Smt. Rammuli	20	Lodhi		New
9	Manoj	22	Lodhi	Secretary	New
10	Peetam	20	Lodhi		New

Formation of User's Groups :

User's groups are farmated by the help of watershed committee and watershed development team in the micro watershed comprised villages. Formers which have land village are involved in the User's groups and they will be direct benefited as expected by the implementation of watershed project easy and convenienced condition are made to resource use between user's groups and they will be responsible to operate and maintenance for the created assets in the watershed. Nos. of farmated user's groups details are given as follows :

Table – 35 : Village wise user's groups

S. No.	Name of village	No. of groups	No. of farmers	Total Agri. Land	Area under treat-ment	Cost of essets
1	2	3	4	5	6	7
1	Dalpatpur	6	95	95	58.00	
2	Narendrapur	16	240	241.85	235.00	
3	Kado	7	102	210.15	208.00	
4	Rampur	1	15	27.00	9.00	
		30	480	574.00	510	

10. Estimation and Costing of Proposed activities of the watershed Project Year 2009-10.

Proposed works / activities for the Project Period (Year 2010-11) under proposed treatable area 510.00 Ha. Out of total Geographical area 574.00 Ha.

(10.1) Financial and Physical Outlets :

Table – 36 : Financial and Physical Outlets for the Year 2009-10 :

Sl. No.	Components	Unit cost per ha.	Physical ha.	Financial (Lacs)			Man-days Generation
				Labour Component	Material Component	Total	
1	2	3	4	5	6	7	8
A	Management Cost 10%						
1	Administrative Cost – TA & DA Hiring of Vehicles, Official Expenditure Electricity & Phone bill Computer, Stationery and office consumable materials & contingency	1200	-	-	5.304	5.304	-
2	Monitoring	120	-	-	0.5304	0.5304	
3	Evaluation	120	-	-	0.5304	0.5304	
	Sub Total	1440		-	6.3648	6.3648	
B	Preparatory Phase 10%						
1	Entry Point Activities 4%	480	-	0.4243	1.6973	2.1216	424
2	Institutional & Capacity Building 5%	600	-	-	2.652	2.652	
3	Detailed Project Report 1%	120	-	-	0.5304	0.5304	
	Sub Total	1200	-	0.4243	4.8797	5.304	424
C	Watershed Work Phase						
a	Watershed Development Works						
1	Graded, Contour & Field Bunds	3000	47.00	1.41	-	1.41	1410
2	Gully Plug, Earthen Checkdam /WHS	7500	80.00	4.20	1.80	6.00	4508
3	Submergence bunds	4000	70.00	2.80	-	2.80	2800
4	Peripheral Bund	3500	70.00	2.45	-	2.45	2450
5	Earthen Water Harvesting Bund	9000	88.00	4.752	3.168	7.92	5021
6	Renovation of existing Bunds	3000	52.00	1.56	-	1.56	1560
7	Renovation of existing W.H.B	-	-	-	-	-	-
8	Aforestation and Development of silvi postural system	13500	25	0.476	1.904	2.38	476
9	Dry Land Horticulture	20000	10	0.40	1.60	2.00	400
10	Community Pound (Renovation)	-			-	-	
	Sub Total		442	18.048	8.472	26.52	18625
B	Livelihood Programme (Community Based) 7.620						
	Income generating activities through SHG's for landless and marginal farmers 10%						
1	Live stock development activities	200	-	-	0.884	0.884	-
2	Bee Keeping	100	-	-	0.442	0.442	-
3	Poultry Farming	200	-	-	0.884	0.884	-
4	Nursery Development	300	-	-	1.326	1.326	-
5	Vegetable Production	100	-	-	0.442	0.442	-
6	Milk Dairy Promotion Unit	200	-	-	0.884	0.884	-
7	Establishment of Vermi compost Unit	100	-	-	0.442	0.442	-
8	Sub Total	1200	-	-	5.304	5.304	-
C	Production System and micro Enterprises						
1	Crop production, diversification of agriculture and introduction of agro forestry	1170	-	-	5.1714	5.1714	-
2	Demonstration of improved composting system	390	-	-	1.7238	1.7238	-
	Sub Total	1560	-	-	6.8952	6.8952	-
D	Consolidation Phase 5% Sub Total						
	Sub Total	600	-	-	2.652	2.652	-
Grand Total		12000	-	18.4723	34.5677	76.20	19049

—: संकल्प पत्र :-

ग्राम पंचायत:- दलपतपुर, कोड सं०- 3B3E3c3f विकास खण्ड- पहासू जिला- बुलन्दशहर

यह कि आई०डब्ल्यू०एम०पी० परियोजना में तैयार की गयी निर्माण की नयी सुजित परिसम्पत्तियों को ग्राम पंचायत एवं माइक्रोवाटरशेड के अन्तर्गत सम्मिलित ग्रामों में योजना क्रियान्वयन कराने एवं योजना उपरान्त चालू रखने तथा सुजित परिसम्पत्तियों के अनुक्षण हेतु कृत संकल्प एवं इच्छुक है।

दलपतपुर ग्राम पंचायत के सभी स्रोत स्थल जैसे तालाब ग्राम सभा गोचर (चारागाह) जल संसाधन, जंगल आदि में भूमि विकास परियोजना के अन्तर्गत किये जायेंगे। उन कार्यों को समाज के कमजोर वर्ग जैसे अनुसूचित जाति/जनजाति, महिला वर्ग एवं अल्प भूमिहीन गरीबी रेखा के नीचे के लाभार्थियों को लाभ पहुंचाने हेतु इच्छुक होंगे।

हम योजना संचालन हेतु प्रस्तावित करते हैं एवं सहमति देते हैं कि भारत सरकार के समस्त मार्गदर्शी सिद्धान्तों के अनुपालन में कार्य सम्पन्न करायेगे। यह भी घोषित करते हैं कि चयनित क्षेत्र जिसको मेरे द्वारा भलीभाँति देखा गया है, और प्रस्तावित योजना में प्रस्तावित समस्त कार्य 15 सालो से नही कराया गया है। जिसकी मुझे पूर्णरूप से जानकारी है और अनुमोदन करते हैं।



राजेश कुमार

यशभान सिंह

रमेश सिंह

राजेश

राजेश

राजेश

PROJECT AT A GLANCE

IWMP-II (Bulandshahar)

1	State	Uttar Pradesh
2	Distt.	Bulandshahar
3	Block	Pahasu
4	M.W.S. Code	2B3E4d3e
5	Name of M.W.S. Project	Uthrauli
6	Involved Village	03
7	Geographical Area of M.W.S.	622
8	Rainfed Area	
9	Treatable Area	560
10	Weightage	
11	Cost of Project	67.200
12	For the year	2011-12

Budget Components

S. No.	Components	Area (Ha.)	Cost (in Lacs)
1	2	3	4
1	Management Cost 12%	-	8.064
2	Preparatory Phase 10%	-	6.720
3	Watershed Work Phase	-	
	A- Watershed Development Works 50%	560.00	33.600
	B- Livelihood Programme (Community Base) 10%	-	6.720
	C- Production System & Micro Enterprises 13%	-	8.736
4	Consolidation Phase 5%	-	3.360
	Total	560.00	67.200

Executive Summary of the Project

Identified selected micro watershed project Utravali is coded as 2B3E4d3e has been proposed from cluster of I.W.M.P. Bulandshahar – I project in Pahasu Block district Bulandshahar four villages namely Utravali, Asharauli, Nawada, Maripur and Rampur is comprised in the micro watershed which is located in the east of district Bulandshahar on the east bank of River Kali Nadi and border of district Badaun area is known as Khadar. It lies between $28^{\circ}-15'$ S and $28^{\circ}-10'$ N Latitudes and $78^{\circ}-0'$ E and $78^{\circ}-10'$ W Longitudes Covering area. Its altitudes ranges from 187 meter to 190 meter above the mean sea level. Khurja Railway Station 201.18 m, Khurja Jh. Railway station is 201.46 m above mean sea level is displayed. Project area of I.W.M.P. BSR-III is lied in the Pahasu Block of Bulandshahar District which is come in the western plan zone under semi arid area. The annual average rainfall is near to 397 mm which an average of 35 rainy days. Out of which about 85% is received during the mansoon season from July to September and very less rainfall is received in the winter season.

Temperature ranges from as high as 43°C in the May-June to as $3^{\circ}-4^{\circ}\text{C}$ during December – January. The Trend of rain fall is highly eratic and maximum water goes as runoff.

Main occupation of the dwellers is agriculture in the watershed. Some part of the lands are shown during the Kharif season. Cane sugar are preferred crops in the project area. The main Crops raised are Wheat, Pea & Mustered and maze.

The topmost portion of the watershed is sloppy flat land. Other than topmost portion of the watershed is under soil erotic portion and depreciative. The soil of the land are sandy loam Soil. The middle agricultural position of watershed relatively smooth sloppy flat land with sandy loam soil texture. These soil is yellow in colour and are inherently good in fertility status.

Natural vegetation of the watershed is very poor. Somewhere forest vegetation is seen which are predominant with Vilayati Babool (*Prosopis Juliflora*), followed by Babool (*Accasia nilotica*), somewhere Neem Plants (*Azadirachta Indica*), Shisham (*Dolbergia Sisson*) and Karanj (*Pongamia Glabra*) are seen in occasional occurrence. There is no grass land in the watershed. Somewhere grass patches are seen only on the bunds, road sides and other such places. Coverage of massive green belt is in poor percentage for environment which is envisaged. That watershed is very poor climate area.

There is normal condition of animal physics and for their fodder arrangement is the watershed and creative possibility would be expected by the implementations of the project.

Due to Arial soil erosion poor harvesting managements, cropping pattern, non treated watershed etc. are very anti effective causes for the watershed. Problem of the watershed is to be

tackled by harvesting structures which have lost most of their capacity new water bodies for the prevention of erosion and conservation of soil and moisture various type of earthen bunds in the watershed field, necessity has been observed. Wasteland will be treated with staggered Trenches, afforestation and bunding for the changing of characteristics.

The detail project report has been prepared by the applying of nine process steps for the micro watershed code no. 2B3E4d3e brief is as follows.

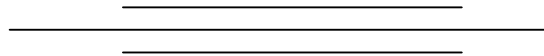
- STEP-1 Secondary data collection:-** During the five days visit programme in the micro watershed project with all available documents of village label by approaching the Gram panchayat collected secondary data.
- STEP-2 Village meeting & conducting PRA exercise:-** Community meeting conducted on five days for the consultation with villagers for the PRA Exercise. Participatory mode of the villages was positive indicated for the success of programme. With good participation has been drawn social & resource map on ground & paper & discussed various topics of problematic thoughts in the micro watershed.
- STEP-3 Socio economic survey:-** The resource organization of village label volunteers identified to conduct house hold socio economic survey/states.
- STEP-4 Problem typology analysis:-** Thoroughly analyzed the data & identified problem type as soil & moisture conservation, crop rotation, crop coverage, productivity, livelihoods, social issues & capacity building gaps etc. Problems discussed with the watershed committee & came up with alternative solution.
- STEP-5 Conduct of net participatory planning (NPP):-** The planning team visited together in the planning blocks on the scheduled date along with the beneficiaries of the villages & data gathered as for the participatory net planning.
- STEP-6 Productivity & livelihood planning exercise:-** For the product livelihood exercise, group discussion on various livelihood as Agriculture, Animal husbandry enterprise development held discussion with the villagers in the micro watershed.
- STEP-7 Institutional & capacity building :-** This plan is prepared based on the data available in the field and consultations with the watershed committee.
- STEP-8 Data consolidation & documentation of DPR :-** After gathering all required information compiled collected data. Thoroughly discussed and finalized the expected outcomes and benefits specially in the respect of livelihood for different segments. These are the target and performers indicators for the micro watershed.
- STEP-9 Conduct of Gram Sabha obtaining approvals submissions of DPR:-** After preparation of the draft DPR convened to Gram sabha and activities proposed expected

outcomes benefits of implementing the programm are explained in case of any changes are proposed in the Gram sabha approval obtained by the Gram sabha and already singed of Mau paper.

STEP-9A Attachment of detail estimate, cost and design:-Estimating, Costing and design prepared technically According to plan in the micro watershed project. And attached with the DPR.

STEP-9B Various type of mapping :- DPR prepared in the support of micro watershed project using various type of maps is as follows :

- | | |
|--------------------------------------|-----------------------------|
| 1.Index Map of Watershed | 2. Watershed Map |
| 3. Relief/ Drainage Map | 4. Slop Map |
| 5.Soil and Land Capability class map | 6. Land use/ Land Cover Map |
| 7. Cadastral map | 8. Proposed Action Plan map |
| 9. Social Map | |



Project Report

Table – 1 : Micro watershed project brief : -

1	State	U.P.
2	District	Bulandshahar
3	Block	Pahasu
4	Comprised Villages (Nos.)	03
5	Name of Watershed	Utravali
6	Name of MWS Project	Utravali
7	MWS Code No.	2B3E4d3e
8	Geographical Area of MWS	622
9	Treatable Area	560

1- Project Objectives :- The aim and objectives of the Project are :

- h- Conservation, development and sustainable management of natural resources including their users.
- i- Enhancement of agriculture production and productivity in a sustainable manner.
- j- Restoration of ecological balance in the degraded and fragile rain fed ecosystem.
- k- Reduction in regional disparity between rains fed and irrigated area.
- l- Creation of sustainable employment opportunities for the rural community for livelihood security.
- m- Generation of massive employment.
- n- Reduce migration from rural employment.

2- Major Problem of Project Area :

- g- Actual shortage of drinking water.
- h- Near to nil activated water bodies and water harvesting structures.
- i- Low depth of ground water table.
- j- Undulated and generally sloppy rainfed area.
- k- Large number of Small, Marginal and S.C. farmer land holding.
- l- Lower wages of agriculture labour and also migration of labour due to shortage of employment in the watershed.

3- General Description :

(3.1) Location :-

Tyore Bujurg Watershed has been taken with MWS Code No. 2B3E4d3e in Pahasu Block of Distt. Bulandshahar is located on Bulandshahar via Khurja to Utravali Via Pahasu road about 57 Km. between 28°15' and 28°15' N Latitudes and 78°0' and 78°5' N Longitudes. Location and delineation of watershed has been located on watershed map **Fig. 2** and on top sheet **Fig. 3**.

(3.2) Area and Elevation :

Elevation ranges from 187 to 190 mtr. above the mean sea level(MSL) altogether comprised villages and their's area is described as follows. (Comprises village map Fig. 3)

Table – 2 : Area and Elevation

Sl. No.	MWS Code	Block	Name of Village	Geographical Area	Treatable Area
1	2	3	4	5	6
1	2B3E4d3e	Pahasu	Utravali	238.360	222.36
			Asarauli	278.64	289.64
			Nawada	73.00	32.00
			Jalapi	32.00	16.00
Total				622.00	560.00

(3.3) Shape of the Micro Watershed:

The shape of watershed is Elongated and as Rectangular. The maximum length and width of the watershed are 5000 Mtr. and 1814 Mtr. respectively with the Length: Width ratio of 2.76:1.

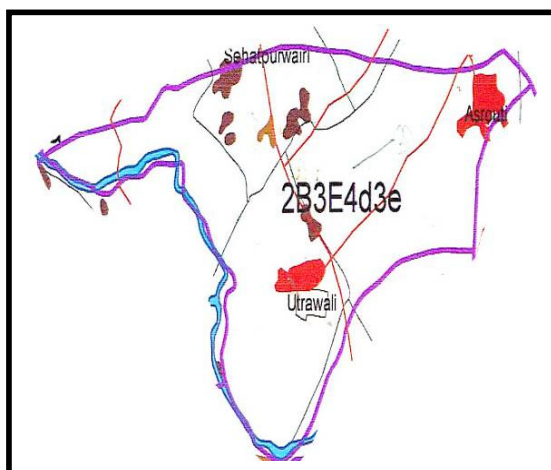


Fig. 1 (Shape of Micro Watershed)

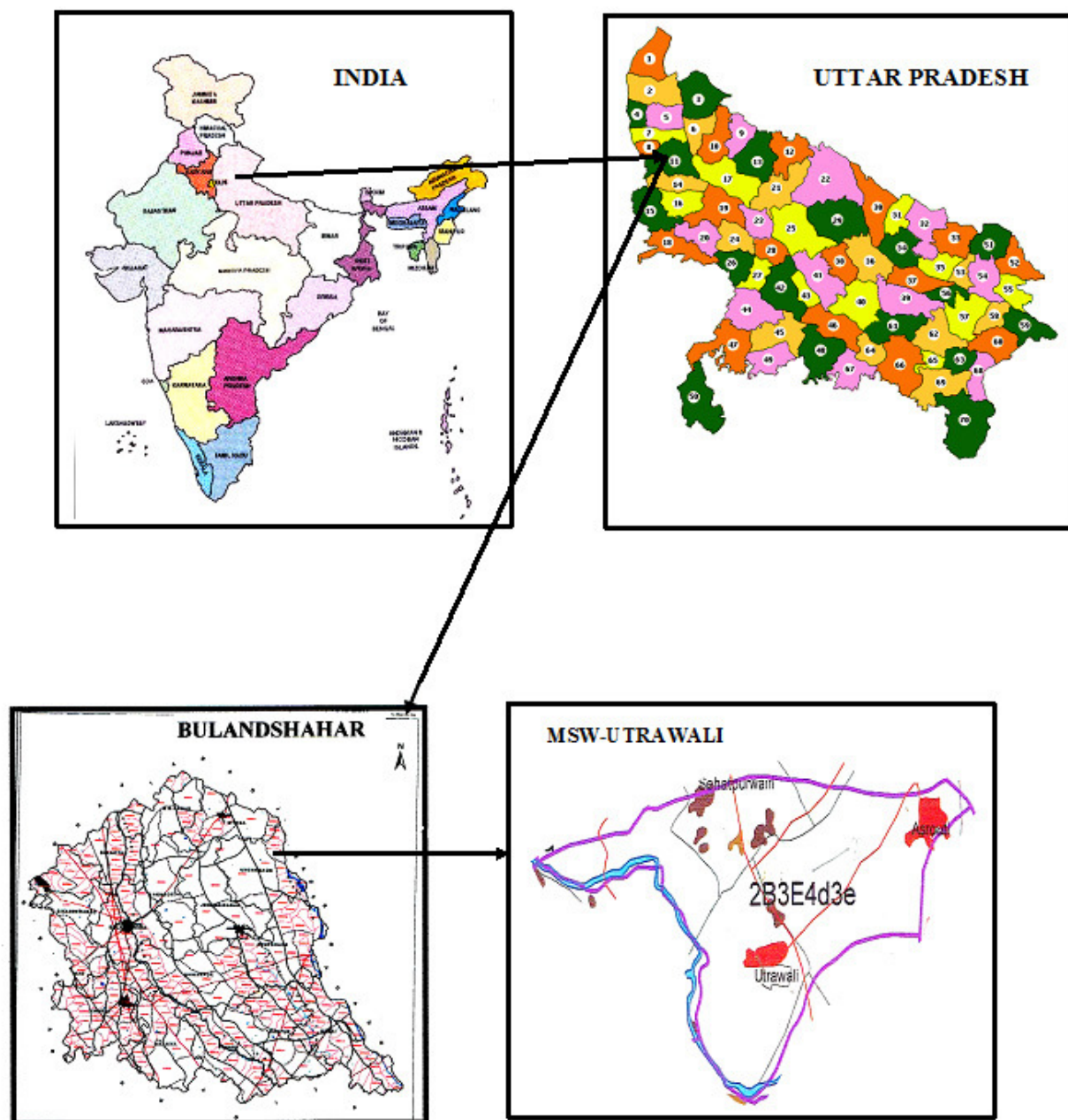


Fig.- 2 Location of the Micro Watershed

2B3E4d3e (MWS Project – UTRAWALI)

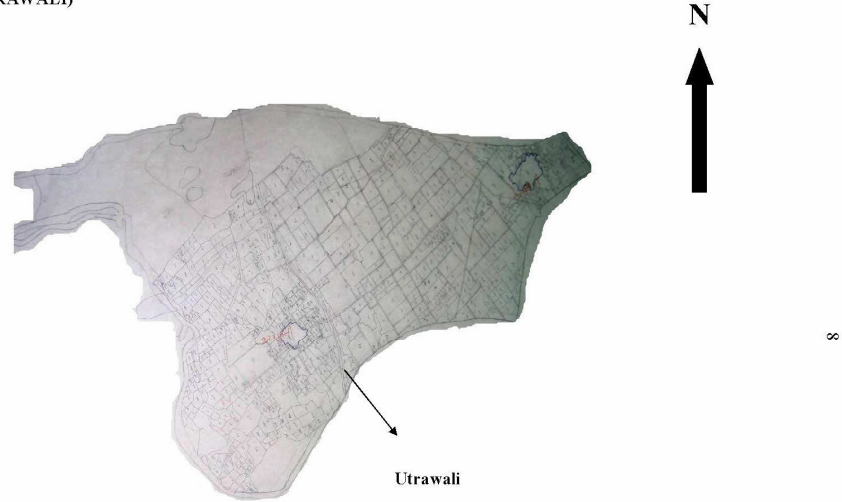


Fig No.-3 Cadastral Map (Located Comprised Villages)

Sl. No.	Name of Project	Name of Village	Geographical Area (in ha.)	Raifed Area (in ha.)	Treatable Area	Agri. Land
1	2	3	4	5	6	7
1	Utravali	Utravali	238.360	212.26	222.36	195.45
2		Asarauli	278.64	229.30	289.64	229.87
3		Nawada	73.00	62.00	32.00	59.86
		Jalapi	32.00	26.00	16.00	26.24
			622.00	529.56	560.00	511.42

(3.4) Climate :

The Watershed falls under semi arid region of tropical climate inclined in Western Plan Zone. The average annual precipitation is about approx. is 397 mm. spreading over 35 rainy days. Most of the rain fall (about 85%) is received during July to September. The rain fall of moderate intensity. Nothing the area receives of scarcity rainfall in the winter season. The temperator variation ranges from as high as 43⁰c in the month of May-June to as low as 4⁰c in December-January.

(3.5) Geomorphology and Soils :

Geomorphology :

The entire watershed is topographically divided into major landforms. Accordingly the soils of watershed can be grouped into various categories such plane land, undulated land, sloppy land and erosic ravenous land.

Soil :

(a) Fine textured soil :

The soil are the most extensive soil group found in the watershed. Some portion of the watershed is relatively sloppy flat land with fine soil texture as sandy sandy loam. The soils are in color and are inherently good high in fertility status. Soil texture is sandy lome loam particularly in depressions and loam in the elevated portion. The soil characteristic texture is dispersive and smooth. Therefore without impede the downward movement of water productive layer of soil are easily by high runoff.

a- Coarse Textured Soil :

These soil are lying mostly in downward portion, along with erosic gully and drainage line upto end of watershed outlet. These soils are coarser in texture and are relatively poor in fertility status. The soils are lomy sand in texture. Rill and gully formation in same parts particularly near the outlet of watershed can be seen.

(3.6) Drainage and Slope:

Due to prevalence of mild steep slope and presence of a number of drainage lines in the watershed the drainage system is adequate. The watershed from part of Ganga Basin and watershed. Under mild to steep topographical slope of MWS as divided as follow : (Drainage and slope map fig.-4)

Table - 4 : Drainage and Slope

S. No.	Grade	Slope Percent	Area in Ha.	Remark
1	A	0.5-1	102	-
2	B	1-2	140	-
3	C	2-3	110	-
4	D	3-4	115	-
5	E	4-5	93	-
6	F	5-6		-

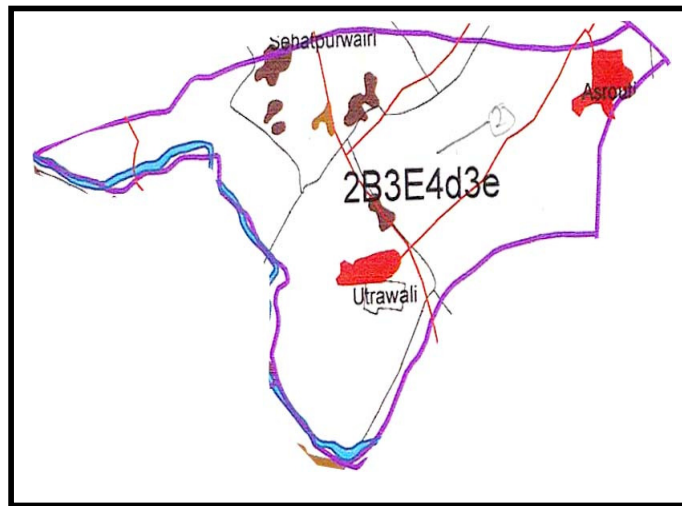


Fig-4 (Drainage & Scrub Map)

(3.7) Vegetation :

a- Natural Vegetation :

Natural vegetation is very poor in the watershed. The forest vegetation is predominant with Vilayti Babool (*Prosopis Juliflora*). There are occasional occurrence of Neem Plants (*Azadirochta Indica*), Shisham (*Dalbergia Sissoo*) and Karanj (*Pangamia Glabra*) and anywhere some scrubs are seen. There are no grass land in the watershed. Somewhere grass patches are seen only on the bunds, roadside and other such places. Poor percentage of massive green trees has been not seen in the watershed except Horticulture backyard.

b- Horticulture :

There is no backyards or commercial horticulture plantation in villages are been in some part of watershed.

c- Agroforestry :

The agriculture fields of the villages have some horticulture plantation at places isolated trees whose frequency is seen as under agroforestry and some where in where in backyards.

(3.8) Human Population:

a- Human Population:

Total Population of involved villages in watershed is 10048 with average family size of six persons as detailed as follows

Table – 5 : Human Population

S. No.	Name of village	Nos. of families	Human Population			Total
			Male	Female	Children	
1	Utravali	551	1601	1470	768	3839
2	Asarauli	421	1273	1085	471	2829
3	Nawada	326	875	790	289	1954
	Jalapi	155	662	526	238	1426
	Total	1453	4409	3871	1766	10048

c- Categorization of Human Population :

In the total population of watershed villages, categories are defined as below :

Table – 6 : Population Categories

S. No.	Particulars	Unit	Number of families in population in the villages		
			Population	Family	Remark
1	2	3	4	5	6
1	Agri Farmer	No.	1740	606	
2	Landless	No.	356	73	
3	Agri. Labour	No.	304	61	
4	Land less Labour	No.	230	33	
5	BPL Family	No.	285	90	
6	SC Family	No.	1036	172	
7	ST Family	No.	-	-	

(3.9) Land Holding :

All the categories of farmers as small, marginal, medium and large are involved in land holding average of about 1-18 ha. Small land holding farmers are further scattered at different places which makes cultivation very difficult. Distribution of farm families according to the size of the land holdings are given as below :

Table – 7 : Distribution of farm families according to their size of land holdings

S. No.	Name of Village	Total Agri. Land in MWS	Land Holding Family (Nos.)					Percentage
			Marginal (< - 1Ha.)	Small (1-2 Ha.)	Medium (2-4 Ha.)	Large (4-7 Ha.)	Total	
1	Utravali	265	136	92	37	-	265	
2	Asarauli	270	138	119	12	-	270	
3	Nawada	75	58	10	7	-	75	
	Jalapi	41	32	6	3	-	41	
	Total		364	227	60	-	651	

(3.10) Live Stock Population :

Total live stock population of the watershed is 7016. Buffalos is preferred as mulch animal compared to Cow. But milk yield is poor. Goats are also kept for milk as well as for meat purpose. The breakup of livestock population is as follows :

Table – 8 : Live Stock Position

S. No.	Name of Village	Unit	Live Stock Position				Total
			Buffaloes	Cows	Bullocks	Goats	
1	Utravali		625	289	38	76	1028
2	Nawada		648	176	36	18	878
3	Asarauli		709	395	95	51	1150
4	Rampur		540	190	46	29	805

(3.11) Infrastructure Social Feature :

- a- Comprised villages in the micro watershed has moderate communication facilities. Watershed linked with metaled road and approachable through motarable road.
- e- All the villages are electrified and have T.V. and Telephone connection.
- f- Literacy rate in the watershed is very low all villages are having education upto Junior High School.
- g- Nearest small market is at Pahasu 13 Km. Nearest big market Bulandshahar is about 60 Km. from watershed. Religious and ritual features are almost common as in other parts af U.P. small land holding with large family size and more than 25% of the labour force of the total population living below poverty line indicate poor socio economic status of the watershed community.

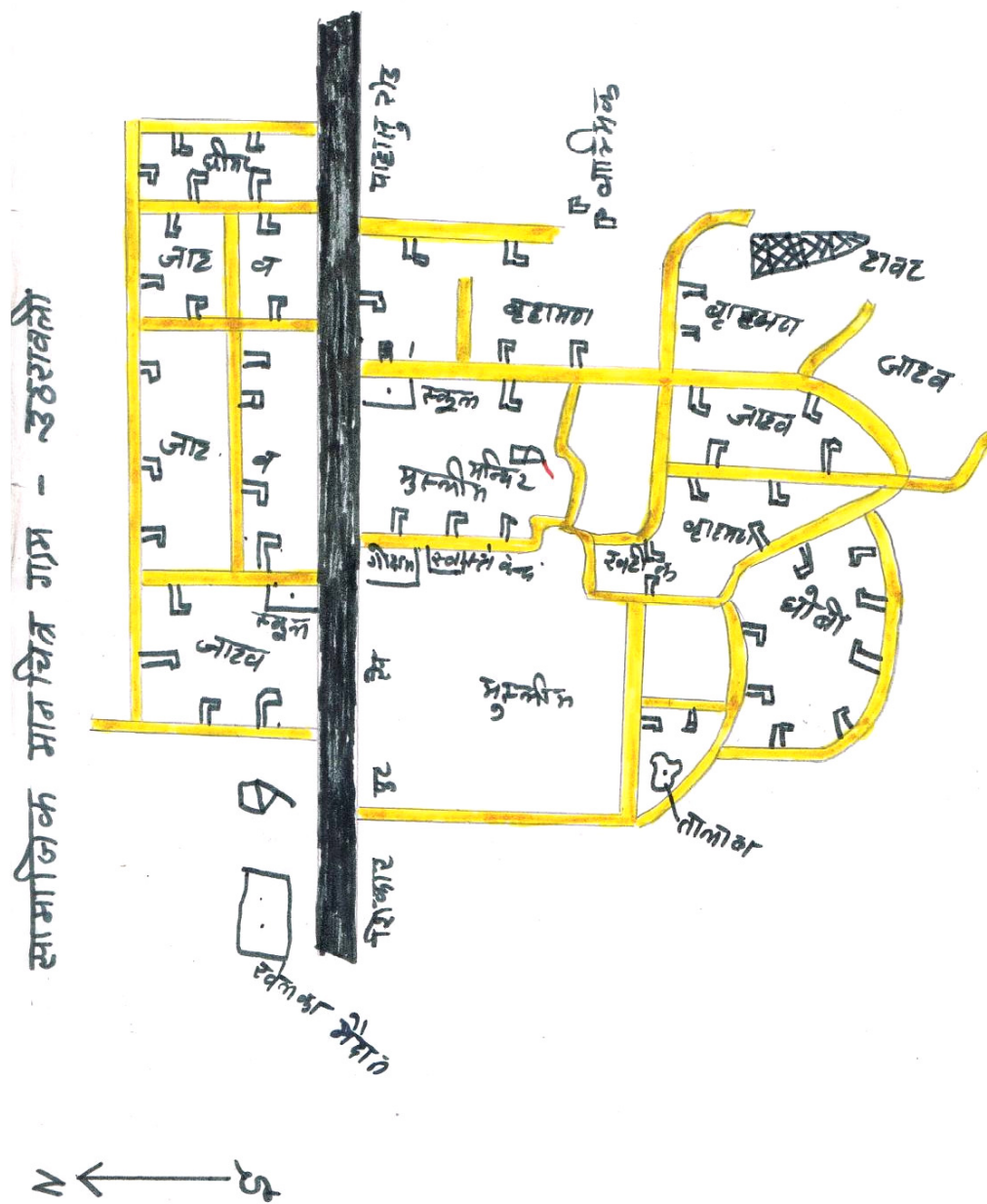
Participatory Rural Appraisal

Participatory mode of the villagers shows positive indication for the success of the programme. Traditionally the entire village community participate in the individual works. Social map of one of the watershed village drawn by villagers themselves, depicting various village figures is shown in sketched map in Fig.-4 & 5. Infrastructures position of the village recorded as follows :

Table – 9 : MW.S. Project – Teyore Bujurg.

S. No.	Infrastructure	Unit	Qty.
1	2	3	4
1	Primary School	No.	1
2	Junior High School	No.	1
3	Kanya Pathshala	No.	-
4	Public Health Center	No.	1
5	Vet nary Hospital	No.	-
6	Panchayat Ghar	No.	1
7	Post Office	No.	1
8	Agan Bari Center	No.	2
9	Electricity	-	Yes
10	Road	-	Yes
11	Pond	No.	
12	Hand Pump	No.	12
13	Irrigation Well	No.	1
14	Canal	No.	
15	Temple	No.	4
16	Well (Drinking Water)	No.	-
17	Pumping Set	No.	47
18	Toilet	No.	35
19	Market	No.	

SOCIAL MAP



Recorded importance of development institution

Farmers perception recorded for importance and role of different development institution in relation to infrastructure. Importance has been depicted with size of circle and role with distance from village circle. (Fig 8)

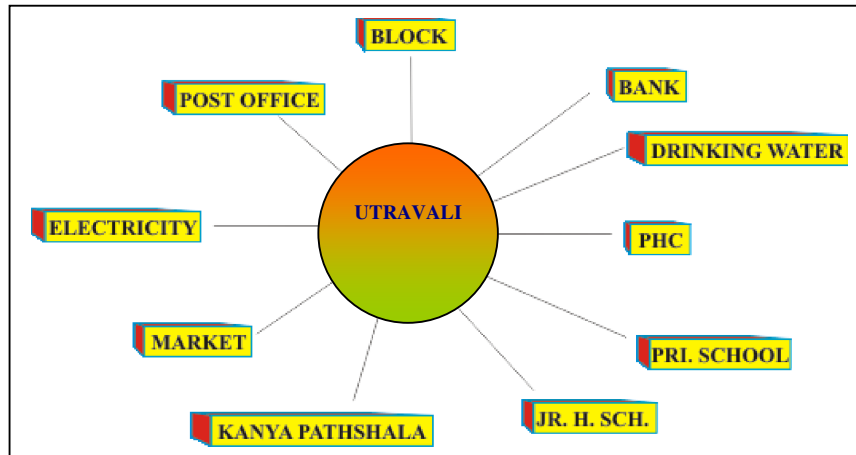


Fig. -8 (Venn diagram of Micro watershed)

(3.12) Communication :

Watershed can approached from Distt Headquarter Bulandshahar to Project area 57 km. by Road.

(3.13) Natural Resource Base :

Transact of watershed showed typical land use profile consisting of plain agriculture land, erodic area and medium ravenous ridge. Main source of the irrigation are the canal for pre showing irrigation only. The total geographical area of the watershed is 472.00 Ha. classification.

Approach roads for the micro watershed is shown for the communication is shown on topo sheet map Fig 9 as next page.

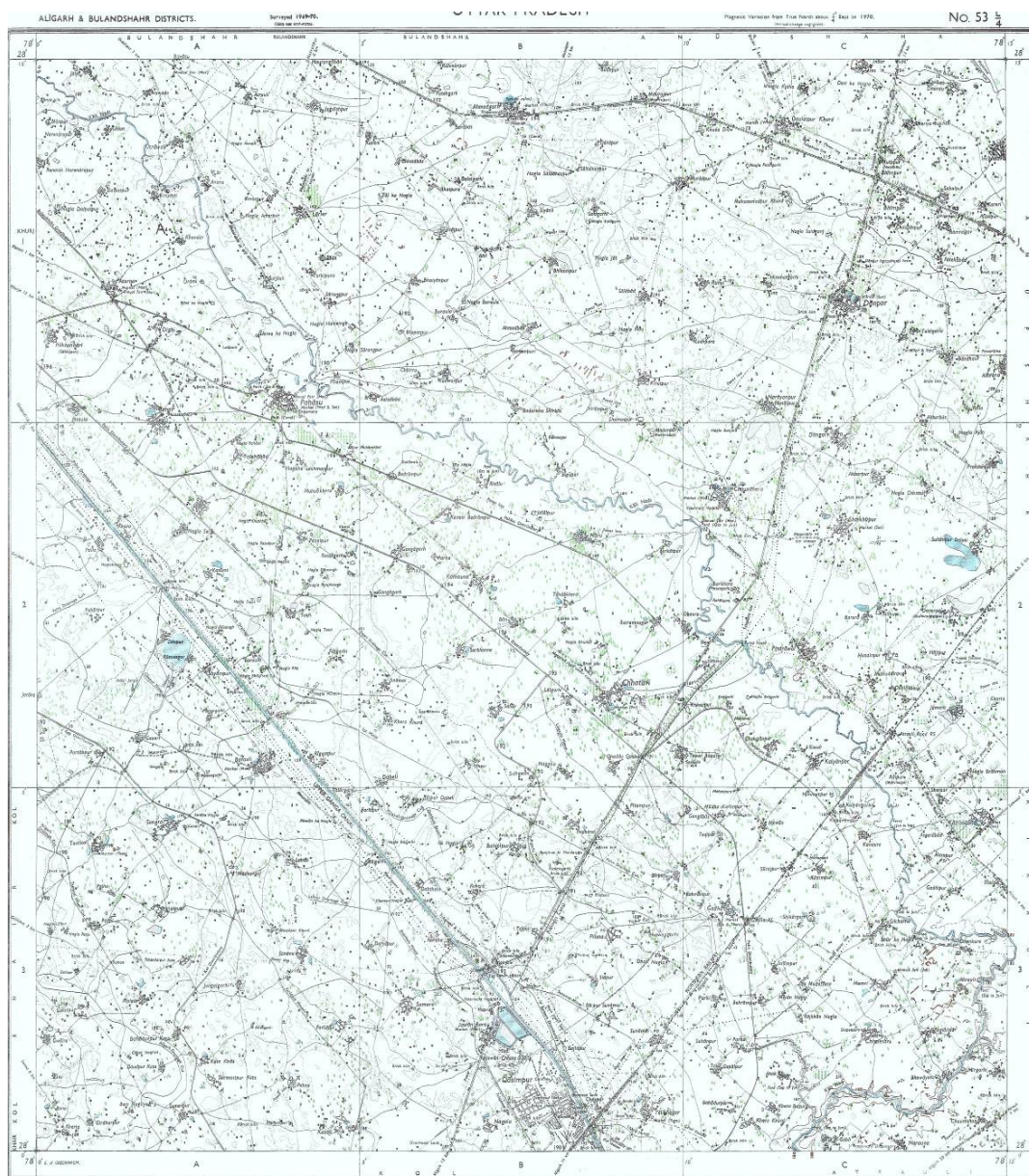


Fig.- 7 Communication Map on Toposheet

Table – 10 : Classification of area(Hect.)

S.No	Name of Village	Unit	Total Geographical Area	Rainfed Area	Wasteland	Village Land and Road	Irrigation Resource	
							Water Bodies	Borewell
1	2	3	4	5	6	7	8	9
1	Utravali	Ha.	238.360	212.26	10.72	4.06	-	35.25
2	Asrauli	Ha.	278.64	229.30	16.01	5.81	-	29.45
3	Nawada	Ha.	73.00	62.00	3.06	3.04	-	18.26
4	Rampur	Ha.	32.00	26.00	1.50	1.12	-	9.92
			622.00	529.560	31.29	14.03	-	94.05

(3.14) Livelihood :

Total Population of the watershed is 8936 and out of the total population a majority more than 80% has farming as their major source of livelihood followed by labours, serviceman and small business class. Classified livelihood given in form as fallows :

Table – 11 : Livelihood Classification in population :

S. No.	Name of Village	Farmer	Labour	In Service	In Local small business	Others
1	2	3	4	5	6	7
1.	Utravali	265	227	185	18	
2.	Asrauli	270	159	38	24	
3.	Nawada	75	204	38	14	
4.	Rampur	41	102	41	8	

(3.15) Dependency of forest fuel wood and fodder :

- a. **Fuel wood :-** The main source of fuel is from cow dung cake, woody stem of crops. About 70% of the climactic energy requirement is met from the agriculture by product and cow dung cake. Rest is met out from the forest outside the village and watershed boundary, most preferred fuel wood is Juliflora fuel wood Juliflora obtained from standing along and between watershed.
- c- **Fodder :-** Villages have not any sufficient signified dependency on forest based fodder as these resource are nothing availability in the forest.

(3.16) Labour requirement :

Labour requirements was found to be maximum at the time of October, November and December when the sowing of Rabi crops are done. The crucial periods are March and April coinciding harvesting and threshing of Rabi crops and July/August is sowing Kharif Crops take a little place. Other income generating enterprises having potential during the remaining.

(3.17) Crop Rotation :

Present Crop rotation in the watershed comprise of :

Kharif	-	Bajra	-	Rare
		Maize	-	Rare
		Jwar	-	Rare
Rabi	-	Fallow Wheat	-	Major
		Fallow Barly	-	Major
		Fallow Sugarcane	-	Major
		Fallow Mustard	-	Major
Zayad	-	Urad, Moong, Makka, Arahar		

The above said Rabi Crops is the most prevailing crop rotation on the agriculture lands both in the rainfed and irrigated conditions.

Organized vegetable cultivation fruit plantation and traditional agro forestry systems are lacking as per requirement in the watershed the limited vegetable cultivation in the watershed is confined as kitchen gardens and field to the irrigated condition in a scattered manner. The cultivation of cash crops other than the sugarcane, wheat and mustard also in the watershed.

(3.18) Historical Events :

Chronological record of important events of the watershed village is prepared through participatory rural appraisal (PRA) which is very useful in understanding of its background and chronology is given as follows :

Table – 12 : Historical Events

S. No.	Events/Activities	Year	Rem.
1	2	3	4
1	Established	1651	
2	Opening of Primary School	1962	
3	Opening of Junior School	2004	
4	Opening of Kanya Pathshala	-	
5	Opening of PHC	2003	
6	Opening of Vet. Hospital	-	
7	Panchayat Ghar	2001	
8	Introduction of Tractor	1972	
9	Gobar Gas Plant	-	
10	Thresher	1972	
11	First Tube well/Pumpset	1976	
12	First Motorcycle	1981	
13	T.V. & D.V.D. Players	1994	
14	Electricity in Village	2001	
15	Bituminous Road	2006	
16	First Hand Pump	1952	
17	Templo Renovation	1999	
18	First Land Line Telephone	2003	
19	Planning for Watershed Project	2010-11	

(3.19) Present Land Use in the Watershed :-

The watershed has diversified land uses. The varied present land use under different use in the watershed. The mixed land use followed in the watershed is almost similar in other parts of U.P. During P.R.A. Exercise prepared land has been shown in Table No. 13, 14 & 15.

Table – 13 : (Ownership)

S. No.	Name of Village	Pvt. Agri. Land		Govt. Revenu Land	Forest Land	Other Land
		S.C./S.T.	Others			
1	2	3	4	5	6	7
1	Utravali	69.167	189.193	-	-	6.640
2	Asrauli	52.240	209.433	5.137	-	3.190
3	Nawada	9.240	65.760	-	-	-
	Rampur	8.270	31.390	-	-	1.340

Table –14 : (Present Land under different categories)

S. No.	Name of Village	Land Use (Ha.)				
		Agricultural	Wasteland (All Types)	Seasonal waterbodies	Village/Road Etc.	Total
1	2	3	4	5	6	7
1	Utravali					
2	Asrauli					
3	Nawada					
	Rampur					

Table – 15 : (Present land use classified)

S. No.	Land Use Under	Unit (ha.)	Area (Ha.)	Percentage
1	2	3	4	5
1	Under Agriculture	Ha	476	
	A- Rainfed-	Ha	398	
	I- Crops	Hact	371.28	78%
	II- Agro forestry	Hact	71.4	1.5%
	B- Irrigated-	-	-	-
	I- Assured	Hact	42.84	9%
	II- Portial	Hact	52.36	11%
2	Wasteland	-	-	-
	A- Aforestation	-	-	-
	B- Pasture	-	-	-
	C- Untreatable	Hact	19.51	45%
	D- Treatable	Hact	23.85	55%

Proposed Post Land Use has been given on Page No. 32

4- Focus on Present Land Use :

(4.1) Agriculture :

The total area under agriculture in the watershed is about 487.89 ha. out of which 574.00 ha. is under rainfed agriculture. Agriculture land uses in the watershed extended to diversified land capabilities starting marginal to good class II land. The irrigated and drinking water is most scarce natural resource in the watershed. The operation of tube well 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 of the watershed area. The agricultural field bund are common in the watersheds however they frequently breach on heavy rains.

Various mixed texture of soils are located in patches through out the watershed. The heavy soils are almost kept fallow during rainy season. the agricultural soils also have

some as share calcium pan at variable depths. The irrigation water is conveyed by the earthen channels. Surface irrigation methods following mainly border method of flood method by the formers in the watershed. These factors reduce the water use efficiency of limited and valuable irrigation water.

Drought hardy species like Juliflora suitable multi purpose trees is suitable for rehabilitation of the wasteland. Rehabilitation of waste lands promoting agro forestry with appropriate fruit and forest species suitable vegetative barriers on sloppy lands can be high future value and by these adoption would be meet out many demands of fire wood and fodder in the wasteland. Except above but also for soil and water conservation, rehabilitation of wasteland and sustainable income generation for socio-economic upliftment of farmers.

Crop Productivity :

The farmers also do not have suitable cropping system to deal aberrant weather. Weeds impose considerable constraint in productivity of both Karif and Rabi crops under irrigated as well as rainfed production system farmer undertake normally one manual weeding in mustard and other valuable crops however, practices is energy and time consuming. Use of we decide is rare in the watershed.

In the watershed area, limited cropping in the Kharif with mixed cropping practices is not only irrigational but also unscientific and best for low productivity. Subsequent Rabi crops in general. Sugarcane & Mustard crop in particular are raised on residual soil moisture under rainfed production system during post monsoon season.

(4.2) Indigenous Technological Knowledge (ITK) :

Under process of PRA tracked out rural applying technology in various field of local technology and some technology is very popular in village. In which the agriculture is an old traditional practices of farmers who have improved themselves with passage of the time according to their domestic needs and technological reforms in the nearby areas. The villages have their traditional village ponds, practice of field bunding which typically constitute agricultural related ITKs in the watershed. The Mustard & sugarcane being a cash and firewood crop of the watershed and also sugarcane crop is being. Cultivated in self designed manner by the farmers. Its carried out that the area is totally depend on rain and under the rainfed area technology is applied by the farmers. However limited fertilizer application specifically the DAP came in the practices since about 15-20 years.

(4.3) Forest and Other Vegetation :

Forest :

The watershed have a tract of wasteland area which are under uncultivable position is liesed in the watershed. These wasteland have not any tree vegetation or very less than real requirement for the wasteland use.

Horticulture/Agro forestry :

Horticulture and agro forestry practices were observed in the watershed.

(4.4) Agro forestry :

Agro forestry practices are lacking in the watershed. Though it has good potential under existing disposition and may a role particularly with respect to minimization of cropping risk, built up soil fertility and productivity, protection of soil erosion, soil conservation partly meeting out the fire wood demand of rural community and more over optimizing the economical return from system as whole under typical semi arid climate in the watershed. Bund and boundary plantation also have good potential to care the fire wood and fodder demands of the rural community in the watershed. The existing area under agro forestry is almost negligible. Prosopis Jhliflora may be planted as block or sole plantation specifically on marginal and degraded land in the watershed.

The agro forestry interventions comprising of ber, bail, aonla, guava, papular etc. may be applied for benefit of the farmers under rainfed to irrigation production system on leveled to slopping and marginal agricultural using proper planting techniques and term it control measures.

The multipurpose trees may be also help in supplementing fire wood and fodder demands of the rural community in the watershed and my be planted as hedge rows on rainfed, marginal and degraded lands.

(4.5) Horticulture :

Fruits and vegetables practices are lacking in the watershed area. Its practices may be sustainable very good potential for the formers of watershed. There are a limited lack fruit trees in number like mango, guava, lime, ber, aonla and papaya fruit trees well as vegetables like radish, okra, tomato, cabbage, garlic, onion, chilly, bringer and cucurbits but they are found surviving well in the watershed villages. Organized orchards (vatika) commercial vegetable cultivation horti-agri and other systems of agro forestry etc. are lacking but have good agriculture.

5. Soil and land capability classification :

(5.1) Soil Morphology :

Watershed is located North East corner of Bulandshahr Distt. near about 55 Km. away. The entire terrain of watershed is topographically divided into various land forms. Accordingly the soils of watershed have been grouped major categories is given as follow :

Hill Terrain	Plane Land Sloppy	Undulated Land	Rill Erosic Land	Moderate ravenous
-	25%	20%	15%	7%

Given categories in the blocks is located the soil morphology in the watershed areas. Representation of soil characteristics by soil profile is represented as follows :

Soil Profile :

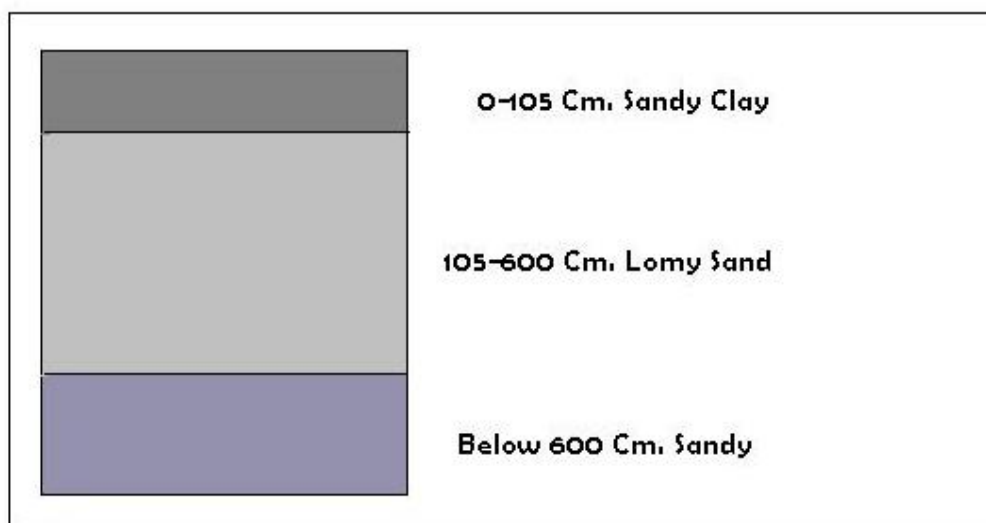


Fig. – 9 (Soil Profile)

Table – 16 : (Morphology of a Typical Soil Profile) :

Horizone	Depth in Cm.	Morphology
1	2	3
A V & H	0-150	Silky when moist, Hard when dry quick soluble, high elasticity, fissures, and cracks, occasional occurrence of free calcium carbonate granules black in colour, clay content 29%, PH- 8 to 8.7
B V & H	150-160	Whitish yellow in colour, very fine mixed with free cacaos and gravels, Hard when dry compact and indurate hard pan restricting development of root and down ward water transmission.
C V & H	7600	Red and white sand stone

(5.2) Soil and Characteristic and Fertility Status :

Soil characteristic pertaining to soil fertility of various classes accruing around villages in the watershed are given as follows :

Table – 17 : Soil Characteristic & Fertility Status :

Sl. No.	Soil Properties	LCC-II	LCC-III & IV
1	2	3	4
1	Sand %	47.04	75.04
2	Silt %	24.40	18.60
3	Clay %	28.36	6:4:6
4	Texture	Sandy Clay	Lomy Sand
5	PH (1:2)	7.05	7.55
6	Organic Carbon %	37	0.12
7	Available N Kg ha ⁻¹	316	173
8	Available P Kg ha ⁻¹	29	15
9	Available K Kg ha ⁻¹	189	326
10	EC (dS m ⁻¹)	0.47	0.12

(5.3) Land Capability Classification (LCC) :

Land capability classification (LCC) was done to classification the soils in different groups based upon the limitations and to emphasize the hazards prevailing in the 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. Classes of land capability namely II, III, IV and V are demarcated in the watershed. The areas under different classes are sown as follows :

Table – 18 : Land Capability Classification (LCC) :

S. No.	Land capability class	Area in Ha.	Colour
1	2	3	4
1	I Class	-	-
2	II Class	80.240	15%
3	III Class	395.214	70%
4	IV Class	74.174	10%
5	V Class	38.074	5%
6	VI Class	-	-
7	VII Class	-	-
8	VIII Class	-	-

Land capability classification of various agricultural practices under land use can be classified as groups, class, sub class and units. Utilization of various land class is given as follows :

Table – 19 : Utilization of various land uses

S. N.	LCC	Forestry	Ltd. Grazing	Light Grazing	Dense Grazing	Limited Agriculture	Light Agriculture	Dense Agriculture	More Dense Agriculture
1	I								
2	II								
3	III								
4	IV								
5	V								
6	VI								
7	VII								
8	VIII								

(5.4) Land Capability Class II & III :

This group is one of the most extensive LCC watershed. and also near to class III for the agricultural practices. The soils are sandy & sandy 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 & III. These lands potentially very productive but due to rainfed a single cropping pattern is in habitation.

(5.5) Land Capability Class IV :

This class is found in lower portion near the outlets of watershed. The soils are coarser in texture, deep, erosion hazard and undulating in topography. Rill and initiation of gully can be seen near the outlet of the watershed.

(5.6) Land Capability Class VII & VIII :

This class of land is not found in watershed. Somewhere lack of soil are found with admixture gravels fragments in these classes of lands.

(5.7) Conclusions :

The majority of land form is coming under class II, which give an insight of good agriculture production potential of the watershed.

The land capability classification provides reasonable good information with regard to capability of soil, that could be used for agriculture, agrihorticulture, silviculture and posture development.

The productivity of these lands could be further enhanced by adoption of simple soil & water conservation measures like bunding practices.

The reasonable area is under watershed of wasteland and other wasteland including grater potential of this watershed for forestry and pasture development. Rare places namely water body of low portion of land area under seasonally works as water harvesting structures and these harvested water is used or can use for some other beneficial activities during the crop season also.

6. Problems and needs of the watershed indentified during the PRA

(6.1) Problem Identification and prioritization :

- f- The are has undulating topography, steep unstable slopes, gradient of excessive branches of rills and hence highly prone to soil erosion.
- g- Major issues addressed to food sufficiency economic growth and environmental security in the watershed area.
- h- Effective soil depth is limited and highly variable hampering good crop growth.

- i- The watershed have low productive cropping due to tradition single cropping pattern and over all average crop production percentage not sufficient against requirement.
- j- Identified that there is no assured irrigation system has been development capacity of water bodies are reduced due to silt ration which are utilized to store of rainy water and they are renovatable.

(6.3) Transact walk during the PRA :

Problems identified and prioritized during the transact walk and PRA exercises in all comprised villages of watershed. There were pooled and a list of problems representing the whole watershed was prepared. Problems were ranked as per their total weight age in the watershed village.

Table – 20 : Ranking of Problem identification and prioritization of watershed

S.No.	Problem	Rank
1	2	3
1	Lack of irrigation	3
2	Lack of drinking water	3
3	Low production of field crops	6
4	Lack of fodder availability and low productivity	4
5	Lack of availability of fuel wood	3
6	Lack of market facility	5
7	Lack of quality seeds, fertilizer, pesticides etc.	5
8.	Medical and Health care facilities for milching animals and low productivity.	7
9	Lack of medical, educational and transportation facilities	7
10	Lack of water bodies renovation	9
11	Lack of run of earthen check bunds	1
12	Lack of water harvesting structures	1
13	Lack of livelihoods opportunity	2

Prioritized ranking (Upto four Numbers) :-

- 4- Lack of earthen check bunds.
- 5- Lack of livelihood opportunities.
- 6- Lack of irrigation water was the greatest problem. Lack of irrigation water problem experienced by the people followed by low crop production.

(6.3) Analysis of SWOT of the watershed :

Strength (S), Weakness (W), Opportunity (O) and Threat (T) analysis is a useful decision support tool. A SWOT analysis of watershed is presented as follows :

SWOT analysis of the watershed

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

7. Proposed land use for the watershed :

Watershed management plan preparation due importance is given to topographic, land suitability, irrigation potentially, prevailing farming systems, micro farming situation, farming, farmers preferences and priorities along with economic and environment securities.

Crop and tree selection and area distribution was done as per farmers priorities revealed through PRA exercise.

The watershed management plan for watershed is prepared with specific objectives of food sufficiency, income and employment generation with environment security.

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

Table – 21 : Present and proposed land use plan of the watershed

S.No.	Land use	Present (ha)	Proposed area (ha)
1	2	3	4
1	Agriculture		
a	Rainfed		
	I Crops	334.210	518.180
	II Agro-forestry	8.340	62.172
b	Irrigated		
	I Assured	35.58	35.58
	II Partial	67.12	86.68
2	Waste land	-	14.10
a	Aforestation	-	2.5
b	Pasture	-	-
c	Untreatable	-	-
d	Treatable	69.51	31.23
3	Village land	52.60	52.66

(7.1) Status of Present Water Resources Utilization :

Watershed is having some canal system. Management and maintenance of these canal are required. Before sowing of Rabi crops, water from these canal is issued as supplementary irrigation for Rabi sowing ar allowed to go as waste. After releasing water from canal, submergence area also put under cultivation.

Some where bore well irrigation applied by the farmers in the watershed.

(7.2) Proposed Plan for Irrigation Development :

- a- Present system of irrigation and wastage of water during October–November need to be made more efficient from water management point of view by minimizing conveyance losses in the existing water courses.
- b- Present irrigation canal capacity have to build up by the reform. Which are lack capacity of water.
- c- Construction of new water harvesting earthen structures, Pucca Check Dem, Series Gully Plugging, etc. has been sloppy portion to increase irrigation potential and for recharging of ground water, soil and moisture conservation maximum field irrigation, best production and expected change of crop rotation.
- d- The up gradation of the exciting system of irrigation will result in :
 - i- Minimization of conveyance losses.
 - ii- Increase in frequency of irrigation.
 - iii- Adoption of high yielding varieties of crops.
 - iv- Assured cultivation of cash crops.
 - v- Capacity buildup by the planning of new water harvesting structures.

(7.3) Ground Water Recharge :

For the purpose of ground water recharge, the area of the upper side of watershed is recommended for Field Bunds, Contour Bunds, Peripheral Bunds and Submergence Bunds and in the lower portion Contour Staggered Trenches, Gully Plugs, Earthen Check Dem and Pacca Outlets. In the undulated sloppy portion of the watershed recommended water harvesting structure for dual purpose as ground water storage and under ground water recharge.

(7.4) Crop Production :

Practices proposed in the watershed is given as follows :-

- a- Mulching and crop residue management.
- b- Application of green manuring.
- c- Vermi Composting.
- d- Crop rotation and inter cropping.
- e- Biofertilizers.

(7.5) Tillage Operation :

Deep tillage technology is proposed to apply to be demonstrated for benefit of farmers in the watershed.

(7.6) Improved Seeds of High Yielding Varieties (H.Y.V.) :

Recommendation of improved varieties is necessary for improving the productivity and farm income. Through replacement of low yielding traditional varieties of seeds in villages of watershed.

(7.7) Balanced Fertilizer Use :-

Demonstration of use of fertilizer in various crops of watershed recommended balance fertilizer use in different crops will be benefited of farming community.

(7.8) Control of insects and diseases :

Aphid in the mustard are the major insects in the watershed areas leading to loss in crop productivity. Similarly white blister is also a common disease in the mustard crop.

The management strategies of these insect pest and diseases will also be demonstrated in the watershed for benefit of the growers.

(7.9) Dry Land Horticulture :

Such portion of dry land in which proposed horticulture development planning recommended species like Ber, Bel and Aonla will be planted at suitable spacing in the watershed.

(7.10) Agri Horticulture :

Aonla and Sahjan would be suitable horticultural crops to the locality. Therefore, a part of land in the farmer field shall be selected and brought under Agri-horticulture system. The cropping system followed will be Jwar and Wheat.

(7.11) Plantation (Fuel wood) :

Such a portion which are under wasteland will be taken falling in the class-IV category in the watershed. These lands will be planted with species like Vilayati Babool (Prosopis Juliflora), Babool (Acacia Nilotica), Karanj (Pangamia Glabra).

9. Socio Economic Analysis of the of the Project :

(9.1) Sustainability and environment security :

The proposed land use plan will improve the land utilization index and crop diversification index significantly as compared to the existing one. in the proposed watershed management plan proper blending of the bio engineering measures will be applied on above 80% of the total area of watershed. It is estimated that more than above 70% of the watershed area will be treated and consequently the soil loss and runoff from the area is expected to be reduced by 70% respectively.

It will help in maintaining ecosystem integrity on sustained basis along with improving the livelihood security of the farming community.

(9.2) Economic Analysis :

Economic analysis of the project was carried by taking direct benefits and costs considering 10 years for project life at 10% discount rate. Whole watershed development plan was divided into three sector as agriculture, horticulture and forest/Fuel wood plantation. Net Present Value (NPV) and Benefit Cost ratio criteria were applied judge the economic efficiency of each enterprises and sector. Net present value (NPV) of the project life is considered to be 10 years and discount rate for NPV estimation is 10% is given NPV and benefits as follows :-

Table – 22 : Present productivity income analysis :

S. No.	Name of Sector	Name of Crops	Produ- cti- on/ha.	Rate/ Qtl.	Cost of Production	Expend. of cultivation	Net income	B.C. Ratio between Col. 8 & 7
1	2	3	4	5	6	7	8	9
A	Agriculture	Urad	3.00	4500.00	13500.00	5450.00	6450.00	1:1
		Moong	3.00	4600.00	13800.00	6075.00	7425.00	1.12:1
		Jwar	4.80	600.00	2880.00	1584.00	1296.00	0.82:1
		Wheat	18.50	1000.00	18500.00	8650.00	7075.00	0.82:1
		Pea	7.50	2400.00	18000.00	10970.00	5905.00	0.54:1
		Mustard	3.50	2400.00	10150.00	3235.00	3240.00	1:1
Total		-				54105.00	51000.00	0.94:1
Average		-				6763.00	6375.00	0.94:1
B	Forestry	Vilayati Babool				15000.00	-	Nil
C	Horticulture	Ber				20000.00	-	Nil
		Aonla				20000.00	-	Nil
		Bel				20000.00	-	Nil
Total		-				60000.00	-	Nil
Average		-				20000.00	-	Nil
Grand Total						-		

Table –23 : Post productivity and income analysis for Post Productivity**Value and B.C.:**

S. No.	Name of Sector	Name of Crops	Produ- ction/ha.	Rate/ Qtl.	Cost of Production	Expend. of cultivation	Net income	B.C. Ratio between Col. 8 & 7
1	2	3	4	5	6	7	8	9
A	Agriculture	Urad	4.00	5000.00	20000.00	8325.00	11615.00	1.39:1
		Moong	4.00	5000.00	20000.00	8200.00	11800.00	1.44:1
		Jwar	5.50	800.00	4400.00	1900.00	2500.00	1.32:1
		Wheat	25.00	1000.00	25000.00	11680.00	13320.00	1.14:1
		Pea	9.50	3500.00	33250.00	14810.00	18540.00	1.12:1
		Mustard	5.00	3000.00	15000.00	4370.00	8130.00	1.86:1
Total		-	-	-	172250.00	72845.00	99765.00	1.38:1
Average		-	-	-	21531.00	9061.00	12471.00	1.38:1
B	Forestry	Vilayati Babool	80.00	500.00	40000.00	15000.00	25000.00	1.67:1
C	Horticulture	Ber	35.00	1500.00	70000.00	20000.00	32500.00	1.63:1
		Aonla	35.00	2000.00	70000.00	20000.00	50000.00	2.50:1
		Bel	40.00	1500.00	80000.00	20000.00	40000.00	2:1
Total		-			182500.00	7000.00	122500.00	2.04:1
Average		-			60833.00	20000.00	40833.00	2.04:1
Grand Total		-			1394750.00	147485.00	247265.00	1.68:1

Table –24 : Summary of NPV, PPV and B.C. Ratio (Sector wise) :

S. No.	Name of Sector	NPV		PPV		B.C. Ratio
		Expend.	Net Income	Expend.	Net Income	
1	2	3	4	5	6	7
1	Rain fed Agriculture	54105	51000	72485.00	99765.00	1.38:1
2	Forest/Fuel wood Plantation	15000	-	15000	25000	1.67:1
3	Horticulture	60000	-	60000	122500	2.04:1
Total		129105	51000	147485.00	247265	1.68:1

(9.3) Economics of Agriculture Sector :

The development cost can be recovered by the adoption of plan in present rain fed agriculture is being done on well maintained field, therefore does not require much investment. In rain fed agriculture, investment of Rs. 44.50 lacs is proposed to made is given as fallows :

Table – 25 : Economics of Agriculture Sector :

S. No.	Name of sector	Name of Activities / Plan	Treatble Area (Ha.)	NPV (Lacs)	Post Productivity Value (Lacs)	Benifit / Income	B.C. Ratio
1	2	3	4	5	6	7	8
1.	Rainfed	Soil, moisture and water cons works	560	29591	921.01	413.08	1:38:1

(9.4) Economics of forest fuel wood plantation :

Economic analysis of fuel wood plantation in the watershed. Project life is considered to be 20 years and discount rate for NPV estimation is 10 % is followed and as is given follows :

Table –26 : Economics of forest fuel wood Plantation :

S. No.	Name of sector	Comman Name of Plant	Area (Ha.)	NPV (Lacs)	Post Productivity Value (Lacs)	Benifit / Income	B.C. Ratio
1	2	3	4	5	6	7	8
1.	Forest Fuel wood sector	Vilayati Babool (Prasopis Juliflora)	25	2.5	6.675	4.675	1.67:1

(9.5) Economics of Horticulture Sector :

Economic analysis of Horticulture Plantation in agri-horti system and on wasteland patches of watershed project, life is considered about 15-20 years and discount factor rate for NPV estimation is 10% is follows :

Table – 27 : Economics of Horticulture system :

S. No.	Name of Sector	Common name of Plants	Area (Ha.)	NPV (Lacs)	Post Productive Value (Lacs)	Benefit Lacs	B.C. Ratio
1	2	3	4	5	6	7	8
1	Horticulture	Ber (zyziphus mouritana)	4.00	0.80	2.104	1.304	1.63:1
		Aonla (Embelica officianalis)	3.80	0.76	2.660	1.90	2.5:1
		Bel (Aegle marmelos)	2.20	0.44	1.320	0.88	2:1
Total			10.00	2.00	6.084	4.084	2.04:1

(9.6) Food requirement and sufficiency :

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

Table – 28 : Status of food requirement and availability of per annual :

S. No.	Name of Foods	Requirement Q./Yr.	Present Status		Expected Post Status	
			Availability Q./Yr.	Deficit or surplus Q./Yr.	Availability Q./Yr.	Deficit or surplus Q./Yr.
1	2	3	4	5	6	7
1	Cereals 110 Kg.	11053	9395	- 1658	18790	9937
2	Pulses 36.50	3668	2017	- 1651	6602	2934
3	Oil Seeds 29.20	2934	1174	- 1760	4698	1764
4	Vegetable 71 kg	9144	1829	- 7315	16459	7315

(9.7) Employment generation :

One of the major problem of the labour migration in watershed project. By the implementation of the project activities employment opportunities will be generated. However the changes in land use pattern and adoption of other subsidiary enterprise will generate employment opportunities in the watershed as given in table follows :

Table – 29 : Employment generation under proposed works :

S. No.	Employment activities/works	Area under work	Cost	Mandays generation (Nos.)			
				Unskilled	Skill	Total	Person
1	2	3	4	5	6	7	8
2	Graded Contour Bund	63	1.890	1890	-	1890	
3	Gully Plug, C.D.	105	7.875	5512	404	5916	
4	Submergence Bund	90	3.600	3600	-	3600	
1	Peripheral Bund	89	3115	3115	-	3115	
5	W.H.B.	110	9.950	5940	336	6276	
6	Renovation of Bund	68	2.040	2040	-	2040	
7	Reno. of W.H.B.	-	-	-	-	-	
8	Community Pond	-	-	-	-	-	
9	Afforestation	25	3180	636	-	636	
10	Horticulture	10	2.00	400	-	400	
Total		560	33600	23133	740	23873	

10. Formation of watershed committee :

Under compliance of common guideline Para (6.3) is followed and by the help of watershed development team, watershed committee is organized in the micro watershed village Teyore Bujurg with 10 members as prescribed in common guide line. List for organization of W.C. village details given as follows :

Table – 30 : Details of comprised village W.C. organization in M.W.S. :

S. No.	Particulars	Details	Block	Geographical Area
1	2	3	4	5
1	Micro watershed code	3B3E4d3e	Pahasu	622
2	Name of Gram Panchayat in M.W.S.			

Table – 31 : List of organized W.C. for the Gram Panchyat Uthravali in watershed.

S. No.	Name of selected members	Age	Representation Members from	Post	Qualification	Village
1	2	3	4	5	6	7
1	Shavir khan	42	Gram Sabha	8	Marit	Uthravali
2	Yadram	50	U.G.	Secretary	Inter	Uthravali
3	Ranvir	32	U.G.	Member	Ag. Engineer Diploma	Uthravali
4	Vijendra	38	U.G.	Member		Uthravali
5	Nasruddin	38	U.G.	Member		Uthravali
6	Rahish khan	29	S.H.G.	Member	B.A.	Uthravali
7	Pramod	40	S.H.G.	Member		Uthravali
8	Pavan Kumar	32	S.C.	Member	M.A.	Uthravali
9	Pramod Sharma	40	S.H.G.	Member	8	Uthravali
10	Sanjay Sharma	35	U.G.	Member	High School	Uthravali
11	Hemraj	39	Fram PLA	Member	Graduation	Uthravali

(10.1) Formation of Self Help Groups in M.W.S.

By the help of watershed committee and watershed development team self help group are formatted / organized. Families and persons are selected from poor, small and marginal farmers families, landless poor families, agriculture labour families, women, herdsman and shepherd and S.C. families in the formatted self help groups are given as follow :

Table – 32 : Ambedkar Pashupalan Self help group – Uthravali.

S. No.	Name of member in formatted SHG's	Age	From represented family	Name of proposed activities	Activation Position
1	2	3	4	5	6
1	Vittu	33	B-C	Livestock	New
2	Suresh	521	Baghel	Livestock	New
3	Pramod	28	Baghel	Livestock	New
4	Sunil Kumar	20	Baghel	Livestock	New
5	Pradeep	25	Baghel	Livestock	New
6	Rajeev	28	Baghel	Livestock	New
7	Tejvir	29	Baghel	Livestock	New
8	Omprakash	30	SC	Livestock	New
9	Sanjay Kumar	32	-	Livestock	New
10	Rajvir	33	SC	Livestock	New

Table – 33 : Self help group Utharavli – Buffaloes.

S. No.	Name of member in formed SHG's	Age	From represented family	Name of proposed activities	Activation Position
1	2	3	4	5	6
1	Shri Shavir khan	65	HS	Dairy	New
2	Shri Vasir khan	65	B.A.	Dairy	New
3	Shri Kalekha	25	8	Dairy	New
4	Shri Rahish	26	-	Dairy	New
5	Shri Raju khan	65	-	Dairy	New
6	ShriAsmohammad	40	8	Dairy	New
7	Shri Prem	50	-	Dairy	New
8	Shri Dinesh	40	-	Dairy	New
9	Shri Satish	30	8	Dairy	New
10	Shri Gopal	50	5	Dairy	New

Table – 34 : Self help group in Teyore Bujurg of watershed.

S. No.	Name of member in farmated SHG's	Age	From represented family	Name of proposed activities	Activation Position
1	2	3	4	5	6
1	Mukesh Kumar	35	Inter	Livestock	New
2	Jayprakash	50	HS	Livestock	New
3	Satish	45	Inter	Livestock	New
4	Tekchand	30	Inter	Livestock	New
5	Jagdish	40	HS	Livestock	New
6	Pravesh Kumar	40	Inter	Livestock	New
7	Annu	47	Inter	Livestock	New
8	Ravi	28	Inter	Livestock	New
9	Vedprakash	45	HS	Livestock	New
10	Sarvan	55	HS	Livestock	New

Formation of User's Groups :

User's groups are farmated by the help of watershed committee and watershed development team in the micro watershed comprised villages. Formers which have land village are involved in the User's groups and they will be direct benefited as expected by the implementation of watershed project easy and convenienced condition are made to resource use between user's groups and they will be responsible to operate and maintenance for the created assets in the watershed. Nos. of farmated user's groups details are given as follows :

Table – 35 : Village wise user's groups

S. No.	Name of village	No. of groups	No. of farmers	Total Agri. Land	Area under treat-ment	Cost of essets
1	2	3	4	5	6	7
1	Uthravali	18	265	238.360	272.36	
2	Asrauli	19	270	278.64	289.64	
3	Nawada	5	75	73.00	32.00	
4	Rampur	3	41	32.00	16.00	

10. Estimation and Costing of Proposed activities of the watershed Project Year 2009-10.

Proposed works / activities for the Project Period (Year 2010-11) under proposed treatable area 560.00 Ha. Out of total Geographical area 622.00 Ha.

