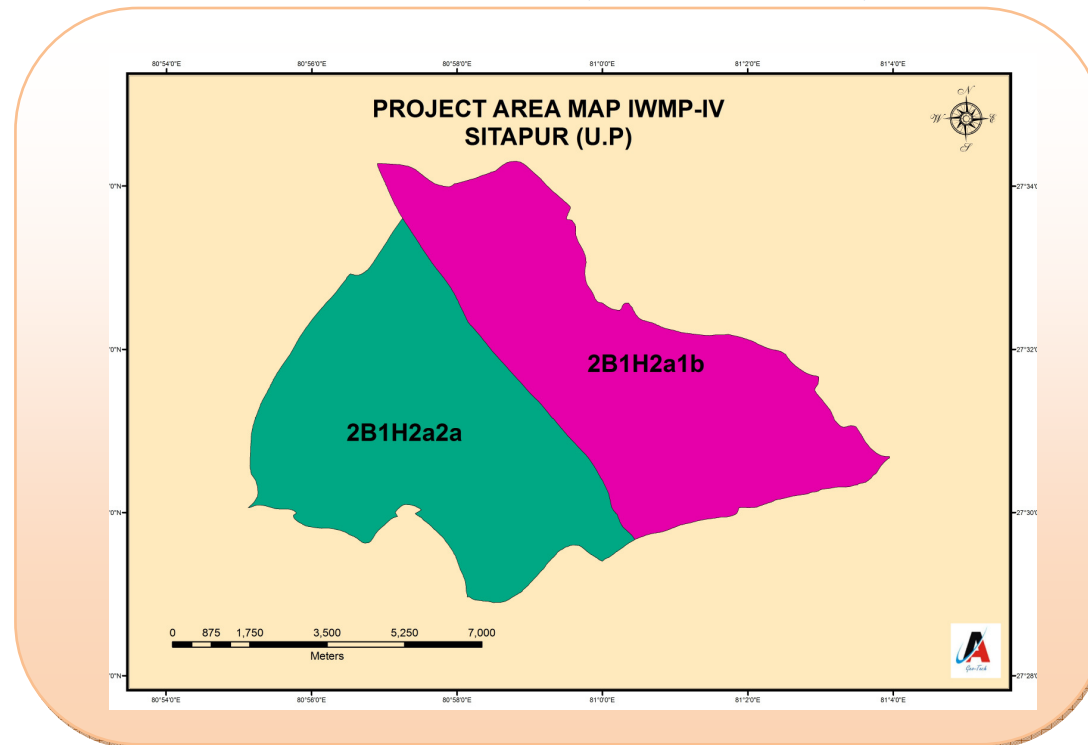


DETAILED PROJECT REPORT (D.P.R.)

(I.W.M.P. 4th - SITAPUR)

INTEGRATED WATERSHED MANAGEMENT PROGRAMME BLOCK- SAKRAN, BISWAN, PARSENDI
DISTRICT - SITAPUR (UTTAR PRADESH)



Submitted to: -
Department of Land Development &
Water Resources Lucknow (U.P.)



Prepared By:-
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Land Development & Water Resources Government of U. P. Lucknow

EXECUTIVE SUMMARY

ABOUT THE PROJECT AREA

The watershed management plan of Ghagra river having code No. 2B1H2a1b, and 2B1H2a2a is located in the South-East of the district Sitapur and lies between latitudes N 27° 29' 13.5" to 27° 34' 43.072" & E 80° 52' 52.50". To 81° 03' 8.47". longitude while altitude ranges between 248 to 279 ft. above the mean sea level(MSL) .The watershed identification has been done by the State Department under NWDPRA schemes. The selection coding and their prioritization has also been done on the basis of the different technical and social parameters of watershed selection. There are 47 villages of Sakran, Biswan, Pahla C.D.Block which forms the part of the watershed with an area of 7675.13 hectare.

The watershed falls in the Mid Plain Agro climatic Zone. This is characterized by the largest zone of highly productive alluvial soils, high fertility with intensive irrigation and increased cropping intensity. The soils vary widely from sandy loam to clay loam. The average rainfall of the zone is 898 mm and the temperature ranges from 4.5 °C to 45 °C. Monthly relative humidity ranges from 33% to 86% (annual mean 67%)

The main source of livelihood is the Agriculture. The crops of the zone are rice, wheat, maize Black gram (urd), lentil, rape seed, mustard, potato and sugarcane. The erratic nature of the rainfall, with maximum 80% during rainy season with an 65% of runoff creates problems for irrigation of winter crops. Beside runoff, lack of proper cover on sloping land is main reasons for the low crop productivity and poor livelihood of the area. In the project suitable measures has been recommended to overcome these shortcomings.

After collecting the primary & secondary data, major watershed problems were identified and considering management possibilities the priority has been given to areas having critical conditions due to soil erosion and are close to main stream, storage and rehabilitation of existing reservoir etc. The management plan has been given in the foregoing paras taking the capital problem of the farmers.

INSTITUTIONAL ARRANGEMENTS:-

Because of the people of watershed area having different levels of literacy, knowledge, attitudes, perception and capabilities an organization as per guideline like watershed committee(W.C) has been formed through which community decisions are to be implemented. This WC shall offer a forum to interact, disseminate the implications of integrated watershed management to people in general. It has also been envisaged that WC shall promote and support creation of other functional institutions like SHG & Users groups (U.G). It has also been ensured that wide representation covering all sections of the community as per GOI, New Guide line for Watershed Development Projects 2008 is achieved. The details of institutions formed are given in table ES-1.

Table : -1 Details of Institutions:-

S. No.	Name of watershed	Code No.	U.G. (No.)	SHG (No.)	WDT (No.)	PIA	WC (No.)
1	Ghagra	2B1H2a1b	20	10	1	1	8
2	Ghagra	2B1H2a2a	24	12	1	1	10
		Total	44	47	2	1	18

Budget component: The estimated budget on different components are given in table ES-2

Table: ES-2 Budget components

S. No.	Budget Component	Total (Lakhs Rs)
A	1. Administrative 2. Monitoring 3. Evaluation	79.764 7.9764 7.9764
B	Preparation of DPR	7.9764
	E.P.A	31.9056
	Preparatory Phase & C.B	39.882
C.	WATERSHED WORKS	398.82
(i)	Livelihood Programm	79.764
(ii)	Production System and micro-enterprises	103.6932
D.	CONSOLIDATION PHASE	39.882
	GRAND TOTAL	797.64

PROJECT AT A GLANCE

1.	Name of Project	-	I.W.M.P. 4 th Sitapur
2.	Name of Block	-	Sakran, Biswan, Parsendi
3.	Name of District	-	Sitapur
4.	Name of State	-	UTTAR PRADESH
5.	Name of watershed	-	Ghara
6.	Name of Concern villages	-	Kamapur, Rajapur, Dharampur, Mithmani, Kotra, Budhanpur, Pachghara, Jalalpur, Mahmoodpur Bazar, Saraiya kala, Nakara, Hailatpur, Parsehara, Tewra, Bharkudi, Essepur, Kalhapur, Mahmdapur, Bannikaralla, Pura Dasapur, Intedaha, Mauzuddinpur, Guresh
7.	Code of Micro Watershed	-	2B1H2a1b, and 2B1H2a2a
8.	Total area of watershed	-	7617.00 ha.
9.	Proposed area for treatment.	-	6647.00 ha.
10.	Cost per hectare	-	Rs. 12000.00
11.	Project period	-	2010-11 to 2014-14
12.	Total Cost of Project	-	Rs. 797.64 Lacs
13.	Proposed Mandays	-	319000 Nos.

Chapter- 1

Project Background

1.1: Project background:

Ghagra river watershed delineated with code number **2B1H2a1b**, and **2B1H2a2a** falls in Mid Plain Agro-climatic Zone of U.P. having constraints in rainfall, which limited to average 863 mm rainfall. Out of this about 80% rain occurs during July-August. Remaining rainfall is of erratic in nature and about 4147 Hectare of land of watershed remains unirrigated. This unpredictable behavior of rainfall suffers the productivity of crops thereby the livelihood of the people and animals of watershed area

1.2: Need and scope of watershed Development:

Soil water and vegetation are the most vital natural resources for the survival of man and animals. To obtain the maximum and optimum production off all these three resources, it has to be managed efficiently.

For efficient management of these resources one has to look for suitable unit of management so that these three resources are handled and managed effectively, collectively and simultaneously on the basis of watersheds. Soils can be managed on the basis of soil series or type or any other convenient unit of land; vegetation can be managed on forest type- subtype or similar classification for trees and grasses etc; while water can be managed if a watershed is taken as unit. Since soil and vegetation can also be conveniently and effeciently managed in this unit, hence the watershed is considered the ideal unit for managing these three vital resources of soil, water and vegetation.

People and animals are part of watershed community. All depend on the watershed and they in turn influence what happens there- whether of good or bad. What happens in a small watershed also affects the larger watershed. A watershed affects the people in every sphere of life. The sustained productivity of food, fuel, forage, fibre, fruit and water by the management of vital resources of water, soil, vegetation and phenomena like floods and droughts are determined by the nature of watershed functioning.

Watershed deterioration takes place due to the uncontrolled, unplanned, unscientific land use and

activities of men: like agriculture land where cultivation is done without adequate precautions on sloping land, stream banks, cultivation of erosion permitting crops, while forest land by clear felling on steep slopes; drastic thinning of plantations along slopes, The grass land are with excessive grazing etc.

Non cooperation of the people and ignoring the people is most important factor. Without the people's cooperation, no watershed can remain managed. The consequences of watershed deterioration leads to low productivity of land with respect to food, fuel, fodder, forage, fiber and fruits. It will also lead and cause erosion and denudation within and outside of the watershed, quick siltation of reservoirs, lakes etc, poor quality water frequent floods and droughts along with affect on health of people. With these entire if and but it is obvious that community participation is essential for successful implementation of as well as for the maintenance of community assets created under the project.

In this watershed project having code No. 2B1H2a1b, and 2B1H2a2a all envisaged shadows have been totally cared off by creating adequate peoples participation by their involvement in all decision making activities for the development of the watershed. To obtain these objectives the project report contains the process of awareness creation and organising the people by intensifying training and also technical services.

The watershed, having code No. 2B1H2a1b, and 2B1H2a2a has an area of 9730.30 ha. It is located in South East Part of District-Sitapur of U.P. It has been under taken by Bhoomi Sanrakshan Adhikari, Department of Land Development & Water Resources Sitapur for Integrated Watershed Management Programme (IWMP) from the year 2010-11 The project is proposed to be completed by 2014-15. The L.B. Chauka or Sharda watershed is situated in Sakran, Biswan, Parsendi Block of Sitapur district (U.P.) . The watershed comprises of 47 village, Kamapur, Rajapur, Dharampur, Mithmani, Kotra, Budhanpur, Pachghara, Jalalpur, Mahmoodpur Bazar, Saraiyakala,, Nakara, Hailatpur, Parsehara, Tewra, Bharkudi, Essepur, Kalhapur, Mahmdapur,

Bannikaralla, Pura Dasapur, Intedaha, Mauzuddinpur, Guresh The Area lies between between latitudes N 27028'53.5 sec. to 270 34'1.65 sec & E 800 55' 9.15 Sec. To 810357.37sec. longitude Total Area of the watershed is 7675.13 ha (Proposed Area for treatment is 6647.00 ha).Altitude(Elevation) ranges between 101 to107 above MSL. About 80% of the land in the watershed is predominantly agriculture. The area in the watershed is sloping towards river Ghaghra. The soils of the watershed is mainly sandy loam and clay loam.

Table.1: Basic Project information

Name of Project	District	Community Development Block	No of Village	No of MWS	Watershed Area (Ha)	Proposed Area	Treatable Area (Ha)	Cost Estimate (Rs in Lacs)
IWMP 4 th	Sitapur	Sakran, Biswan, Laharpur	47	2	7675.13	7617.00	6647.00	797.64

Weightage for selections of watershed

Watershed Development Programme is prioritized on the basis of thirteen parameters (as per Do LR's instructions) namely1- poverty index,2- percentage of Sc/ST,3- actual wages, 4- percentage of small and marginal farmers, 5-ground water status,6 moisture index , 7-area under rain fed agriculture, 8-drinking water situation in the area, 9-percentage of degraded land,10-productivity potential of the land, 11-continuity of another watershed that has already developed / treated,12-cluster approach for plain and 13-hilly terrain, Based on these thirteen parameter a composite ranking has been given below:

Table 2: Weightage of the project

Project Name	Project Type	Weightage														Total
IWMP-4 th	Eastern plain	pov erty index	percent age of Sc/ST	act ua l wa ges	percen tage of small and margi nal farmer s	grou nd wat er stat us	mois ture inde x	area und er rain fed agri cult ure	drin king wat er situ atio n in the area	perce ntage of degr aded land	produ ctivit y potent ial of the land	continui ty of another watersh ed that has already develop ed / treated	clus ter appr oac h for plai n	hilly terrai n	78	
		5.0	10	5	10	5	0	10	5	5	10	5	0	N.A.		

Table 2.1 Criteria and weightage for selection of watershed

S.No .	Criteria	Maximu m Score	Ranges and Score			
i	Poverty index (% of poor to population)	10	Above 80% (10)	80-50% (7.5)	50-20% (5)	Below 20% (2.5)
ii	% of SC/ST Population	10	> 40 % (10)	20-40 % (5)	< 20 % (3)	-
iii	Actual wages	5	Actual wages significantly lower	Actual wages significantly	-	-

			than minimum wages (5)	higher than minimum wages (0)		
iv	% of small and marginal farmers	10	> 80 % (10)	50-80 % (5)	< 50 % (3)	-
v	Ground water status	5	Over exploitation (5)	Critical (3)	Sub critical (2)	Safe (0)
vi	Moisture index	15	-66.7 & below (15)	-33.3 to-66.6 (10)	0 to -33.3 (0)	-
vii	Area under rainfed agriculture	15	> 90 % (15)	80-90 % (10)	70-80 % (5)	< 70% (Reject)
viii	Drinking water	10	No source (10)	Problematic village (7.5)	Partially recovered (5)	Fully covered(0)
ix	Degraded land	15	High-above 20% (15)	Medium-10-20% (10)	Low less than 10% (5)	-
x	Productivity potential of the land	15	Land with low production & where productivity can be significantly enhanced with reasonable efforts (15)	Land with moderate production & where productivity can be enhanced with reasonable efforts (10)	Land with high production & where productivity can be marginally enhanced with reasonable efforts (5)	-
xi	Contiguity to another watershed that has already been developed/treated	10	Contagious to previously treated watershed & contiguity within the micro watershed in the	Contiguity within the micro watershed in the project but non contagious to previously treated	Neither contagious to previously treated watershed nor contiguity within the micro watershed in the	-

			project (10)	watershed (5)	project(0)	
xii	Cluster approach in the watershed	15	Above 6 micro watershed in the cluster (15)	4 to 6 micro watershed in the cluster (15	2 to 6 micro watershed in the cluster (15	-
xiii	Cluster approach in the hills	15	Above 5 micro watershed in the cluster (15)	3 to 5 micro watershed in the cluster (15	2 to 3 micro watershed in the cluster (15	

Objectives and Scope of Project

The objectives and scope of the project is enumerated below:

Conservation, development and sustainable management of natural resources including their use

Enhancement of agriculture production and productivity in a sustainable manner.

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

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

Creation of sustainable employment opportunities for the rural community for livelihood security.

3 Watershed Information

The details of type of watershed and micro watershed along with their code and area is as under:

S. No.	Name of the Project	Type of watershed	Micro watershed Name	Code	Area (ha)
1	IWMP-4 th Sitapur	Micro watershed	Ghagra river	2B1H2a1b	3867.73
2		Micro watershed	Ghagra river	2B1H2a2a	3865.53

Source: secondary data

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

The Status of previous watershed programme was limited to the activities related to Mahatma Gandhi National Employment Guarantee Scheme, Swarn Jayanti Gram Swarajgar Yojna (SGSY) and REGS etc. Under these schemes only earth works related to village link roads and cleaning of village drains were carried out. These schemes were for the employment of land less & BPL class people. So far no concrete work on watershed basis was carried out in IWMP 4th Sitapur

Details of employment schemes are given below

Table 4 - Developmental Programmes running in the project area

S. No.	Name of Programmes/Scheme	Sponsored Agencies	Objectives	Commencement (year)	Village Covered
1	MGNREGS	Rural Development Dept.	Employment	2009	58
2	IAY	Rural Development Dept.	Housing	2005	49
3	SGSY	Rural Development Dept.	Self employment	1999	27

Source: Primary data

Chapter- 2

Project Implementing Agency

2.1 PROJECT IMPLEMENTING AGENCIES

U.P. Government, Land Development Water Resources Department Section-1 Lucknow has nominated as PIA to Bhoomi Sanrakshan Unit, Land Development Water Resources Department Sitapur for IWMP 4th vide letter no-666(10)/54-1-10-1(9)02008 dated 25-05-2010

Table. 5: Project Implementing Agency (PIA)

S.No.	Particulars of PIA	
(i)	Date of selection of PIA	25.05.2010
(ii)	Type of organization	Govt. organization
(iii)	Name of organization #	DoLR
(iv)	Designation & Address	BSA, IWDP, Sitapur

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

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

2.2 Project Implementation Strategy

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

Participatory Rural Appraisal (PRA)

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

questionnaires. Various tool like matrix ranking, Venn diagramme were used to identify various local vegetation (apt for afforestation), fodder crops, various institution and their significance in the life of the farmers.



Village – Mujuddinpur

Problem identification and prioritization for watershed

S.N	Problem	Rank
1.	Low production of field crops	7.5
2.	Lack of drinking water	5

3.	Lack of irrigation water	5
4.	Lack of fodder availability	10
5.	Non-availability of fuel wood	0
6.	Lack of inputs like quality seeds, fertilizer, pesticides etc.	0
7.	Lack of market facility	10
8.	Lack of medical, educational and transportation facilities	7.5
9.	Medical and Health care facilities for and low animal productivity.	10

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

Table. 6: SWOT analysis of the Micro Watersheds

Strengths (S)		Weakness (W)	
1	Cooperative work culture in traditional activities.	1	Poor water management
2	Close ethnic ties	2	Resource poor farmers

3	Road at the top as well as outlet of the watershed	3	Migration of youth
4	Hard working	4	Low and erratic rainfall
5	Resource pool of crop genetics diversity	5	Fragile geology
6	Awareness of farmers about watershed management programme	6	Fragmented land holding
7	Well established CPR maintaining and sharing system	7	Heavy infestation of wild animals
8	Stall feeding of animals	8	Problem of fuel and fodder
9	Social outlook of the community towards land less		
Opportunities (O)		Threats (T)	
1	Wide range of annual and perennial crops	1	Prone to adverse climate like drought and flood
2	Scope of regular employment opportunities to check out migration	2	High market risk
3	Strengthening of existing irrigation system	3	Social conflicts owing to PRI and WSM polices and local politics
4	Conducive climate for rainfed crop	4	Weak coordination among line departments

	diversification		
5	Good scope for Agro forestry and dry land horticulture	5	Leadership enmity in Panchayat elections
6	Potential for collective action and management of CPR	6	Influence of politics in W.C.

Table.7 Detail Staffing Pattern of PIA:

S.No.	Name	Designation	Qualification	Experience (Year)
1	Sri Anil Kumar Verma	Soil Conservation Officers	Diploma in Ag. Engg.	30
2	Sri Ran Naresh Verma	Junior Engineer	Diploma in Ag. Engg.	30
3	Sri Satya Prakash Sing	Junior Engineer	Diploma in Ag. Engg.	30
4	Sri Vijay Kumar Gupta	Accountant	M.Com.	30
5	Sri Raja Bax Sing	Accountant	B.Com, L.L.B.	30
6	Sri Harishchandra	Drought Man	Inter Mediate, I.T.I.	07
7	Sri Vijay Kumar Srivastava	Junior Clerk	Inter Mediate	30
8	Sri Viredra Pratap Sing	Junior Clerk	Graduation	30
9	Sri Subodh Kumar Sharma	Junior Clerk	B.Sc. Ag (Hons.)	07
10	Sri Vijay Pal Singh	Tracer	Inter Mediate	30
11	Sri Deena Nath Dubey	Tracer	Graduation	30
12	Sri Badri Singh	Assistant Soil Conservation Inspector	B.Sc. Ag (Hons.)	30
13	Sri Shailendra Kumar	Assistant Soil Conservation Inspector	B.Sc. Ag (Hons.)	02
14	Sri Mo. Tahir	Driver	literate	30

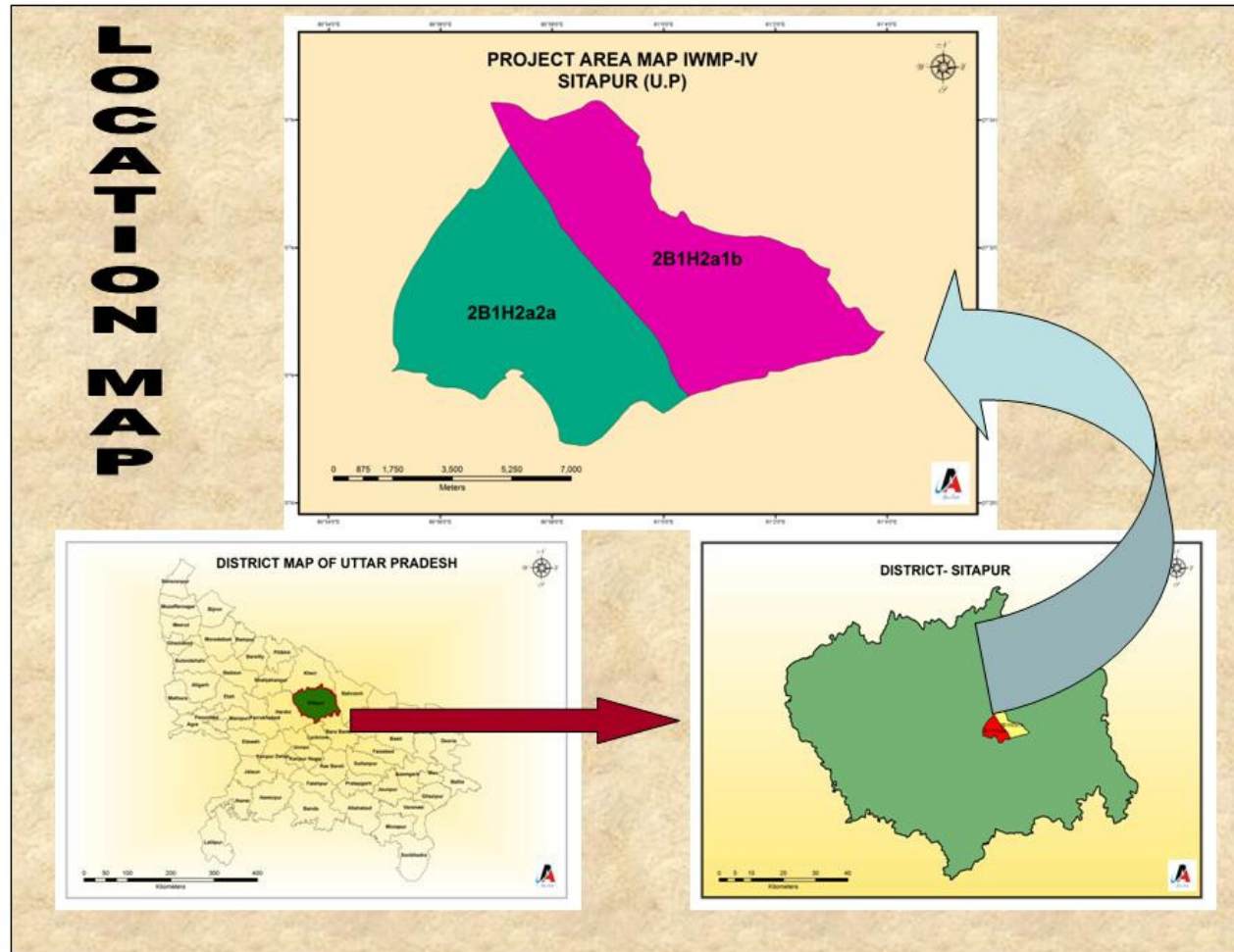
15	Sri Ram Bachan Ram	Work Incharge	Inter Mediate	30
16	Sri Shailesh Kumar Srivastava	Work Incharge	B.Com.	New
17	Sri Durga Prasad Verma	Work Incharge	High School	30
18	Sri Ravendra Pratap Singh	Work Incharge	High School	30
19	Sri Mastram Verma	IV Th	High School	30
20	Sri Jay Singh	IV Th	Junior High School	30
21	Sri Amar Nath Tiwari	IV Th	literate	30

Chapter- 3

Basic Information of the Project Area

Location:

The three micro watersheds namely 2B1H2a1b, and 2B1H2a2a are located in Sakran, Biswan, Parsendi block of Sitapur District (U.P.) at a distance of 26 Km from District headquarters and 8 Km from block headquarter. These watershed lies between latitudes N $27^{\circ}28'53.5$ sec. to $27^{\circ}34'1.65$ sec & E $80^{\circ}55'9.15$ Sec. To $81^{\circ}03'57.37$ sec. longitude. Following 23 villages are part of watershed namely Kamapur, Rajapur, Dharampur, Mithmani, Kotra, Budhanpur, Pachghara, Jalalpur, Mahmoodpur Bazar, Saraiyakala,, Nakara, Hailatpur, Parsehara, Tewra, Bharkudi, Essepur, Kalhapur, Mahmdapur, Bannikaralla, Pura Dasapur, Intedaha, Mauzuddinpur, Guresh. Approach road to the watershed is all weather road from Sitapur to Sidhauli 40 Km and from Sidhauli. to watershed area 28 Km: The land mark of the watershed is the chinni mill of Biswa which forms the ridge of the watershed which drains to river Sumli. The gross area of the watershed approximately 63 Sq.Km.



Problem Identification and prioritization

Food sufficiency, economic growth and environmental security were identified as the major issues to be addressed in the watershed area. The area has slopy topography hence highly prone to soil erosion. Lack of irrigation water is the greatest problem experienced by the people followed by low production of field crops, lack of fodder availability and low animal productivity Problems identified and prioritized during the transact walk and PRA exercises in all 23 villages of watershed viz: Kamapur, Rajapur, Dharampur, Mithmani, Kotra, Budhanpur, Pachghara, Jalalpur, Mahmoodpur Bazar, Saraiyakala,, Nakara, Hailatpur, Parsehara, Tewra, Bharkudi, Essepur, Kalhapur, Mahmdapur, Bannikaralla, Pura Dasapur, Intedaha, Mauzuddinpur, Guresh were pooled and a list of nine problems representing the whole watershed has been prepared. Problems were ranked as per their total weightage in these villages.

3.2 AREA: LAND USE PATTERN

Land is non- renewable resource that supports all primary production system as well as provides essential social environment in terms of shelter roads and other facilities. It is scarce and in expansible resource which has to be managed judiciously to meet various competing demands.The IWMP 4th watersheds has diversified land uses namely agriculture, waste lands (open scrub), seasonal water bodies etc. The varied present land use and area under different categories in watershed is shown in Table 5.

Table 18: Land use pattern**Area in hectare**

S.N	Name of project	No. of Micro Watershed	Geographical area	Forest	Watershed area	Treatable Area	pasture	Wastelands		Rainfed area
								Culturable waste	Unculturable waste	
1	IWMP 4 th	2	7675.13	1.35	7617	6647	-	1620.00	108.00	6685.00

Source : ppr

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

S.N	Name of Project	No. of Micro Watershed	Geographical area(Ha)	Watershed area(Ha)	Forest area(Ha)	Pasture land(Ha)	Wastelands		Land suitable for Agriculture (Ha)	Rain fed Area (Ha)	Proposed Area for treatment (Ha)
							Culturable waste (Ha)	Unculturable (Ha)			
1	2	3	4	5	6	7	8	9	10	11	12
1	IWMP 4 th	2	7675.13	7617.0	1.35	-	1620	108	6845	6685	6647

Source: Primary data

Various agricultural land uses in the present watershed are extended to diversified land capabilities starting from marginal to good class (I-II) lands. The watershed distinctly has three types of lands i.e.

levelled, sloping, degraded and undulating. The agriculture is practiced on all these land having different land capabilities the productivity on these lands considerably varies. The total area under agriculture use in the watershed is about 6845 ha out of which about 10% area is irrigated while 6685 ha is under rain-fed agriculture. The water, both for irrigation and drinking is most scarce natural resource in the watershed. The problem of tube wells for irrigation of agricultural crops frequently leads to the drinking water problem to the farmers of watershed forcing them to carry drinking water from out side the watershed area. The field bunds are quite common in the watershed areas. These bunds having no technical specification frequently breach on heavy rains which leads to heavy runoff depriving in-situ moisture conservation in the rainfed area.

3.3 : PHYSIOGRAPHY

The watershed falls Indo Gangetic Plain, one of the two physiographic regions. Total area of the IWMP 4th Sitapur is 7617.00 ha with problem area of 6647.00 ha. Elevation range and location of altogether the three micro watershed shed are given in table -6:-

Table. 6: Elevation range, longitude latitude, relief height difference etc*

Location of watershed						Elevation of watershed from MSL		
District	Mandal	Micro watershed	Habitation	Longitude	Latitude	Highest	Lowest	Relief height difference
Sitapur	Lucknow	Ghagra 2B1H2a1b	Kamapur, Rajapur, Dharampur, Mithmani, Kotra, Budhanpur, Pachghara, Jalalpur, Mahmoodpur Bazar, Saraiya kala,	E 80° 55' 9.15 Sec. To 81° 03' 57.37 sec.	N 27° 28' 53.5 sec. to 27° 34' 1.65 sec	102.00	107.00	5.00

Sitapur	Lucknow	Ghagra 2B1H2a2a	Nakara, Hailatpur, Parsehara, Tewra, Bharkudi, Essepur, Kalhapur, Mahmdapur, Bannikaralla, Pura Dasapur, Intedaha, Mauzuddinpur, Guresh	E 81°00' to E 81° 17'	E 80°55' 9.15 Sec. To 81°35' 7.37sec.	101.50	107.00	5.50
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Source: Remote sensing & GPS Data

3.2.1 Soil and Topography

The three micro watershed of IWMP 4th is located south west corner of the Sitapur district. The entire watershed is topographically divided into three major landforms accordingly; the soils of watershed have been grouped in three major categories.