(10.1) Financial and Physical Outlets :

Table – 36 : Financial and Physical Outlets for the Year 2009-10 :

Sl. No.	Components	Unit cost per ha.	Physical ha.	Financial (Lacs)			Man-days Generation
				Labour Component	Material Component	Total	
1	2	3	4	5	6	7	8
A	Management Cost 10%						
1	Administrative Cost – TA & DA Hiring of Vehicles, Official Expenditure Electricity & Phone bill Computer, Stationery and office consumable materials & contingency	1200	-	-	6.720	6.720	-
2	Monitoring	120	-	-	0.6720	0.6720	-
3	Evaluation	120	-	-	0.6720	0.6720	-
	Sub Total	1440		-	8.0640	8.0640	-
B	Preparatory Phase 10%						
1	Entry Point Activities 4%	480	-	0.5376	2.1504	2.688	538
2	Institutional & Capacity Building 5%	600	-	-	3.360	3.360	-
3	Detailed Project Report 1%	120	-	-	0.672	0.672	-
	Sub Total	1200	-	0.5376	6.1824	6.720	538
C	Watershed Work Phase						
a	Watershed Development Works						
1	Graded, Contour & Field Bunds	3000	63	1.890	-	1.890	1890
2	Gully Plug, Earthen Checkdam /WHS	7500	105	5.5125	2.3625	7.875	5916
3	Submergence bunds	4000	90	3.600	-	3.600	3600
4	Peripheral Bund	3500	89	3.115	-	3.115	3115
5	Earthen Water Harvesting Bund	9000	110	5.940	3.960	9.900	6276
6	Renovation of existing Bunds	3000	68	2.040	-	2.04	2040
7	Renovation of existing W.H.B	-	-	-	-	-	-
8	Aforestation and Development of silvi postural system	12720	25	0.636	2.544	3.18	636
9	Dry Land Horticulture	20000	10	0.400	1.600	2.00	400
10	Community Pound (Renovation)	-	-	-	-	-	-
	Sub Total		560	23.1335	10.4665	33.600	23873
B	Livelihood Programme (Community Based) 7.620						
	Income generating activities through SHG's for landless and marginal farmers 10%						
1	Live stock development activities	200	-	-	1.1202	1.1202	-
2	Bee Keeping	100	-	-	0.5598	0.5598	-
3	Poultry Farming	200	-	-	1.1202	1.1202	-
4	Nursery Development	300	-	-	1.6800	1.6800	-
5	Vegetable Production	100	-	-	0.5598	0.5598	-
6	Milk Dairy Promotion Unit	200	-	-	1.1202	1.1202	-
7	Establishment of Vermi compost Unit	100	-	-	0.5598	0.5598	-
8	Sub Total	1200	-	-	6.7200	6.7200	-
C	Production System and micro Enterprises						
1	Crop production, diversification of agriculture and introduction of agro forestry	1170	-	-	6.552	6.552	-
2	Demonstration of improved composting system	390	-	-	2.184	2.184	-
	Sub Total	1560	-	-	8.736	8.736	-
D	Consolidation Phase 5% Sub Total						
	Sub Total	600	-	-	3.360	3.360	-
Grand Total		12000	-	23.6711	43.5289	67.200	24411

—: संकल्प पत्र :-

ग्राम पंचायत:- उटरावली, कोड सं०- 2B3E4d3e विकास खण्ड- पहासू जिला- बुलन्दशहर

यह कि आई०डब्लू०एम०पी० परियोजना में तैयार की गयी निर्माण की नयी सृजित परिसम्पत्तियों को ग्राम पंचायत एवं माइक्रोवाटरशेड के अन्तर्गत सम्मिलित ग्रामों में योजना क्रियान्वयन कराने एवं योजना उपरान्त चालू रखने तथा सुजित परिसम्पत्तियों के अनुरक्षण हेतु कृत संकल्प एवं इच्छुक है।

उटरावली ग्राम पंचायत के सभी स्रोत स्थल जैसे तालाब ग्राम सभा गोचर (चारागाह) जल संसाधन, जंगल आदि में भूमि विकास परियोजना के अन्तर्गत किये जायेंगे। उन कार्यों को समाज के कमजोर वर्ग जैसे अनुसूचित जाति/जनजाति, महिला वर्ग एवं अल्प भूमिहीन गरीबी रेखा के नीचे के लाभार्थियों को लाभ पहुंचाने हेतु इच्छुक होंगे।

हम योजना संचालन हेतु प्रस्तावित करते हैं एवं सहमति देते हैं कि भारत सरकार के समस्त मार्गदर्शी सिद्धान्तों के अनुपालन में कार्य सम्पन्न करायेगे। यह भी घोषित करते हैं कि चयनित क्षेत्र जिसको मेरे द्वारा भलीभाँति देखा गया है, और प्रस्तावित योजना में प्रस्तावित समस्त कार्य 15 सालो से नही कराया गया है। जिसकी मुझे पूर्णरूप से जानकारी है और अनुमोदन करते हैं।

सुरेश चन्द राकेश कुमार

सुरेश चन्द

कर्मचारी

ग्राम पंचायत

किशनपाल

उपप्रमुख

उज्जैन कुमार

महेश कुमार

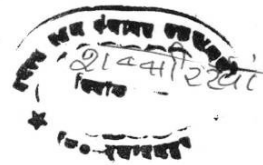
चौधरी

पुष्प

सुरेश चन्द

कर्मचारी

ग्राम पंचायत



ग्राम पंचायत
21 अप्रैल 2018

PROJECT AT A GLANCE

IWMP-II (Bulandshahar)

1	State	Uttar Pradesh
2	Distt.	Bulandshahar
3	Block	Pahasu
4	M.W.S. Code	2B3E4d3d
5	Name of M.W.S. Project	Nagla Amarpur
6	Involved Village	N. Amarpur, Anauna Asroti, Jagdishpur, Surjawali
7	Geographical Area of M.W.S.	468 Ha.
8	Rainfed Area	395
9	Treatable Area	413
10	Weightage	
11	Cost of Project	
12	For the year	2010-11

Budget Components

S. No.	Components	Area (Ha.)	Cost (in Lacs)
1	2	3	4
1	Management Cost 12%	-	5.9472
2	Preparatory Phase 10%	-	4.9560
3	Watershed Work Phase	-	-
	A- Watershed Development Works 50%	413	24.780
	B- Livelihood Programme (Community Base) 10%	-	4.9560
	C- Production System & Micro Enterprises 13%	-	6.4428
4	Consolidation Phase 5%	-	2.4780
	Total	413	49.5627

Executive Summary of the Project

Identified selected micro watershed project Nagla Amarpur is coded as **2B3E4d3d** has been proposed from cluster of I.W.M.P. Bulandshahar – II project in Pahasu Block district Bulandshahar five villages namely Nagla Amarpur, Anauna, Surjawali and Asurauti is comprised in the micro watershed which is located in the east of district Bulandshahar on the west bank of River Kali Nadi and border of district Badaun area is known as Khadar. It lies between 28° -5' and 15° -5' N Latitudes and 78° -E and 78° -15 N Longitudes Covering area. Its altitudes ranges from 181 meter to 190 meter above the mean sea level. Khurja Railway Station 184.11 m, Bulandshahar Railway station is 201.18 m above mean sea level is displayed. Project area of I.W.M.P. BSR-II is lied in the Pahasu Block of Bulandshahar District which is come in the western plan zone under semi arid area. The annual average rainfall is near to 397 mm which an average of 35 rainy days. Out of which about 85% is received during the mansoon season from July to September and very less rainfall is received in the winter season.

Temperature ranges from as high as 42°C in the May-June to as 3°-4°C during December – January. The Trend of rain fall is highly erotic and maximum water goes as runoff.

Main occupation of the dwellers is agriculture in the watershed. Some part of the lands are shown during the Kharif season. Cane sugar are preferred crops in the project area. The main Crops raised are Wheat, Pea & Mustered & Maize

The topmost portion of the watershed is sloppy flat land. Other than topmost portion of the watershed is under soil erotic portion and depreciative. The soil of the land are sandy loam Soil. The middle agricultural position of watershed relatively smooth sloppy flat land with sandy loam soil texture. These soil is yellow in colour and are inherently good in fertility status.

Natural vegetation of the watershed is very poor. Somewhere forest vegetation is seen which are predominant with Vilayati Babool (*Prosopis Juliflora*), followed by Babool (*Accasia nilotica*), somewhere Neem Plants (*Azadirachta Indica*), Shisham (*Dolbergia Sisson*) and Karanj (*Pongamia Glabra*) are seen in occasional occurrence. There is no grass land in the watershed. Somewhere grass patches are seen only on the bunds, road sides and other such places. Coverage of massive green belt is in poor percentage for environment which is envisaged. That watershed is very poor climate area.

There is normal condition of animal physics and for their fodder arrangement is the watershed and creative possibility would be expected by the implementations of the project.

Due to Arial soil erosion poor harvesting managements, cropping pattern, non treated watershed etc. are very anti effective causes for the watershed. Problem of the watershed is to be

tackled by harvesting structures which have lost most of their capacity new water bodies for the prevention of erosion and conservation of soil and moisture various type of earthen bunds in the watershed field, necessity has been observed. Wasteland will be treated with staggered Trenches, afforestation and bunding for the changing of characteristics.

The detail project report has been prepared by the applying of nine process steps for the micro watershed code no. **2B3E4d3d** brief is as follows.

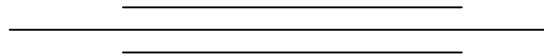
- STEP-1 Secondary data collection:-** During the five days visit programme in the micro watershed project with of all available documents of village label by approaching the Gram panchayat collected secondary data.
- STEP-2 Village meeting & conducting PRA exercise:-** Community meeting conducted on five days for the consultation with villagers for the PRA Exercise. Participatory mode of the villages was positive indicated for the success of programme. With good in testing participation has been drawn social & resource map on ground & paper & discussed various topics of problematic thoughts in the micro watershed.
- STEP-3 Socio economic survey:-** The resource organization of village label volunteers identified to conduct house hold socio economic survey/states.
- STEP-4 Problem typology analysis:-** Thoroughly analyzed the data & identified problem type as soil & moisture conservation, crop rotation, crop coverage, productivity, livelihoods, social issues & capacity building gaps etc. Problems discussed with the watershed committee & came up with alternative solution.
- STEP-5 Conduct of net participatory planning (NPP):-** The planning team visited together in the planning blocks on the scheduled date along with the beneficiaries of the villages & data gathered as for the participatory net planning.
- STEP-6 Productivity & livelihood planning exercise:-** For the product livelihood exercise, group discussion on various livelihood as Agriculture, Animal husbandry enterprise development held discussion with the villagers in the micro watershed.
- STEP-7 Institutional & capacity building :-** This plan is prepared based on the data available in the field and consultations with the watershed committee.
- STEP-8 Data consolidation & documentation of DPR :-** After gathering all required information compiled collected data. Thoroughly discussed and finalized the expected outcomes and benefits specially in the respect of livelihood for different segments. These are the target and performers indicators for the micro watershed.
- STEP-9 Conduct of Gram Sabha obtaining approvals submissions of DPR:-** After preparation of the draft DPR convened to Gram sabha and activities proposed expected

outcomes benefits of implementing the programm are explained in case of any changes are proposed in the Gram sabha approval obtained by the Gram sabha and already singed of Mau paper.

STEP-9A Attachment of detail estimate, cost and design:-Estimating, Costing and design prepared technically According to plan in the micro watershed project. And attached with the DPR.

STEP-9B Various type of mapping :- DPR prepared in the support of micro watershed project using various type of maps is as follows :

- | | |
|--------------------------------------|-----------------------------|
| 1.Index Map of Watershed | 2. Watershed Map |
| 3. Relief/ Drainage Map | 4. Slop Map |
| 5.Soil and Land Capability class map | 6. Land use/ Land Cover Map |
| 7. Cadastral map | 8. Proposed Action Plan map |
| 9. Social Map | |



Project Report

Table – 1 : Micro watershed project brief : -

1	State	U.P.
2	District	Bulandshahar
3	Block	Pahasu
4	Comprised Villages (Nos.)	04
5	Name of Watershed	Nagla Amarpur
6	Name of MWS Project	Nagla Amarpur
7	MWS Code No.	2B3E4d3d
8	Geographical Area of MWS	468.00
9	Treatable Area	413

1- Project Objectives :- The aim and objectives of the Project are :

- o- Conservation, development and sustainable management of natural resources including their users.
- p- Enhancement of agriculture production and productivity in a sustainable manner.
- q- Restoration of ecological balance in the degraded and fragile rain fed ecosystem.
- r- Reduction in regional disparity between rains fed and irrigated area.
- s- Creation of sustainable employment opportunities for the rural community for livelihood security.
- t- Generation of massive employment.
- u- Reduce migration from rural employment.

2- Major Problem of Project Area :

- m- Actual shortage of drinking water.
- n- Near to nil activated water bodies and water harvesting structures.
- o- Low depth of ground water table.
- p- Undulated and generally sloppy rainfed area.
- q- Large number of Small, Marginal and S.C. farmer land holding.
- r- Lower wages of agriculture labour and also migration of labour due to shortage of employment in the watershed.

3- General Description :

(3.1) Location :-

Farida Watershed has been taken with MWS Code No. **2B3E4d3d** in Pahasu Block of Distt. Bulandshahar is located on Khurja via Shikarpur Syana to Pahasu road about 25 Km. between 28°15' and 28°10' N Latitudes and 78°0' and 78°5' N Longitudes. Location and delineation of watershed has been located on watershed map **Fig. 2** and on top sheet **Fig. 3**.

(3.2) Area and Elevation :

Elevation ranges from 181 to 208 mtr. above the mean sea level(MSL) altogether comprised villages and their's area is described as follows.

(Comprises village map Fig. 3)

Table – 2 : Area and Elevation

Sl. No.	MWS Code	Block	Name of Village	Geographical Area	Treatable Area
1	2	3	4	5	6
1	2B3E4d3d	Pahasu	Nagla Amarpur	185	165.00
			Surjawali	71	30
			Anauna	182.00	175
			Ausroti	30	43
				468.00	413.00

(3.3) Shape of the Micro Watershed:

The shape of watershed is Elongated and as Rectangular. The maximum length and width of the watershed are 5000 Mtr. and 1814 Mtr. respectively with the Length: Width ratio of 2.76:1.

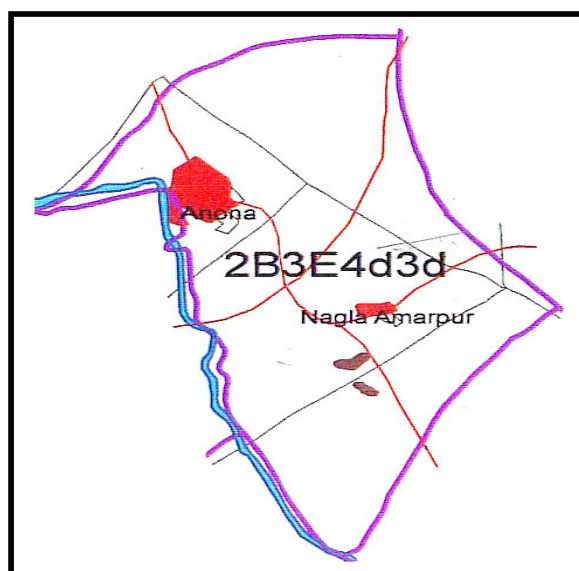


Fig. 1 (Shape of Micro Watershed)

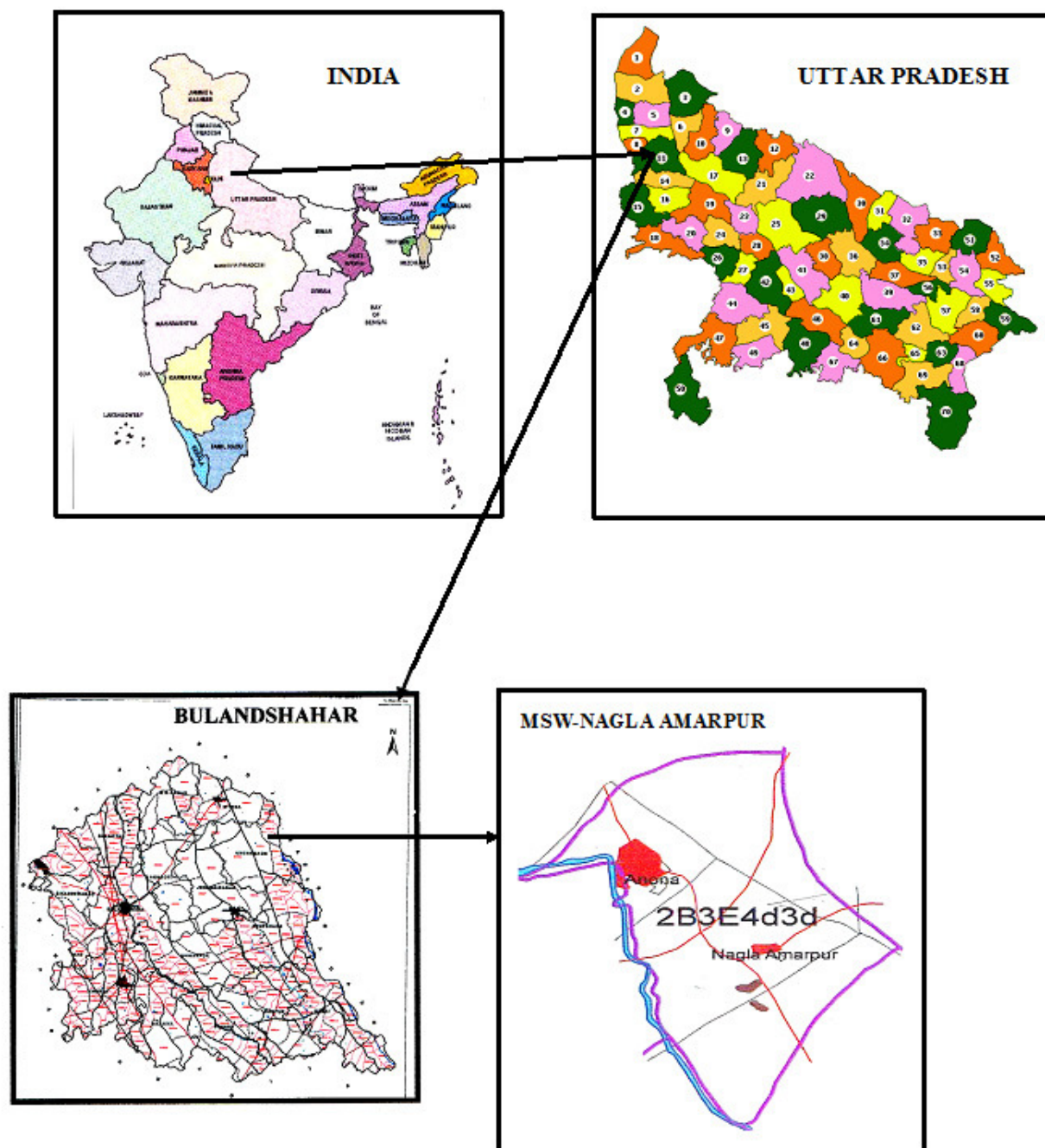


Fig.- 2 Location of the Micro Watershed

2B3E4d3d (MWS Project – N. Amarpur)

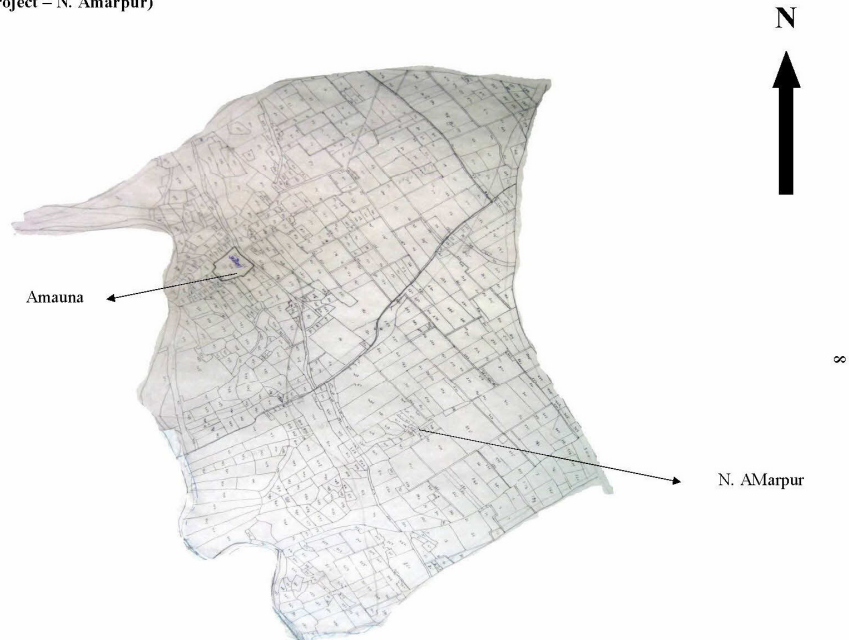


Fig No.-3 Cadestal Map (Located Comprised Villages)

Sl. No.	Name of Project	Name of Village	Geograph ical Area (in ha.)	Raifed Area (in ha.)	Treatable Area	Agri. Land
1	2	3	4	5	6	7
1	Nagla Amarpur	Nagla Amarpur	185	156.25	165	163.18
2		Surjawali	71	56.00	30.00	32.10
3		Anauna	182	162.25	175	162.26
4		Asrauti	30	20.50	43	57.48
Total			468	395.00	413	415.02

(3.4) Climate :

The Watershed falls under semi arid region of tropical climate inclined in Western Plan Zone. The average annual precipitation is about approx. is 397 mm. spreading over 35 rainy days. Most of the rain fall (about 85%) is received during July to September. The rain fall of moderate intensity. Nothing the area receives of scarcity rainfall in the winter season. The temperator variation ranges from as high as 42⁰c in the month of May-June to as low as 4⁰c in December-January.

(3.5) Geomorphology and Soils :

Geomorphology :

The entire watershed is topographically divided into major landforms. Accordingly the soils of watershed can be grouped into various categories such plane land, undulated land, sloppy land and erosic ravenous land.

Soil :**(a) Fine textured soil :**

The soil are the most extensive soil group found in the watershed. Some portion of the watershed is relatively sloppy flat land with fine soil texture as sandy loam. The soils are in color and are inherently good high in fertility status. Soil texture is sandy lome loam particularly in depressions and loam in the elevated portion. The soil characteristic texture is dispersive and smooth. Therefore without impeded the downward movement of water productive layer of soil are easily by high runoff.

a- Coarse Textured Soil :

These soil are lying mostly in downward portion, along with erosic gully and drainage line upto end of watershed outlet. These soils are coarser in texture and are relatively poor in fertility status. The soils are lomy sand in texture. Rill and gully formation in same parts particularly near the outlet of watershed can be seen.

(3.6) Drainage and Slope:

Due to prevalence of mild steep slope and presence of a number of drainage lines in the watershed the drainage system is adequate. The watershed from part of Ganga Basin and watershed. Under mild to steep topographical slope of MWS as divided as follow : (Drainage and slope map fig.-4)

Table - 4 : Drainage and Slope

S. No.	Grade	Slope Percent	Area in Ha.	Remark
1	A	0.5-1	138	-
2	B	1-2	102	-
3	C	2-3	81	-
4	D	3-4	54	-
5	E	4-5	25	-
6	F	5-6	13	-

(3.8) Human Population:

a- Human Population:

Total Population of involved villages in watershed is 8936 with average family size of six persons as detailed as follows

Table – 5 : Human Population

S. No.	Name of village	Nos. of families	Human Population			Total
			Male	Female	Children	
1	Nagla Amarpur	385	1766	1567	508	3841
2	Anauna	345	1407	1262	409	3078
3	Asrauti	307	1204	1109	207	2520
4	Surjawali	461	1778	1643	1140	4561
		1498	6155	5581	2264	14000

d- Categorization of Human Population :

In the total population of watershed villages, categories are defined as below :

Table – 6 : Population Categories

S. No.	Particulars	Unit	Number of families in population in the villages		
			Population	Family	Remark
1	2	3	4	5	6
1	Agri Farmer	No.	1742	290	
2	Landless	No.	242	40	
3	Agri. Labour	No.	327	55	
4	Land less Labour	No.	204	34	
5	BPL Family	No.	39	39	
6	SC Family	No.	1772	295	
7	ST Family	No.	-	-	
			4326	753	

(3.9) Land Holding :

All the categories of farmers as small, marginal, medium and large are involved in land holding average of about 1-18 ha. Small land holding farmers are further scattered at different places which makes cultivation very difficult. Distribution of farm families according to the size of the land holdings are given as below :

Table – 7 : Distribution of farm families according to their size of land holdings

S. No.	Name of Village	Total Agri. Land in MWS	Land Holding Family (Nos.)					Percentage
			Marginal (< - 1Ha.)	Small (1-2 Ha.)	Medium (2-4 Ha.)	Large (4-7 Ha.)	Total	
1	Nagla Amarpur	163.18	95	52	11	-	158	
2	Anauna	32.10	22	8	2	-	32	
3	Asrauti	162.26	92	36	7	-	135	
4	Surjawali	57.48	31	21	3	-	62	
Total		415.02	240	118	23	-	387	

(3.10) Live Stock Population :

Total live stock population of the watershed is 3848 Nos. Buffalos is preferred as mulch animal compared to Cow. But milk yield is poor. Goats are also kept for milk as well as for meat purpose. The breakup of livestock population is as follows :

Table – 8 : Live Stock Position

S. No.	Name of Village	Unit	Live Stock Position				Total
			Buffaloes	Cows	Bullocks	Goats	
1	Nagla Amarpur	No.	622	312	48	26	1008
2	Anauna	No.	683	298	36	49	1066
3	Asrauti	No.	709	295	95	51	1250
4	Surjawali	No.	718	177	117	231	1243
Total			2732	1182	296	357	4567

(3.11) Infrastructure Social Feature :

- a- Comprised villages in the micro watershed has moderate communication facilities. Watershed linked with metaled road and approachable through motarable road.
- h- All the villages are electrified and have T.V. and Telephone connection.
- i- Literacy rate in the watershed is very low all villages are having education upto Junior High School.
- j- Nearest small market is at Sayana 13 Km. Nearest big market Bulandshahar is about 55 Km. from watershed. Religious and ritual features are almost common as in other parts af U.P. small land holding with large family size and more than 25% of the labour force of the total population living below poverty line indicate poor socio economic status of the watershed community.

Participatory Rural Appraisal

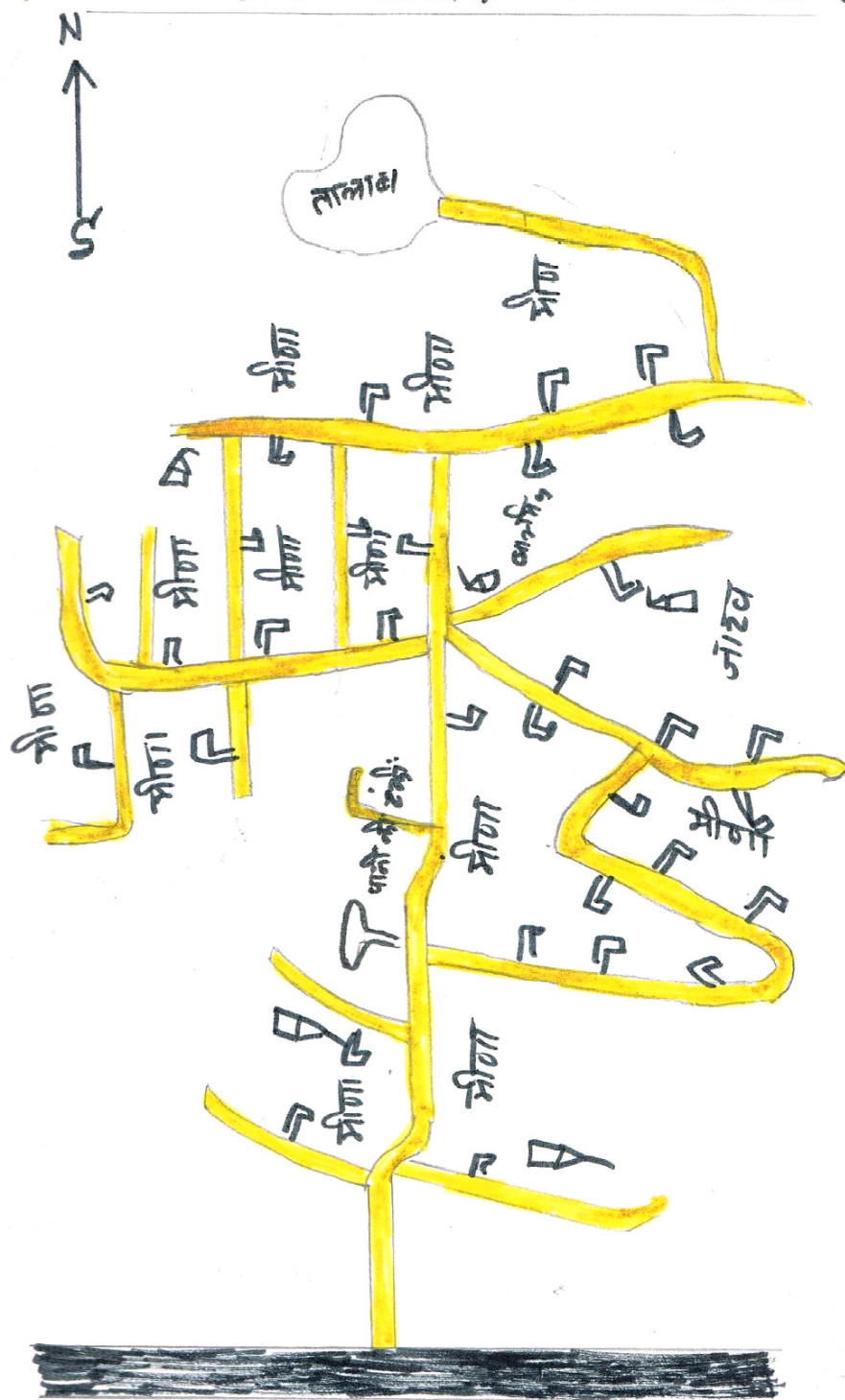
Participatory mode of the villagers shows positive indication for the success of the programme. Traditionally the entire village community participate in the individual works. Social map of one of the watershed village drawn by villagers themselves, depicting various village figures is shown in sketched map in Fig.-4 & 5. Infrastructures position of the village recorded as follows :

Table – 9 : MW.S. Project – Farida

S. No.	Infrastructure	Unit	Qty.
1	2	3	4
1	Primary School	No.	1
2	Junior High School	No.	1
3	Kanya Pathshala	No.	-
4	Public Health Center	No.	-
5	Vet nary Hospital	No.	-
6	Panchayat Ghar	No.	1
7	Post Office	No.	-
8	Agan Bari Center	No.	3
9	Electricity	-	Yes
10	Road	-	No
11	Pond	No.	2
12	Hand Pump	No.	11
13	Irrigation Well	No.	-
14	Canal	No.	-
15	Temple	No.	3
16	Well (Drinking Water)	No.	7
17	Pumping Set	No.	40
18	Toilet	No.	149
19	Market	No.	-

SOCIAL MAP

સામાજિક માહિતી ગત - નગરા અમરપુર



શિખરપુર ને જાદાનુ રોડ

Recorded importance of development institution

Farmers perception recorded for importance and role of different development institution in relation to infrastructure. Importance has been depicted with size of circle and role with distance from village circle. (Fig 8)

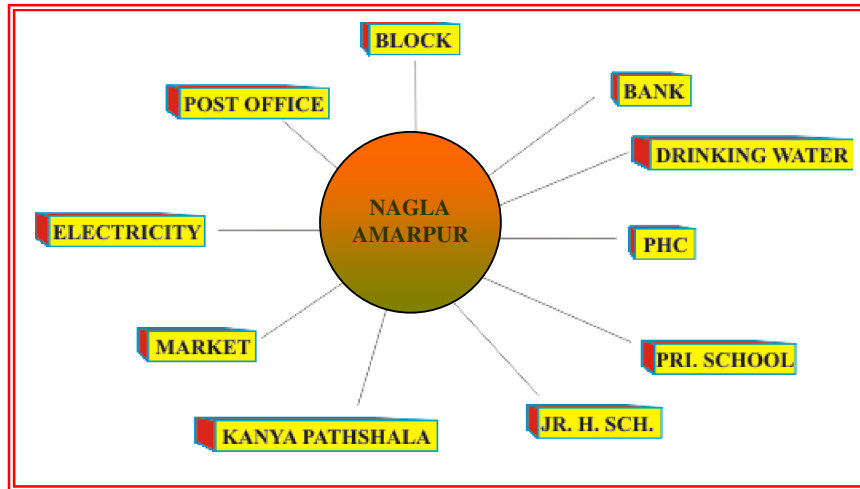


Fig. -8 (Venn diagram of Micro watershed)

(3.12) Communication :

Watershed can be approached from District Headquarter Bulandshahar to Project area 35 km. by Road.

(3.13) Natural Resource Base :

Transact of watershed showed typical land use profile consisting of plain agriculture land, erodic area and medium ravenous ridge. Main source of the irrigation are the canal for pre showing irrigation only. The total geographical area of the watershed is 468.001 Ha. classification .

Approach roads for the micro watershed is shown for the communication is shown on topo sheet map Fig 9 as next page.

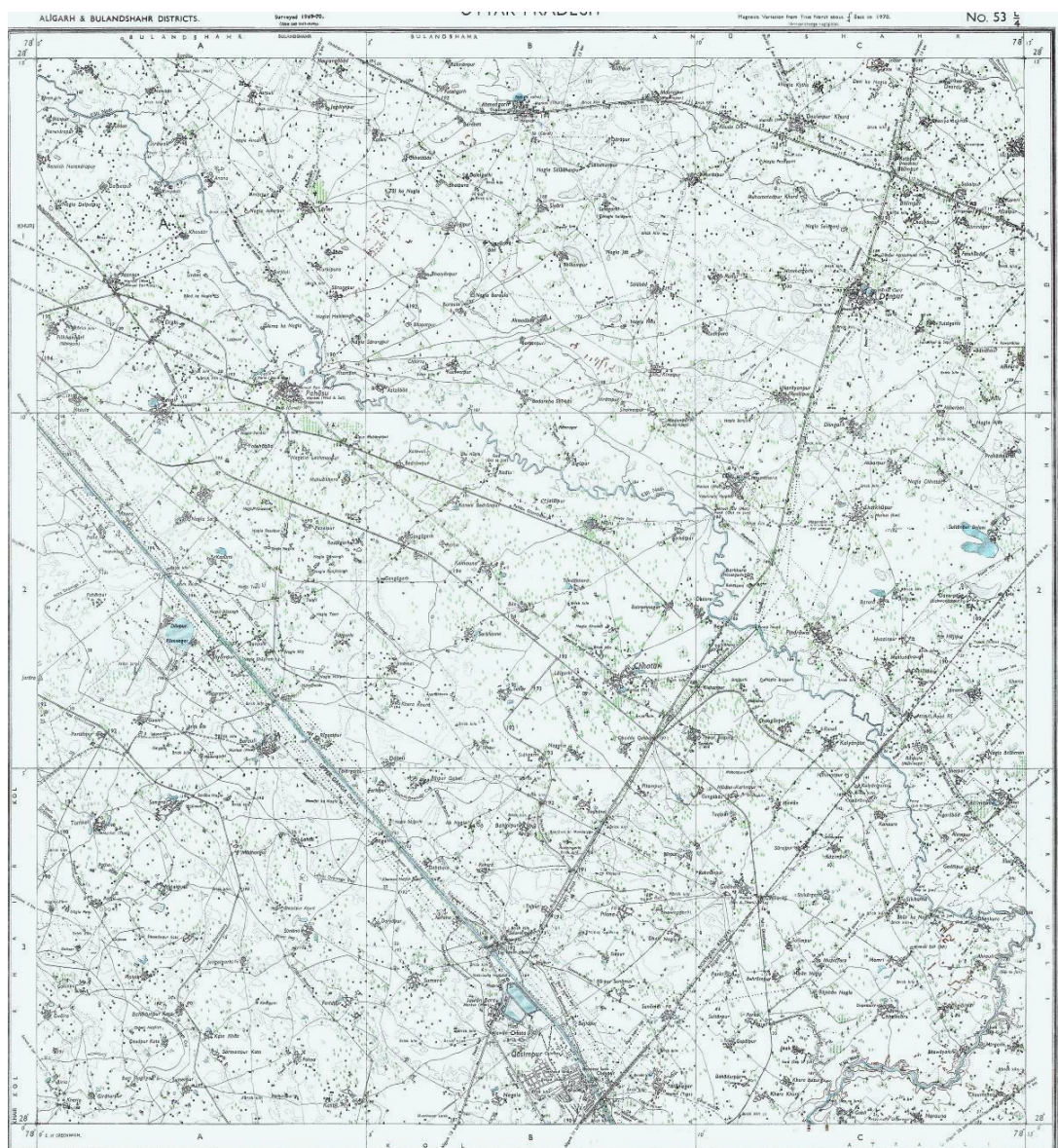


Fig.- 7 Communication Map on Toposheet

Table – 10 : Classification of area(Hect.)

S.N o.	Name of Village	Unit	Total Geographical Area	Rainfed Area	Wasteland	Village Land and Road	Irrigation Resource	
							Water Bodies	Borewell
1	2	3	4	5	6	7	8	9
1	Nagla Amarpur	Ha.		335.15	26.16	9.41	30.35	32.94
2	Anauna	Ha.		120.37	19.60	15.18	8.13	12.66
3	Asrauti	Ha.		79.48	16.140	9.62	9.81	6.77
4	Surjawali	Ha						
Total			669.24	535.00	61.90	34.21	48.29	52.37

(3.14) Livelihood :

Total Population of the watershed is 8936 and out of the total population a majority more than 80% has farming as their major source of livelihood followed by labours, serviceman and small business class. Classified livelihood given in form as follows :

Table – 11 : Livelihood Classification in population :

S. No.	Name of Village	Farmer	Labour	In Service	In Local small business	Others
1	2	3	4	5	6	7
1	Nagla Amarpur	216	248	107	17	-
2	Anauna	185	305	32	18	-
3	Asrauti	32	204	38	14	-
4	Surjawali	60	190	45	8	-
	Total	493	947	222	57	-

(3.15) Dependency of forest fuel wood and fodder :

- a. **Fuel wood :-** The main source of fuel is from cow dung cake, woody stem of crops. About 70% of the domestic energy requirement is met from the agriculture by product and cow dung cake. Rest is met out from the forest outside the village and watershed boundry, most preferred fuel wood is Juliflora fuel wood Juliflora obtained from standing along and between watershed.
- d- **Fodder :-** Villages have not any sufficient signified dependency on forest based fodder as these resource are nothing availability in the forest.

(3.16) Labour requirement :

Labour requirements was found to be maximum at the time of October, November and December when the sowing of Rabi crops are done. The crucial periods are March and April coinciding harvesting and threshing of Rabi crops and July/August is sowing Kharif Crops take a little place. Other income generating enterprises having potential during the remaining.

(3.17) Crop Rotation :

Present Crop rotation in the watershed comprise of :

Kharif	-	Bajra	-	Rare
		Maize	-	Rare
		Jwar	-	Rare
Rabi	-	Fallow Wheat	-	Major
		Fallow Barly	-	Major
		Fallow Sugarcane	-	Major
		Fallow Mustard	-	Major
Zayad	-	Urad, Moong, Makka		

The above said Rabi Crops is the most prevailing crop rotation on the agriculture lands both in the rainfed and irrigated conditions.

Organized vegetable cultivation fruit plantation and traditional agro forestry systems are lacking as per requirement in the watershed the limited vegetable cultivation in the watershed is confined as kitchen gardens and field to the irrigated condition in a scattered manner. The cultivation of cash crops other than the sugarcane, wheat and mustard also in the watershed.

(3.18) Historical Events :

Chronological record of important events of the watershed village is prepared through participatory rural appraisal (PRA) which is very useful in understanding of its background and chronology is given as follows :

Table – 12 : Historical Events

S. No.	Events/Activities	Year	Rem.
1	2	3	4
1	Established	1650	
2	Opening of Primary School	1971	
3	Opening of Junior School	2003	
4	Opening of Kanya Pathshala	-	
5	Opening of PHC	-	
6	Opening of Vet. Hospital	-	
7	Panchayat Ghar	2005	
8	Introduction of Tractor	1982	
9	Gobar Gas Plant	-	
10	Thresher	1984	
11	First Tube well/Pumpset	1980	
12	First Motorcycle	1988	
13	T.V. & D.V.D. Players	1994	
14	Electricity in Village	1996	
15	Bituminous Road	2005	
16	First Hand Pump	1962	
17	Templo Renovation	1996	
18	First Land Line Telephone	2001	
19	Planning for Watershed Project	2010-11	

(3.19) Present Land Use in the Watershed :-

The watershed has diversified land uses. The varied present land use under different use in the watershed. The mixed land use followed in the watershed is almost similar in other parts of U.P. During P.R.A. Exercise prepared land has been shown in Table No. 13, 14 & 15.

Table – 13 : (Ownership)

S. No.	Name of Village	Pvt. Agri. Land		Govt. Revenu Land	Forest Land	Other Land
		S.C./S.T.	Others			
1	2	3	4	5	6	7
1	Nagla Amarpur	32.40	100.70	-	-	51.90
2	Anauna	28.03	106.67	-	-	47.30
3.	Asrauti	3.06	28.94	-	-	-
4.	Surjawali	9.14	53.86	-	-	-

Table –14 : (Present Land under different categories)

S. No.	Name of Village	Land Use (Ha.)				
		Agricultural	Wasteland (All Types)	Seasonal waterbodies	Village/Raod Etc.	Total
1	2	3	4	5	6	7
1	Nagla Amarpur	172.26	10.68	-	2.06	185.00
2	Anauna	179.62	1.34	-	1.04	182.00
3	Asrauti	18.01	9.75	-	3.24	38.00
4	Surjawali	59.55	2.25	-	1.20	63.00
Total		429.08	24.02	-	7.54	468.00

Table – 15 : (Present land use classified)

S. No.	Land Use Under	Unit (ha.)	Area (Ha.)	Percentage
1	2	3	4	5
1	Under Agriculture			
	A- Rainfed-			10%
	I- Crops		245.48	
	II- Agro forestry		5.35	
	B- Irrigated-		-	20%
	I- Assured		26.34	
	II- Portial		49.50	
2	Wasteland			
	A- Aforestation			
	B- Pasture			
	C- Untreatable			
	D- Treatable		51.27	

Proposed Post Land Use has been given on Page No. 32

4- Focus on Present Land Use :

(4.1) Agriculture :

The total area under agriculture in the watershed is about 415.02 ha. out of which 906.61 ha. is under rainfed agriculture. Agriculture land uses in the watershed extended to diversified land capabilities starting marginal to good class II land. The irrigated and drinking water is most scarce natural resource in the watershed. The operation of tube well 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 of the watershed area. The agricultural field bund are common in the watersheds however they frequently breach on heavy rains.

Various mixed texture of soils are located in patches through out the watershed. The heavy soils are almost kept fallow during rainy season. the agricultural soils also have some as share calcium pan at variable depths. The irrigation water is conveyed by the earthen channels. Surface irrigation methods following mainly border method of flood method by the formers in the watershed. These factors reduce the water use efficiency of limited and valuable irrigation water.

Drought hardy species like Juliflora suitable multi purpose trees is suitable for rehabilitation of the wasteland. Rehabilitation of waste lands promoting agro forestry with appropriate fruit and forest species suitable vegetative barriers on sloppy lands can be high future value and by these adoption would be meet out many demands of fire wood and fodder in the wasteland. Except above but also for soil and water conservation, rehabilitation of wasteland and sustainable income generation for socio-economic upliftment of farmers.

Crop Productivity :

The farmers also do not have suitable cropping system to deal aberrant weather. Weeds impose considerable constraint in productivity of both Karif and Rabi crops under irrigated as well as rainfed production system farmer undertake normally one manual weeding in mustard and other valuable crops however, practices is energy and time consuming. Use of we decide is rare in the watershed.

In the watershed area, limited cropping in the Kharif with mixed cropping practices is not only irrigational but also unscientific and best for low productivity. Subsequent Rabi crops in general. Sugarcane & Mustard crop in particular are raised on residual soil moisture under rainfed production system during post monsoon season.

(4.2) Indigenous Technological Knowledge (ITK) :

Under process of PRA tracked out rural applying technology in various field of local technology and some technology is very popular in village. In which the agriculture is an old traditional practices of farmers who have improved themselves with passage of the time according to their domestic needs and technological reforms in the nearby areas. The villages have their traditional village ponds, practice of field bunding which typically constitute agricultural related ITKs in the watershed. The Mustard & sugarcane being a cash and firewood crop of the watershed and also sugarcane crop is being. Cultivated in self designed manner by the farmers. Its carried out that the area is totally depend on rain

and under the rainfed area technology is applied by the farmers. However limited fertilizer application specifically the DAP came in the practices since about 15-20 years.

(4.3) Forest and Other Vegetation :

Forest :

The watershed have a tract of wasteland area which are under uncultivable position is liesed in the watershed. These wasteland have not any tree vegetation or very less than real requirement for the wasteland use.

Horticulture/Agro forestry :

Horticulture and agro forestry practices were observed in the watershed.

(4.4) Agro forestry :

Agro forestry practices are lacking in the watershed. Though it has good potential under existing disposition and may a role particularly with respect to minimization of cropping risk, built up soil fertility and productivity, protection of soil erosion, soil conservation partly meeting out the fire wood demand of rural community and more over optimizing the economical return from system as whole under typical semi arid climate in the watershed. Bund and boundary plantation also have good potential to care the fire wood and fodder demands of the rural community in the watershed. The existing area under agro forestry is almost negligible. Prosopis Jhliflora may be planted as block or sole plantation specifically on marginal and degraded land in the watershed.

The agro forestry interventions comprising of ber, bail, aonla, guava, papular etc. may be applied for benefit of the farmers under rainfed to irrigation production system on leveled to slopping and marginal agricultural using proper planting techniques and term it control measures.

The multipurpose trees may be also help in supplementing fire wood and fodder demands of the rural community in the watershed and my be planted as hedge rows on rainfed, marginal and degraded lands.

(4.5) Horticulture :

Fruits and vegetables practices are lacking in the watershed area. Its practices may be sustainable very good potential for the formers of watershed. There are a limited lack fruit trees in number like mango, guava, lime, ber, aonla and papaya fruit trees well as vegetables like radish, okra, tomato, cabbage, garlic, onion, chilly, bringer and cucurbits but they are found surviving well in the watershed villages. Organized orchards (vatika) commercial vegetable cultivation horti-agri and other systems of agro forestry etc. are lacking but have good agriculture.

5. Soil and land capability classification :

(5.1) Soil Morphology :

Watershed is located North East corner of Bulandshahr Distt. near about 55 Km. away. The entire terrain of watershed is topographically divided into various land forms. Accordingly the soils of watershed have been grouped major categories is given as follow :

Hill Terrain	Plane Land Sloppy	Undulated Land	Rill Erosic Land	Moderate ravenous
-	35%	31%	19%	15%

Given categories in the blocks is located the soil morphology in the watershed areas. Representation of soil characteristics by soil profile is represented as follows :

Soil Profile :

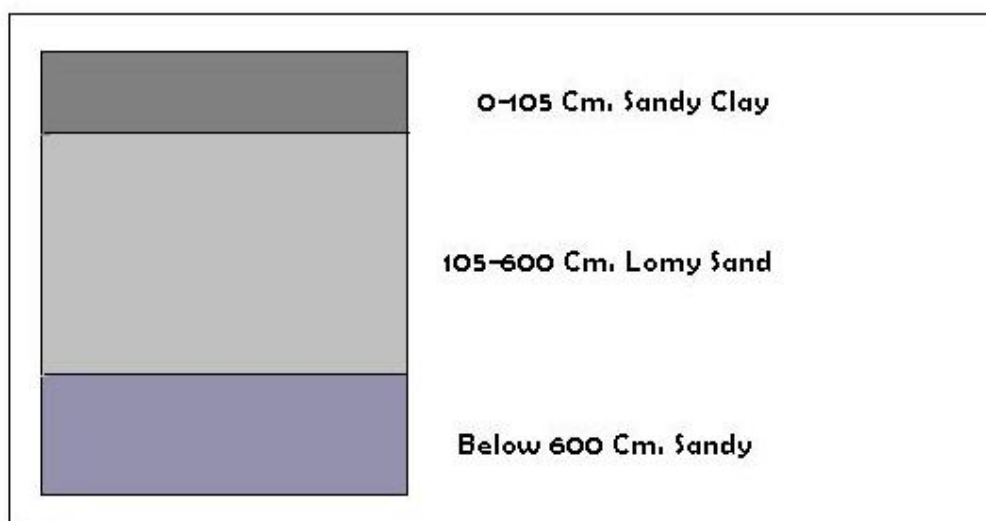


Fig. – 9 (Soil Profile)

Table – 16 : (Morphology of a Typical Soil Profile) :

Horizone	Depth in Cm.	Morphology
1	2	3
A V & H	0-150	Silky when moist, Hard when dry quick soluble, high elasticity, fissures, and cracks, occasional occurrence of free calcium carbonate granules black in colour, clay content 29%, PH- 8 to 8.7
B V & H	150-160	Whitish yellow in colour, very fine mixed with free cacaos and gravels, Hard when dry compact and indurate hard pan restricting development of root and down ward water transmission.
C V & H	7600	Red and white sand stone

(5.2) Soil and Characteristic and Fertility Status :

Soil characteristic pertaining to soil fertility of various classes accruing around villages in the watershed are given as follows :

Table – 17 : Soil Characteristic & Fertility Status :

Sl. No.	Soil Properties	LCC-II	LCC-III & IV
1	2	3	4
1	Sand %	47.04	75.04
2	Silt %	24.60	18.60
3	Clay %	28.36	6.3.6
4	Texture	Sandy Clay	Lomy Sand
5	PH (1:2)	8.41	8.67
6	Organic Carbon %	0.37	0.12
7	Available N Kg ha ⁻¹	316	173
8	Available P Kg ha ⁻¹	29	15
9	Available K Kg ha ⁻¹	189	325
10	EC (dS m ⁻¹)	0.47	0.12

(5.3) Land Capability Classification (LCC) :

Land capability classification (LCC) was done to classification the soils in different groups based upon the limitations and to emphasize the hazards prevailing in the 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. Classes of land capability namely II, III, IV and V are demarcated in the watershed. The areas under different classes are sown as follows :

Table – 18 : Land Capability Classification (LCC) :

S. No.	Land capability class	Area in Ha.	Colour
1	2	3	4
1	I Class	-	-
2	II Class	60.70	14
3	III Class	304.64	71
4	IV Class	42.90	10
5	V Class	21.47	5
6	VI Class	-	-
7	VII Class	-	-
8	VIII Class	-	-

Land capability classification of various agricultural practices under land use can be classified as groups, class, sub class and units. Utilization of various land class is given as follows :

Table – 19 : Utilization of various land uses

S. N.	LCC	Forestry	Ltd. Grazing	Light Grazing	Dense Grazing	Limited Agriculture	Light Agriculture	Dense Agriculture	More Dense Agriculture
1	I								
2	II								
3	III								
4	IV								
5	V								
6	VI								
7	VII								
8	VIII								

(5.4) Land Capability Class II & III :

This group is one of the most extensive LCC watershed. and also near to class III for the agricultural practices. The soils are sandy & sandy 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 & III. These lands potentially very productive but due to rainfed a single cropping pattern is in habitation.

(5.5) Land Capability Class IV :

This class is found in lower portion near the outlets of watershed. The soils are coarser in texture, deep, erosion hazard and undulating in topography. Rill and initiation of gully can be seen near the outlet of the watershed.

(5.6) Land Capability Class VII & VIII :

This class of land is not found in watershed. Somewhere lack of soil are found with admixture gravels fragments in these classes of lands.

(5.7) Conclusions :

The majority of land form is coming under class II, which give an insight of good agriculture production potential of the watershed.

The land capability classification provides reasonable good information with regard to capability of soil, that could be used for agriculture, agrihorticulture, silviculture and posture development.

The productivity of these lands could be further enhanced by adoption of simple soil & water conservation measures like bunding practices.

The reasonable area is under watershed of wasteland and other wasteland including grater potential of this watershed for forestry and pasture development. Rare places namely water body of low portion of land area under seasonally works as water harvesting structures and these harvested water is used or can use for some other beneficial activities during the crop season also.

6. Problems and needs of the watershed indentified during the PRA

(6.1) Problem Identification and prioritization :

- k- The are has undulating topography, steep unstable slopes, gradient of excessive branches of rills and hence highly prone to soil erosion.
- l- Major issues addressed to food sufficiency economic growth and environmental security in the watershed area.

- m- Effective soil depth is limited and highly variable hampering good crop growth.
- n- The watershed have low productive cropping due to tradition single cropping pattern and over all average crop production percentage not sufficient against requirement.
- o- Identified that there is no assured irrigation system has been development capacity of water bodies are reduced due to silt ration which are utilized to store of rainy water and they are renovatable.

(6.4) Transact walk during the PRA :

Problems identified and prioritized during the transact walk and PRA exercises in all comprised villages of watershed. There were pooled and a list of problems representing the whole watershed was prepared. Problems were ranked as per their total weight age in the watershed village.

Table – 20 : Ranking of Problem identification and prioritization of watershed

S.No.	Problem	Rank
1	2	3
1	Lack of irrigation	3
2	Lack of drinking water	3
3	Low production of field crops	6
4	Lack of fodder availability and low productivity	4
5	Lack of availability of fuel wood	5
6	Lack of market facility	5
7	Lack of quality seeds, fertilizer, pesticides etc.	7
8.	Medical and Health care facilities for milching animals and low productivity.	7
9	Lack of medical, educational and transportation facilities	9
10	Lack of water bodies renovation	8
11	Lack of run of earthen check bunds	1
12	Lack of water harvesting structures	1
13	Lack of livelihoods opportunity	2

Prioritized ranking (Upto four Numbers) :-

- 7- Lack of earthen check bunds.
- 8- Lack of livelihood opportunities.
- 9- Lack of irrigation water was the greatest problem. Lack of irrigation water problem experienced by the people followed by low crop production.

(6.3) Analysis of SWOT of the watershed :

Strength (S), Weakness (W), Opportunity (O) and Threat (T) analysis is a useful decision support tool. A SWOT analysis of watershed is presented as follows :

SWOT analysis of the watershed

Strengths (S) xxi. Cooperative work culture in traditional activities xxii. Close ethnic ties xxiii. Road at the top as well as outlet of the watershed xxiv. Hard working xxv. Resource pool of crop genetics diversity xxvi. Awareness of farmers about watershed management programme xxvii. Well established CPR maintaining and sharing system xxviii. Stall feeding of animals xxix. Well maintained seasonal water bodies xxx. Social outlook of the community towards land less	Weakness (W) xix. Poor water management xx. Resource poor farmers xxi. Out migration of youth xxii. Low and erratic rainfall xxiii. Fragile geology xxiv. Fragmented land holding xxv. Heavy infestation of wild animals xxvi. Problem of fuel and fodder xxvii. Shallow soil depth and with high percentage of gravel
Opportunities (O) xiii. Wide range of annual and perennial crops xiv. Scope of regular employment opportunities to check out migration xv. Strengthening of existing irrigation system xvi. Conducive climate for rainfed crop diversification xvii. Good scope for Agro forestry and dry land horticulture xviii. Potential for collective action and management of CPR	Threats (T) xi. Prone to adverse climate like drought xii. High market risk xiii. Social conflicts owing to PRI and WSM policies and local politics xiv. Weak coordination among line departments xv. Lack of expertise of implementing agency in different aspects of WSM

7. Proposed land use for the watershed :

Watershed management plan preparation due importance is given to topographic, land suitability, irrigation potentially, prevailing farming systems, micro farming situation, farming, farmers preferences and priorities along with economic and environment securities.

Crop and tree selection and area distribution was done as per farmers priorities revealed through PRA exercise.

The watershed management plan for watershed is prepared with specific objectives of food sufficiency, income and employment generation with environment security.

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

Table – 21 : Present and proposed land use plan of the watershed

S.No.	Land use	Present (ha)	Proposed area (ha)
1	2	3	4
1	Agriculture		
a	Rainfed		
	I Crops	245.48	395.27
	II Agro-forestry	5.35	53.20
b	Irrigated		
	I Assured	26.24	26.24
	II Partial	49.50	65.70
2	Waste land		
a	Aforestation		10.40
b	Pasture		2.5
c	Untreatable		
d	Treatable	5127	23.77
3	Village land	38.84	38.84

(7.1) Status of Present Water Resources Utilization :

Watershed is having some canal system. Management and maintenance of these canal are required. Before sowing of Rabi crops, water from these canal is issued as supplementary irrigation for Rabi sowing ar allowed to go as waste. After releasing water from canal, submergence area also put under cultivation.

Some where bore well irrigation applied by the farmers in the watershed.

(7.2) Proposed Plan for Irrigation Development :

- a- Present system of irrigation and wastage of water during October–November need to be made more efficient from water management point of view by minimizing conveyance losses in the existing water courses.

- b- Present irrigation canal capacity have to build up by the reform. Which are lack capacity of water.
- c- Construction of new water harvesting earthen structures, Pucca Check Dem, Series Gully Plugging, etc. has been sloppy portion to increase irrigation potential and for recharging of ground water, soil and moisture conservation maximum field irrigation, best production and expected change of crop rotation.
- d- The up gradation of the exciting system of irrigation will result in :
 - i- Minimization of conveyance losses.
 - ii- Increase in frequency of irrigation.
 - iii- Adoption of high yielding varieties of crops.
 - iv- Assured cultivation of cash crops.
 - v- Capacity buildup by the planning of new water harvesting structures.

(7.3) Ground Water Recharge :

For the purpose of ground water recharge, the area of the upper side of watershed is recommended for Field Bunds, Contour Bunds, Peripheral Bunds and Submergence Bunds and in the lower portion Contour Staggered Trenches, Gully Plugs, Earthen Check Dem and Pacca Outlets. In the undulated sloppy portion of the watershed recommended water harvesting structure for dual purpose as ground water storage and under ground water recharge.

(7.4) Crop Production :

Practices proposed in the watershed is given as follows :-

- a- Mulching and crop residue management.
- b- Application of green manuring.
- c- Vermi Composting.
- d- Crop rotation and inter cropping.
- e- Biofertilizers.

(7.5) Tillage Operation :

Deep tillage technology is proposed to apply to be demonstrated for benefit of farmers in the watershed.

(7.6) Improved Seeds of High Yielding Verities (H.Y.V.) :

Recommendation of improved varieties is necessary for improving the productivity and farm income. Through replacement of low yielding traditional verities of seeds in villages of watershed.

(7.7) Balanced Fertilizer Use :-

Demonstration of use of fertilizer in various crops of watershed recommended balance fertilizer use in different crops will be benefited of forming community.

(7.8) Control of insects and diseases :

Aphid in the mustard are the major insects in the watershed areas leading to loss in crop productivity. Similarly white blister is also a common disease in the mustard crop.

The management strategies of these insect pest and diseased will also be demonstrated in the watershed for benefit of the growers.

(7.9) Dry Land Horticulture :

Such portion of dry land in which proposed horticulture development planning recommended species like Ber, Bel and Aonla will be planted at suitable spacing in the watershed.

(7.10) Agri Horticulture :

Aonla and Sahjan would be suitable horticultural crops to the locality. Therefore, a part of land in the farmer field shall be selected and brought under Agri-horticulture system. The cropping system followed will be Jwar and Wheat.

(7.11) Plantation (Fuel wood) :

Such a portion which are under wasteland will be taken falling in the class-IV category in the watershed. These lands will be planted with species like Vilayati Babool (Prosopis Juliflora), Babool (Acacia Nilotica), Karanj (Pangamia Glabra).

9. Socio Economic Analysis of the of the Project :

(9.1) Sustainability and environment security :

The proposed land use plan will improve the land utilization index and crop diversification index significantly as compared to the existing one. in the proposed watershed management plan proper blending of the bio engineering measures will be applied on above 80% of the total area of watershed. It is estimated that more than above 70% of the watershed area will be treated and consequently the soil loss and runoff from the area is excepted to be reduced by 70% respectively.

It will help in maintaining ecosystem integrity on sustained basis along with improving the livelihood security of the farming community.

(9.2) Economic Analysis :

Economic analysis of the project was carried by taking direct benefits and costs considering 10 years for project life at 10% discount rate. Whole watershed development plan was divided into three sector as agriculture, horticulture and forest/Fuel wood plantation. Net Present Value (NPV) and Benefit Cost ratio criteria were applied judge the economic efficiency of each enterprises and sector. Net present value (NPV) of the project life is considered to be 10 years and discount rate for NPV estimation is 10% is given NPV and benefits as follows :-

Table – 22 : Present productivity income analysis :

S. No.	Name of Sector	Name of Crops	Produ- cti- on/ha.	Rate/ Qtl.	Cost of Production	Expend. of cultivation	Net income	B.C. Ratio between Col. 8 & 7
1	2	3	4	5	6	7	8	9
A	Agriculture	Urad	3.00	4500.00	13500.00	6450.00	4450.00	1:1
		Moong	3.00	4600.00	13800.00	6075.00	7425.00	1.22:1
		Jwar	4.80	600.00	2880.00	1584.00	1296.00	0.82:1
		Wheat	18.50	1000.00	18500.00	8650.00	7075.00	0.82:1
		Pea	7.50	2400.00	18000.00	10970.00	5905.00	0.54:1
		Mustard	3.50	2900.00	10.50	3235.00	3240.00	1:1
Total		-			76830.00	54105.00	51000.00	0.94:1
Average		-			13138.00	6763.00	6375.00	0.94:1
B	Forestry	Vilayati Babool				15000.00	-	Nil
C	Horticulture	Ber				20000.00	-	Nil
		Aonla				20000.00	-	Nil
		Bel				20000.00	-	Nil
Total		-				60000.00	-	Nil
Average		-				20000.00	-	Nil
Grand Total								

Table –23 : Post productivity and income analysis for Post Productivity**Value and B.C.:**

S. No.	Name of Sector	Name of Crops	Production/ha.	Rate/Qtl.	Cost of Production	Expend. of cultivation	Net income	B.C. Ratio between Col. 8 & 7
1	2	3	4	5	6	7	8	9
A	Agriculture	Urad	4.00	5000.00	20000.00	8325.00	11615.00	1.39:1
		Moong	4.00	5000.00	20000.00	8200.00	11800.00	1.44:1
		Jwar	5.50	800.00	4400.00	1900.00	2500.00	1.32:1
		Wheat	25.00	1000.00	25000.00	16680.00	13320.00	1.14:1
		Pea	9.50	3500.00	33250.00	14810.00	18540.00	1.12:1
		Mustard	5.00	3000.00	15000.00	4370.00	8130.00	1.86:1
Total		-	-	-	172250.00	72845.00	99765.00	1.38:1
Average		-	-	-	21531.00	9061.00	12471.00	1.38:1
B	Forestry	Vilayati Babool	80.00	500.00	40000.00	15000.00	25000.00	1.67:1
C	Horticulture	Ber	35.00	2000.00	52500.00	20000.00	32500.00	1.63:1
		Aonla	35.00	2000.00	70000.00	20000.00	50000.00	2.50:1
		Bel	40.00	1500.00	80000.00	20000.00	40000.00	2:1
Total		-	-	-	182500.00	60000.00	122500.00	2.04:1
Average		-	-	-	60833.00	20000.00	40833.00	2.04:1
Grand Total		-	-	-	1394750.00	147485.00	247265.00	1.68:1

Table –24 : Summary of NPV, PPV and B.C. Ratio (Sector wise) :

S. No.	Name of Sector	NPV		PPV		B.C. Ratio
		Expend.	Net Income	Expend.	Net Income	
1	2	3	4	5	6	7
1	Rain fed Agriculture	54105.00	51000.00	72485.00	99765.00	1.38:1
2	Forest/Fuel wood Plantation	15000.00	-	15000.00	25000.00	1.67 : 1
3	Horticulture	60000.00	-	60000.00	122500.00	2.04:1
Total		129105.00	51000.00	147485.00	247265.00	1.68:1

(9.3) Economics of Agriculture Sector :

The development cost can be recovered by the adoption of plan in present rain fed agriculture is being done on well maintained field, therefore does not require much investment. In rain fed agriculture, investment of Rs. 44.50 lacs is proposed to made is given as fallows :

Table – 25 : Economics of Agriculture Sector :

S. No.	Name of sector	Name of Activities / Plan	Treatble Area (Ha.)	NPV (Lacs)	Post Productivity Value (Lacs)	Benifit / Income	B.C. Ratio
1	2	3	4	5	6	7	8
1.	Rainfed	Soil, moisture and water cons works	413	218.234	531.75	304.648	1.38 :1

(9.4) Economics of forest fuel wood plantation :

Economic analysis of fuel wood plantation in the watershed. Project life is considered to be 20 years and discount rate for NPV estimation is 10 % is followed and as is given follows :

Table –26 : Economics of forest fuel wood Plantation :

S. No.	Name of sector	Comman Name of Plant	Area (Ha.)	NPV (Lacs)	Post Productivity Value (Lacs)	Benifit / Income	B.C. Ratio
1	2	3	4	5	6	7	8
1.	Forest Fuel wood sector	Vilayati Babool (Prasopis Juliflora)	25.00	2.50	6.675	4.675	1.67 : 1

(9.5) Economics of Horticulture Sector :

Economic analysis of Horticulture Plantation in agri-horti system and on wasteland patches of watershed project, life is considered about 15-20 years and discount factor rate for NPV estimation is 10% is follows :

Table – 27 : Economics of Horticulture system :

S. No.	Name of Sector	Common name of Plants	Area (Ha.)	NPV (Lacs)	Post Productive Value (Lacs)	Benefit Lacs	B.C. Ratio
1	2	3	4	5	6	7	8
1	Horticulture	Ber (zyziphus mouritana)	4.00	0.80	2.104	1.304	1.63: 1
		Aonla (Embelica officianalis)	3.80	0.76	2.660	1.40	2.5 : 1
		Bel (Aegle marmelos)	2.20	0.44	1.320	0.88	2 : 1
Total			10.00	2.00	2.00	4.084	2.04 : 1

(9.6) Food requirement and sufficiency :

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

Table – 28 : Status of food requirement and availability of per annual :

S. No.	Name of Foods	Requirement Q./Yr.	Present Status		Expected Post Status	
			Availability Q./Yr.	Deficit or surplus Q./Yr.	Availability Q./Yr.	Deficit or surplus Q./Yr.
1	2	3	4	5	6	7
1	Cereals 110 Kg.	16281	13839	- 2442	27678	11397
2	Pulses 36.50	5402	2971	- 2431	9724	4322
3	Oil Seeds 29.20	4322	1729	- 2593	6915	2593
4	Vegetable 71 kg	13469	2694	- 10775	24244	10775

(9.7) Employment generation :

One of the major problem of the labour migration in watershed project. By the implementation of the project activities employment opportunities will be generated. However the changes in land use pattern and adoption of other subsidiary enterprise will generate employment opportunities in the watershed as given in table follows :

Table – 29 : Employment generation under proposed works :

S. No.	Employment activities/works	Area under work	Cost	Mandays generation (Nos.)			
				Unskilled	Skill	Total	Person
1	2	3	4	5	6	7	8
2	Graded Contour Bund	45	1.350	1350	-	1350	
3	Gully Plug, C.D.	76	5.700	3990	293	4283	
4	Submergence Bund	65	2.600	2600	-	2600	
1	Peripheral Bund	64	2.240	2240	-	2240	
5	W.H.B.	79	7.110	4266	241	4507	
6	Renovation of Bund	49	1.470	1470	-	1470	
7	Reno. of W.H.B.	-	-	-	-	-	
8	Community Pond	-	-	-	-	-	
9	Afforestation	25	2.31	4620	-	4620	
10	Horticulture	10	2.00	400	-	400	
Total		413	24.78	20936	534	21470	

10. Formation of watershed committee :

Under compliance of common guideline Para (6.3) is followed and by the help of watershed development team, watershed committee is organized in the micro watershed village Ghuraiya with 10 members as prescribed in common guide line. List for organization of W.C. village details given as follows :

Table – 30 : Details of comprised village W.C. organization in M.W.S. :

S. No.	Particulars	Details	Block	Geographical Area
1	2	3	4	5
1	Micro watershed code	2B3E4d3d	Pahasu	468.00
2	Name of Gram Panchayat in M.W.S.	Nagla Amarpur		

Table – 31 : List of organized W.C. for the Gram Panchyat Amarpur in watershed.

S. No.	Name of selected members	Age	Representation Members from	Post	Qualification	Village
1	2	3	4	5	6	7
1	Sh. Ram kishan	42	Gram Sabha	Secretary	M.A.	Amarpur
2	“ Jaybhagwan	35	Gram Sabha	Sachiv	High School	Amarpur
3	“ Amar pal	45	From – U.G	Member	5	Amarpur
4	“ Bhikam Singh	50	From – U.G	Member	8	Amarpur
5	“ Mahendra Pal	40	From – U.G	Member	M.com	Amarpur
6	“ Sangeeta Devi	32	From – S.H.G.	Member	8	Amarpur
7	“ Chatar Singh	31	From – S.H.G.	Member	5	Amarpur
8	“ Ramphul Singh	40	From – S.H.G.	Member	8	Amarpur
9	“ Harkesh	35	From – S.C.	Member	High School	Amarpur
10	“ Jaychand	50	From – S.C.	Member	High School	Amarpur
11	“ Hemraj	24	From – PLA	Work out	M.Sc. (Ag.)	Khurja

(10.1) Formation of Self Help Groups in M.W.S.

By the help of watershed committee and watershed development team self help group are formatted / organized. Families and persons are selected from poor, small and marginal farmers families, landless poor families, agriculture labour families, women, herdsman and shepherd and S.C. families in the formatted self help groups are given as follow :

Table – 32 : Shiv Pashupalan Self help group – Nagla Amarpur.

S. No.	Name of member in formatted SHG's	Age	From represented family	Name of proposed activities	Activation Position
1	2	3	4	5	6
1	Kumarpal Singh	47	H.S.	Line Store	Secretary
2	Jaychand	42	H.S.		Sachiv New
3	Gorakhpal	30	H.S.		Member New
4	Man Singh	50	8		Member New
5	Omveer Singh	32	H.S.		Member New
6	Harkesh	35	H.S.		Member New
7	Jaybhagwan	35	H.S.		Member New
8	Amarpal	30	Inter		Member New
9	Chandrawan	30	8		Member New
10	Harkishan	32	8		Member New

Table – 33 : Self help group Anona.

S. No.	Name of member in formed SHG's	Age	From represented family	Name of proposed activities	Activation Position
1	2	3	4	5	6
1	Indal Singh	40	H.S. OBC	Dairy	Secretary New
2	Ajit	30	H.S. OBC	Dairy	Sachiv New
3	Manveer	22	H.S. OBC	Dairy	Member New
4	Devendra	30	Inter OBC	Dairy	Member New
5	Rampal	30	H.S. OBC	Dairy	Member New
6	Ramesh	40	H.S. OBC	Dairy	Member New
7	Ravi	23	Inter OBC	Dairy	Member New
8	Sanjay	28	8 OBC	Dairy	Member New
9	Vipin	18	H.S. OBC	Dairy	Member New
10	Arjun	19	Inter OBC	Dairy	Member New

Table – 34 : Geeta Self help group in Anona.

S. No.	Name of member in farmated SHG's	Age	From represented family	Name of proposed activities	Activation Position
1	2	3	4	5	6
1	Daya Kumari	19	H.S. OBC	Kadhai Bunai	Secretary New
2	Rashmi	19	Inter OBC	Kadhai Bunai	Sachiv New
3	Rupwati	20	H.S. OBC	Kadhai Bunai	Member New
4	Suman	21	H.S. OBC	Kadhai Bunai	Member New
5	Laxmi	22	H.S. OBC	Kadhai Bunai	Member New
6	Anshu	24	Inter OBC	Kadhai Bunai	Member New
7	Manwati	38	Inter OBC	Kadhai Bunai	Member New
8	Babali	35	8 OBC	Kadhai Bunai	Member New
9	Bhogshri	35	Inter OBC	Kadhai Bunai	Member New
10	Rekha	22	Inter OBC	Kadhai Bunai	Member New
11	Kamlesh	40	Inter OBC	Kadhai Bunai	Member New
12	Neetu	18	Inter OBC	Kadhai Bunai	Member New

Formation of User's Groups :

User's groups are farmated by the help of watershed committee and watershed development team in the micro watershed comprised villages. Formers which have land village are involved in the User's groups and they will be direct benefited as expected by the implementation of watershed project easy and convenienced condition are made to resource use between user's groups and they will be responsible to operate and maintenance for the created assets in the watershed. Nos. of farmated user's groups details are given as follows :

Table – 35 : Village wise user's groups

S. No.	Name of village	No. of groups	No. of farmers	Total Agri. Land	Area under treat-ment	Cost of essets
1	2	3	4	5	6	7
1	Nagla Amarpur	15	216	168	148.256	-
2	Anona	13	185	105	92.660	-
3	Arorali	9	135	75	66.186	-
4	Surajwali	4	60	8108	73.112	-
	Total	41	596	429.08	380.214	-

10. Estimation and Costing of Proposed activities of the watershed Project Year 2009-10.

Proposed works / activities for the Project Period (Year 2009-10) under proposed treatable area 635.00 Ha. Out of total Geographical area 906.61 Ha.

(10.1) Financial and Physical Outlets :

Table – 36 : Financial and Physical Outlets for the Year 2009-10 :

Sl. No.	Components	Unit cost per ha.	Physical ha.	Financial (Lacs)			Man-days Generation
				Labour Component	Material Component	Total	
1	2	3	4	5	6	7	8
A	Management Cost 10%						
1	Administrative Cost – TA & DA Hiring of Vehicles, Official Expenditure Electricity & Phone bill Computer, Stationery and office consumable materials & contingency	1200	-	-	4.956	4.956	-
2	Monitoring	120	-	-	0.4956	0.4956	
3	Evaluation	120	-	-	0.4956	0.4956	
	Sub Total	1440		-	5.9472	5.9472	
B	Preparatory Phase 10%						
1	Entry Point Activities 4%	480	-	0.3965	1.5859	1.9854	396
2	Institutional & Capacity Building 5%	600	-	-	2.4780	2.4780	
3	Detailed Project Report 1%	120	-	-	0.4956	0.4956	
	Sub Total	1200	-	0.3965	4.5595	4.9560	396
C	Watershed Work Phase						
a	Watershed Development Works						
1	Graded, Contour & Field Bunds	3000	45.00	1.350	-	1.350	1350
2	Gully Plug, Earthen Checkdam /WHS	7500	76.00	3.99	1.710	5.700	4283
3	Submergence bunds	4000	65.00	2.600	-	2.600	2600
4	Peripheral Bund	3500	64.00	2.240	-	2.240	2240
5	Earthen Water Harvesting Bund	9000	79.00	4.266	2.844	7.110	4507
6	Renovation of existing Bunds	3000	49.00	1.470	-	1.470	1470
7	Renovation of existing W.H.B	-	-	-	-	-	-
8	Aforestation and Development of silvi postural system	10440	25	0.462	1.848	2.31	4620
9	Dry Land Horticulture	20000	10	0.400	1.600	2.00	400
10	Community Pound (Renovation)	-			-	-	-
	Sub Total		442	16.778	8.002	24.78	21470
B	Livelihood Programme (Community Based) 7.620						
	Income generating activities through SHG's for landless and marginal farmers 10%						
1	Live stock development activities	200	-	-	0.8262	0.8262	-
2	Bee Keeping	100	-	-	0.4128	0.4128	-
3	Poultry Farming	200	-	-	0.8262	0.8262	-
4	Nursery Development	300	-	-	1.2390	1.239	-
5	Vegetable Production	100	-	-	0.4128	0.4128	-
6	Milk Dairy Promotion Unit	200	-	-	0.8262	0.8262	-
7	Establishment of Vermi compost Unit	100	-	-	0.4128	0.4128	-
8	Sub Total	1200	-	-	4.9560	4.956	-
C	Production System and micro Enterprises						
1	Crop production, diversification of agriculture and introduction of agro forestry	1170	-	-	4.8321	4.8321	-
2	Demonstration of improved composting system	390	-	-	1.6107	1.6107	-
	Sub Total	1560	-	-	6.4428	6.4428	-
D	Consolidation Phase 5% Sub Total						
	Sub Total	600	-	-	2.478	2.478	-
Grand Total		12000	-	17.1745	32.3855	49.560	21866

:- संकल्प पत्र :-

ग्राम पंचायत:- नगला अमरपुर, कोड सं०- 2B3E4d3d विकास खण्ड- पहासू जिला- बुलन्दशहर

यह कि आई०डब्लू०एम०पी० परियोजना में तैयार की गयी निर्माण की नयी सृजित परिसम्पत्तियों को ग्राम पंचायत एवं माइक्रोवाटरशेड के अन्तर्गत सम्मिलित ग्रामों में योजना क्रियान्वयन कराने एवं योजना उपरान्त चालू रखने तथा सुजित परिसम्पत्तियों के अनुरक्षण हेतु कृत संकल्प एवं इच्छुक है।

नगला अमरपुर ग्राम पंचायत के सभी स्रोत स्थल जैसे तालाब ग्राम सभा गोचर (चारागाड़) जल संसाधन, जंगल आदि में भूमि विकास परियोजना के अन्तर्गत किये जायेंगे। उन कार्यों को समाज के कमजोर वर्ग जैसे अनुसूचित जाति/जनजाति, महिला वर्ग एवं अल्प भूमिहीन गरीबी रेखा के नीचे के लाभार्थियों को लाभ पहुंचाने हेतु इच्छुक होंगे।

हम योजना संचालन हेतु प्रस्तावित करते हैं एवं सहमति देते हैं कि भारत सरकार के समस्त मार्गदर्शी सिद्धान्तों के अनुपालन में कार्य सम्पन्न करायेगे। यह भी घोषित करते हैं कि चयनित क्षेत्र जिसको मेरे द्वारा भलीभाँति देखा गया है, और प्रस्तावित योजना में प्रस्तावित समस्त कार्य 15 सालों से नहीं कराया गया है। जिसकी मुझे पूर्णरूप से जानकारी है और अनुमोदन करते हैं।

[Signature]
[Stamp]

नगला
पंचायत
हाकिमसिंह
देव-प्रसिंह
अनन्दाप्रसिंह
रीपक कुमाल

[Stamp]
[Signature]

[Signature]
[Signature]

PROJECT AT A GLANCE

IWMP-II (Bulandshahar)

1	State	Uttar Pradesh
2	Distt.	Bulandshahar
3	Block	Pahasu
4	M.W.S. Code	2B3E3c3e
5	Name of M.W.S. Project	Khandar
6	Involved Village	09
7	Geographical Area of M.W.S.	1011 Ha.
8	Rainfed Area	
9	Treatable Area	890
10	Weightage	
11	Cost of Project	106.80
12	For the year	2010-11

Budget Components

S. No.	Components	Area (Ha.)	Cost (in Lacs)
1	2	3	4
1	Management Cost 12%	-	12.816
2	Preparatory Phase 10%	-	10.680
3	Watershed Work Phase	-	
	A- Watershed Development Works 50%	890	53.400
	B- Livelihood Programme (Community Base) 10%	-	10.680
	C- Production System & Micro Enterprises 13%	-	13.884
4	Consolidation Phase 5%	-	5.340
	Total	890	106.80

Executive Summary of the Project

Identified selected micro watershed project Khandar is coded as **2B3E3c3e** has been proposed from cluster of I.W.M.P. Bulandshahar-II project in Pahasu Block district Bulandshahar four villages namely Khandar, Dalpatpur, Atrena, Rinayach Narendrapur, Dighi, Udarmi, Anauna, Utrawali and N. Amarpur is comprised in the micro watershed which is located in the east of district Bulandshahar on the west bank of River Ganga and border of district area is known as Khadar. It lies between $28^{\circ} -50'$ and $28^{\circ} -15'$ N Latitudes and $78^{\circ} -0$ and $78^{\circ} -10$ W Longitudes Covering area. Its altitudes ranges from 187 meter to 190 meter above the mean sea level. Khurja Railway Station 184.11 m, Bulandshahar Railway station is 201.18 m above mean sea level is displayed. Project area of I.W.M.P. BSR-II is lied in the Pahasu Block of Bulandshahar District which is come in the western plan zone under semi arid area. The annual average rainfall is near to 397 mm which an average of 35 rainy days. Out of which about 85% is received during the mansoon season from July to September and very less rainfall is received in the winter season.