- 1 Plain land
- 2 Sloppy land
- 3 Eroded land

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

3.2.4.Land Capability Classification (LCC)

Land capability classification was done to classify the soils of the watershed in different groups based upon the limitations and to emphasize prevailing in the watershed under different kinds of soils. Initially reconnaissance survey was carried out for entire

watershed in order to find out the different topo-sequences, landforms, soil depth and erosion hazards. This was followed by the detailed investigation of selected landforms to bring out the LCC classes of the Micro Watershed. Three classes of land capability namely II, III and IV were demarcated in the IWMP 4th watersheds. The areas under different classes are shown in table and figure.

Table 16: Area under different land capability class under micro watersheds

Land Capability Class	Area (ha)
I	3168.20
II	2070.80
III	1120.50
IV	1257.80
Total	9730.30

3.2.4.1. Land capability class I (White)

This group is one of the most extensive LUC class of the watershed. This group of soil is occupying around 6845.00 ha of the Agricultural watershed area. The soils are Sandy loam or silty clay loam in texture. The land under this class is nearly level to mild sloping (<1

%). These soils are deep and erosion hazard is slight. Most of the productive agriculture land comes under this class A These lands have no major limitations and except occasional water logging. During rabi season, the water is drained out and cultivation is carried out. These lands are potentially very productive. The mapping unit for this class is given as under.

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

3.2.4.2 Land capability class II (whitish yellow)

A considerable area of watershed i.e. $3168.00+2070.20=5238.80$ ha is under class I & II. This class is found in lower portion of watershed. The soils are coarser in texture (loamy sand/sand), deep, susceptible to erosion hazard and undulating in topography. Rill and initiation of gully can be seen near the outlet of the watershed. mapping unit for this class is as follows.

Land capability class IIe=ls-d5-e3.IVes= ls-d3/D-e2

3.2.4.3. Land capability class III/IV (Greysh yellow)

These lands are occupying an area of $(1120.50+1257.70= 2378.20)$ ha of the watershed. This class of land is mostly found near drainage terrain of watershed. The soils are found under this class. Class III and IV are intermixed in the watershed. Mostly class IV (926.80 ha) lands are located near drains, where soil depth is limited. The mapping unit for

this class of land is as follows:

Land capability class IIle= gls-d1/H/I-e3,e4

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

Table. 15: Morphology of a typical soil profile of micro watershed (dominant soil)

Horizon	Depth (cm)	Morphology
A	0-150	Light yellow colour 28% with free NaCO ₃ , Sticky when moist, hard when dry, high elasticity, fissures and cracks, occasional occurrence of free calcium carbonate granules ph 8.3-8.7
B	150-600	Grayish -yellow in colour,. very fine mixed with free CaCO ₃ and granules, very hard when dry, compact & indurate hard pan, restricting development of root and downward water transmission
C	> 600	Sandy Clay

3.3.1 Major stream

The watershed is having moderate slope and drains in Sumli tributary of Ghagra river. About 35 % of watershed area has more than 1% slope. While lower portion of the watershed has moderate slope (less than 1 %). at the outlet of the watershed small gullies are noticed , covered with sparse vegetation. In Total (1st order -6 numbers, 2nd order-7 numbers and 3rd order-2 numbers) numbers of streams of different order are found in the watershed, with total stream length of 21300 m. Stream characteristics of watershed are presented in the table 7.

Table No.7: Stream characteristics of watershed (IWMP 4th Sitapur)

Stream order	Stream number	Main stream length (M)
1 st order	6	3200.00
2 nd order	5	4300.00
3 rd order	2	13800.00
Total	15	21300.00

3.4 CLIMATE

The watershed falls under the semi-arid region of tropical climate. The average annual precipitation is 863 mm spreading over about 90 rainy days. Most of the rainfall (about 85 %) is received during July to September. The rainfall occurs with moderate to high intensity. The area receives scanty rainfall in the winter season. The temperature variation ranges as high as 42°C in the month of May-June to as low as 4°C in December- January. The details of climatic data collected from Pune for the year

1972 to 2003 is annexed at-1 for monthwise MMAX,HMAX,MMIN-MIN,TMRF HVTRF,RD,MWS,MEVP &MSSH, For the rest period (2004-2009) the climatic data has been collected and is annexed at-2 The average of three year is given below

3.4.1 Climatic Condition

Table. 8: Climatic Condition

S. No	Name of Project	Name of the block	No.of Micro Watershed	No. of revenue village	Information											
					Average Rainfall and rainy days (in mm)						Temperature (c)			Relative humidity (%)		
					2007		2008		2009		2007	2008	2009	2007	2008	2009
					Avg. in Mm	No. Of Days	Avg. in Mm	No. Of Days	Avg. in Mm	No. Of Days	Min-Max	Min - Max	Min - Max	Min - Max	Min - Max	Min - Max
1	IWMP ^{4th} Sitapur	RampurMathuraMahmoodabad, Pahla,	2	23	850	90	650	72	647	92	36.00	37.9	35	80	82	80

Table -8 A: Reference Evapotranspiration(ETO) for watershed area(modified penman method)

Meteorological station Bareilly.

Year(Average for the year 2001-2009)

Altitude:173 M		Cooordinates:Latitude 28.47N		Longitude 79 24'E		
Month	Max Temp c	Min Temp c	Humidity %	Wind Speed Km/day	Sunsine Hours	ETo- penman mm/day
1	2	3	4	5	6	7
June	38.05	28.90	56.60	3.80	8.75	6.09
July	34.20	26.60	75.50	3.40	5.37	4.43
August	33.50	26.30	75.80	3.20	5.90	4.27
September	32.60	24.60	78.80	2.60	7.80	4.39
October	32.50	19.90	67.20	1.60	9.80	3.50
November	29.10	14.50	71.20	1.40	9.78	2.30
December	23.40	9.70	77.50	2.20	7.64	1.73
January	20.60	8.46	75.90	2.30	7.94	1.78
February	24.50	11.20	67.20	3.00	7.82	2.69
March	30.70	15.26	55.80	3.70	8.76	4.18
April	36.60	21.30	38.40	3.80	10.10	5.64
May	39.50	25.40	41.10	4.00	10.80	6.66

Table – 8B

Mean Monthly Rainfall in the watershed area(Average for the year 2001-2009)

Month	ETo(mm/day)	Rainfall(mm/month)	Effective Rainfall (mm/month) (computer based)
1	2	3	4
June	6.09	98.60	83.0
July	4.43	278.90	152.90
August	4.27	375.70	162.60
September	4.39	199.20	135.70
October	3.5	23.10	47.20
November	2.3	5.20	5.20
December	1.73	17.70	17.20
January	1.78	33.70	31.90

February	2.69	44.80	41.60
March	4.18	18.20	17.70
April	5.64	12.70	12.40
May	6.66	29.60	28.20
Total	47.66	1137.40	710.60

Table – 8C

Reference: Irrigation Crop water Requirment by Modified Penman-Method & GIR(Data of IMD Bareilly)

Sl · No	Crop	Crop period		ETo(mm)		Kc for cro p pei od	ETc crop (mm)	Mo nthl y Avg rain fall(mm)	Effect ive rainfa ll(Re) (mm)	Perco lation loss(mm)	Grou nd wate r contr i butio n	Special requirement(mm)				Net irrigatio n require ment(N IR)(mm) (ETc +Spl.)- (Re)- (GW)	\$Fi eld appl icati on effi enc y %	Field irrigati on require ment FIR(m m)/FA E)	Gross irrigation requiremen t GIR(mm)(FIR)/Conv eyance losses)(0.6 7)
				For full mont h	For crop perio d							Nur sery	Field prepat ation	Sta ndi ng wat er	To tal				
1	2	3	4	5	6	7	8	9	10		11	12	13	14	15	16	17	18	19
1	Padd y	Jul y	3 1	137. 3	137. 3	1.1 0	151.0	278 .9	150.0	200#	50	20	200	100	32 0	365.28	80	456.6	681.49 say 681

		Au	3	132.	132.	1.1	149.7	375	149.7										
		g	1	40	40	0		.7											
		Se	3	124.	124.	1.1	146.6	199	127.5										
		pt	0	20	20	0		.2											
		Oc	3	108.	108.	0.9	103.3	473	18.12										
		t	1	50	50	5		.1											
	Total		1	502.	502.		540.6	876	445.3										
			2	40	40		0	.9	2										
			3																
2	Other	Jul	3	137.	137.	0.3	41.2	278	41.0		50	-	100	-	10	114.5	65	176.15	262.92 say
	kharif	y	1	3	3	0		.9							0				263
	(i)So																		
	yabee	Au	3	132.	132.	0.7	92.7	375	92.0										
	n	g	1	40	40	0		.7											
	(ii)Ur	Se	3	124.	124.	1.0	124.2	199	124.0										
	d(iii)	pt	0	20	20	0		.2											
	Til(iv	Oc	3	108.	108.	0.7	81.4	473	18.0										
)Food	t	1	50	50	5		.1											
	er																		
	Total		1	502.	502.		339.5	876	275.0										
			2	40	40			.9											

		3																	

S . N o	Crop	Crop period		ETo(mm)		Kc for cro p pei od	ETc crop (mm)	Mon thly Avg rainf all(mm)	Effe ctive rainf all(R e) (mm)	Perc olati on loss(mm)	Gro und wate r cont ri buti on	Special requirement(mm)				Net irrigati on require ment(N IR)(m m)(ETc) +Spl.)- (Re)- (GW)	\$Fi eld app lica tion effi cenc y %	Field irrigati on requir ement FIR(m m)/FA E)	Gross irrigation requiremen t GIR(mm)(FIR)/Conv eyance losses)(0.6 7)
												Nu rse ry	Field prep atati on	Sta ndi ng wa ter	T ot al				
1	2	3	4	5	6	7	8	9	10		11	12	13	14	15	16	17	18	19
3	Wh eat	Nov	15	69.0 0	34.5 0	0. 3	10.3 5	5.20	5.00	-	50	-	150	-	15 0	308.7 5	65	475.0 0	708.96 say 709
		Dec	31	53.6 0	53.6 0	0. 8	42.9	17.7 0	15.0 0										

		Jan	31	55.2 0	55.2 0	1. 05	58	33.7 0	33.3 0										
		Feb	28	75.3 0	75.3 0	1. 05	79	44.8 0	35.0 0										
		March	31	129. 60	129. 60	0. 95	123. 1	18.7 0	18.0 0										
		April	10	169. 20	56.4 0	0.2 5	14.1	12.7 0	12.4 0										
	Total		14 6	551. 90	404. 60		327. 45	132. 80	118. 70										
	Pea Lent il/Gr am/ Mus terd, fedd er	Nov Dec Jan Feb Mar	30 31 31 28 10	63.0 0 49.0 0 51.4 6 74.2 0 130.	63.0 0 49.0 0 51.4 6 74.2 0 -	0.4 0.7 0 1.0 5 0.5 -	18.9 0 34.3 54 70.5 -	5.20 17.7 0 33.7 0 44.8 0 -	5.00 15.0 0 31.7 0 41.6 	-	50	-	100	-	10 0	134.40	65	206.77	308.61 say 309

	ch		20															
	Total	130	367.86	237.66	-	177.70	101.40	93.30										

Table – 8C

S l · N o	Crop	Crop period		ETo(mm)		Kc for cro p pei od	ETc crop (mm)	Month ly Avg rainfal l(mm)	Effec tive rainf all(R e) (mm)	Perc olati on loss(mm)	Grou nd water contr i butio n	Special requirement(mm)				Net irrigatio n require ment(NI R)(mm)(ETc) +Spl.)- (Re)- (GW)	\$Fie ld appl icati on effie ncy %	Field irrigati on require ment FIR(m m)/FA E)	Gross irrigation requiremen t GIR(mm)(F IR)/Convey ance losses)(0.67)
				For full mont h	For crop perio d							Nur sery	Field prepata tion	Stan ding wate r	Tot al				
1	2	3	4	5	6	7	8	9	10		11	12	13	14	15	16	17	18	19
5	Suga rcane	Feb	15	75.32	40.40	0.50	20.20	44.80	19.20	-	50	-	150	-	150	743.23	70	1061.76	1584.71 say 1585

		Marc h	31	129.5 8	129.5 8	0.7 0	90.70	18.20	17.70										
		April	30	174.8 4	174.8 4	1.0 0	174.8 4	12.70	12.40										
		May	31	206.4 6	206.4 6	1.0 0	206.4 6	29.60	28.20										
		June	30	182.7	182.7	1.0 0	182.7 0	98.60	83.00										
		July	31	137.3 3	137.3 3	1.0 0	137.3 3	278.90	137.3 3										
		Aug	31	132.3 7	132.3 7	1.0 0	132.3 7	375.70	132.3 7										
		Sep.	30	105	105	1.0 0	105.0 0	199.20	105.0 0										
		Oct.	31	108.5	108.5	0.7 5	81.37	23.10	47.20										
		Nov	30	69.00	69.00	0.7 5	51.75	5.20	5.20										
		Dec	31	53.61	53.63	0.7 5	40.47	17.70	17.20										
		Jan	31	55.18	55.18	0.5 0	27.59	33.70	27.50										
	Total		352	1429. 9	1394. 99		1250. 53	1137.4 0	607.3 0										

Field application Efficiency FAE assumed as per table No. 12(A guide line for estimating crop water requirement, published by MOWR, GOI)

3.5 Watershed Characteristics

3.5.1 Shape and Size

The shape of the watershed (IWMP 4th Sitapur) is rectangular. The maximum length and width of IWMP 4th Sitapur watershed is 16500 m and 7000 m, respectively The length: width ratio is 2.25:1

Table 9: Shape and Size of watershed

S.No	Name of the Micro watershed	Code	Area(ha)	Shape	Approximate size in meter		Ratio Length: width
					Length	Width	
1	Ghagra river	2B1H2a1b,	3867.73	Rectangle	16500	7000	2.25:1
2	Ghagra river	2B1H2a2a	3807.40	Rectangle	10200	4500	2.44:1

3.5.2 Length of main stream, drainage density, average slope, watershed relief etc.

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

S.No.	Project Name	Main stream	Drainage Density	Average Slope	Watershed Relief
1	IWMP 4 th Sitapur	I- 3200 meter II- 4300 meter	0.75-1.00 meter/second	0-2.5%	2.5 meter

		III- 13800 meter			
--	--	------------------	--	--	--

3.5.3 DRAINAGE

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

3.3.1 Land holding

Majority of the farmers are in the category of marginal (< 1 ha) and small (1-2 ha) with average land holding of about 1.2 ha. These small land holding are further scattered at distant places, which makes cultivation very difficult. Distribution of farm families according to the size of the land holdings are given in the table.

Table. 17: Distribution of farm families according to their size of landings.

S. No	Name of Micro Watershed	Name of Villages	Land holding			
			Marginal (<1 ha)	Small (1-2 ha)	Large (>2 ha)	Total
1	Ghagra 2B1H2a1b	Kamapur, Rajapur, Dharampur, Mithmani, Kotra, Budhanpur, Pachghara, Jalalpur, Mahmoodpur Bazar, Saraiya kala,	131	275	46	452

2	Ghagra 2B1H2a2a	Nakara, Hailatpur, Parsehara, Tewra, Bharkudi, Essepur, Kalhapur, Mahmdapur, Bannikaralla, Pura Dasapur, Intedaha, Mauzuddinpur, Guresh	653	815	244	1712
Total			1605	1952	561	4118

Source : District statistic magazine

Agriculture:

3.3.2.2. Crop Production and Productivity

Table no. 19 Production and productivities of important crops in IWMP 4th Sitapur

Sl. No	Name of crop	2005			2006			2007			2008		
		A (Ha.)	P (Qtls)	Y (Qt Ha)	A (Ha.)	P (Qtls)	Y (Qt Ha)	A (Ha.)	P (Qtls)	Y (Qt./Ha)	A (Ha.)	P (Qtls)	Y (Qt./Ha)
1	Paddy	1633	50623	31.0	1642	54186	yy	1659	58065	35.0	1680.0	60480	36.0
2.	Wheat	1552	46560	30.0	1558	49856	32.0	1550	46500	30.0	1593.0	52569	33.0
3.	Mustard	118	1121	9.5	121	1089	9.0	120	960	8.0	120.0	1080	9.0

4.	Lentil	20	190	9.5	18	144	8.0	10	75	7.5	5	44	8.5
5.	Pea	23	184	8.0	20	179	8.5	18	162	9.0	19	171	9.0
6.	Potato	20	2960	148.0	23	3565	155.0	47.0	3520	160	23	3406	152
7.	Sugarcane	4750	1805000	380	4734	1917270	405	4737	2150598	454	4676	21135 52	452
	Total	8116			8116			8116			8116		

Source : District statistic magazine

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

The mixed cropping is in practice in limited area with kharif crops like gram and musterd but it is not only irrational but also unscientific and have low productivity. Subsequent rabi crops in general and

mustard crop in particular are raised on residual soil moisture under rain-fed production system. Imbalanced use of fertilizers is common in not only rabi and kharif crops but also in rain-fed and irrigated production system. The recommended deep plowing for enhanced in situ residual soil moisture conservation and higher production is also not followed in the watershed. The shallow ploughing tractor drawn tillage implements are available with the farmers in the watershed but deep ploughing implements yet needed to be introduced. The soil fertility/health restoration practices like green manuring, crop rotations and intercropping specifically with legumes, use of FYM/compost, Vermicompost, bio fertilizers, soil and water conservation measures, use of brought up or in situ mulches are widely lacking in the watershed. The soil and water conservation measures are limited to mechanical/earthen measures created by the state Govt. agencies. Conservation agronomical measures like seeding and plowing across the slope, weed mulching, agro-forestry, vegetative barriers etc also completely lack in the watershed.

3.3.2.1 Agriculture

Watershed deterioration takes place due to the uncontrolled, unplanned, unscientific land use and activities of men. These activities could be as follows :-

Agricultural Land : Cultivation on sloping land without adequate precautions, cultivation- along-nala or stream bank, cultivation of erosion permitting crops, over cropping areas without replenishing soil fertility are the activities which leads to low productivity of land with respect to food,fuel, forage, fibre and

fruit along with quick siltation of waterbodies.

Shifting Cultivation: Shifting cultivation destroys protective and productive vegetation in preference for a very brief period of immediate crop production and results in soil loss and other consequential damages. This practice can cause widespread destruction in the watershed

Various agricultural land uses in the watershed are extended to diversified land capabilities starting from marginal to good class I and II lands. The watershed distinctly has three types of lands i.e. plain, sloping and eroded. The agriculture is practiced on all these soil types though the productivity considerably varies. The total area under agriculture in the watershed is about 6845 ha out of which 160 ha is irrigated while 6685 ha is under rain-fed agriculture. The water (both irrigated and drinking) is most scarce natural resource in the watershed. The problem of tube wells for irrigation of agricultural crops frequently leads to the drinking water problem to the farmers of watershed forcing them to carry drinking water from out side the watershed area. The agricultural field bunds are common in the watershed, however, they frequently breach on heavy rains adversely affecting the in situ moisture conservation.

The agriculture soils in the watershed have diversified texture i.e sandy loam and clay loam through out the watershed. The heavy soils are almost kept fallow during rainy season. The agricultural soils also have hard calcium pan at variable depths. The irrigation water is conveyed in earthen channels and surface irrigation methods following mainly border method or wild flooding method of irrigation by the farmers in the watershed. These factors substantially reduce the water use efficiency of limited available and valuable irrigation water in the watershed

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

Crop rotation

After considering land use and soil type the existing cropping pattern in the rainfed part of watershed is as follows

One year crop rotation

- (i) Fallow-mustard/wheat(ii) Paddy- wheat(iii)Paddy-Toria-potato(iv)Paddy-pea,(v)Paddy-gram

Two year crop rotation

- (i) Paddy-mustard- sugarcane-wheat,(ii)Paddy-sugarcane-wheat (iii) Paddy-Potato-Sugarcane
gram/lentil/winter vegetables

Crop rotation in Irrigated area

One year rotation

- (i) Paddy-wheat (ii) Paddy-mustard-potato (iii) Paddy- vegetables

Two year crop rotation:

- (i) Paddy-mustard-sugarcane-gram (ii) Paddy-sugarcane- wheat

3.3.2.3. Indigenous technological knowledge (ITK)

The agriculture is an old traditional practice of farmers in the watershed who have improved themselves with passage of the time according to their domestic need and technological reforms in the nearby areas. The villagers have their traditional village ponds, practice of field bunding which typically constitute agriculture related ITKs in the watershed. The mustard and potato sugercane being a cash crop of the watershed is being cultivated in self designed manner by the farmers. However, limited fertilizer application specifically the DAP came in to practice since about 20 years back.

3.4 Horticulture

The subtropical fruits and vegetables have very good potential in the watershed. The fruit trees has limited in number area like mango, guava, , lemon, lime, ber, aoula, bael as vegetables like cucurbits, radish, tomato, cauliflower cabbage, garlic, onion, brinjal, chilly, but they are found surviving well in the watershed villages. Organized orchards, commercial vegetable cultivation, horti-agri and

other systems of agro-forestry etc are lacking but have good potential in the water shed. For the improvement of Horticultural programme GOUP are giving subsidies for raising nurseries like the following:

S.No	Programme	Subsidy
1	Establishment of 'Aadarsh' Nursery(2-4Ha)	50% of investment cost or maximum upto 12.50 lakh 4 Ha credit linked Bank aided subsidy
2	Establishment of 'Small' Nursery(1Ha)	50% of investment cost or maximum upto 3.125 lakh Ha credit linked Bank aided subsidy
3	Cold storage units	40% of cost investment or maximum upto 120.00 lakh credit linked Bank aided subsidy
4	Primary Processing unit	40% of investment cost or maximum upto 9.60 lakh credit linked Bank aided subsidy
5	Low cost preservation unit (Establishment of new unit)	50% of investment cost or maximum upto 1.00 lakh linked Bank aided subsidy
6	Low cost onion storage house	50% of investment cost or maximum upto 0.50 lakh linked Bank aided subsidy
7	Functional infra-structure for collection sorting, grading & packing	40% of investment cost or maximum upto 6.00 lakh credit linked Bank aided subsidy

Source: Govt. Publications

3.5 Live Stock Population

Total livestock population of the IWMP 4th watersheds is 5026 bafalloes are preferred as milch animal compared to cow, but milk yield on average is 2-3 kg perday. Goats are also kept for milk as well as for meat purpose. The detail of live stock population is given in table 20

Table. 20: Live stock population

S. N .	Name of Micro Watershed	Name of Villages	Buffaloes	Cows	Bullocks	Goat	Sheep	Pigs	Total
1	Ghagra 2B1H2a1b,	Kamapur, Rajapur, Dharampur, Mithmani, Kotra, Budhanpur, Pachghara, Jalalpur, Mahmoodpur Bazar, Saraiya kala,	684	252	86	478	-	210	1460
2	Ghagra 2B1H2a2a	Nakara, Hailatpur, Parsehara, Tewra, Bharkudi, Essepur, Kalhapur, Mahmdapur, Bannikaralla, Pura Dasapur, Intedaha, Mauzuddinpur,	975	624	167	556	28	300	2650

		Guresh							
Total			2527	1132	377	930	50	710	5736

Source: District statistic magazine and secondary data

3.6 Fisheries

Commercial fish farming are not being done by the farmers of in IWMP 4th but there is a big scope for fish farming in these area.

3.7. Forest and other Vegetation

3.7.1. Forests The watershed has only 1.35 ha. forest area. Some wild trees are found in scattered manner.

3.7.2. Horticulture/ Agro-forest

3.7.3. Agro-forestry

When trees are grown on agricultural lands along with agricultural crops is called agro-forestry. The agro-forestry practices are highly lacking in the watershed though it has good potential under existing dispositions and may play a vital role particularly with respect to minimization of cropping risk, build up soil fertility and productivity, soil conservation, partly meeting out the fire wood demand of rural community and moreover, optimizing the economical return from system as a whole in the watershed. The other agro-forestry

systems like agri-silvi, silvi-pastoral, bund and boundary plantations also have good potential to cater the fire wood and fodder demands of the rural community in the watershed. The existing area under agro-forestry is almost negligible. *Prosopis cineraria* and *Zizyphus* spp are most suitable for plantation as block or sole plantation specifically on marginal and degraded lands in the watershed. The agro-forestry interventions comprising of ber, beal, aonla, guava, popular etc may be applied to benefit of the farmers under rain-fed to irrigated production systems on leveled to sloping and marginal agricultural land using proper planting techniques with termite control measures. These multipurpose trees may also help in supplementing fire wood and fodder demands of the rural community in the watershed and may be planted as hedge rows on rain-fed, marginal and degraded lands.

Table 21: Hydrology status

S.N o.	Name of Project	Item	Unit of measurement	Status
1	IWMP 4 th Sitapur	Status of water table	Meters	7.5 to 10.00
2		Ground water structures repaired/rejuvenated	No.	-
3		Quality of drinking water	Quality	poor
4		Availability of drinking water	Days	365
5		Irrigation potential	%	4

3.8.2. Water Resource

The available water resources in the watershed are enumerated below:

Table. 24: Information about water resources

S.N o.	Name of Mircro Watershed	Canal		Wells/Borew ells		Tubewells		Ponds		Govt. handpump		Pvt. handpumps		Others	
		D	N	D	N	D	N	D	N	D	N	D	N	D	N
1	Ghagra river 2B1H2a1b	-	-	365	4	250	3	310	5	365	12	284	26	-	-
2	Ghagra river 2B1H2a2a	-	-	365	7	250	5	310	7	365	18	284	42	-	-

D= Availability of water in days

N=

Number

Source: District statistic magazine and secondary data

3.9. Socio- Economic Profile

SOCIO-ECONOMIC STATUS OF DISTRICT SITAPUR (SOURCE: PLANNINGATLAS.U.P.)

Economic Region- Central Region.

As per Planning Atlas, U.P. the characters the district Sitapur as compared to U.P. is given below

S.No.	Particulars	District Sitapur	State U.P.
1	Density of Population/Sq. Km.	630	690
2	% of Urban Population to total population	11.94	20.78
3	% of S.C. & S.T. Population to total population	31.90	21.20
4	Literacy percentage(Total)	48.32	56.27
5	Literacy percentage(Female)	34.59	42.47
6	% of total workers to total population	31.09	32.48
7	% of culturable land to total reporting area	87.40	80.00
8	% of net area sown to total reporting area	76.10	69.20
9	% of culturable land to reporting area	1.20	2.30

10	% of area under forest to total reporting area	1.00	7.00
11	% of area under commercial crops to sown area	30.54	20.19
12	Composite index of development of land use	82.11	83.99
13	%of Gross irrigated area to Gross area sown	75.50	72.86
14	No. of pumpset on per thousand Ha. Of Gross sown area	198.85	129.48
15	% of area irrigated by tubewells to net irrigated area	84.88	70.24
16	Distribution of fertilizers per Ha. Of Gross area sown(kg)	132.39	129.48
17	Intensity of cropping	146.90	151.79
18	Per capita Production of food grain(kg)	478.57	253.68
19	Average yield of food grain (Q/Ha.)	19.64	21.91
20	Gross value of agricultural produce at current price	5683	4783
21	No. of Milk Productive Cooperative Societies per lakh of milch cattle	66	72
47	Per capita Milk Production (kg)	68.64	181.17
23	Gross value of industrial Produce per capita(Rs.)	1592	4544
24	Per capita State domestic Product from industrial sector at current price(Rs.)	697.70	1161.69
25	% of electrified villages to total inhabited villages	50.40	60.50
26	Per capita consumption of electricity (KW/)	40.0	156.5
27	% of boys enrolled in primary scools	51.64	52.29
28	% of girls enrolled in primary scools	48.36	47.71
29	% of boys enrolled in upper scools	53.50	54.69
30	% of girls enrolled in upper scools	46.50	45.31
31	No. of ITIs per lakh population	0.80	0.10
32	No. of poly techniques per lakh population	0.03	0.04
33	No. of Allopathic Hospital/Dispensaries/Lakh of population(including P.H.C's)	2.55	2.98
34	% of children having no immunization	43.90	35.80
35	Malnutrition status of children	87.30	82.60

36	Infant mortality rate	94.92	74.00
37	Composite index of Health	39.20	44.80
38	Human Development Index	0.361	0.447
39	Composite index of development (Based on 36 important endicators)	87.07	-

3.9.1 Socio Economic Base line Survey:

The subject of socio economic survey confronts a vast array of socio conditions and economic activities in the watershed. Base line survey shall help to identify the impact of the project over time. Socio economic survey are essential parts of watershed survey and planning undertaking. In this watershed questionnaires were prepared in logical order. Questionnaires included double checking system so that inconsistency maybe detected in the responses and uncertainty can be resolved immediately. To asses the socio economic conditions indicators were enumerated like land holding pattern, literacy rate, gender rate, status of health services and infrastructural facilities. Data about these indicators have been collected in field surveys of the 47 villages of the watershed on structured questionnaires from about 385 beneficiaries. The data so obtained has been analyzed for various indicators, correlated from statistical diary of Planning and statistics department GOUP.

3.9.2 Demographic Status:

The demographic pattern has been enumerated in Table 11

Table. 22: Demographic pattern detail

S.	Name of	Name of Villages	Total	Population	Population of
----	---------	------------------	-------	------------	---------------

No	Micro Watershed		No. of House Hold				SC/ST		
				Male	Female	Total	Male	Female	Total
1	Ghagra 2B1H2a1b	Kamapur, Rajapur, Dharampur, Mithmani, Kotra, Budhanpur, Pachghara, Jalalpur, Mahmoodpur Bazar, Saraiya kala,	567	1864	1652	3516	424	375	799
2	Ghagra 2B1H2a2a	Nakara, Hailatpur, Parsehara, Tewra, Bharkudi, Essepur, Kalhapur, Mahmdapur, Bannikaralla, Pura Dasapur, Intedaha, Mauzuddinpur, Guresh	1941	6585	5839	12424	4732	1979	4211
Total			4118	13657	12109	24766	4598	4085	8673

Source: District statistic magazine

The Data indicates the ratio of male to female as 1.12:1 in general and is in SC/ST community.