Temperature ranges from as high as 43°C in the May-June to as $3^{\circ}-4^{\circ}\text{C}$ during December – January. The Trend of rain fall is highly erotic and maximum water goes as runoff.

Main occupation of the dwellers is agriculture in the watershed. Some part of the lands are shown during the Kharif season. Cane sugar are preferred crops in the project area. The main Crops raised are Wheat, Pea & Mustered & Maize

The topmost portion of the watershed is sloppy flat land. Other than topmost portion of the watershed is under soil erotic portion and depreciative. The soil of the land are sandy loam Soil. The middle agricultural position of watershed relatively smooth sloppy flat land with sandy loam soil texture. These soil is yellow in colour and are inherently good in fertility status.

Natural vegetation of the watershed is very poor. Somewhere forest vegetation is seen which are predominant with Vilayati Babool (*Prosopis Juliflora*), followed by Babool (*Accasia nilotica*), somewhere Neem Plants (*Azadirachta Indica*), Shisham (*Dolbergia Sisson*) and Karanj (*Pongamia Glabra*) are seen in occasional occurrence. There is no grass land in the watershed. Somewhere grass patches are seen only on the bunds, road sides and other such places. Coverage of massive green belt is in poor percentage for environment which is envisaged. That watershed is very poor climate area.

There is normal condition of animal physics and for their fodder arrangement is the watershed and creative possibility would be expected by the implementations of the project.

Due to Aerial soil erosion poor harvesting managements, cropping pattern, non treated watershed etc. are very anti effective causes for the watershed. Problem of the watershed is to be tackled by harvesting structures which have lost most of their capacity new water bodies for the prevention of erosion and conservation of soil and moisture various type of earthen bunds in the watershed field, necessity has been observed. Wasteland will be treated with staggered Trenches, afforestation and bunding for the changing of characteristics.

The detail project report has been prepared by the applying of nine process steps for the micro watershed code no. **2B3E3c3e** brief is as follows.

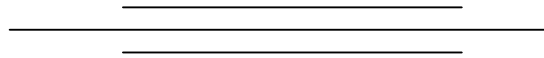
- STEP-1 Secondary data collection:-** During the five days visit programme in the micro watershed project with of all available documents of village label by approaching the Gram panchayat collected secondary data.
- STEP-2 Village meeting & conducting PRA exercise:-** Community meeting conducted on fix days for the consultation with villagers for the PRA Exercise. Participatory mode of the villages was positive indicated for the success of programme. With good in testing participation has been drawn social & resource map on ground & paper & discussed on various topics of problematic thoughts in the micro watershed.
- STEP-3 Socio economic survey:-** The resource organization of village label volunteers identified to conduct house hold socio economic survey/states.
- STEP-4 Problem typology analysis:-** Thoroughly analyzed the data & identified problem type as soil & moisture conservation, crop rotation, crop coverage, productivity, livelihoods, social issues & capacity building gaps etc. Problems discussed with the watershed committee & came up with alternative solution.
- STEP-5 Conduct of net participatory planning (NPP):-** The planning team visited together in the planning blocks on the scheduled date along with the beneficiaries of the villages & data gathered as for the participatory net planning.
- STEP-6 Productivity & livelihood planning exercise:-** For the product livelihood exercise, group discussion on various livelihood as Agriculture, Animal husbandry enterprise development held discussion with the villagers in the micro watershed.
- STEP-7 Institutional & capacity building :-** This plan is prepared based on the data available in the field and auscultations with the watershed committee.
- STEP-8 Data consolidation & documentation of DPR :-** After gathering all required information compiled collected data. Thoroughly discussed and finalized the expected outcomes and benefits specially in the respect of livelihood for different segments. These are the target and performers indicators for the micro watershed.

STEP-9 Conduct of Gram Sabha obtaining approvals submissions of DPR:-After preparation of the draft DPR convened to Gram sabha and activities proposed expected outcomes benefits of implementing the programm are explained in case of any changes are proposed in the Gram sabha approval obtained by the Gram sabha and already singed of Mau paper.

STEP-9A Attachment of detail estimate, cost and design:-Estimating, Costing and design prepared technically According to plan in the micro watershed project. And attached with the DPR.

STEP-9B Various type of mapping :- DPR prepared in the support of micro watershed project using various type of maps is as follows :

- | | |
|--------------------------------------|-----------------------------|
| 1.Index Map of Watershed | 2. Watershed Map |
| 3. Relief/ Drainage Map | 4. Slop Map |
| 5.Soil and Land Capability class map | 6. Land use/ Land Cover Map |
| 7. Cadastral map | 8. Proposed Action Plan map |
| 9. Social Map | |



Project Report

Table – 1 : Micro watershed project brief : -

1	State	U.P.
2	District	Bulandshahar
3	Block	Pahasu
4	Comprised Villages (Nos.)	05
5	Name of Watershed	Khandar
6	Name of MWS Project	Khandar
7	MWS Code No.	2B3E3c3e
8	Geographical Area of MWS	1011
9	Treatable Area	890

1- Project Objectives :- The aim and objectives of the Project are :

- v- Conservation, development and sustainable management of natural resources including their users.
- w- Enhancement of agriculture production and productivity in a sustainable manner.
- x- Restoration of ecological balance in the degraded and fragile rain fed ecosystem.
- y- Reduction in regional disparity between rains fed and irrigated area.
- z- Creation of sustainable employment opportunities for the rural community for livelihood security.
- aa- Generation of massive employment.
- bb- Reduce migration from rural employment.

2- Major Problem of Project Area :

- s- Actual shortage of drinking water.
- t- Near to nil activated water bodies and water harvesting structures.
- u- Low depth of ground water table.
- v- Undulated and generally sloppy rainfed area.
- w- Large number of Small, Marginal and S.C. farmer land holding.
- x- Lower wages of agriculture labour and also migration of labour due to shortage of employment in the watershed.

3- General Description :

(3.1) Location :-

Farida Watershed has been taken with MWS Code No. **2B3E3c3e** in Pahasu Block of Distt. Bulandshahar is located on Khurja via Shikarpur Syana to Pahasu road about 25 Km. between 28⁰15' and 28⁰10' N Latitudes and 78⁰0' and

78°5' N Longitudes. Location and delineation of watershed has been located on watershed map **Fig. 2** and on top sheet **Fig. 3**.

(3.2) Area and Elevation :

Elevation ranges from 181 to 208 mtr. above the mean sea level(MSL) altogether comprised villages and their's area is described as follows.

(Comprises village map Fig. 3)

Table – 2 : Area and Elevation

Sl. No.	MWS Code	Block	Name of Village	Geographical Area	Treatable Area
1	2	3	4	5	6
1	2B3E3c3e	Pahasu	Khandar	263	231.55
			Dalpatpur	144	126.76
			Atraina	215	189.26
			R. Narendrapur	104	91.55
			Dighi	8	7.04
			Udarmi	30	26.41
			Anauna	99	87.15
			Utrawali	36	31.69
			N. Amarpur	112	98.59
				1011	890

(3.3) Shape of the Micro Watershed:

The shape of watershed is Elongated and as Rectangular. The maximum length and width of the watershed are 5000 Mtr. and 1814 Mtr. respectively with the Length: Width ratio of 2.76:1.

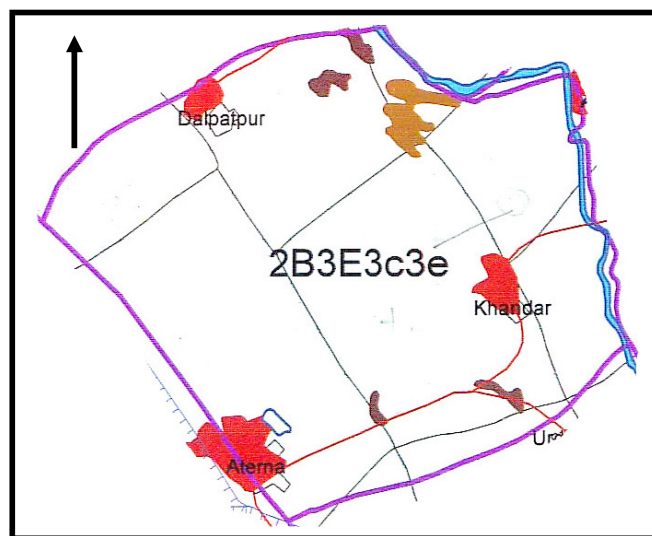


Fig. 1 (Shape of Micro Watershed)

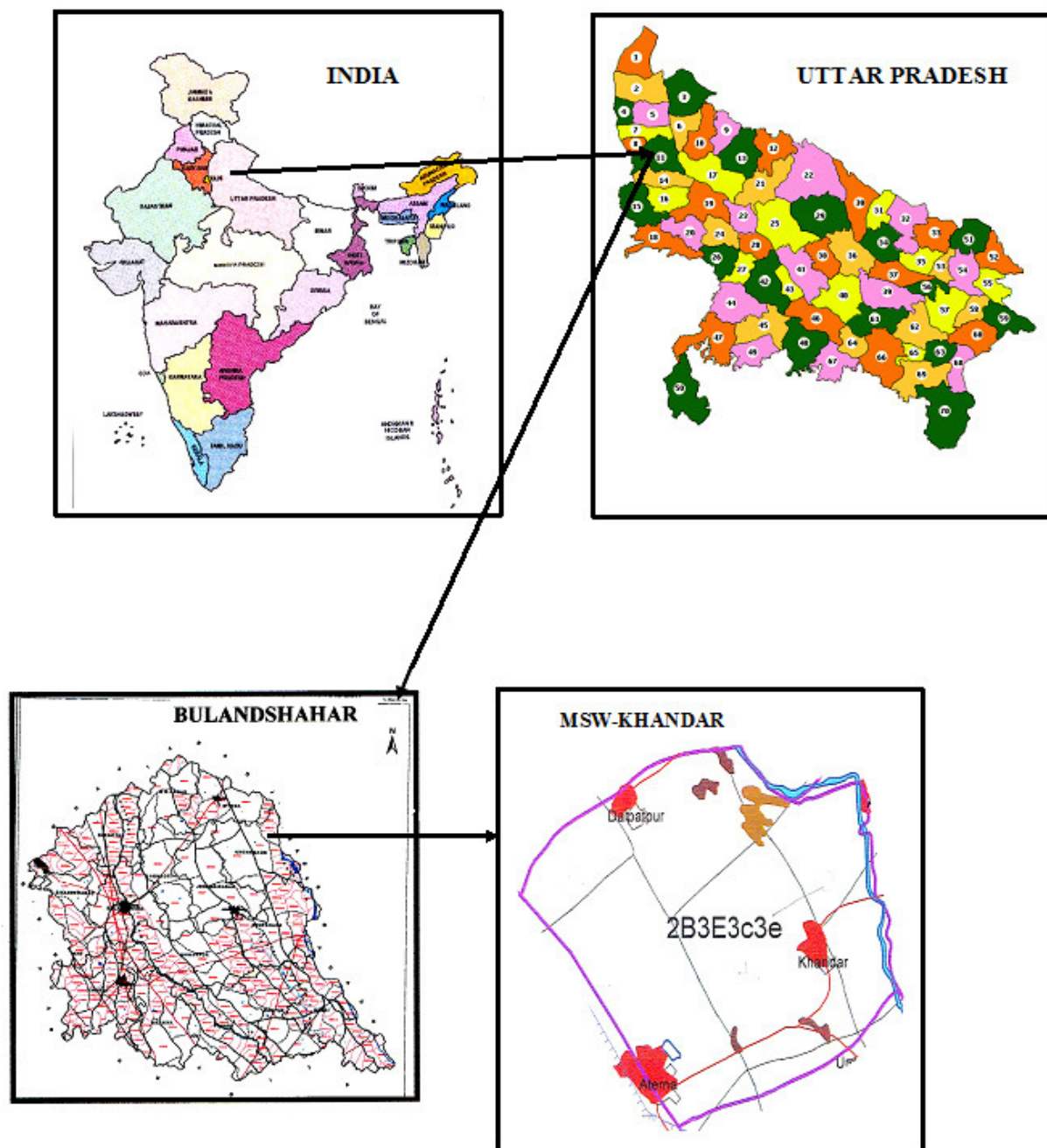
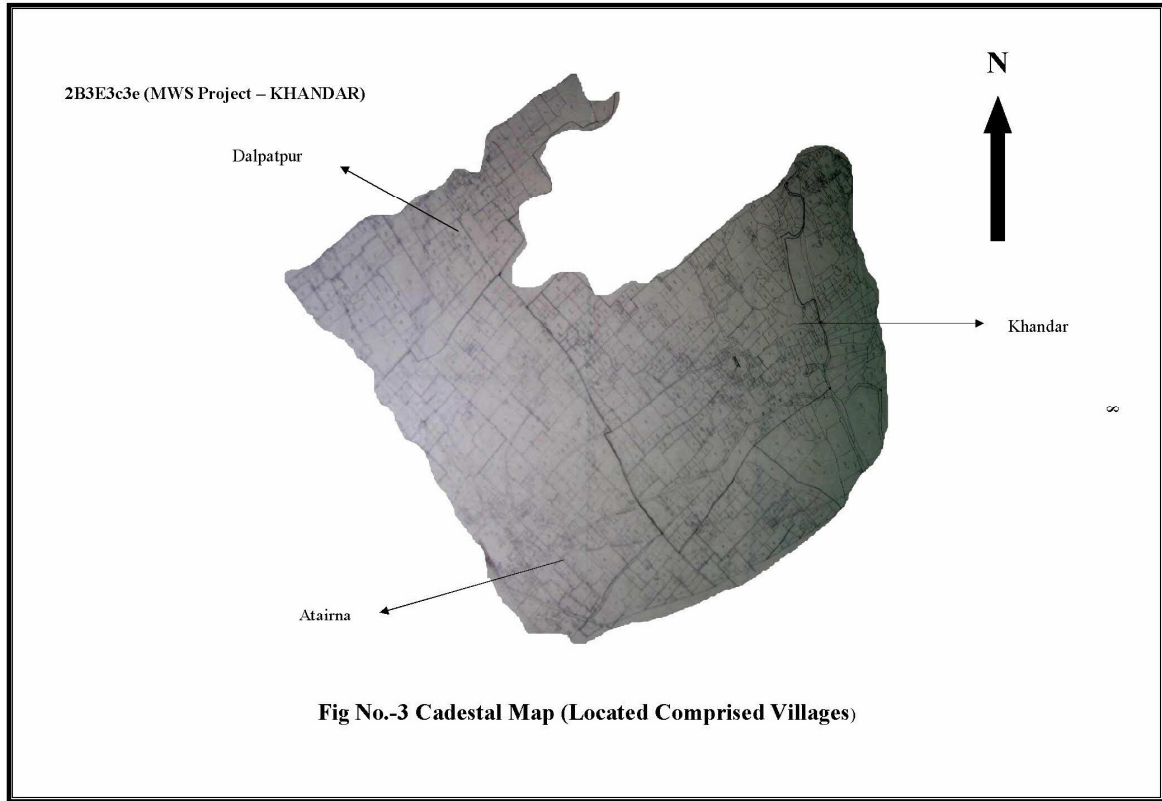


Fig.- 2 Location of the Micro Watershed



Sl. No.	Name of Project	Name of Village	Geograph ical Area (in ha.)	Raifed Area (in ha.)	Treatable Area	Agri. Land
1	2	3	4	5	6	7
1	Khandar	Khandar	263	223.50	231.55	236.70
2		Dalpatpur	144	122.00	127.76	131.04
3		Atraina	215	182.75	189.76	195.69
4		R. Narendrapur	104	93.60	91.55	94.64
5		Dighi	8	7.20	7.04	7.400
6		Udarmi	30	27.00	26.41	27.300
7		Anauna	99	84.15	87.15	90.09
8		Utrawali	36	30.60	31.69	34.200
9		N. Amarpur	112	95.20	98.59	106.40
Total			1011.00	866.00	890.00	923.46

(3.4) Climate :

The Watershed falls under semi arid region of tropical climate inclined in Western Plan Zone. The average annual precipitation is about approx. is 397 mm. spreading over 35 rainy days. Most of the rain fall (about 85%) is received during July to September. The rain fall of moderate intensity. Nothing the area receives of scarcity rainfall in the winter season. The temperator variation ranges from as high as 43⁰c in the month of May-June to as low as 4⁰c in December-January.

(3.5) Geomorphology and Soils :

Geomorphology :

The entire watershed is topographically divided into major landforms. Accordingly the soils of watershed can be grouped into various categories such plane land, undulated land, sloppy land and erosic ravenous land.

Soil :**(a) Fine textured soil :**

The soil are the most extensive soil group found in the watershed. Some portion of the watershed is relatively sloppy flat land with fine soil texture as sandy loam. The soils are in color and are inherently good high in fertility status. Soil texture is sandy lome loam particularly in depressions and loam in the elevated portion. The soil characteristic texture is dispersive and smooth. Therefore without impeded the downward movement of water productive layer of soil are easily by high runoff.

a- Coarse Textured Soil :

These soil are lying mostly in downward portion, along with erosic gully and drainage line upto end of watershed outlet. These soils are coarser in texture and are relatively poor in fertility status. The soils are lomy sand in texture. Rill and gully formation in same parts particularly near the outlet of watershed can be seen.

(3.6) Drainage and Slope:

Due to prevalence of mild steep slope and presence of a number of drainage lines in the watershed the drainage system is adequate. The watershed from part of Ganga Basin and watershed. Under mild to steep topographical slope of MWS as divided as follow : (Drainage and slope map fig.-4)

Table - 4 : Drainage and Slope

S. No.	Grade	Slope Percent	Area in Ha.	Remark
1	A	0.5-1	267	-
2	B	1 – 2	222	-
3	C	2 – 3	178	-
4	D	3 – 4	133	-
5	E	4 – 5	62	-
6	F	5 – 6	28	-

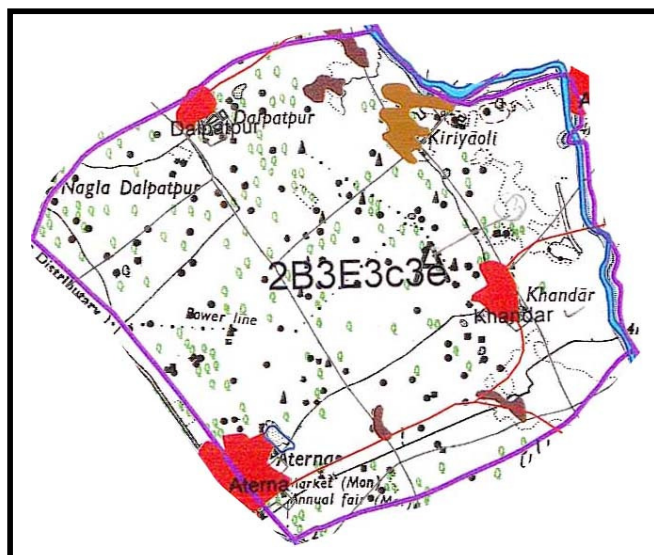


Fig-4 (Drainage & Scrub Map)

(3.7) Vegetation :

a- Natural Vegetation :

Natural vegetation is very poor in the watershed. The forest vegetation is predominant with Vilayti Babool (*Prosopis Juliflora*). There are occasional occurrence of Neem Plants (*Azadirachta Indica*), Shisham (*Dalbergia Sissoo*) and Karanj (*Pongamia Glabra*) and anywhere some scrubs are seen. There are no grass land in the watershed. Somewhere grass patches are seen only on the bunds, roadside and other such places. Poor percentage of massive green trees has been not seen in the watershed except Horticulture backyard.

b- Horticulture :

There is no backyards or commercial horticulture plantation in villages are been in some part of watershed.

c- Agro forestry :

The agriculture fields of the villages have some horticulture plantation at places isolated trees whose frequency is seen as under agroforestry and some where in where in backyards.

(3.8) Human Population:**a- Human Population:**

Total Population of involved villages in watershed is 8936 with average family size of six persons as detailed as follows

Table – 5 : Human Population

S. No.	Name of village	Nos. of families	Human Population			Total
			Male	Female	Children	
1	Khandar	333	591	546	487	1624
2	Dalpatpur	153	309	286	198	793
3	Atraina	441	1385	1281	709	2375
4	R. Narendrapur	392	1083	984	485	2552
5	Dighi	1350	2632	2431	1687	6750
6	Udarmi	136	312	289	200	801
7	Anauna	345	1407	1262	409	3078
8	Utrawali	551	1601	1470	768	3839
9	N. Amarpur	385	1766	1567	508	3841
		4086				26653

e- Categorization of Human Population :

In the total population of watershed villages, categories are defined as below :

Table – 6 : Population Categories

S. No.	Particulars	Unit	Number of families in population in the villages		
			Population	Family	Remark
1	2	3	4	5	6
1	Agri Farmer	No.	21322	3268	
2	Landless	No.	567	81	
3	Agri. Labour	No.	2856	408	
4	Land less Labour	No.	21	3	
5	BPL Family	No.	91	13	
6	SC Family	No.	1694	242	
7	ST Family	No.	-	-	

(3.9) Land Holding :

All the categories of farmers as small, marginal, medium and large are involved in land holding average of about 1-18 ha. Small land holding farmers are further scattered at different places which makes cultivation very difficult. Distribution of farm families according to the size of the land holdings are given as below :

Table – 7 : Distribution of farm families according to their size of land holdings

S. No.	Name of Village	Total Agri. Land in MWS	Land Holding Family (Nos.)					Percentage
			Marginal (< - 1Ha.)	Small (1-2 Ha.)	Medium (2-4 Ha.)	Large (4-7 Ha.)	Total	
1	Khandar	236.7	165	7	5	2	175	
2	Dalpatpur	131.04	91	4	3	01	95	
3	Atraina	195.67	175	19	17	1	162	
4	R. Narendrapur	94.64	67	11	9	1	21	
5	Dighi	7.400	4	1	01	-	6	
6	Udarmi	27.300	22	3	2	-	27	
7	Anauna	90.09	80	5	1	1	87	
8	Utrawali	34.04	25	2	1	-	28	
9	N. Amarpur	106.46	85	8	5	1	99	
Total		923.46						

(3.10) Live Stock Population :

Total live stock population of the watershed is Nos. Buffalos is preferred as mulch animal compared to Cow. But milk yield is poor. Goats are also kept for milk as well as for meat purpose. The breakup of livestock population is as follows:

Table – 8 : Live Stock Position

S. No.	Name of Village	Unit	Live Stock Position				Total
			Buffaloes	Cows	Bullocks	Goats	
1	Khandar	No.	824	497	169	119	1309
2	Dalpatpur	No.	1011	211	114	87	1423
3	Atraina	No.	1625	249	141	219	2234
4	R. Narendrapur	No.	1193	395	179	197	1964
5	Dighi	No.	871	197	176	237	1481
6	Udarmi	No.	627	191	137	129	1084
7	Anauna	No.	493	139	69	76	777
8	Utrawali	No.	923	238	139	191	1491
9	N. Amarpur	No.	1037	198	132	231	1598
Total			8604	2015	1256	1486	13361

(3.11) Infrastructure Social Feature :

- a- Comprised villages in the micro watershed has moderate communication facilities. Watershed linked with metaled road and approachable through motarable road.
- k- All the villages are electrified and have T.V. and Telephone connection.
- l- Literacy rate in the watershed is very low all villages are having education upto Junior High School.
- m- Nearest small market is at Pahasu 13 Km. Nearest big market Bulandshahar is about 55 Km. from watershed. Religious and ritual features are almost common as in other parts af U.P. small land holding with large family size and more than 25% of the labour force of the total population living below poverty line indicate poor socio economic status of the watershed community.

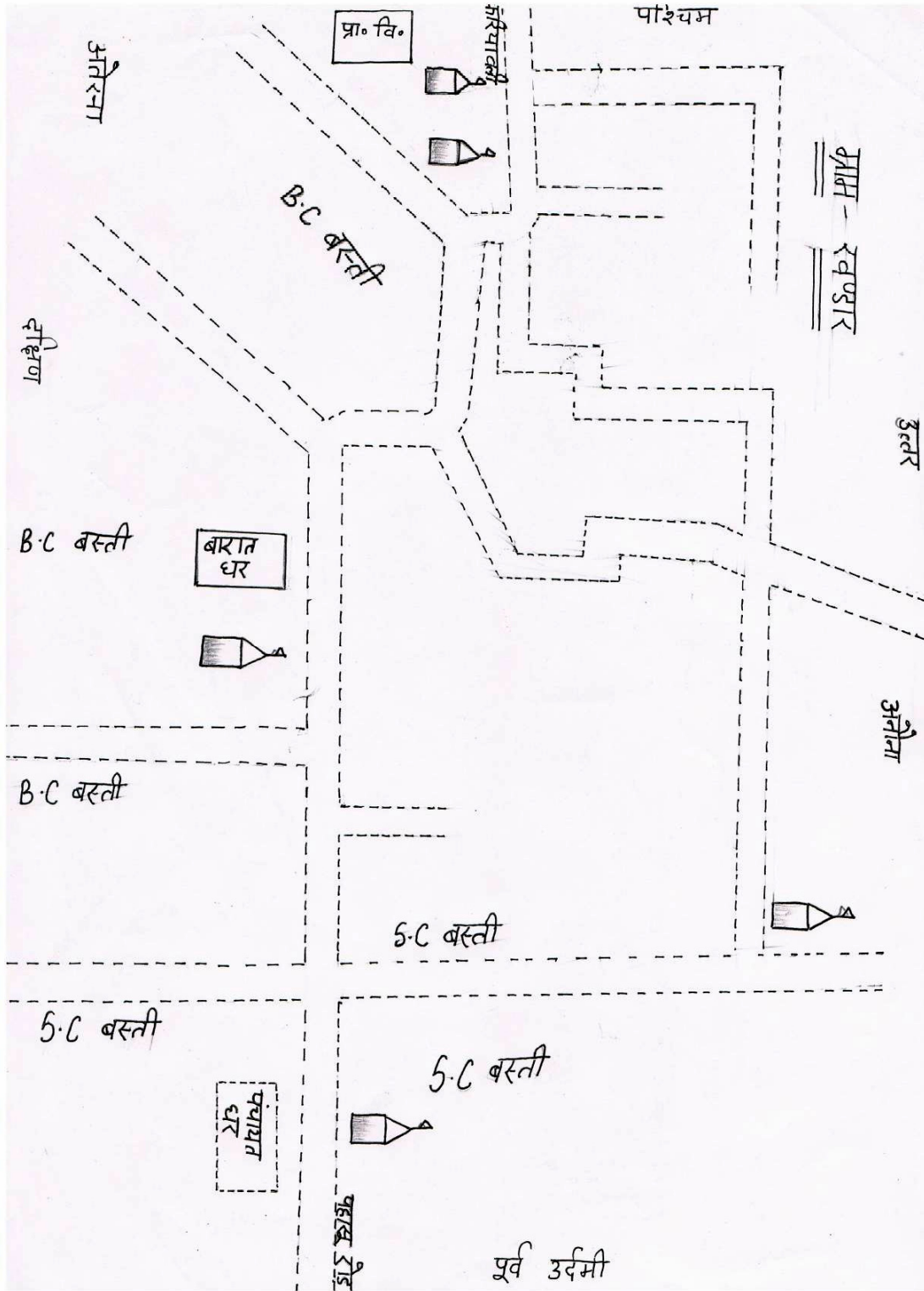
Participatory Rural Appraisal

Participatory mode of the villagers shows positive indication for the success of the programme. Traditionally the entire village community participate in the individual works. Social map of one of the watershed village drawn by villagers themselves, depicting various village figures is shown in sketched map in Fig.-4 & 5. Infrastructures position of the village recorded as follows :

Table – 9 : MW.S. Project – Farida

S. No.	Infrastructure	Unit	Qty.
1	2	3	4
1	Primary School	No.	2
2	Junior High School	No.	1
3	Kanya Pathshala	No.	-
4	Public Health Center	No.	-
5	Vet nary Hospital	No.	-
6	Panchayat Ghar	No.	2
7	Post Office	No.	-
8	Agan Bari Center	No.	2
9	Electricity	-	Yes
10	Road	-	Yes
11	Pond	No.	2
12	Hand Pump	No.	23
13	Irrigation Well	No.	-
14	Canal	No.	-
15	Temple	No.	8
16	Well (Drinking Water)	No.	-
17	Pumping Set	No.	31
18	Toilet	No.	13
19	Market	No.	No

SOCIAL MAP



Recorded importance of development institution

Farmers perception recorded for importance and role of different development institution in relation to infrastructure. Importance has been depicted with size of circle and role with distance from village circle. (Fig 8)

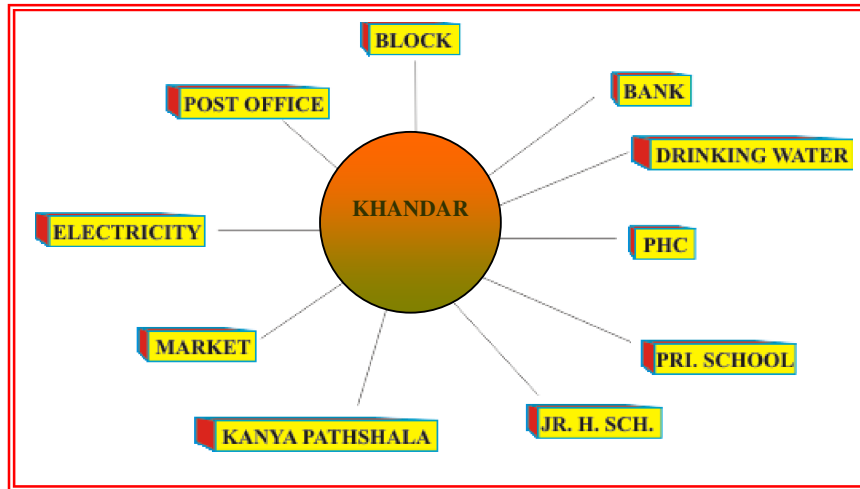


Fig. -8 (Venn diagram of Micro watershed)

(3.12) Communication :

Watershed can be approached from District Headquarter Bulandshahar to Project area 35 km. by Road.

(3.13) Natural Resource Base :

Transact of watershed showed typical land use profile consisting of plain agriculture land, erodic area and medium ravenous ridge. Main source of the irrigation are the canal for pre showing irrigation only. The total geographical area of the watershed is 890.00 Ha. classification .

Approach roads for the micro watershed is shown for the communication is shown on topo sheet map Fig 9 as next page.

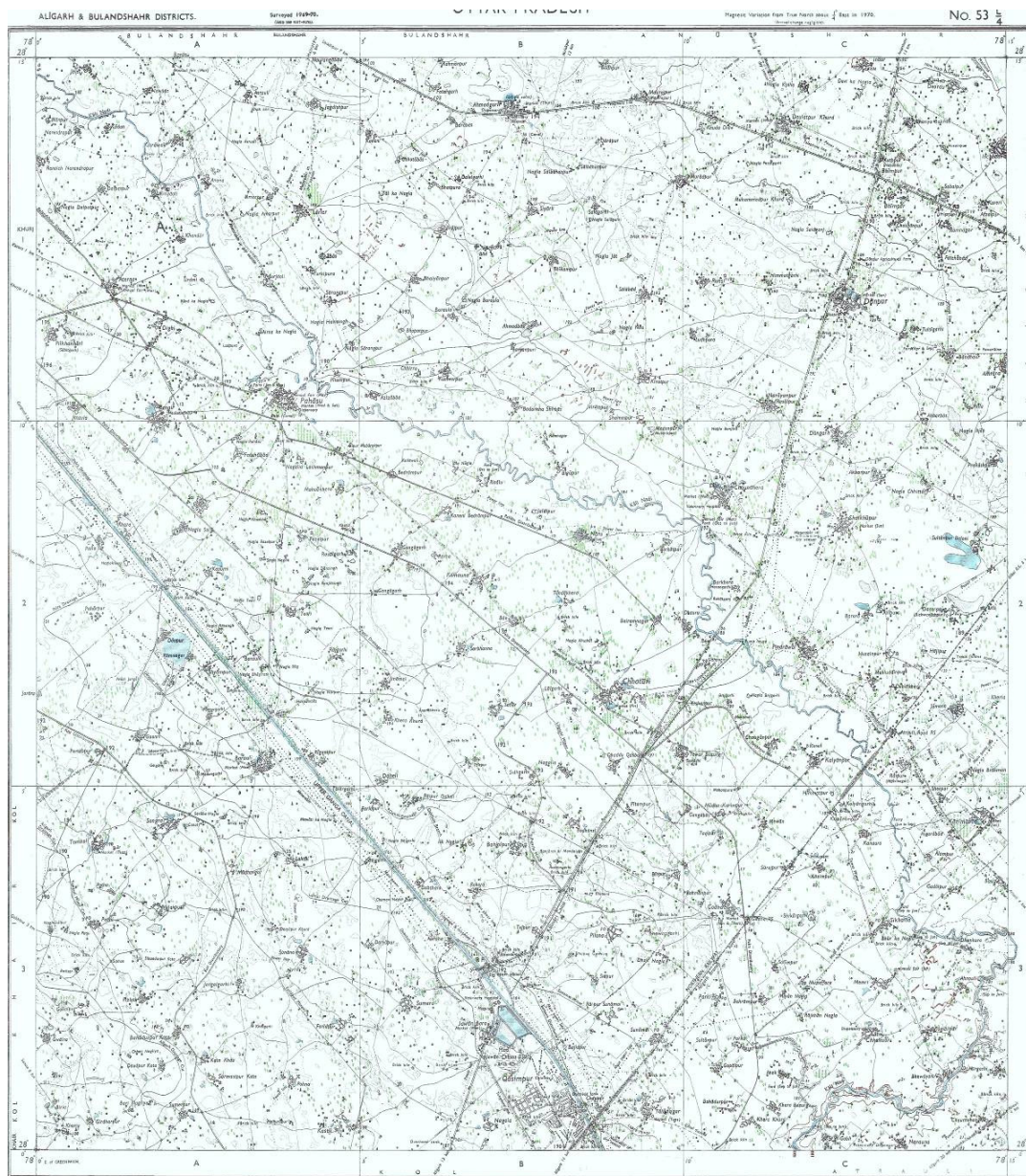


Fig.- 7 Communication Map on Toposheet

Table – 10 : Classification of area(Hect.)

S.N o.	Name of Village	Unit	Total Geographical Area	Rainfed Area	Wasteland	Village Land and Road	Irrigation Resource	
							Water Bodies	Borewell
1	2	3	4	5	6	7	8	9
1	Khandar	Ha.	263	194.50	10.30	5.00	-	18.35
2	Dalpatpur	Ha.	144	106.47	5.76	2.00	-	5.20
3	Atraina	Ha.	215	158.98	8.00	3.70	-	15.80
4	R. Narendrapur	Ha	104	75.90	4.30	-	-	11.70
5	Dighi	Ha	8	-	-	-	-	-
6	Udarmi	Ha	30	18.00	-	-	-	2.00
7	Anauna	Ha	99	49.00	3.10	1.80	-	11.00
8	Utrawali	Ha	36	-	1.00	-	-	3.70
9	N. Amarpur	Ha	112	94.00	4.75	4.20	-	16.00
Total			1011	697.85	37.81	16.70	-	83.75

(3.14) Livelihood :

Total Population of the watershed is 8936 and out of the total population a majority more than 80% has farming as their major source of livelihood followed by labours, serviceman and small business class. Classified livelihood given in form as follows :

Table – 11 : Livelihood Classification in population :

S. No.	Name of Village	Farmer	Labour	In Service	In Local small business	Others
1	2	3	4	5	6	7
1	Khandar	175	21	8	4	-
2	Dalpatpur	95	17	13	7	-
3	Atraina	162	29	14	9	-
4	R. Narendrapur	21	7	2	2	-
5	Dighi	6	1	1	3	-
6	Udarmi	27	2	2	4	-
7	Anauna	87	11	7	5	-
8	Utrawali	28	9	5	3	-
9	N. Amarpur	99	17	10	7	-
	Total	720	114	62	44	-

(3.15) Dependency of forest fuel wood and fodder :

- a. Fuel wood :-** The main source of fuel is from cow dung cake, woody stem of crops. About 70% of the domestic energy requirement is met from the agriculture by product and cow dung cake. Rest is met out from the forest outside the village and watershed boundary, most preferred fuel wood is Juliflora fuel wood Juliflora obtained from standing along and between watershed.
- e- Fodder :-** Villages have not any sufficient signified dependency on forest based fodder as these resource are nothing availability in the forest.

(3.16) Labour requirement :

Labour requirements was found to be maximum at the time of October, November and December when the sowing of Rabi crops are done. The crucial periods are March and April coinciding harvesting and threshing of Rabi crops and July/August is sowing Kharif Crops take a little place. Other income generating enterprises having potential during the remaining.

(3.17) Crop Rotation :

Present Crop rotation in the watershed comprise of :

Kharif	-	Bajra	-	Rare
		Maize	-	Rare
		Jwar	-	Rare
Rabi	-	Fallow Wheat	-	Major
		Fallow Barly	-	Major
		Fallow Sugarcane	-	Major
		Fallow Mustard	-	Major
Zayad	-	Urad, Moong, Makka		

The above said Rabi Crops is the most prevailing crop rotation on the agriculture lands both in the rainfed and irrigated conditions.

Organized vegetable cultivation fruit plantation and traditional agro forestry systems are lacking as per requirement in the watershed the limited vegetable cultivation in the watershed is confined as kitchen gardens and field to the irrigated condition in a scattered manner. The cultivation of cash crops other than the sugarcane, wheat and mustard also in the watershed.

(3.18) Historical Events :

Chronological record of important events of the watershed village is prepared through participatory rural appraisal (PRA) which is very useful in understanding of its background and chronology is given as follows :

Table – 12 : Historical Events

S. No.	Events/Activities	Year	Rem.
1	2	3	4
1	Established	1600	
2	Opening of Primary School	1970	
3	Opening of Junior School	2007-08	
4	Opening of Kanya Pathshala	-	
5	Opening of PHC	-	
6	Opening of Vet. Hospital	-	
7	Panchayat Ghar	2008	
8	Introduction of Tractor	1990	
9	Gobar Gas Plant	-	
10	Thresher	1975-76	
11	First Tube well/Pumpset	1968	
12	First Motorcycle	1985	
13	T.V. & D.V.D. Players	1984	
14	Electricity in Village	-	
15	Bituminous Road	2009-10	
16	First Hand Pump	1962	
17	Templo Renovation	1960	
18	First Land Line Telephone	1990	
19	Planning for Watershed Project	2011-12	

(3.19) Present Land Use in the Watershed :-

The watershed has diversified land uses. The varied present land use under different use in the watershed. The mixed land use followed in the watershed is almost similar in other parts of U.P. During P.R.A. Exercise prepared land has been shown in Table No. 13, 14 & 15.

Table – 13 : (Ownership)

S. No.	Name of Village	Pvt. Agri. Land		Govt. Revenu Land	Forest Land	Other Land
		S.C./S.T.	Others			
1	2	3	4	5	6	7
1	Khandar	101.500	120.80	5.00	-	-
2	Dalpatpur	129.00	12.00	4.00	-	-
3	Atraina	53.70	160.0	2.30	-	-
4	R. Narendrapur	52.00	50.00	2.0	-	-
5	Dighi	-	8	-		
6	Udarmi	29	-	1.00		
7	Anauna	62	36	1.00		
8	Utrawali	21	13.7	1.30		
9	N. Amarpur	39	72.60	1.40		

Table –14 : (Present Land under different categories)

S. No.	Name of Village	Land Use (Ha.)				
		Agricultural	Wasteland (All Types)	Seasonal waterbodies	Village/Road Etc.	Total
1	2	3	4	5	6	7
1	Khandar	236.70	21.30		5.00	
2	Dalpatpur	131.04	10.60		2.40	
3	Atraina	195.69	17.01		2.30	
4	R. Narendrapur	94.64	7.360		2.00	
5	Dighi	7.400	1.700		1.00	
6	Udarmi	27.30	9.00		1.00	
7	Anauna	90.09	2.00		1.00	
8	Utrawali	34.200	9.00		1.300	
9	N. Amarpur	106.40	6.00		1.200	
Total						

Table – 15 : (Present land use classified)

S. No.	Land Use Under	Unit (ha.)	Area (Ha.)	Percentage
1	2	3	4	5
1	Under Agriculture			
	A- Rainfed-			
	I- Crops		506.00	70%
	II- Agro forestry		32.00	7%
	B- Irrigated-		-	
	I- Assured			
	II- Portial		118.25	17%
2	Wasteland			
	A- Aforestation			
	B- Pasture			
	C- Untreatable			
	D- Treatable		156.44	100%

Proposed Post Land Use has been given on Page No. 32

4- Focus on Present Land Use :

(4.1) Agriculture :

The total area under agriculture in the watershed is about 415.02 ha. out of which 906.61 ha. is under rainfed agriculture. Agriculture land uses in the watershed extended to diversified land capabilities starting marginal to good class II land. The irrigated and drinking water is most scarce natural resource in the watershed. The operation of tube well 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 of the watershed area. The agricultural field bund are common in the watersheds however they frequently breach on heavy rains.

Various mixed texture of soils are located in patches through out the watershed. The heavy soils are almost kept fallow during rainy season. the agricultural soils also have some as share calcium pan at variable depths. The irrigation water is conveyed by the earthen channels. Surface irrigation methods following mainly border method of flood method by the formers in the watershed. These factors reduce the water use efficiency of limited and valuable irrigation water.

Drought hardy species like Juliflora suitable multi purpose trees is suitable for rehabilitation of the wasteland. Rehabilitation of waste lands promoting agro forestry with appropriate fruit and forest species suitable vegetative barriers on sloppy lands can be high future value and by these adoption would be meet out many demands of fire wood and fodder in the wasteland. Except above but also for soil and water conservation, rehabilitation of wasteland and sustainable income generation for socio-economic upliftment of farmers.

Crop Productivity :

The farmers also do not have suitable cropping system to deal aberrant weather. Weeds impose considerable constraint in productivity of both Karif and Rabi crops under irrigated as well as rainfed production system farmer undertake normally one manual weeding in mustard and other valuable crops however, practices is energy and time consuming. Use of we decide is rare in the watershed.

In the watershed area, limited cropping in the Kharif with mixed cropping practices is not only irrigational but also unscientific and best for low productivity. Subsequent Rabi crops in general. Sugarcane & Mustard crop in particular are raised on residual soil moisture under rainfed production system during post monsoon season.

(4.2) Indigenous Technological Knowledge (ITK) :

Under process of PRA tracked out rural applying technology in various field of local technology and some technology is very popular in village. In which the agriculture is an old traditional practices of farmers who have improved themselves with passage of the time according to their domestic needs and technological reforms in the nearby areas. The villages have their traditional village ponds, practice of field bunding which typically constitute agricultural related ITKs in the watershed. The Mustard & sugarcane being a cash and firewood crop of the watershed and also sugarcane crop is being. Cultivated in

self designed manner by the farmers. Its carried out that the area is totally depend on rain and under the rainfed area technology is applied by the farmers. However limited fertilizer application specifically the DAP came in the practices since about 15-20 years.

(4.3) Forest and Other Vegetation :

Forest :

The watershed have a tract of wasteland area which are under uncultivable position is liesed in the watershed. These wasteland have not any tree vegetation or very less than real requirement for the wasteland use.

Horticulture/Agro forestry :

Horticulture and agro forestry practices were observed in the watershed.

(4.4) Agro forestry :

Agro forestry practices are lacking in the watershed. Though it has good potential under existing disposition and may a role particularly with respect to minimization of cropping risk, built up soil fertility and productivity, protection of soil erosion, soil conservation partly meeting out the fire wood demand of rural community and more over optimizing the economical return from system as whole under typical semi arid climate in the watershed. Bund and boundary plantation also have good potential to care the fire wood and fodder demands of the rural community in the watershed. The existing area under agro forestry is almost negligible. Prosopis Jhliflora may be planted as block or sole plantation specifically on marginal and degraded land in the watershed.

The agro forestry interventions comprising of ber, bail, aonla, guava, papular etc. may be applied for benefit of the farmers under rainfed to irrigation production system on leveled to slopping and marginal agricultural using proper planting techniques and term it control measures.

The multipurpose trees may be also help in supplementing fire wood and fodder demands of the rural community in the watershed and my be planted as hedge rows on rainfed, marginal and degraded lands.

(4.5) Horticulture :

Fruits and vegetables practices are lacking in the watershed area. Its practices may be sustainable very good potential for the formers of watershed. There are a limited lack fruit trees in number like mango, guava, lime, ber, aonla and papaya fruit trees well as vegetables like radish, okra, tomato, cabbage, garlic, onion, chilly, bringer and cucurbits but they are found surviving well in the watershed villages. Organized orchards (vatika) commercial vegetable cultivation horti-agri and other systems of agro forestry etc. are lacking but have good agriculture.

5. Soil and land capability classification :

(5.1) Soil Morphology :

Watershed is located North East corner of Bulandshahr Distt. near about 55 Km. away. The entire terrain of watershed is topographically divided into various land forms. Accordingly the soils of watershed have been grouped major categories is given as follow :

Hill Terrain	Plane Land Sloppy	Undulated Land	Rill Erosic Land	Moderate ravenous
-	25%	20%	15%	7%

Given categories in the blocks is located the soil morphology in the watershed areas. Representation of soil characteristics by soil profile is represented as follows :

Soil Profile :

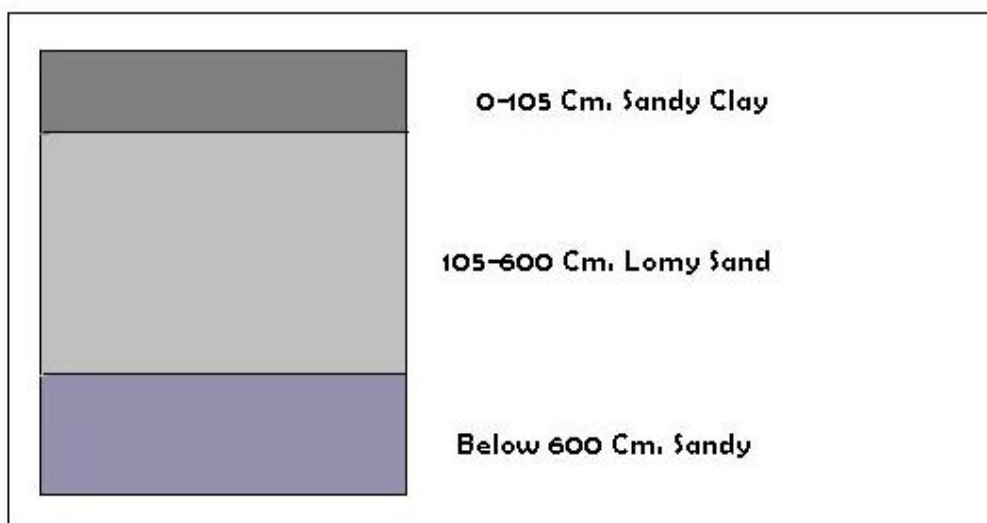


Fig. – 9 (Soil Profile)

Table – 16 : (Morphology of a Typical Soil Profile) :

Horizone	Depth in Cm.	Morphology
1	2	3
A V & H	0-150	Silky when moist, Hard when dry quick soluble, high elasticity, fissures, and cracks, occasional occurrence of free calcium carbonate granules black in colour, clay content 29%, PH- 8 to 8.7
B V & H	150-160	Whitish yellow in colour, very fine mixed with free cacaos and gravels, Hard when dry compact and indurate hard pan restricting development of root and down ward water transmission.
C V & H	7600	Red and white sand stone

(5.2) Soil and Characteristic and Fertility Status :

Soil characteristic pertaining to soil fertility of various classes accruing around villages in the watershed are given as follows :

Table – 17 : Soil Characteristic & Fertility Status :

Sl. No.	Soil Properties	LCC-II	LCC-III & IV
1	2	3	4
1	Sand %	45.04	72.04
2	Silt %	22.55	17.80
3	Clay %	28.35	6.4.6
4	Texture	Sandy Clay	Lomy Sand
5	PH (1:2)	7.05	7.55
6	Organic Carbon %	0.35	0.13
7	Available N Kg ha ⁻¹	312	171
8	Available P Kg ha ⁻¹	28	13
9	Available K Kg ha ⁻¹	185	322
10	EC (dS m ⁻¹)	0.45	0.12

(5.3) Land Capability Classification (LCC) :

Land capability classification (LCC) was done to classification the soils in different groups based upon the limitations and to emphasize the hazards prevailing in the 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. Classes of land capability namely II, III, IV and V are demarcated in the watershed. The areas under different classes are sown as follows :

Table – 18 : Land Capability Classification (LCC) :

S. No.	Land capability class	Area in Ha.	Colour
1	2	3	4
1	I Class	-	-
2	II Class	108.560	-
3	III Class	325.004	-
4	IV Class	150.500	-
5	V Class	34.500	-
6	VI Class	-	-
7	VII Class	-	-
8	VIII Class	-	-

Land capability classification of various agricultural practices under land use can be classified as groups, class, sub class and units. Utilization of various land class is given as follows :

Table – 19 : Utilization of various land uses

S. N.	LCC	Forestry	Ltd. Grazing	Light Grazing	Dense Grazing	Limited Agriculture	Light Agriculture	Dense Agriculture	More Dense Agriculture
1	I								
2	II								
3	III								
4	IV								
5	V								
6	VI								
7	VII								
8	VIII								

(5.4) Land Capability Class II & III :

This group is one of the most extensive LCC watershed. and also near to class III for the agricultural practices. The soils are sandy & sandy 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 & III. These lands potentially very productive but due to rainfed a single cropping pattern is in habitation.

(5.5) Land Capability Class IV :

This class is found in lower portion near the outlets of watershed. The soils are coarser in texture, deep, erosion hazard and undulating in topography. Rill and initiation of gully can be seen near the outlet of the watershed.

(5.6) Land Capability Class VII & VIII :

This class of land is not found in watershed. Somewhere lack of soil are found with admixture gravels fragments in these classes of lands.

(5.7) Conclusions :

The majority of land form is coming under class II, which give an insight of good agriculture production potential of the watershed.

The land capability classification provides reasonable good information with regard to capability of soil, that could be used for agriculture, agrihorticulture, silviculture and posture development.

The productivity of these lands could be further enhanced by adoption of simple soil & water conservation measures like bunding practices.

The reasonable area is under watershed of wasteland and other wasteland including grater potential of this watershed for forestry and pasture development. Rare places namely water body of low portion of land area under seasonally works as water harvesting structures and these harvested water is used or can use for some other beneficial activities during the crop season also.

6. Problems and needs of the watershed indentified during the PRA

(6.1) Problem Identification and prioritization :

- p- The are has undulating topography, steep unstable slopes, gradient of excessive branches of rills and hence highly prone to soil erosion.
- q- Major issues addressed to food sufficiency economic growth and environmental security in the watershed area.
- r- Effective soil depth is limited and highly variable hampering good crop growth.

- s- The watershed have low productive cropping due to tradition single cropping pattern and over all average crop production percentage not sufficient against requirement.
- t- Identified that there is no assured irrigation system has been development capacity of water bodies are reduced due to silt ration which are utilized to store of rainy water and they are renovatable.

(6.5) Transact walk during the PRA :

Problems identified and prioritized during the transact walk and PRA exercises in all comprised villages of watershed. There were pooled and a list of problems representing the whole watershed was prepared. Problems were ranked as per their total weight age in the watershed village.

Table – 20 : Ranking of Problem identification and prioritization of watershed

S.No.	Problem	Rank
1	2	3
1	Lack of irrigation	3
2	Lack of drinking water	7
3	Low production of field crops	4
4	Lack of fodder availability and low productivity	3
5	Lack of availability of fuel wood	4
6	Lack of market facility	4
7	Lack of quality seeds, fertilizer, pesticides etc.	3
8.	Medical and Health care facilities for milching animals and low productivity.	6
9	Lack of medical, educational and transportation facilities	8
10	Lack of water bodies renovation	9
11	Lack of run of earthen check bunds	1
12	Lack of water harvesting structures	1
13	Lack of livelihoods opportunity	3

Prioritized ranking (Upto four Numbers) :-

- 10- Lack of earthen check bunds.
- 11- Lack of livelihood opportunities.
- 12- Lack of irrigation water was the greatest problem. Lack of irrigation water problem experienced by the people followed by low crop production.

(6.3) Analysis of SWOT of the watershed :

Strength (S), Weakness (W), Opportunity (O) and Threat (T) analysis is a useful decision support tool. A SWOT analysis of watershed is presented as follows :

SWOT analysis of the watershed

Strengths (S) xxxi. Cooperative work culture in traditional activities xxxii. Close ethnic ties xxxiii. Road at the top as well as outlet of the watershed xxxiv. Hard working xxxv. Resource pool of crop genetics diversity xxxvi. Awareness of farmers about watershed management programme xxxvii. Well established CPR maintaining and sharing system xxxviii. Stall feeding of animals xxxix. Well maintained seasonal water bodies xl. Social outlook of the community towards land less	Weakness (W) xxviii. Poor water management xxix. Resource poor farmers xxx. Out migration of youth xxxi. Low and erratic rainfall xxxii. Fragile geology xxxiii. Fragmented land holding xxxiv. Heavy infestation of wild animals xxxv. Problem of fuel and fodder xxxvi. Shallow soil depth and with high percentage of gravel
Opportunities (O) xix. Wide range of annual and perennial crops xx. Scope of regular employment opportunities to check out migration xxi. Strengthening of existing irrigation system xxii. Conducive climate for rainfed crop diversification xxiii. Good scope for Agro forestry and dry land horticulture xxiv. Potential for collective action and management of CPR	Threats (T) xvi. Prone to adverse climate like drought xvii. High market risk xxviii. Social conflicts owing to PRI and WSM policies and local politics xix. Weak coordination among line departments xx. Lack of expertise of implementing agency in different aspects of WSM

7. Proposed land use for the watershed :

Watershed management plan preparation due importance is given to topographic, land suitability, irrigation potentially, prevailing farming systems, micro farming situation, farming, farmers preferences and priorities along with economic and environment securities.

Crop and tree selection and area distribution was done as per farmers priorities revealed through PRA exercise.

The watershed management plan for watershed is prepared with specific objectives of food sufficiency, income and employment generation with environment security.

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

Table – 21 : Present and proposed land use plan of the watershed

S.No.	Land use	Present (ha)	Proposed area (ha)
1	2	3	4
1	Agriculture		
a	Rainfed		
	I Crops	820.00	70%
	II Agro-forestry	25.00	7%
b	Irrigated		
	I Assured		
	II Partial	125.00	17%
2	Waste land		
a	Aforestation		
b	Pasture		
c	Untreatable		
d	Treatable		
3	Village land	256.44	100%

(7.1) Status of Present Water Resources Utilization :

Watershed is having some canal system. Management and maintenance of these canal are required. Before sowing of Rabi crops, water from these canal is issued as supplementary irrigation for Rabi sowing are allowed to go as waste. After releasing water from canal, submergence area also put under cultivation.

Some where bore well irrigation applied by the farmers in the watershed.

(7.2) Proposed Plan for Irrigation Development :

- a- Present system of irrigation and wastage of water during October–November need to be made more efficient from water management point of view by minimizing conveyance losses in the existing water courses.
- b- Present irrigation canal capacity have to build up by the reform. Which are lack capacity of water.
- c- Construction of new water harvesting earthen structures, Pucca Check Dem, Series Gully Plugging, etc. has been sloppy portion to increase irrigation potential and for recharging of ground water, soil and moisture conservation maximum field irrigation, best production and expected change of crop rotation.
- d- The up gradation of the exciting system of irrigation will result in :
 - i- Minimization of conveyance losses.
 - ii- Increase in frequency of irrigation.
 - iii- Adoption of high yielding varieties of crops.
 - iv- Assured cultivation of cash crops.
 - v- Capacity buildup by the planning of new water harvesting structures.

(7.3) Ground Water Recharge :

For the purpose of ground water recharge, the area of the upper side of watershed is recommended for Field Bunds, Contour Bunds, Peripheral Bunds and Submergence Bunds and in the lower portion Contour Staggered Trenches, Gully Plugs, Earthen Check Dem and Pacca Outlets. In the undulated sloppy portion of the watershed recommended water harvesting structure for dual purpose as ground water storage and under ground water recharge.

(7.4) Crop Production :

Practices proposed in the watershed is given as follows :-

- a- Mulching and crop residue management.
- b- Application of green manuring.
- c- Vermi Composting.
- d- Crop rotation and inter cropping.
- e- Biofertilizers.

(7.5) Tillage Operation :

Deep tillage technology is proposed to apply to be demonstrated for benefit of farmers in the watershed.

(7.6) Improved Seeds of High Yielding Verities (H.Y.V.) :

Recommendation of improved varieties is necessary for improving the productivity and farm income. Through replacement of low yielding traditional varieties of seeds in villages of watershed.

(7.7) Balanced Fertilizer Use :-

Demonstration of use of fertilizer in various crops of watershed recommended balance fertilizer use in different crops will be benefited of forming community.

(7.8) Control of insects and diseases :

Aphid in the mustard are the major insects in the watershed areas leading to loss in crop productivity. Similarly white blister is also a common disease in the mustard crop.

The management strategies of these insect pest and diseased will also be demonstrated in the watershed for benefit of the growers.

(7.9) Dry Land Horticulture :

Such portion of dry land in which proposed horticulture development planning recommended species like Ber, Bel and Aonla will be planted at suitable spacing in the watershed.

(7.10) Agri Horticulture :

Aonla and Sahjan would be suitable horticultural crops to the locality. Therefore, a part of land in the farmer field shall be selected and brought under Agri-horticulture system. The cropping system followed will be Jwar and Wheat.

(7.11) Plantation (Fuel wood) :

Such a portion which are under wasteland will be taken falling in the class-IV category in the watershed. These lands will be planted with species like Vilayati Babool (Prosopis Juliflora), Babool (Acacia Nilotica), Karanj (Pangamia Glabra).

9. Socio Economic Analysis of the of the Project :

(9.1) Sustainability and environment security :

The proposed land use plan will improve the land utilization index and crop diversification index significantly as compared to the existing one. in the proposed watershed management plan proper blending of the bio engineering measures will be applied on above 80% of the total area of watershed. It is estimated that more than above 70% of the watershed area will be treated and consequently the soil loss and runoff from the area is excepted to be reduced by 70% respectively.

It will help in maintaining ecosystem integrity on sustained basis along with improving the livelihood security of the farming community.

(9.2) Economic Analysis :

Economic analysis of the project was carried by taking direct benefits and costs considering 10 years for project life at 10% discount rate. Whole watershed development plan was divided into three sector as agriculture, horticulture and forest/Fuel wood plantation. Net Present Value (NPV) and Benefit Cost ratio criteria were applied judge the economic efficiency of each enterprises and sector. Net present value (NPV) of the project life is considered to be 10 years and discount rate for NPV estimation is 10% is given NPV and benefits as follows :-

Table – 22 : Present productivity income analysis :

S. No.	Name of Sector	Name of Crops	Produ- ction/ha.	Rate/ Qtl.	Cost of Production	Expend. of cultivation	Net income	B.C. Ratio between Col. 8 & 7
1	2	3	4	5	6	7	8	9
A	Agriculture	Urad	3.00	4300.00	12900.00	6450.00	6450.00	1:1
		Moong	3.00	4500.00	13500.00	6075.00	7425.00	1.22:1
		Jwar	4.80	600.00	2880.00	1584.00	1296.00	0.82:1
		Wheat	18.50	850.00	15275.00	8650.00	7075.00	0.82:1
		Pea	7.50	2250.00	16875.00	10970.00	5905.00	0.54:1
		Mustard	3.50	18.500	6475.00	3235.00	3240.00	1:1
Total		-			105105.00	54105.00	51000.00	0.94:1
Average		-			13138.00	6763.00	6375.00	0.94:1
B	Forestry	Vilayati Babool				15000.00	-	Nil
C	Horticulture	Ber				20000.00	-	Nil
		Aonla				20000.00	-	Nil
		Bel				20000.00	-	Nil
Total		-				60000.00	-	Nil
Average		-				20000.00	-	Nil
Grand Total								

Table –23 : Post productivity and income analysis for Post Productivity**Value and B.C.:**

S. No.	Name of Sector	Name of Crops	Production/ha.	Rate/Qtl.	Cost of Production	Expend. of cultivation	Net income	B.C. Ratio between Col. 8 & 7
1	2	3	4	5	6	7	8	9
A	Agriculture	Urad	4.00	5000.00	20000.00	8325.00	11615.00	1.39:1
		Moong	4.00	5000.00	20000.00	8200.00	11800.00	1.44:1
		Jwar	5.50	800.00	4400.00	1900.00	2500.00	1.32:1
		Wheat	25.00	1000.00	25000.00	16680.00	13320.00	1.14:1
		Pea	9.50	3500.00	33250.00	14810.00	18540.00	1.12:1
		Mustard	5.00	3000.00	15000.00	4370.00	8130.00	1.86:1
Total		-	-	-	172250.00	72845.00	99765.00	1.38:1
Average		-	-	-	21531.00	9061.00	12471.00	1.38:1
B	Forestry	Vilayati Babool	80.00	500.00	40000.00	15000.00	25000.00	1.67:1
C	Horticulture	Ber	35.00	2000.00	52500.00	20000.00	32500.00	1.63:1
		Aonla	35.00	2000.00	70000.00	20000.00	50000.00	2.50:1
		Bel	40.00	1500.00	80000.00	20000.00	40000.00	2:1
Total		-	-	-	182500.00	60000.00	122500.00	2.04:1
Average		-	-	-	60833.00	20000.00	40833.00	2.04:1
Grand Total		-	-	-	1394750.00	147485.00	247265.00	1.68:1

Table –24 : Summary of NPV, PPV and B.C. Ratio (Sector wise) :

S. No.	Name of Sector	NPV		PPV		B.C. Ratio
		Expend.	Net Income	Expend.	Net Income	
1	2	3	4	5	6	7
1	Rain fed Agriculture	54105.00	51000.00	72485.00	99765.00	1.38:1
2	Forest/Fuel wood Plantation	15000.00	-	15000.00	25000.00	1.67 : 1
3	Horticulture	60000.00	-	60000.00	122500.00	2.04:1
Total		129105.00	51000.00	147485.00	247265.00	1.68:1

(9.3) Economics of Agriculture Sector :

The development cost can be recovered by the adoption of plan in present rain fed agriculture is being done on well maintained field, therefore does not require much investment. In rain fed agriculture, investment of Rs. 44.50 lacs is proposed to made is given as fallows :

Table – 25 : Economics of Agriculture Sector :

S. No.	Name of sector	Name of Activities / Plan	Treatble Area (Ha.)	NPV (Lacs)	Post Productivity Value (Lacs)	Benifit / Income	B.C. Ratio
1	2	3	4	5	6	7	8
1.	Rainfed	Soil, moisture and water cons works	890.00	481.49	1195.93	664.44	1.38:1

(9.4) Economics of forest fuel wood plantation :

Economic analysis of fuel wood plantation in the watershed. Project life is considered to be 20 years and discount rate for NPV estimation is 10 % is followed and as is given follows :

Table –26 : Economics of forest fuel wood Plantation :

S. No.	Name of sector	Common Name of Plant	Area (Ha.)	NPV (Lacs)	Post Productivity Value (Lacs)	Benifit / Income	B.C. Ratio
1	2	3	4	5	6	7	8
1.	Forest Fuel wood sector	Vilayati Babool (Prasopis Juliflora)	25.00	2.50	6.675	4.675	1.67 : 1

(9.5) Economics of Horticulture Sector :

Economic analysis of Horticulture Plantation in agri-horti system and on wasteland patches of watershed project, life is considered about 15-20 years and discount factor rate for NPV estimation is 10% is follows :

Table – 27 : Economics of Horticulture system :

S. No.	Name of Sector	Common name of Plants	Area (Ha.)	NPV (Lacs)	Post Productive Value (Lacs)	Benefit Lacs	B.C. Ratio
1	2	3	4	5	6	7	8
1	Horticulture	Ber (zyziphus mouritana)	4.00	0.80	2.104	1.304	1.63: 1
		Amla (Embelica officianalis)	3.80	0.76	2.660	1.40	2.5 : 1
		Bel (Aegle marmelos)	2.20	0.44	1.320	0.88	2 : 1
Total			10.00	2.00	6.084	4.084	2.04 : 1

(9.6) Food requirement and sufficiency :

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

Table – 28 : Status of food requirement and availability of per annual :

S. No.	Name of Foods	Requirement Q./Yr.	Present Status		Expected Post Status	
			Availability Q./Yr.	Deficit or surplus Q./Yr.	Availability Q./Yr.	Deficit or surplus Q./Yr.
1	2	3	4	5	6	7
1	Cereals 110 Kg.	29318	24920	(-) 4398	49841	20523
2	Pulses 36.50	9728	5350	(-) 4378	17510	7782
3	Oil Seeds 29.20	7783	3113	(-) 4670	12453	4670
4	Vegetable 71 kg	24254	4851	(-) 19403	43657	19403

(9.7) Employment generation :

One of the major problem of the labour migration in watershed project. By the implementation of the project activities employment opportunities will be generated. However the changes in land use pattern and adoption of other subsidiary enterprise will generate employment opportunities in the watershed as given in table follows :

Table – 29 : Employment generation under proposed works :

S. No.	Employment activities/works	Area under work	Cost	Mandays generation (Nos.)			
				Unskilled	Skill	Total	Person
1	2	3	4	5	6	7	8
2	Graded Contour Bund	103	3.090	3090	-	3090	
3	Gully Plug, C.D.	171	12.825	8978	227	9205	
4	Submergence Bund	146	5.840	5840	-	5840	
1	Peripheral Bund	145	5.075	5075	-	5075	
5	W.H.B.	180	16.200	9720	550	10270	
6	Renovation of Bund	111	3.330	3330	-	3330	
7	Reno. of W.H.B.	-	-	-	-	-	
8	Community Pond	25	5.040	1008	-	1008	
9	Afforestation	10	2.00	400	-	400	
10	Horticulture	-	-	-	-	-	
Total		890	53.400	3744	777	38218	

10. Formation of watershed committee :

Under compliance of common guideline Para (6.3) is followed and by the help of watershed development team, watershed committee is organized in the micro watershed village Ghuraiya with 10 members as prescribed in common guide line. List for organization of W.C. village details given as follows :

Table – 30 : Details of comprised village W.C. organization in M.W.S. :

S. No.	Particulars	Details	Block	Geographical Area
1	2	3	4	5
1	Micro watershed code	2B3E3c3e	Pahasu	
2	Name of Gram Panchayat in M.W.S.	Khandar		1011

Table – 31 : List of organized W.C. for the Gram Panchyat Khandar in watershed.

S. No.	Name of selected members	Age	Representation Members from	Post	Qualification	Village
1	2	3	4	5	6	7
1	Indrajeet Singh	52	Gram Sabha	President	Sakhar	Khandar
2	Jagveer Singh	34	Gram Sabha	SHG	Sakhar	Khandar
3	Bijendra Singh	34	From – U.G	Member	Sakhar	Khandar
4	Jaswant Singh	30	From – U.G	Member	Sakhar	Khandar
5	Chotelal	23	From – U.G	Member	Sakhar	Khandar
6	Prem Chand	28	From – S.H.G.	Member	Sakhar	Khandar
7	Bhoop Singh	25	From – S.H.G.	Secretary	Sakhar	Khandar
8	Smt. Rajkumari	29	From – S.H.G.	Member	Sakhar	Khandar
9	Smt. Kuldeep	39	From – S.C.	Member	Sakhar	Khandar
10	Bhimbhoo Singh	40	From – S.C.	Member	Sakhar	Dalpatpur
11	Ram Singh	34	From – PIA	Work out	B.Sc.	Khandar

(10.1) Formation of Self Help Groups in M.W.S.

By the help of watershed committee and watershed development team self help group are formatted / organized. Families and persons are selected from poor, small and marginal farmers families, landless poor families, agriculture labour families, women, herdsman and shepherd and S.C. families in the formatted self help groups are given as follow :

Table – 32 : Vikas Self help group – Khandar (Livelihood) .

S. No.	Name of member in formatted SHG's	Age	From represented family	Name of proposed activities	Activation Position
1	2	3	4	5	6
1	Bijendra	46	L.R.	Live Stock	New
2	Ajay Kumar	25	L.R.	Live Stock	New
3	Rakesh Kumar	23	L.R.	Live Stock	New
4	Chunni Lal	30	L.R.	Live Stock	New
5	Har Prasad	28	L.R.	Live Stock	New
6	Sonu Kumar	25	L.R.	Live Stock	New
7	Rajeshwari	27	L.R.	Live Stock	New
8	Raj Kumari	23	L.R.	Live Stock	New
9	Rani Devi	22	L.R.	Live Stock	New
10	Kunwar Singh	18	L.R.	Live Stock	New

Table – 33 : Jagarti Self help group Khandar i.

S. No.	Name of member in formatted SHG's	Age	From represented family	Name of proposed activities	Activation Position
1	2	3	4	5	6
1	Babu Lal	40	President	Livestock	New
2	Nemwati	38	Member	Livestock	New
3	Satyaveer	35	Member	Livestock	New
4	Brajrao	20	Member	Livestock	New
5	Sandeep Kumar	20	Member	Livestock	New
6	Khubiram	30	Secretary	Livestock	New
7	Indra Pal	40	Member	Livestock	New
8	Rajwati	38	Member	Livestock	New
9	Prem Chand	8	Member	Livestock	New
10	Smt Reshma	25	Member	Livestock	New

Table – 33 : Satyam Self help group Dalpatpur

S. No.	Name of member in formatted SHG's	Age	From represented family	Name of proposed activities	Activation Position
1	2	3	4	5	6
1	Sheeshpal	45	President	Livestock	New
2	Om Prakash	43		Livestock	New
3	Pratap	32		Livestock	New
4	Omveer	38		Livestock	New
5	Jagveer	28	Secretary	Livestock	New
6	Prahlad	23		Livestock	New
7	Sanjay	48		Livestock	New
8	Meenu	22		Livestock	New
9	Veerpal	41		Livestock	New
10	Harendra	50		Livestock	New

Formation of User's Groups :

User's groups are farmated by the help of watershed committee and watershed development team in the micro watershed comprised villages. Formers which have land village are involved in the User's groups and they will be direct benefited as expected by the implementation of watershed project easy and convenienced condition are made to resource use between user's groups and they will be responsible to operate and maintenance for the created assets in the watershed. Nos. of farmated user's groups details are given as follows :

Table – 35 : Village wise user's groups

S. No.	Name of village	No. of groups	No. of farmers	Total Agri. Land	Area under treat-ment	Cost of assets
1	2	3	4	5	6	7
1	Khandar	1	10	236.70	231.05	
2	Khandar	2	10	236.70	231.05	
3	Dalpatpur	3	10	131.04	127.26	

10. Estimation and Costing of Proposed activities of the watershed Project Year 2010-11.

Proposed works / activities for the Project Period (Year 2010-11) under proposed treatable area 629.00 Ha. Out of total Geographical area 677 Ha.