3.9.3. Literacy rate

Table. 23: Literacy rate detail

S. No	Name of Micro Watershed	Name of Villages		% of Literacy		
				Male	Female	Total
1	Ghagra 2B1H2a1b	Kamapur, Rajapur, Dharampur, Mithmani, Kotra, Budhanpur, Pachghara, Jalalpur, Mahmoodpur Bazar, Saraiya kala,	3516	58	36	47
2	Ghagra 2B1H2a2a	Nakara, Hailatpur, Parsehara, Tewra, Bharkudi, Essepur, Kalhapur, Mahmdapur, Bannikaralla, Pura Dasapur, Intedaha, Mauzuddinpur, Guresh	12424	61	35	48
Total			25766	59.3	34	46.6

The data reflects that for 100% literacy rate a long way has to be covered.

3.9.4. Migration pattern

Table. 24: Migration detail: The following migration pattern has been noticed from primary data collected on structured questionnaires

S. No	Name of Micro Watershed	No of Village	Total population	Migration			Migration by Month			Main reason for migration	Income per capita
				Total	Male	Female	<3Month	3-6 Month	>6 month		
1	Ghagra 2B1H2a1b,	10	3516	70	60	10	58	9	3	Employment Livelyhood	Rs 4500/month
2	Ghagra 2B1H2a2a	12	12424	248	170	28	195	40	13	Employment Livelyhood	Rs 4800/month

3.9.5 Infrastructure social features

Table 25: Details of infrastructure in the project area

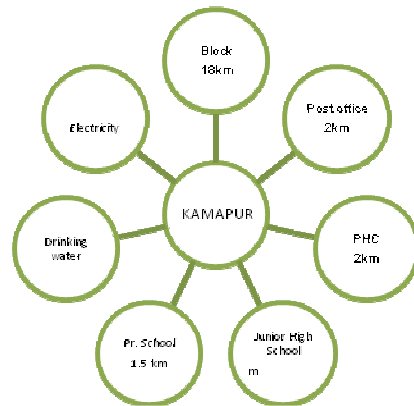
S.No.	Parameters	Status			
(I)	No. of Villages connected to the main road by an all-weather road	16			
(ii)	No. of villages provided with electricity	14			
(iii)	No. of households without access to safe drinking water	1870			
(iv)	No. of educational institutions: Primary (p)/Secondary(S)/ Higher secondary(HS)/ vocational Institution (VI)	(P) 14	(S) 6	(HS) 5	(VI) -
(v)	No. of villages with access to primary Health Center	7			
(vi)	No. of villages with access to Veterinary Dispensary	9			
(vii)	No. of villages with access to Post office	7			
(viii)	No. of villages with access to Banks	5			
(ix)	No. of villages with access to Markets/mandis	8			
(x)	No. of villages with access to Agro-industries	-			
(xi)	Total quantity of surplus milk	2880 liter			
(xii)	No. of milk collection centers (e.g. Union(U)/Society(S)/ Private agency (PA)/ others (O)	(U) No	(S) No	(PA) 28	(O)
(xiii)	No. of villages with access to anganwadi Center	12			
(xiv)	Any other facilities with no. of villages (please specify)	-			

The IWMP 4th watersheds have moderate communication facilities and all 47 villages are approachable through motorable road. Literacy rate in the watershed is very low. Only 15 villages are electrified and have TV & telephonic connection. Nearest big market Biswan & Mahmoodabad is about 12 km from the watershed. Religious and ritual features are almost common as in other part of the U.P. Small land holding (average less than 1.3 ha) with large family size (average 5.52 person) and more than 45% of the labour force of the total population living below poverty line indicates poor socio economic status of the watershed community. However, strong community spirit among the villager's show positive indication for the success of any programme to be implemented in participatory mode.

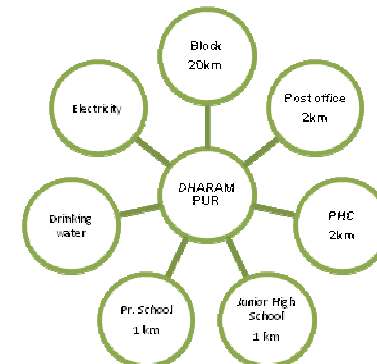
Traditionally the entire village community participates in the individual works. They are to be mobilized for community participation.

3.1.5 Venn diagrams

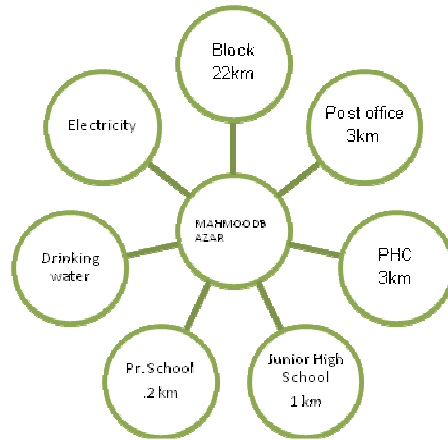
In the Venn diagram , farmers perceptions was recorded for importance and role of different development institution is relation to infrastructure development in the villages, importance has been depicted with size of circle and role with distance from the village circle. The Venn diagram of the IWMP 4th watershed villages are being attach here with



VENN DIGRAM OF VILAAGE KAMAPUR

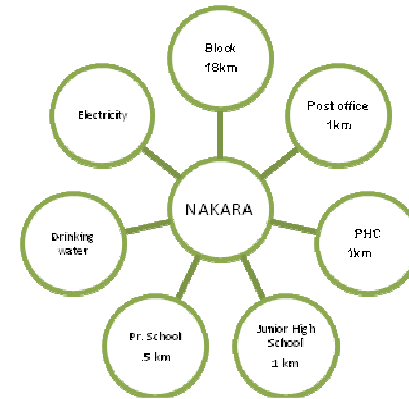


VENN DIGRAM OF VILAAGE DHARAMPUR

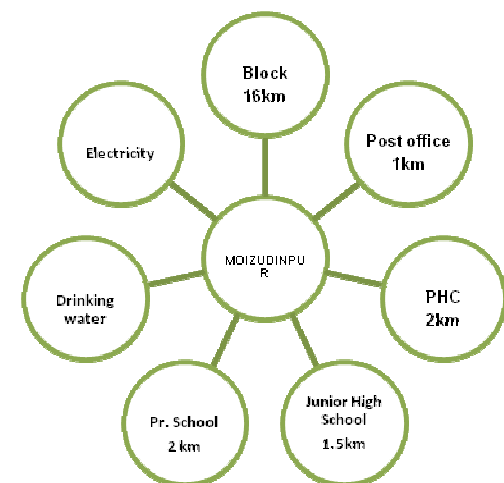
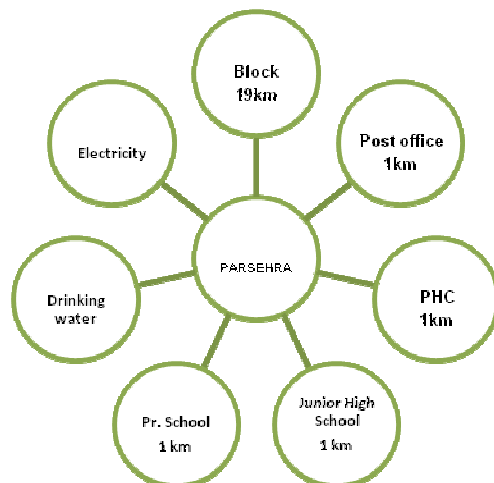


E MAHMOOD BAZAR

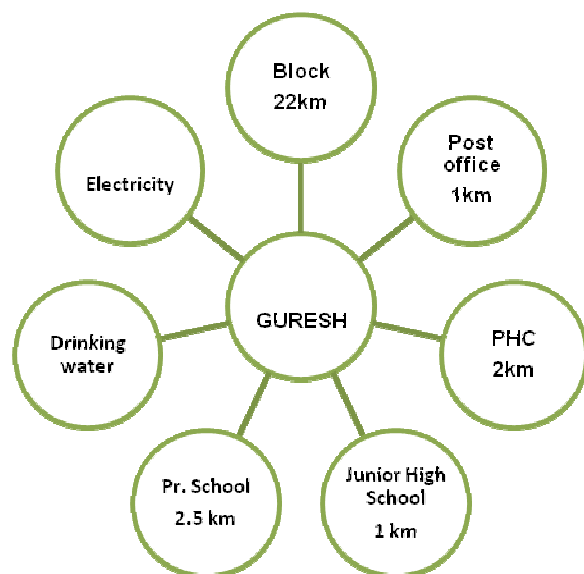
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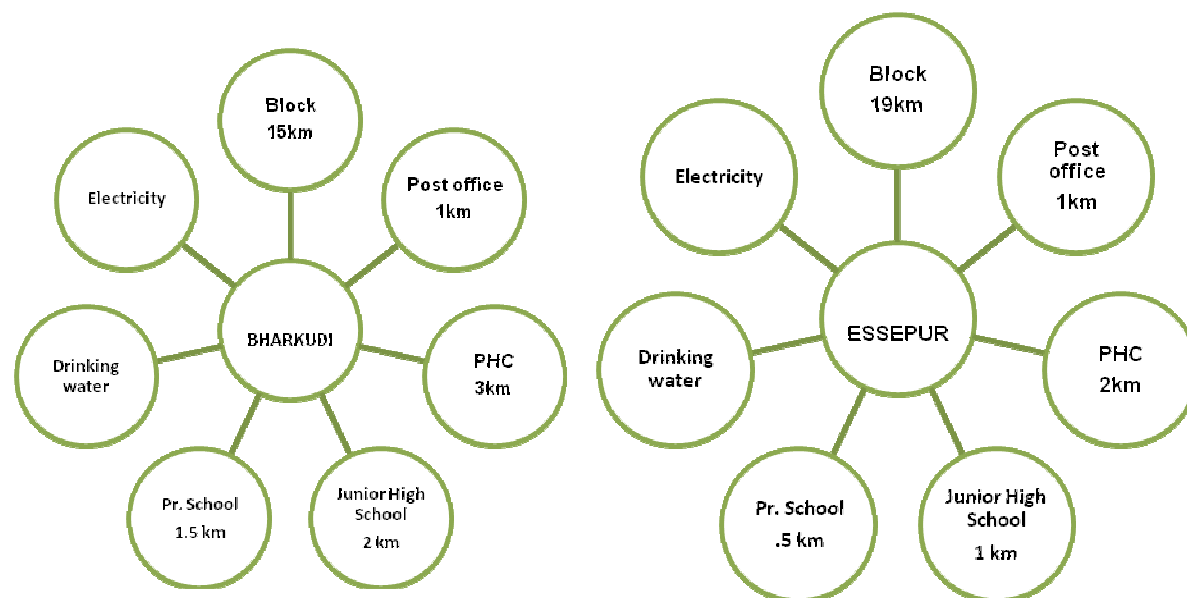
VENN DIGRAM OF VILAAGE NAKARA



VENN DIGRAM OF VILAAGE PARSEHRA



VENN DIGRAM OF VILAAGE MOIZUDDINPUR



3.9.6. Historical timeline

An historical timeline is the chronological record of important events in the history of the village which is useful in understanding its background in the context of three micro watersheds of Sitapur district. Historical timeline depicting important events in respect of different villages of the IWMP 4th watershed was prepared through PRA. Historical timeline for important villages are given in table .

Village- Kamapur		Village- Dharampur	
Year	Activities	Year	Activities
1715	Established	1770	Established
1965	Construction Bandhi (water harvesting structure)	1965	Construction Bandhi (water harvesting structure)
1968	Opening up Primary School	1985	Opening up Primary School
1976	Introduction of Tractor	1980	Introduction of Tractor
1978	Establishment of Gobar gas plant	1978	Establishment of Gobar gas plant
1979	Kacha road	1982	Kacha road
1985	Introduction of thresher	1987	Introduction of thresher
1986	First Tube well	1988	First Tube well
1990	First motorcycle	1992	First motorcycle
1993	TV and DVD player	1996	TV and DVD player

2002	Electricity in the village	2002	Electricity in the village
2003	Bituminous road	2003	Bituminous road
2005	Temple renovation	2007	Temple renovation
2009-10	Planning for watershed project	2009-10	Planning for watershed project
Village- Mahmoodpur Bazar		Village- Nakara	
Year	Activities	Year	Activities
1790	Established	1728	Established
1964	Construction Bandhi (water harvesting structure)	1965	Construction Bandhi (water harvesting structure)
1985	Opening up Primary School	1986	Opening up Primary School
1980	Introduction of Tractor	1985	Introduction of Tractor
1978	Establishment of Gobar gas plant	1980	Establishment of Gobar gas plant
1982	Kacha road	1982	Kacha road
1987	Introduction of thresher	1988	Introduction of thresher
1988	First Tube well	1987	First Tube well
1992	First motorcycle	1993	First motorcycle
1996	TV and DVD player	1998	TV and DVD player
2002	Electricity in the village	2002	Electricity in the village
2003	Bituminous road	2004	Bituminous road
2007	Temple renovation	2009-10	Planning for watershed project
2009-10	Planning for watershed project		

Village- Parsehra		Village- Moizuddinpur	
Year	Activities	Year	Activities

1890	Established	1762	Established
1967	Construction Bandhi (water harvesting structure)	1967	Construction Bandhi (water harvesting structure)
1984	Opening up Primary School	1985	Opening up Primary School
1985	Introduction of Tractor	1980	Introduction of Tractor
1980	Establishment of Gobar gas plant	1978	Establishment of Gobar gas plant
1982	Kacha road	1982	Kacha road
1988	Introduction of thresher	1987	Introduction of thresher
1987	First Tube well	1988	First Tube well
1993	First motorcycle	1992	First motorcycle
1998	TV and DVD player	1990	TV and DVD player
2002	Electricity in the village	2002	Electricity in the village
2004	Bituminous road	2003	Bituminous road
2009-10	Planning for watershed project	2007	Temple renovation
		2009-10	Planning for watershed project

Village- Guresh		Village- Bharkudi	
Year	Avtivities	Year	Avtivities
1890	Established	1860	Established
1965	Construction Bandhi (water harvesting structure)	1968	Construction Bandhi (water harvesting structure)
1980	Opening up Primary School	1982	Opening up Primary School
1984	Introduction of Tractor	1981	Introduction of Tractor
1986	Establishment of Gobar gas plant	1985	Establishment of Gobar gas plant
1982	Kacha road	1983	Kacha road
1987	Introduction of thresher	1985	Introduction of thresher
1988	First Tube well	1984	First Tube well

1993	First motorcycle	1992	First motorcycle
1998	TV and DVD player	1995	TV and DVD player
2002	Electricity in the village	2002	Electricity in the village
2004	Bituminous road	2004	Bituminous road
2009-10	Planning for watershed project	2009-10	Planning for watershed project

Source : Secondary data

Conclusions

The land capability classification of IWMP 4th watershed provides reasonable good information with regard to capability of soil, that could be used for agriculture, agri-horticulture, silviculture and pasture development. The majority of land form is coming under class II, which give an insight of good agriculture production potential of this watershed. The productivity of these lands could be further enhanced by adoption of simple soil & water conservation measures like mild leveling, bunding, diversion drain and in-situ moisture conservation practices. The reasonable area is under class III indicating greater potential of this watershed for forestry and pasture development. The major physical limitations in case of agriculture soils are the sub soil hardness, low water infiltrability and slope. A small portion(4.5ha.) of watershed is under seasonally waterlogged. The waterlogged area could be used for some other beneficial farming activities during the kharif season also.