(10.1) Financial and Physical Outlets :

Table – 36 : Financial and Physical Outlets for the Year 2009-10 :

Sl. No.	Components	Unit cost per ha.	Physical ha.	Financial (Lacs)			Man-days Generation
				Labour Component	Material Component	Total	
1	2	3	4	5	6	7	8
A	Management Cost 10%						
1	Administrative Cost – TA & DA Hiring of Vehicles, Official Expenditure Electricity & Phone bill Computer, Stationery and office consumable materials & contingency	1200	-	-	10.680	10.680	-
2	Monitoring	120	-	-	1.068	1.068	
3	Evaluation	120	-	-	1.068	1.068	
	Sub Total	1440		-	12.816	12.816	
B	Preparatory Phase 10%						
1	Entry Point Activities 4%	480	-	0.8544	3.4176	4.2720	854
2	Institutional & Capacity Building 5%	600	-	-	5.340	5.340	
3	Detailed Project Report 1%	120	-	-	1.068	1.068	
	Sub Total	1200	-	0.8544	9.8256	10.68	854
C	Watershed Work Phase						
a	Watershed Development Works						
1	Graded, Contour & Field Bunds	3000	103	3.090	-	3.090	3090
2	Gully Plug, Earthen Checkdam /WHS	7500	171	8.9775	3.8475	12.825	9205
3	Submergence bunds	4000	146	5.840	-	5.840	5840
4	Peripheral Bund	3500	145	5.0750	-	5.075	5075
5	Earthen Water Harvesting Bund	9000	180	9.720	6.480	16.200	10270
6	Renovation of existing Bunds	3000	111	3.330	-	3.330	3330
7	Renovation of existing W.H.B	-	-	-	-	-	-
8	Aforestation and Development of silvi postural system	20160	25	1.008	4.032	5.040	1008
9	Dry Land Horticulture	20000	10	.400	1.60	2.00	400
10	Community Pound (Renovation)	-		-	-		-
	Sub Total		890	37.4405	15.9595	53.400	38218
B	Livelihood Programme (Community Based) 7.620						
	Income generating activities through SHG's for landless and marginal farmers 10%						
1	Live stock development activities	200	-	-	1.7803	1.7803	-
2	Bee Keeping	100	-	-	0.8900	0.8900	-
3	Poultry Farming	200	-	-	1.7803	1.7803	-
4	Nursery Development	300	-	-	0.6700	0.6700	-
5	Vegetable Production	100	-	-	0.8900	0.8900	-
6	Milk Dairy Promotion Unit	200	-	-	1.7803	1.7803	-
7	Establishment of Vermi compost Unit	100	-	-	0.8900	0.8900	-
8	Sub Total	1200	-	-	10.6809	10.6809	-
C	Production System and micro Enterprises						
1	Crop production, diversification of agriculture and introduction of agro forestry	1170	-	-	10.413	10.413	-
2	Demonstration of improved composting system	390	-	-	3.471	3.471	-
	Sub Total	1560	-	-	13.884	13.884	
D	Consolidation Phase 5% Sub Total						
	Sub Total	600	-	-	5.340	5.340	-
Grand Total		12000	890	38.2949	68.5060	106.809	39072

संकल्प पत्र

ग्राम पंचायत – खण्डार कोड सं० 2B3E3c3e विकास खण्ड –पहासू जिला – बुलन्दशहर

यह कि आई०डब्लू०एम०पी० परियोजना में तैयार की गयी निर्माण की नयी सृजित परिसम्पत्तियों को ग्राम पंचायत खण्डार एवं माइक्रो वाटरशेड के अन्तर्गत सम्मिलित ग्रामों में योजना क्रियान्वयन कराने एवं योजना उपरान्त चालू रखने तथा सृजित परिसम्पत्तियों के अनुरक्षण हेतु कृत संकल्प एवं इच्छुक है।

खण्डार ग्राम पंचायत के सभी स्रोत स्थल जैसे तालाब, ग्रामसभा गोचर (चारागाह), जल संसाधन, जंगल आदि में भूमि विकास परियोजना के अन्तर्गत किये जायेंगे। उन कार्यों को समाज के कमजोर वर्ग जैसे अनुसूचित जाति/जनजाति, महिला वर्ग एवं अल्प भूमिहीन गरीबी रेखा के नीचे के लाभार्थियों को लाभ पहुँचाने हेतु इच्छुक होंगे।

हम योजना संचालन हेतु प्रस्तावित करते हैं एवं सहमति देते हैं कि भारत सरकार के समस्त मार्गदर्शी सिद्धान्तों के अनुपालन में कार्य सम्पन्न करायेगें यह भी घोषित करते हैं कि चयनित क्षेत्र जिसको मेरे द्वारा भलीभाँति देखा गया है, और प्रस्तावित योजना में प्रस्तावित समस्त कार्य 15 सालों से नहीं कराया गया है जिसकी मुझे पूर्ण रूप से जानकारी है और अनुमोदन करते हैं।



विजयपाल
मुख्याधिकारी
खण्डार
बुलन्दशहर
जिला
उत्तर प्रदेश
गर्जना
आयुक्त
विजयपाल

PROJECT AT A GLANCE

IWMP-II (Bulandshahar)

1	State	Uttar Pradesh
2	Distt.	Bulandshahar
3	Block	Pahasu
4	M.W.S. Code	2B3E3c3d
5	Name of M.W.S. Project	Udarmi
6	Involved Village	05
7	Geographical Area of M.W.S.	507 Ha.
8	Rainfed Area	399.26
9	Treatable Area	456
10	Weightage	
11	Cost of Project	54.72
12	For the year	2010-11

Budget Components

S. No.	Components	Area (Ha.)	Cost (in Lacs)
1	2	3	4
1	Management Cost 12%	-	6.5664
2	Preparatory Phase 10%	-	5.4720
3	Watershed Work Phase	-	
	A- Watershed Development Works 50%	456	27.360
	B- Livelihood Programme (Community Base) 10%	-	5.4720
	C- Production System & Micro Enterprises 13%	-	7.1136
4	Consolidation Phase 5%	-	2.7360
	Total	456	54.720

Executive Summary of the Project

Identified selected micro watershed project Udarmi is coded as **2B3E3c3d** has been proposed from cluster of I.W.M.P. Bulandshahar – II project in Pahasu Block district Bulandshahar four villages namely Madanpur, Samaspur, Chodera and Kutubpur is comprised in the micro watershed which is located in the east of district Bulandshahar on the west bank of River Upper Kali Nadi and border of district area is known as Khadar. It lies between $28^{\circ}-5'$ and $28^{\circ}-15'$ N Latitudes and $78^{\circ}-0$ and $78^{\circ}-10$ W Longitudes Covering area. Its altitudes ranges from 181 meter to 190 meter above the mean sea level. Khurja Railway Station 184.11 m, Bulandshahar Railway station is 201.18 m above mean sea level is displayed. Project area of I.W.M.P. BSR-II is lied in the Pahasu Block of Bulandshahar District which is come in the western plan zone under semi arid area. The annual average rainfall is near to 397 mm which an average of 35 rainy days. Out of which about 85% is received during the mansoon season from July to September and very less rainfall is received in the winter season.

Temperature ranges from as high as 43°C in the May-June to as $3^{\circ}-4^{\circ}\text{C}$ during December – January. The Trend of rain fall is highly erotic and maximum water goes as runoff.

Main occupation of the dwellers is agriculture in the watershed. Some part of the lands are shown during the Kharif season. Cane sugar are preferred crops in the project area. The main Crops raised are Wheat, Pea & Mustered & Maize

The topmost portion of the watershed is sloppy flat land. Other than topmost portion of the watershed is under soil erotic portion and depreciative. The soil of the land are sandy loam Soil. The middle agricultural position of watershed relatively smooth sloppy flat land with sandy loam soil texture. These soil is yellow in colour and are inherently good in fertility status.

Natural vegetation of the watershed is very poor. Somewhere forest vegetation is seen which are predominant with Vilayati Babool (*Prosopis Juliflora*), followed by Babool (*Accasia nilotica*), somewhere Neem Plants (*Azadirachta Indica*), Shisham (*Dolbergia Sisson*) and Karanj (*Pongamia Glabra*) are seen in occasional occurrence. There is no grass land in the watershed. Somewhere grass patches are seen only on the bunds, road sides and other such places. Coverage of massive green belt is in poor percentage for environment which is envisaged. That watershed is very poor climate area.

There is normal condition of animal physics and for their fodder arrangement is the watershed and creative possibility would be expected by the implementations of the project.

Due to Arial soil erosion poor harvesting managements, cropping pattern, non treated watershed etc. are very anti effective causes for the watershed. Problem of the watershed is to be

tackled by harvesting structures which have lost most of their capacity new water bodies for the prevention of erosion and conservation of soil and moisture various type of earthen bunds in the watershed field, necessity has been observed. Wasteland will be treated with staggered Trenches, afforestation and bunding for the changing of characteristics.

The detail project report has been prepared by the applying of nine process steps for the micro watershed code no. **2B3E3c3d** brief is as follows.

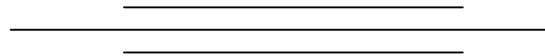
- STEP-1 Secondary data collection:-** During the five days visit programme in the micro watershed project with of all available documents of village label by approaching the Gram panchayat collected secondary data.
- STEP-2 Village meeting & conducting PRA exercise:-** Community meeting conducted on five days for the consultation with villagers for the PRA Exercise. Participatory mode of the villages was positive indicated for the success of programme. With good in testing participation has been drawn social & resource map on ground & paper & discussed various topics of problematic thoughts in the micro watershed.
- STEP-3 Socio economic survey:-** The resource organization of village label volunteers identified to conduct house hold socio economic survey/states.
- STEP-4 Problem typology analysis:-** Thoroughly analyzed the data & identified problem type as soil & moisture conservation, crop rotation, crop coverage, productivity, livelihoods, social issues & capacity building gaps etc. Problems discussed with the watershed committee & came up with alternative solution.
- STEP-5 Conduct of net participatory planning (NPP):-** The planning team visited together in the planning blocks on the scheduled date along with the beneficiaries of the villages & data gathered as for the participatory net planning.
- STEP-6 Productivity & livelihood planning exercise:-** For the product livelihood exercise, group discussion on various livelihood as Agriculture, Animal husbandry enterprise development held discussion with the villagers in the micro watershed.
- STEP-7 Institutional & capacity building :-** This plan is prepared based on the data available in the field and consultations with the watershed committee.
- STEP-8 Data consolidation & documentation of DPR :-** After gathering all required information compiled collected data. Thoroughly discussed and finalized the expected outcomes and benefits specially in the respect of livelihood for different segments. These are the target and performers indicators for the micro watershed.
- STEP-9 Conduct of Gram Sabha obtaining approvals submissions of DPR:-** After preparation of the draft DPR convened to Gram sabha and activities proposed expected

outcomes benefits of implementing the programm are explained in case of any changes are proposed in the Gram sabha approval obtained by the Gram sabha and already singed of Mau paper.

STEP-9A Attachment of detail estimate, cost and design:-Estimating, Costing and design prepared technically According to plan in the micro watershed project. And attached with the DPR.

STEP-9B Various type of mapping :- DPR prepared in the support of micro watershed project using various type of maps is as follows :

- | | |
|--------------------------------------|-----------------------------|
| 1.Index Map of Watershed | 2. Watershed Map |
| 3. Relief/ Drainage Map | 4. Slop Map |
| 5.Soil and Land Capability class map | 6. Land use/ Land Cover Map |
| 7. Cadastral map | 8. Proposed Action Plan map |
| 9. Social Map | |



Project Report

Table – 1 : Micro watershed project brief : -

1	State	U.P.
2	District	Bulandshahar
3	Block	Pahasu
4	Comprised Villages (Nos.)	05
5	Name of Watershed	Udarmi
6	Name of MWS Project	Udarmi
7	MWS Code No.	2B3E3c3d
8	Geographical Area of MWS	507.000
9	Treatable Area	456

1- Project Objectives :- The aim and objectives of the Project are :

- cc- Conservation, development and sustainable management of natural resources including their users.
- dd- Enhancement of agriculture production and productivity in a sustainable manner.
- ee- Restoration of ecological balance in the degraded and fragile rain fed ecosystem.
- ff- Reduction in regional disparity between rains fed and irrigated area.
- gg- Creation of sustainable employment opportunities for the rural community for livelihood security.
- hh- Generation of massive employment.
- ii- Reduce migration from rural employment.

2- Major Problem of Project Area :

- y- Actual shortage of drinking water.
- z- Near to nil activated water bodies and water harvesting structures.
- aa- Low depth of ground water table.
- bb- Undulated and generally sloppy rainfed area.
- cc- Large number of Small, Marginal and S.C. farmer land holding.
- dd- Lower wages of agriculture labour and also migration of labour due to shortage of employment in the watershed.

3- General Description :

(3.1) Location :-

Udarmi Watershed has been taken with MWS Code No. **2B3E3c3d** in Pahasu Block of Distt. Bulandshahar is located on Khurja via Shikarpur Syana to Pahasu road about 25 Km. between 28°15' and 28°10' N Latitudes and 78°0' and 78°5' N Longitudes. Location and delineation of watershed has been located on watershed map **Fig. 2** and on top sheet **Fig. 3**.

(3.2) Area and Elevation :

Elevation ranges from 181 to 208 mtr. above the mean sea level(MSL) altogether comprised villages and their's area is described as follows.

(Comprises village map Fig. 3)

Table – 2 : Area and Elevation

Sl. No.	MWS Code	Block	Name of Village	Geographical Area	Treatable Area
1	2	3	4	5	6
1	2B3E3c3d	Pahasu	Dighi	112	100.75
			Pahasu	160	143.90
			Udarmi	126	113.32
			Surjawali	67	60.26
			Pitampur	42	37.77
				507.00	456.00

(3.3) Shape of the Micro Watershed:

The shape of watershed is Elongated and as Rectangular. The maximum length and width of the watershed are 5000 Mtr. and 1814 Mtr. respectively with the Length: Width ratio of 2.76:1.

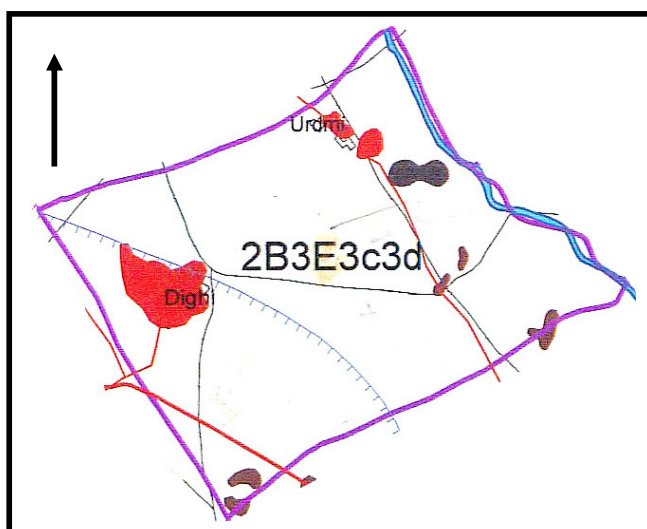


Fig. 1 (Shape of Micro Watershed)

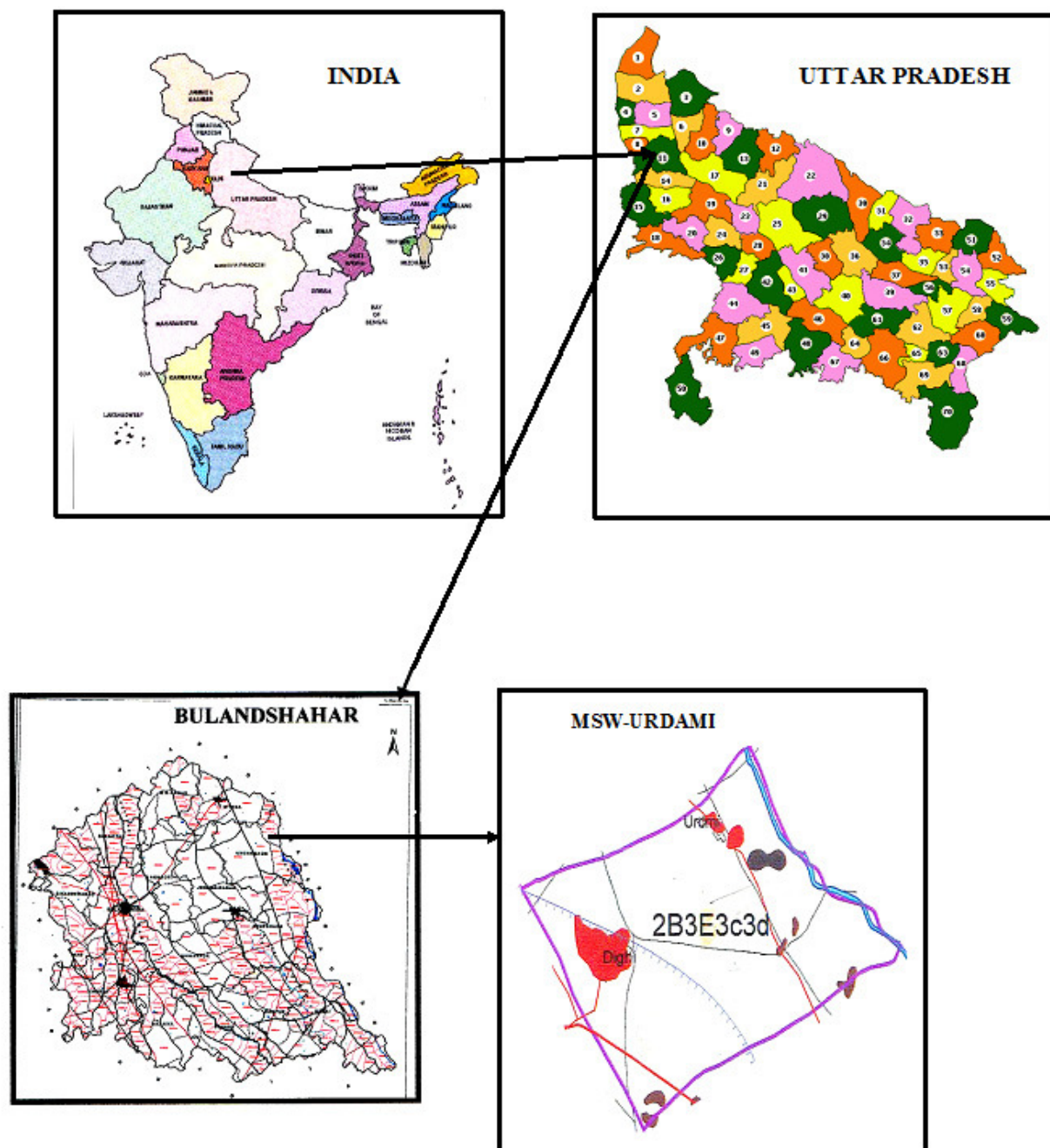
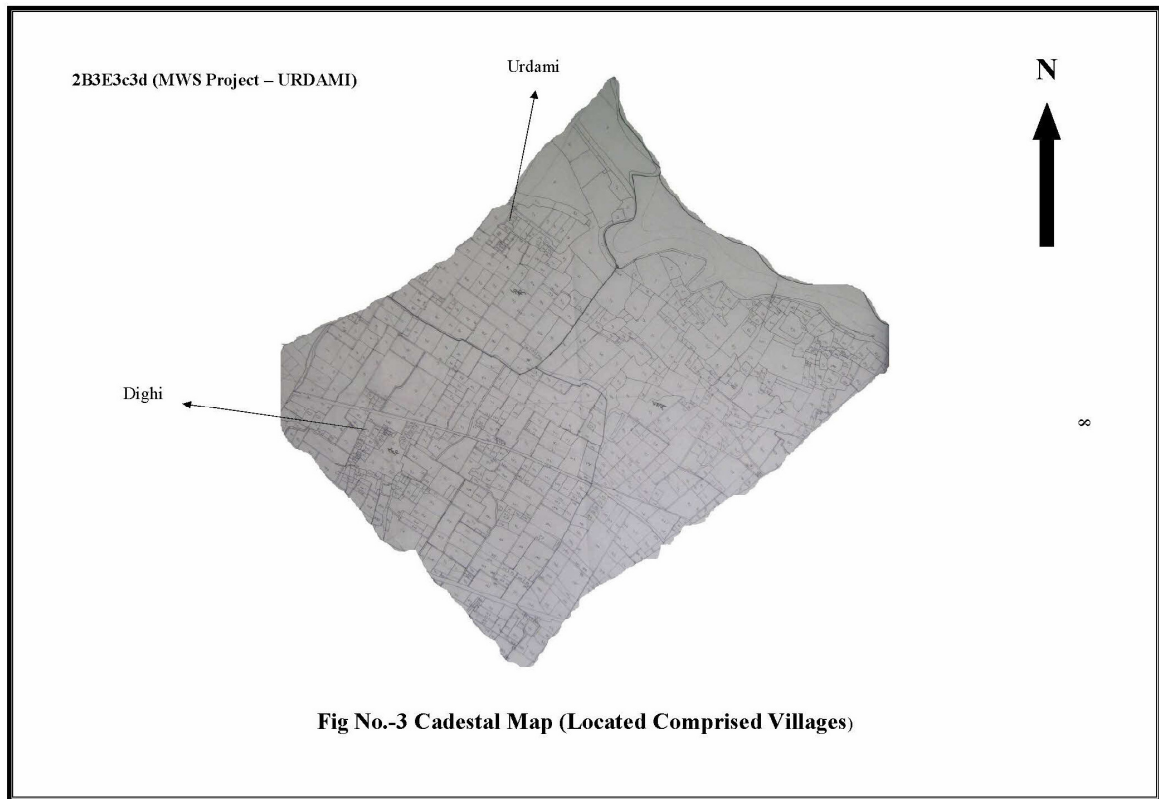


Fig.- 2 Location of the Micro Watershed



Sl. No.	Name of Project	Name of Village	Geograph ical Area (in ha.)	Raifed Area (in ha.)	Treatable Area	Agri. Land
1	2	3	4	5	6	7
1	Udarmi	Dighi	112.00	81.50	100.75	124.40
2		Pahasu	160.00	127.90	143.90	177.67
3		Udarmi	126.00	100.73	113.32	139.90
4		Surjawali	67.00	53.56	60.26	74.40
5		Pitampur	42.00	35.57	37.77	46.63
Total			507.00	399.26	456.00	563.00

(3.4) Climate :

The Watershed falls under semi arid region of tropical climate inclined in Western Plan Zone. The average annual precipitation is about approx. is 397 mm. spreading over 35 rainy days. Most of the rain fall (about 85%) is received during July to September. The rain fall of moderate intensity. Nothing the area receives of scarcity rainfall in the winter season. The temperator variation ranges from as high as 43⁰c in the month of May-June to as low as 4⁰c in December-January.

(3.5) Geomorphology and Soils :

Geomorphology :

The entire watershed is topographically divided into major landforms. Accordingly the soils of watershed can be grouped into various categories such plane land, undulated land, sloppy land and erosic ravenous land.

Soil :**(a) Fine textured soil :**

The soil are the most extensive soil group found in the watershed. Some portion of the watershed is relatively sloppy flat land with fine soil texture as sandy loam. The soils are in color and are inherently good high in fertility status. Soil texture is sandy lome loam particularly in depressions and loam in the elevated portion. The soil characteristic texture is dispersive and smooth. Therefore without impeded the downward movement of water productive layer of soil are easily by high runoff.

a- Coarse Textured Soil :

These soil are lying mostly in downward portion, along with erosic gully and drainage line upto end of watershed outlet. These soils are coarser in texture and are relatively poor in fertility status. The soils are lomy sand in texture. Rill and gully formation in same parts particularly near the outlet of watershed can be seen.

(3.6) Drainage and Slope:

Due to prevalence of mild steep slope and presence of a number of drainage lines in the watershed the drainage system is adequate. The watershed from part of Ganga Basin and watershed. Under mild to steep topographical slope of MWS as divided as follow : (Drainage and slope map fig.-4)

Table - 4 : Drainage and Slope

S. No.	Grade	Slope Percent	Area in Ha.	Remark
1	A	0.5-1	136	-
2	B	1-2	114	-
3	C	2-3	91	-
4	D	3-4	68	-
5	E	4-5	31	-
6	F	5-6	16	-

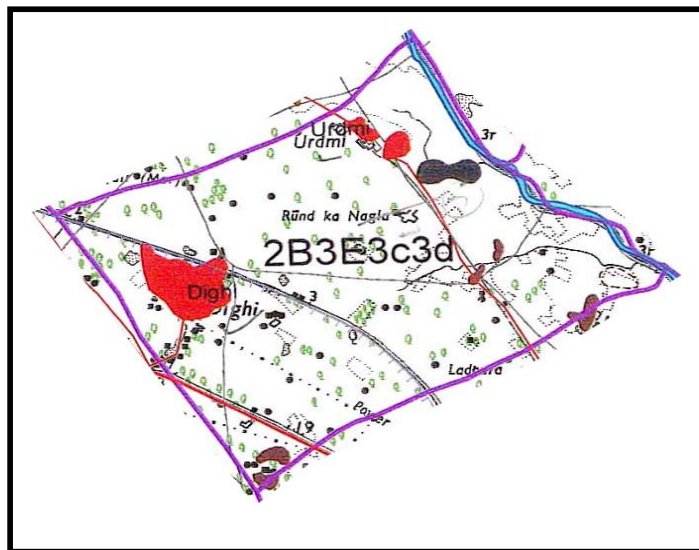


Fig-4 (Drainage & Scrub Map)

(3.7) Vegetation :

a- Natural Vegetation :

Natural vegetation is very poor in the watershed. The forest vegetation is predominant with Vilayti Babool (*Prosopis Juliflora*). There are occasional occurrence of Neem Plants (*Azadirochta Indica*), Shisham (*Dalbergia Sissoo*) and Karanj (*Pangamia Glabra*) and anywhere some scrubs are seen. There are no grass land in the watershed. Somewhere grass patches are seen only on the bunds, roadside and other such places. Poor percentage of massive green trees has been not seen in the watershed except Horticulture backyard.

b- Horticulture :

There is no backyards or commercial horticulture plantation in villages are been in some part of watershed.

c- Agro forestry :

The agriculture fields of the villages have some horticulture plantation at places isolated trees whose frequency is seen as under agroforestry and some where in where in backyards.

(3.8) Human Population:

a- Human Population:

Total Population of involved villages in watershed is 8936 with average family size of six persons as detailed as follows

Table – 5 : Human Population

S. No.	Name of village	Nos. of families	Human Population			Total
			Male	Female	Children	
1	Dighi	577	1218	1125	1261	3604
2	Pahasu	352	762	704	977	2443
3	Udarmi	136	312	289	200	801
4	Surjawali	461	1778	1643	1140	4561
5	Pitampur	57	124	116	159	399
		1583	4194	3877	3737	11808

f- Categorization of Human Population :

In the total population of watershed villages, categories are defined as below :

Table – 6 : Population Categories

S. No.	Particulars	Unit	Number of families in population in the villages		
			Population	Family	Remark
1	2	3	4	5	6
1	Agri Farmer	No.	9446	1266	
2	Landless	No.	259	37	
3	Agri. Labour	No.	1614	237	
4	Land less Labour	No.	273	39	
5	BPL Family	No.	605	121	
6	SC Family	No.	4345	620	
7	ST Family	No.	-	-	

(3.9) Land Holding :

All the categories of farmers as small, marginal, medium and large are involved in land holding average of about 1-18 ha. Small land holding farmers are further scattered at different places which makes cultivation very difficult. Distribution of farm families according to the size of the land holdings are given as below :

Table – 7 : Distribution of farm families according to their size of land holdings

S. No.	Name of Village	Total Agri. Land in MWS	Land Holding Family (Nos.)					Percentage
			Marginal (< - 1Ha.)	Small (1-2 Ha.)	Medium (2-4 Ha.)	Large (4-7 Ha.)	Total	
1	Dighi	124.40	230	57	43	10	340	
2	Pahasu	177.67	328	81	62	14	485	
3	Udarmi	139.90	259	64	49	10	382	
4	Surjawali	74.40	137	34	26	6	203	
5.	Pitampur	46.63	85	21	16	6	128	
Total		563.00	1039	257	196	46	1538	

(3.10) Live Stock Population :

Total live stock population of the watershed is Nos. Buffalos is preferred as mulch animal compared to Cow. But milk yield is poor. Goats are also kept for milk as well as for meat purpose. The breakup of livestock population is as follows :

Table – 8 : Live Stock Position

S. No.	Name of Village	Unit	Live Stock Position				Total
			Buffaloes	Cows	Bullocks	Goats	
1	Dighi	No.	871	197	176	237	1481
2	Pahasu	No.	993	229	107	219	1548
3	Udarmi	No.	627	191	137	129	1084
4	Surjawali	No.	723	181	108	141	1153
5.	Pitampur		419	113	91	79	702
Total			3633	911	619	805	5968

(3.11) Infrastructure Social Feature :

- a- Comprised villages in the micro watershed has moderate communication facilities. Watershed linked with metaled road and approachable through motarable road.
- n- All the villages are electrified and have T.V. and Telephone connection.
- o- Literacy rate in the watershed is very low all villages are having education upto Junior High School.
- p- Nearest small market is at Pahasu 13 Km. Nearest big market Bulandshahar is about 55 Km. from watershed. Religious and ritual features are almost common as in other parts af U.P. small land holding with large family size and more than 25% of the labour force of the total population living below poverty line indicate poor socio economic status of the watershed community.

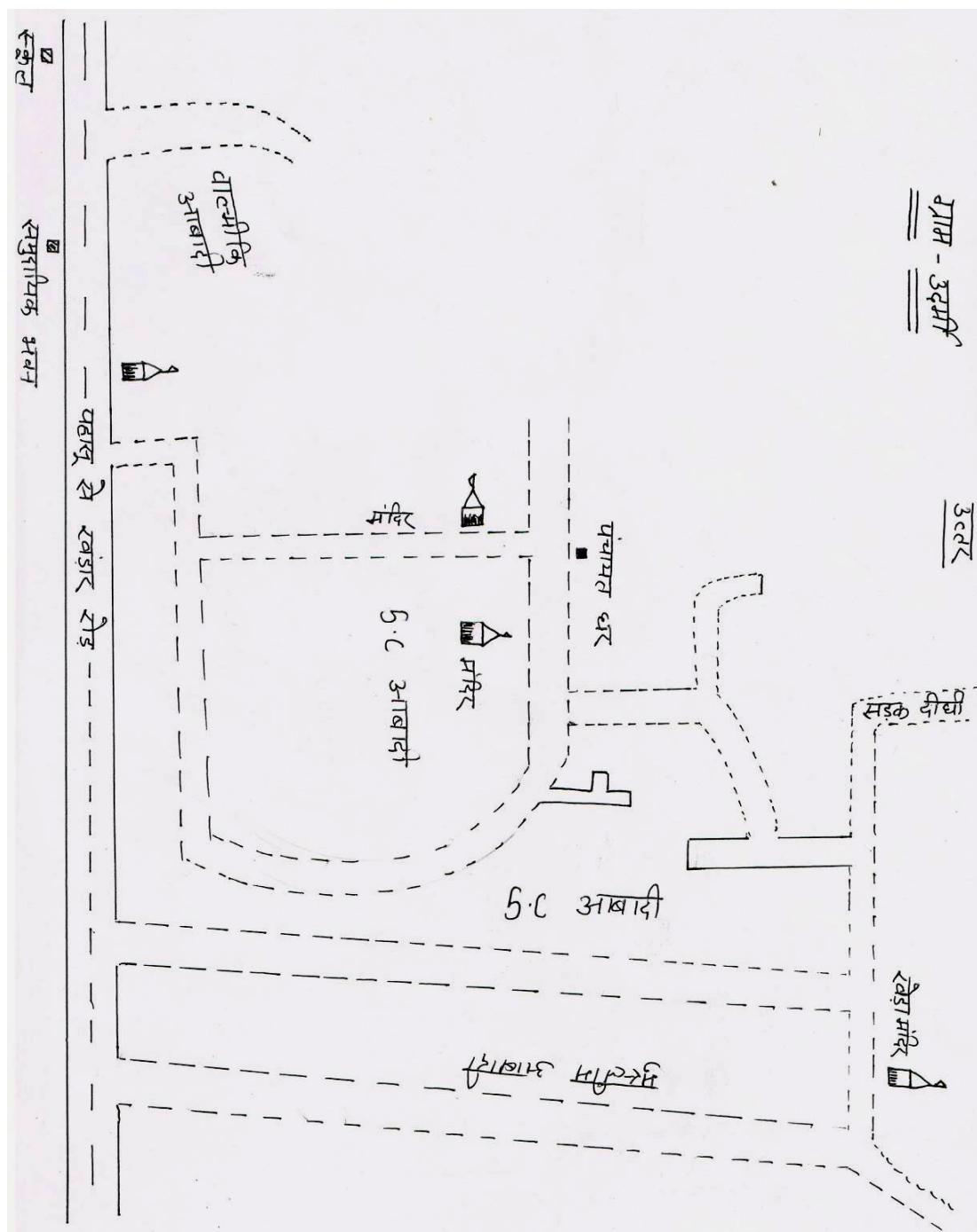
Participatory Rural Appraisal

Participatory mode of the villagers shows positive indication for the success of the programme. Traditionally the entire village community participate in the individual works. Social map of one of the watershed village drawn by villagers themselves, depicting various village figures is shown in sketched map in Fig.-4 & 5. Infrastructures position of the village recorded as follows :

Table – 9 : MW.S. Project – Udarmi

S. No.	Infrastructure	Unit	Qty.
1	2	3	4
1	Primary School	No.	1
2	Junior High School	No.	1
3	Kanya Pathshala	No.	-
4	Public Health Center	No.	-
5	Vet nary Hospital	No.	-
6	Panchayat Ghar	No.	1
7	Post Office	No.	-
8	Agan Bari Center	No.	1
9	Electricity	-	Yes
10	Road	-	Yes
11	Pond	No.	1
12	Hand Pump	No.	11
13	Irrigation Well	No.	-
14	Canal	No.	1
15	Temple	No.	1
16	Well (Drinking Water)	No.	1
17	Pumping Set	No.	21
18	Toilet	No.	9
19	Market	No.	No

SOCIAL MAP



Recorded importance of development institution

Farmers perception recorded for importance and role of different development institution in relation to infrastructure. Importance has been depicted with size of circle and role with distance from village circle. (Fig 8)

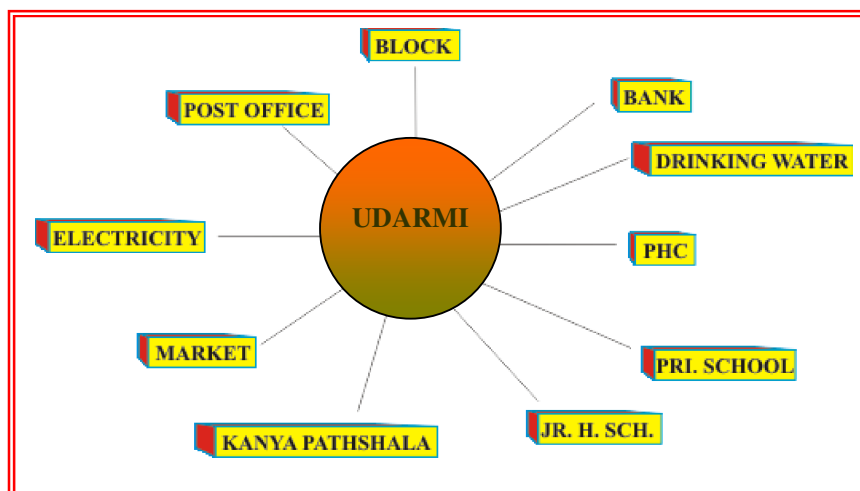


Fig. -8 (Venn diagram of Micro watershed)

(3.12) Communication :

Watershed can be approached from District Headquarter Bulandshahar to Project area 35 km. by Road.

(3.13) Natural Resource Base :

Transact of watershed showed typical land use profile consisting of plain agriculture land, erodic area and medium ravenous ridge. Main source of the irrigation are the canal for pre showing irrigation only. The total geographical area of the watershed is 468.001 Ha. classification .

Approach roads for the micro watershed is shown for the communication is shown on topo sheet map Fig 9 as next page.

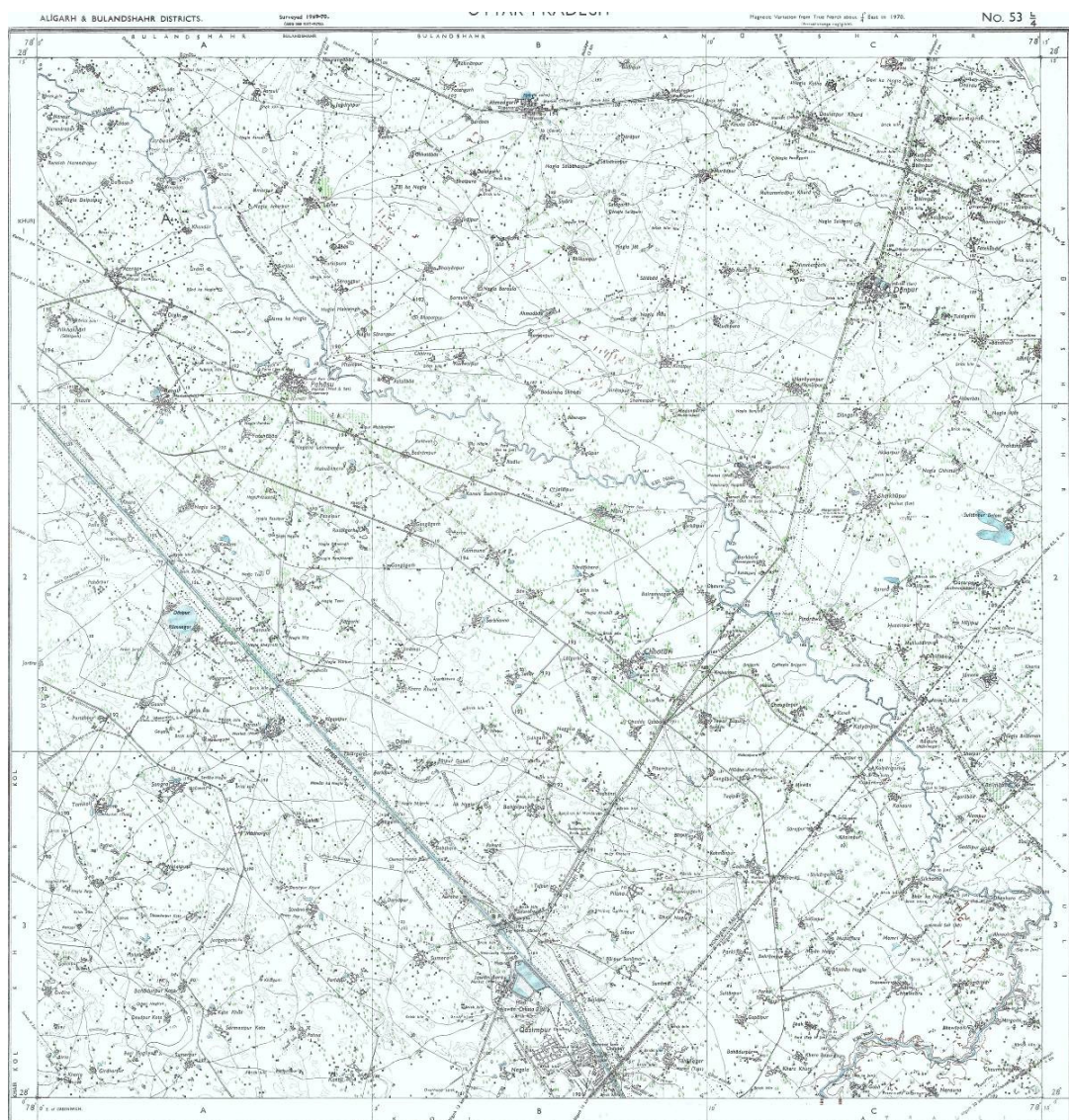


Fig.- 7 Communication Map on Toposheet

Table – 10 : Classification of area(Hect.)

S.N o.	Name of Village	Unit	Total Geographical Area	Rainfed Area	Wasteland	Village Land and Road	Irrigation Resource	
							Water Bodies	Borewell
1	2	3	4	5	6	7	8	9
1	Dighi	Ha.	112	81.50	7.00	2.10	6.15	15.10
2	Pahasu	Ha.	160	127.90	10.00	2.83	2.10	18.00
3	Udarmi	Ha.	126	100.73	7.85	1.85	1.72	8.30
4	Surjawali	Ha	67	53.56	4.18	2.10	0.73	5.45
5.	Pitampur	Ha	42	35.57	2.62	1.23	2.27	2.38
Total			507	399.26	31.65	10.11	12.97	49.23

(3.14) Livelihood :

Total Population of the watershed is 8936 and out of the total population a majority more than 80% has farming as their major source of livelihood followed by labours, serviceman and small business class. Classified livelihood given in form as follows :

Table – 11 : Livelihood Classification in population :

S. No.	Name of Village	Farmer	Labour	In Service	In Local small business	Others
1	2	3	4	5	6	7
1	Dighi	461	51	27	19	-
2	Pahasu	281	35	19	39	-
3	Udarmi	108	17	7	4	-
4	Surjawali	368	49	19	9	-
5.	Pitampur	45	5	7	5	
	Total	1263	157	79	74	-

(3.15) Dependency of forest fuel wood and fodder :

- a. **Fuel wood :-** The main source of fuel is from cow dung cake, woody stem of crops. About 70% of the clomestic energy requirement is met from the agriculture by product and cow dung cake. Rest is met out from the forest outside the village and watershed boundary, most preferred fuel wood is Juliflora fuel wood Juliflora obtained from standing along and between watershed.
- f- **Fodder :-** Villages have not any sufficient signified dependency on forest based fodder as these resource are nothing availability in the forest.

(3.16) Labour requirement :

Labour requirements was found to be maximum at the time of October, November and December when the sawing of Rabi crops are done. The crucial periods are March and April coinciding harvesting and threshing of Rabi crops and July/August is sowing Kharif Crops take a little place. Other income generating enterprises having potential during the remaining.

(3.17) Crop Rotation :

Present Crop rotation in the watershed comprise of :

Kharif	-	Bajra	-	Rare
		Maize	-	Rare
		Jwar	-	Rare
Rabi	-	Fallow Wheat	-	Major
		Fallow Barly	-	Major
		Fallow Sugarcane	-	Major
		Fallow Mustard	-	Major
Zayad	-	Urad, Moong, Makka		

The above said Rabi Crops is the most prevailing crop rotation on the agriculture lands both in the rainfed and irrigated conditions.

Organized vegetable cultivation fruit plantation and traditional agro forestry systems are lacking as per requirement in the watershed the limited vegetable cultivation in the watershed is confined as kitchen gardens and field to the irrigated condition in a scattered manner. The cultivation of cash crops other than the sugarcane, wheat and mustard also in the watershed.

(3.18) Historical Events :

Chronological record of important events of the watershed village is prepared through participatory rural appraisal (PRA) which is very useful in understanding of its background and chronology is given as follows :

Table – 12 : Historical Events

S. No.	Events/Activities	Year	Rem.
1	2	3	4
1	Established	1411	
2	Opening of Primary School	1962	
3	Opening of Junior School	1992	
4	Opening of Kanya Pathshala	1970	
5	Opening of PHC	-	
6	Opening of Vet. Hospital	-	
7	Panchayat Ghar	1988	
8	Introduction of Tractor	1974-75	
9	Gobar Gas Plant	1977	
10	Thresher	1975-76	
11	First Tube well/Pumpset	1962	
12	First Motorcycle	1984	
13	T.V. & D.V.D. Players	1984	
14	Electricity in Village	1964-65	
15	Bituminous Road	1955	
16	First Hand Pump	1980	
17	Templo Renovation	1956	
18	First Land Line Telephone	1990	
19	Planning for Watershed Project	2011-12	

(3.19) Present Land Use in the Watershed :-

The watershed has diversified land uses. The varied present land use under different use in the watershed. The mixed land use followed in the watershed is almost similar in other parts of U.P. During P.R.A. Exercise prepared land has been shown in Table No. 13, 14 & 15.

Table – 13 : (Ownership)

S. No.	Name of Village	Pvt. Agri. Land		Govt. Revenu Land	Forest Land	Other Land
		S.C./S.T.	Others			
1	2	3	4	5	6	7
1	Dighi	25.75	77.25	2.775	-	-
2	Pahasu	75.5	77.50	2.181	-	-
3	Udarmi	107	12.50	2.235	-	-
4	Surjawali	44.50	20.00	1.810	-	-
5.	Pitampur	16.80	21.00	0.724		

Table –14 : (Present Land under different categories)

S. No.	Name of Village	Land Use (Ha.)				
		Agricultural	Wasteland (All Types)	Seasonal waterbodies	Village/Road Etc.	Total
1	2	3	4	5	6	7
1	Dighi	100.800	84.29		2.775	
2	Pahasu	144.00	13.819		2.181	
3	Udarmi	113.40	10.361		2.239	
4	Surjawali	60.30	4.89		1.810	
5.	Pitampur	37.80	3.426		0.724	
Total						

Table – 15 : (Present land use classified)

S. No.	Land Use Under	Unit (ha.)	Area (Ha.)	Percentage
1	2	3	4	5
1	Under Agriculture			
	A- Rainfed-			
	I- Crops		377.425	70%
	II- Agro forestry		14.075	7%
	B- Irrigated-		-	
	I- Assured			
	II- Portial		115.025	12%
2	Wasteland			
	A- Aforestation			
	B- Pasture			
	C- Untreatable			
	D- Treatable		506.575	100%

Proposed Post Land Use has been given on Page No. 32

4- Focus on Present Land Use :

(4.1) Agriculture :

The total area under agriculture in the watershed is about 415.02 ha. out of which 906.61 ha. is under rainfed agriculture. Agriculture land uses in the watershed extended to diversified land capabilities starting marginal to good class II land. The irrigated and drinking water is most scarce natural resource in the watershed. The operation of tube well 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 of the watershed

area. The agricultural field bund are common in the watersheds however they frequently breach on heavy rains.

Various mixed texture of soils are located in patches through out the watershed. The heavy soils are almost kept fallow during rainy season. the agricultural soils also have some as share calcium pan at variable depths. The irrigation water is conveyed by the earthen channels. Surface irrigation methods following mainly border method of flood method by the formers in the watershed. These factors reduce the water use efficiency of limited and valuable irrigation water.

Drought hardy species like Juliflora suitable multi purpose trees is suitable for rehabilitation of the wasteland. Rehabilitation of waste lands promoting agro forestry with appropriate fruit and forest species suitable vegetative barriers on sloppy lands can be high future value and by these adoption would be meet out many demands of fire wood and fodder in the wasteland. Except above but also for soil and water conservation, rehabilitation of wasteland and sustainable income generation for socio-economic upliftment of farmers.

Crop Productivity :

The farmers also do not have suitable cropping system to deal aberrant weather. Weeds impose considerable constraint in productivity of both Karif and Rabi crops under irrigated as well as rainfed production system farmer undertake normally one manual weeding in mustard and other valuable crops however, practices is energy and time consuming. Use of we decide is rare in the watershed.

In the watershed area, limited cropping in the Kharif with mixed cropping practices is not only irrigational but also unscientific and best for low productivity. Subsequent Rabi crops in general. Sugarcane & Mustard crop in particular are raised on residual soil moisture under rainfed production system during post monsoon season.

(4.2) Indigenous Technological Knowledge (ITK) :

Under process of PRA tracked out rural applying technology in various field of local technology and some technology is very popular in village. In which the agriculture is an old traditional practices of farmers who have improved themselves with passage of the time according to their domestic needs and technological reforms in the nearby areas. The villages have their traditional village ponds, practice of field bunding which typically constitute agricultural related ITKs in the watershed. The Mustard & sugarcane being a

cash and firewood crop of the watershed and also sugarcane crop is being. Cultivated in self designed manner by the farmers. Its carried out that the area is totally depend on rain and under the rainfed area technology is applied by the farmers. However limited fertilizer application specifically the DAP came in the practices since about 15-20 years.

(4.3) Forest and Other Vegetation :

Forest :

The watershed have a tract of wasteland area which are under uncultivable position is liesed in the watershed. These wasteland have not any tree vegetation or very less than real requirement for the wasteland use.

Horticulture/Agro forestry :

Horticulture and agro forestry practices were observed in the watershed.

(4.4) Agro forestry :

Agro forestry practices are lacking in the watershed. Though it has good potential under existing disposition and may a role particularly with respect to minimization of cropping risk, built up soil fertility and productivity, protection of soil erosion, soil conservation partly meeting out the fire wood demand of rural community and more over optimizing the economical return from system as whole under typical semi arid climate in the watershed. Bund and boundary plantation also have good potential to care the fire wood and fodder demands of the rural community in the watershed. The existing area under agro forestry is almost negligible. Prosopis Jhliflora may be planted as block or sole plantation specifically on marginal and degraded land in the watershed.

The agro forestry interventions comprising of ber, bail, aonla, guava, papular etc. may be applied for benefit of the farmers under rainfed to irrigation production system on leveled to slopping and marginal agricultural using proper planting techniques and term it control measures.

The multipurpose trees may be also help in supplementing fire wood and fodder demands of the rural community in the watershed and my be planted as hedge rows on rainfed, marginal and degraded lands.

(4.5) Horticulture :

Fruits and vegetables practices are lacking in the watershed area. Its practices may be sustainable very good potential for the formers of watershed. There are a limited lack fruit trees in number like mango, guava, lime, ber, aonla and papaya fruit trees well as vegetables like radish, okra, tomato, cabbage, garlic, onion, chilly, bringer and cucurbits

but they are found surviving well in the watershed villages. Organized orchards (vatika) commercial vegetable cultivation horti-agri and other systems of agro forestry etc. are lacking but have good agriculture.

5. Soil and land capability classification :

(5.1) Soil Morphology :

Watershed is located North East corner of Bulandshahr Distt. near about 55 Km. away. The entire terrain of watershed is topographically divided into various land forms. Accordingly the soils of watershed have been grouped major categories is given as follow :

Hill Terrain	Plane Land Sloppy	Undulated Land	Rill Erosic Land	Moderate ravenous
-	25%	20%	15%	7%

Given categories in the blocks is located the soil morphology in the watershed areas. Representation of soil characteristics by soil profile is represented as follows :

Soil Profile

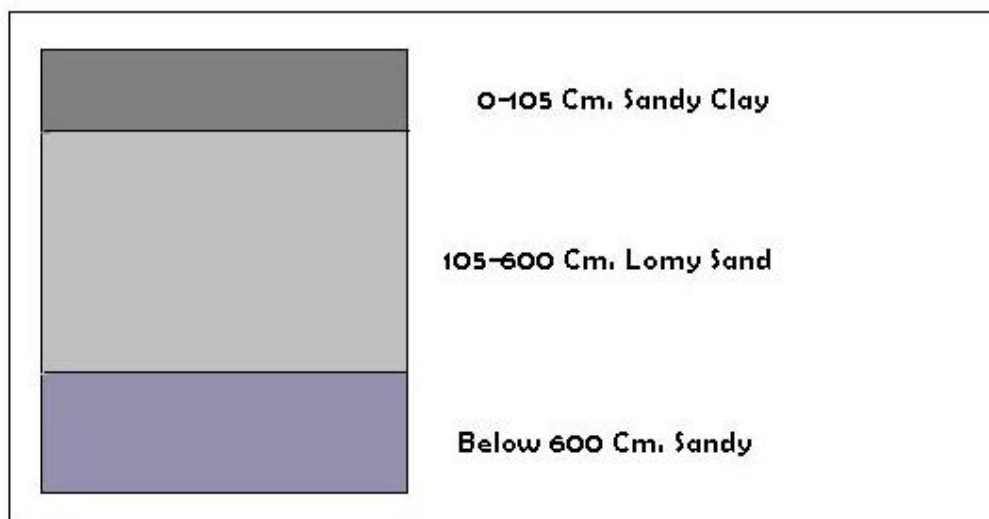


Fig. – 9 (Soil Profile)

Table – 16 : (Morphology of a Typical Soil Profile) :

Horizone	Depth in Cm.	Morphology
1	2	3
A V & H	0-150	Silky when moist, Hard when dry quick soluble, high elasticity, fissures, and cracks, occasional occurrence of free calcium carbonate granules black in colour, clay content 29%, PH- 8 to 8.7
B V & H	150-160	Whitish yellow in colour, very fine mixed with free cacaos and gravels, Hard when dry compact and indurate hard pan restricting development of root and down ward water transmission.
C V & H	7600	Red and white sand stone

(5.2) Soil and Characteristic and Fertility Status :

Soil characteristic pertaining to soil fertility of various classes accruing around villages in the watershed are given as follows :

Table – 17 : Soil Characteristic & Fertility Status :

Sl. No.	Soil Properties	LCC-II	LCC-III & IV
1	2	3	4
1	Sand %	45.04	72.04
2	Silt %	22.55	17.80
3	Clay %	28.35	6.4.6
4	Texture	Sandy Clay	Lomy Sand
5	PH (1:2)	7.05	7.55
6	Organic Carbon %	0.35	0.13
7	Available N Kg ha ⁻¹	312	171
8	Available P Kg ha ⁻¹	28	13
9	Available K Kg ha ⁻¹	185	322
10	EC (dS m ⁻¹)	0.45	0.12

(5.3) Land Capability Classification (LCC) :

Land capability classification (LCC) was done to classification the soils in different groups based upon the limitations and to emphasize the hazards prevailing in the 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. Classes of land capability namely II, III, IV and V are demarcated in the watershed. The areas under different classes are sown as follows :

Table – 18 : Land Capability Classification (LCC) :

S. No.	Land capability class	Area in Ha.	Colour
1	2	3	4
1	I Class	-	-
2	II Class	108.560	-
3	III Class	325.004	-
4	IV Class	150.500	-
5	V Class	34.500	-
6	VI Class	-	-
7	VII Class	-	-
8	VIII Class	-	-

Land capability classification of various agricultural practices under land use can be classified as groups, class, sub class and units. Utilization of various land class is given as follows :

Table – 19 : Utilization of various land uses

S. N.	LCC	Forestry	Ltd. Grazing	Light Grazing	Dense Grazing	Limited Agriculture	Light Agriculture	Dense Agriculture	More Dense Agriculture
1	I								
2	II								
3	III								
4	IV								
5	V								
6	VI								
7	VII								
8	VIII								

(5.4) Land Capability Class II & III :

This group is one of the most extensive LCC watershed. and also near to class III for the agricultural practices. The soils are sandy & sandy 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 & III. These lands potentially very productive but due to rainfed a single cropping pattern is in habitation.

(5.5) Land Capability Class IV :

This class is found in lower portion near the outlets of watershed. The soils are coarser in texture, deep, erosion hazard and undulating in topography. Rill and initiation of gully can be seen near the outlet of the watershed.

(5.6) Land Capability Class VII & VIII :

This class of land is not found in watershed. Somewhere lack of soil are found with admixture gravels fragments in these classes of lands.

(5.7) Conclusions :

The majority of land form is coming under class II, which give an insight of good agriculture production potential of the watershed.

The land capability classification provides reasonable good information with regard to capability of soil, that could be used for agriculture, agrihorticulture, silviculture and posture development.

The productivity of these lands could be further enhanced by adoption of simple soil & water conservation measures like bunding practices.

The reasonable area is under watershed of wasteland and other wasteland including grater potential of this watershed for forestry and pasture development. Rare places namely water body of low portion of land area under seasonally works as water harvesting structures and these harvested water is used or can use for some other beneficial activities during the crop season also.

6. Problems and needs of the watershed indentified during the PRA

(6.1) Problem Identification and prioritization :

- u- The are has undulating topography, steep unstable slopes, gradient of excessive branches of rills and hence highly prone to soil erosion.
- v- Major issues addressed to food sufficiency economic growth and environmental security in the watershed area.

- w- Effective soil depth is limited and highly variable hampering good crop growth.
- x- The watershed have low productive cropping due to tradition single cropping pattern and over all average crop production percentage not sufficient against requirement.
- y- Identified that there is no assured irrigation system has been development capacity of water bodies are reduced due to silt ration which are utilized to store of rainy water and they are renovatable.

(6.6) Transact walk during the PRA :

Problems identified and prioritized during the transact walk and PRA exercises in all comprised villages of watershed. There were pooled and a list of problems representing the whole watershed was prepared. Problems were ranked as per their total weight age in the watershed village.

Table – 20 : Ranking of Problem identification and prioritization of watershed

S.No.	Problem	Rank
1	2	3
1	Lack of irrigation	3
2	Lack of drinking water	7
3	Low production of field crops	4
4	Lack of fodder availability and low productivity	3
5	Lack of availability of fuel wood	4
6	Lack of market facility	4
7	Lack of quality seeds, fertilizer, pesticides etc.	3
8.	Medical and Health care facilities for milching animals and low productivity.	6
9	Lack of medical, educational and transportation facilities	8
10	Lack of water bodies renovation	9
11	Lack of run of earthen check bunds	1
12	Lack of water harvesting structures	1
13	Lack of livelihoods opportunity	3

Prioritized ranking (Upto four Numbers) :-

- 13- Lack of earthen check bunds.
- 14- Lack of livelihood opportunities.
- 15- Lack of irrigation water was the greatest problem. Lack of irrigation water problem experienced by the people followed by low crop production.

(6.3) Analysis of SWOT of the watershed :

Strength (S), Weakness (W), Opportunity (O) and Threat (T) analysis is a useful decision support tool. A SWOT analysis of watershed is presented as follows :

SWOT analysis of the watershed

Strengths (S)	Weakness (W)
<ul style="list-style-type: none">xli. Cooperative work culture in traditional activitiesxl.ii. Close ethnic tiesxl.iii. Road at the top as well as outlet of the watershedxl.iv. Hard workingxl.v. Resource pool of crop genetics diversityxl.vi. Awareness of farmers about watershed management programmexl.vii. Well established CPR maintaining and sharing systemxl.viii. Stall feeding of animalsxl.ix. Well maintained seasonal water bodiesl. Social outlook of the community towards land less	<ul style="list-style-type: none">xxxvii. Poor water managementxxxviii. Resource poor farmersxxxix. Out migration of youthxl. Low and erratic rainfallxl.i. Fragile geologyxl.ii. Fragmented land holdingxl.iii. Heavy infestation of wild animalsxl.iv. Problem of fuel and fodderxl.v. Shallow soil depth and with high percentage of gravel
Opportunities (O)	Threats (T)
<ul style="list-style-type: none">xxv. Wide range of annual and perennial cropsxxvi. Scope of regular employment opportunities to check out migrationxxvii. Strengthening of existing irrigation systemxxviii. Conducive climate for rainfed crop diversificationxxix. Good scope for Agro forestry and dry land horticulturexxx. Potential for collective action and management of CPR	<ul style="list-style-type: none">xxi. Prone to adverse climate like droughtxxii. High market riskxxiii. Social conflicts owing to PRI and WSM policies and local politicsxxiv. Weak coordination among line departmentsxxv. Lack of expertise of implementing agency in different aspects of WSM

7. Proposed land use for the watershed :

Watershed management plan preparation due importance is given to topographic, land suitability, irrigation potentially, prevailing farming systems, micro farming situation, farming, farmers preferences and priorities along with economic and environment securities.

Crop and tree selection and area distribution was done as per farmers priorities revealed through PRA exercise.

The watershed management plan for watershed is prepared with specific objectives of food sufficiency, income and employment generation with environment security.

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

Table – 21 : Present and proposed land use plan of the watershed

S.No.	Land use	Present (ha)	Proposed area (ha)
1	2	3	4
1	Agriculture		
a	Rainfed		
	I Crops	465.00	
	II Agro-forestry	25.00	
b	Irrigated		
	I Assured		
	II Partial	115.25	
2	Waste land		
a	Aforestation		
b	Pasture		
c	Untreatable		
d	Treatable		
3	Village land	158.44	

(7.1) Status of Present Water Resources Utilization :

Watershed is having some canal system. Management and maintenance of these canal are required. Before sowing of Rabi crops, water from these canal is issued as supplementary irrigation for Rabi sowing ar allowed to go as waste. After releasing water from canal, submergence area also put under cultivation.

Some where bore well irrigation applied by the farmers in the watershed.

(7.2) Proposed Plan for Irrigation Development :

- a- Present system of irrigation and wastage of water during October–November need to be made more efficient from water management point of view by minimizing conveyance losses in the existing water courses.
- b- Present irrigation canal capacity have to build up by the reform. Which are lack capacity of water.
- c- Construction of new water harvesting earthen structures, Pucca Check Dem, Series Gully Plugging, etc. has been sloppy portion to increase irrigation potential and for recharging of ground water, soil and moisture conservation maximum field irrigation, best production and expected change of crop rotation.
- d- The up gradation of the exciting system of irrigation will result in :
 - i- Minimization of conveyance losses.
 - ii- Increase in frequency of irrigation.
 - iii- Adoption of high yielding varieties of crops.
 - iv- Assured cultivation of cash crops.
 - v- Capacity buildup by the planning of new water harvesting structures.

(7.3) Ground Water Recharge :

For the purpose of ground water recharge, the area of the upper side of watershed is recommended for Field Bunds, Contour Bunds, Peripheral Bunds and Submergence Bunds and in the lower portion Contour Staggered Trenches, Gully Plugs, Earthen Check Dem and Pacca Outlets. In the undulated sloppy portion of the watershed recommended water harvesting structure for dual purpose as ground water storage and under ground water recharge.

(7.4) Crop Production :

Practices proposed in the watershed is given as follows :-

- a- Mulching and crop residue management.
- b- Application of green manuring.
- c- Vermi Composting.
- d- Crop rotation and inter cropping.
- e- Biofertilizers.

(7.5) Tillage Operation :

Deep tillage technology is proposed to apply to be demonstrated for benefit of farmers in the watershed.

(7.6) Improved Seeds of High Yielding Verities (H.Y.V.) :

Recommendation of improved varieties is necessary for improving the productivity and farm income. Through replacement of low yielding traditional varieties of seeds in villages of watershed.

(7.7) Balanced Fertilizer Use :-

Demonstration of use of fertilizer in various crops of watershed recommended balance fertilizer use in different crops will be benefited of farming community.

(7.8) Control of insects and diseases :

Aphid in the mustard are the major insects in the watershed areas leading to loss in crop productivity. Similarly white blister is also a common disease in the mustard crop.

The management strategies of these insect pest and diseases will also be demonstrated in the watershed for benefit of the growers.

(7.9) Dry Land Horticulture :

Such portion of dry land in which proposed horticulture development planning recommended species like Ber, Bel and Aonla will be planted at suitable spacing in the watershed.

(7.10) Agri Horticulture :

Aonla and Sahjan would be suitable horticultural crops to the locality. Therefore, a part of land in the farmer field shall be selected and brought under Agri-horticulture system. The cropping system followed will be Jwar and Wheat.

(7.11) Plantation (Fuel wood) :

Such a portion which are under wasteland will be taken falling in the class-IV category in the watershed. These lands will be planted with species like Vilayati Babool (Prosopis Juliflora), Babool (Acacia Nilotica), Karanj (Pangamia Glabra).

9. Socio Economic Analysis of the of the Project :

(9.1) Sustainability and environment security :

The proposed land use plan will improve the land utilization index and crop diversification index significantly as compared to the existing one. in the proposed watershed management plan proper blending of the bio engineering measures will be applied on above 80% of the total area of watershed. It is estimated that more than above 70% of the watershed area will be treated and consequently the soil loss and runoff from the area is excepted to be reduced by 70% respectively.

It will help in maintaining ecosystem integrity on sustained basis along with improving the livelihood security of the farming community.

(9.2) Economic Analysis :

Economic analysis of the project was carried by taking direct benefits and costs considering 10 years for project life at 10% discount rate. Whole watershed development plan was divided into three sector as agriculture, horticulture and forest/Fuel wood plantation. Net Present Value (NPV) and Benefit Cost ratio criteria were applied judge the economic efficiency of each enterprises and sector. Net present value (NPV) of the project life is considered to be 10 years and discount rate for NPV estimation is 10% is given NPV and benefits as follows :-

Table – 22 : Present productivity income analysis :

S. No.	Name of Sector	Name of Crops	Produ- cti- on/ha.	Rate/ Qtl.	Cost of Production	Expend. of cultivation	Net income	B.C. Ratio between Col. 8 & 7
1	2	3	4	5	6	7	8	9
A	Agriculture	Urad	3.00	4300.00	12900.00	6450.00	6450.00	1:1
		Moong	3.00	4500.00	13500.00	6075.00	7425.00	1.22:1
		Jwar	4.80	600.00	2880.00	1584.00	1296.00	0.82:1
		Wheat	18.50	850.00	15275.00	8650.00	7075.00	0.82:1
		Pea	7.50	2250.00	16875.00	10970.00	5905.00	0.54:1
		Mustard	3.50	18.500	6475.00	3235.00	3240.00	1:1
Total		-			105105.00	54105.00	51000.00	0.94:1
Average		-			13138.00	6763.00	6375.00	0.94:1
B	Forestry	Vilayati Babool				15000.00	-	Nil
C	Horticulture	Ber				20000.00	-	Nil
		Aonla				20000.00	-	Nil
		Bel				20000.00	-	Nil
Total		-				60000.00	-	Nil
Average		-				20000.00	-	Nil
Grand Total								

Table –23 : Post productivity and income analysis for Post Productivity**Value and B.C.:**

S. No.	Name of Sector	Name of Crops	Production/ha.	Rate/Qtl.	Cost of Production	Expend. of cultivation	Net income	B.C. Ratio between Col. 8 & 7
1	2	3	4	5	6	7	8	9
A	Agriculture	Urad	4.00	5000.00	20000.00	8325.00	11615.00	1.39:1
		Moong	4.00	5000.00	20000.00	8200.00	11800.00	1.44:1
		Jwar	5.50	800.00	4400.00	1900.00	2500.00	1.32:1
		Wheat	25.00	1000.00	25000.00	16680.00	13320.00	1.14:1
		Pea	9.50	3500.00	33250.00	14810.00	18540.00	1.12:1
		Mustard	5.00	3000.00	15000.00	4370.00	8130.00	1.86:1
Total		-	-	-	172250.00	72845.00	99765.00	1.38:1
Average		-	-	-	21531.00	9061.00	12471.00	1.38:1
B	Forestry	Vilayati Babool	80.00	500.00	40000.00	15000.00	25000.00	1.67:1
C	Horticulture	Ber	35.00	2000.00	52500.00	20000.00	32500.00	1.63:1
		Aonla	35.00	2000.00	70000.00	20000.00	50000.00	2.50:1
		Bel	40.00	1500.00	80000.00	20000.00	40000.00	2:1
Total		-	-	-	182500.00	60000.00	122500.00	2.04:1
Average		-	-	-	60833.00	20000.00	40833.00	2.04:1
Grand Total		-	-	-	1394750.00	147485.00	247265.00	1.68:1

Table –24 : Summary of NPV, PPV and B.C. Ratio (Sector wise) :

S. No.	Name of Sector	NPV		PPV		B.C. Ratio
		Expend.	Net Income	Expend.	Net Income	
1	2	3	4	5	6	7
1	Rain fed Agriculture	54105.00	51000.00	72485.00	99765.00	1.38:1
2	Forest/Fuel wood Plantation	15000.00	-	15000.00	25000.00	1.67 : 1
3	Horticulture	60000.00	-	60000.00	122500.00	2.04:1
Total		129105.00	51000.00	147485.00	247265.00	1.68:1

(9.3) Economics of Agriculture Sector :

The development cost can be recovered by the adoption of plan in present rain fed agriculture is being done on well maintained field, therefore does not require much investment. In rain fed agriculture, investment of Rs. 44.50 lacs is proposed to made is given as fallows :

Table – 25 : Economics of Agriculture Sector :

S. No.	Name of sector	Name of Activities / Plan	Treatble Area (Ha.)	NPV (Lacs)	Post Productivity Value (Lacs)	Benifit / Income	B.C. Ratio
1	2	3	4	5	6	7	8
1.	Rainfed	Soil, moisture and water cons works	456.00	24669	612.74	340.43	1.38:1

(9.4) Economics of forest fuel wood plantation :

Economic analysis of fuel wood plantation in the watershed. Project life is considered to be 20 years and discount rate for NPV estimation is 10 % is followed and as is given follows :

Table –26 : Economics of forest fuel wood Plantation :

S. No.	Name of sector	Comman Name of Plant	Area (Ha.)	NPV (Lacs)	Post Productivity Value (Lacs)	Benifit / Income	B.C. Ratio
1	2	3	4	5	6	7	8
1.	Forest Fuel wood sector	Vilayati Babool (Prasopis Juliflora)	25.00	2.50	6.675	4.675	1.67 : 1

(9.5) Economics of Horticulture Sector :

Economic analysis of Horticulture Plantation in agri-horti system and on wasteland patches of watershed project, life is considered about 15-20 years and discount factor rate for NPV estimation is 10% is follows :

Table – 27 : Economics of Horticulture system :

S. No.	Name of Sector	Common name of Plants	Area (Ha.)	NPV (Lacs)	Post Productive Value (Lacs)	Benefit Lacs	B.C. Ratio
1	2	3	4	5	6	7	8
1	Horticulture	Ber (zyziphus mouritana)	4.00	0.80	2.104	1.304	1.63: 1
		Amla (Embelica officianalis)	3.80	0.76	2.660	1.40	2.5 : 1
		Bel (Aegle marmelos)	2.20	0.44	1.320	0.88	2 : 1
Total			10.00	2.00	6.084	4.084	2.04 : 1

(9.6) Food requirement and sufficiency :

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

Table – 28 : Status of food requirement and availability of per annual :

S. No.	Name of Foods	Requirement Q./Yr.	Present Status		Expected Post Status	
			Availability Q./Yr.	Deficit or surplus Q./Yr.	Availability Q./Yr.	Deficit or surplus Q./Yr.
1	2	3	4	5	6	7
1	Cereals 110 Kg.	12989	11041	-1948	22083	9094
2	Pulses 36.50	4310	2370	-1940	7758	3448
3	Oil Seeds 29.20	3448	1379	-2069	5517	2069
4	Vegetable 71 kg	10745	2149	-8596	19341	8596

(9.7) Employment generation :

One of the major problem of the labour migration in watershed project. By the implementation of the project activities employment opportunities will be generated. However the changes in land use pattern and adoption of other subsidiary enterprise will generate employment opportunities in the watershed as given in table follows :

Table – 29 : Employment generation under proposed works :

S. No.	Employment activities/works	Area under work	Cost	Mandays generation (Nos.)			
				Unskilled	Skill	Total	Person
1	2	3	4	5	6	7	8
2	Graded Contour Bund	51	1.53	1530	-	1530	51
3	Gully Plug, C.D.	84	6.300	4410	323	4733	158
4	Submergence Bund	72	2.880	2880	-	2880	96
1	Peripheral Bund	71	2.485	2485	-	2485	83
5	W.H.B.	88	7.920	4752	259	5021	167
6	Renovation of Bund	55	1.650	1650	-	1650	55
7	Reno. of W.H.B.	-	-	-	-	-	--
8	Community Pond	-	-	-	-	-	-
9	Afforestation	25	2.595	519	-	519	17
10	Horticulture	10	2.00	400	-	400	13
Total		456	27.36	18626	592	19218	640

10. Formation of watershed committee :

Under compliance of common guideline Para (6.3) is followed and by the help of watershed development team, watershed committee is organized in the micro watershed village Ghuraiya with 10 members as prescribed in common guide line. List for organization of W.C. village details given as follows :

Table – 30 : Details of comprised village W.C. organization in M.W.S. :

S. No.	Particulars	Details	Block	Geographical Area
1	2	3	4	5
1	Micro watershed code	2B3E3c3d	Pahasu	
2	Name of Gram Panchayat in M.W.S.	Khandar		507.00

Table – 31 : List of organized W.C. for the Gram Panchyat Udarmi in watershed.

S. No.	Name of selected members	Age	Representation Members from	Post	Qualification	Village
1	2	3	4	5	6	7
1	Indrajeet Singh	52	Gram Sabha	President	Sakhar	Udarmi
2	Hari Singh	41	Gram Sabha	SHG	Sakhar	Udarmi
3	Mahavir	29	From – U.G	Member	Sakhar	Udarmi
4	Karelal	34	From – U.G	Member	Sakhar	Udarmi
5	Tej Singh	31	From – U.G	Member	Sakhar	Udarmi
6	Hazari Lal	35	From – S.H.G.	Member	Sakhar	Udarmi
7	Babulal	40	From – S.H.G.	Secretary	Sakhar	Udarmi
8	Ajay Pal Singh	27	From – S.H.G.	Member	Sakhar	Udarmi
9	Shanti Devi	35	From – S.C.	Member	Sakhar	Udarmi
10	Kavita Devi	32	From – S.C.	Member	Sakhar	Udarmi
11	Dinesh	44	From – PIA	Work out	B.Sc.	Udarmi

(10.1) Formation of Self Help Groups in M.W.S.

By the help of watershed committee and watershed development team self help group are formatted / organized. Families and persons are selected from poor, small and marginal farmers families, landless poor families, agriculture labour families, women, herdsman and shepherd and S.C. families in the formatted self help groups are given as follow :

Table – 32 : Baba Sahab Self help group – Udarmi (Livelihood) .

S. No.	Name of member in formatted SHG's	Age	From represented family	Name of proposed activities	Activation Position
1	2	3	4	5	6
1	Hari Singh	45	L.R.	Live Stock	New
2	Gajendra	32	L.R.	Live Stock	New
3	Lalit Kumar	25	L.R.	Live Stock	New
4	Prem Singh	50	L.R.	Live Stock	New
5	Jagat Singh	28	L.R.	Live Stock	New
6	Ashish Kumar	55	L.R.	Live Stock	New
7	Ajaipal Singh	25	L.R.	Live Stock	New
8	Arun Kumar	21	L.R.	Live Stock	New
9	Banti	22	L.R.	Live Stock	New
10	Sultan	35	L.R.	Live Stock	New

Table – 33 : Kanshiram Self help group Udarmi.

S. No.	Name of member in formed SHG's	Age	From represented family	Name of proposed activities	Activation Position
1	2	3	4	5	6
1	Pradeep	30		Livestock	New
2	Ramji Lal	55		Livestock	New
3	Mahendra	30		Livestock	New
4	Harish Kumar	33		Livestock	New
5	Inder Singh	40		Livestock	New
6	Rajpal Singh	45		Livestock	New
7	Yashpal Singh	45		Livestock	New
8	Naresh	30		Livestock	New
9	Vikram	24		Livestock	New
10	Suresh	25		Livestock	New

Formation of User's Groups :

User's groups are farmated by the help of watershed committee and watershed development team in the micro watershed comprised villages. Formers which have land village are involved in the User's groups and they will be direct benefited as expected by the implementation of watershed project easy and convenienced condition are made to resource use between user's groups and they will be responsible to operate and maintenance for the created assets in the watershed. Nos. of farmated user's groups details are given as follows :

Table – 35 : Village wise user's groups

S. No.	Name of village	No. of groups	No. of farmers	Total Agri. Land	Area under treat-ment	Cost of essets
1	2	3	4	5	6	7
1	Dighi				100.75	12.09
2	Pahasu				143.90	17.27
3	Udarmi				113.32	13.60
4	Surjawali			-	60.26	7.23
5.	Pitampur				32.77	4.53

10. Estimation and Costing of Proposed activities of the watershed Project Year 2010-11.

Proposed works / activities for the Project Period (Year 2010-11) under proposed treatable area 629.00 Ha. Out of total Geographical area 677 Ha.

(10.1) Financial and Physical Outlets :

Table – 36 : Financial and Physical Outlets for the Year 2009-10 :

Sl. No.	Components	Unit cost per ha.	Physical ha.	Financial (Lacs)			Man-days Generation
				Labour Component	Material Component	Total	
1	2	3	4	5	6	7	8
A	Management Cost 10%						
1	Administrative Cost – TA & DA Hiring of Vehicles, Official Expenditure Electricity & Phone bill Computer, Stationery and office consumable materials & contingency	1200	-	-	5.4472	5.4472	-
2	Monitoring	120	-	-	0.5472	0.5472	
3	Evaluation	120	-	-	0.5472	0.5472	
	Sub Total	1440		-	6.5664	6.5664	
B	Preparatory Phase 10%						
1	Entry Point Activities 4%	480	-	0.4378	1.7510	2.1888	438
2	Institutional & Capacity Building 5%	600	-	-	2.7360	2.7360	
3	Detailed Project Report 1%	120	-	-	0.5472	0.5472	
	Sub Total	1200	-	0.4378	5.0342	5.4720	438
C	Watershed Work Phase						
a	Watershed Development Works						
1	Graded, Contour & Field Bunds	3000	57	1.530	-	1.530	1530
2	Gully Plug, Earthen Checkdam /WHS	7500	84	4.410	1.890	6.300	4733
3	Submergence bunds	4000	72	2.880	-	2.880	2880
4	Peripheral Bund	3500	71	2.485	-	2.485	2485
5	Earthen Water Harvesting Bund	9000	88	4.752	3.168	7.920	5021
6	Renovation of existing Bunds	3000	55	1.650	-	1.650	1650
7	Renovation of existing W.H.B	-	-	-	-	-	-
8	Aforestation and Development of silvi postural system	10380	25	0.519	2.076	2.595	519
9	Dry Land Horticulture	20000	10	0.400	1.600	2.00	400
10	Community Pound (Renovation)	-	-	-	-	-	-
	Sub Total		456	18.626	8.734	27.360	19218
B	Livelihood Programme (Community Based) 7.620						
	Income generating activities through SHG's for landless and marginal farmers 10%						
1	Live stock development activities	200	-	-	0.912	0.912	-
2	Bee Keeping	100	-	-	0.456	0.456	-
3	Poultry Farming	200	-	-	0.912	0.912	-
4	Nursery Development	300	-	-	1.368	1.368	-
5	Vegetable Production	100	-	-	0.456	0.456	-
6	Milk Dairy Promotion Unit	200	-	-	0.912	0.912	-
7	Establishment of Vermi compost Unit	100	-	-	0.456	0.456	-
8	Sub Total	1200	-	-	5.472	5.472	-
C	Production System and micro Enterprises						
1	Crop production, diversification of agriculture and introduction of agro forestry	1170	-	-	5.3352	5.3352	-
2	Demonstration of improved composting system	390	-	-	1.7784	1.7784	-
	Sub Total	1560	-	-	7.1136	7.1136	
D	Consolidation Phase 5% Sub Total	600	-	-	2.736	2.736	-
Grand Total		12000	456	19.0638	35.6562	54.720	19656

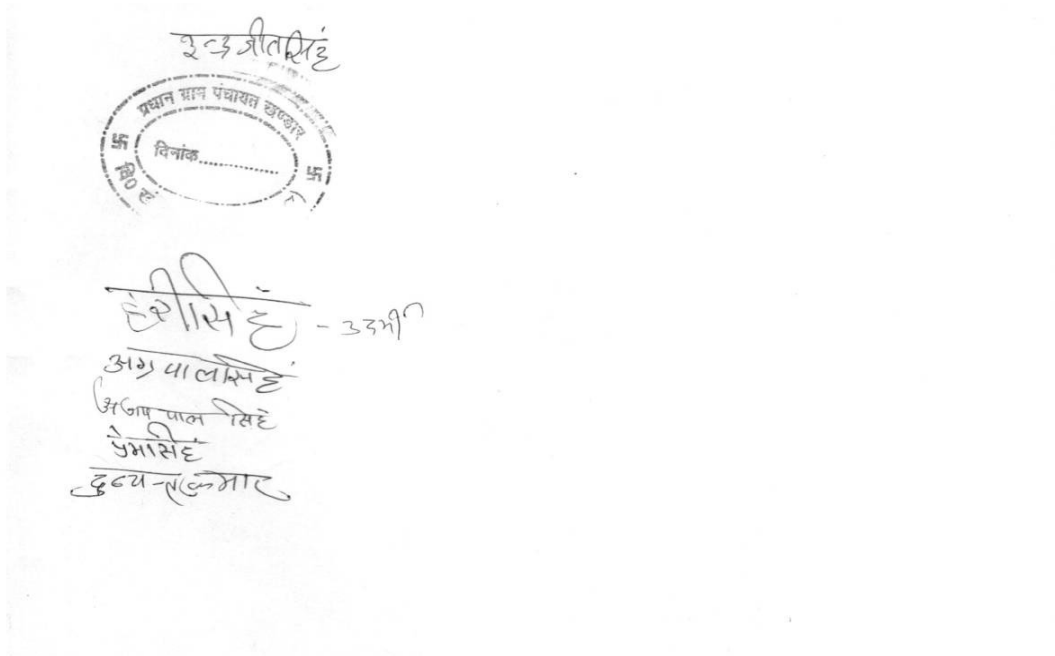
संकल्प पत्र

ग्राम पंचायत – उर्दभी कोड सं० 2B3E3c3d विकास खण्ड –पहासू जिला – बुलन्दशहर

यह कि आई०डब्ल्यू०एम०पी० परियोजना में तैयार की गयी निर्माण की नयी सृजित परिसम्पत्तियों को ग्राम पंचायत उर्दभी एवं माइक्रो वाटरशेड के अन्तर्गत सम्मिलित ग्रामों में योजना क्रियान्वयन कराने एवं योजना उपरान्त चालू रखने तथा सृजित परिसम्पत्तियों के अनुरक्षण हेतु कृत संकल्प एवं इच्छुक है।

उर्दभी ग्राम पंचायत के सभी स्रोत स्थल जैसे तालाब, ग्रामसभा गोचर (चारागाह), जल संसाधन, जंगल आदि में भूमि विकास परियोजना के अन्तर्गत किये जायेंगे। उन कार्यों को समाज के कमजोर वर्ग जैसे अनुसूचित जाति/जनजाति, महिला वर्ग एवं अल्प भूमिहीन गरीबी रेखा के नीचे के लाभार्थियों को लाभ पहुँचाने हेतु इच्छुक होंगे।

हम योजना संचालन हेतु प्रस्तावित करते हैं एवं सहमति देते हैं कि भारत सरकार के समस्त मार्गदर्शी सिद्धान्तों के अनुपालन में कार्य सम्पन्न करायेगें यह भी घोषित करते हैं कि चयनित क्षेत्र जिसको मेरे द्वारा भलीभाँति देखा गया है, और प्रस्तावित योजना में प्रस्तावित समस्त कार्य 15 सालों से नहीं कराया गया है जिसकी मुझे पूर्ण रूप से जानकारी है और अनुमोदन करते हैं।



PROJECT AT A GLANCE

IWMP-II (Bulandshahar)

1	State	Uttar Pradesh
2	Distt.	Bulandshahar
3	Block	Pahasu
4	M.W.S. Code	2B3E4d3c
5	Name of M.W.S. Project	Surjawali
6	Involved Village	05
7	Geographical Area of M.W.S.	650.00
8	Rainfed Area	
9	Treatable Area	585
10	Weightage	
11	Cost of Project	70.20
12	For the year	2011-12

Budget Components

S. No.	Components	Area (Ha.)	Cost (in Lacs)
1	2	3	4
1	Management Cost 12%	-	8.4240
2	Preparatory Phase 10%	-	7.0200
3	Watershed Work Phase	-	-
	A- Watershed Development Works 50%	585.00	35.1000
	B- Livelihood Programme (Community Base) 10%	-	7.0200
	C- Production System & Micro Enterprises 13%	-	9.1260
4	Consolidation Phase 5%	-	3.5100
	Total	585.00	70.2000

Executive Summary of the Project

Identified selected micro watershed project Surjawali is coded as **2B3E4d3c** has been proposed from cluster of I.W.M.P. Bulandshahar – II project in Pahasu Block district Bulandshahar four villages namely Surjawali, Sarangpur, Baraula, Kunwarpur, Peetampur, is comprised in the micro watershed which is located in the east of district Bulandshahar on the east bank of River GANGA and border of district Badaun area is known as Khadar. It lies between 28° -30' and 28°-45' E Latitudes and 78° -0' and 78° -15' N Longitudes Covering area. Its altitudes ranges from 181 meter to 208 meter above the mean sea level. Dewai Railway Station 184.11 m, Bulandshahar Railway station is 201.18 m above mean sea level is displayed. Project area of I.W.M.P. BSR-II is lied in the Pahasu Block of Bulandshahar District which is come in the western plan zone under semi arid area. The annual average rainfall is near to 397 mm which an average of 35 rainy days. Out of which about 85% is received during the mansoon season from July to September and very less rainfall is received in the winter season.

Temperature ranges from as high as 42°C in the May-June to as 3°-4°C during December – January. The Trend of rain fall is highly eratic and maximum water goes as runoff.

Main occupation of the dwellers is agriculture in the watershed. Some part of the lands are shown during the Kharif season. Cane sugar are preferred crops in the project area. The main Crops raised are Wheat, Pea & Mustered and maze.

The topmost portion of the watershed is sloppy flat land. Other than topmost portion of the watershed is under soil erotic portion and depreciative. The soil of the land are sandy loam Soil. The middle agricultural position of watershed relatively smooth sloppy flat land with sandy loam soil texture. These soil is yellow in colour and are inherently good in fertility status.

Natural vegetation of the watershed is very poor. Somewhere forest vegetation is seen which are predominant with Vilayati Babool (*Prosopis Juliflora*), followed by Babool (*Accasia nilotica*), somewhere Neem Plants (*Azadirachta Indica*), Shisham (*Dolbergia Sisson*) and Karanj (*Pongamia Glabra*) are seen in occasional occurrence. There is no grass land in the watershed. Somewhere grass patches are seen only on the bunds, road sides and other such places. Coverage of massive green belt is in poor percentage for environment which is envisaged. That watershed is very poor climate area.

There is normal condition of animal physics and for their fodder arrangement is the watershed and creative possibility would be expected by the implementations of the project.

Due to Arial soil erosion poor harvesting managements, cropping pattern, non treated watershed etc. are very anti effective causes for the watershed. Problem of the watershed is to be

tackled by harvesting structures which have lost most of their capacity new water bodies for the prevention of erosion and conservation of soil and moisture various type of earthen bunds in the watershed field, necessity has been observed. Wasteland will be treated with staggered Trenches, afforestation and bunding for the changing of characteristics.

The detail project report has been prepared by the applying of nine process steps for the micro watershed code no. **2B3E4d3c** brief is as follows.

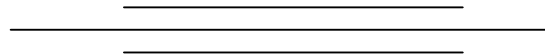
- STEP-1 Secondary data collection:-** During the five days visit programme in the micro watershed project with of all available documents of village label by approaching the Gram panchayat collected secondary data.
- STEP-2 Village meeting & conducting PRA exercise:-** Community meeting conducted on fix days for the consultation with villagers for the PRA Exercise. Participatory mode of the villages was positive indicated for the success of programme. With good in testing participation has been drawn social & resource map on ground & paper & discussed various topics of problematic thoughts in the micro watershed.
- STEP-3 Socio economic survey:-** The resource organization of village label volunteers identified to conduct house hold socio economic survey/states.
- STEP-4 Problem typology analysis:-** Thoroughly analyzed the data & identified problem type as soil & moisture conservation, crop rotation, crop coverage, productivity, livelihoods, social issues & capacity building gaps etc. Problems discussed with the watershed committee & came up with alternative solution.
- STEP-5 Conduct of net participatory planning (NPP):-** The planning team visited together in the planning blocks on the scheduled date along with the beneficiaries of the villages & data gathered as for the participatory net planning.
- STEP-6 Productivity & livelihood planning exercise:-** For the product livelihood exercise, group discussion on various livelihood as Agriculture, Animal husbandry enterprise development held discussion with the villagers in the micro watershed.
- STEP-7 Institutional & capacity building :-** This plan is prepared based on the data available in the field and auscultations with the watershed committee.
- STEP-8 Data consolidation & documentation of DPR :-** After gathering all required information compiled collected data. Thoroughly discussed and finalized the expected outcomes and benefits specially in the respect of livelihood for different segments. These are the target and performers indicators for the micro watershed.
- STEP-9 Conduct of Gram Sabha obtaining approvals submissions of DPR:-** After preparation of the draft DPR convened to Gram sabha and activities proposed expected

outcomes benefits of implementing the programm are explained in case of any changes are proposed in the Gram sabha approval obtained by the Gram sabha and already singed of Mau paper.

STEP-9A Attachment of detail estimate, cost and design:-Estimating, Costing and design prepared technically According to plan in the micro watershed project. And attached with the DPR.

STEP-9B Various type of mapping :- DPR prepared in the support of micro watershed project using various type of maps is as follows :

- | | |
|--------------------------------------|-----------------------------|
| 1.Index Map of Watershed | 2. Watershed Map |
| 3. Relief/ Drainage Map | 4. Slop Map |
| 5.Soil and Land Capability class map | 6. Land use/ Land Cover Map |
| 7. Cadastral map | 8. Proposed Action Plan map |
| 9. Social Map | |



Project Report

Table – 1 : Micro watershed project brief : -

1	State	U.P.
2	District	Bulandshahar
3	Block	Pahasu
4	Comprised Villages (Nos.)	06
5	Name of Watershed	Surjawali
6	Name of MWS Project	Surjawali
7	MWS Code No.	2B3E4d3c
8	Geographical Area of MWS	650.00
9	Treatable Area	585.00

1- Project Objectives :- The aim and objectives of the Project are :

- jj- Conservation, development and sustainable management of natural resources including their users.
- kk- Enhancement of agriculture production and productivity in a sustainable manner.
- ll- Restoration of ecological balance in the degraded and fragile rain fed ecosystem.
- mm- Reduction in regional disparity between rains fed and irrigated area.
- nn- Creation of sustainable employment opportunities for the rural community for livelihood security.
- oo- Generation of massive employment.
- pp- Reduce migration from rural employment.

2- Major Problem of Project Area :

- ee- Actual shortage of drinking water.
- ff- Near to nil activated water bodies and water harvesting structures.
- gg- Low depth of ground water table.
- hh- Undulated and generally sloppy rainfed area.
- ii- Large number of Small, Marginal and S.C. farmer land holding.
- jj- Lower wages of agriculture labour and also migration of labour due to shortage of employment in the watershed.

3- General Description :

(3.1) Location :-

Surjawali Watershed has been taken with MWS Code No. **2B3E4d3c** in Pahasu Block of Distt. Bulandshahar is located on Bulandshahar via Diwai to Narau Via Pahasu road about 30 Km. between 28°15' and 28° 15' N Latitudes and 78°0' and 78° 10' w Longitudes. Location and delineation of watershed has been located on watershed map **Fig. 2** and on top sheet **Fig. 3**.

(3.2) Area and Elevation :

Elevation ranges from 181 to 208 mtr. above the mean sea level(MSL) altogether comprised villages and their's area is described as follows. (Comprises village map Fig. 3)

Table – 2 : Area and Elevation

Sl. No.	MWS Code	Block	Name of Village	Geographical Area	Treatable Area
1	2	3	4	5	6
1	2B3E4d3c	Pahasu	Surjawali	220	198.00
			Sarangpur	193	173.70
			Turkipur	68	61.00
			Bhaiyapur	54	48.300
			Baraula	16	15.00
			Lalner	99	89.00
				650	585

(3.3) Shape of the Micro Watershed:

The shape of watershed is Elongated and as Rectangular. The maximum length and width of the watershed are 5000 Mtr. and 1814 Mtr. respectively with the Length: Width ratio of 2.76:1.

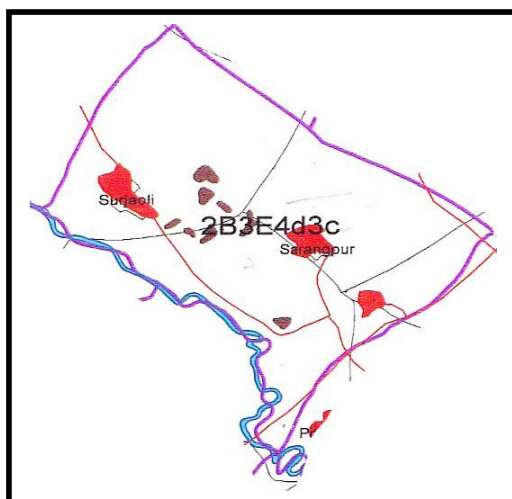


Fig. 1 (Shape of Micro Watershed)

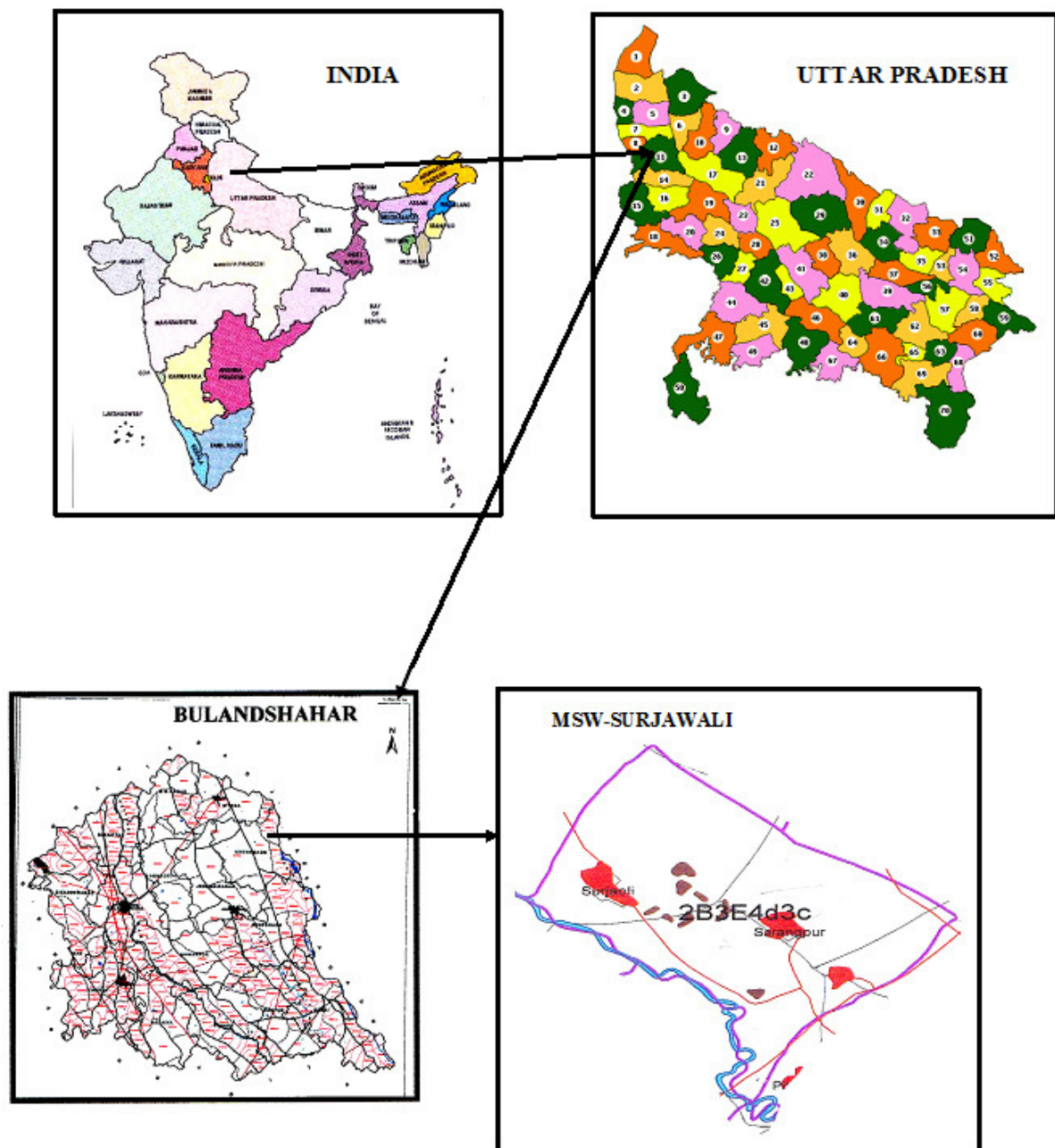
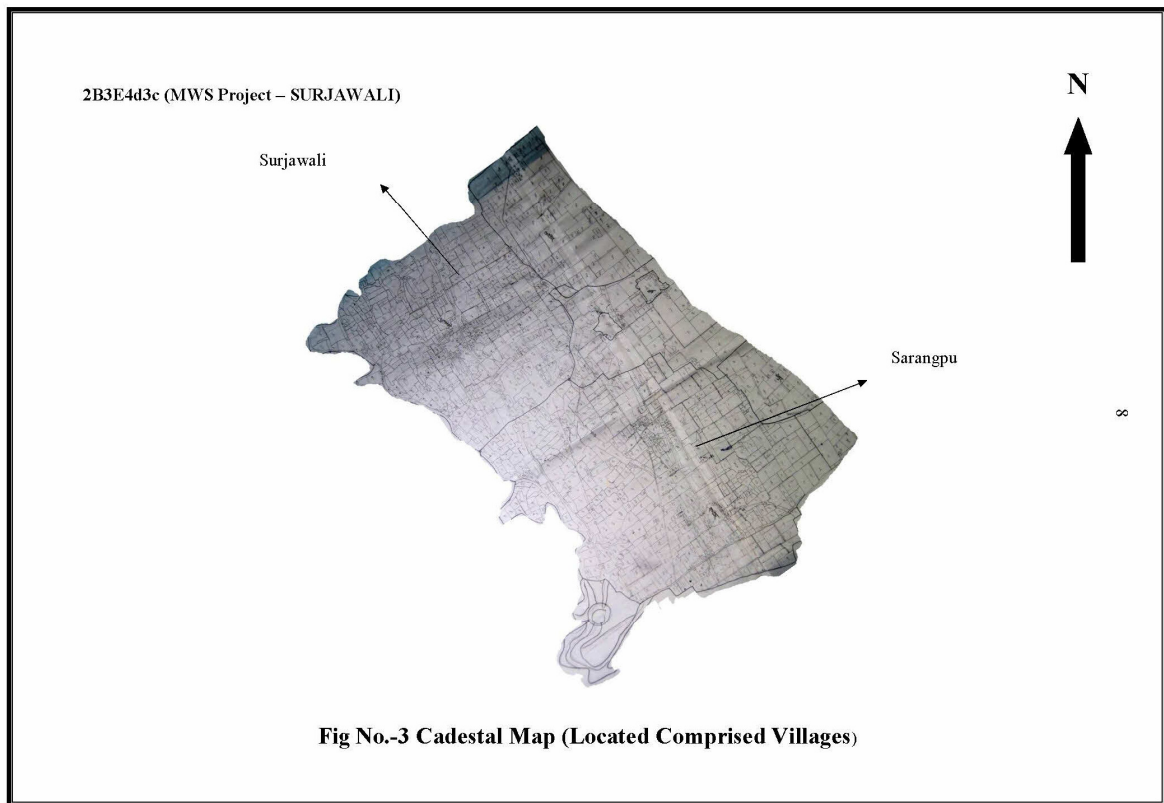


Fig.- 2 Location of the Micro Watershed



Sl. No.	Name of Project	Name of Village	Geographical Area (in ha.)	Raifed Area (in ha.)	Treatable Area	Agri. Land
1	2	3	4	5	6	7
1	Surjawali	Surjawali	220	175.87	198	187.00
2		Sarangpur	193	154.29	173.70	164.05
3		Baraula	16	12.80	15.00	57.108
4		Turkipur	68	54.400	61.00	45.90
5		Bhaiyapur	54	43.20	48.30	13.60
		Lalner	99	79.20	89.00	84.15
Total			650	519.26	585	551.808

(3.4) Climate :

The Watershed falls under semi arid region of tropical climate inclined in Western Plan Zone. The average annual precipitation is about approx. is 397 mm. spreading over 35 rainy days. Most of the rain fall (about 85%) is received during July to September. The rain fall of moderate intensity. Nothing the area receives of scarcity rainfall in the winter season. The temperator variation ranges from as high as 43⁰c in the month of May-June to as low as 4⁰c in December-January.

(3.5) Geomorphology and Soils :

Geomorphology :

The entire watershed is topographically divided into major landforms. Accordingly the soils of watershed can be grouped into various categories such plane land, undulated land, sloppy land and erosic ravenous land.

Soil :**(a) Fine textured soil :**

The soil are the most extensive soil group found in the watershed. Some portion of the watershed is relatively sloppy flat land with fine soil texture as sandy sandy loam. The soils are in color and are inherently good high in fertility status. Soil texture is sandy lome loam particularly in depressions and loam in the elevated portion. The soil characteristic texture is dispersive and smooth. Therefore without impede the downward movement of water productive layer of soil are easily by high runoff.

a- Coarse Textured Soil :

These soil are lying mostly in downward portion, along with erosic gully and drainage line upto end of watershed outlet. These soils are coarser in texture and are relatively poor in fertility status. The soils are lomy sand in texture. Rill and gully formation in same parts particularly near the outlet of watershed can be seen.

(3.6) Drainage and Slope:

Due to prevalence of mild steep slope and presence of a number of drainage lines in the watershed the drainage system is adequate. The watershed from part of Ganga Basin and watershed. Under mild to steep topographical slope of MWS as divided as follow : (Drainage and slope map fig.-4)

Table - 4 : Drainage and Slope

S. No.	Grade	Slope Percent	Area in Ha.	Remark
1	A	0.5-1	175	-
2	B	1-2	146	-
3	C	2-3	117	-
4	D	3-4	87	-
5	E	4-5	41	-
6	F	5-6	19	-

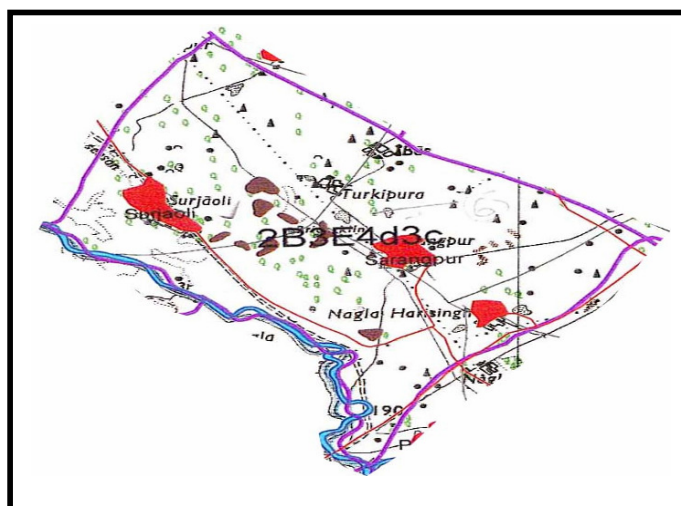


Fig-4 (Drainage & Scrub Map)

(3.7) Vegetation :

a- Natural Vegetation :

Natural vegetation is very poor in the watershed. The forest vegetation is predominant with Vilayti Babool (*Prosopis Juliflora*). There are occasional occurrence of Neem Plants (*Azadirochta Indica*), Shisham (*Dalbergia Sissoo*) and Karanj (*Pangamia Glabra*) and anywhere some scrubs are seen. There are no grass land in the watershed. Somewhere grass patches are seen only on the bunds, roadside and other such places. Poor percentage of massive green trees has been not seen in the watershed except Horticulture backyard.

b- Horticulture :

There is no backyards or commercial horticulture plantation in villages are been in some part of watershed.

c- Agroforestry :

The agriculture fields of the villages have some horticulture plantation at places isolated trees whose frequency is seen as under agroforestry and some where in where in backyards.

(3.8) Human Population:

a- Human Population:

Total Population of involved villages in watershed is 8936 with average family size of six persons as detailed as follows

Table – 5 : Human Population

S. No.	Name of village	Nos. of families	Human Population			Total
			Male	Female	Children	
1	Surjawali	461	1778	1643	1140	4561
2	Sarangpur	431	1057	976	871	2904
3	Baraula	258	562	607	500	1669
4	Bhaiyapur	282	736	680	606	2022
5	Turkipur	57	124	116	159	399
6	Lalner	521	1120	1078	942	3140
	Total	2010	5377	5100	4218	14695

g- Categorization of Human Population :

In the total population of watershed villages, categories are defined as below :

Table – 6 : Population Categories

S. No.	Particulars	Unit	Number of families in population in the villages		
			Population	Family	Remark
1	2	3	4	5	6
1	Agri Farmer	No.	11756	1728	
2	Landless	No.	402	51	
3	Agri. Labour	No.	1470	209	
4	Land less Labour	No.	440	64	
5	BPL Family	No.	833	119	
6	SC Family	No.	4039	577	
7	ST Family	No.	-	-	
			18940	2748	

(3.9) Land Holding :

All the categories of farmers as small, marginal, medium and large are involved in land holding average of about 1-18 ha. Small land holding farmers are further scattered at different places which makes cultivation very difficult. Distribution of farm families according to the size of the land holdings are given as below :

Table – 7 : Distribution of farm families according to their size of land holdings

S. No.	Name of Village	Total Agri. Land in MWS	Land Holding Family (Nos.)					Percentage
			Marginal (< - 1Ha.)	Small (1-2 Ha.)	Medium (2-4 Ha.)	Large (4-7 Ha.)	Total	
1	Surjawali	179.40	150	7	5	3	165	
2	Sarangpur	157.38	140	3	2	1	146	
3	Baraula	15.00	11	1	1	-	-	
4	Bhaiyapur	51.00	3	-	-	-	3	
5	Turkipur	64.00	-	-	-	-	-	
6	Lalner	94.00	5	-	-	-	5	
	Total							

(3.10) Live Stock Population :

Total live stock population of the watershed is 2911 Nos. Buffalos is preferred as mulch animal compared to Cow. But milk yield is poor. Goats are also kept for milk as well as for meat purpose. The breakup of livestock population is as follows :

Table – 8 : Live Stock Position

S. No.	Name of Village	Unit	Live Stock Position				Total
			Buffaloes	Cows	Bullocks	Goats	
1	Surjawali		723	181	108	219	1231
2	Sarangpur		1089	368	181	207	1845
3	Baraula		831	217	107	119	1274
4	Bhaiyapur		764	226	181	201	1352
5	Turkipur		419	113	87	79	698
6	Lalner		631	171	97	169	1068
	Total		4457	1276	741	994	7468

(3.11) Infrastructure Social Feature :

- a- Comprised villages in the micro watershed has moderate communication facilities. Watershed linked with metaled road and approachable through motarable road.
- q- All the villages are electrified and have T.V. and Telephone connection.
- r- Literacy rate in the watershed is very low all villages are having education upto Junior High School.
- s- Nearest small market is at Sayana 13 Km. Nearest big market Bulandshahar is about 55 Km. from watershed. Religious and ritual features are almost common as in other parts af U.P. small land holding with large family size and more than 25% of the labour force of the total population living below poverty line indicate poor socio economic status of the watershed community.

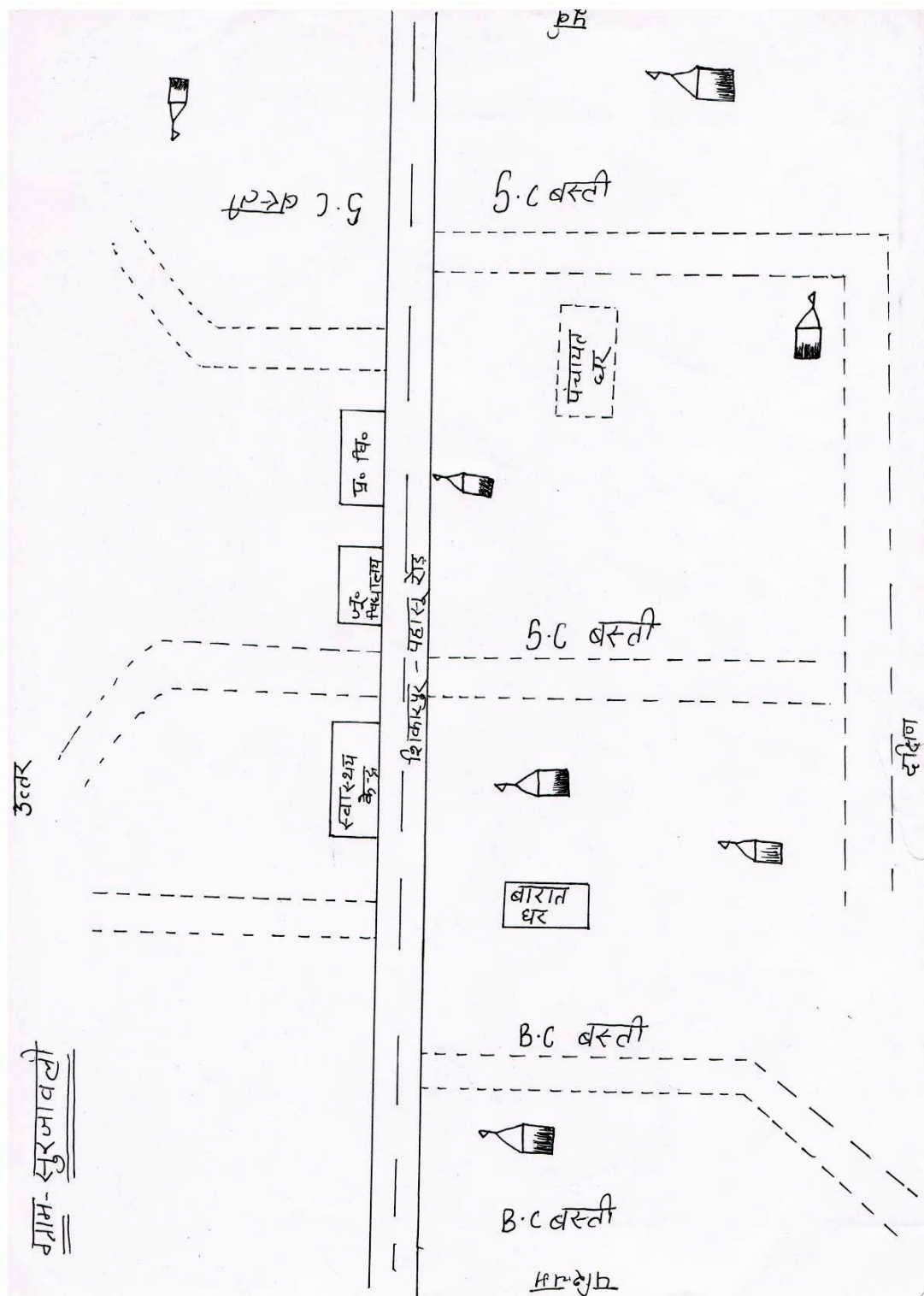
Participatory Rural Appraisal

Participatory mode of the villagers shows positive indication for the success of the programme. Traditionally the entire village community participate in the individual works. Social map of one of the watershed village drawn by villagers themselves, depicting various village figures is shown in sketched map in Fig.-4 & 5. Infrastructures position of the village recorded as follows :

Table – 9 : MW.S. Project – Surjawali.

S. No.	Infrastructure	Unit	Qty.
1	2	3	4
1	Primary School	No.	1
2	Junior High School	No.	1
3	Kanya Pathshala	No.	-
4	Public Health Center	No.	1
5	Vet nary Hospital	No.	-
6	Panchayat Ghar	No.	1
7	Post Office	No.	-
8	Agan Bari Center	No.	1
9	Electricity	-	Yes
10	Road	-	Yes
11	Pond	No.	1
12	Hand Pump	No.	56
13	Irrigation Well	No.	-
14	Canal	No.	-
15	Temple	No.	3
16	Well (Drinking Water)	No.	-
17	Pumping Set	No.	80
18	Toilet	No.	50
19	Market	No.	-

SOCIAL MAP



Recorded importance of development institution

Farmers perception recorded for importance and role of different development institution in relation to infrastructure. Importance has been depicted with size of circle and role with distance from village circle. (Fig 8)

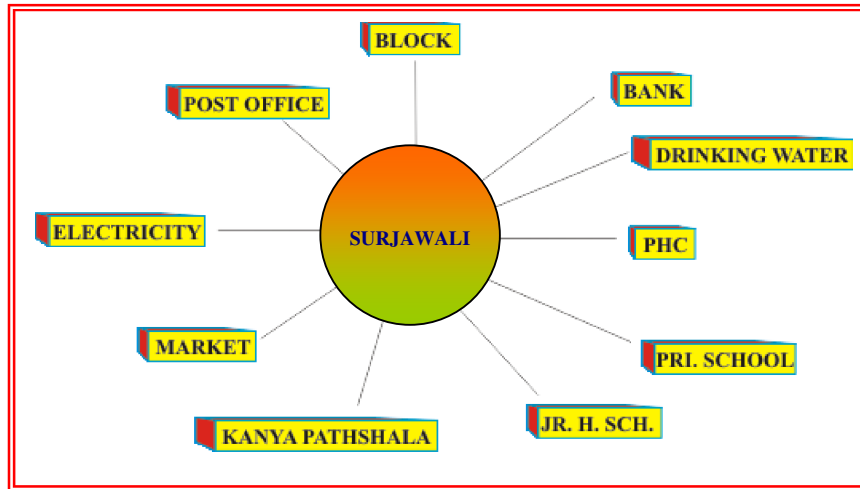


Fig. -8 (Venn diagram of Micro watershed)

(3.12) Communication :

Watershed can approached from Distt Headquarter Bulandshahar to Project area 35 km. by Road.

(3.13) Natural Resource Base :

Transact of watershed showed typical land use profile consisting of plain agriculture land, erodic area and medium ravenous ridge. Main source of the irrigation are the canal for pre showing irrigation only. The total geographical area of the watershed is 574.00 Ha. classification.

Approach roads for the micro watershed is shown for the communication is shown on topo sheet map Fig 9 as next page.

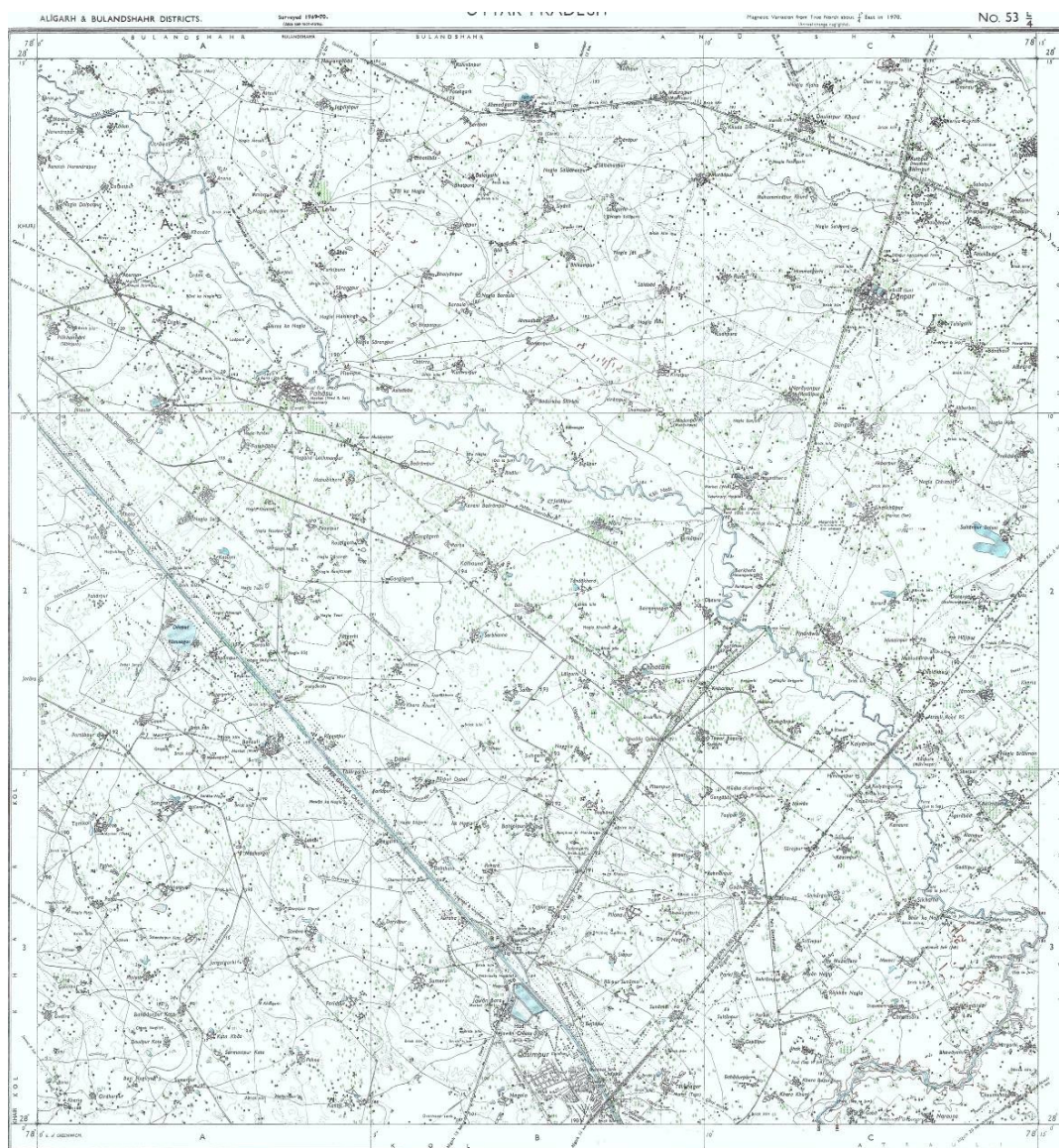


Fig.- 7 Communication Map on Toposheet

Table – 10 : Classification of area(Hect.)

S.N o.	Name of Village	Unit	Total Geographical Area	Rainfed Area	Wasteland	Village Land and Road	Irrigation Resource	
							Water Bodies	Borewell
1	2	3	4	5	6	7	8	9
1	Surjawali	Ha.	220	175.87	39.45	4.600		
2	Sarangpur	Ha.	193	154.29	33.350	5.320		
3	Baraula	Ha.	16	12.80	2.969	0.231		
4	Turkipur	Ha.	68	54.400	12.739	0.861		
5	BHaiyapur	Ha.	54	43.20	9.869	0.931		
6	Lalner	Ha.	99	79.20	18.6	1.200		
	Total							

(3.14) Livelihood :

Total Population of the watershed is 8936 and out of the total population a majority more than 80% has farming as their major source of livelihood followed by labours, serviceman and small business class. Classified livelihood given in form as fallows :

Table – 11 : Livelihood Classification in population :

S. No.	Name of Village	Farmer	Labour	In Service	In Local small business	Others
1	2	3	4	5	6	7
1.	Surjawali	171	15	20	9	
2.	Sarangpur	151	17	19	7	
3.	Baraula	11	9	3	3	
4.	Turkipur	50	11	7	5	
5	Bhaiyapur	40	7	9	4	
6	Lalner	67	19	8	7	
	Total					

(3.15) Dependency of forest fuel wood and fodder :

- a. Fuel wood :-** The main source of fuel is from cow dung cake, woody stem of crops. About 70% of the climactic energy requirement is met from the agriculture by product and cow dung cake. Rest is met out from the forest outside the village and watershed boundary, most preferred fuel wood is Juliflora fuel wood Juliflora obtained from standing along and between watershed.
- g- Fodder :-** Villages have not any sufficient signified dependency on forest based fodder as these resource are nothing availability in the forest.

(3.16) Labour requirement :

Labour requirements was found to be maximum at the time of October, November and December when the sowing of Rabi crops are done. The crucial periods are March and April coinciding harvesting and threshing of Rabi crops and July/August is sowing Kharif Crops take a little place. Other income generating enterprises having potential during the remaining.

(3.17) Crop Rotation :

Present Crop rotation in the watershed comprise of :

Kharif	-	Bajra	-	Rare
		Maize	-	Rare
		Jwar	-	Rare
Rabi	-	Fallow Wheat	-	Major
		Fallow Barly	-	Major
		Fallow Sugarcane	-	Major
		Fallow Mustard	-	Major
Zayad	-	Urad, Moong, Makka		

The above said Rabi Crops is the most prevailing crop rotation on the agriculture lands both in the rainfed and irrigated conditions.

Organized vegetable cultivation fruit plantation and traditional agro forestry systems are lacking as per requirement in the watershed the limited vegetable cultivation in the watershed is confined as kitchen gardens and field to the irrigated condition in a scattered manner. The cultivation of cash crops other than the sugarcane, wheat and mustard also in the watershed.

(3.18) Historical Events :

Chronological record of important events of the watershed village is prepared through participatory rural appraisal (PRA) which is very useful in understanding of its background and chronology is given as follows :

Table – 12 : Historical Events

S. No.	Events/Activities	Year	Rem.
1	2	3	4
1	Established	1511	
2	Opening of Primary School	1962	
3	Opening of Junior School	2006-07	
4	Opening of Kanya Pathshala	-	
5	Opening of PHC	-	
6	Opening of Vet. Hospital	-	
7	Panchayat Ghar	2008-09	
8	Introduction of Tractor	1970	
9	Gobar Gas Plant	1980-81	
10	Thresher	1972	
11	First Tube well/Pumpset	1962	
12	First Motorcycle	1980	
13	T.V. & D.V.D. Players	1982	
14	Electricity in Village	1965	
15	Bituminous Road	-	
16	First Hand Pump	1960	
17	Templo Renovation	1945	
18	First Land Line Telephone	1982	
19	Planning for Watershed Project	2011-12	

(3.19) Present Land Use in the Watershed :-

The watershed has diversified land uses. The varied present land use under different use in the watershed. The mixed land use followed in the watershed is almost similar in other parts of U.P. During P.R.A. Exercise prepared land has been shown in Table No. 13, 14 & 15.

Table – 13 : (Ownership)

S. No.	Name of Village	Pvt. Agri. Land		Govt. Revenu Land	Forest Land	Other Land
		S.C./S.T.	Others			
1	2	3	4	5	6	7
1	Surjawali	134		4.680		
2	Sarangpur	119.680		5.320		
3	Baraula	-	15.769	0.231		
4	Turkipur	-		0.931		
5	Lalner	-		0.861		
6	Bhaiyapur	-		0.200		
	Total					

Table –14 : (Present Land under different categories)

S. No.	Name of Village	Land Use (Ha.)				
		Agricultural	Wasteland (All Types)	Seasonal waterbodies	Village/Raod Etc.	Total
1	2	3	4	5	6	7
1	Surjawali	187.00	39.45	-	4.600	231.09
2	Sarangpur	164.05	33.300	-	5.320	202.670
3	Baraula	578.08	2.969	-	0.231	60.308
4	Turkipur	45.90	12.739	-	0.861	59.500
5	Bhaiyapur	13.60	9.869	-	0.931	24.400
6	Lalner	84.15	18.600	-	1.200	103.972
	Total	551.808	116.927		13.143	

Table – 15 : (Present land use classified)

S. No.	Land Use Under	Unit (ha.)	Area (Ha.)	Percentage
1	2	3	4	5
1	Under Agriculture			
	A- Rainfed-			
	I- Crops		321.75	
	II- Agro forestry		7.32	
	B- Irrigated-			
	I- Assured		39.26	
	II- Portial		53.70	
2	Wasteland			
	A- Aforestation			
	B- Pasture			
	C- Untreatable			
	D- Treatable		54.28	

Proposed Post Land Use has been given on Page No. 32

4- Focus on Present Land Use :

(4.1) Agriculture :

The total area under agriculture in the watershed is about 487.89 ha. out of which 574.00 ha. is under rainfed agriculture. Agriculture land uses in the watershed extended to diversified land capabilities starting marginal to good class II land. The irrigated and drinking water is most scarce natural resource in the watershed. The operation of tube well 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 of the watershed area. The agricultural field bund are common in the watersheds however they frequently breach on heavy rains.

Various mixed texture of soils are located in patches through out the watershed. The heavy soils are almost kept fallow during rainy season. the agricultural soils also have some as share calcium pan at variable depths. The irrigation water is conveyed by the earthen channels. Surface irrigation methods following mainly border method of flood method by the formers in the watershed. These factors reduce the water use efficiency of limited and valuable irrigation water.

Drought hardy species like Juliflora suitable multi purpose trees is suitable for rehabilitation of the wasteland. Rehabilitation of waste lands promoting agro forestry with appropriate fruit and forest species suitable vegetative barriers on sloppy lands can be high future value and by these adoption would be meet out many demands of fire wood and fodder in the wasteland. Except above but also for soil and water conservation, rehabilitation of wasteland and sustainable income generation for socio-economic upliftment of farmers.

Crop Productivity :

The farmers also do not have suitable cropping system to deal aberrant weather. Weeds impose considerable constraint in productivity of both Karif and Rabi crops under irrigated as well as rainfed production system farmer undertake normally one manual weeding in mustard and other valuable crops however, practices is energy and time consuming. Use of we decide is rare in the watershed.

In the watershed area, limited cropping in the Kharif with mixed cropping practices is not only irrigational but also unscientific and best for low productivity. Subsequent Rabi crops in general. Sugarcane & Mustard crop in particular are raised on residual soil moisture under rainfed production system during post mansoon season.

(4.2) Indigenous Technological Knowledge (ITK) :

Under process of PRA tracked out rural applying technology in various field of local technology and some technology is very popular in village. In which the agriculture is an old traditional practices of farmers who have improved themselves with passage of the time according to their domestic needs and technological reforms in the nearby areas. The villages have their traditional village ponds, practice of field bunding which typically

constitute agricultural related ITKs in the watershed. The Mustard & sugarcane being a cash and firewood crop of the watershed and also sugarcane crop is being. Cultivated in self designed manner by the farmers. Its carried out that the area is totally depend on rain and under the rainfed area technology is applied by the farmers. However limited fertilizer application specifically the DAP came in the practices since about 15-20 years.

(4.3) Forest and Other Vegetation :

Forest :

The watershed have a tract of wasteland area which are under uncultivable position is liesed in the watershed. These wasteland have not any tree vegetation or very less than real requirement for the wasteland use.

Horticulture/Agro forestry :

Horticulture and agro forestry practices were observed in the watershed.

(4.4) Agro forestry :

Agro forestry practices are lacking in the watershed. Though it has good potential under existing disposition and may a role particularly with respect to minimization of cropping risk, built up soil fertility and productivity, protection of soil erosion, soil conservation partly meeting out the fire wood demand of rural community and more over optimizing the economical return from system as whole under typical semi arid climate in the watershed. Bund and boundary plantation also have good potential to care the fire wood and fodder demands of the rural community in the watershed. The existing area under agro forestry is almost negligible. Prosopis Jhliflora may be planted as block or sole plantation specifically on marginal and degraded land in the watershed.

The agro forestry interventions comprising of ber, bail, aonla, guava, papular etc. may be applied for benefit of the farmers under rainfed to irrigation production system on leveled to slopping and marginal agricultural using proper planting techniques and term it control measures.

The multipurpose trees may be also help in supplementing fire wood and fodder demands of the rural community in the watershed and my be planted as hedge rows on rainfed, marginal and degraded lands.

(4.5) Horticulture :

Fruits and vegetables practices are lacking in the watershed area. Its practices may be sustainable very good potential for the formers of watershed. There are a limited lack fruit trees in number like mango, guava, lime, ber, aonla and papaya fruit trees well as vegetables like radish, okra, tomato, cabbage, garlic, onion, chilly, bringer and cucurbits but they are found surviving well in the watershed villages. Organized orchards (vatika) commercial vegetable cultivation horti-agri and other systems of agro forestry etc. are lacking but have good agriculture.

5. Soil and land capability classification :

(5.1) Soil Morphology :

Watershed is located North East corner of Bulandshahr Distt. near about 55 Km. away. The entire terrain of watershed is topographically divided into various land forms. Accordingly the soils of watershed have been grouped major categories is given as follow :

Hill Terrain	Plane Land Sloppy	Undulated Land	Rill Erosic Land	Moderate ravenous
-	35%	31%	19%	15%

Given categories in the blocks is located the soil morphology in the watershed areas. Representation of soil characteristics by soil profile is represented as follows :

Soil Profile :

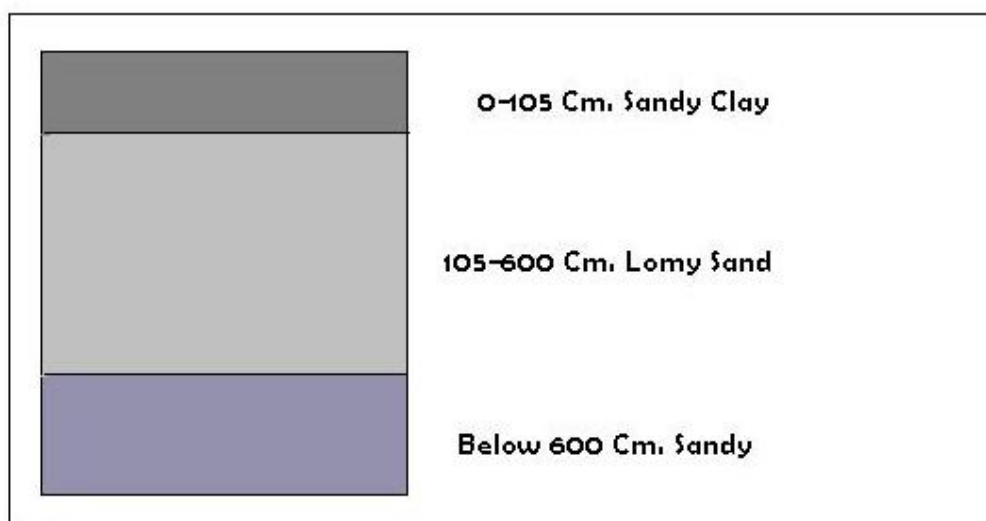


Fig. – 9 (Soil Profile)

Table – 16 : (Morphology of a Typical Soil Profile) :

Horizone	Depth in Cm.	Morphology
1	2	3
A V & H	0-150	Silky when moist, Hard when dry quick soluble, high elasticity, fissures, and cracks, occasional occurrence of free calcium carbonate granules black in colour, clay content 29%, PH- 8 to 8.7
B V & H	150-160	Whitish yellow in colour, very fine mixed with free cacaos and gravels, Hard when dry compact and indurate hard pan restricting development of root and down ward water transmission.
C V & H	7600	Red and white sand stone

(5.2) Soil and Characteristic and Fertility Status :

Soil characteristic pertaining to soil fertility of various classes accruing around villages in the watershed are given as follows :

Table – 17 : Soil Characteristic & Fertility Status :

Sl. No.	Soil Properties	LCC-II	LCC-III & IV
1	2	3	4
1	Sand %	47.04	
2	Silt %	24.60	
3	Clay %	28.36	
4	Texture	Sandy Clay	Lomy Sand
5	PH (1:2)	8.41	8.67
6	Organic Carbon %	0.31	0.12
7	Available N Kg ha ⁻¹	310	173
8	Available P Kg ha ⁻¹	39	15
9	Available K Kg ha ⁻¹	189	325
10	EC (dS m ⁻¹)	0.47	0.10

(5.3) Land Capability Classification (LCC) :

Land capability classification (LCC) was done to classification the soils in different groups based upon the limitations and to emphasize the hazards prevailing in the 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. Classes of land capability namely II, III, IV and V are demarcated in the watershed. The areas under different classes are sown as follows :

Table – 18 : Land Capability Classification (LCC) :

S. No.	Land capability class	Area in Ha.	Colour
1	2	3	4
1	I Class		
2	II Class		14
3	III Class		71
4	IV Class		10
5	V Class		5
6	VI Class		
7	VII Class		
8	VIII Class		

Land capability classification of various agricultural practices under land use can be classified as groups, class, sub class and units. Utilization of various land class is given as follows :

Table – 19 : Utilization of various land uses

S. N.	LCC	Forestry	Ltd. Grazing	Light Grazing	Dense Grazing	Limited Agriculture	Light Agriculture	Dense Agriculture	More Dense Agriculture
1	I								
2	II								
3	III								
4	IV								
5	V								
6	VI								
7	VII								
8	VIII								

(5.4) Land Capability Class II & III :

This group is one of the most extensive LCC watershed. and also near to class III for the agricultural practices. The soils are sandy & sandy 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 & III. These lands potentially very productive but due to rainfed a single cropping pattern is in habitation.

(5.5) Land Capability Class IV :

This class is found in lower portion near the outlets of watershed. The soils are coarser in texture, deep, erosion hazard and undulating in topography. Rill and initiation of gully can be seen near the outlet of the watershed.

(5.6) Land Capability Class VII & VIII :

This class of land is not found in watershed. Somewhere lack of soil are found with admixture gravels fragments in these classes of lands.

(5.7) Conclusions :

The majority of land form is coming under class II, which give an insight of good agriculture production potential of the watershed.

The land capability classification provides reasonable good information with regard to capability of soil, that could be used for agriculture, agrihorticulture, silviculture and posture development.

The productivity of these lands could be further enhanced by adoption of simple soil & water conservation measures like bunding practices.

The reasonable area is under watershed of wasteland and other wasteland including grater potential of this watershed for forestry and pasture development. Rare places namely water body of low portion of land area under seasonally works as water harvesting structures and these harvested water is used or can use for some other beneficial activities during the crop season also.

6. Problems and needs of the watershed indentified during the PRA

(6.1) Problem Identification and prioritization :

- z- The are has undulating topography, steep unstable slopes, gradient of excessive branches of rills and hence highly prone to soil erosion.
- aa- Major issues addressed to food sufficiency economic growth and environmental security in the watershed area.
- bb- Effective soil depth is limited and highly variable hampering good crop growth.

- cc- The watershed have low productive cropping due to tradition single cropping pattern and over all average crop production percentage not sufficient against requirement.
- dd- Identified that there is no assured irrigation system has been development capacity of water bodies are reduced due to silt ration which are utilized to store of rainy water and they are renovatable.

(6.7) Transact walk during the PRA :

Problems identified and prioritized during the transact walk and PRA exercises in all comprised villages of watershed. There were pooled and a list of problems representing the whole watershed was prepared. Problems were ranked as per their total weight age in the watershed village.

Table – 20 : Ranking of Problem identification and prioritization of watershed

S.No.	Problem	Rank
1	2	3
1	Lack of irrigation	
2	Lack of drinking water	
3	Low production of field crops	
4	Lack of fodder availability and low productivity	
5	Lack of availability of fuel wood	
6	Lack of market facility	
7	Lack of quality seeds, fertilizer, pesticides etc.	
8.	Medical and Health care facilities for milching animals and low productivity.	
9	Lack of medical, educational and transportation facilities	
10	Lack of water bodies renovation	
11	Lack of run of earthen check bunds	
12	Lack of water harvesting structures	
13	Lack of livelihoods opportunity	

Prioritized ranking (Upto four Numbers) :-

- 16- Lack of earthen check bunds.
- 17- Lack of livelihood opportunities.
- 18- Lack of irrigation water was the greatest problem. Lack of irrigation water problem experienced by the people followed by low crop production.

(6.3) Analysis of SWOT of the watershed :

Strength (S), Weakness (W), Opportunity (O) and Threat (T) analysis is a useful decision support tool. A SWOT analysis of watershed is presented as follows :

SWOT analysis of the watershed

Strengths (S)	Weakness (W)
<ul style="list-style-type: none">li. Cooperative work culture in traditional activitieslii. Close ethnic tiesliii. Road at the top as well as outlet of the watershedliv. Hard workinglv. Resource pool of crop genetics diversitylvi. Awareness of farmers about watershed management programmelvii. Well established CPR maintaining and sharing systemlviii. Stall feeding of animalslix. Well maintained seasonal water bodieslx. Social outlook of the community towards land less	<ul style="list-style-type: none">xlvi. Poor water managementxlvi. Resource poor farmersxlvi. Out migration of youthxlvi. Low and erratic rainfalll. Fragile geologyli. Fragmented land holdinglii. Heavy infestation of wild animalsliii. Problem of fuel and fodderliv. Shallow soil depth and with high percentage of gravel
Opportunities (O)	Threats (T)
<ul style="list-style-type: none">xxxi. Wide range of annual and perennial cropsxxxii. Scope of regular employment opportunities to check out migrationxxxiii. Strengthening of existing irrigation systemxxxiv. Conducive climate for rainfed crop diversificationxxxv. Good scope for Agro forestry and dry land horticulturexxxvi. Potential for collective action and management of CPR	<ul style="list-style-type: none">xxvi. Prone to adverse climate like droughtxxvii. High market riskxxviii. Social conflicts owing to PRI and WSM policies and local politicsxxix. Weak coordination among line departmentsxxx. Lack of expertise of implementing agency in different aspects of WSM

7. Proposed land use for the watershed :

Watershed management plan preparation due importance is given to topographic, land suitability, irrigation potentially, prevailing farming systems, micro farming situation, farming, farmers preferences and priorities along with economic and environment securities.

Crop and tree selection and area distribution was done as per farmers priorities revealed through PRA exercise.

The watershed management plan for watershed is prepared with specific objectives of food sufficiency, income and employment generation with environment security.

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

Table – 21 : Present and proposed land use plan of the watershed

S.No.	Land use	Present (ha)	Proposed area (ha)
1	2	3	4
1	Agriculture		
a	Rainfed		
	I Crops		
	II Agro-forestry		
b	Irrigated		
	I Assured		
	II Partial		
2	Waste land		
a	Aforestation		
b	Pasture		
c	Untreatable		
d	Treatable		
3	Village land		

(7.1) Status of Present Water Resources Utilization :

Watershed is having some canal system. Management and maintenance of these canal are required. Before sowing of Rabi crops, water from these canal is issued as supplementary irrigation for Rabi sowing ar allowed to go as waste. After releasing water from canal, submergence area also put under cultivation.

Some where bore well irrigation applied by the farmers in the watershed.

(7.2) Proposed Plan for Irrigation Development :

- a- Present system of irrigation and wastage of water during October–November need to be made more efficient from water management point of view by minimizing conveyance losses in the existing water courses.
- b- Present irrigation canal capacity have to build up by the reform. Which are lack capacity of water.
- c- Construction of new water harvesting earthen structures, Pucca Check Dem, Series Gully Plugging, etc. has been sloppy portion to increase irrigation potential and for recharging of ground water, soil and moisture conservation maximum field irrigation, best production and expected change of crop rotation.
- d- The up gradation of the exciting system of irrigation will result in :
 - i- Minimization of conveyance losses.
 - ii- Increase in frequency of irrigation.
 - iii- Adoption of high yielding varieties of crops.
 - iv- Assured cultivation of cash crops.
 - v- Capacity buildup by the planning of new water harvesting structures.

(7.3) Ground Water Recharge :

For the purpose of ground water recharge, the area of the upper side of watershed is recommended for Field Bunds, Contour Bunds, Peripheral Bunds and Submergence Bunds and in the lower portion Contour Staggered Trenches, Gully Plugs, Earthen Check Dem and Pacca Outlets. In the undulated sloppy portion of the watershed recommended water harvesting structure for dual purpose as ground water storage and under ground water recharge.

(7.4) Crop Production :

Practices proposed in the watershed is given as follows :-

- a- Mulching and crop residue management.
- b- Application of green manuring.
- c- Vermi Composting.
- d- Crop rotation and inter cropping.
- e- Biofertilizers.

(7.5) Tillage Operation :

Deep tillage technology is proposed to apply to be demonstrated for benefit of farmers in the watershed.

(7.6) Improved Seeds of High Yielding Varieties (H.Y.V.) :

Recommendation of improved varieties is necessary for improving the productivity and farm income. Through replacement of low yielding traditional varieties of seeds in villages of watershed.

(7.7) Balanced Fertilizer Use :-

Demonstration of use of fertilizer in various crops of watershed recommended balance fertilizer use in different crops will be benefited of farming community.

(7.8) Control of insects and diseases :

Aphid in the mustard are the major insects in the watershed areas leading to loss in crop productivity. Similarly white blister is also a common disease in the mustard crop.

The management strategies of these insect pest and diseases will also be demonstrated in the watershed for benefit of the growers.

(7.9) Dry Land Horticulture :

Such portion of dry land in which proposed horticulture development planning recommended species like Ber, Bel and Aonla will be planted at suitable spacing in the watershed.

(7.10) Agri Horticulture :

Aonla and Sahjan would be suitable horticultural crops to the locality. Therefore, a part of land in the farmer field shall be selected and brought under Agri-horticulture system. The cropping system followed will be Jwar and Wheat.

(7.11) Plantation (Fuel wood) :

Such a portion which are under wasteland will be taken falling in the class-IV category in the watershed. These lands will be planted with species like Vilayati Babool (Prosopis Juliflora), Babool (Acacia Nilotica), Karanj (Pangamia Glabra).

9. Socio Economic Analysis of the of the Project :

(9.1) Sustainability and environment security :

The proposed land use plan will improve the land utilization index and crop diversification index significantly as compared to the existing one. in the proposed watershed management plan proper blending of the bio engineering measures will be applied on above 80% of the total area of watershed. It is estimated that more than above 70% of the watershed area will be treated and consequently the soil loss and runoff from the area is excepted to be reduced by 70% respectively.

It will help in maintaining ecosystem integrity on sustained basis along with improving the livelihood security of the farming community.

(9.2) Economic Analysis :

Economic analysis of the project was carried by taking direct benefits and costs considering 10 years for project life at 10% discount rate. Whole watershed development plan was divided into three sector as agriculture, horticulture and forest/Fuel wood plantation. Net Present Value (NPV) and Benefit Cost ratio criteria were applied judge the economic efficiency of each enterprises and sector. Net present value (NPV) of the project life is considered to be 10 years and discount rate for NPV estimation is 10% is given NPV and benefits as follows :-

Table – 22 : Present productivity income analysis :

S. No.	Name of Sector	Name of Crops	Produ- cti- on/ha.	Rate/ Qtl.	Cost of Production	Expend. of cultivation	Net income	B.C. Ratio between Col. 8 & 7
1	2	3	4	5	6	7	8	9
A	Agriculture	Urad	3.00	4500.00	13500.00	6450.00	4450.00	1:1
		Moong	3.00	4600.00	6075.00	6075.00	7426.00	1.27:1
		Jwar	4.80	600.00	1880.00	1584.00	1296.00	0.82:1
		Wheat	18.50	1000.00	18500.00	8650.00	7075.00	0.82:1
		Pea	7.50	2400.00	18000.00	10970.00	5905.00	0.54:1
		Mustard	3.00	2400.00	10152.00	3235.00	3240.00	1:1
Total		-			76830.00	54105.00	51000.00	0.94:1
Average		-			131380.00	6763.00	6375.00	0.94:1
B	Forestry	Vilayati Babool				15000.00	-	Nil
C	Horticulture	Ber				20000.00	-	Nil
		Aonla				20000.00	-	Nil
		Bel				20000.00	-	Nil
Total		-				60000.00	-	Nil
Average		-				20000.00	-	Nil
Grand Total								

Table –23 : Post productivity and income analysis for Post Productivity**Value and B.C.:**

S. No.	Name of Sector	Name of Crops	Produ- ction/ha.	Rate/ Qtl.	Cost of Production	Expend. of cultivation	Net income	B.C. Ratio between Col. 8 & 7
1	2	3	4	5	6	7	8	9
A	Agriculture	Urad	4.00	5000.00	2000.00	8325.00	1145.00	1.39:1
		Moong	4.00	5000.00	2000.00	8200.00	11800.00	1.44:1
		Jwar	5.50	800.00	440.00	1900.00	2500.00	1.32:1
		Wheat	25.00	1000.00	25000.00	16680.00	13320.00	1.14:1
		Pea	1.00	3500.00	32250.00	14810.00	18540.00	1.12:1
		Mustard	5.00	3000.00	15000.00	4370.00	8130.00	1.86:1
Total		-	-	-	172250.00	72845.00	99765.00	1.38:1
Average		-	-	-	21531.00	9061.00	12471.00	1.38:1
B	Forestry	Vilayati Babool	80.00	500.00	4000.00	15000.00	25000.00	1.67:1
C	Horticulture	Ber	35.00	2000.00	52500.00	20000.00	32500.00	1.63:1
		Aonla	35.00	2000.00	70000.00	20000.00	5000.00	2.50:1
		Bel	40.00	1500.00	8000.00	20000.00	40000.00	2:1
Total		-			182500.00	60000.00	122500.00	2.01:1
Average		-			60833.00	20000.00	40833.00	2.04:1
Grand Total		-			1394750.00	147485.00	247265.00	1.68:1

Table –24 : Summary of NPV, PPV and B.C. Ratio (Sector wise) :

S. No.	Name of Sector	NPV		PPV		B.C. Ratio
		Expend.	Net Income	Expend.	Net Income	
1	2	3	4	5	6	7
1	Rain fed Agriculture	54105	51000	51000	72485	99765
2	Forest/Fuel wood Plantation	15000	-	15000	25000	1.67:1
3	Horticulture	60000	-	60000	122500	2.04:1
Total		129105	51000	147485	247265	1.68:1

(9.3) Economics of Agriculture Sector :

The development cost can be recovered by the adoption of plan in present rain fed agriculture is being done on well maintained field, therefore does not require much investment. In rain fed agriculture, investment of Rs. 44.50 lacs is proposed to made is given as fallows :

Table – 25 : Economics of Agriculture Sector :

S. No.	Name of sector	Name of Activities / Plan	Treatble Area (Ha.)	NPV (Lacs)	Post Productivity Value (Lacs)	Benifit / Income	B.C. Ratio
1	2	3	4	5	6	7	8
1.	Rainfed	Soil, moisture and water cons works	585	316.485	753.226	436.74	1.38:1

(9.4) Economics of forest fuel wood plantation :

Economic analysis of fuel wood plantation in the watershed. Project life is considered to be 20 years and discount rate for NPV estimation is 10 % is followed and as is given follows :

Table –26 : Economics of forest fuel wood Plantation :

S. No.	Name of sector	Comman Name of Plant	Area (Ha.)	NPV (Lacs)	Post Productivity Value (Lacs)	Benifit / Income	B.C. Ratio
1	2	3	4	5	6	7	8
1.	Forest Fuel wood sector	Vilayati Babool (Prasopis Juliflora)	25	2.5	6.675	4.175	1.67:1

(9.5) Economics of Horticulture Sector :

Economic analysis of Horticulture Plantation in agri-horti system and on wasteland patches of watershed project, life is considered about 15-20 years and discount factor rate for NPV estimation is 10% is follows :

Table – 27 : Economics of Horticulture system :

S. No.	Name of Sector	Common name of Plants	Area (Ha.)	NPV (Lacs)	Post Productive Value (Lacs)	Benefit Lacs	B.C. Ratio
1	2	3	4	5	6	7	8
1	Horticulture	Ber (zyziphus mouritana)	4.00	0.80	2.104	1.304	1.63:1
		Aonla (Embelica officianalis)	3.80	0.76	2.66	1.90	2.5:1
		Bel (Aegle marmelos)	2.20	0.44	1.32	0.88	2:1
Total			10	2.00	6.084	4.084	2.04:1

(9.6) Food requirement and sufficiency :

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

Table – 28 : Status of food requirement and availability of per annual :

S. No.	Name of Foods	Requirement Q./Yr.	Present Status		Expected Post Status	
			Availability Q./Yr.	Deficit or surplus Q./Yr.	Availability Q./Yr.	Deficit or surplus Q./Yr.
1	2	3	4	5	6	7
1	Cereals 110 Kg.	16165	13740	- 2425	27480	11315
2	Pulses 36.50	5364	2950	- 2414	9655	4291
3	Oil Seeds 29.20	4291	1716	- 2513	6866	2575
4	Vegetable 71 kg	13372	2674	- 10698	24070	10698

(9.7) Employment generation :

One of the major problem of the labour migration in watershed project. By the implementation of the project activities employment opportunities will be generated. However the changes in land use pattern and adoption of other subsidiary enterprise will generate employment opportunities in the watershed as given in table follows :

Table – 29 : Employment generation under proposed works :

S. No.	Employment activities/works	Area under work	Cost	Mandays generation (Nos.)			
				Unskilled	Skill	Total	Person
1	2	3	4	5	6	7	8
2	Graded Contour Bund	66	1.98	1980		1980	66
3	Gully Plug, C.D.	110	8.25	5775	424	6199	206
4	Submergence Bund	94	3.76	3760		3760	125
1	Peripheral Bund	93	3.255	3255		3255	108
5	W.H.B.	115	10.350	6210	352	6562	219
6	Renovation of Bund	72	2.16	2160		2160	72
7	Reno. of W.H.B.	-	-	-	-	-	-
8	Community Pond	-	-	-	-	-	-
9	Afforestation	25	3.345	669	-	669	22
10	Horticulture	10	2.00	400	-	400	13
Total		585	-	24209	776	24985	831

10. Formation of watershed committee :

Under compliance of common guideline Para (6.3) is followed and by the help of watershed development team, watershed committee is organized in the micro watershed village Ranayach Narendrapur with 10 members as prescribed in common guide line. List for organization of W.C. village details given as follows :

Table – 30 : Details of comprised village W.C. organization in M.W.S. :

S. No.	Particulars	Details	Block	Geographical Area
1	2	3	4	5
1	Micro watershed code	3B3E4d3c	Pahasu	650
2	Name of Gram Panchayat in M.W.S.	Surjawali		

Table – 31 : List of organized W.C. for the Gram Panchyat Surjawali in watershed.

S. No.	Name of selected members	Age	Representation Members from	Post	Qualification	Village
1	2	3	4	5	6	7
1	Krapal Singh	35	President	Vill. Pradhan	Intermediate	Surjawali
2	Jagdish	45	Secretary		Intermediate	Surjawali
3	Ram Singh	42	Self member		Intermediate	Surjawali
4	Bani Singh	45	Self member		Intermediate	Surjawali
5	Rakesh	35	Self member		Intermediate	Surjawali
6	Vijendra	40	Self member		Intermediate	Surjawali
7	Manju	42	Lady		Intermediate	Surjawali
8	Vimla	37	Lady		Intermediate	Surjawali
9	Sukharam	25	No earth		Intermediate	Surjawali
10	Ghanshyam	35	Member		Intermediate	Surjawali
11	Badan Singh	35	From – W.D.T.		Intermediate	Surjawali

(10.1) Formation of Self Help Groups in M.W.S.

By the help of watershed committee and watershed development team self help group are formatted / organized. Families and persons are selected from poor, small and marginal farmers families, landless poor families, agriculture labour families, women, herdsman and shepherd and S.C. families in the formatted self help groups are given as follow :

Table – 32 : Chatan Self help group – Surjawali .

S. No.	Name of member in formatted SHG's	Age	From represented family	Name of proposed activities	Activation Position
1	2	3	4	5	6
1	Prem Sharma	40			
2	Sarvesh	31			
3	Mohan	35			
4	Bahadur	83			
5	Jagat Singh	34			
6	Bhanupratap	27			
7	Deep Chand	19			
8	Jagdish	28			
9	Dharmveer	31			
10	Vishmber	26			

Table – 33 : Mahima self help group Surjawali

S. No.	Name of member in formed SHG's	Age	From represented family	Name of proposed activities	Activation Position
1	2	3	4	5	6
1	Ram Singh	24	President		
2	Anand	35			
3	Bani Singh	40	Secretary		
4	Bheekam	25			
5	Kunmarpal	28			
6	Shivkumar	40			
7	Peetam	35			
8	Gopal	25			
9	Dauliram	24			
10	Gajraj	35			

Table – 34 : Self help group in Surjawali of watershed.

S. No.	Name of member in farmated SHG's	Age	From represented family	Name of proposed activities	Activation Position
1	2	3	4	5	6
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					

Formation of User's Groups :

User's groups are farmated by the help of watershed committee and watershed development team in the micro watershed comprised villages. Formers which have land village are involved in the User's groups and they will be direct benefited as expected by the implementation of watershed project easy and convenienced condition are made to resource use between user's groups and they will be responsible to operate and maintenance for the created assets in the watershed. Nos. of farmated user's groups details are given as follows :

Table – 35 : Village wise user's groups

S. No.	Name of village	No. of groups	No. of farmers	Total Agri. Land	Area under treat-ment	Cost of essets
1	2	3	4	5	6	7
1	Surjawali	13	27	187	198.00	-
2	Sarangpur	11	35	164.05	173.70	-
3	Turkipur	4	6	57.108	15.00	-
4	Bhaiyapur	3	2	45.90	61.00	-
5	Baraula	1	1	13.60	48.30	-
6	Lalner	6	5	84.15	89.00	-
	Total	38	78	551.808	585	-

10. Estimation and Costing of Proposed activities of the watershed Project Year 2009-10.

Proposed works / activities for the Project Period (Year 2009-10) under proposed treatable area 635.00 Ha. Out of total Geographical area 906.61 Ha.