3.3 Livelihood Pattern

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

Table. 24: Livelihood pattern (Occupational Distribution)

S. N.	Name of Micro Watershed	Total Workforce	Agriculture	A. Husbandry	Casual Labour	Service	Handcraft	Daily wage labour
1	Ghagra river 2B1H2a1b	3964	2055	727	664	47	6	490
2	Ghagra river 2B1H2a2a	5488	2644	1065	476	49	9	1245

3.7.1. Per capita income

Per capita income based on primary & secondary data from different sources are given below:

Table 25: Per capita income in IWMP 4th Sitapur

S. no.	Name of Project	Agriculture (Rs)	A. Husbandry (Rs)	Casual labour (Rs)	Others (Rs)	Total (Rs)
1	IWMP 4 th Sitapur	4496.50	1123.50	2500.00	1470.00	9590.00

Source : District statistical magazine and primary data.

LIVELIHOOD ACTIVITIES

Income generating activities through self help groups for landless farmers like goat farming, poultry farming bee keeping, livestock development activities, vocational training given with the involvement of KVK, Sitapur and NGOs. Financial out lays for this component is 10 % i.e., Rs 66.018 lacs, details are given below in table.

Table 26 : (A) Details of activities of livelihoods created for landless people- including micro enterprises

Sl .no.	Name of Villages	Name of the Activities	No. of beneficiaries					Pre project income (Rs)	Expected change in income from project intervention	Funds required for the activity (Rs.)	Sources of funding(Rs.)					Expected month & year of completion (mm/yyyy)
			S F	MF	LF	Land less	Total				Project Fund	Beneficiary	Financial institution	N G O	Other s	
1	23 villages in IWMP 4 th	Fruit preservation	10	2		108	120	12000.00	600000.00	800000	800000	-	-	-	-	March, 2015
		Rural craft	47	5	-	168	195	20000.00	650000.00	1300000	1300000	-	-	-	-	March, 2015
		Goatery	31	14	-	60	105	12000.00	490000.00	700000	700000	-	-	-	-	March, 2015
		Piggery	-	-	-	180	180	60000.00	1200000.00	1200000	1200000	-	-	-	-	March, 2015

Table. 27: (B) Details of other activities of livelihoods created for farmers

Sl .no.	Name of Villages	Name of the Activities	No. of beneficiaries					Pre project income (Rs)	Expected change in income from project intervention	Funds required for the activity (Rs.)	Sources of funding(Rs.)					Expected month & year of completion (mm/yyyy)
			SF	MF	LF	Land less	Total				Project Fund	Beneficiary	Financial institution	NG O	Other s	
1	23	Crop(0.5 Ha.)	100	100	10	-	210	900000.00	1200000.00	1800000	1800000	-	-	-	-	March,

	villag s in IWMP 4 th	demonstration													2015
		Medicinal plant	15	30	15	-	60	-	3000000.00	600000	600000	-	-	-	March, 2015
		Horticulture	10	50	25	-	85	50000.00	8500000.00	850000	850000	-	-	-	March, 2015
		Nursery raising	4	2	3	-	9	-	900000.00	450000	450000	-	-	-	March, 2015

3.3.1 Marketing linkage

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

Chapter- 4

Watershed Activities

4.1 Scientific Planning

i) Cluster Approach

This envisages a broader vision of Geo-hydrological unit which involves treating a cluster of micro watershed. The IWMP 4th Sitapur watershed project consist of three micro watershed

ii) Base line Survey

To access the impact of any watershed development programme a detailed baseline survey has been conducted. This acts a benchmark for any intervention during pre and post implementation of any development programme. A detailed baseline survey was undertaken which involved household census survey, Bio-physical survey and Village level data collection from PIA. Household census survey includes a detailed questionnaire which was filled by visiting household on sample basis in the village. This gave the details of the demographic profile of the village, the literacy percentage, SC/ST population, number of BPL household, cattle population, net consumption rate in the IWMP-4th average milk production of the cattle and various schemes running and their benefits. Bio-physical survey was undertaken to identify various natural resources available in the village. It included the soil typology, well in the area, crop taken in the field, Cropping pattern, fertilizer used and various sources of irrigation in

the field.

iii) Use of GIS and Remote Sensing for planning

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

a) Prioritization

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

b) Planning

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

c) Hydrological modelling

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

d) Participatory Rural Appraisal (PRA)

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

Table 28: Details of Scientific Planning and Inputs in IWMP 4th projects

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

Online IT connectivity between	Yes
(1) Project and DRDA cell/ZP	Yes
(2) DRDA and SLNA	Yes
(3) SLNA and DoLR	Yes
Availability of GIS layers	Yes
1. Cadastral map	Yes
2. Village boundaries	Yes
3. Drainage	Yes
4. Soil (Soil nutrient status)	Yes
5. Land use	Yes
6. Ground water status	Yes
7. Watershed boundaries	Yes
8. Activity	Yes
Crop simulation models#	No
Integrated coupled analyzer/ near infrared visible spectroscopy/ medium spectroscopy for high speed soil nutrient analysis	No

Normalized difference vegetation index (NDVI)# Weather Station	No
(B) Inputs	
1. Bio-pesticides	No
2. Organic manures	Yes
3. Vermicompost	Yes
4. Bio-fertilizer	Yes
5. Water saving devices	Yes
6. Mechanized tools/ implements	Yes
7. Bio-fencing	Yes
8. Nutrient budgeting	No
9. Automatic water level recorders & sediment samplers	No

4.2 INSTITUTION BUILDING

4.2.1 Watershed Committee

Watershed committee has been constituted in all three nos of micro-watersheds partially by WDT and Gram Sabha in the village of micro watershed. These committees are yet to be registered under society Registration Act 1860. Capacity building trainings will be given to the watershed committee by

WDT. The watershed committee has a pivotal role to play during and after the project implementation period. Detail of W.C. is given below

Table. 29: Details of Watershed Committees (WC)

SELECTION OF WATERSHED COMMITTEE SITAPUR

I.W.M.P.4th -YEAR 2010-11

S.No.	Name of Project	Name of W.C.	Name of Chairman	Name of Secretary	Name of Member
1	Kamapur	Kamapur	Sri Ganga Vishnoo	Sri Nakelal	1. Sri Khalil Ahmad 2. Vasant lal 3. Jagdish 4. Smt Gayatri Devi 5. Riyajuddin 6. Haresh Kumar 7. Moh. Husain 8. Aziz Ahmad 9. Govinde
2	Rajapur	Rajapur	Sri	Sri	1. Sri
3	Dharampur	Dharampur	Sri	Sri	1. Sri
4	Mithmani	Mithmani	Smt Gomti Devi	Sri Dinesh Kumar	1. Sri Gaya Prasad 2. Zarakhan 3. Smt. Bhagana 4. Ram Lakhan 5. Munnilal 6. Rais 7. Ishwardeen 8. Achchhelal 9 Bhagauti
5	Kotra	Kotra	Sri Sunil Kumar	Sri Sandeep	1. Sri Barati 2. Anurag 3. Sarwan 4. Tejram 5. Ramlakhan 6. Satyaprakash 7. Ramesh 8. Sushil 9. Kamlesh
6	Budhanapur	Budhanapur	Sri Jagatpal	Sri Moh. Khalid	1. Sri Shiv Kumar 2. Surender 3. Srikrashan 4. Bankelal 5. Mevalal 6. Ramoutar 7. Ushadevi 8. Karmullah 9. Arjun 10 Deshraj
7	Jalalpur,	Jalalpur,	Sri Moh. Ismile	Sri Moh. Akram	1. Sri Gaya Prasad 2. Mahmood Alam 3. Mashook Ali 4. Lallan 5. Lata Devi 6. Baggu 7. Moin 8. Chhanga 9. Baldev 10. Rameshwar
8	Mahmoodpur Bazar	Mahmoodpur Bazar	Smt.Siyadulari	Sri Ravishankar Pandey	1. Sri Haidar Ali 2. Amarsingh 3. Smt. Bitta 4. Ramdya 5. Kishori 6. Vishambhar 7. Bihari 8. Triveni 9. Parshuram
9	Nakara	Nakara	Sri Jagdish	Sri Sanjay	1. Sri Akhilesh 2. Karuna Shankar 3. Sunderlal 4. Vikram Kumar 5. Azad Ali 6. Radheyshyam 7. Jabir Ali 8. Sriram 9. Smt Vidyavati
10.	Haibatpur,	Haibatpur,	Sri Inderpal	Sri Sunil	1. Sri Keshavram 2. Dinesh Kumar 3. Chhatrapal 4. Mewalal 5. Randulare 6. Kadeleram 7. Gayatri Devi 8. Raj Kumar 9. Puttulal

11.	Parsehara,	Parsehara,	Sri	Sri	1. Sri
12.	Tewla	Tewla	Sri Ramsnehi	Sri Islamuddin	1. Sri Ishtyak Husain 2. Moh. Ahamad 3. Manohar 4. Smt. Priyanka 5. Rampal 6. Noor Mohammad 7. Khushiram 8. Bannelal 9. Pramod Kumar
13.	Bharkudi	Bharkudi	Sri Liyakat Ali	Sri Ramchandarsingh	1. Sri Ramswaroop 2. Faiyaz Ali 3. Shatrohan 4. Sageer 5. Asgar ali 6. shafiq 7. Ram Prasad 8. Sanjay 9. Ramesh
14.	Mahmdapur	Mahmdapur	Sri Gajraj singh Verma	Sri Arvind Kumar Verma	1. Sri Vinod Mishra 2. Mahender Kumar 3. Rajesh Kumar 4. Smt Sushila Devi 5. Mangre Bhargava 6. Ashok Kumar 7. Sri Ram Verma 8. Rajesh Ku. Verma 9. Arvind Kumar
15.	Bannikaralla	Bannikaralla	Sri Manohar	Sri Navi Ahmad	1. Sri Arunpal 2. Sonelal 3. Pankaj Ku. Verma 4. Jagdamba Prasad 5. Sarojni devi 6. Brijmohanlal 7. Raamjeevan 8. Lalli Devi 9. Raj Kumar
16.	Pura Dasapur	Pura Dasapur	Sri	Sri	1. Sri
17.	Mauzuddinpur	Mauzuddinpur	Sri Sunderlal	Sri Kuldeep verma	1. Sri Santosh Verma 2. Chhotelal 3. Shamullah Khan 4. Munna Ali 5. Musheer Khan 6. Lallan Khan 7. Moharram Ali 8 Chunnial 9.Smt Kushmavati 10 Vishnoo
18.	Gurera	Gurera	Smt. Rampyari	Sri Lovkush kumar	1. Sri Hareesh Chander 2. Rampal 3. Gobardhan 4. Chnder mohan 5. Puttilal 6. Sobran 7. Sushil Kumar 8. Ajai Kumar 9. Bihari 10. Dayaram
19.	Rajapur	Rajapur	Sri Ajay Kumar	Sri Rajkumar	1.Sri Maheshwar 2. Haridwari 3. Smt. Rampyari 4. Smt. Sarojani 5. Mishrilal 6. Ali Ahmad 7. Mohan 8. Kaushal 9. Suresh
20.	PurwaDasapur	PurwaDasapur	Sri Ramesh	Sri Saurabh	1. Sri Ramsewak 2. Harinam singh 3. Shrawan Dixit 4. Smt. Urmila 5. Smt. Pooja 6. Raghunath 7. Shatrohalal
21.	Dharampur	Dharampur	Sri Tarkul nissa	Sri Moh. Jamil	1.Sri Moh. Saleem 2. Moh. Umar 3. Navi Ahmad 4. Smt. Ramyati 5. Kishorilal 6. Ramkumar 7. Jabir Ali 8. Makil 9. Vakeel
47.	Parsehra	Parsehra	Sri Moh. Kamil	Sri Akhilesh	1. Sri Maksood Khan 2. Omprakash 3. Rukhsar Khan 4. Ishwardeen 5. Imran 6. Smt. Foolmati 7. Ikrar Khan 8. Rajkumar 9. Salauddeen

4.2.2 Watershed Development Team

As per as common guide line of GOI- 2008 direction/ instruction given in para 5.3 point 40 P.I.A. has constituted watershed development team(W.D.T.) as given below

Table.30: Details of Watershed Development Teams (WDTs) in the project area

S. N o.	Name of the PIA	Name of the micro water shed	Names of WDT members	M/ F	Age	Qualification / Experience	Description of professional training	Role/ Function	Date of appointment of WDT member
1	2		4	5	6	7	8	9	10
1	Bhomi Sanrakshan Adhikari Land development And water resources Department Sitapur(U.P.)	Ghagra 2B1H2a 1b	Sri Shalender Kumar	M	27	B. Sc. Ag	Agriculture	E	
			Sri Badri Singh	M	55	B. Sc.Ag.	Field Worker	H	
			Sri R.P.Singh	M	40	Hsc..Ag	Field Worker	J B	
			Smt Sushma Vajpayee	F	33	M.A Sociology	Social Moblizer	A	
			Sri R.N.Verma	M	53	Ag. Engineer		C D F	
2		Ghagra 2B1H2a 2a	Sri Shalesh Srivastav	M	35	B .A	Field Worker	E	
			Sri Durga Prasad	M	25	H. Sc.	Field Worker	H	
			Sri D.N.Dubey	M	40	Isc.	Field Worker	J B	

			Arpana Mishra	F	33	M.A Sociology	Social Mobilizer	A	
			Sri S.P.Singh	M	43	Ag. Engineer		C D F	

M – Male, F- Female

In column 9, the work, assigned as below,.