(10.1) Financial and Physical Outlets :

Table – 36 : Financial and Physical Outlets for the Year 2009-10 :

Sl. No.	Components	Unit cost per ha.	Physical ha.	Financial (Lacs)			Man-days Generation
				Labour Component	Material Component	Total	
1	2	3	4	5	6	7	8
A	Management Cost 10%						
1	Administrative Cost – TA & DA Hiring of Vehicles, Official Expenditure Electricity & Phone bill Computer, Stationery and office consumable materials & contingency	1200	-	-	7.020	7.020	-
2	Monitoring	120	-	-	0.7020	0.7020	
3	Evaluation	120	-	-	0.7020	0.7020	
	Sub Total	1440		-	8.4240	8.4240	
B	Preparatory Phase 10%						
1	Entry Point Activities 4%	480	-	0.5616	2.2464	2.8080	502
2	Institutional & Capacity Building 5%	600	-	-	3.5100	3.5100	
3	Detailed Project Report 1%	120	-	-	0.7020	0.7020	
	Sub Total	1200	-	0.5616	6.4584	7.020	5616
C	Watershed Work Phase						
a	Watershed Development Works						
1	Graded, Contour & Field Bunds	3000	66	1.980	-	1.980	1980
2	Gully Plug, Earthen Checkdam /WHS	7500	110	5.775	2.475	8.250	6199
3	Submergence bunds	4000	94	3.760	-	3.760	3760
4	Peripheral Bund	3500	93	3.255	-	3.255	3255
5	Earthen Water Harvesting Bund	9000	115	6.210	4.140	10.350	6562
6	Renovation of existing Bunds	3000	72	2.160	-	2.160	2160
7	Renovation of existing W.H.B	-	-	-	-	-	-
8	Aforestation and Development of silvi postural system	13380	25	0.669	2.676	3.345	669
9	Dry Land Horticulture	20000	10	0.400	1.600	2.00	400
10	Community Pound (Renovation)	-	-	-	-	-	-
	Sub Total		585	24.209	10.891	35.10	24985
B	Livelihood Programme (Community Based) 7.620						
	Income generating activities through SHG's for landless and marginal farmers 10%						
1	Live stock development activities	200	-	-	1.1702	1.1702	-
2	Bee Keeping	100	-	-	0.5848	0.5848	-
3	Poultry Farming	200	-	-	1.1702	1.1702	-
4	Nursery Development	300	-	-	1.7550	1.7550	-
5	Vegetable Production	100	-	-	0.5848	0.5848	-
6	Milk Dairy Promotion Unit	200	-	-	1.1702	1.1702	-
7	Establishment of Vermi compost Unit	100	-	-	0.5848	0.5848	-
8	Sub Total	1200	-	-	7.020	7.020	-
C	Production System and micro Enterprises						
1	Crop production, diversification of agriculture and introduction of agro forestry	1170	-	-	6.8445	6.8445	-
2	Demonstration of improved composting system	390	-	-	2.2815	2.2815	-
	Sub Total	1560	-	-	-	9.126	-
D	Consolidation Phase 5% Sub Total						
	Sub Total	600	-	-	3.510	3.51	-
Grand Total		12000	585	24.7706	45.4294	70.20	26109

संकल्प पत्र

ग्राम पंचायत — सुरजावली कोड सं० 2B3E4d3c विकास खण्ड —पहासू जिला — बुलन्दशहर

यह कि आई०डब्लू०एम०पी० परियोजना में तैयार की गयी निर्माण की नयी सृजित परिसम्पत्तियों को ग्राम पंचायत सुरजावली एवं माइक्रो वाटरशेड के अन्तर्गत सम्मिलित ग्रामों में योजना क्रियान्वयन कराने एवं योजना उपरान्त चालू रखने तथा सृजित परिसम्पत्तियों के अनुरक्षण हेतु कृत संकल्प एवं इच्छुक है।

सुरजावली ग्राम पंचायत के सभी स्रोत स्थल जैसे तालाब, ग्रामसभा गोचर (चारागाह), जल संसाधन, जंगल आदि में भूमि विकास परियोजना के अन्तर्गत किये जायेंगे। उन कार्यों को समाज के कमजोर वर्ग जैसे अनुसूचित जाति/जनजाति, महिला वर्ग एवं अल्प भूमिहीन गरीबी रेखा के नीचे के लाभार्थियों को लाभ पहुँचाने हेतु इच्छुक होंगे।

हम योजना संचालन हेतु प्रस्तावित करते हैं एवं सहमति देते हैं कि भारत सरकार के समस्त मार्गदर्शी सिद्धान्तों के अनुपालन में कार्य सम्पन्न करायेगें यह भी घोषित करते हैं कि चयनित क्षेत्र जिसको मेरे द्वारा भलीभाँति देखा गया है, और प्रस्तावित योजना में प्रस्तावित समस्त कार्य 15 सालों से नहीं कराया गया है जिसकी मुझे पूर्ण रूप से जानकारी है और अनुमोदन करते हैं।

बीना देवी
प्रधान
नगला सारनपुर
विकास खण्ड पहासू जिला
दोशमसिंह
बुलन्दशहर
जी.एस.एस.
शम-चन्द
नौवलासिंह
लेजवीरसिंह
महेश्वरसिंह

PROJECT AT A GLANCE

IWMP-II (Bulandshahar)

1	State	Uttar Pradesh
2	Distt.	Bulandshahar
3	Block	Pahasu
4	M.W.S. Code	2B3E3c3c
5	Name of M.W.S. Project	Pahashu
6	Involved Village	Pahashu Dehat, Peetampur
7	Geographical Area of M.W.S.	770.00
8	Rainfed Area	616.00
9	Treatable Area	693
10	Weightage	
11	Cost of Project	83.16
12	For the year	2011-12

Budget Components

S. No.	Components	Area (Ha.)	Cost (in Lacs)
1	2	3	4
1	Management Cost 12%	-	9.9792
2	Preparatory Phase 10%	-	8.316
3	Watershed Work Phase	-	
	A- Watershed Development Works 50%	693.00	41.580
	B- Livelihood Programme (Community Base) 10%	-	8.316
	C- Production System & Micro Enterprises 13%	-	10.8108
4	Consolidation Phase 5%	-	4.158
	Total	693.00	83.16

Executive Summary of the Project

Identified selected micro watershed project Pahashu is coded as **2B3E3c3c** has been proposed from cluster of I.W.M.P. Bulandshahar – I project in Pahasu Block district Bulandshahar four villages namely Pahasu dehat, Peetampur and Bannauj is comprised in the micro watershed which is located in the east of district Bulandshahar on the east bank of River Kali Nadi and border of district Badaun area is known as Khadar. It lies between $28^{\circ}-5'$ S and $28^{\circ}-15'$ N Latitudes and $78^{\circ}-0'$ E and $78^{\circ}-10'$ W Longitudes Covering area. Its altitudes ranges from 181 meter to 208 meter above the mean sea level. Khurja Railway Station 184.11 m, Khurja Jh. Railway station is 201.18 m above mean sea level is displayed. Project area of I.W.M.P. BSR-II is lied in the Pahasu Block of Bulandshahar District which is come in the western plan zone under semi arid area. The annual average rainfall is near to 397 mm which an average of 35 rainy days. Out of which about 85% is received during the mansoon season from July to September and very less rainfall is received in the winter season.

Temperature ranges from as high as 43°C in the May-June to as $3^{\circ}-4^{\circ}\text{C}$ during December – January. The Trend of rain fall is highly eratic and maximum water goes as runoff.

Main occupation of the dwellers is agriculture in the watershed. Some part of the lands are shown during the Kharif season. Cane sugar are preferred crops in the project area. The main Crops raised are Wheat, Pea & Mustered and maze.

The topmost portion of the watershed is sloppy flat land. Other than topmost portion of the watershed is under soil erotic portion and depreciative. The soil of the land are sandy loam Soil. The middle agricultural position of watershed relatively smooth sloppy flat land with sandy loam soil texture. These soil is yellow in colour and are inherently good in fertility status.

Natural vegetation of the watershed is very poor. Somewhere forest vegetation is seen which are predominant with Vilayati Babool (*Prosopis Juliflora*), followed by Babool (*Accasia nilotica*), somewhere Neem Plants (*Azadirachta Indica*), Shisham (*Dolbergia Sisson*) and Karanj (*Pongamia Glabra*) are seen in occasional occurrence. There is no grass land in the watershed. Somewhere grass patches are seen only on the bunds, road sides and other such places. Coverage of massive green belt is in poor percentage for environment which is envisaged. That watershed is very poor climate area.

There is normal condition of animal physics and for their fodder arrangement is the watershed and creative possibility would be expected by the implementations of the project.

Due to Aerial soil erosion poor harvesting managements, cropping pattern, non treated watershed etc. are very anti effective causes for the watershed. Problem of the watershed is to be tackled by harvesting structures which have lost most of their capacity new water bodies for the prevention of erosion and conservation of soil and moisture various type of earthen bunds in the watershed field, necessity has been observed. Wasteland will be treated with staggered Trenches, afforestation and bunding for the changing of characteristics.

The detail project report has been prepared by the applying of nine process steps for the micro watershed code no. **2B3E3c3c** brief is as follows.

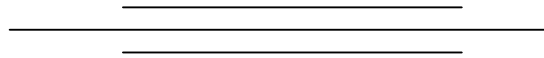
- STEP-1 Secondary data collection:-** During the five days visit programme in the micro watershed project with of all available documents of village label by approaching the Gram panchayat collected secondary data.
- STEP-2 Village meeting & conducting PRA exercise:-** Community meeting conducted on fix days for the consultation with villagers for the PRA Exercise. Participatory mode of the villages was positive indicated for the success of programme. With good in testing participation has been drawn social & resource map on ground & paper & discussed on various topics of problematic thoughts in the micro watershed.
- STEP-3 Socio economic survey:-** The resource organization of village label volunteers identified to conduct house hold socio economic survey/states.
- STEP-4 Problem typology analysis:-** Thoroughly analyzed the data & identified problem type as soil & moisture conservation, crop rotation, crop coverage, productivity, livelihoods, social issues & capacity building gaps etc. Problems discussed with the watershed committee & came up with alternative solution.
- STEP-5 Conduct of net participatory planning (NPP):-** The planning team visited together in the planning blocks on the scheduled date along with the beneficiaries of the villages & data gathered as for the participatory net planning.
- STEP-6 Productivity & livelihood planning exercise:-** For the product livelihood exercise, group discussion on various livelihood as Agriculture, Animal husbandry enterprise development held discussion with the villagers in the micro watershed.
- STEP-7 Institutional & capacity building :-** This plan is prepared based on the data available in the field and auscultations with the watershed committee.
- STEP-8 Data consolidation & documentation of DPR :-** After gathering all required information compiled collected data. Thoroughly discussed and finalized the expected outcomes and benefits specially in the respect of livelihood for different segments. These are the target and performers indicators for the micro watershed.

STEP-9 Conduct of Gram Sabha obtaining approvals submissions of DPR:-After preparation of the draft DPR convened to Gram sabha and activities proposed expected outcomes benefits of implementing the programm are explained in case of any changes are proposed in the Gram sabha approval obtained by the Gram sabha and already singed of Mau paper.

STEP-9A Attachment of detail estimate, cost and design:-Estimating, Costing and design prepared technically According to plan in the micro watershed project. And attached with the DPR.

STEP-9B Various type of mapping :- DPR prepared in the support of micro watershed project using various type of maps is as follows :

- | | |
|--------------------------------------|-----------------------------|
| 1.Index Map of Watershed | 2. Watershed Map |
| 3. Relief/ Drainage Map | 4. Slop Map |
| 5.Soil and Land Capability class map | 6. Land use/ Land Cover Map |
| 7. Cadastral map | 8. Proposed Action Plan map |
| 9. Social Map | |



Project Report

Table – 1 : Micro watershed project brief : -

1	State	U.P.
2	District	Bulandshahar
3	Block	Pahasu
4	Comprised Villages (Nos.)	02
5	Name of Watershed	Pahashu
6	Name of MWS Project	Pahashu
7	MWS Code No.	2B3E3c3c
8	Geographical Area of MWS	770.00
9	Treatable Area	693.00

1- Project Objectives :- The aim and objectives of the Project are :

- qq- Conservation, development and sustainable management of natural resources including their users.
- rr- Enhancement of agriculture production and productivity in a sustainable manner.
- ss- Restoration of ecological balance in the degraded and fragile rain fed ecosystem.
- tt- Reduction in regional disparity between rains fed and irrigated area.
- uu- Creation of sustainable employment opportunities for the rural community for livelihood security.
- vv- Generation of massive employment.
- ww- Reduce migration from rural employment.

2- Major Problem of Project Area :

- kk- Actual shortage of drinking water.
- ll- Near to nil activated water bodies and water harvesting structures.
- mm- Low depth of ground water table.
- nn- Undulated and generally sloppy rainfed area.
- oo- Large number of Small, Marginal and S.C. farmer land holding.
- pp- Lower wages of agriculture labour and also migration of labour due to shortage of employment in the watershed.

3- General Description :

(3.1) Location :-

Pahasu Watershed has been taken with MWS Code No. **2B3E3c3c** in Pahasu Block of Distt. Bulandshahar is located on Bulandshahar via Diwai to Tyore Bujurg Via Pahasu road about 57 Km. between 28⁰35' and 28⁰43' N Latitudes and 78⁰0' and 78⁰5' N Longitudes. Location and delineation of watershed has been located on watershed map **Fig. 2** and on top sheet **Fig. 3**.

(3.2) Area and Elevation :

Elevation ranges from 187 to 190 mtr. above the mean sea level(MSL) altogether comprised villages and their's area is described as follows. (Comprises village map Fig. 3)

Table – 2 : Area and Elevation

Sl. No.	MWS Code	Block	Name of Village	Geographical Area	Treatable Area
1	2	3	4	5	6
1	2B3E3c3c	Pahasu	Pahasu	623.34	561.00
			Banel	146.60	132.00
				770.00	693.00

(3.3) Shape of the Micro Watershed:

The shape of watershed is Elongated and as Rectangular. The maximum length and width of the watershed are 5000 Mtr. and 1814 Mtr. respectively with the Length: Width ratio of 2.76:1.

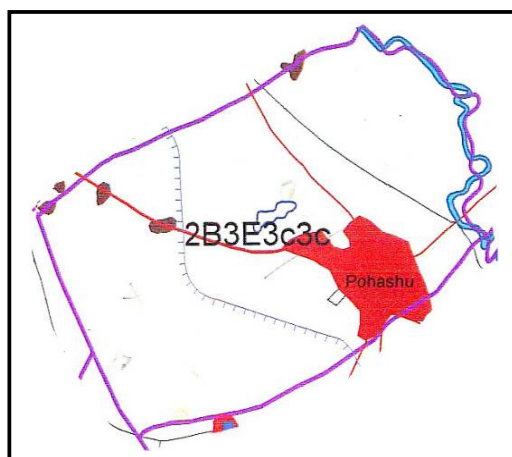


Fig. 1 (Shape of Micro Watershed)

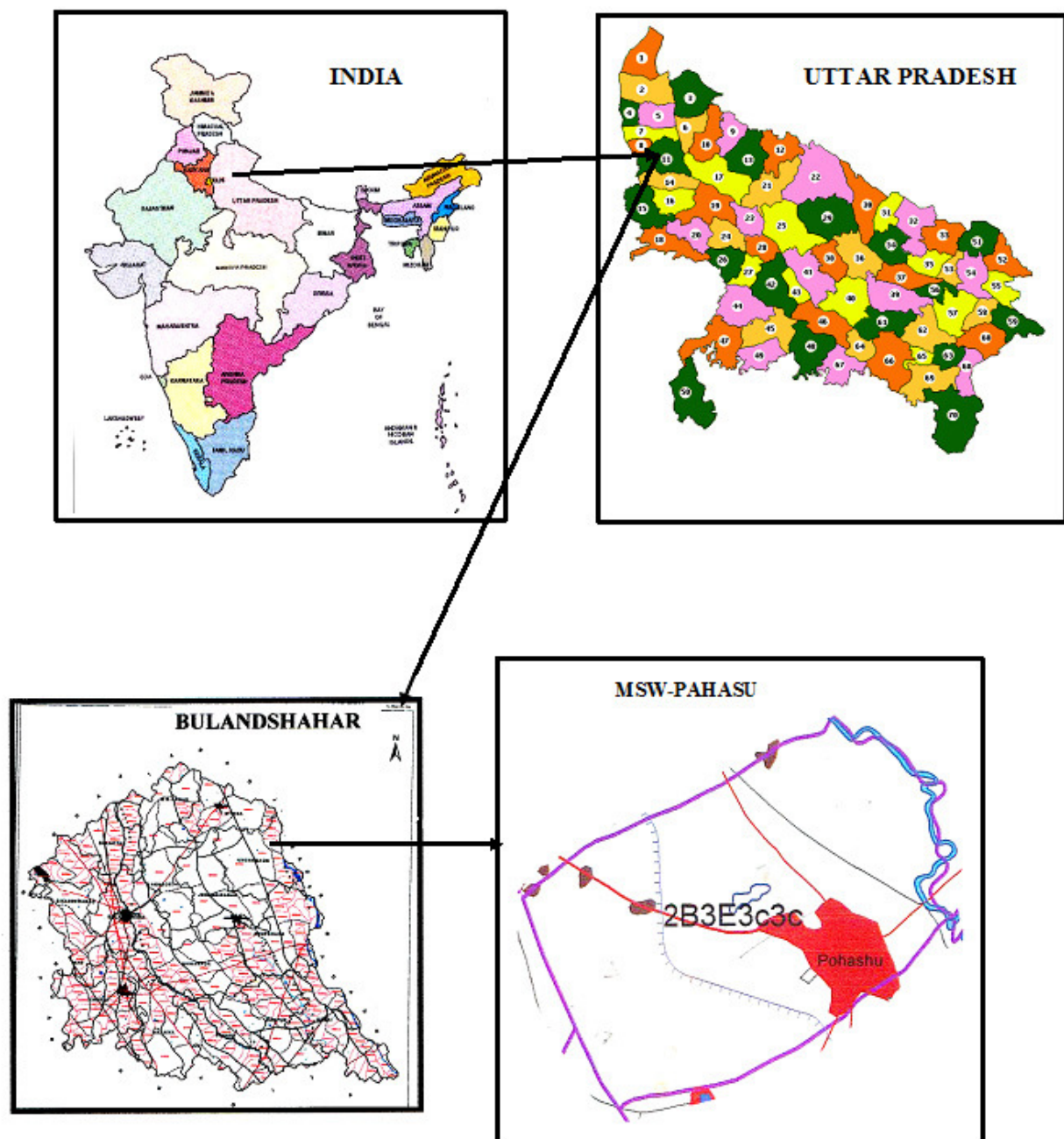
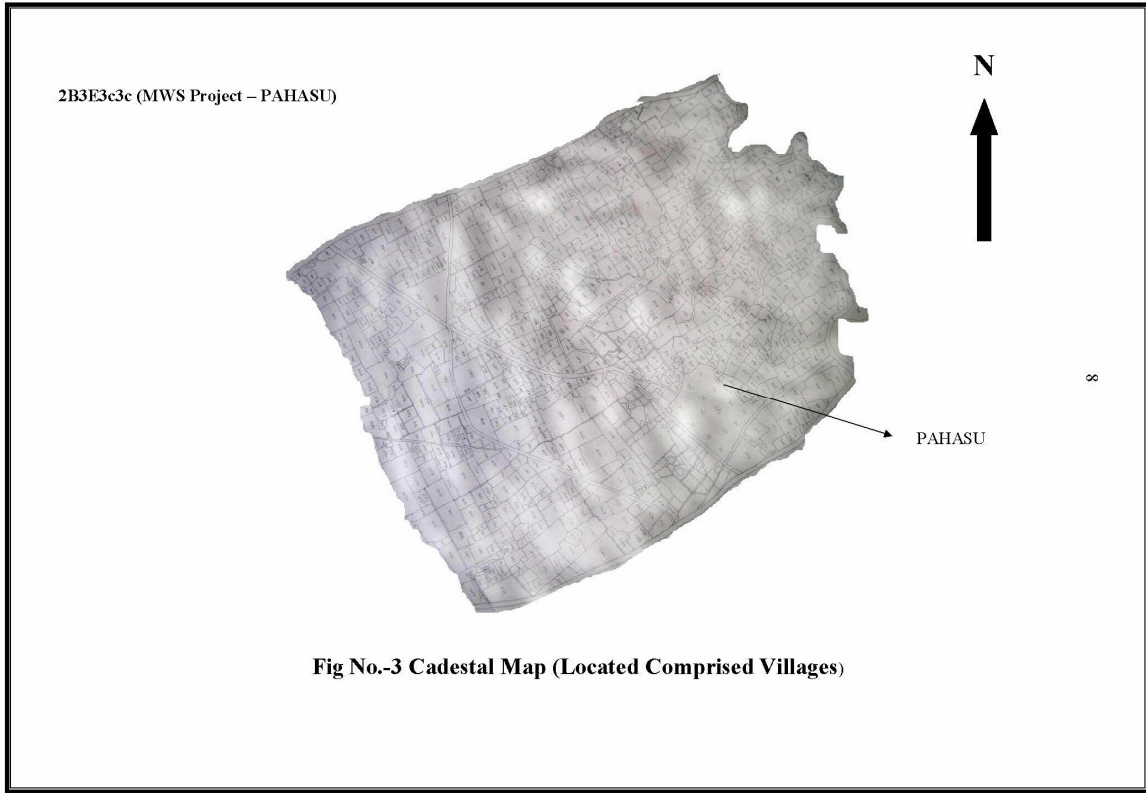


Fig.- 2 Location of the Micro Watershed



Sl. No.	Name of Project	Name of Village	Geographical Area (in ha.)	Raifed Area (in ha.)	Treatable Area	Agri. Land
1	2	3	4	5	6	7
1	Pahasu	Pahasu	623.34	498.67	561.00	571.50
2		Banel	146.66	117.33	132.00	135.50
Total			770.00	616.00	693.00	707.00

(3.4) Climate :

The Watershed falls under semi arid region of tropical climate inclined in Western Plan Zone. The average annual precipitation is about approx. is 397 mm. spreading over 35 rainy days. Most of the rain fall (about 85%) is received during July to September. The rain fall of moderate intensity. Nothing the area receives of scarcity rainfall in the winter season. The temperator variation ranges from as high as 43⁰c in the month of May-June to as low as 4⁰c in December-January.

(3.5) Geomorphology and Soils :

Geomorphology :

The entire watershed is topographically divided into major landforms. Accordingly the soils of watershed can be grouped into various categories such plane land, undulated land, sloppy land and erosic ravenous land.

Soil :

(a) Fine textured soil :

The soil are the most extensive soil group found in the watershed. Some portion of the watershed is relatively sloppy flat land with fine soil texture as sandy sandy loam. The

soils are in color and are inherently good high in fertility status. Soil texture is sandy lome loam particularly in depressions and loam in the elevated portion. The soil characteristic texture is dispersive and smooth. Therefore without impede the downward movement of water productive layer of soil are easily by high runoff.

a- Coarse Textured Soil :

These soil are lying mostly in downward portion, along with erosic gully and drainage line upto end of watershed outlet. These soils are coarser in texture and are relatively poor in fertility status. The soils are lomy sand in texture. Rill and gully formation in same parts particularly near the outlet of watershed can be seen.

(3.6) Drainage and Slope:

Due to prevalence of mild steep slope and presence of a number of drainage lines in the watershed the drainage system is adequate. The watershed from part of Ganga Basin and watershed. Under mild to steep topographical slope of MWS as divided as follow :
(Drainage and slope map fig.-4)

Table - 4 : Drainage and Slope

S. No.	Grade	Slope Percent	Area in Ha.	Remark
1	A	0.5-1	207.90	30%
2	B	1-2	173.25	25%
3	C	2-3	138.60	20%
4	D	3-4	103.95	15%
5	E	4-5	48.51	7%
6	F	5-6	20.79	3%

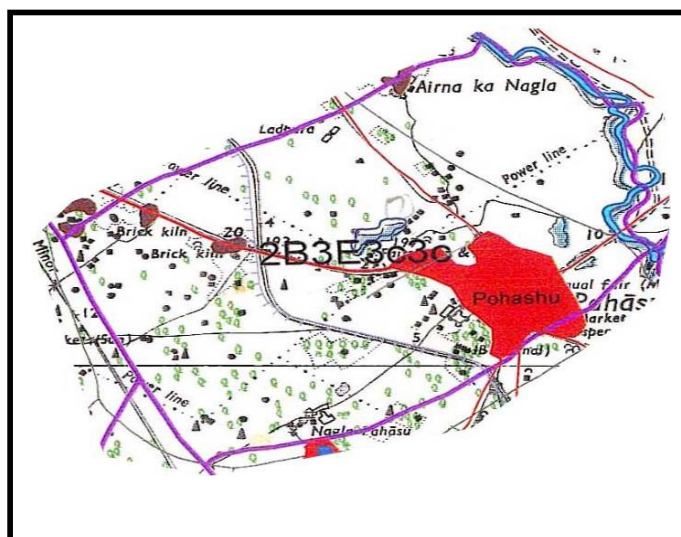


Fig-4 (Drainage & Scrub Map)

(3.7) Vegetation :

a- Natural Vegetation :

Natural vegetation is very poor in the watershed. The forest vegetation is predominant with Vilayti Babool (*Prosopis Juliflora*). There are occasional occurrence of Neem Plants (*Azadirochta Indica*), Shisham (*Dalbergia Sissoo*) and Karanj (*Pangamia Glabra*) and anywhere some scrubs are seen. There are no grass land in the watershed. Somewhere grass patches are seen only on the bunds, roadside and other such places. Poor percentage of massive green trees has been not seen in the watershed except Horticulture backyard.

b- Horticulture :

There is no backyards or commercial horticulture plantation in villages are been in some part of watershed.

c- Agroforestry :

The agriculture fields of the villages have some horticulture plantation at places isolated trees whose frequency is seen as under agroforestry and some where in where in backyards.

(3.8) Human Population:

a- Human Population:

Total Population of involved villages in watershed is 8936 with average family size of six persons as detailed as follows

Table – 5 : Human Population

S. No.	Name of village	Nos. of families	Human Population			Total
			Male	Female	Children	
1	Pahasu	352	762	704	977	2443
2	Banel	57	124	116	159	399
		-	-	-	-	-
	Total	409	886	820	1136	2842

h- Categorization of Human Population :

In the total population of watershed villages, categories are defined as below :

Table – 6 : Population Categories

S. No.	Particulars	Unit	Number of families in population in the villages		
			Population	Family	Remark
1	2	3	4	5	6
1	Agri Farmer	No.	814	266	
2	Landless	No.	54	16	
3	Agri. Labour	No.	104	37	
4	Land less Labour	No.	31	8	
5	BPL Family	No.	142	46	
6	SC Family	No.	107	36	
7	ST Family	No.	-	-	
			1252	409	

(3.9) Land Holding :

All the categories of farmers as small, marginal, medium and large are involved in land holding average of about 1-18 ha. Small land holding farmers are further scattered at different places which makes cultivation very difficult. Distribution of farm families according to the size of the land holdings are given as below :

Table – 7 : Distribution of farm families according to their size of land holdings

S. No.	Name of Village	Total Agri. Land in MWS	Land Holding Family (Nos.)					Percentage
			Marginal (< - 1Ha.)	Small (1-2 Ha.)	Medium (2-4 Ha.)	Large (4-7 Ha.)	Total	
1	Pahasu	571.50	274	95	28	12	409	
2	Banel	135.50	72	19	9	5	105	
3		-	-	-	-	-	-	
	Total	707.00	346	114	37	17	514	

(3.10) Live Stock Population :

Total live stock population of the watershed is 7016. Buffalos is preferred as mulch animal compared to Cow. But milk yield is poor. Goats are also kept for milk as well as for meat purpose. The breakup of livestock population is as follows :

Table – 8 : Live Stock Position

S. No.	Name of Village	Unit	Live Stock Position				Total
			Buffaloes	Cows	Bullocks	Goats	
1	Pahasu		1103	282	115	205	1705
2	Banel		432	143	57	74	706
Total			1535	425	172	279	2411

(3.11) Infrastructure Social Feature :

- a- Comprised villages in the micro watershed has moderate communication facilities. Watershed linked with metaled road and approachable through motarable road.
- t- All the villages are electrified and have T.V. and Telephone connection.
- u- Literacy rate in the watershed is very low all villages are having education upto Junior High School.
- v- Nearest small market is at Pahasu 13 Km. Nearest big market Bulandshahar is about 60 Km. from watershed. Religious and ritual features are almost common as in other parts af U.P. small land holding with large family size and more than 25% of the labour force of the total population living below poverty line indicate poor socio economic status of the watershed community.

Participatory Rural Appraisal

Participatory mode of the villagers shows positive indication for the success of the programme. Traditionally the entire village community participate in the individual works. Social map of one of the watershed village drawn by villagers themselves, depicting various village figures is shown in sketched map in Fig.-4 & 5. Infrastructures position of the village recorded as follows :

Table – 9 : MW.S. Project – Pahasu.

S. No.	Infrastructure	Unit	Qty.
1	2	3	4
1	Primary School	No.	5
2	Junior High School	No.	2
3	Kanya Pathshala	No.	2
4	Public Health Center	No.	1
5	Vet nary Hospital	No.	1
6	Panchayat Ghar	No.	1
7	Post Office	No.	1
8	Agan Bari Center	No.	5
9	Electricity	-	Yes
10	Road	-	Yes
11	Pond	No.	4
12	Hand Pump	No.	54
13	Irrigation Well	No.	-
14	Canal	No.	1
15	Temple	No.	10
16	Well (Drinking Water)	No.	-
17	Pumping Set	No.	154
18	Toilet	No.	110
19	Market	No.	Yes

SOCIAL MAP



मंगला घनश्याम (पद्यासू)

Recorded importance of development institution

Farmers perception recorded for importance and role of different development institution in relation to infrastructure. Importance has been depicted with size of circle and role with distance from village circle. (Fig 8)

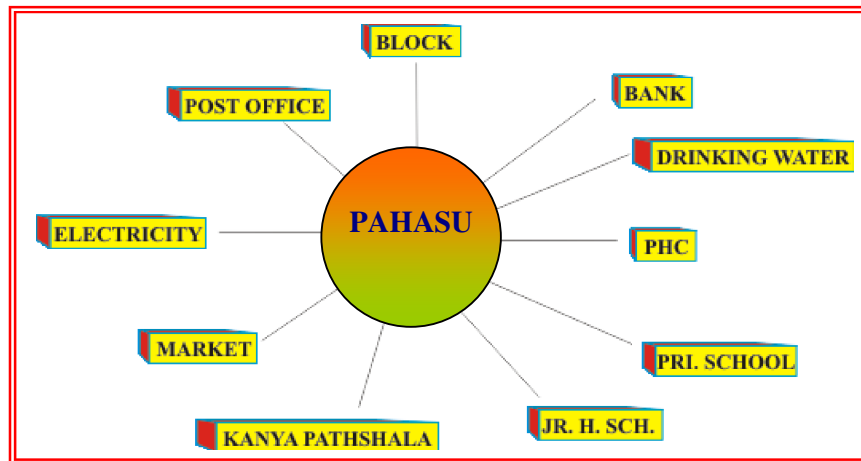


Fig. -8 (Venn diagram of Micro watershed)

(3.12) Communication :

Watershed can approached from Distt Headquarter Bulandshahar to Project area 57 km. by Road.

(3.13) Natural Resource Base :

Transact of watershed showed typical land use profile consisting of plain agriculture land, erodic area and medium ravenous ridge. Main source of the irrigation are the canal for pre showing irrigation only. The total geographical area of the watershed is 472.00 Ha. classification.

Approach roads for the micro watershed is shown for the communication is shown on topo sheet map Fig 9 as next page.

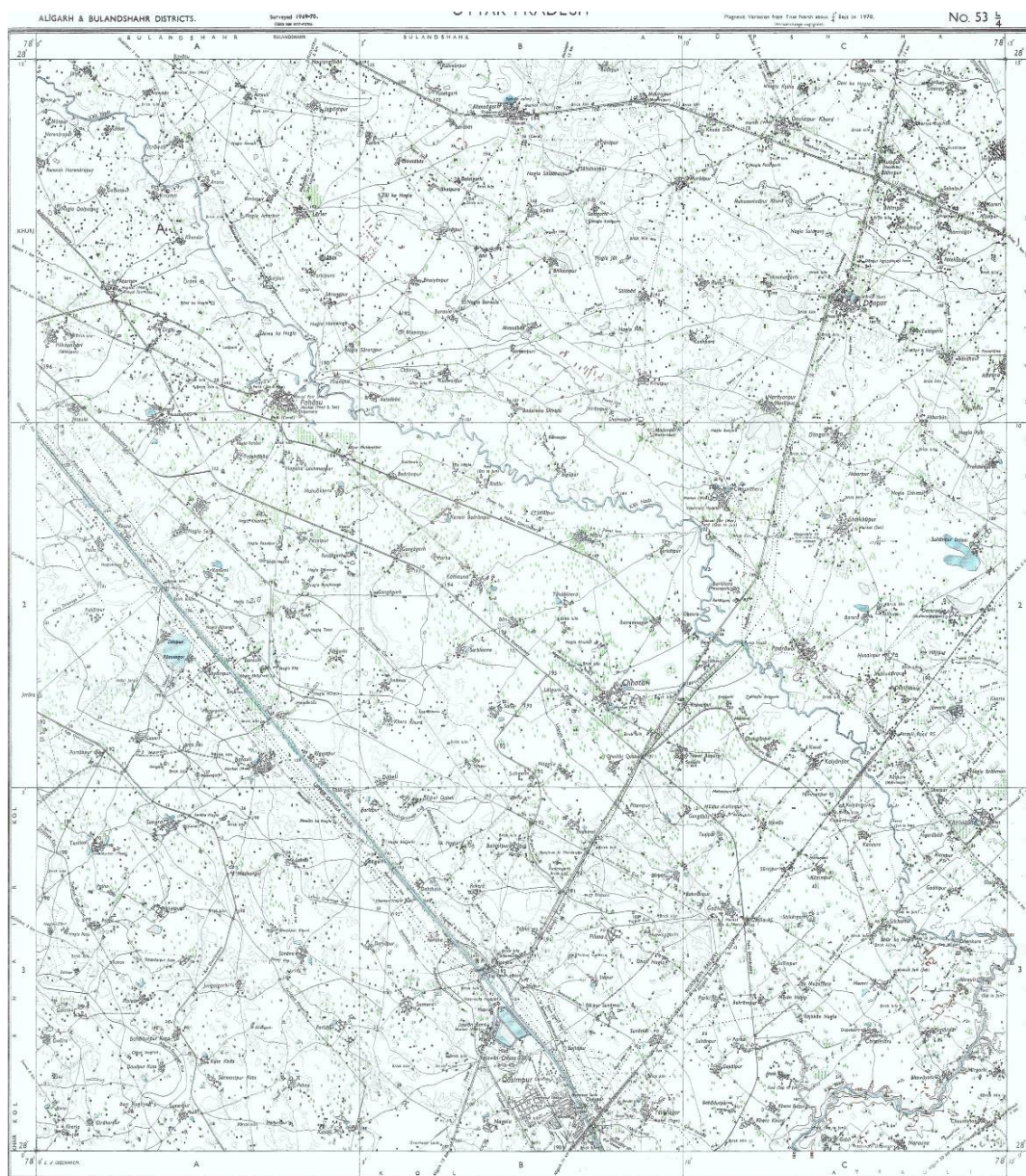


Fig.- 7 Communication Map on Toposheet

Table – 10 : Classification of area(Hect.)

S.No .	Name of Village	Unit	Total Geographical Area	Rainfed Area	Wasteland	Village Land and Road	Irrigation Resource	
							Water Bodies	Borewell
1	2	3	4	5	6	7	8	9
1	Pahasu	Ha.	623.34	498.67	37.40	14.44	-	81.03
2	Banel	Ha.	146.66	117.33	8.79	2.37	-	19.06
3			-	-	-	-	-	-
	Total		770.00	616.00	46.19	16.81	-	100.09

(3.14) Livelihood :

Total Population of the watershed is 8936 and out of the total population a majority more than 80% has farming as their major source of livelihood followed by labours, serviceman and small business class. Classified livelihood given in form as follows :

Table – 11 : Livelihood Classification in population :

S. No.	Name of Village	Farmer	Labour	In Service	In Local small business	Others
1	2	3	4	5	6	7
1.	Pahasu	246	42	31	32	9
2.	Banel	40	3	5	8	6
3.		-	-	-	-	-
	Total	286	45	36	40	15

(3.15) Dependency of forest fuel wood and fodder :

- a. Fuel wood :-** The main source of fuel is from cow dung cake, woody stem of crops. About 70% of the climactic energy requirement is met from the agriculture by product and cow dung cake. Rest is met out from the forest outside the village and watershed boundary, most preferred fuel wood is Juliflora fuel wood Juliflora obtained from standing along and between watershed.
- h- Fodder :-** Villages have not any sufficient signified dependency on forest based fodder as these resource are nothing availability in the forest.

(3.16) Labour requirement :

Labour requirements was found to be maximum at the time of October, November and December when the sowing of Rabi crops are done. The crucial periods are March and April coinciding harvesting and threshing of Rabi crops and July/August is sowing Kharif Crops take a little place. Other income generating enterprises having potential during the remaining.

(3.17) Crop Rotation :

Present Crop rotation in the watershed comprise of :

Kharif	-	Bajra	-	Rare
		Maize	-	Rare
		Jwar	-	Rare
Rabi	-	Fallow Wheat	-	Major
		Fallow Barly	-	Major
		Fallow Sugarcane	-	Major
		Fallow Mustard	-	Major
Zayad	-	Urad, Moong, Makka,		

The above said Rabi Crops is the most prevailing crop rotation on the agriculture lands both in the rainfed and irrigated conditions.

Organized vegetable cultivation fruit plantation and traditional agro forestry systems are lacking as per requirement in the watershed the limited vegetable cultivation in the watershed is confined as kitchen gardens and field to the irrigated condition in a scattered manner. The cultivation of cash crops other than the sugarcane, wheat and mustard also in the watershed.

(3.18) Historical Events :

Chronological record of important events of the watershed village is prepared through participatory rural appraisal (PRA) which is very useful in understanding of its background and chronology is given as follows :

Table – 12 : Historical Events

S. No.	Events/Activities	Year	Rem.
1	2	3	4
1	Established	500 year ago	
2	Opening of Primary School	1990	
3	Opening of Junior School	1985	
4	Opening of Kanya Pathshala	1988	
5	Opening of PHC	1990	
6	Opening of Vet. Hospital	1982	
7	Panchayat Ghar	1998	
8	Introduction of Tractor	1960	
9	Gobar Gas Plant	1995	
10	Thresher	1985	
11	First Tube well/Pumpset	1980	
12	First Motorcycle	1982	
13	T.V. & D.V.D. Players	1976	
14	Electricity in Village	1990	
15	Bituminous Road	2006	
16	First Hand Pump	1985	
17	Templo Renovation	2001	
18	First Land Line Telephone	1996	
19	Planning for Watershed Project	2010-11	

(3.19) Present Land Use in the Watershed :-

The watershed has diversified land uses. The varied present land use under different use in the watershed. The mixed land use followed in the watershed is almost similar in other parts of U.P. During P.R.A. Exercise prepared land has been shown in Table No. 13, 14 & 15.

Table – 13 : (Ownership)

S. No.	Name of Village	Pvt. Agri. Land		Govt. Revenu Land	Forest Land	Other Land
		S.C./S.T.	Others			
1	2	3	4	5	6	7
1	Pahasu	97.15	474.35	-	-	73.95
2	Banel	24.40	111.10	-	-	17.77
3				-	-	
	Total	121.55	585.45	-	-	91.72

Table –14 : (Present Land under different categories)

S. No.	Name of Village	Land Use (Ha.)				
		Agricultural	Wasteland (All Types)	Seasonal waterbodies	Village/Road Etc.	Total
1	2	3	4	5	6	7
1	Pahasu	571.50	37.40	-	14.44	623.34
2	Banel	135.50	8.79	-	2.37	146.66
	Total	707.00	46.19	-	16.81	770.00

Table – 15 : (Present land use classified)

Proposed Post Land Use has been given on Page No. 32	S. No.	Land Use Under	Unit (ha.)	Area (Ha.)	Percentage
	1	2	3	4	5
	1	Under Agriculture	Ha		
		A- Rainfed-	Ha		
		I- Crops	Hact	665.00	70%
		II- Agro forestry	Hact	35.00	7%
		B- Irrigated-	-		
		I- Assured	Hact		
		II- Portial	Hact	116.25	17%
	2	Wasteland	-		
		A- Aforestation	-		
		B- Pasture	-		
		C- Untreatable	Hact		
		D- Treatable	Hact	156.44	100%

4- Focus on Present Land Use :**(4.1) Agriculture :**

The total area under agriculture in the watershed is about 487.89 ha. out of which 574.00 ha. is under rainfed agriculture. Agriculture land uses in the watershed extended to diversified land capabilities starting marginal to good class II land. The irrigated and drinking water is most scarce natural resource in the watershed. The operation of tube well 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 of the watershed area. The agricultural field bund are common in the watersheds however they frequently breach on heavy rains.

Various mixed texture of soils are located in patches through out the watershed. The heavy soils are almost kept fallow during rainy season. the agricultural soils also have some as share calcium pan at variable depths. The irrigation water is conveyed by the

earthen channels. Surface irrigation methods following mainly border method of flood method by the formers in the watershed. These factors reduce the water use efficiency of limited and valuable irrigation water.

Drought hardy species like Juliflora suitable multi purpose trees is suitable for rehabilitation of the wasteland. Rehabilitation of waste lands promoting agro forestry with appropriate fruit and forest species suitable vegetative barriers on sloppy lands can be high future value and by these adoption would be meet out many demands of fire wood and fodder in the wasteland. Except above but also for soil and water conservation, rehabilitation of wasteland and sustainable income generation for socio-economic upliftment of farmers.

Crop Productivity :

The farmers also do not have suitable cropping system to deal aberrant weather. Weeds impose considerable constraint in productivity of both Karif and Rabi crops under irrigated as well as rainfed production system farmer undertake normally one manual weeding in mustard and other valuable crops however, practices is energy and time consuming. Use of we decide is rare in the watershed.

In the watershed area, limited cropping in the Kharif with mixed cropping practices is not only irrigational but also unscientific and best for low productivity. Subsequent Rabi crops in general. Sugarcane & Mustard crop in particular are raised on residual soil moisture under rainfed production system during post monsoon season.

(4.2) Indigenous Technological Knowledge (ITK) :

Under process of PRA tracked out rural applying technology in various field of local technology and some technology is very popular in village. In which the agriculture is an old traditional practices of farmers who have improved themselves with passage of the time according to their domestic needs and technological reforms in the nearby areas. The villages have their traditional village ponds, practice of field bunding which typically constitute agricultural related ITKs in the watershed. The Mustard & sugarcane being a cash and firewood crop of the watershed and also sugarcane crop is being. Cultivated in self designed manner by the farmers. Its carried out that the area is totally depend on rain and under the rainfed area technology is applied by the farmers. However limited fertilizer application specifically the DAP came in the practices since about 15-20 years.

(4.3) Forest and Other Vegetation :

Forest :

The watershed have a tract of wasteland area which are under uncultivable position is liesed in the watershed. These wasteland have not any tree vegetation or very less than real requirement for the wasteland use.

Horticulture/Agro forestry :

Horticulture and agro forestry practices were observed in the watershed.

(4.4) Agro forestry :

Agro forestry practices are lacking in the watershed. Though it has good potential under existing disposition and may a role particularly with respect to minimization of cropping risk, built up soil fertility and productivity, protection of soil erosion, soil conservation partly meeting out the fire wood demand of rural community and more over optimizing the economical return from system as whole under typical semi arid climate in the watershed. Bund and boundary plantation also have good potential to care the fire wood and fodder demands of the rural community in the watershed. The existing area under agro forestry is almost negligible. Prosopis Jhliflora may be planted as block or sole plantation specifically on marginal and degraded land in the watershed.

The agro forestry interventions comprising of ber, bail, aonla, guava, papular etc. may be applied for benefit of the farmers under rainfed to irrigation production system on leveled to slopping and marginal agricultural using proper planting techniques and term it control measures.

The multipurpose trees may be also help in supplementing fire wood and fodder demands of the rural community in the watershed and my be planted as hedge rows on rainfed, marginal and degraded lands.

(4.5) Horticulture :

Fruits and vegetables practices are lacking in the watershed area. Its practices may be sustainable very good potential for the formers of watershed. There are a limited lack fruit trees in number like mango, guava, lime, ber, aonla and papaya fruit trees well as vegetables like radish, okra, tomato, cabbage, garlic, onion, chilly, bringer and cucurbits but they are found surviving well in the watershed villages. Organized orchards (vatika) commercial vegetable cultivation horti-agri and other systems of agro forestry etc. are lacking but have good agriculture.

5. Soil and land capability classification :

(5.1) Soil Morphology :

Watershed is located North East corner of Bulandshahr Distt. near about 55 Km. away. The entire terrain of watershed is topographically divided into various land forms. Accordingly the soils of watershed have been grouped major categories is given as follow :

Hill Terrain	Plane Land Sloppy	Undulated Land	Rill Erosic Land	Moderate ravenous
-	45%	28%	15%	12%

Given categories in the blocks is located the soil morphology in the watershed areas. Representation of soil characteristics by soil profile is represented as follows :

Soil Profile :

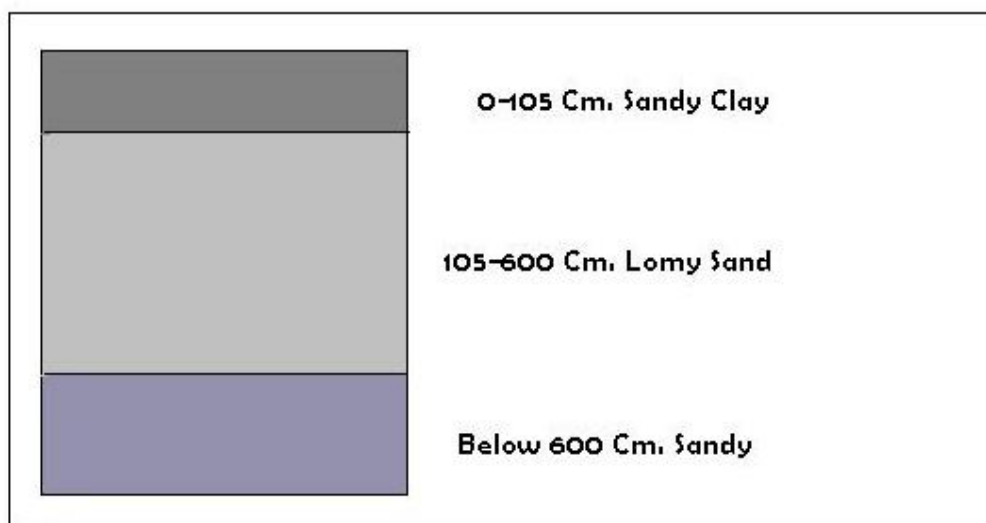


Fig. – 9 (Soil Profile)

Table – 16 : (Morphology of a Typical Soil Profile) :

Horizone	Depth in Cm.	Morphology
1	2	3
A V & H	0-150	Silky when moist, Hard when dry quick soluble, high elasticity, fissures, and cracks, occasional occurrence of free calcium carbonate granules black in colour, clay content 29%, PH- 8 to 8.7
B V & H	150-160	Whitish yellow in colour, very fine mixed with free cacaos and gravels, Hard when dry compact and indurate hard pan restricting development of root and down ward water transmission.
C V & H	7600	Red and white sand stone

(5.2) Soil and Characteristic and Fertility Status :

Soil characteristic pertaining to soil fertility of various classes accruing around villages in the watershed are given as follows :

Table – 17 : Soil Characteristic & Fertility Status :

Sl. No.	Soil Properties	LCC-II	LCC-III & IV
1	2	3	4
1	Sand %	44.05	72.04
2	Silt %	23.90	17.16
3	Clay %	32.05	11.80
4	Texture	Sandy Clay	Lomy Sand
5	PH (1:2)	7.75	8.00
6	Organic Carbon %	0.40	0.14
7	Available N Kg ha ⁻¹	320	1.75
8	Available P Kg ha ⁻¹	27	15
9	Available K Kg ha ⁻¹	184	321
10	EC (dS m ⁻¹)	0.47	0.13

(5.3) Land Capability Classification (LCC) :

Land capability classification (LCC) was done to classification the soils in different groups based upon the limitations and to emphasize the hazards prevailing in the 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. Classes of land capability namely II, III, IV and V are demarcated in the watershed. The areas under different classes are sown as follows :

Table – 18 : Land Capability Classification (LCC) :

S. No.	Land capability class	Area in Ha.	Colour
1	2	3	4
1	I Class	-	-
2	II Class	70.8	15%
3	III Class	330.4	70%
4	IV Class	47.20	10%
5	V Class	23.60	5%
6	VI Class	-	-
7	VII Class	-	-
8	VIII Class	-	-

Land capability classification of various agricultural practices under land use can be classified as groups, class, sub class and units. Utilization of various land class is given as follows :

Table – 19 : Utilization of various land uses

S. N.	LCC	Forestry	Ltd. Grazing	Light Grazing	Dense Grazing	Limited Agriculture	Light Agriculture	Dense Agriculture	More Dense Agriculture
1	I								
2	II								
3	III								
4	IV								
5	V								
6	VI								
7	VII								
8	VIII								

(5.4) Land Capability Class II & III :

This group is one of the most extensive LCC watershed. and also near to class III for the agricultural practices. The soils are sandy & sandy 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 & III. These lands potentially very productive but due to rainfed a single cropping pattern is in habitation.

(5.5) Land Capability Class IV :

This class is found in lower portion near the outlets of watershed. The soils are coarser in texture, deep, erosion hazard and undulating in topography. Rill and initiation of gully can be seen near the outlet of the watershed.

(5.6) Land Capability Class VII & VIII :

This class of land is not found in watershed. Somewhere lack of soil are found with admixture gravels fragments in these classes of lands.

(5.7) Conclusions :

The majority of land form is coming under class II, which give an insight of good agriculture production potential of the watershed.

The land capability classification provides reasonable good information with regard to capability of soil, that could be used for agriculture, agrihorticulture, silviculture and posture development.

The productivity of these lands could be further enhanced by adoption of simple soil & water conservation measures like bunding practices.

The reasonable area is under watershed of wasteland and other wasteland including grater potential of this watershed for forestry and pasture development. Rare places namely water body of low portion of land area under seasonally works as water harvesting structures and these harvested water is used or can use for some other beneficial activities during the crop season also.

6. Problems and needs of the watershed indentified during the PRA

(6.1) Problem Identification and prioritization :

- ee- The are has undulating topography, steep unstable slopes, gradient of excessive branches of rills and hence highly prone to soil erosion.
- ff- Major issues addressed to food sufficiency economic growth and environmental security in the watershed area.
- gg- Effective soil depth is limited and highly variable hampering good crop growth.

- hh- The watershed have low productive cropping due to tradition single cropping pattern and over all average crop production percentage not sufficient against requirement.
- ii- Identified that there is no assured irrigation system has been development capacity of water bodies are reduced due to silt ration which are utilized to store of rainy water and they are renovatable.

(6.8) Transact walk during the PRA :

Problems identified and prioritized during the transact walk and PRA exercises in all comprised villages of watershed. There were pooled and a list of problems representing the whole watershed was prepared. Problems were ranked as per their total weight age in the watershed village.

Table – 20 : Ranking of Problem identification and prioritization of watershed

S.No.	Problem	Rank
1	2	3
1	Lack of irrigation	6
2	Lack of drinking water	8
3	Low production of field crops	8
4	Lack of fodder availability and low productivity	5
5	Lack of availability of fuel wood	3
6	Lack of market facility	6
7	Lack of quality seeds, fertilizer, pesticides etc.	5
8.	Medical and Health care facilities for milching animals and low productivity.	7
9	Lack of medical, educational and transportation facilities	7
10	Lack of water bodies renovation	7
11	Lack of run of earthen check bunds	1
12	Lack of water harvesting structures	1
13	Lack of livelihoods opportunity	2

Prioritized ranking (Upto four Numbers) :-

- 19- Lack of earthen check bunds.
- 20- Lack of livelihood opportunities.
- 21- Lack of irrigation water was the greatest problem. Lack of irrigation water problem experienced by the people followed by low crop production.

(6.3) Analysis of SWOT of the watershed :

Strength (S), Weakness (W), Opportunity (O) and Threat (T) analysis is a useful decision support tool. A SWOT analysis of watershed is presented as follows :

SWOT analysis of the watershed

Strengths (S)	Weakness (W)
lxi. Cooperative work culture in traditional activities lxii. Close ethnic ties lxiii. Road at the top as well as outlet of the watershed lxiv. Hard working lxv. Resource pool of crop genetics diversity lxvi. Awareness of farmers about watershed management programme lxvii. Well established CPR maintaining and sharing system lxviii. Stall feeding of animals lxix. Well maintained seasonal water bodies lxx. Social outlook of the community towards land less	lv. Poor water management lvi. Resource poor farmers lvii. Out migration of youth lviii. Low and erratic rainfall lix. Fragile geology lx. Fragmented land holding lxi. Heavy infestation of wild animals lxii. Problem of fuel and fodder lxiii. Shallow soil depth and with high percentage of gravel
Opportunities (O)	Threats (T)
xxxvii. Wide range of annual and perennial crops xxxviii. Scope of regular employment opportunities to check out migration xxxix. Strengthening of existing irrigation system xl. Conducive climate for rainfed crop diversification xli. Good scope for Agro forestry and dry land horticulture xlii. Potential for collective action and management of CPR	xxxi. Prone to adverse climate like drought xxxii. High market risk xxxiii. Social conflicts owing to PRI and WSM policies and local politics xxxiv. Weak coordination among line departments xxxv. Lack of expertise of implementing agency in different aspects of WSM

7. Proposed land use for the watershed :

Watershed management plan preparation due importance is given to topographic, land suitability, irrigation potentially, prevailing farming systems, micro farming situation, farming, farmers preferences and priorities along with economic and environment securities.

Crop and tree selection and area distribution was done as per farmers priorities revealed through PRA exercise.

The watershed management plan for watershed is prepared with specific objectives of food sufficiency, income and employment generation with environment security.

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

Table – 21 : Present and proposed land use plan of the watershed

S.No.	Land use	Present (ha)	Proposed area (ha)
1	2	3	4
1	Agriculture		
a	Rainfed		
	I Crops	325.00	70%
	II Agro-forestry	20.00	7%
b	Irrigated		
	I Assured		
	II Partial	105.00	17%
2	Waste land		
a	Aforestation		
b	Pasture		
c	Untreatable		
d	Treatable		
3	Village land	155.00	100%

(7.1) Status of Present Water Resources Utilization :

Watershed is having some canal system. Management and maintenance of these canal are required. Before sowing of Rabi crops, water from these canal is issued as supplementary irrigation for Rabi sowing ar allowed to go as waste. After releasing water from canal, submergence area also put under cultivation.

Some where bore well irrigation applied by the farmers in the watershed.

(7.2) Proposed Plan for Irrigation Development :

- a- Present system of irrigation and wastage of water during October–November need to be made more efficient from water management point of view by minimizing conveyance losses in the existing water courses.
- b- Present irrigation canal capacity have to build up by the reform. Which are lack capacity of water.
- c- Construction of new water harvesting earthen structures, Pucca Check Dem, Series Gully Plugging, etc. has been sloppy portion to increase irrigation potential and for recharging of ground water, soil and moisture conservation maximum field irrigation, best production and expected change of crop rotation.
- d- The up gradation of the exciting system of irrigation will result in :
 - i- Minimization of conveyance losses.
 - ii- Increase in frequency of irrigation.
 - iii- Adoption of high yielding varieties of crops.
 - iv- Assured cultivation of cash crops.
 - v- Capacity buildup by the planning of new water harvesting structures.

(7.3) Ground Water Recharge :

For the purpose of ground water recharge, the area of the upper side of watershed is recommended for Field Bunds, Contour Bunds, Peripheral Bunds and Submergence Bunds and in the lower portion Contour Staggered Trenches, Gully Plugs, Earthen Check Dem and Pacca Outlets. In the undulated sloppy portion of the watershed recommended water harvesting structure for dual purpose as ground water storage and under ground water recharge.

(7.4) Crop Production :

Practices proposed in the watershed is given as follows :-

- a- Mulching and crop residue management.
- b- Application of green manuring.
- c- Vermi Composting.
- d- Crop rotation and inter cropping.
- e- Biofertilizers.

(7.5) Tillage Operation :

Deep tillage technology is proposed to apply to be demonstrated for benefit of farmers in the watershed.

(7.6) Improved Seeds of High Yielding Verities (H.Y.V.) :

Recommendation of improved varieties is necessary for improving the productivity and farm income. Through replacement of low yielding traditional varieties of seeds in villages of watershed.

(7.7) Balanced Fertilizer Use :-

Demonstration of use of fertilizer in various crops of watershed recommended balance fertilizer use in different crops will be benefited of forming community.

(7.8) Control of insects and diseases :

Aphid in the mustard are the major insects in the watershed areas leading to loss in crop productivity. Similarly white blister is also a common disease in the mustard crop.

The management strategies of these insect pest and diseased will also be demonstrated in the watershed for benefit of the growers.

(7.9) Dry Land Horticulture :

Such portion of dry land in which proposed horticulture development planning recommended species like Ber, Bel and Aonla will be planted at suitable spacing in the watershed.

(7.10) Agri Horticulture :

Aonla and Sahjan would be suitable horticultural crops to the locality. Therefore, a part of land in the farmer field shall be selected and brought under Agri-horticulture system. The cropping system followed will be Jwar and Wheat.

(7.11) Plantation (Fuel wood) :

Such a portion which are under wasteland will be taken falling in the class-IV category in the watershed. These lands will be planted with species like Vilayati Babool (Prosopis Juliflora), Babool (Acacia Nilotica), Karanj (Pangamia Glabra).

9. Socio Economic Analysis of the of the Project :

(9.1) Sustainability and environment security :

The proposed land use plan will improve the land utilization index and crop diversification index significantly as compared to the existing one. in the proposed watershed management plan proper blending of the bio engineering measures will be applied on above 80% of the total area of watershed. It is estimated that more than above 70% of the watershed area will be treated and consequently the soil loss and runoff from the area is expected to be reduced by 70% respectively.

It will help in maintaining ecosystem integrity on sustained basis along with improving the livelihood security of the farming community.

(9.2) Economic Analysis :

Economic analysis of the project was carried by taking direct benefits and costs considering 10 years for project life at 10% discount rate. Whole watershed development plan was divided into three sector as agriculture, horticulture and forest/Fuel wood plantation. Net Present Value (NPV) and Benefit Cost ratio criteria were applied judge the economic efficiency of each enterprises and sector. Net present value (NPV) of the project life is considered to be 10 years and discount rate for NPV estimation is 10% is given NPV and benefits as follows :-

Table – 22 : Present productivity income analysis :

S. No.	Name of Sector	Name of Crops	Produ- ction/ha.	Rate/ Qtl.	Cost of Production	Expend. of cultivation	Net income	B.C. Ratio between Col. 8 & 7
1	2	3	4	5	6	7	8	9
A	Agriculture	Urad	3.00	4300.00	12900.00	6450.00	6450.00	1:1
		Moong	3.00	4500.00	13500.00	6075.00	7425.00	1.12:1
		Jwar	4.80	600.00	2880.00	1584.00	1296.00	0.82:1
		Wheat	18.50	850.00	15725.00	8650.00	7075.00	0.82:1
		Pea	7.50	2250.00	16875.00	10970.00	5905.00	0.54:1
		Mustard	3.50	1850.00	6475.00	3235.00	3240.00	1:1
Total		-			105105.00	54105.00	51000.00	0.94:1
Average		-			13138.00	6763.00	6375.00	0.94:1
B	Forestry	Vilayati Babool				15000.00	-	Nil
C	Horticulture	Ber				20000.00	-	Nil
		Aonla				20000.00	-	Nil
		Bel				20000.00	-	Nil
Total		-				60000.00	-	Nil
Average		-				20000.00	-	Nil
Grand Total						-		

Table –23 : Post productivity and income analysis for Post Productivity**Value and B.C.:**

S. No.	Name of Sector	Name of Crops	Produ- ction/ha.	Rate/ Qtl.	Cost of Production	Expend. of cultivation	Net income	B.C. Ratio between Col. 8 & 7
1	2	3	4	5	6	7	8	9
A	Agriculture	Urad	2.50	4500.00	11250.00	5000.00	6250.00	1.25:1
		Moong	3.00	5000.00	15000.00	6200.00	8800.00	1.41:1
		Jwar	5.00	700.00	3500.00	1650.00	1850.00	1.12:1
		Wheat	8.00	1000.00	20000.00	9500.00	10500.00	1.10:1
		Pea	4.00	2500.00	20000.00	9250.00	10750.00	1.16:1
		Mustard		2000.00	8000.00	3675.00	4325.00	1.17:1
Total		-	-	-	77750.00	35275.00	42475.00	1.20:1
Average		-	-	-	9718.00	4409.00	5309.00	1.20:1
B	Forestry	Vilayati Babool				-	-	-
C	Horticulture	Ber				22000.00	-	Nil
		Aonla				22000.00	-	Nil
		Bel				22000.00	-	Nil
Total		-				66000.00	-	Nil
Average		-				22000.00	-	Nil
Grand Total		-					-	

Table –24 : Summary of NPV, PPV and B.C. Ratio (Sector wise) :

S. No.	Name of Sector	NPV		PPV		B.C. Ratio
		Expend.	Net Income	Expend.	Net Income	
1	2	3	4	5	6	7
1	Rain fed Agriculture	54105	51000	72485.00	99765.00	1.38:1
2	Forest/Fuel wood Plantation	15000	-	15000	25000	1.67:1
3	Horticulture	60000	-	60000	122500	2.04:1
Total		129105	51000	147485.00	247265	1.68:1

(9.3) Economics of Agriculture Sector :

The development cost can be recovered by the adoption of plan in present rain fed agriculture is being done on well maintained field, therefore does not require much investment. In rain fed agriculture, investment of Rs. 44.50 lacs is proposed to made is given as fallows :

Table – 25 : Economics of Agriculture Sector :

S. No.	Name of sector	Name of Activities / Plan	Treatble Area (Ha.)	NPV (Lacs)	Post Productivity Value (Lacs)	Benifit / Income	B.C. Ratio
1	2	3	4	5	6	7	8
1.	Rainfed	Soil, moisture and water cons works	472	269.34	640.87	371.69	1:38:1

(9.4) Economics of forest fuel wood plantation :

Economic analysis of fuel wood plantation in the watershed. Project life is considered to be 20 years and discount rate for NPV estimation is 10 % is followed and as is given follows :

Table –26 : Economics of forest fuel wood Plantation :

S. No.	Name of sector	Comman Name of Plant	Area (Ha.)	NPV (Lacs)	Post Productivity Value (Lacs)	Benifit / Income	B.C. Ratio
1	2	3	4	5	6	7	8
1.	Forest Fuel wood sector	Vilayati Babool (Prasopis Juliflora)	25	2.50	6.675	4.175	1.67:1

(9.5) Economics of Horticulture Sector :

Economic analysis of Horticulture Plantation in agri-horti system and on wasteland patches of watershed project, life is considered about 15-20 years and discount factor rate for NPV estimation is 10% is follows :

Table – 27 : Economics of Horticulture system :

S. No.	Name of Sector	Common name of Plants	Area (Ha.)	NPV (Lacs)	Post Productive Value (Lacs)	Benefit Lacs	B.C. Ratio
1	2	3	4	5	6	7	8
1	Horticulture	Ber (zyziphus mouritana)	4.00	0.80	2.104	1.304	1.63:1
		Aonla (Embelica officianalis)	3.80	0.76	2.660	1.90	2.5:1
		Bel (Aegle marmelos)	2.20	0.44	1.320	0.88	2:1
Total			10.00	2.00	6.084	4.084	2.04:1

(9.6) Food requirement and sufficiency :

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

Table – 28 : Status of food requirement and availability of per annual :

S. No.	Name of Foods	Requirement Q./Yr.	Present Status		Expected Post Status	
			Availability Q./Yr.	Deficit or surplus Q./Yr.	Availability Q./Yr.	Deficit or surplus Q./Yr.
1	2	3	4	5	6	7
1	Cereals 110 Kg.	3126	2657	- 469	5314	2188
2	Pulses 36.50	1037	570	- 467	1867	830
3	Oil Seeds 29.20	830	332	- 498	1328	498
4	Vegetable 71 kg	2586	517	- 2069	4655	2069

(9.7) Employment generation :

One of the major problem of the labour migration in watershed project. By the implementation of the project activities employment opportunities will be generated. However the changes in land use pattern and adoption of other subsidiary enterprise will generate employment opportunities in the watershed as given in table follows :

Table – 29 : Employment generation under proposed works :

S. No.	Employment activities/works	Area under work	Cost	Mandays generation (Nos.)			
				Unskilled	Skill	Total	Person
1	2	3	4	5	6	7	8
2	Graded Contour Bund	79	2.37	2370	-	2370	79
3	Gully Plug, C.D.	132	9.90	6930	508	7438	248
4	Submergence Bund	112	4.48	4480	-	4480	149
1	Peripheral Bund	111	3.885	3885	-	3885	129
5	W.H.B.	138	12.420	7452	269	7721	257
6	Renovation of Bund	86	2.58	2580	-	2580	86
7	Reno. of W.H.B.	-	-	-	-	-	-
8	Community Pond	-	-	-	-	-	-
9	Afforestation	25	3.945	789	-	789	26
10	Horticulture	10	2.00	400	-	400	13
Total				28886	777	29663	987

10. Formation of watershed committee :

Under compliance of common guideline Para (6.3) is followed and by the help of watershed development team, watershed committee is organized in the micro watershed village Teyore Bujurg with 10 members as prescribed in common guide line. List for organization of W.C. village details given as follows :

Table – 30 : Details of comprised village W.C. organization in M.W.S. :

S. No.	Particulars	Details	Block	Geographical Area
1	2	3	4	5
1	Micro watershed code	3B3E3c3c	Pahasu	770
2	Name of Gram Panchayat in M.W.S.			

Table – 31 : List of organized W.C. for the Gram Panchyat Pahasu Dehat in watershed.

S. No.	Name of selected members	Age	Representation Members from	Post	Qualification	Village
1	2	3	4	5	6	7
1	Smt. Shikha devi	32	President	Pradhan	10	Pahasu Dehat
2	Shri Vinod Kumar	38	Secretary		12	Pahasu Dehat
3	Shri Sunil Kumar	36	S.H.G.		12	Pahasu Dehat
4	Shri Narendra Kumar	36	S.H.G.		10	Pahasu Dehat
5	Smt. Sushma Devi	37	Lady		10	Pahasu Dehat
6	Shri Hubb Lal	50	No field		5	Pahasu Dehat
7	Shri Fateh Singh	45	S.C.		8	Pahasu Dehat
8	Shri Kailash	45	U.G.		5	Pahasu Dehat
9	Shri Madan mohan	55	U.G.		10	Pahasu Dehat
10	Shri Brajkishor	48	U.G.		10	Pahasu Dehat
11	Shri V.P. Singh	52	WDT		Agri Engg	Pahasu Dehat

(10.1) Formation of Self Help Groups in M.W.S.

By the help of watershed committee and watershed development team self help group are formatted / organized. Families and persons are selected from poor, small and marginal farmers families, landless poor families, agriculture labour families, women, herdsman and shepherd and S.C. families in the formatted self help groups are given as follow :

Table – 32 : Ganga Ji Self help group – Pahasu Dehat.

S. No.	Name of member in formatted SHG's	Age	From represented family	Name of proposed activities	Activation Position
1	2	3	4	5	6
1	Shri Pooran Singh	32	President	Buffalo Palan	
2	Shri Arvind Kumar	28	Secretary		
3	Shri BhoopSingh	50			
4	Shri Sanjan Singh	25			
5	Shri Somveer	50			
6	Shri Santosh Kumar	35			
7	Shri Kumwar Pal	40			
8	Shri Rajesh Kumar	32			
9	Shri Praveen Kumar	28			
10	Shri Pradeep Kumar	24			

Table – 33 : Self help group Teyore Bujurg – Buffaloes.

S. No.	Name of member in formed SHG's	Age	From represented family	Name of proposed activities	Activation Position
1	2	3	4	5	6
1	Shri Rajesh Kumar	30	President	Buffalo Palan	
2	Shri Narendra Kumar	36	Secretary		
3	Shri Ashok Kumar	42			
4	Shri Mahesh Chand	37			
5	Shri Ravindra Kumar	32			
6	Shri Bhupendra Kumar	36			
7	Shri Jitendra Kumar	26			
8	Devendra Kumar	38			
9	Pappu Singh	38			
10	Shri Satyaprakash	50			

Table – 34 : Self help group in Teyore Bujurg of watershed.

S. No.	Name of member in farmated SHG's	Age	From represented family	Name of proposed activities	Activation Position
1	2	3	4	5	6
1	Shri Rohtash	35	SC	Pashupalan	New
2	Shri Ganda lal	50	SC	Pashupalan	New
3	Shri Bhikam	45	BC	Pashupalan	New
4	Shri Himmat Singh	30	BC	Pashupalan	New
5	Shri Bhagwandas	40	BC	Pashupalan	New
6	Shri Raj Kumar	40	BC	Pashupalan	New
7	Shri Rambabu	47	SC	Pashupalan	New
8	Shri Anvesh	28	SC	Pashupalan	New
9	Shri Gajraj	45	SC	Pashupalan	New
10	Shri Mahaveer Singh	55	BC	Pashupalan	New

Formation of User's Groups :

User's groups are farmated by the help of watershed committee and watershed development team in the micro watershed comprised villages. Formers which have land village are involved in the User's groups and they will be direct benefited as expected by the implementation of watershed project easy and convenienced condition are made to resource use between user's groups and they will be responsible to operate and maintenance for the created assets in the watershed. Nos. of farmated user's groups details are given as follows :

Table – 35 : Village wise user's groups

S. No.	Name of village	No. of groups	No. of farmers	Total Agri. Land	Area under treat-ment	Cost of essets
1	2	3	4	5	6	7
1	Pahasu	41	623	571.50	561.00	-
2	Banel	9	146	135.50	132	-
3						

10. Estimation and Costing of Proposed activities of the watershed Project Year 2009-10.

Proposed works / activities for the Project Period (Year 2010-11) under proposed treatable area 472.00 Ha. Out of total Geographical area 497.00 Ha.

(10.1) Financial and Physical Outlets :

Table – 36 : Financial and Physical Outlets for the Year 2009-10 :

Sl. No.	Components	Unit cost per ha.	Physical ha.	Financial (Lacs)			Man-days Generation
				Labour Component	Material Component	Total	
1	2	3	4	5	6	7	8
A	Management Cost 10%						
1	Administrative Cost – TA & DA Hiring of Vehicles, Official Expenditure Electricity & Phone bill Computer, Stationery and office consumable materials & contingency	1200	-	-	8.316	8.316	-
2	Monitoring	120	-	-	0.8316	0.8316	-
3	Evaluation	120	-	-	0.8316	0.8316	-
	Sub Total	1440		-	9.9792	9.9792	-
B	Preparatory Phase 10%						
1	Entry Point Activities 4%	480	-	0.6653	2.6611	3.3264	665
2	Institutional & Capacity Building 5%	600	-	-	4.158	4.158	-
3	Detailed Project Report 1%	120	-	-	0.8316	0.8316	-
	Sub Total	1200	-	0.6653	7.6507	8.316	665
C	Watershed Work Phase						
a	Watershed Development Works						
1	Graded, Contour & Field Bunds	3000	79	2.37	-	2.37	2370
2	Gully Plug, Earthen Checkdam /WHS	7500	132	6.93	2.97	9.90	7438
3	Submergence bunds	4000	112	4.48	-	4.48	4480
4	Peripheral Bund	3500	111	3.885	-	3.885	3885
5	Earthen Water Harvesting Bund	9000	138	7.452	4.9680	12.420	7721
6	Renovation of existing Bunds	3000	86	2.580	-	2.580	2580
7	Renovation of existing W.H.B	-	-	-	-	-	-
8	Aforestation and Development of silvi postural system	15780	25	0.789	3.156	3.945	789
9	Dry Land Horticulture	20000	10	0.400	1.60	2.00	400
10	Community Pound (Renovation)	-	-	-	-	-	-
	Sub Total		693	28.886	12.694	41.58	29663
B	Livelihood Programme (Community Based) 7.620						
	Income generating activities through SHG's for landless and marginal farmers 10%						
1	Live stock development activities	200	-	-	1.3863	1.3863	-
2	Bee Keeping	100	-	-	0.6927	0.6927	-
3	Poultry Farming	200	-	-	1.3863	1.3863	-
4	Nursery Development	300	-	-	2.0790	2.0790	-
5	Vegetable Production	100	-	-	0.6927	0.6927	-
6	Milk Dairy Promotion Unit	200	-	-	1.3863	1.3863	-
7	Establishment of Vermi compost Unit	100	-	-	0.6927	0.6927	-
8	Sub Total	1200	-	-	8.3160	8.316	-
C	Production System and micro Enterprises						
1	Crop production, diversification of agriculture and introduction of agro forestry	1170	-	-	8.1081	8.1081	-
2	Demonstration of improved composting system	390	-	-	2.7027	2.7027	-
	Sub Total	1560	-	-	10.8108	10.8108	-
D	Consolidation Phase 5% Sub Total						
	Sub Total	600	-	-	4.158	4.158	-
Grand Total		12000	693	29.5513	53.6087	83.160	30328

संकल्प पत्र

ग्राम पंचायत – पहासू कोड सं० 2B3E3c3c विकास खण्ड –पहासू जिला – बुलन्दशहर

यह कि आई०डब्ल्यू०एम०पी० परियोजना में तैयार की गयी निर्माण की नयी सृजित परिसम्पत्तियों को ग्राम पंचायत पहासू एवं माइक्रो वाटरशेड के अन्तर्गत सम्मिलित ग्रामों में योजना क्रियान्वयन कराने एवं योजना उपरान्त चालू रखने तथा सृजित परिसम्पत्तियों के अनुरक्षण हेतु कृत संकल्प एवं इच्छुक है।

पहासू ग्राम पंचायत के सभी स्रोत स्थल जैसे तालाब, ग्रामसभा गोचर (चारागाह), जल संसाधन, जंगल आदि में भूमि विकास परियोजना के अन्तर्गत किये जायेंगे। उन कार्यों को समाज के कमजोर वर्ग जैसे अनुसूचित जाति/जनजाति, महिला वर्ग एवं अल्प भूमिहीन गरीबी रेखा के नीचे के लाभार्थियों को लाभ पहुँचाने हेतु इच्छुक होंगे।

हम योजना संचालन हेतु प्रस्तावित करते हैं एवं सहमति देते हैं कि भारत सरकार के समस्त मार्गदर्शी सिद्धान्तों के अनुपालन में कार्य सम्पन्न करायेगें यह भी घोषित करते हैं कि चयनित क्षेत्र जिसको मेरे द्वारा भलीभाँति देखा गया है, और प्रस्तावित योजना में प्रस्तावित समस्त कार्य 15 सालों से नहीं कराया गया है जिसकी मुझे पूर्ण रूप से जानकारी है और अनुमोदन करते हैं।



शिव लाल शर्मा
राजेश कुमार
मनोज कुमार शर्मा
विनोद कुमार
विष्णु कुमार
दुर्गा शर्मा
श्री लाल शर्मा

PROJECT AT A GLANCE

IWMP-II (Bulandshahar)

1	State	Uttar Pradesh
2	Distt.	Bulandshahar
3	Block	Pahasu
4	M.W.S. Code	2B3E3c3b
5	Name of M.W.S. Project	N. Lakshamanpur,
6	Involved Village	05
7	Geographical Area of M.W.S.	536
8	Rainfed Area	428.73
9	Treatable Area	482
10	Weightage	
11	Cost of Project	57.84
12	For the year	

Budget Components

S. No.	Components	Area (Ha.)	Cost (in Lacs)
1	2	3	4
1	Management Cost 12%	-	6.9408
2	Preparatory Phase 10%	-	5.784
3	Watershed Work Phase	-	-
	A- Watershed Development Works 50%	482	28.92
	B- Livelihood Programme (Community Base) 10%	-	5.784
	C- Production System & Micro Enterprises 13%	-	7.5192
4	Consolidation Phase 5%	-	2.892
	Total	482	57.84

Executive Summary of the Project

Identified selected micro watershed project Naglia Lakshamanpur is coded as **2B3E3c3b** has been proposed from cluster of I.W.M.P. Bulandshahar –II project in Pahasu Block district Bulandshahar four villages namely Naglia Lakshamanpur, Pahasu, Nagla khushal, Mahoakhera, Peetampur, is comprised in the micro watershed which is located in the east of district Bulandshahar on the east bank of River GANGA and border of district Badaun area is known as Khadar. It lies between 28° - $30'$ and 28° - $45'$ E Latitudes and 78° - $0'$ and 78° - $15'$ N Longitudes Covering area. Its altitudes ranges from 181 meter to 208 meter above the mean sea level. Dewai Railway Station 184.11 m, Bulandshahar Railway station is 201.18 m above mean sea level is displayed. Project area of I.W.M.P. BSR-II is lied in the Pahasu Block of Bulandshahar District which is come in the western plan zone under semi arid area. The annual average rainfall is near to 397 mm which an average of 35 rainy days. Out of which about 85% is received during the mansoon season from July to September and very less rainfall is received in the winter season.

Temperature ranges from as high as 42°C in the May-June to as 3° - 4°C during December – January. The Trend of rain fall is highly eratic and maximum water goes as runoff.

Main occupation of the dwellers is agriculture in the watershed. Some part of the lands are shown during the Kharif season. Cane sugar are preferred crops in the project area. The main Crops raised are Wheat, Pea & Mustered and maze.

The topmost portion of the watershed is sloppy flat land. Other than topmost portion of the watershed is under soil erotic portion and depreciative. The soil of the land are sandy loam Soil. The middle agricultural position of watershed relatively smooth sloppy flat land with sandy loam soil texture. These soil is yellow in colour and are inherently good in fertility status.

Natural vegetation of the watershed is very poor. Somewhere forest vegetation is seen which are predominant with Vilayati Babool (*Prosopis Juliflora*), followed by Babool (*Accasia nilotica*), somewhere Neem Plants (*Azadirachta Indica*), Shisham (*Dolbergia Sisson*) and Karanj (*Pongamia Glabra*) are seen in occasional occurrence. There is no grass land in the watershed. Somewhere grass patches are seen only on the bunds, road sides and other such places. Coverage of massive green belt is in poor percentage for environment which is envisaged. That watershed is very poor climate area.

There is normal condition of animal physics and for their fodder arrangement is the watershed and creative possibility would be expected by the implementations of the project.

Due to Aerial soil erosion poor harvesting managements, cropping pattern, non treated watershed etc. are very anti effective causes for the watershed. Problem of the watershed is to be tackled by harvesting structures which have lost most of their capacity new water bodies for the prevention of erosion and conservation of soil and moisture various type of earthen bunds in the watershed field, necessity has been observed. Wasteland will be treated with staggered Trenches, afforestation and bunding for the changing of characteristics.

The detail project report has been prepared by the applying of nine process steps for the micro watershed code no. **2B3E3c3b** brief is as follows.

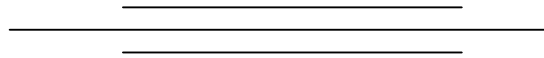
- STEP-1 Secondary data collection:-** During the five days visit programme in the micro watershed project with of all available documents of village label by approaching the Gram panchayat collected secondary data.
- STEP-2 Village meeting & conducting PRA exercise:-** Community meeting conducted on fix days for the consultation with villagers for the PRA Exercise. Participatory mode of the villages was positive indicated for the success of programme. With good in testing participation has been drawn social & resource map on ground & paper & discussed on various topics of problematic thoughts in the micro watershed.
- STEP-3 Socio economic survey:-** The resource organization of village label volunteers identified to conduct house hold socio economic survey/states.
- STEP-4 Problem typology analysis:-** Thoroughly analyzed the data & identified problem type as soil & moisture conservation, crop rotation, crop coverage, productivity, livelihoods, social issues & capacity building gaps etc. Problems discussed with the watershed committee & came up with alternative solution.
- STEP-5 Conduct of net participatory planning (NPP):-** The planning team visited together in the planning blocks on the scheduled date along with the beneficiaries of the villages & data gathered as for the participatory net planning.
- STEP-6 Productivity & livelihood planning exercise:-** For the product livelihood exercise, group discussion on various livelihood as Agriculture, Animal husbandry enterprise development held discussion with the villagers in the micro watershed.
- STEP-7 Institutional & capacity building :-** This plan is prepared based on the data available in the field and auscultations with the watershed committee.
- STEP-8 Data consolidation & documentation of DPR :-** After gathering all required information compiled collected data. Thoroughly discussed and finalized the expected outcomes and benefits specially in the respect of livelihood for different segments. These are the target and performers indicators for the micro watershed.

STEP-9 Conduct of Gram Sabha obtaining approvals submissions of DPR:-After preparation of the draft DPR convened to Gram sabha and activities proposed expected outcomes benefits of implementing the programm are explained in case of any changes are proposed in the Gram sabha approval obtained by the Gram sabha and already singed of Mau paper.

STEP-9A Attachment of detail estimate, cost and design:-Estimating, Costing and design prepared technically According to plan in the micro watershed project. And attached with the DPR.

STEP-9B Various type of mapping :- DPR prepared in the support of micro watershed project using various type of maps is as follows :

- | | |
|--------------------------------------|-----------------------------|
| 1.Index Map of Watershed | 2. Watershed Map |
| 3. Relief/ Drainage Map | 4. Slop Map |
| 5.Soil and Land Capability class map | 6. Land use/ Land Cover Map |
| 7. Cadastral map | 8. Proposed Action Plan map |
| 9. Social Map | |



Project Report

Table – 1 : Micro watershed project brief : -

1	State	U.P.
2	District	Bulandshahar
3	Block	Pahasu
4	Comprised Villages (Nos.)	05
5	Name of Watershed	N. Lakshamanpur
6	Name of MWS Project	N. Lakshamanpur
7	MWS Code No.	2B3E3c3b
8	Geographical Area of MWS	536
9	Treatable Area	482

1- Project Objectives :- The aim and objectives of the Project are :

- xx- Conservation, development and sustainable management of natural resources including their users.
- yy- Enhancement of agriculture production and productivity in a sustainable manner.
- zz- Restoration of ecological balance in the degraded and fragile rain fed ecosystem.
- aaa- Reduction in regional disparity between rains fed and irrigated area.
- bbb- Creation of sustainable employment opportunities for the rural community for livelihood security.
- ccc- Generation of massive employment.
- ddd- Reduce migration from rural employment.

2- Major Problem of Project Area :

- qq- Actual shortage of drinking water.
- rr- Near to nil activated water bodies and water harvesting structures.
- ss- Low depth of ground water table.
- tt- Undulated and generally sloppy rainfed area.
- uu- Large number of Small, Marginal and S.C. farmer land holding.
- vv- Lower wages of agriculture labour and also migration of labour due to shortage of employment in the watershed.

3- General Description :

(3.1) Location :-

Nagalia Laxmanpur Watershed has been taken with MWS Code No. **2B3E3c3b** in Pahasu Block of Distt. Bulandshahar is located on Bulandshahar via Diwai to Narau Via Pahasu road about 30 Km. between 28°15' and 28° 15' N Latitudes and 78°0' and 78° 10' w Longitudes. Location and delineation of watershed has been located on watershed map **Fig. 2** and on top sheet **Fig. 3**.

(3.2) Area and Elevation :

Elevation ranges from 181 to 208 mtr. above the mean sea level(MSL) altogether comprised villages and their's area is described as follows. (Comprises village map Fig. 3)

Table – 2 : Area and Elevation

Sl. No.	MWS Code	Block	Name of Village	Geographical Area	Treatable Area
1	2	3	4	5	6
1	2B3E3c3b	Pahasu	N. Lakshamanpur	330.08	296.82
			Pitampur	55.00	49.59
			Pahasu	52.54	47.25
			N. Khushahal	94.58	85.05
			Fazalpur	3.80	3.42
				536.00	482.00

(3.3) Shape of the Micro Watershed:

The shape of watershed is Elongated and as Rectangular. The maximum length and width of the watershed are 5000 Mtr. and 1814 Mtr. respectively with the Length: Width ratio of 2.76:1.

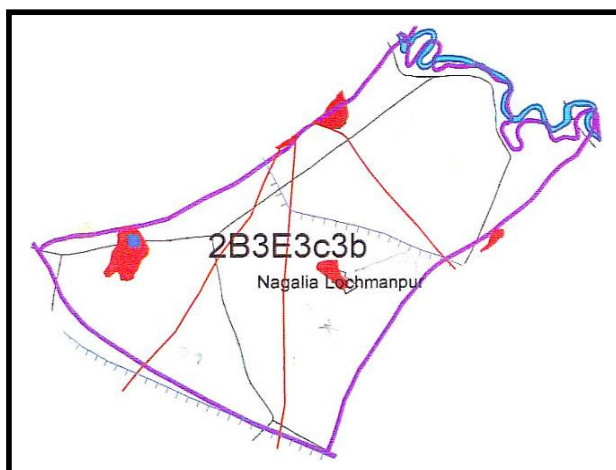


Fig. 1 (Shape of Micro Watershed)

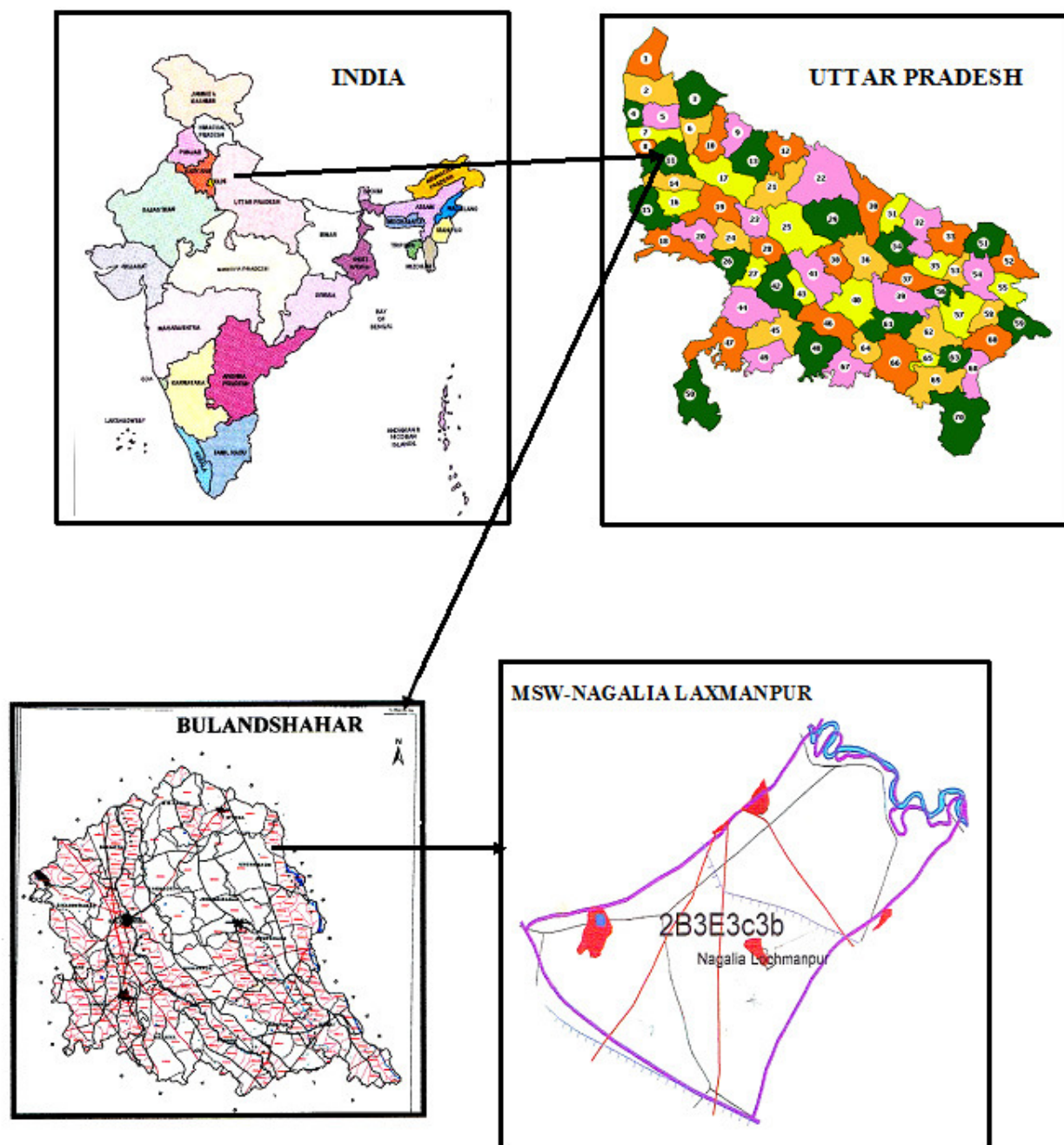


Fig.- 2 Location of the Micro Watershed

2B3E3c3b (MWS Project – Nagalia Laxmanpur)

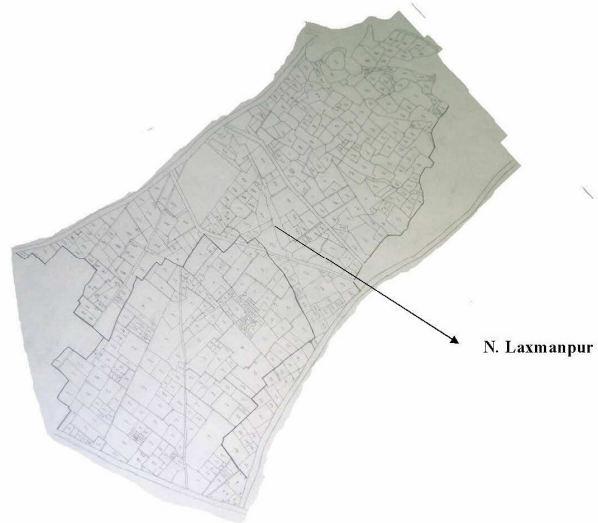


Fig No.-3 Cadastral Map (Located Comprised Villages)

Sl. No.	Name of Project	Name of Village	Geographical Area (in ha.)	Raifed Area (in ha.)	Treatable Area	Agri. Land
1	2	3	4	5	6	7
1	Nagaliya Lakshamanpur	N. Lakshamanpur	330.00	264.00	296.82	290.47
2		Pitampur	55.00	44.00	49.59	49.00
3		Pahsu	52.54	42.03	47.25	45.70
4		Nagala Khushal	94.58	75.66	85.05	83.23
		Fazalpur	3.80	3.04	3.42	3.42
Total			536.00	428.73	482.00	471.82

(3.4) Climate :

The Watershed falls under semi arid region of tropical climate inclined in Western Plan Zone. The average annual precipitation is about approx. is 397 mm. spreading over 35 rainy days. Most of the rain fall (about 85%) is received during July to September. The rain fall of moderate intensity. Nothing the area receives of scarcity rainfall in the winter season. The temperator variation ranges from as high as 43⁰c in the month of May-June to as low as 4⁰c in December-January.

(3.5) Geomorphology and Soils :

Geomorphology :

The entire watershed is topographically divided into major landforms. Accordingly the soils of watershed can be grouped into various categories such plane land, undulated land, sloppy land and erosic ravenous land.

Soil :**(a) Fine textured soil :**

The soil are the most extensive soil group found in the watershed. Some portion of the watershed is relatively sloppy flat land with fine soil texture as sandy sandy loam. The soils are in color and are inherently good high in fertility status. Soil texture is sandy lome loam particularly in depressions and loam in the elevated portion. The soil characteristic texture is dispersive and smooth. Therefore without impede the downward movement of water productive layer of soil are easily by high runoff.

a- Coarse Textured Soil :

These soil are lying mostly in downward portion, along with erosic gully and drainage line upto end of watershed outlet. These soils are coarser in texture and are relatively poor in fertility status. The soils are lomy sand in texture. Rill and gully formation in same parts particularly near the outlet of watershed can be seen.

(3.6) Drainage and Slope:

Due to prevalence of mild steep slope and presence of a number of drainage lines in the watershed the drainage system is adequate. The watershed from part of Ganga Basin and watershed. Under mild to steep topographical slope of MWS as divided as follow : (Drainage and slope map fig.-4)

Table - 4 : Drainage and Slope

S. No.	Grade	Slope Percent	Area in Ha.	Remark
1	A	0.5-1	144.60	-
2	B	1-2	120.50	-
3	C	2-3	96.40	-
4	D	3-4	72.30	-
5	E	4-5	33.74	-
6	F	5-6	14.46	-

(3.8) Human Population:

a- Human Population:

Total Population of involved villages in watershed is 8936 with average family size of six persons as detailed as follows

Table – 5 : Human Population

S. No.	Name of village	Nos. of families	Human Population			Total
			Male	Female	Children	
1	N. Lakshamanpur	142	332	298	462	1092
2	Pitampur	57	124	116	159	399
3	Pahasu	352	762	704	977	2443
4	N. Khushahal	138	311	283	414	1008
5	Fazal pur	125	295	264	403	962
	Total	814	1824	1665	2415	5904

i- Categorization of Human Population :

In the total population of watershed villages, categories are defined as below :

Table – 6 : Population Categories

S. No.	Particulars	Unit	Number of families in population in the villages		
			Population	Family	Remark
1	2	3	4	5	6
1	Agri Farmer	No.	1932	610	
2	Landless	No.	117	32	
3	Agri. Labour	No.	242	73	
4	Land less Labour	No.	71	19	
5	BPL Family	No.	89	26	
6	SC Family	No.	205	54	
7	ST Family	No.	-	-	
				814	

(3.9) Land Holding :

All the categories of farmers as small, marginal, medium and large are involved in land holding average of about 1-18 ha. Small land holding farmers are further scattered at different places which makes cultivation very difficult. Distribution of farm families according to the size of the land holdings are given as below :

Table – 7 : Distribution of farm families according to their size of land holdings

S. No.	Name of Village	Total Agri. Land in MWS	Land Holding Family (Nos.)					Percentage
			Marginal (< - 1Ha.)	Small (1-2 Ha.)	Medium (2-4 Ha.)	Large (4-7 Ha.)	Total	
1	N. Lakshamanpur	290.47	110	55	17	12	194	
2	Pitampur	49.00	38	11	5	-	54	
3	Pahasu	45.70	32	8	6	-	46	
4	N. Khushahal	83.23	44	15	4	2	65	
5	Fazalpur	3.42	5	-	-	-	5	
	Total	471.82	29	89	32	14	364	

(3.10) Live Stock Population :

Total live stock population of the watershed is 2911 Nos. Buffalos is preferred as much animal compared to Cow. But milk yield is poor. Goats are also kept for milk as well as for meat purpose. The breakup of livestock population is as follows :

Table – 8 : Live Stock Position

S. No.	Name of Village	Unit	Live Stock Position				Total
			Buffaloes	Cows	Bullocks	Goats	
1	N. Lakshamanpur		455	172	65	82	774
2	Pitampur		432	143	57	74	406
3	Pahasu		1103	282	115	205	1705
4	N. Khushahal		514	196	73	92	875
5	Fazalpur		629	207	90	98	1024
Total			3133	1000	400	551	5084

(3.11) Infrastructure Social Feature :

- a- Comprised villages in the micro watershed has moderate communication facilities. Watershed linked with metaled road and approachable through motarable road.
- w- All the villages are electrified and have T.V. and Telephone connection.
- x- Literacy rate in the watershed is very low all villages are having education upto Junior High School.
- y- Nearest small market is at Sayana 13 Km. Nearest big market Bulandshahar is about 55 Km. from watershed. Religious and ritual features are almost common as in other parts af U.P. small land holding with large family size and more than 25% of the labour force of the total population living below poverty line indicate poor socio economic status of the watershed community.

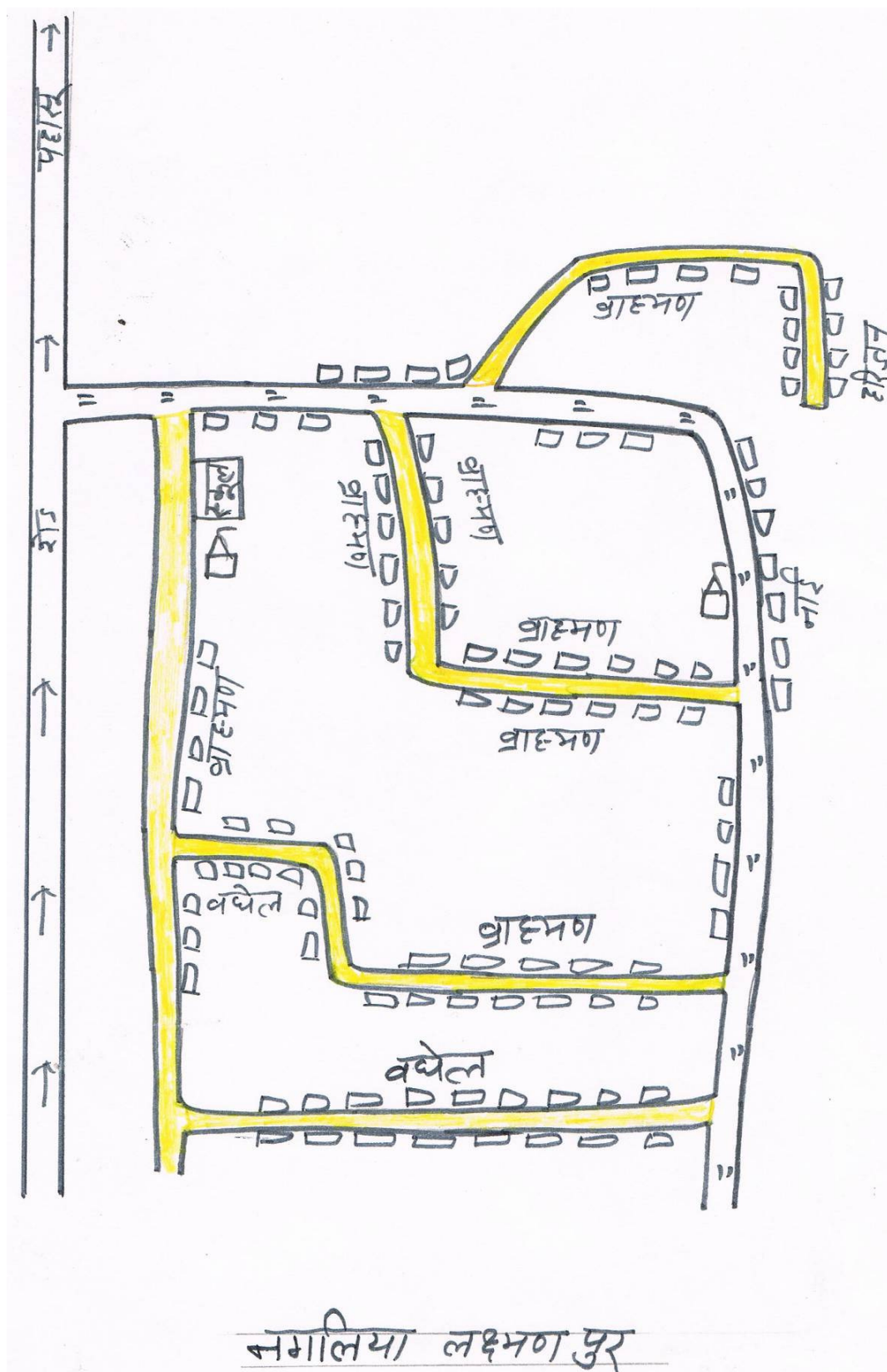
Participatory Rural Appraisal

Participatory mode of the villagers shows positive indication for the success of the programme. Traditionally the entire village community participate in the individual works. Social map of one of the watershed village drawn by villagers themselves, depicting various village figures is shown in sketched map in Fig.-4 & 5. Infrastructures position of the village recorded as follows :

Table – 9 : MW.S. Project – Nagaliya Lakshamanpur.

S. No.	Infrastructure	Unit	Qty.
1	2	3	4
1	Primary School	No.	3
2	Junior High School	No.	-
3	Kanya Pathshala	No.	-
4	Public Health Center	No.	-
5	Vet nary Hospital	No.	-
6	Panchayat Ghar	No.	1
7	Post Office	No.	-
8	Agan Bari Center	No.	-
9	Electricity	-	Yes
10	Road	-	Yes
11	Pond	No.	3
12	Hand Pump	No.	16
13	Irrigation Well	No.	-
14	Canal	No.	1
15	Temple	No.	5
16	Well (Drinking Water)	No.	-
17	Pumping Set	No.	48
18	Toilet	No.	22
19	Market	No.	-

SOCIAL MAP



Recorded importance of development institution

Farmers perception recorded for importance and role of different development institution in relation to infrastructure. Importance has been depicted with size of circle and role with distance from village circle. (Fig 8)

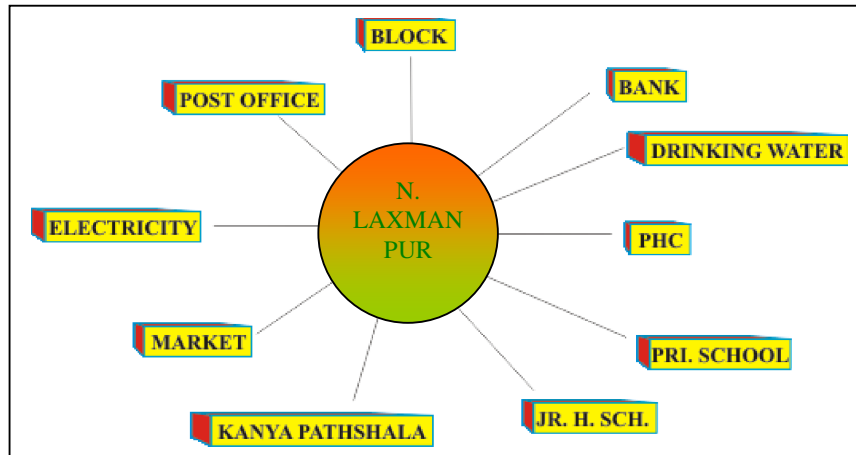


Fig. -8 (Venn diagram of Micro watershed)

(3.12) Communication :

Watershed can approached from Distt Headquarter Bulandshahar to Project area 35 km. by Road.

(3.13) Natural Resource Base :

Transact of watershed showed typical land use profile consisting of plain agriculture land, erodic area and medium ravenous ridge. Main source of the irrigation are the canal for pre showing irrigation only. The total geographical area of the watershed is 574.00 Ha. classification.

Approach roads for the micro watershed is shown for the communication is shown on topo sheet map Fig 9 as next page.

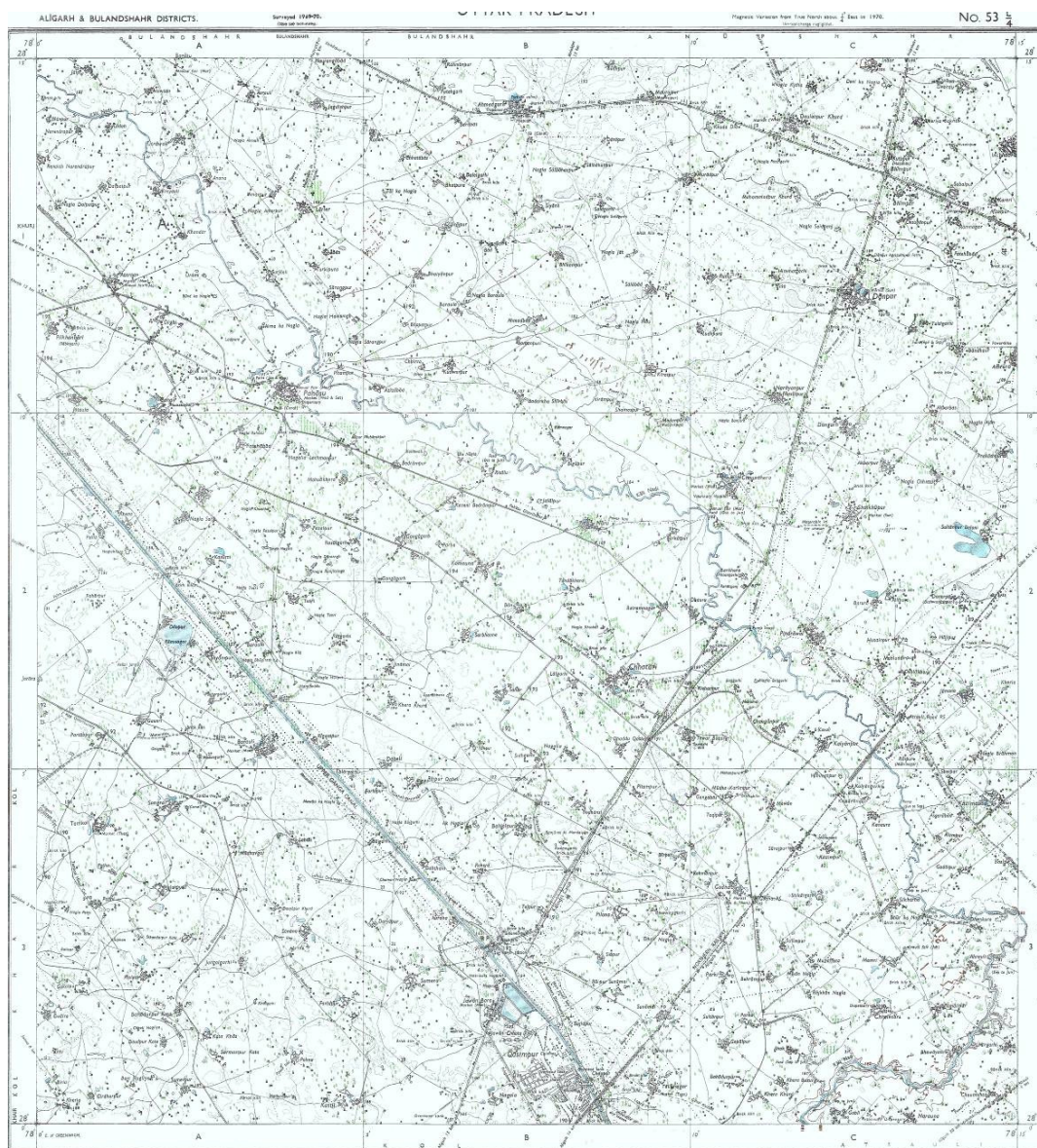


Fig.- 7 Communication Map on Toposheet

Table – 10 : Classification of area(Hect.)

S.N o.	Name of Village	Unit	Total Geographical Area	Rainfed Area	Wasteland	Village Land and Road	Irrigation Resource	
							Water Bodies	Borewell
1	2	3	4	5	6	7	8	9
1	N. Lakshmanpur	Ha.	330.08	180	19.80	19.81	-	42.90
2	Pitampur	Ha.	55.00	35	3.30	2.70	-	7.15
3	Pahasu	Ha.	52.54	30	3.15	3.69	-	6.83
4	N. Khushahal		94.58	62	5.67	5.68	-	12.29
5	Fazal pur		3.80	2	0.22	0.16		0.50
Total			536.00	309	32.14	32.04		69.67

(3.14) Livelihood :

Total Population of the watershed is 8936 and out of the total population a majority more than 80% has farming as their major source of livelihood followed by labours, serviceman and small business class. Classified livelihood given in form as follows :

Table – 11 : Livelihood Classification in population :

S. No.	Name of Village	Farmer	Labour	In Service	In Local small business	Others
1	2	3	4	5	6	7
1.	N. Lakshamanpur	117	22	16	27	7
2.	Pitampur	39	12	5	11	6
3.	Pahasu	214	38	57	90	9
4.	N. Khushahal	115	19	12	23	5
	Fazal Pur	94	18	8	19	8
	Total	579	109	98	170	35

(3.15) Dependency of forest fuel wood and fodder :

- a. **Fuel wood :-** The main source of fuel is from cow dung cake, woody stem of crops. About 70% of the climactic energy requirement is met from the agriculture by product and cow dung cake. Rest is met out from the forest outside the village and watershed boundary, most preferred fuel wood is Juliflora fuel wood Juliflora obtained from standing along and between watershed.
- i- **Fodder :-** Villages have not any sufficient signified dependency on forest based fodder as these resource are nothing availability in the forest.

(3.16) Labour requirement :

Labour requirements was found to be maximum at the time of October, November and December when the sowing of Rabi crops are done. The crucial periods are March and April coinciding harvesting and threshing of Rabi crops and July/August is sowing Kharif Crops take a little place. Other income generating enterprises having potential during the remaining.

(3.17) Crop Rotation :

Present Crop rotation in the watershed comprise of :

Kharif	-	Bajra	-	Rare
		Maize	-	Rare
		Jwar	-	Rare
Rabi	-	Fallow Wheat	-	Major
		Fallow Barly	-	Major
		Fallow Sugarcane	-	Major
		Fallow Mustard	-	Major
Zayad	-	Urad, Moong, Makka		

The above said Rabi Crops is the most prevailing crop rotation on the agriculture lands both in the rainfed and irrigated conditions.

Organized vegetable cultivation fruit plantation and traditional agro forestry systems are lacking as per requirement in the watershed the limited vegetable cultivation in the watershed is confined as kitchen gardens and field to the irrigated condition in a scattered manner. The cultivation of cash crops other than the sugarcane, wheat and mustard also in the watershed.

(3.18) Historical Events :

Chronological record of important events of the watershed village is prepared through participatory rural appraisal (PRA) which is very useful in understanding of its background and chronology is given as follows :

Table – 12 : Historical Events

S. No.	Events/Activities	Year	Rem.
1	2	3	4
1	Established	1750	
2	Opening of Primary School	1995	
3	Opening of Junior School	-	
4	Opening of Kanya Pathshala	-	
5	Opening of PHC	-	
6	Opening of Vet. Hospital	-	
7	Panchayat Ghar	2007	
8	Introduction of Tractor	1972	
9	Gobar Gas Plant	-	
10	Thresher	1982	
11	First Tube well/Pumpset	1970	
12	First Motorcycle	1980	
13	T.V. & D.V.D. Players	1985	
14	Electricity in Village	1988	
15	Bituminous Road	-	
16	First Hand Pump	1992	
17	Templo Renovation	-	
18	First Land Line Telephone	-	
19	Planning for Watershed Project	-	

(3.19) Present Land Use in the Watershed :-

The watershed has diversified land uses. The varied present land use under different use in the watershed. The mixed land use followed in the watershed is almost similar in other parts of U.P. During P.R.A. Exercise prepared land has been shown in Table No. 13, 14 & 15.

Table – 13 : (Ownership)

S. No.	Name of Village	Pvt. Agri. Land		Govt. Revenu Land	Forest Land	Other Land
		S.C./S.T.	Others			
1	2	3	4	5	6	7
1	N. Lakshamanpur	33.00	290.00	-	-	7.08
2	Pitampur	6.00	46.50	-	-	2.50
3	Pahasu	17.00	33.00	-	-	2.54
4	N. Khushahal	14.58	72.00	-	-	8.00
5	Fazal Pur	-	3.80	-	-	-

Table –14 : (Present Land under different categories)

S. No.	Name of Village	Land Use (Ha.)				
		Agricultural	Wasteland (All Types)	Seasonal waterbodies	Village/Road Etc.	Total
1	2	3	4	5	6	7
1	N. Lakshamanpur	290.47	19.80	-	19.81	330.08
2	Pitampur	49.00	3.30	-	2.70	55.00
3	Pahasu	45.70	3.15	-	3.69	52.54
4	N. Khushahal	83.23	5.67	-	5.68	94.58
5	Fazal Pur	3.42	0.22	-	0.16	3.80
Total		471.82	32.14	-	32.04	536.00

Table – 15 : (Present land use classified)

S. No.	Land Use Under	Unit (ha.)	Area (Ha.)	Percentage
1	2	3	4	5
1	Under Agriculture			
	A- Rainfed-			
	I- Crops		319.126	
	II- Agro forestry		8.092	
	B- Irrigated-			
	I- Assured		32.400	
	II- Portial		59.270	
2	Wasteland			
	A- Aforestation			
	B- Pasture			
	C- Untreatable			
	D- Treatable		58.134	

Proposed Post Land Use has been given on Page No. 32

4- Focus on Present Land Use :

(4.1) Agriculture :

The total area under agriculture in the watershed is about 487.89 ha. out of which 574.00 ha. is under rainfed agriculture. Agriculture land uses in the watershed extended to diversified land capabilities starting marginal to good class II land. The irrigated and drinking water is most scarce natural resource in the watershed. The operation of tube well 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 of the watershed area. The agricultural field bund are common in the watersheds however they frequently breach on heavy rains.

Various mixed texture of soils are located in patches through out the watershed. The heavy soils are almost kept fallow during rainy season. the agricultural soils also have some as share calcium pan at variable depths. The irrigation water is conveyed by the earthen channels. Surface irrigation methods following mainly border method of flood method by the formers in the watershed. These factors reduce the water use efficiency of limited and valuable irrigation water.

Drought hardy species like Juliflora suitable multi purpose trees is suitable for rehabilitation of the wasteland. Rehabilitation of waste lands promoting agro forestry with appropriate fruit and forest species suitable vegetative barriers on sloppy lands can be high future value and by these adoption would be meet out many demands of fire wood and fodder in the wasteland. Except above but also for soil and water conservation, rehabilitation of wasteland and sustainable income generation for socio-economic upliftment of farmers.

Crop Productivity :

The farmers also do not have suitable cropping system to deal aberrant weather. Weeds impose considerable constraint in productivity of both Karif and Rabi crops under irrigated as well as rainfed production system farmer undertake normally one manual weeding in mustard and other valuable crops however, practices is energy and time consuming. Use of we decide is rare in the watershed.

In the watershed area, limited cropping in the Kharif with mixed cropping practices is not only irrigational but also unscientific and best for low productivity. Subsequent Rabi crops in general. Sugarcane & Mustard crop in particular are raised on residual soil moisture under rainfed production system during post mansoon season.

(4.2) Indigenous Technological Knowledge (ITK) :

Under process of PRA tracked out rural applying technology in various field of local technology and some technology is very popular in village. In which the agriculture is an old traditional practices of farmers who have improved themselves with passage of the time according to their domestic needs and technological reforms in the nearby areas. The villages have their traditional village ponds, practice of field bunding which typically constitute agricultural related ITKs in the watershed. The Mustard & sugarcane being a cash and firewood crop of the watershed and also sugarcane crop is being. Cultivated in self designed manner by the farmers. Its carried out that the area is totally depend on rain

and under the rainfed area technology is applied by the farmers. However limited fertilizer application specifically the DAP came in the practices since about 15-20 years.

(4.3) Forest and Other Vegetation :

Forest :

The watershed have a tract of wasteland area which are under uncultivable position is liesed in the watershed. These wasteland have not any tree vegetation or very less than real requirement for the wasteland use.

Horticulture/Agro forestry :

Horticulture and agro forestry practices were observed in the watershed.

(4.4) Agro forestry :

Agro forestry practices are lacking in the watershed. Though it has good potential under existing disposition and may a role particularly with respect to minimization of cropping risk, built up soil fertility and productivity, protection of soil erosion, soil conservation partly meeting out the fire wood demand of rural community and more over optimizing the economical return from system as whole under typical semi arid climate in the watershed. Bund and boundary plantation also have good potential to care the fire wood and fodder demands of the rural community in the watershed. The existing area under agro forestry is almost negligible. Prosopis Jhliflora may be planted as block or sole plantation specifically on marginal and degraded land in the watershed.

The agro forestry interventions comprising of ber, bail, aonla, guava, papular etc. may be applied for benefit of the farmers under rainfed to irrigation production system on leveled to slopping and marginal agricultural using proper planting techniques and term it control measures.

The multipurpose trees may be also help in supplementing fire wood and fodder demands of the rural community in the watershed and my be planted as hedge rows on rainfed, marginal and degraded lands.

(4.5) Horticulture :

Fruits and vegetables practices are lacking in the watershed area. Its practices may be sustainable very good potential for the formers of watershed. There are a limited lack fruit trees in number like mango, guava, lime, ber, aonla and papaya fruit trees well as vegetables like radish, okra, tomato, cabbage, garlic, onion, chilly, bringer and cucurbits but they are found surviving well in the watershed villages. Organized orchards (vatika) commercial vegetable cultivation horti-agri and other systems of agro forestry etc. are lacking but have good agriculture.

5. Soil and land capability classification :

(5.1) Soil Morphology :

Watershed is located North East corner of Bulandshahr Distt. near about 55 Km. away. The entire terrain of watershed is topographically divided into various land forms. Accordingly the soils of watershed have been grouped major categories is given as follow :

Hill Terrain	Plane Land Sloppy	Undulated Land	Rill Erosic Land	Moderate ravenous
-	45%	28%	15%	12%

Given categories in the blocks is located the soil morphology in the watershed areas. Representation of soil characteristics by soil profile is represented as follows :

Soil Profile :

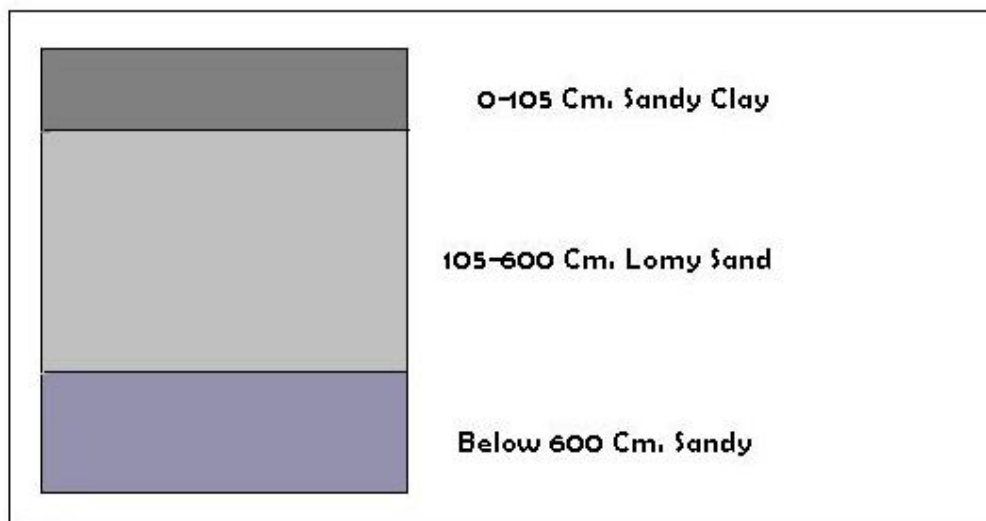


Fig. – 9 (Soil Profile)

Table – 16 : (Morphology of a Typical Soil Profile) :

Horizone	Depth in Cm.	Morphology
1	2	3
A V & H	0-150	Silky when moist, Hard when dry quick soluble, high elasticity, fissures, and cracks, occasional occurrence of free calcium carbonate granules black in colour, clay content 29%, PH- 8 to 8.7
B V & H	150-160	Whitish yellow in colour, very fine mixed with free cacaos and gravels, Hard when dry compact and indurate hard pan restricting development of root and down ward water transmission.
C V & H	7600	Red and white sand stone

(5.2) Soil and Characteristic and Fertility Status :

Soil characteristic pertaining to soil fertility of various classes accruing around villages in the watershed are given as follows :

Table – 17 : Soil Characteristic & Fertility Status :

Sl. No.	Soil Properties	LCC-II	LCC-III & IV
1	2	3	4
1	Sand %	43.00	71.03
2	Silt %	22.10	17.24
3	Clay %	31.07	11.70
4	Texture	Sandy Clay	Lomy Sand
5	PH (1:2)	7.70	7.95
6	Organic Carbon %	0.42	0.15
7	Available N Kg ha ⁻¹	322	177
8	Available P Kg ha ⁻¹	27	16
9	Available K Kg ha ⁻¹	184	323
10	EC (dS m ⁻¹)	0.47	0.11

(5.3) Land Capability Classification (LCC) :

Land capability classification (LCC) was done to classification the soils in different groups based upon the limitations and to emphasize the hazards prevailing in the 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. Classes of land capability namely II, III, IV and V are demarcated in the watershed. The areas under different classes are sown as follows :

Table – 18 : Land Capability Classification (LCC) :

S. No.	Land capability class	Area in Ha.	Colour
1	2	3	4
1	I Class		
2	II Class		
3	III Class		
4	IV Class		
5	V Class		
6	VI Class		
7	VII Class		
8	VIII Class		

Land capability classification of various agricultural practices under land use can be classified as groups, class, sub class and units. Utilization of various land class is given as follows :

Table – 19 : Utilization of various land uses

S. N.	LCC	Forestry	Ltd. Grazing	Light Grazing	Dense Grazing	Limited Agriculture	Light Agriculture	Dense Agriculture	More Dense Agriculture
1	I								
2	II								
3	III								
4	IV								
5	V								
6	VI								
7	VII								
8	VIII								

(5.4) Land Capability Class II & III :

This group is one of the most extensive LCC watershed. and also near to class III for the agricultural practices. The soils are sandy & sandy 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 & III. These lands potentially very productive but due to rainfed a single cropping pattern is in habitation.

(5.5) Land Capability Class IV :

This class is found in lower portion near the outlets of watershed. The soils are coarser in texture, deep, erosion hazard and undulating in topography. Rill and initiation of gully can be seen near the outlet of the watershed.

(5.6) Land Capability Class VII & VIII :

This class of land is not found in watershed. Somewhere lack of soil are found with admixture gravels fragments in these classes of lands.

(5.7) Conclusions :

The majority of land form is coming under class II, which give an insight of good agriculture production potential of the watershed.

The land capability classification provides reasonable good information with regard to capability of soil, that could be used for agriculture, agrihorticulture, silviculture and posture development.

The productivity of these lands could be further enhanced by adoption of simple soil & water conservation measures like bunding practices.

The reasonable area is under watershed of wasteland and other wasteland including grater potential of this watershed for forestry and pasture development. Rare places namely water body of low portion of land area under seasonally works as water harvesting structures and these harvested water is used or can use for some other beneficial activities during the crop season also.

6. Problems and needs of the watershed indentified during the PRA

(6.1) Problem Identification and prioritization :

- jj- The are has undulating topography, steep unstable slopes, gradient of excessive branches of rills and hence highly prone to soil erosion.
- kk- Major issues addressed to food sufficiency economic growth and environmental security in the watershed area.
- ll- Effective soil depth is limited and highly variable hampering good crop growth.

- mm- The watershed have low productive cropping due to tradition single cropping pattern and over all average crop production percentage not sufficient against requirement.
- nn- Identified that there is no assured irrigation system has been development capacity of water bodies are reduced due to silt ration which are utilized to store of rainy water and they are renovatable.

(6.9) Transact walk during the PRA :

Problems identified and prioritized during the transact walk and PRA exercises in all comprised villages of watershed. There were pooled and a list of problems representing the whole watershed was prepared. Problems were ranked as per their total weight age in the watershed village.

Table – 20 : Ranking of Problem identification and prioritization of watershed

S.No.	Problem	Rank
1	2	3
1	Lack of irrigation	6
2	Lack of drinking water	8
3	Low production of field crops	7
4	Lack of fodder availability and low productivity	5
5	Lack of availability of fuel wood	3
6	Lack of market facility	5
7	Lack of quality seeds, fertilizer, pesticides etc.	5
8.	Medical and Health care facilities for milching animals and low productivity.	7
9	Lack of medical, educational and transportation facilities	6
10	Lack of water bodies renovation	7
11	Lack of run of earthen check bunds	1
12	Lack of water harvesting structures	1
13	Lack of livelihoods opportunity	1

Prioritized ranking (Upto four Numbers) :-

- 22- Lack of earthen check bunds.
- 23- Lack of livelihood opportunities.
- 24- Lack of irrigation water was the greatest problem. Lack of irrigation water problem experienced by the people followed by low crop production.

(6.3) Analysis of SWOT of the watershed :

Strength (S), Weakness (W), Opportunity (O) and Threat (T) analysis is a useful decision support tool. A SWOT analysis of watershed is presented as follows :

SWOT analysis of the watershed

Strengths (S)	Weakness (W)
lxxi. Cooperative work culture in traditional activities lxxii. Close ethnic ties lxxiii. Road at the top as well as outlet of the watershed lxxiv. Hard working lxxv. Resource pool of crop genetics diversity lxxvi. Awareness of farmers about watershed management programme lxxvii. Well established CPR maintaining and sharing system lxxviii. Stall feeding of animals lxxix. Well maintained seasonal water bodies lxxx. Social outlook of the community towards land less	lxiv. Poor water management lxv. Resource poor farmers lxvi. Out migration of youth lxvii. Low and erratic rainfall lxviii. Fragile geology lxix. Fragmented land holding lxx. Heavy infestation of wild animals lxxi. Problem of fuel and fodder lxxii. Shallow soil depth and with high percentage of gravel
Opportunities (O)	Threats (T)
xl.iii. Wide range of annual and perennial crops xl.iv. Scope of regular employment opportunities to check out migration xl.v. Strengthening of existing irrigation system xl.vi. Conducive climate for rainfed crop diversification xl.vii. Good scope for Agro forestry and dry land horticulture xl.viii. Potential for collective action and management of CPR	xxxvi. Prone to adverse climate like drought xxxvii. High market risk xxxviii. Social conflicts owing to PRI and WSM policies and local politics xxxix. Weak coordination among line departments xl. Lack of expertise of implementing agency in different aspects of WSM

7. Proposed land use for the watershed :

Watershed management plan preparation due importance is given to topographic, land suitability, irrigation potentially, prevailing farming systems, micro farming situation, farming, farmers preferences and priorities along with economic and environment securities.

Crop and tree selection and area distribution was done as per farmers priorities revealed through PRA exercise.

The watershed management plan for watershed is prepared with specific objectives of food sufficiency, income and employment generation with environment security.

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

Table – 21 : Present and proposed land use plan of the watershed

S.No.	Land use	Present (ha)	Proposed area (ha)
1	2	3	4
1	Agriculture		
a	Rainfed		
	I Crops		
	II Agro-forestry		
b	Irrigated		
	I Assured		
	II Partial		
2	Waste land		
a	Aforestation		
b	Pasture		
c	Untreatable		
d	Treatable		
3	Village land		

(7.1) Status of Present Water Resources Utilization :

Watershed is having some canal system. Management and maintenance of these canal are required. Before sowing of Rabi crops, water from these canal is issued as supplementary irrigation for Rabi sowing ar allowed to go as waste. After releasing water from canal, submergence area also put under cultivation.

Some where bore well irrigation applied by the farmers in the watershed.

(7.2) Proposed Plan for Irrigation Development :

- a- Present system of irrigation and wastage of water during October–November need to be made more efficient from water management point of view by minimizing conveyance losses in the existing water courses.
- b- Present irrigation canal capacity have to build up by the reform. Which are lack capacity of water.
- c- Construction of new water harvesting earthen structures, Pucca Check Dem, Series Gully Plugging, etc. has been sloppy portion to increase irrigation potential and for recharging of ground water, soil and moisture conservation maximum field irrigation, best production and expected change of crop rotation.
- d- The up gradation of the exciting system of irrigation will result in :
 - i- Minimization of conveyance losses.
 - ii- Increase in frequency of irrigation.
 - iii- Adoption of high yielding varieties of crops.
 - iv- Assured cultivation of cash crops.
 - v- Capacity buildup by the planning of new water harvesting structures.

(7.3) Ground Water Recharge :

For the purpose of ground water recharge, the area of the upper side of watershed is recommended for Field Bunds, Contour Bunds, Peripheral Bunds and Submergence Bunds and in the lower portion Contour Staggered Trenches, Gully Plugs, Earthen Check Dem and Pacca Outlets. In the undulated sloppy portion of the watershed recommended water harvesting structure for dual purpose as ground water storage and under ground water recharge.

(7.4) Crop Production :

Practices proposed in the watershed is given as follows :-

- a- Mulching and crop residue management.
- b- Application of green manuring.
- c- Vermi Composting.
- d- Crop rotation and inter cropping.
- e- Biofertilizers.

(7.5) Tillage Operation :

Deep tillage technology is proposed to apply to be demonstrated for benefit of farmers in the watershed.

(7.6) Improved Seeds of High Yielding Verities (H.Y.V.) :

Recommendation of improved varieties is necessary for improving the productivity and farm income. Through replacement of low yielding traditional varieties of seeds in villages of watershed.

(7.7) Balanced Fertilizer Use :-

Demonstration of use of fertilizer in various crops of watershed recommended balance fertilizer use in different crops will be benefited of forming community.

(7.8) Control of insects and diseases :

Aphid in the mustard are the major insects in the watershed areas leading to loss in crop productivity. Similarly white blister is also a common disease in the mustard crop.

The management strategies of these insect pest and diseased will also be demonstrated in the watershed for benefit of the growers.

(7.9) Dry Land Horticulture :

Such portion of dry land in which proposed horticulture development planning recommended species like Ber, Bel and Aonla will be planted at suitable spacing in the watershed.

(7.10) Agri Horticulture :

Aonla and Sahjan would be suitable horticultural crops to the locality. Therefore, a part of land in the farmer field shall be selected and brought under Agri-horticulture system. The cropping system followed will be Jwar and Wheat.

(7.11) Plantation (Fuel wood) :

Such a portion which are under wasteland will be taken falling in the class-IV category in the watershed. These lands will be planted with species like Vilayati Babool (Prosopis Juliflora), Babool (Acacia Nilotica), Karanj (Pangamia Glabra).

9. Socio Economic Analysis of the of the Project :

(9.1) Sustainability and environment security :

The proposed land use plan will improve the land utilization index and crop diversification index significantly as compared to the existing one. in the proposed watershed management plan proper blending of the bio engineering measures will be applied on above 80% of the total area of watershed. It is estimated that more than above 70% of the watershed area will be treated and consequently the soil loss and runoff from the area is excepted to be reduced by 70% respectively.

It will help in maintaining ecosystem integrity on sustained basis along with improving the livelihood security of the farming community.

(9.2) Economic Analysis :

Economic analysis of the project was carried by taking direct benefits and costs considering 10 years for project life at 10% discount rate. Whole watershed development plan was divided into three sector as agriculture, horticulture and forest/Fuel wood plantation. Net Present Value (NPV) and Benefit Cost ratio criteria were applied judge the economic efficiency of each enterprises and sector. Net present value (NPV) of the project life is considered to be 10 years and discount rate for NPV estimation is 10% is given NPV and benefits as follows :-

Table – 22 : Present productivity income analysis :

S. No.	Name of Sector	Name of Crops	Produ- ction/ha.	Rate/ Qtl.	Cost of Production	Expend. of cultivation	Net income	B.C. Ratio between Col. 8 & 7
1	2	3	4	5	6	7	8	9
A	Agriculture	Urad	2.50	4500.00	11250.00	5000.00	6250.00	1.25:1
		Moong	3.00	5000.00	15000.00	6200.00	8800.00	1.41:1
		Jwar	5.00	700.00	3500.00	1650.00	1850.00	1.12:1
		Wheat	20.00	1000.00	20000.00	9500.00	10500.00	1.10:1
		Pea	8.00	2500.00	20000.00	9250.00	10750.00	1.16:1
		Mustard	4.00	2000.00	8000.00	3675.00	4325.00	1.17:1
Total		-			77750.00	35275.00	42475.00	1.20:1
Average		-			9718.00	4409.00	5309.00	1.20:1
B	Forestry	Vilayati Babool				-	-	-
C	Horticulture	Ber				22000.00	-	Nil
		Aonla				22000.00	-	Nil
		Bel				22000.00	-	Nil
Total		-				66000.00	-	Nil
Average		-				22000.00	-	Nil
Grand Total								

Table –23 : Post productivity and income analysis for Post Productivity**Value and B.C.:**

S. No.	Name of Sector	Name of Crops	Produ- cti- on/ha.	Rate/ Qtl.	Cost of Production	Expend. of cultivation	Net income	B.C. Ratio between Col. 8 & 7
1	2	3	4	5	6	7	8	9
A	Agriculture	Urad	4.00	5000.00	20000.00	8325.00	11615.00	1.39:1
		Moong	4.00	5000.00	20000.00	8200.00	11800.00	1.44:1
		Jwar	5.50	800.00	4400.00	1900.00	2500.00	1.32:1
		Wheat	25.00	1000.00	25000.00	11680.00	13320.00	1.14:1
		Pea	9.50	3500.00	33250.00	14810.00	18540.00	1.12:1
		Mustard	5.00	3000.00	15000.00	4370.00	8130.00	1.86:1
Total		-	-	-	172250.00	72845.00	99765.00	1.38:1
Average		-	-	-	21531.00	9061.00	12471.00	1.38:1
B	Forestry	Vilayati Babool	80.00	500.00	40000.00	15000.00	25000.00	1.67:1
C	Horticulture	Ber	35.00	1500.00	70000.00	20000.00	32500.00	1.63:1
		Aonla	35.00	2000.00	70000.00	20000.00	50000.00	2.50:1
		Bel	40.00	1500.00	80000.00	20000.00	40000.00	2:1
Total		-			182500.00	7000.00	122500.00	2.04:1
Average		-			60833.00	20000.00	40833.00	2.04:1
Grand Total		-			1394750.00	147485.00	247265.00	1.68:1

Table –24 : Summary of NPV, PPV and B.C. Ratio (Sector wise) :

S. No.	Name of Sector	NPV		PPV		B.C. Ratio
		Expend.	Net Income	Expend.	Net Income	
1	2	3	4	5	6	7
1	Rain fed Agriculture	54105	51000	72485.00	99765.00	1.38:1
2	Forest/Fuel wood Plantation	15000	-	15000	25000	1.67:1
3	Horticulture	60000	-	60000	122500	2.04:1
Total		129105	51000	147485.00	247265	1.68:1

(9.3) Economics of Agriculture Sector :

The development cost can be recovered by the adoption of plan in present rain fed agriculture is being done on well maintained field, therefore does not require much investment. In rain fed agriculture, investment of Rs. 44.50 lacs is proposed to made is given as fallows :

Table – 25 : Economics of Agriculture Sector :

S. No.	Name of sector	Name of Activities / Plan	Treatble Area (Ha.)	NPV (Lacs)	Post Productivity Value (Lacs)	Benifit / Income	B.C. Ratio
1	2	3	4	5	6	7	8
1.	Rainfed	Soil, moisture and water cons works	560	29591	921.01	413.08	1:38:1

(9.4) Economics of forest fuel wood plantation :

Economic analysis of fuel wood plantation in the watershed. Project life is considered to be 20 years and discount rate for NPV estimation is 10 % is followed and as is given follows :

Table –26 : Economics of forest fuel wood Plantation :

S. No.	Name of sector	Comman Name of Plant	Area (Ha.)	NPV (Lacs)	Post Productivity Value (Lacs)	Benifit / Income	B.C. Ratio
1	2	3	4	5	6	7	8
1.	Forest Fuel wood sector	Vilayati Babool (Prasopis Juliflora)	25	2.5	6.675	4.675	1.67:1

(9.5) Economics of Horticulture Sector :

Economic analysis of Horticulture Plantation in agri-horti system and on wasteland patches of watershed project, life is considered about 15-20 years and discount factor rate for NPV estimation is 10% is follows :

Table – 27 : Economics of Horticulture system :

S. No.	Name of Sector	Common name of Plants	Area (Ha.)	NPV (Lacs)	Post Productive Value (Lacs)	Benefit Lacs	B.C. Ratio
1	2	3	4	5	6	7	8
1	Horticulture	Ber (zyziphus mouritana)	4.00	0.80	2.104	1.304	1.63:1
		Aonla (Embelica officianalis)	3.80	0.76	2.660	1.90	2.5:1
		Bel (Aegle marmelos)	2.20	0.44	1.320	0.88	2:1
Total			10.00	2.00	6.084	4.084	2.04:1

(9.6) Food requirement and sufficiency :

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

Table – 28 : Status of food requirement and availability of per annual :

S. No.	Name of Foods	Requirement Q./Yr.	Present Status		Expected Post Status	
			Availability Q./Yr.	Deficit or surplus Q./Yr.	Availability Q./Yr.	Deficit or surplus Q./Yr.
1	2	3	4	5	6	7
1	Cereals 110 Kg.	6494	5520	-974	11040	4546
2	Pulses 36.50	2155	1185	-970	3879	1724
3	Oil Seeds 29.20	1724	690	-1034	2758	1034
4	Vegetable 71 kg	5373	1075	-4298	4298	1075

(9.7) Employment generation :

One of the major problem of the labour migration in watershed project. By the implementation of the project activities employment opportunities will be generated. However the changes in land use pattern and adoption of other subsidiary enterprise will generate employment opportunities in the watershed as given in table follows :

Table – 29 : Employment generation under proposed works :

S. No.	Employment activities/works	Area under work	Cost	Mandays generation (Nos.)			
				Unskilled	Skill	Total	Person
1	2	3	4	5	6	7	8
2	Graded Contour Bund	54	1.62	1620	-	1620	54
3	Gully Plug, C.D.	89	6.675	4672	156	4828	161
4	Submergence Bund	76	3.040	3040	-	3040	101
1	Peripheral Bund	76	2.660	2660	-	2660	89
5	W.H.B.	94	8.460	5076	287	5363	179
6	Renovation of Bund	58	1.74	1740	-	1740	58
7	Reno. of W.H.B.	-	-	-	-	-	-
8	Community Pond	-	-	-	-	-	-
9	Afforestation	25	2.725	545	-	545	18
10	Horticulture	10	2.00	480	-	400	13
Total		482	28.92	19753	443	20196	673

10. Formation of watershed committee :

Under compliance of common guideline Para (6.3) is followed and by the help of watershed development team, watershed committee is organized in the micro watershed village Ranayach Narendrapur with 10 members as prescribed in common guide line. List for organization of W.C. village details given as follows :

Table – 30 : Details of comprised village W.C. organization in M.W.S. :

S. No.	Particulars	Details	Block	Geographical Area
1	2	3	4	5
1	Micro watershed code	3B3E3c3b	Pahasu	536
2	Name of Gram Panchayat in M.W.S.	N. Lakshamanpur		

Table – 31 : List of organized W.C. for the Gram Panchyat Nagaliya Lakshamanpur in watershed.

S. No.	Name of selected members	Age	Representation Members from	Post	Qualification	Village
1	2	3	4	5	6	7
1	Smt. Shanti Devi	70	Secretary	Pradhan	High School	N. Lakshanpur
2	Shri Uma shankar Sharma	55	Sachiv		High School	N. Lakshanpur
3	Shri Nepal Singh	32	From – S.H.G.		M.A.	N. Lakshanpur
4	Shri Rajvir	35	From – S.H.G.		Inter	N. Lakshanpur
5	Smt. Hemlata	32	Lady		High school	N. Lakshanpur
6	Shri Ashok Kumar	40	Bhumihin		8	N. Lakshanpur
7	Shri Gabber Singh	25	S.C.		High School	N. Lakshanpur
8	Shri Omprakash	40	From U.G.		8	N. Lakshanpur
9	Shri Mahipal	32	From U.G.		5	N. Lakshanpur
10	Shri Narendra Kumar	40	From U.G.		8	N. Lakshanpur
11	Shri V.P. Singh	52	From – W.D.T.		Agri Engineer	N. Lakshanpur

(10.1) Formation of Self Help Groups in M.W.S.

By the help of watershed committee and watershed development team self help group are formatted / organized. Families and persons are selected from poor, small and marginal farmers families, landless poor families, agriculture labour families, women, herdsman and shepherd and S.C. families in the formatted self help groups are given as follow :

Table – 32 : Jay Shri Ram Self help group – Nagaliya Lakshamanpur .

S. No.	Name of member in formatted SHG's	Age	From represented family	Name of proposed activities	Activation Position
1	2	3	4	5	6
1	Shri Nepal Singh	32	Secretary	Buffalo Palan	
2	Shri Ashok Kumar	40	Sachiv		
3	Lokesh Kumar	26	Member		
4	Hariom	34	Member		
5	Prem shankar	35	Member		
6	Alok	28	Member		
7	Bhurelal	45	Member		
8	Ratan Singh	26	Member		
9	Himanshu	18	Member		
10	Prem shankar	36	Member		

Table – 33 : Gopal Ji self help group Nagaliya Lakshamanpur (Goat)

S. No.	Name of member in formed SHG's	Age	From represented family	Name of proposed activities	Activation Position
1	2	3	4	5	6
1	Shri Kishan pal	24	Pal	Buffalo Palan	New
2	Shri Suresh chand	35	Pal		New
3	Shri Munna Lal	40	Lodhi		New
4	Shri Sanjeev Kumar	25	Lodhi		New
5	Shri Ram Prakash	28	Lodhi		New
6	Shri Bhisham pal	40	Pal		New
7	Shri Resham pal	35	Pal		New
8	Shri Om prakash	25	Pal		New
9	Shri Pramod kumar	24	Pal		New
10	Shri Rajvir	35	Pal		New

Table – 34 : Self help group in Nizampur village of watershed.

S. No.	Name of member in farmated SHG's	Age	From represented family	Name of proposed activities	Activation Position
1	2	3	4	5	6
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					

Formation of User's Groups :

User's groups are farmated by the help of watershed committee and watershed development team in the micro watershed comprised villages. Formers which have land village are involved in the User's groups and they will be direct benefited as expected by the implementation of watershed project easy and convenienced condition are made to resource use between user's groups and they will be responsible to operate and maintenance for the created assets in the watershed. Nos. of farmated user's groups details are given as follows :

Table – 35 : Village wise user's groups

S. No.	Name of village	No. of groups	No. of farmers	Total Agri. Land	Area under treat-ment	Cost of essets
1	2	3	4	5	6	7
1	N. Lakshamanpur	22	330	290.47	296.82	
2	Pitampur	3	55	49.00	49.59	
3	Pahasu	3	52	45.70	47.25	
4	N. Khushahal	6	94	83.23	85.05	
5	Fazal Pur	-	-	3.42	3.42	

10. Estimation and Costing of Proposed activities of the watershed Project Year 2009-10.

Proposed works / activities for the Project Period (Year 2009-10) under proposed treatable area 635.00 Ha. Out of total Geographical area 906.61 Ha.

(10.1) Financial and Physical Outlets :**Table – 36 : Financial and Physical Outlets for the Year 2009-10 :**

Sl. No.	Components	Unit cost per ha.	Physical ha.	Financial (Lacs)			Man-days Generation
				Labour Component	Material Component	Total	
1	2	3	4	5	6	7	8
A	Management Cost 10%						
1	Administrative Cost – TA & DA Hiring of Vehicles, Official Expenditure Electricity & Phone bill Computer, Stationery and office consumable materials & contingency	1200	-	-	5.7840	5.784	-
2	Monitoring	120	-	-	0.5784	0.5784	
3	Evaluation	120	-	-	0.5784	0.5784	
	Sub Total	1440		-	6.9408	6.9408	
B	Preparatory Phase 10%						
1	Entry Point Activities 4%	480	-	0.4627	1.8509	2.3136	463
2	Institutional & Capacity Building 5%	600	-	-	2.8920	2.892	
3	Detailed Project Report 1%	120	-	-	0.5784	0.5784	
	Sub Total	1200	-	0.4627	5.3213	5.784	463
C	Watershed Work Phase						
a	Watershed Development Works						
1	Graded, Contour & Field Bunds	3000	54	1.62	-	1.62	1620
2	Gully Plug, Earthen Checkdam /WHS	7500	89	4.6725	2.0025	6.675	4828
3	Submergence bunds	4000	76	3.0400	-	3.04	3040
4	Peripheral Bund	3500	76	2.6600	-	2.66	2660
5	Earthen Water Harvesting Bund	9000	94	5.0760	3.384	8.46	5363
6	Renovation of existing Bunds	3000	58	1.740	-	1.74	1740
7	Renovation of existing W.H.B	-	-	-	-	-	-
8	Aforestation and Development of silvi postural system	10900	25	0.545	2.180	2.725	545
9	Dry Land Horticulture	20000	10	0.400	1.600	2.00	400
10	Community Pound (Renovation)	-			-	-	-
	Sub Total		482	19.7535	9.1665	28.92	20196
B	Livelihood Programme (Community Based) 7.620						
	Income generating activities through SHG's for landless and marginal farmers 10%						
1	Live stock development activities	200	-	-	0.9642	0.9642	-
2	Bee Keeping	100	-	-	0.4818	0.4818	-
3	Poultry Farming	200	-	-	0.9642	0.9642	-
4	Nursery Development	300	-	-	1.446	1.446	-
5	Vegetable Production	100	-	-	0.4818	0.4818	-
6	Milk Dairy Promotion Unit	200	-	-	0.9642	0.9642	-
7	Establishment of Vermi compost Unit	100	-	-	0.4818	0.4818	-
8	Sub Total	1200	-	-	5.784	5.784	-
C	Production System and micro Enterprises						
1	Crop production, diversification of agriculture and introduction of agro forestry	1170	-	-	5.6394	5.6394	-
2	Demonstration of improved composting system	390	-	-	1.8798	1.8798	-
	Sub Total	1560	-	-	7.5192	7.5192	-
D	Consolidation Phase 5% Sub Total						
	Grand Total	12000	482	20.2162	37.6238	57.840	

संकल्प पत्र

ग्राम पंचायत – नगलिया लक्ष्मनपुर कोड सं० 2B3E3c3b विकास खण्ड –पहासू जिला – बुलन्दशहर

यह कि आई०डब्लू०एम०पी० परियोजना में तैयार की गयी निर्माण की नयी सृजित परिसम्पत्तियों को ग्राम पंचायत **नगलिया लक्ष्मनपुर** एवं माइक्रो वाटरशेड के अन्तर्गत सम्मिलित ग्रामों में योजना क्रियान्वयन कराने एवं योजना उपरान्त चालू रखने तथा सृजित परिसम्पत्तियों के अनुरक्षण हेतु कृत संकल्प एवं इच्छुक है।

नगलिया लक्ष्मनपुर ग्राम पंचायत के सभी स्रोत स्थल जैसे तालाब, ग्रामसभा गोचर (चारागाह), जल संसाधन, जंगल आदि में भूमि विकास परियोजना के अन्तर्गत किये जायेंगे। उन कार्यों को समाज के कमजोर वर्ग जैसे अनुसूचित जाति/जनजाति, महिला वर्ग एवं अल्प भूमिहीन गरीबी रेखा के नीचे के लाभार्थियों को लाभ पहुँचाने हेतु इच्छुक होंगे।

हम योजना संचालन हेतु प्रस्तावित करते हैं एवं सहमति देते हैं कि भारत सरकार के समस्त मार्गदर्शी सिद्धान्तों के अनुपालन में कार्य सम्पन्न करायेगें यह भी घोषित करते हैं कि चयनित क्षेत्र जिसको मेरे द्वारा भलीभाँति देखा गया है, और प्रस्तावित योजना में प्रस्तावित समस्त कार्य 15 सालों से नहीं कराया गया है जिसकी मुझे पूर्ण रूप से जानकारी है और अनुमोदन करते हैं।



उपराज्य
राजगीर
२२ मपाल
नेपाली
Bhumba
मनाडा कमाउ रामी
मनवीर
विजिन्द्र
वीपक रामी

PROJECT AT A GLANCE

IWMP-II (Bulandshahar)

1	State	Uttar Pradesh
2	Distt.	Bulandshahar
3	Block	Pahasu
4	M.W.S. Code	2B3E3c2e
5	Name of M.W.S. Project	Bedrampur
6	Involved Village	05
7	Geographical Area of M.W.S.	762.00 Ha
8	Rainfed Area	
9	Treatable Area	686.00
10	Weightage	
11	Cost of Project	686.00
12	For the year	2011-12

Budget Components

S. No.	Components	Area (Ha.)	Cost (in Lacs)
1	2	3	4
1	Management Cost 12%	-	9.8784
2	Preparatory Phase 10%	-	8.2320
3	Watershed Work Phase	-	
	A- Watershed Development Works 50%		41.1600
	B- Livelihood Programme (Community Base) 10%	-	8.2320
	C- Production System & Micro Enterprises 13%	-	10.7016
4	Consolidation Phase 5%	-	4.116
	Total		82.320

Executive Summary of the Project

Identified selected micro watershed project Vedrampur is coded as **2B3E3c2e** has been proposed from cluster of I.W.M.P. Bulandshahar – I project in Pahasu Block district Bulandshahar four villages namely Gangagarh, Kamauna, Rasalgarh, Rishalu, and Bedrampur is comprised in the micro watershed which is located in the east of district Bulandshahar on the east bank of River GANGA and border of district Badaun area is known as Khadar. It lies between $28^{\circ} -15'$ S and $28^{\circ} -10'$ N Latitudes and $78^{\circ} -0'$ E and $78^{\circ} -10'$ W Longitudes Covering area. Its altitudes ranges from 187 meter to 190 meter above the mean sea level. Khurja Railway Station 201.18 m, Khurja Jh. Railway station is 201.46 m above mean sea level is displayed. Project area of I.W.M.P. BSR-III is lied in the Pahasu Block of Bulandshahar District which is come in the western plan zone under semi arid area. The annual average rainfall is near to 397 mm which an average of 35 rainy days. Out of which about 85% is received during the mansoon season from July to September and very less rainfall is received in the winter season.

Temperature ranges from as high as 43°C in the May-June to as $3^{\circ} -4^{\circ}\text{C}$ during December – January. The Trend of rain fall is highly eratic and maximum water goes as runoff.

Main occupation of the dwellers is agriculture in the watershed. Some part of the lands are shown during the Kharif season. Cane sugar are preferred crops in the project area. The main Crops raised are Wheat, Pea & Mustered and maze.

The topmost portion of the watershed is sloppy flat land. Other than topmost portion of the watershed is under soil erotic portion and depreciative. The soil of the land are sandy loam Soil. The middle agricultural position of watershed relatively smooth sloppy flat land with sandy loam soil texture. These soil is yellow in colour and are inherently good in fertility status.

Natural vegetation of the watershed is very poor. Somewhere forest vegetation is seen which are predominant with Vilayati Babool (*Prosopis Juliflora*), followed by Babool (*Accasia nilotica*), somewhere Neem Plants (*Azadirachta Indica*), Shisham (*Dolbergia Sisson*) and Karanj (*Pongamia Glabra*) are seen in occasional occurrence. There is no grass land in the watershed. Somewhere grass patches are seen only on the bunds, road sides and other such places. Coverage of massive green belt is in poor percentage for environment which is envisaged. That watershed is very poor climate area.

There is normal condition of animal physics and for their fodder arrangement is the watershed and creative possibility would be expected by the implementations of the project.

Due to Aerial soil erosion poor harvesting managements, cropping pattern, non treated watershed etc. are very anti effective causes for the watershed. Problem of the watershed is to be tackled by harvesting structures which have lost most of their capacity new water bodies for the prevention of erosion and conservation of soil and moisture various type of earthen bunds in the watershed field, necessity has been observed. Wasteland will be treated with staggered Trenches, afforestation and bunding for the changing of characteristics.

The detail project report has been prepared by the applying of nine process steps for the micro watershed code no. **2B3E3c2e** brief is as follows.

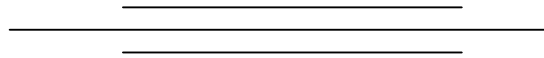
- STEP-1 Secondary data collection:-** During the five days visit programme in the micro watershed project with of all available documents of village label by approaching the Gram panchayat collected secondary data.
- STEP-2 Village meeting & conducting PRA exercise:-** Community meeting conducted on fix days for the consultation with villagers for the PRA Exercise. Participatory mode of the villages was positive indicated for the success of programme. With good in testing participation has been drawn social & resource map on ground & paper & discussed on various topics of problematic thoughts in the micro watershed.
- STEP-3 Socio economic survey:-** The resource organization of village label volunteers identified to conduct house hold socio economic survey/states.
- STEP-4 Problem typology analysis:-** Thoroughly analyzed the data & identified problem type as soil & moisture conservation, crop rotation, crop coverage, productivity, livelihoods, social issues & capacity building gaps etc. Problems discussed with the watershed committee & came up with alternative solution.
- STEP-5 Conduct of net participatory planning (NPP):-** The planning team visited together in the planning blocks on the scheduled date along with the beneficiaries of the villages & data gathered as for the participatory net planning.
- STEP-6 Productivity & livelihood planning exercise:-** For the product livelihood exercise, group discussion on various livelihood as Agriculture, Animal husbandry enterprise development held discussion with the villagers in the micro watershed.
- STEP-7 Institutional & capacity building :-** This plan is prepared based on the data available in the field and auscultations with the watershed committee.
- STEP-8 Data consolidation & documentation of DPR :-** After gathering all required information compiled collected data. Thoroughly discussed and finalized the expected outcomes and benefits specially in the respect of livelihood for different segments. These are the target and performers indicators for the micro watershed.