- A Participatory Net Planning (PNP) and Participatory Rural Approach (PRA), Training and Capacity Building
- B Planning
- C Maintenance of Accounts
- D Signing of cheques and making payments
- E Social audit
- F Engineering surveys, drawings and cost estimations
- G Physical verification & measurement
- H Record of labour employed
- I Livelihood opportunities for landless
- J Post project operation, maintenance of assets
- K Any other (please specify)

4.2.3 Self Help Group

The constitution of Self Help Groups have been constituted by W.C. in all micro watershed for generating income & improved their social status with the help and financial

support through scheme and by technical support of P.I.A., detail of SHG_s are given below

4.2.4 User Group

The following user's group has been identified and constituted in all micro watershed in presence of Watershed Development Team for implementation of watershed work, proper use and management of all engineering and vegetative assets to be created in watershed. Detail of user's group are given below

Table 31: Details of Users Group

S. No.	Names of Watershed	Total no. UGs				No. of Members				No. of SC/ST in each category			No. of BPL in each category			
		With only Men	With only Women	With Both	Total	Categories	M	F	Total	M	F	Total	M	F	Total	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	Ghagra river 2B1H2a 1b					(i) Landless	4	5	9	1	1	2	5	2	7	
						(ii) SF	10	3	13	3	1	4	3	1	4	
						(iii) MF	3	-	3	1	-	1	3	-	3	
						(iv) LF	1	-	1	-	-	-	-	-	-	

	Sub Total	6	1	1	8		1 8	8	26	5	2	7	1 1	3	14	
2	Ghagra river 2B1H2a 2a					(i) Landless	5	2	2	2	1	3	5	2	7	
						(ii) SF	1 2	3	15	4	1	5	3	1	4	
						(iii) MF	7	-	7	2	-	2	3	-	3	
						(iv) LF	3	-	4	-	-	-	-	-	-	
	Sub Total	8	0	2	10		2 7	5	32	8	2	10	1 1	3	14	
	Total	5	0	1	6		1 6	6	47	4	2	6	1 1	3	14	

(M- Male, F- Female)

4.5 Convergence of watershed programmes

Regarding convergence of other schemes with present watershed programme, the work of following schemes will be converged with watershed programme. These details are given in Table 35

- 4.5.1 Earthen bund, contour bund, percolation tank, injection well will be constructed in watershed area with convergence of MNREGS
- 4.5.2 Soil health card, crop demonstration, kisan gosthi, kisan mela, farmer's school shall be organized in watershed area under schemes of department of Agriculture.
- 4.5.3 Composite fish farming or mixed fish farming shall be popularized in this area with the help of Department of fisheries.
- 4.5.4 Animal health camp, fodder development, vaccination work shall be made through Veterinary Department.

4.5.5 A forestation in project area shall be done with the help of Forest Department.

Table 32 : Details of Convergence of other Schemes in the Project area with IWMP Project

S.No	Name of MW	Name of Departments with Schemes converging with IWMP*	Funds made available to IWMP Project due to convergence (Rs. In lakhs)	Was this fund included in Rs. 12,000/15,000 Per ha		Name of activity/task/structure undertaken with converged funds (a) Structures (b) Livelihoods (c) Production System	Reference no. of activity/task/structure in DPR	Level at which decision for convergence was taken \$
				Yes	No			
1	2	3	4	5	6	7	8	9
1	Ghagra river 2B1H2a1b		4.00		No	a	5	DRDA
		DA	0.40		No	b, c	5	PIA
		DHO	0.10		No	b, c	5	PIA
		DF	0.20		No	b, c	5	PIA
		F	0.30		No	b, c	5	PIA
		Total	5.00		No			
2	Ghagra river 2B1H2a2a	MNREGS	15.00		No	a	5	DRDA
		DA	1.50		No	b, c	5	PIA
		DHO	0.30		No	b, c	5	PIA
		DF	0.40		No	b, c	5	PIA
		F	0.30		No	b, c	5	PIA
		Total	17.50		No			
		Grand Total	26.20		No			

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

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

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

4.3 Entry Point Activities

Integrated Watershed Development Programme 4th of the district Sitapur is aimed at the socio economic upliftments of the dweller of watershed area and to create trust about the programme to be implemented so that they can coordinate in participatory mode for the success of the watershed programme. As per the new common guidelines total financial outlay for the entry point activities is 4 % of the total project cost. To increase the per capita availability of drinking water older wells of the village will be renovated as well as pucca jagat (plate forms) will be constructed. To increase the irrigation water availability older bundhies which are already existed but not functioning will be reconstructed/ renovated. Repairing and maintenance of water bodies have also been proposed on priority basis. School lies in the watershed areas will be equipped with drinking water facility and extracurricular activities will be promoted among the children in the watershed area by supplying sport goods to the school. To approach watershed village construction and repairing of damaged VRB has also been proposed and construction of women latrines and bathrooms besides hand pump or wells. Total estimated cost for

these activities is Rs 31.9056 Lacs.The details are given in table 36

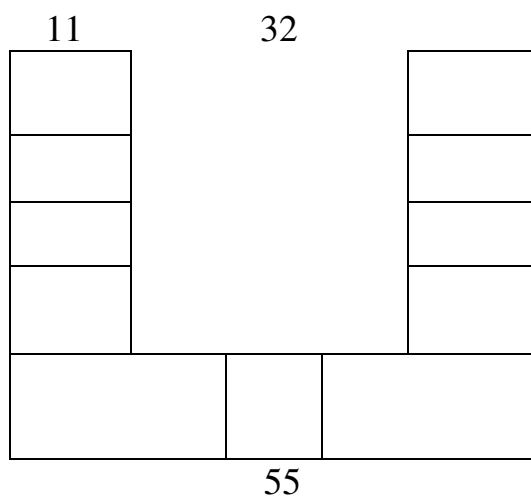
Table. 36: Entry point activities (EPA)

(All financial figures in lacs Rs.)

S. no .	Names of the Villages	Amount earmarked for EPA	Entry point Activities planned	Estimated cost	Expected outcome	Name of agency which selected the EPA#	Expected month & year of completion (mm/yyyy)
1	2	3	4	5	6	7	8
1	23	31.9056	Chabutra (Pucca plate form)	2.40	-	WC, PIA, WDT	March, 2011
			Well Repairing	1.365	-	WC, PIA, WDT	March, 2011
			Village Drain	1.0451	-	WC, PIA, WDT	March, 2011
			Planting with Tree Guard	0.135	-	WC, PIA, WDT	March, 2011
			Repairing & Jointing of Brick on Edge	0.9486	-	WC, PIA, WDT	March, 2011
			Sitting Bench	0.136	-	WC, PIA, WDT	March, 2011
			Culvert	1.560	-	WC, PIA,	March, 2011

						WDT	
			Repairing community Road	of	4.3303		

Detail Estimate of Drainage Channel



Sl.no.	Particulars	No.	Length	Width	Depth/Height	Quantity
1.	Earth work (Cu m)					
	In cutting	1	100.00	0.60	0.45	27.00
	In side filling & disposal	1	100.00	0.60	0.45	27.00
						54.00
2.	Brick Work 1:4(Cu m)					

	In bed	1	100.00	0.55	0.11	6.05
	In side walls	2	100.00	0.11	0.32	7.04
						13.09
3.	Plaster Work 1:4(Sq.m)					
	In bed	1	100.00	0.33	-	33.00
	In side walls	2	100.00	0.32	-	64.00
	Top of walls	2	100.00	0.11	-	47.00
						119.00

Requirement of Material & labours

S.No	Item	Quantity	Rate	Material			labours	
				Brick class 23x11x7	Coarse Sand	Cement	Masons	Labours
1	Earth Work	54.00	Cu.mt.	-	-	-	-	18
2.	Brick Work 1:4	13.09	,,	6545	3.60	26.18	13.09	26.18
3.	Plaster Work 1:4	119.00	Sq. mt.	-	1.78	13.09	14.87	47.31
4.	Curing for 7 days	-	-	-	-	-	-	7
	Total	-	-	6545	5.38	39.27	27.96	73.49

Cost of Material & Labour

Sl.no.	Item	Quantity	Rate	Unit	Amount
	Material Cost				
1	Brick 1 st class 11x23x7	6545	4000/=	1000 Bricks	26180.00
2	Coarse Sand (Banda)	5.38	1400/=	Cu.mt.	7532.00

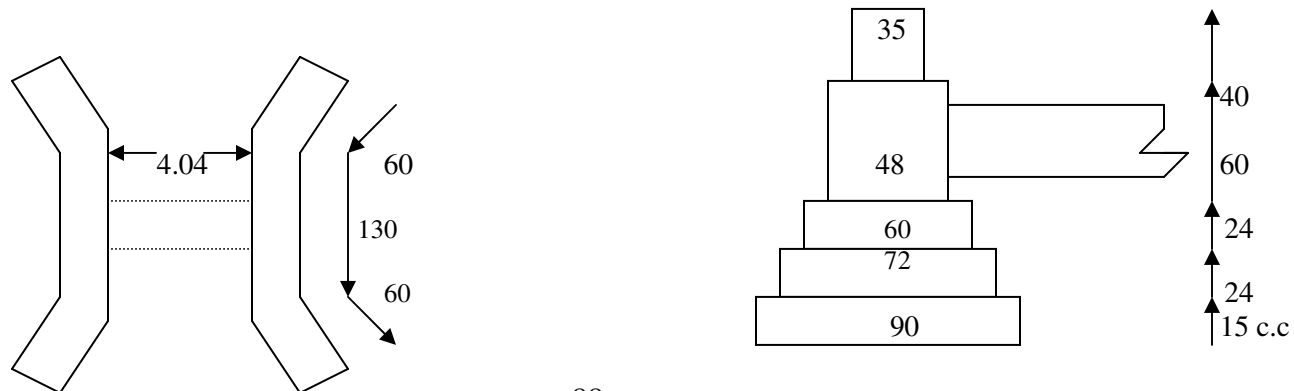
3	Portland Cement	39.27	250/=	Bag	9817.50
	Sub Total				43529.50
	Labor cost				
1	Mason	27.96	180/=	Each	5032.80
2.	Labor	73.49	100/=	Each	7349.00
	Sub Total				12381.80
	Cartage 2% of Material cost & Water				870.00
	Total cost				56781.30

Say Rs. 56781.00

Cost of 100.00 mts Channel Rs. 56781.00

Cost of one meter Channel Rs. 567.81

Detail Estimate of culvert



Plan**Detail of Foundation**

Sl.no.	Item	Nos	Length	Width	Depth /Height	Quantity
1.	Excavation in Foundation of(Cu m)					
	Walls	2	2.50	0.80	1.05	4.20
	for laying of H. pipe	1	4.04	1.00	0.60	2.42
	Side filling &disposal	-	-	-	-	6.62
						13.24
2.	C.C Work 1:4:8(Cu m)					
	In Foundation of walls	2	2.50	0.80	0.15	0.60
3.	Brick Work 1:4(Cu m)					
	In foundation of walls					
	1 st step	2	2.50	0.72	0.24	0.864
	2 nd step	2	2.50	0.60	0.24	0.720
	3 rd step	2	2.50	0.48	0.60	1.440
	In super walls	2	2.50	0.35	0.40	0.700
						3.724
	B.W deduction for pipe	2	$3.14 \times (.175)^2 \times 0.47$			0.09
	Total Brick Work(Cu m)				$(3.724-.09) =$	3.634
	Pointing work 1:2(Sq.m)					
	Out side of walls	2	2.50	1.00	-	5.00
	In side of walls	2	2.50	0.32	-	1.60
	Top of walls	2	3.50	0.35	-	2.45
						9.05

Requirement of Material & labours

Sl.no.	Item	Quantity	Unit	Material					labours	
				Brick 1 st class 23x11x7	Coarse Sand	Cement	Hume pipe + collar	Brick Ballast	Masons	Labours
1	Earth Work	13.24	Cu.m t.	-	-	-		-	-	4.31
2.	C.C.Work 1:4:8	0.60	,,	-	0.27	1.13		0.56	0.12	2.76
3.	Brick Work 1:4	3.364	,,	1682	0.92	6.72	2+1	-	3.36	6.72
4.	Pointing Work 1:4	9.05	Sq. mt.	-	0.32	0.01		-	1.50	1.50
5.	Curing for 7 days	-	-	-	-	-		-	-	7
	Total	-	-	1682	1.51	9.37		0.56	4.98	47.29

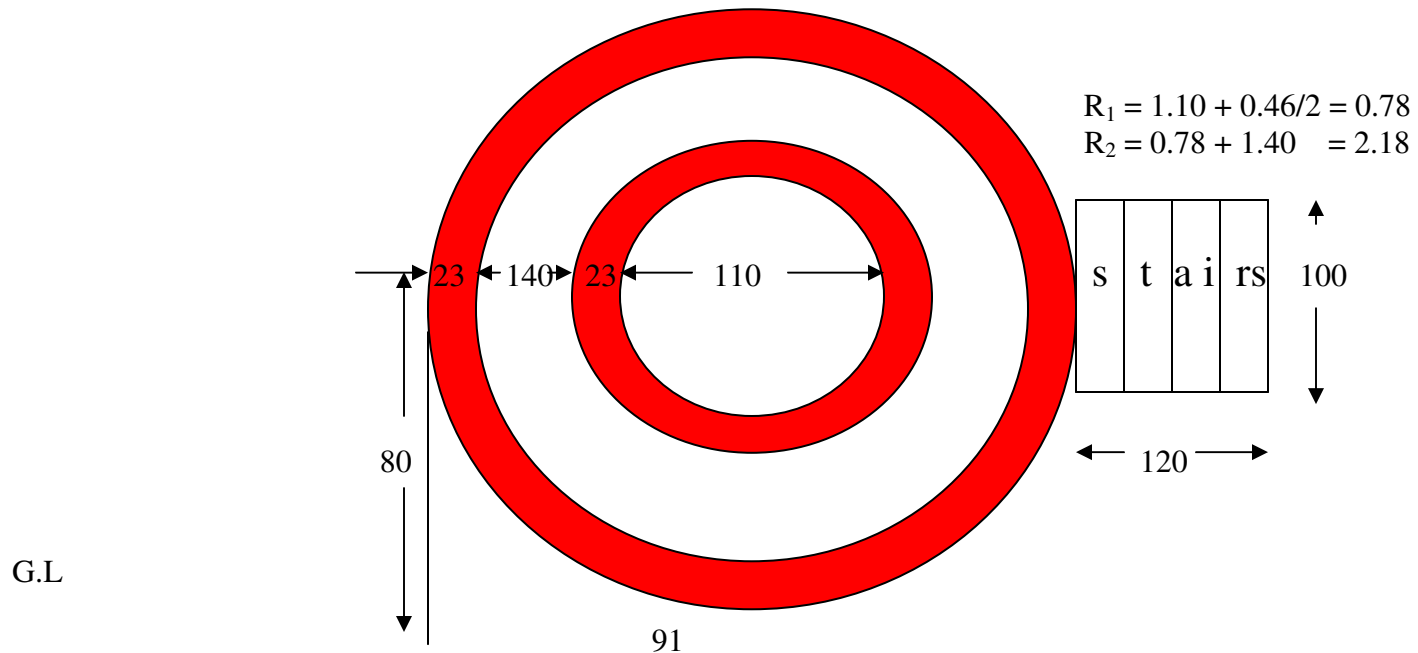
Cost of Material & Labour

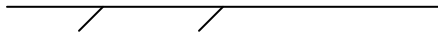
Sl.no .	Item	Quantity	Rate	Unit	Amount
	Material Cost				
1	Brick 1 st class 11x23x7	1682	4000/=	1000 Bricks	6728.00
2	Coarse Sand (Banda)	1.51	1400/=	Cu.mt.	2114.00
3	Portland Cement	9.37	250/=	Bag	2342.50
4.	Brick Ballast	0.56	900/=	Cu.mts.	504.00
5.	Hume pipe 300mm x 2.50 mts.	2+1	1414/=	Nos.	2828.00

	Sub Total				15516.50
	Labour cost				
1	Mason	4.98	180/=	Each	896.40
2.	Labour	47.29	100/=	Each	4729.00
3.	Hume pipe fixing	2+1	275/= each pipe		550.00
	Sub Total				3675.40
	Cartage 2% of Material cost & Water				290.00
	Total cost				19481.90