STEP-9 Conduct of Gram Sabha obtaining approvals submissions of DPR:-After preparation of the draft DPR convened to Gram sabha and activities proposed expected outcomes benefits of implementing the programm are explained in case of any changes are proposed in the Gram sabha approval obtained by the Gram sabha and already singed of Mau paper.

STEP-9A Attachment of detail estimate, cost and design:-Estimating, Costing and design prepared technically According to plan in the micro watershed project. And attached with the DPR.

STEP-9B Various type of mapping :- DPR prepared in the support of micro watershed project using various type of maps is as follows :

- | | |
|--------------------------------------|-----------------------------|
| 1.Index Map of Watershed | 2. Watershed Map |
| 3. Relief/ Drainage Map | 4. Slop Map |
| 5.Soil and Land Capability class map | 6. Land use/ Land Cover Map |
| 7. Cadastral map | 8. Proposed Action Plan map |
| 9. Social Map | |



Project Report

Table – 1 : Micro watershed project brief : -

1	State	U.P.
2	District	Bulandshahar
3	Block	Pahasu
4	Comprised Villages (Nos.)	05
5	Name of Watershed	Bedrampur
6	Name of MWS Project	Bedrampur
7	MWS Code No.	2B3E43c2e
8	Geographical Area of MWS	762.00
9	Treatable Area	686.00

1- **Project Objectives :- The aim and objectives of the Project are :**

- eee- Conservation, development and sustainable management of natural resources including their users.
- fff- Enhancement of agriculture production and productivity in a sustainable manner.
- ggg- Restoration of ecological balance in the degraded and fragile rain fed ecosystem.
- hhh- Reduction in regional disparity between rains fed and irrigated area.
- iii- Creation of sustainable employment opportunities for the rural community for livelihood security.
- jjj- Generation of massive employment.
- kkk- Reduce migration from rural employment.

2- **Major Problem of Project Area :**

- ww- Actual shortage of drinking water.
- xx- Near to nil activated water bodies and water harvesting structures.
- yy- Low depth of ground water table.
- zz- Undulated and generally sloppy rainfed area.
- aaa- Large number of Small, Marginal and S.C. farmer land holding.
- bbb- Lower wages of agriculture labour and also migration of labour due to shortage of employment in the watershed.

3- General Description :

(3.1) Location :-

Nagalia Laxmanpur Watershed has been taken with MWS Code No. **2B3E3c2e** in Pahasu Block of Distt. Bulandshahar is located on Bulandshahar via Khurja to Utravali Via Pahasu road about 57 Km. between 28°15' and 28°15' N Latitudes and 78°0' and 78°5' N Longitudes. Location and delineation of watershed has been located on watershed map **Fig. 2** and on top sheet **Fig. 3**.

(3.2) Area and Elevation :

Elevation ranges from 187 to 190 mtr. above the mean sea level(MSL) altogether comprised villages and their's area is described as follows. (Comprises village map Fig. 3)

Table – 2 : Area and Elevation

Sl. No.	MWS Code	Block	Name of Village	Geographical Area	Treatable Area
1	2	3	4	5	6
1	2B3E3c2e	Pahasu	Kamona	73.20	65.88
			Rishalu	178.22	160.39
			Bedrampur	259.60	233.64
			Gangagarh	240.00	216.21
			Rasoolgarh	10.98	9.88
			Total	762.00	686.00

(3.3) Shape of the Micro Watershed:

The shape of watershed is Elongated and as Rectangular. The maximum length and width of the watershed are 5000 Mtr. and 1814 Mtr. respectively with the Length: Width ratio of 2.76:1.

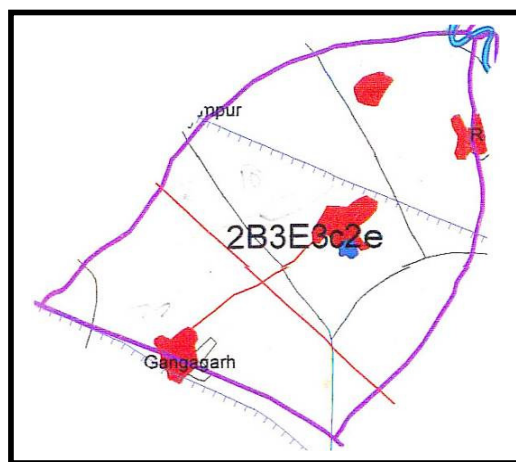


Fig. 1 (Shape of Micro Watershed)

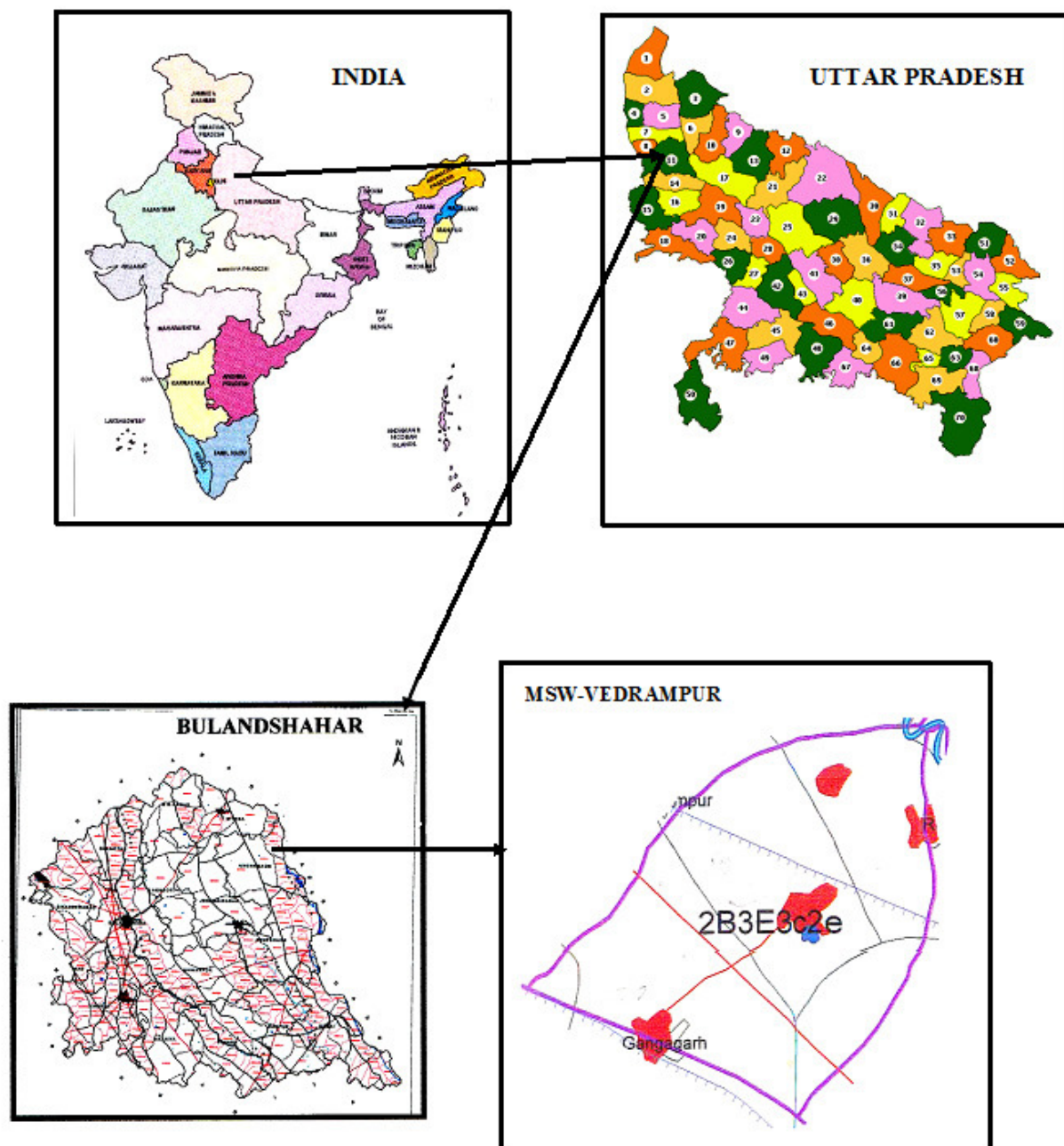
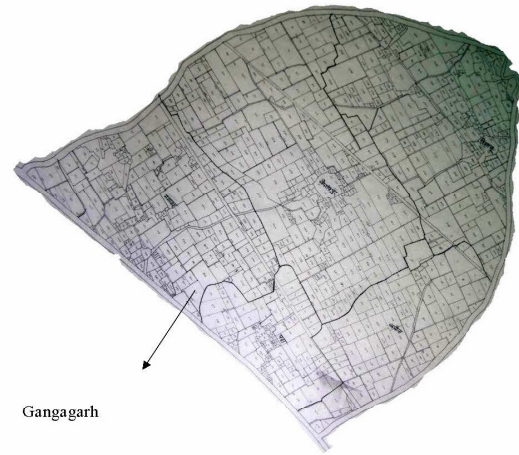


Fig.- 2 Location of the Micro Watershed

2B3E3c2e (MWS Project – VEDRAMPUR)



Gangagarh

Fig No.-3 Cadastral Map (Located Comprised Villages)

Sl. No.	Name of Project	Name of Village	Geographical Area (in ha.)	Raifed Area (in ha.)	Treatable Area	Agri. Land
1	2	3	4	5	6	7
1	Bedrampur	Rishalu	178.22	120	160.39	162.18
2		Bedrampur	259.60	201	233.64	238.83
3		Gangagarh	240.00	155	216.21	216.00
4		Kamona	73.20	42	65.88	62.22
		Rasoolgarh	10.98	3	9.88	9.77
		Total	762.00	521	686.00	689.00

(3.4) Climate :

The Watershed falls under semi arid region of tropical climate inclined in Western Plan Zone. The average annual precipitation is about approx. is 397 mm. spreading over 35 rainy days. Most of the rain fall (about 85%) is received during July to September. The rain fall of moderate intensity. Nothing the area receives of scarcity rainfall in the winter season. The temperator variation ranges from as high as 43⁰c in the month of May-June to as low as 4⁰c in December-January.

(3.5) Geomorphology and Soils :

Geomorphology :

The entire watershed is topographically divided into major landforms. Accordingly the soils of watershed can be grouped into various categories such plane land, undulated land, sloppy land and erosic ravenous land.

Soil :

(a) Fine textured soil :

The soil are the most extensive soil group found in the watershed. Some portion of the watershed is relatively sloppy flat land with fine soil texture as sandy sandy loam. The soils are in color and are inherently good high in fertility status. Soil texture is sandy lome loam particularly in depressions and loam in the elevated portion. The soil characteristic texture is dispersive and smooth. Therefore without impede the downward movement of water productive layer of soil are easily by high runoff.

a- Coarse Textured Soil :

These soil are lying mostly in downward portion, along with erosic gully and drainage line upto end of watershed outlet. These soils are coarser in texture and are relatively poor in fertility status. The soils are lomy sand in texture. Rill and gully formation in same parts particularly near the outlet of watershed can be seen.

(3.6) Drainage and Slope:

Due to prevalence of mild steep slope and presence of a number of drainage lines in the watershed the drainage system is adequate. The watershed from part of Ganga Basin and watershed. Under mild to steep topographical slope of MWS as divided as follow : (Drainage and slope map fig.-4)

Table - 4 : Drainage and Slope

S. No.	Grade	Slope Percent	Area in Ha.	Remark
1	A	0.5-1	205.80	-
2	B	1-2	171.50	-
3	C	2-3	137.20	-
4	D	3-4	102.90	-
5	E	4-5	48.02	-
6	F	5-6	20.58	-

(3.8) Human Population:

a- Human Population:

Total Population of involved villages in watershed is 10048 with average family size of six persons as detailed as follows

Table – 5 : Human Population

S. No.	Name of village	Nos. of families	Human Population			Total
			Male	Female	Children	
1	Rishalu	312	628	596	933	2157
2	Bedrampur	343	708	621	1014	2343
3	Gangagarh	227	498	462	736	1696
4	Kamona	192	425	378	589	1392
5	Rasalgarh	204	474	459	618	1511
	Total	1278	2733	2476	3890	9099

j- Categorization of Human Population :

In the total population of watershed villages, categories are defined as below :

Table – 6 : Population Categories

S. No.	Particulars	Unit	Number of families in population in the villages		
			Population	Family	Remark
1	2	3	4	5	6
1	Agri Farmer	No.	2742	895	
2	Landless	No.	218	52	
3	Agri. Labour	No.	205	115	
4	Land less Labour	No.	127	25	
5	BPL Family	No.	211	51	
6	SC Family	No.	487	140	
7	ST Family	No.	-	-	
			3990	1278	

(3.9) Land Holding :

All the categories of farmers as small, marginal, medium and large are involved in land holding average of about 1-18 ha. Small land holding farmers are further scattered at different places which makes cultivation very difficult. Distribution of farm families according to the size of the land holdings are given as below :

Table – 7 : Distribution of farm families according to their size of land holdings

S. No.	Name of Village	Total Agri. Land in MWS	Land Holding Family (Nos.)					Percentage
			Marginal (< - 1Ha.)	Small (1-2 Ha.)	Medium (2-4 Ha.)	Large (4-7 Ha.)	Total	
1	Rishalu	162.18	76	30	8	5	119	
2	Bedrampur	238.83	122	42	15	11	190	
3	Gangagarh	216.00	108	48	13	9	178	
4	Kamona	62.22	55	11	4	2	72	
5	Rasalgarh	9.77	8	4	-	-	12	
		689.00	369	135	40	27	571	

(3.10) Live Stock Population :

Total live stock population of the watershed is 7016. Buffalos is preferred as mulch animal compared to Cow. But milk yield is poor. Goats are also kept for milk as well as for meat purpose. The breakup of livestock population is as follows :

Table – 8 : Live Stock Position

S. No.	Name of Village	Unit	Live Stock Position				Total
			Buffaloes	Cows	Bullocks	Goats	
1	Rishalu		1387	301	95	85	1868
2	Bedrampur		1021	291	84	64	1460
3	Gangagarh		954	234	52	43	1283
4	Kamona		1087	309	77	72	1545
5	Rasalgarh		972	263	66	58	1359
	Total		5421	1398	374	322	7515

(3.11) Infrastructure Social Feature :

- a- Comprised villages in the micro watershed has moderate communication facilities. Watershed linked with metaled road and approachable through motarable road.
- z- All the villages are electrified and have T.V. and Telephone connection.
- aa- Literacy rate in the watershed is very low all villages are having education upto Junior High School.
- bb- Nearest small market is at Pahasu 13 Km. Nearest big market Bulandshahar is about 60 Km. from watershed. Religious and ritual features are almost common as in other parts af U.P. small land holding with large family size and more than 25% of the labour force of the total population living below poverty line indicate poor socio economic status of the watershed community.

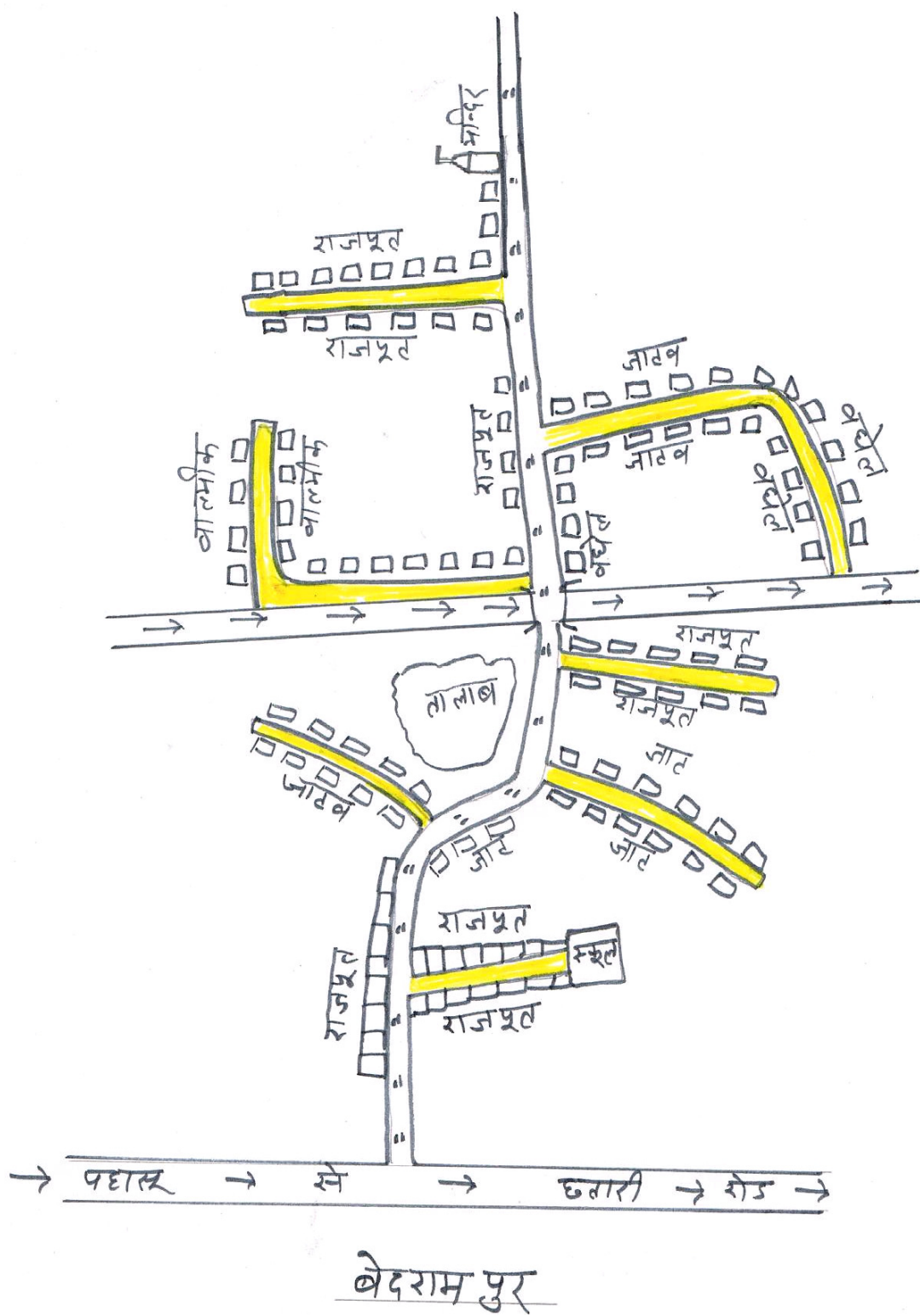
Participatory Rural Appraisal

Participatory mode of the villagers shows positive indication for the success of the programme. Traditionally the entire village community participate in the individual works. Social map of one of the watershed village drawn by villagers themselves, depicting various village figures is shown in sketched map in Fig.-4 & 5. Infrastructures position of the village recorded as follows :

Table – 9 : MW.S. Project – Teyore Bujurg.

S. No.	Infrastructure	Unit	Qty.
1	2	3	4
1	Primary School	No.	3
2	Junior High School	No.	2
3	Kanya Pathshala	No.	-
4	Public Health Center	No.	-
5	Vet nary Hospital	No.	-
6	Panchayat Ghar	No.	2
7	Post Office	No.	-
8	Agan Bari Center	No.	5
9	Electricity	-	Yes
10	Road	-	Yes
11	Pond	No.	2
12	Hand Pump	No.	42
13	Irrigation Well	No.	-
14	Canal	No.	1
15	Temple	No.	4
16	Well (Drinking Water)	No.	2
17	Pumping Set	No.	37
18	Toilet	No.	18
19	Market	No.	-

SOCIAL MAP



Recorded importance of development institution

Farmers perception recorded for importance and role of different development institution in relation to infrastructure. Importance has been depicted with size of circle and role with distance from village circle. (Fig 8)

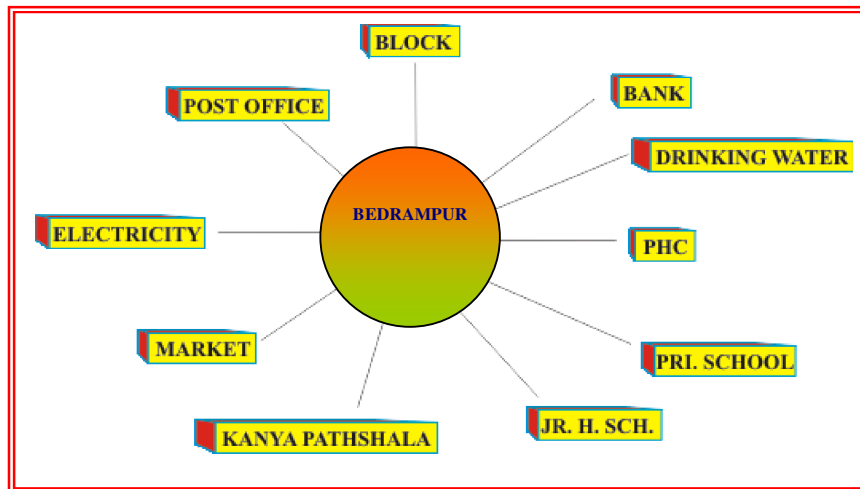


Fig. -8 (Venn diagram of Micro watershed)

(3.12) Communication :

Watershed can be approached from Distt Headquarter Bulandshahar to Project area 57 km. by Road.

(3.13) Natural Resource Base :

Transact of watershed showed typical land use profile consisting of plain agriculture land, erodic area and medium ravenous ridge. Main source of the irrigation are the canal for pre showing irrigation only. The total geographical area of the watershed is 472.00 Ha. classification.

Approach roads for the micro watershed is shown for the communication is shown on topo sheet map Fig 9 as next page.

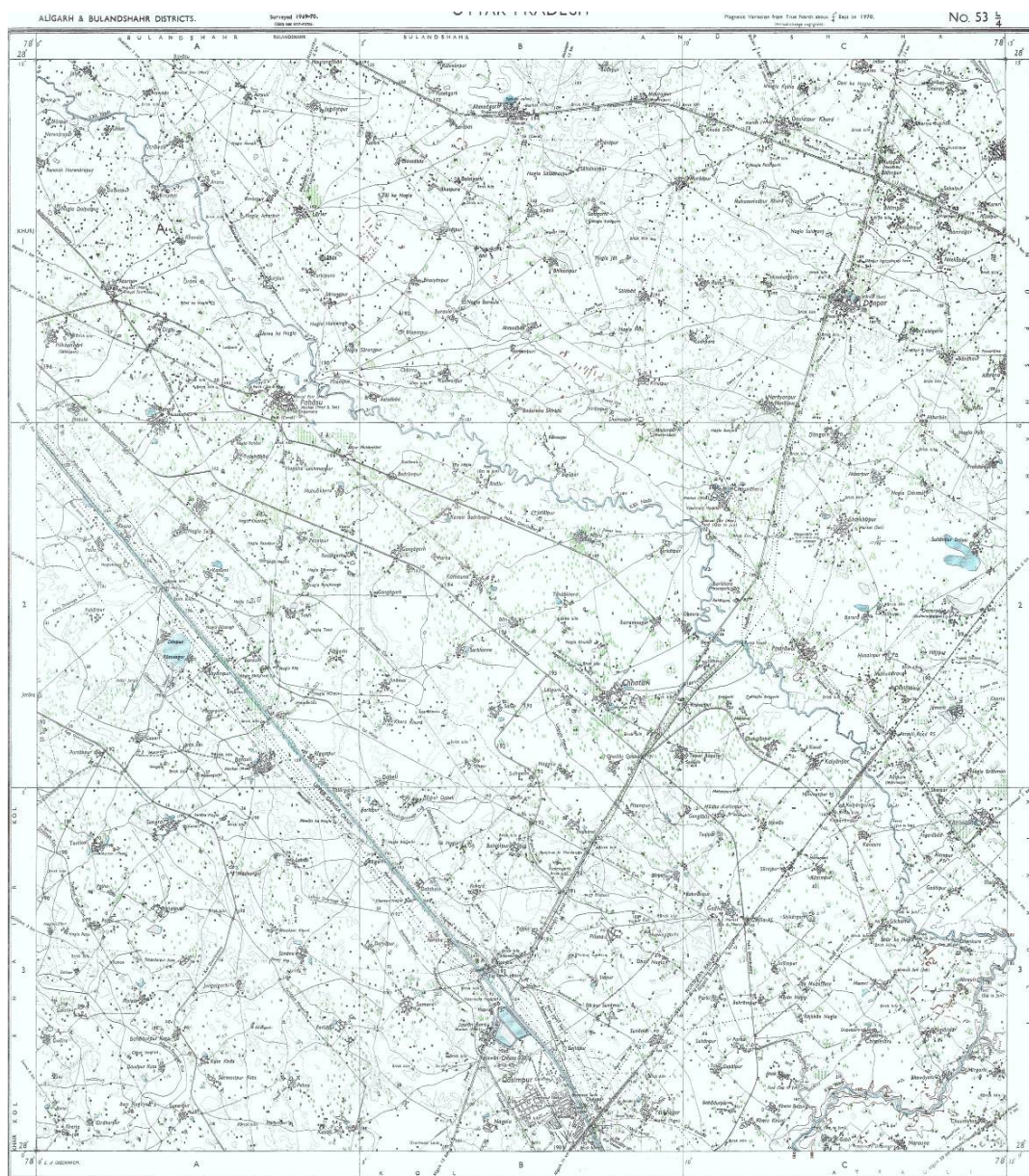


Fig.- 7 Communication Map on Toposheet

Table – 10 : Classification of area(Hect.)

S.No	Name of Village	Unit	Total Geographical Area	Rainfed Area	Wasteland	Village Land and Road	Irrigation Resource	
							Water Bodies	Borewell
1	2	3	4	5	6	7	8	9
1	Rishalu	Ha.	178.22	120	8.90	12.48	-	48.20
2	Bedrampur	Ha.	259.60	201	15.57	18.18	-	41.25
3	Gangagarh	Ha.	240.00	155	12.00	14.40	-	72.12
4	Kamona	Ha.	73.20	42	4.03	3.70	-	28.20
5	Rasalgarh	Ha.	10.98	3	-	1.00	-	800.00
	Total		762	521	40.50	49.33	-	197.77

(3.14) Livelihood :

Total Population of the watershed is 8936 and out of the total population a majority more than 80% has farming as their major source of livelihood followed by labours, serviceman and small business class. Classified livelihood given in form as follows :

Table – 11 : Livelihood Classification in population :

S. No.	Name of Village	Farmer	Labour	In Service	In Local small business	Others
1	2	3	4	5	6	7
1.	Rishalu	194	38	33	28	12
2.	Bedrampur	216	42	36	24	8
3.	Gangagarh	143	32	29	30	9
4.	Kamona	92	21	18	14	7
	Rasalgarh	128	30	22	12	5
	Total	773	201	138	94	41

(3.15) Dependency of forest fuel wood and fodder :

- a. **Fuel wood :-** The main source of fuel is from cow dung cake, woody stem of crops. About 70% of the climactic energy requirement is met from the agriculture by product and cow dung cake. Rest is met out from the forest outside the village and watershed boundary, most preferred fuel wood is Juliflora fuel wood Juliflora obtained from standing along and between watershed.
- j- **Fodder :-** Villages have not any sufficient signified dependency on forest based fodder as these resource are nothing availability in the forest.

(3.16) Labour requirement :

Labour requirements was found to be maximum at the time of October, November and December when the sowing of Rabi crops are done. The crucial periods are March and April coinciding harvesting and threshing of Rabi crops and July/August is sowing Kharif Crops take a little place. Other income generating enterprises having potential during the remaining.

(3.17) Crop Rotation :

Present Crop rotation in the watershed comprise of :

Kharif	-	Bajra	-	Rare
		Maize	-	Rare
		Jwar	-	Rare
Rabi	-	Fallow Wheat	-	Major
		Fallow Barly	-	Major
		Fallow Sugarcane	-	Major
		Fallow Mustard	-	Major
Zayad	-	Urad, Moong, Makka, Arahar		

The above said Rabi Crops is the most prevailing crop rotation on the agriculture lands both in the rainfed and irrigated conditions.

Organized vegetable cultivation fruit plantation and traditional agro forestry systems are lacking as per requirement in the watershed the limited vegetable cultivation in the watershed is confined as kitchen gardens and field to the irrigated condition in a scattered manner. The cultivation of cash crops other than the sugarcane, wheat and mustard also in the watershed.

(3.18) Historical Events :

Chronological record of important events of the watershed village is prepared through participatory rural appraisal (PRA) which is very useful in understanding of its background and chronology is given as follows :

Table – 12 : Historical Events

S. No.	Events/Activities	Year	Rem.
1	2	3	4
1	Established	1560	
2	Opening of Primary School	1962	
3	Opening of Junior School	2006	
4	Opening of Kanya Pathshala	-	
5	Opening of PHC	-	
6	Opening of Vet. Hospital	-	
7	Panchayat Ghar	2008	
8	Introduction of Tractor	1972	
9	Gobar Gas Plant	-	
10	Thresher	1980	
11	First Tube well/Pumpset	1970	
12	First Motorcycle	1981	
13	T.V. & D.V.D. Players	1982	
14	Electricity in Village	2000	
15	Bituminous Road	2003	
16	First Hand Pump	1990	
17	Templo Renovation	2001	
18	First Land Line Telephone	-	
19	Planning for Watershed Project	2010-11	

(3.19) Present Land Use in the Watershed :-

The watershed has diversified land uses. The varied present land use under different use in the watershed. The mixed land use followed in the watershed is almost similar in other parts of U.P. During P.R.A. Exercise prepared land has been shown in Table No. 13, 14 & 15.

Table – 13 : (Ownership)

S. No.	Name of Village	Pvt. Agri. Land		Govt. Revenu Land	Forest Land	Other Land
		S.C./S.T.	Others			
1	2	3	4	5	6	7
1	Rishalu	86.26	70.58	-	-	21.38
2	Bedrampur	119.70	106.15	-	-	33.75
3	Gangagarh	85.44	128.16	-	-	26.40
4	Kamona	16.47	49.43	-	-	7.30
5	Rasalgarh	-	9.98	-	-	1.00
	Total	307.87	364.30	-	-	89.83

Table –14 : (Present Land under different categories)

S. No.	Name of Village	Land Use (Ha.)				
		Agricultural	Wasteland (All Types)	Seasonal waterbodies	Village/Road Etc.	Total
1	2	3	4	5	6	7
1	Rishalu	156.84	8.90	-	12.48	178.22
2	Bedrampur	225.85	15.57	-	18.18	259.60
3	Gangagarh	213.60	12.00	-	14.40	240.00
4	Kamona	65.90	4.03	-	3.27	73.20
5	Rasalgarh	9.98	-	-	1.00	10.98
	Total	672.17	40.50	-	49.33	762.00

Table – 15 : (Present land use classified)

S. No.	Land Use Under	Unit (ha.)	Area (Ha.)	Percentage
1	2	3	4	5
1	Under Agriculture	Ha		
	A- Rainfed-	Ha		
	I- Crops	Hact	656.87	
	II- Agro forestry	Hact	15.30	
	B- Irrigated-	-		
	I- Assured	Hact	35.38	
	II- Portial	Hact	162.39	
2	Wasteland	-		
	A- Aforestation	-	-	
	B- Pasture	-	-	
	C- Untreatable	Hact	8.30	
	D- Treatable	Hact	32.20	

Proposed Post Land Use has been given on Page No. 32

4- Focus on Present Land Use :

(4.1) Agriculture :

The total area under agriculture in the watershed is about 487.89 ha. out of which 574.00 ha. is under rainfed agriculture. Agriculture land uses in the watershed extended to diversified land capabilities starting marginal to good class II land. The irrigated and drinking water is most scarce natural resource in the watershed. The operation of tube well 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 of the watershed area. The agricultural field bund are common in the watersheds however they frequently breach on heavy rains.

Various mixed texture of soils are located in patches through out the watershed. The heavy soils are almost kept fallow during rainy season. the agricultural soils also have some as share calcium pan at variable depths. The irrigation water is conveyed by the earthen channels. Surface irrigation methods following mainly border method of flood method by the formers in the watershed. These factors reduce the water use efficiency of limited and valuable irrigation water.

Drought hardy species like Juliflora suitable multi purpose trees is suitable for rehabilitation of the wasteland. Rehabilitation of waste lands promoting agro forestry with appropriate fruit and forest species suitable vegetative barriers on sloppy lands can be high future value and by these adoption would be meet out many demands of fire wood and fodder in the wasteland. Except above but also for soil and water conservation, rehabilitation of wasteland and sustainable income generation for socio-economic upliftment of farmers.

Crop Productivity :

The farmers also do not have suitable cropping system to deal aberrant weather. Weeds impose considerable constraint in productivity of both Karif and Rabi crops under irrigated as well as rainfed production system farmer undertake normally one manual weeding in mustard and other valuable crops however, practices is energy and time consuming. Use of we decide is rare in the watershed.

In the watershed area, limited cropping in the Kharif with mixed cropping practices is not only irrigational but also unscientific and best for low productivity. Subsequent Rabi crops in general. Sugarcane & Mustard crop in particular are raised on residual soil moisture under rainfed production system during post monsoon season.

(4.2) Indigenous Technological Knowledge (ITK) :

Under process of PRA tracked out rural applying technology in various field of local technology and some technology is very popular in village. In which the agriculture is an old traditional practices of farmers who have improved themselves with passage of the time according to their domestic needs and technological reforms in the nearby areas. The villages have their traditional village ponds, practice of field bunding which typically constitute agricultural related ITKs in the watershed. The Mustard & sugarcane being a cash and firewood crop of the watershed and also sugarcane crop is being. Cultivated in self designed manner by the farmers. Its carried out that the area is totally depend on rain

and under the rainfed area technology is applied by the farmers. However limited fertilizer application specifically the DAP came in the practices since about 15-20 years.

(4.3) Forest and Other Vegetation :

Forest :

The watershed have a tract of wasteland area which are under uncultivable position is liesed in the watershed. These wasteland have not any tree vegetation or very less than real requirement for the wasteland use.

Horticulture/Agro forestry :

Horticulture and agro forestry practices were observed in the watershed.

(4.4) Agro forestry :

Agro forestry practices are lacking in the watershed. Though it has good potential under existing disposition and may a role particularly with respect to minimization of cropping risk, built up soil fertility and productivity, protection of soil erosion, soil conservation partly meeting out the fire wood demand of rural community and more over optimizing the economical return from system as whole under typical semi arid climate in the watershed. Bund and boundary plantation also have good potential to care the fire wood and fodder demands of the rural community in the watershed. The existing area under agro forestry is almost negligible. Prosopis Jhliflora may be planted as block or sole plantation specifically on marginal and degraded land in the watershed.

The agro forestry interventions comprising of ber, bail, aonla, guava, papular etc. may be applied for benefit of the farmers under rainfed to irrigation production system on leveled to slopping and marginal agricultural using proper planting techniques and term it control measures.

The multipurpose trees may be also help in supplementing fire wood and fodder demands of the rural community in the watershed and my be planted as hedge rows on rainfed, marginal and degraded lands.

(4.5) Horticulture :

Fruits and vegetables practices are lacking in the watershed area. Its practices may be sustainable very good potential for the formers of watershed. There are a limited lack fruit trees in number like mango, guava, lime, ber, aonla and papaya fruit trees well as vegetables like radish, okra, tomato, cabbage, garlic, onion, chilly, bringer and cucurbits but they are found surviving well in the watershed villages. Organized orchards (vatika) commercial vegetable cultivation horti-agri and other systems of agro forestry etc. are lacking but have good agriculture.

5. Soil and land capability classification :

(5.1) Soil Morphology :

Watershed is located North East corner of Bulandshahr Distt. near about 55 Km. away. The entire terrain of watershed is topographically divided into various land forms. Accordingly the soils of watershed have been grouped major categories is given as follow :

Hill Terrain	Plane Land Sloppy	Undulated Land	Rill Erosic Land	Moderate ravenous
-	45%	28%	15%	12%

Given categories in the blocks is located the soil morphology in the watershed areas. Representation of soil characteristics by soil profile is represented as follows :

Soil Profile :

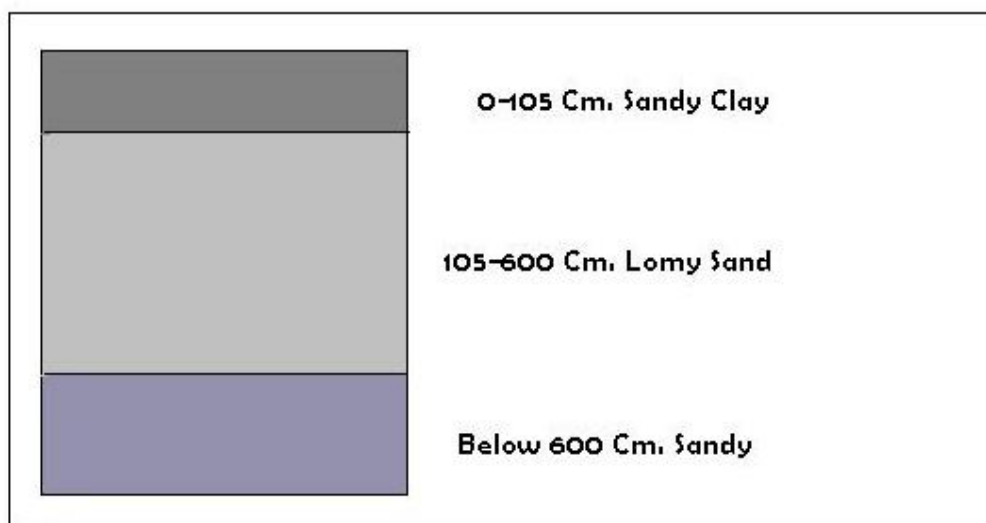


Fig. – 9 (Soil Profile)

Table – 16 : (Morphology of a Typical Soil Profile) :

Horizone	Depth in Cm.	Morphology
1	2	3
A V & H	0-150	Silky when moist, Hard when dry quick soluble, high elasticity, fissures, and cracks, occasional occurrence of free calcium carbonate granules black in colour, clay content 29%, PH- 8 to 8.7
B V & H	150-160	Whitish yellow in colour, very fine mixed with free cacaos and gravels, Hard when dry compact and indurate hard pan restricting development of root and down ward water transmission.
C V & H	7600	Red and white sand stone

(5.2) Soil and Characteristic and Fertility Status :

Soil characteristic pertaining to soil fertility of various classes accruing around villages in the watershed are given as follows :

Table – 17 : Soil Characteristic & Fertility Status :

Sl. No.	Soil Properties	LCC-II	LCC-III & IV
1	2	3	4
1	Sand %	44.05	72.04
2	Silt %	23.90	17.16
3	Clay %	32.05	11.80
4	Texture	Sandy Clay	Lomy Sand
5	PH (1:2)	7.75	8.00
6	Organic Carbon %	0.40	0.14
7	Available N Kg ha ⁻¹	320.00	175
8	Available P Kg ha ⁻¹	28	15
9	Available K Kg ha ⁻¹	185	322
10	EC (dS m ⁻¹)	0.46	0.12

(5.3) Land Capability Classification (LCC) :

Land capability classification (LCC) was done to classification the soils in different groups based upon the limitations and to emphasize the hazards prevailing in the 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. Classes of land capability namely II, III, IV and V are demarcated in the watershed. The areas under different classes are sown as follows :

Table – 18 : Land Capability Classification (LCC) :

S. No.	Land capability class	Area in Ha.	Colour
1	2	3	4
1	I Class	-	-
2	II Class	103.35	15%
3	III Class	482.3	70%
4	IV Class	68.9	10%
5	V Class	34.45	5%
6	VI Class	-	-
7	VII Class	-	-
8	VIII Class	-	-

Land capability classification of various agricultural practices under land use can be classified as groups, class, sub class and units. Utilization of various land class is given as follows :

Table – 19 : Utilization of various land uses

S. N.	LCC	Forestry	Ltd. Grazing	Light Grazing	Dense Grazing	Limited Agriculture	Light Agriculture	Dense Agriculture	More Dense Agriculture
1	I								
2	II								
3	III								
4	IV								
5	V								
6	VI								
7	VII								
8	VIII								

(5.4) Land Capability Class II & III :

This group is one of the most extensive LCC watershed. and also near to class III for the agricultural practices. The soils are sandy & sandy 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 & III. These lands potentially very productive but due to rainfed a single cropping pattern is in habitation.

(5.5) Land Capability Class IV :

This class is found in lower portion near the outlets of watershed. The soils are coarser in texture, deep, erosion hazard and undulating in topography. Rill and initiation of gully can be seen near the outlet of the watershed.

(5.6) Land Capability Class VII & VIII :

This class of land is not found in watershed. Somewhere lack of soil are found with admixture gravels fragments in these classes of lands.

(5.7) Conclusions :

The majority of land form is coming under class II, which give an insight of good agriculture production potential of the watershed.

The land capability classification provides reasonable good information with regard to capability of soil, that could be used for agriculture, agrihorticulture, silviculture and posture development.

The productivity of these lands could be further enhanced by adoption of simple soil & water conservation measures like bunding practices.

The reasonable area is under watershed of wasteland and other wasteland including grater potential of this watershed for forestry and pasture development. Rare places namely water body of low portion of land area under seasonally works as water harvesting structures and these harvested water is used or can use for some other beneficial activities during the crop season also.

6. Problems and needs of the watershed indentified during the PRA

(6.1) Problem Identification and prioritization :

- oo- The are has undulating topography, steep unstable slopes, gradient of excessive branches of rills and hence highly prone to soil erosion.
- pp- Major issues addressed to food sufficiency economic growth and environmental security in the watershed area.
- qq- Effective soil depth is limited and highly variable hampering good crop growth.

- rr- The watershed have low productive cropping due to tradition single cropping pattern and over all average crop production percentage not sufficient against requirement.
- ss- Identified that there is no assured irrigation system has been development capacity of water bodies are reduced due to silt ration which are utilized to store of rainy water and they are renovatable.

(6.10) Transact walk during the PRA :

Problems identified and prioritized during the transact walk and PRA exercises in all comprised villages of watershed. There were pooled and a list of problems representing the whole watershed was prepared. Problems were ranked as per their total weight age in the watershed village.

Table – 20 : Ranking of Problem identification and prioritization of watershed

S.No.	Problem	Rank
1	2	3
1	Lack of irrigation	3
2	Lack of drinking water	6
3	Low production of field crops	8
4	Lack of fodder availability and low productivity	8
5	Lack of availability of fuel wood	5
6	Lack of market facility	3
7	Lack of quality seeds, fertilizer, pesticides etc.	6
8.	Medical and Health care facilities for milching animals and low productivity.	5
9	Lack of medical, educational and transportation facilities	6
10	Lack of water bodies renovation	6
11	Lack of run of earthen check bunds	8
12	Lack of water harvesting structures	1
13	Lack of livelihoods opportunity	1

Prioritized ranking (Upto four Numbers) :-

- 25- Lack of earthen check bunds.
- 26- Lack of livelihood opportunities.
- 27- Lack of irrigation water was the greatest problem. Lack of irrigation water problem experienced by the people followed by low crop production.

(6.3) Analysis of SWOT of the watershed :

Strength (S), Weakness (W), Opportunity (O) and Threat (T) analysis is a useful decision support tool. A SWOT analysis of watershed is presented as follows :

SWOT analysis of the watershed

Strengths (S) lxxxii. Cooperative work culture in traditional activities lxxxiii. Close ethnic ties lxxxiv. Road at the top as well as outlet of the watershed lxxxv. Hard working lxxxvi. Resource pool of crop genetics diversity lxxxvii. Awareness of farmers about watershed management programme lxxxviii. Well established CPR maintaining and sharing system lxxxix. Stall feeding of animals xc. Well maintained seasonal water bodies xc. Social outlook of the community towards land less	Weakness (W) lxxiii. Poor water management lxxiv. Resource poor farmers lxxv. Out migration of youth lxxvi. Low and erratic rainfall lxxvii. Fragile geology lxxviii. Fragmented land holding lxxix. Heavy infestation of wild animals lxxx. Problem of fuel and fodder lxxxi. Shallow soil depth and with high percentage of gravel
Opportunities (O) xlx. Wide range of annual and perennial crops l. Scope of regular employment opportunities to check out migration li. Strengthening of existing irrigation system lii. Conducive climate for rainfed crop diversification liii. Good scope for Agro forestry and dry land horticulture liv. Potential for collective action and management of CPR	Threats (T) xli. Prone to adverse climate like drought xlii. High market risk xlili. Social conflicts owing to PRI and WSM policies and local politics xliv. Weak coordination among line departments xlv. Lack of expertise of implementing agency in different aspects of WSM

7. Proposed land use for the watershed :

Watershed management plan preparation due importance is given to topographic, land suitability, irrigation potentially, prevailing farming systems, micro farming situation, farming, farmers preferences and priorities along with economic and environment securities.

Crop and tree selection and area distribution was done as per farmers priorities revealed through PRA exercise.

The watershed management plan for watershed is prepared with specific objectives of food sufficiency, income and employment generation with environment security.

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

Table – 21 : Present and proposed land use plan of the watershed

S.No.	Land use	Present (ha)	Proposed area (ha)
1	2	3	4
1	Agriculture		
a	Rainfed		
	I Crops	656.87	1050.95
	II Agro-forestry	15.30	40.00
b	Irrigated		
	I Assured	35.38	35.38
	II Partial	162.39	263.00
2	Waste land	-	
a	Aforestation	-	38.00
b	Pasture	-	-
c	Untreatable	8.30	6.10
d	Treatable	32.20	11.20
3	Village land	49.33	49.33

(7.1) Status of Present Water Resources Utilization :

Watershed is having some canal system. Management and maintenance of these canal are required. Before sowing of Rabi crops, water from these canal is issued as supplementary irrigation for Rabi sowing ar allowed to go as waste. After releasing water from canal, submergence area also put under cultivation.

Some where bore well irrigation applied by the farmers in the watershed.

(7.2) Proposed Plan for Irrigation Development :

- a- Present system of irrigation and wastage of water during October–November need to be made more efficient from water management point of view by minimizing conveyance losses in the existing water courses.
- b- Present irrigation canal capacity have to build up by the reform. Which are lack capacity of water.
- c- Construction of new water harvesting earthen structures, Pucca Check Dem, Series Gully Plugging, etc. has been sloppy portion to increase irrigation potential and for recharging of ground water, soil and moisture conservation maximum field irrigation, best production and expected change of crop rotation.
- d- The up gradation of the exciting system of irrigation will result in :
 - i- Minimization of conveyance losses.
 - ii- Increase in frequency of irrigation.
 - iii- Adoption of high yielding varieties of crops.
 - iv- Assured cultivation of cash crops.
 - v- Capacity buildup by the planning of new water harvesting structures.

(7.3) Ground Water Recharge :

For the purpose of ground water recharge, the area of the upper side of watershed is recommended for Field Bunds, Contour Bunds, Peripheral Bunds and Submergence Bunds and in the lower portion Contour Staggered Trenches, Gully Plugs, Earthen Check Dem and Pacca Outlets. In the undulated sloppy portion of the watershed recommended water harvesting structure for dual purpose as ground water storage and under ground water recharge.

(7.4) Crop Production :

Practices proposed in the watershed is given as follows :-

- a- Mulching and crop residue management.
- b- Application of green manuring.
- c- Vermi Composting.
- d- Crop rotation and inter cropping.
- e- Biofertilizers.

(7.5) Tillage Operation :

Deep tillage technology is proposed to apply to be demonstrated for benefit of farmers in the watershed.

(7.6) Improved Seeds of High Yielding Verities (H.Y.V.) :

Recommendation of improved varieties is necessary for improving the productivity and farm income. Through replacement of low yielding traditional varieties of seeds in villages of watershed.

(7.7) Balanced Fertilizer Use :-

Demonstration of use of fertilizer in various crops of watershed recommended balance fertilizer use in different crops will be benefited of farming community.

(7.8) Control of insects and diseases :

Aphid in the mustard are the major insects in the watershed areas leading to loss in crop productivity. Similarly white blister is also a common disease in the mustard crop.

The management strategies of these insect pest and diseases will also be demonstrated in the watershed for benefit of the growers.

(7.9) Dry Land Horticulture :

Such portion of dry land in which proposed horticulture development planning recommended species like Ber, Bel and Aonla will be planted at suitable spacing in the watershed.

(7.10) Agri Horticulture :

Aonla and Sahjan would be suitable horticultural crops to the locality. Therefore, a part of land in the farmer field shall be selected and brought under Agri-horticulture system. The cropping system followed will be Jwar and Wheat.

(7.11) Plantation (Fuel wood) :

Such a portion which are under wasteland will be taken falling in the class-IV category in the watershed. These lands will be planted with species like Vilayati Babool (Prosopis Juliflora), Babool (Acacia Nilotica), Karanj (Pangamia Glabra).

9. Socio Economic Analysis of the of the Project :

(9.1) Sustainability and environment security :

The proposed land use plan will improve the land utilization index and crop diversification index significantly as compared to the existing one. in the proposed watershed management plan proper blending of the bio engineering measures will be applied on above 80% of the total area of watershed. It is estimated that more than above 70% of the watershed area will be treated and consequently the soil loss and runoff from the area is excepted to be reduced by 70% respectively.

It will help in maintaining ecosystem integrity on sustained basis along with improving the livelihood security of the farming community.

(9.2) Economic Analysis :

Economic analysis of the project was carried by taking direct benefits and costs considering 10 years for project life at 10% discount rate. Whole watershed development plan was divided into three sector as agriculture, horticulture and forest/Fuel wood plantation. Net Present Value (NPV) and Benefit Cost ratio criteria were applied judge the economic efficiency of each enterprises and sector. Net present value (NPV) of the project life is considered to be 10 years and discount rate for NPV estimation is 10% is given NPV and benefits as follows :-

Table – 22 : Present productivity income analysis :

S. No.	Name of Sector	Name of Crops	Produ- cti- on/ha.	Rate/ Qtl.	Cost of Production	Expend. of cultivation	Net income	B.C. Ratio between Col. 8 & 7
1	2	3	4	5	6	7	8	9
A	Agriculture	Urad	2.50	4500.00	11250.00	5000.00	6250.00	1.25:1
		Moong	3.00	5000.00	15000.00	6200.00	8800.00	1.41:1
		Jwar	5.00	700.00	3500.00	1650.00	1850.00	1.12:1
		Wheat	20.00	1000.00	20000.00	9500.00	10500.00	1.10:1
		Pea	8.00	2500.00	20000.00	9250.00	10750.00	1.16:1
		Mustard	4.00	2000.00	8000.00	3675.00	4325.00	1.17:1
Total		-			77750.00	35275.00	42475.00	1.20:1
Average		-			9718.00	4409.00	5309.00	1.20:1
B	Forestry	Vilayati Babool				-	-	-
C	Horticulture	Ber				22000.00	-	Nil
		Aonla				22000.00	-	Nil
		Bel				22000.00	-	Nil
Total		-				66000.00	-	Nil
Average		-				22000.00	-	Nil
Grand Total								

Table –23 : Post productivity and income analysis for Post Productivity**Value and B.C.:**

S. No.	Name of Sector	Name of Crops	Produ- ction/ha.	Rate/ Qtl.	Cost of Production	Expend. of cultivation	Net income	B.C. Ratio between Col. 8 & 7
1	2	3	4	5	6	7	8	9
A	Agriculture	Urad	4.00	5000.00	20000.00	8325.00	11615.00	1.39:1
		Moong	4.00	5000.00	20000.00	8200.00	11800.00	1.44:1
		Jwar	5.50	800.00	4400.00	1900.00	2500.00	1.32:1
		Wheat	25.00	1000.00	25000.00	11680.00	13320.00	1.14:1
		Pea	9.50	3500.00	33250.00	14810.00	18540.00	1.12:1
		Mustard	5.00	3000.00	15000.00	4370.00	8130.00	1.86:1
Total		-	-	-	172250.00	72845.00	99765.00	1.38:1
Average		-	-	-	21531.00	9061.00	12471.00	1.38:1
B	Forestry	Vilayati Babool	80.00	500.00	40000.00	15000.00	25000.00	1.67:1
C	Horticulture	Ber	35.00	1500.00	70000.00	20000.00	32500.00	1.63:1
		Aonla	35.00	2000.00	70000.00	20000.00	50000.00	2.50:1
		Bel	40.00	1500.00	80000.00	20000.00	40000.00	2:1
Total		-			182500.00	7000.00	122500.00	2.04:1
Average		-			60833.00	20000.00	40833.00	2.04:1
Grand Total		-			1394750.00	147485.00	247265.00	1.68:1

Table –24 : Summary of NPV, PPV and B.C. Ratio (Sector wise) :

S. No.	Name of Sector	NPV		PPV		B.C. Ratio
		Expend.	Net Income	Expend.	Net Income	
1	2	3	4	5	6	7
1	Rain fed Agriculture	54105	51000	72485.00	99765.00	1.38:1
2	Forest/Fuel wood Plantation	15000	-	15000	25000	1.67:1
3	Horticulture	60000	-	60000	122500	2.04:1
Total		129105	51000	147485.00	247265	1.68:1

(9.3) Economics of Agriculture Sector :

The development cost can be recovered by the adoption of plan in present rain fed agriculture is being done on well maintained field, therefore does not require much investment. In rain fed agriculture, investment of Rs. 44.50 lacs is proposed to made is given as fallows :

Table – 25 : Economics of Agriculture Sector :

S. No.	Name of sector	Name of Activities / Plan	Treatble Area (Ha.)	NPV (Lacs)	Post Productivity Value (Lacs)	Benifit / Income	B.C. Ratio
1	2	3	4	5	6	7	8
1.	Rainfed	Soil, moisture and water cons works	560	29591	921.01	413.08	1:38:1

(9.4) Economics of forest fuel wood plantation :

Economic analysis of fuel wood plantation in the watershed. Project life is considered to be 20 years and discount rate for NPV estimation is 10 % is followed and as is given follows :

Table –26 : Economics of forest fuel wood Plantation :

S. No.	Name of sector	Comman Name of Plant	Area (Ha.)	NPV (Lacs)	Post Productivity Value (Lacs)	Benifit / Income	B.C. Ratio
1	2	3	4	5	6	7	8
1.	Forest Fuel wood sector	Vilayati Babool (Prasopis Juliflora)	25	2.5	6.675	4.675	1.67:1

(9.5) Economics of Horticulture Sector :

Economic analysis of Horticulture Plantation in agri-horti system and on wasteland patches of watershed project, life is considered about 15-20 years and discount factor rate for NPV estimation is 10% is follows :

Table – 27 : Economics of Horticulture system :

S. No.	Name of Sector	Common name of Plants	Area (Ha.)	NPV (Lacs)	Post Productive Value (Lacs)	Benefit Lacs	B.C. Ratio
1	2	3	4	5	6	7	8
1	Horticulture	Ber (zyziphus mouritana)	4.00	0.80	2.104	1.304	1.63:1
		Aonla (Embelica officianalis)	3.80	0.76	2.660	1.90	2.5:1
		Bel (Aegle marmelos)	2.20	0.44	1.320	0.88	2:1
Total			10.00	2.00	6.084	4.084	2.04:1

(9.6) Food requirement and sufficiency :

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

Table – 28 : Status of food requirement and availability of per annual :

S. No.	Name of Foods	Requirement Q./Yr.	Present Status		Expected Post Status	
			Availability Q./Yr.	Deficit or surplus Q./Yr.	Availability Q./Yr.	Deficit or surplus Q./Yr.
1	2	3	4	5	6	7
1	Cereals 110 Kg.	10009	8508	- 1501	17015	7006
2	Pulses 36.50	3321	1827	- 1494	8497	5176
3	Oil Seeds 29.20	2657	1063	- 1594	4249	1592
4	Vegetable 71 kg	8280	1656	- 6624	14904	6624

(9.7) Employment generation :

One of the major problem of the labour migration in watershed project. By the implementation of the project activities employment opportunities will be generated. However the changes in land use pattern and adoption of other subsidiary enterprise will generate employment opportunities in the watershed as given in table follows :

Table – 29 : Employment generation under proposed works :

S. No.	Employment activities/works	Area under work	Cost	Mandays generation (Nos.)			
				Unskilled	Skill	Total	Person
1	2	3	4	5	6	7	8
2	Graded Contour Bund	78	2.340	2340	-	2340	78
3	Gully Plug, C.D.	130	9.750	6825	500	7325	244
4	Submergence Bund	111	4.440	4440	-	4440	148
1	Peripheral Bund	110	3.850	3850	-	3850	128
5	W.H.B.	137	12.330	7398	419	7817	260
6	Renovation of Bund	89	2.550	2550	-	2550	849
7	Reno. of W.H.B.	-	-	-	-	-	-
8	Community Pond	-	-	-	-	-	-
9	Afforestation	25	3.900	636	-	636	26
10	Horticulture	10	2.000	400	-	400	13
Total		686	41.16	23133	919	23873	1746

10. Formation of watershed committee :

Under compliance of common guideline Para (6.3) is followed and by the help of watershed development team, watershed committee is organized in the micro watershed village Bedrampur with 10 members as prescribed in common guide line. List for organization of W.C. village details given as follows :

Table – 30 : Details of comprised village W.C. organization in M.W.S. :

S. No.	Particulars	Details	Block	Geographical Area
1	2	3	4	5
1	Micro watershed code	3B3E3c2e	Pahasu	762.00
2	Name of Gram Panchayat in M.W.S.	Bedrampur		

Table – 31 : List of organized W.C. for the Gram Panchyat Bedrampur in watershed.

S. No.	Name of selected members	Age	Representation Members from	Post	Qualification	Village
1	2	3	4	5	6	7
1	Chandrabhan	37	President	Gram Pradhan	B.A.	
2	Satish	35	Secretary		M.A.	
3	Rajesh Kumar	38	S.H.G		10	
4	Mahipal	45	S.H.G		5	
5	Megh Singh	55	S.C.		5	
6	Smt. Usha Devi	32	Lady		8	
7	Shri Dharam Pal	36	No Field		10	
8	Sardar Singh	55	U.G.		5	
9	Veeri Singh	53	U.G.		5	
10	Bhudev	60	U.G.		8	
11	V.P. Singh	52	WDT		Agri. Engg	

(10.1) Formation of Self Help Groups in M.W.S.

By the help of watershed committee and watershed development team self help group are formatted / organized. Families and persons are selected from poor, small and marginal farmers families, landless poor families, agriculture labour families, women, herdsman and shepherd and S.C. families in the formatted self help groups are given as follow :

Table – 32 : Vikash Self help group – Bedrampur.

S. No.	Name of member in formatted SHG's	Age	From represented family	Name of proposed activities	Activation Position
1	2	3	4	5	6
1	Sunil Kumar	30	President	Buffalo Palan	
2	Ravendra Kumar	42	Secretary	Buffalo Palan	
3	Vinod Kumar	35	Member	Buffalo Palan	
4	Rajesh	38	Member	Buffalo Palan	
5	Aidal Singh	24	Member	Buffalo Palan	
6	Bheesham Pal	55	Member	Buffalo Palan	
7	Pooran Singh	45	Member	Buffalo Palan	
8	Bhawan Das	26	Member	Buffalo Palan	
9	Devendra Singh	34	Member	Buffalo Palan	
10	Tilak Sinigh	24	Member	Buffalo Palan	

Table – 33 : Self help group Bedrampur – Buffaloes.

S. No.	Name of member in formed SHG's	Age	From represented family	Name of proposed activities	Activation Position
1	2	3	4	5	6
1	Shri Ray Singh	30	President	Buffalo Palan	
2	Har Gyan	42	Secretary	Buffalo Palan	
3	Kanheya	35	Member	Buffalo Palan	
4	Mahipal	38	Member	Buffalo Palan	
5	Surendra Singh	24	Member	Buffalo Palan	
6	Vinod	55	Member	Buffalo Palan	
7	Ranveer	45	Member	Buffalo Palan	
8	Shripal	26	Member	Buffalo Palan	
9	Devraj	34	Member	Buffalo Palan	
10	Vishmber	24	Member	Buffalo Palan	

Table – 34 : Self help group in Bedrampur of watershed.

S. No.	Name of member in farmated SHG's	Age	From represented family	Name of proposed activities	Activation Position
1	2	3	4	5	6
1	Mukesh Kumar	35	Inter	Livestock	New
2	Jayprakash	50	HS	Livestock	New
3	Satish	45	Inter	Livestock	New
4	Tekchand	30	Inter	Livestock	New
5	Jagdish	40	HS	Livestock	New
6	Pravesh Kumar	40	Inter	Livestock	New
7	Annu	47	Inter	Livestock	New
8	Ravi	28	Inter	Livestock	New
9	Vedprakash	45	HS	Livestock	New
10	Sarvan	55	HS	Livestock	New

Formation of User's Groups :

User's groups are farmated by the help of watershed committee and watershed development team in the micro watershed comprised villages. Formers which have land village are involved in the User's groups and they will be direct benefited as expected by the implementation of watershed project easy and convenienced condition are made to resource use between user's groups and they will be responsible to operate and maintenance for the created assets in the watershed. Nos. of farmated user's groups details are given as follows :

Table – 35 : Village wise user's groups

S. No.	Name of village	No. of groups	No. of farmers	Total Agri. Land	Area under treat-ment	Cost of essets
1	2	3	4	5	6	7
1	Rishalu	4	62	62.22	65.88	7.9056
2	Bedrampur	11	170	162.18	160.39	19.2468
3	Gangagarh	17	272	238.83	233.64	28.0368
4	Kamona	16	253	216.00	216.21	25.9452
5	Rasalgarh	1	18	9.77	9.88	1.1856
	Total				686	82.32

10. Estimation and Costing of Proposed activities of the watershed Project Year 2009-10.

Proposed works / activities for the Project Period (Year 2010-11) under proposed treatable area 560.00 Ha. Out of total Geographical area 622.00 Ha.

(10.1) Financial and Physical Outlets :

Table – 36 : Financial and Physical Outlets for the Year 2009-10 :

Sl. No.	Components	Unit cost per ha.	Physical ha.	Financial (Lacs)			Man-days Generation
				Labour Component	Material Component	Total	
1	2	3	4	5	6	7	8
A	Management Cost 10%						
1	Administrative Cost – TA & DA Hiring of Vehicles, Official Expenditure Electricity & Phone bill Computer, Stationery and office consumable materials & contingency	1200	-	-	8.232	8.232	-
2	Monitoring	120	-	-	0.8232	0.8232	-
3	Evaluation	120	-	-	0.8232	0.8232	-
	Sub Total	1440		-	9.8784	9.8784	-
B	Preparatory Phase 10%						
1	Entry Point Activities 4%	480	-	0.6586	2.6342	3.2928	659
2	Institutional & Capacity Building 5%	600	-	-	4.1160	4.116	-
3	Detailed Project Report 1%	120	-	-	0.8232	0.8232	-
	Sub Total	1200	-	0.6586	7.5734	8.232	659
C	Watershed Work Phase						
a	Watershed Development Works						
1	Graded, Contour & Field Bunds	3000	78	2.340	-	2.340	2340
2	Gully Plug, Earthen Checkdam /WHS	7500	130	6.825	2.925	9.750	7325
3	Submergence bunds	4000	111	4.440	-	4.440	4440
4	Peripheral Bund	3500	110	3.850	-	3.850	3850
5	Earthen Water Harvesting Bund	9000	137	7.398	4.932	12.330	7817
6	Renovation of existing Bunds	3000	85	2.550	-	2.55	2550
7	Renovation of existing W.H.B	-	-	-	-	-	-
8	Aforestation and Development of silvi postural system	15600	25	0.780	3.12	3.90	780
9	Dry Land Horticulture	20000	10	0.460	1.60	2.00	400
10	Community Pound (Renovation)	-	-	-	-	-	-
	Sub Total		686	28.583	12.577	41.16	29502
B	Livelihood Programme (Community Based) 7.620						
	Income generating activities through SHG's for landless and marginal farmers 10%						
1	Live stock development activities	200	-	-	1.3723	1.3723	-
2	Bee Keeping	100	-	-	0.6857	0.6857	-
3	Poultry Farming	200	-	-	1.3723	1.3723	-
4	Nursery Development	300	-	-	2.0580	2.0580	-
5	Vegetable Production	100	-	-	0.6857	0.6857	-
6	Milk Dairy Promotion Unit	200	-	-	1.3723	1.3723	-
7	Establishment of Vermi compost Unit	100	-	-	0.6857	0.6857	-
8	Sub Total	1200	-	-	8.2320	8.2320	-
C	Production System and micro Enterprises						
1	Crop production, diversification of agriculture and introduction of agro forestry	1170	-	-	8.0262	8.0262	-
2	Demonstration of improved composting system	390	-	-	2.6754	2.6754	-
	Sub Total	1560	-	-	10.7016	10.7016	-
D	Consolidation Phase 5% Sub Total						
	Grand Total	12000	686	29.2416	53.0784	82.320	30161

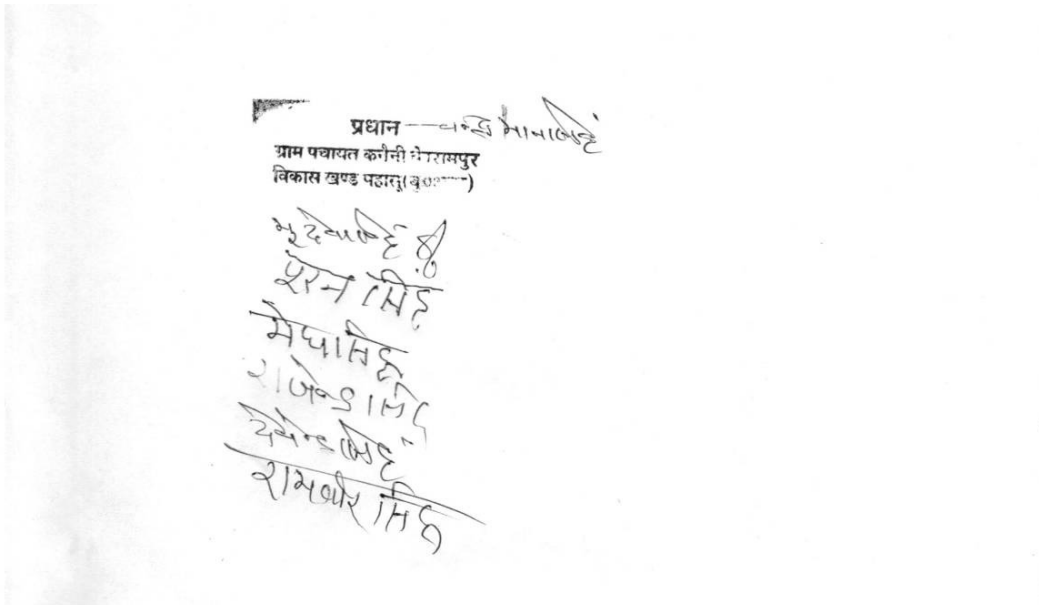
संकल्प पत्र

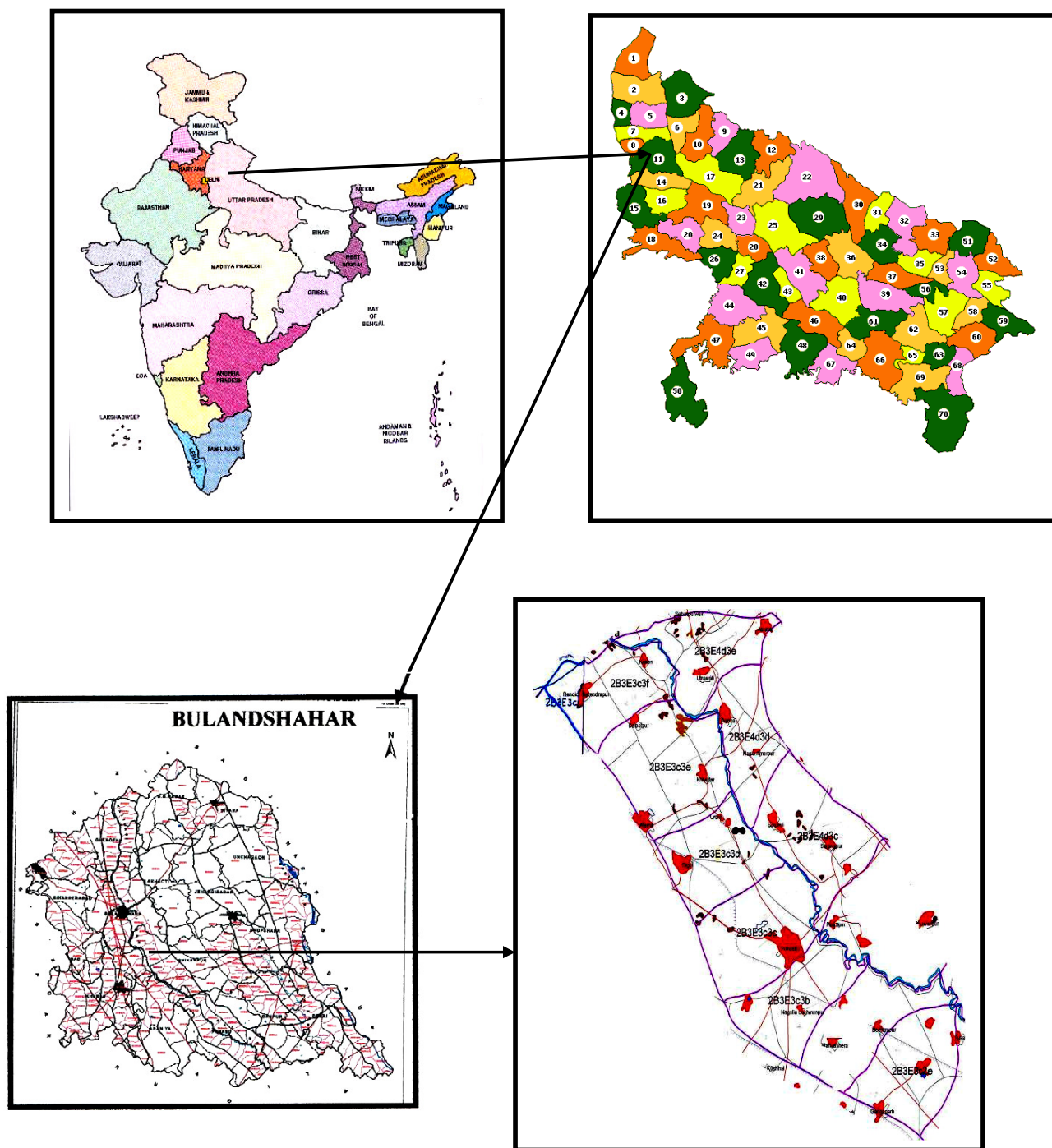
ग्राम पंचायत — वेदरामपुर कोड सं० 2B3E3c2e विकास खण्ड —पहासू जिला — बुलन्दशहर

यह कि आई०डब्लू०एम०पी० परियोजना में तैयार की गयी निर्माण की नयी सृजित परिसम्पत्तियों को ग्राम पंचायत वेदरामपुर एवं माइक्रो वाटरशेड के अन्तर्गत सम्मिलित ग्रामों में योजना क्रियान्वयन कराने एवं योजना उपरान्त चालू रखने तथा सृजित परिसम्पत्तियों के अनुरक्षण हेतु कृत संकल्प एवं इच्छुक है।

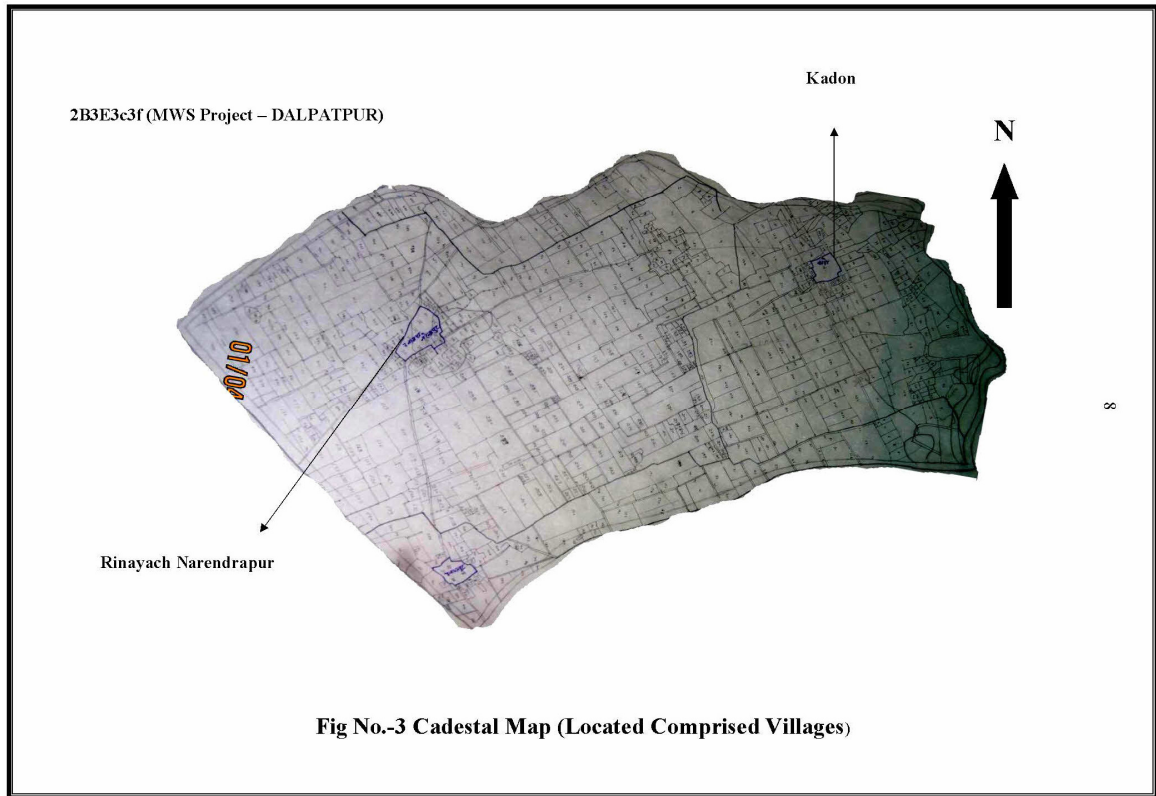
वेदरामपुर ग्राम पंचायत के सभी स्रोत स्थल जैसे तालाब, ग्रामसभा गोचर (चारागाह), जल संसाधन, जंगल आदि में भूमि विकास परियोजना के अन्तर्गत किये जायेंगे। उन कार्यों को समाज के कमजोर वर्ग जैसे अनुसूचित जाति/जनजाति, महिला वर्ग एवं अल्प भूमिहीन गरीबी रेखा के नीचे के लाभार्थियों को लाभ पहुँचाने हेतु इच्छुक होंगे।

हम योजना संचालन हेतु प्रस्तावित करते हैं एवं सहमति देते हैं कि भारत सरकार के समस्त मार्गदर्शी सिद्धान्तों के अनुपालन में कार्य सम्पन्न करायेगें यह भी घोषित करते हैं कि चयनित क्षेत्र जिसको मेरे द्वारा भलीभाँति देखा गया है, और प्रस्तावित योजना में प्रस्तावित समस्त कार्य 15 सालों से नहीं कराया गया है जिसकी मुझे पूर्ण रूप से जानकारी है और अनुमोदन करते हैं।





Index Map of the Watershed





```
ERROR: undefined
OFFENDING COMMAND: f'~

STACK:
```