Say Rs. 19500.0

Detail Estimate of Village Well Repair





Earth Work $\pi(r_1^2 - r_{47}) \times h$

$$3.14 (0.60 - 4.75) \times 0.80$$

$$3.14 \times 4.15 \times 0.80 = 10.42$$

C.C. Work :-

Top of Well Jagat

$$\pi(r_1^2 - r_{47}) \times h$$

$$3.14 \times 4.15 \times 0.10$$

$$= 1.303$$

Brick Work :-

On top floor

$$\pi(r_1^2 - r_{47}) \times h$$

$$3.14 \times 4.15 \times 0.11$$

in outer wall

$$2\pi r \times \text{width} \times \text{height}$$

$$2 \times 3.14 \times 2.18 \times 0.23 \times 0.80$$

$$= 2.519$$

inner wall

$$2\pi r \times \text{width} \times \text{height}$$

$$2 \times 3.14 \times 0.55 \times 0.23 \times 1.10$$

$$= 0.873$$

Plaster Work :-

In side of inner wall - $2\pi r \times \text{lenght}$

$$2 \times 3.14 \times 0.55 \times 5.00$$

$$= 17.27$$

out side of outer wall - $2\pi r h$

$$2 \times 3.14 \times 2.41 \times 0.80$$

$$= 12.10$$

top floor

$$\pi(r_1^2 - r_{47})$$

$$3.14 \times 0.78 \times 0.78 - 2.41 \times 2.41 \\ = 16.32$$

Stair of well

Earth Work $1.00 \times 1.20 \times 0.20$
 $= 0.24$

Brick Work

1 st Step	$1.00 \times 1.20 \times 0.26$	=	0.312
2 nd Step	$1.00 \times 0.90 \times 0.15$	=	0.135
3 rd Step	$1.00 \times 0.60 \times 0.15$	=	0.090
4 th Step	$1.00 \times 0.30 \times 0.15$	=	0.045
Total	-		0.582

Plaster Work

Side of stairs	$2 \times 1.20 + 0.30 / 2 \times 0.60$	=	0.90
Top of stairs	$4 \times 1.00 \times 0.30$	=	1.20
Front of stairs	$4 \times 1.00 \times 0.15$	=	0.60
Total	-		2.70

Requirement of Material & labours

S. No.	Item	Quantity	Unit	Material				labours	
				Brick 1 st class 23x11x7	Coarse Sand	Cement	Brick Ballast Masons		Labours
1	Earth Work	10.66	Cu.mt.	-	-	-	-		3.47
2.	C.C.Work 1:4:8	1.303	„	-	0.60	4.43	1.21	0.26	5.99
3.	Brick Work 1:4	5.407	„	2703	1.48	9.73	-	5.40	10.80
4.	Plaster Work 1:4	48.39	Sq. mt.	-	0.72	5.32	-	6.04	9.07
5.	Curing for 7 days	-	-	-	-	-	-		7
	Total	-	-	2703	2.80	19.48	1.21	11.70	36.34

Cost of Material & Labour

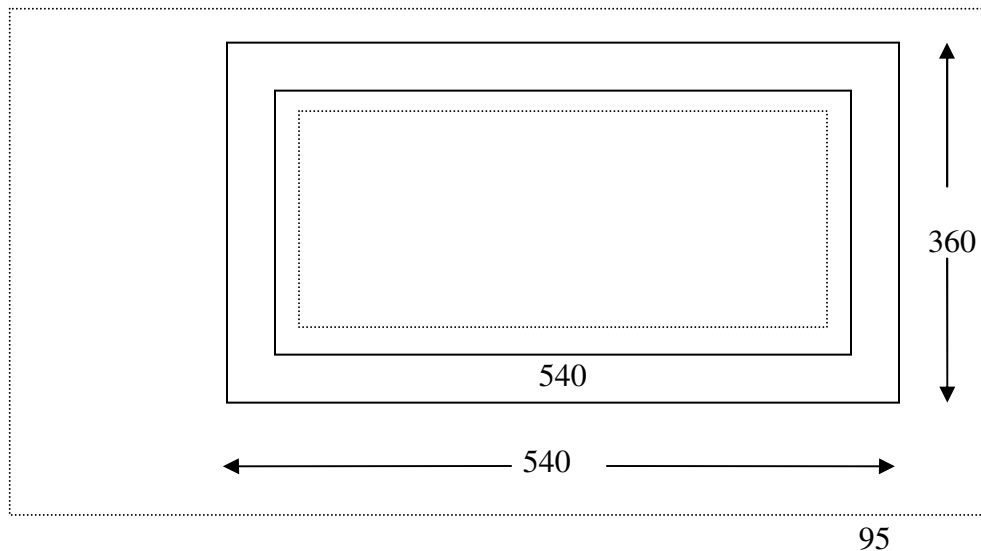
Sl.no .	Item	Quantity	Rate	Unit	Amount
	Material Cost				
1	Brick 1 st class 11x23x7	2703	4000/=	1000 Bricks	10812.00
2	Coarse Sand (Banda)	2.80	1400/=	Cu.mt.	3920.00
3	Portland Cement	19.48	250/=	Bag	4870.00
4.	Brick Ballast	0.56	900/=	Cu.mts.	504.00
5.	Hume pipe 300mm x 2.50 mts.	2+1	1414/=	Nos.	2828.00
	Sub Total				15516.50

	Labor cost				
1	Mason	4.98	180/=	Each	896.40
2.	Labour	47.29	100/=	Each	4729.00
3.	Hume pipe fixing	2+1	275/= each pipe		550.00
	Sub Total				3675.40
	Cartage 2% of Material cost & Water				290.00
	Total cost				19481.90

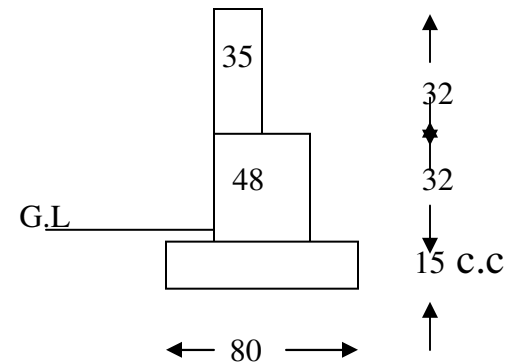
Say Rs. 19500.00

Detail Estimate of Village Chabutra

Plan



Detail of Foundation



Sl.no.	Particulars	No.	Length	Width	Depth/Height	Quantity
1.	Earth work (Cu m)					
	In Foundation long wall	2	5.40	1.20	0.30	
	In Foundation short wall	2	3.60	1.20	0.30	
	Filling transported land	1	2.90	4.70	0.60	
2.	Brick Work 1:4(Cu m)					
	In Long wall 1 st step	2	5.40	0.48	0.32	
	2 nd step	2	5.40	0.48	0.32	
	In short wall 1 st step	2	3.60	0.48	0.32	
	2 nd step	2	3.60	0.48	0.32	
3.	Plaster Work 1:4(Cu m)					
	In bed	1	100.00	0.33	-	33.00
	In side walls	2	100.00	0.32	-	64.00
	Top of walls	2	100.00	0.11	-	47.00
						119.00

Requirement of Material & labours

Sl. No.	Item	Quantity	Unit	Material			labours	
				Brick 1 st class 23x11x7	Coarse Sand	Cement	Masons	Labours
1	Earth Work	54.00	Cu.mt.	-	-	-	-	18
2.	Brick Work 1:4	13.09	„	6545	3.60	26.18	13.09	26.18
3.	Plaster Work 1:4	119.00	Sq. mt.	-	1.78	13.09	14.87	47.31
4.	Curing for 7 days	-	-	-	-	-	-	7
	Total	-	-	6545	5.38	39.27	27.96	73.49

Cost of Material & Labour

Sl.no .	Item	Quantity	Rate	Unit	Amount
	Material Cost				
1	Brick 1 st class 11x23x7	6545	4000/=	1000 Bricks	26180.00
2	Coarse Sand (Banda)	5.38	1400/=	Cu.mt.	7532.00
3	Portland Cement	39.27	250/=	Bag	9817.50
	Sub Total				43529.50
	Labour cost				
1	Mason	27.96	180/=	Each	5032.80
2.	Labour	73.49	100/=	Each	7349.00
	Sub Total				12381.80
	Cartage 2% of Material cost & Water				870.00
	Total cost				56781.30

Institution and Capacity Building:

Objective of Capacity Building:

1. Increased participation of communities and water users in integrated water resource development and management.
2. Enabling local communities to identify their own problem, seek their own solutions and formulate and implement their own project including their monitoring and evaluation.
3. Increased involvement of women at all levels.
4. Rehabilitations of existing water structure through participatory process for improved performance, operation and management.
5. Good quality construction of structures on sound designing.
6. Additional water resource generation through water conservation measures.
7. Control water contamination, pollution and salinity and overall management of water quality.
8. Control water logging, water table recession and water wastage.

4.1.2.1 Institution

Table. 38: List of approved Training Institutes for capacity Building in the project area

S.No.	Name of the Training Institute	Full Address with contact no., website & e-mail	Name & Designation of the Head of Institute	Type of Institute	Area (s) of specialization	Accreditation details
1	Krishi Vigyan Kendra	Sitapur (UP)	Programme Co-ordinator	Research Extension &	Agriculture, Horticulture, A. Husbandry, Fisheries,	GOI
2	Water & Land Management Institute (WALMI)	Uttretia, Lucknow	Director	Training & capacity building	Civil Engineering Mechanical Engineering Agriculture & Social Science	GOI

4.1.2.2 Capacity Building

Capacity building and training are the most important components of watershed management programme both for the field level project staff/ officers and functionaries of people institutions i.e. watershed community. Apart from enhancing technical skill of the project staff, this would also provide opportunities to community members to develop their

capacity as the future custodians of the programmes after project's withdrawal. IWMP 4TH Sitapur financial outlay for capacity buildings is 5% (Rs. 33.018) of the total project cost.

Table 39 : Capacity Building activities in the project

Sl.no .	Project stakeholder	No. of Stakeholder	Total no. of persons	No. of persons trained so far	No. of persons to be trained		Sources of funding for training, BSA Unit or DoLR or other BSA Unit or other
					DoLR	BSA Unit	
1	District Data Center						
2	PIA.	1	1	1		1	1
3	WDTs	1	8	3		8	5
4	W.Cs.	15	150	-		150	-
5	GPs	-	-	-		-	-
6	SHG	15	180	-		180	-
7	UG	36	396	-		396	-
8	Community	-	-	-		-	-

Table 40: Detail of activities undertaken

Strategy	Proposed activity	No. of Units	Unit cost	Total Cost
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	Stakeholders - Scientists Interaction,	11	0.10	1.10
	Training (2 days)	40	0.05	2.00
	Vocational/employment Generation Training (5-10 days)	40	0.10	4.00
	In-service Training. (3 days)	10	0.10	1.00
	Exposure visit within State	5	0.20	1.00
	Exposure visit out of State	4	0.50	2.00
	Field days	10	0.20	2.00
	Workshop	3	0.60	1.80
	Total			14.90

5.2 WORK PHASE

5.2.1 Soil and moisture conservation

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

- 1 Increase the time of concentration.
- 2 Break a long slope into short ones.
- 3 Protection of drainage channel against damage.

4 Prevent excessive soil and water losses.

1. Ridge Area Treatment Plans:

It is very important to treat the ridge as this is where the major water resources originate. For the ridge area treatment of IWMP 4th watershed following structure are been Proposed after interaction between the watershed committee, Range Forest Officer (RFO) and other field staff of forest.

A. Contour Bunding & Graded Bund (Marginal and Peripheral Bund:

Contour bunds are recommended on gentler slopes and in areas where annual rainfall does not exceed 75-100 cm. Contour bunds are also used for water spreading on gentle cultivated slopes. Contour bunding is also effective for erosion control and moisture conservation in dry areas having less than 2 % slope to reduce the length of slope. Contour bund has been proposed to be constructed against the slope in 3140 ha of lands with total estimated cost of Rs. 131.88 lacs

B. Renovation of Existing Bunds for Soil Moisture Conservation:

Renovation of Existing Bunds for Insitu Soil Moisture **Conservation** will be done at middle reaches of watershed have in lesser slope. However, gully plug structure has been proposed to be formed on upper reaches / 1st order stream. Total propped area for the structures jointly is 290.00 ha with total financial outlay of Rs. 13.05 lacs. This generally includes water conservation or surface water storage

structures. This being highly labour intensive, it is proposed to be constructed from funds of National Rural Employment Guarantee Scheme (NREGS)

2. Water Harvesting bundhies:

Water harvesting bundhies are primarily aimed at collecting and storing any form of water which enter through rainfall, runoff or subsurface flow for multiple purposes. There will be 75 water harvesting bundhies with farm ponds structure on 415.00 ha of land will be constructed on lower reaches of the watershed. Estimated financial outlay is Rs. 49.80 lacs.

3. Agroforestry & Dry Land Horticulture:

Agroforestry is defined as a sustainable land management system which increases the yield of land, combines the production of crops(including trees) and forest plants or animals or both simultaneously or sequentially on the same unit of land and applies management practices that are compatible with cultural practices of the local population.

Agroforestry has emerged as an appropriate technology for the areas where fragile ecosystem and subsistence farmers predominate. It is an ideal option in such areas where land is scarce and labour is in plenty but less productive coupled with limited capital and high interest rates. A low-input land-use system is the basic approach in such practice, besides sustainability of productivities, economic viability and, above all, risks minimization.

The unit of management of land under these conditions can be watershed, or part of the watershed, provided the emphasis is on trees/grasses that will protect the land as well as produce fodder, fuel, forage

etc.

About 10.51 ha waste land falls in the class-VII category in the watershed. These lands will be planted with Subabool (*Prosopis cineraria*) and *Zizyuphus Spp* in which urd, moong, til etc shall be cultivated as intercrop, subabool will be used as fuel as well as fodder

Table. 41: Technical detail of Farm Ponds and Injection Well

S. No	Particulars	Value	Ponds	Injection Well
1	Top area	M ²	500.00 (25X20)	1.00
2	Bottom area	M ²	300.00 (20X15)	1.00
3	Depth	M	2.50	1.00
4	Side Slope	-	2:1	-

Table 42: Activities executed by User Groups in the Project @

S.N o.	Name of Project	Major activities				No. of UGs involved	Estimated Cost (Rs.)	Amount of WDF to be collected(R s.)
		Structure/activity proposed						
		Type	No. #	Treatment				
1	IWMP 4 th	Structure work		Engineering	March, 2015	30	249.00 laks	12.45 lakh

Table 43: Technical detail of engineering works in project area

S.	Project	No of	Type of	Type of	Particulars (meter)
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No.		Villages	bund	soil	Top	Base	Height	Slope	Cross section
1	IWMP 4th	24	Field Bund	Normal	0.30	1.65	0.45	1.5:1	0.438
				Clay	0.45	1.65	0.60	1.0:1	0.63
				Loam	0.45	2.25	0.60	1.5:1	0.81
				Sandy	0.45	2.85	0.60	2.0:1	0.99
				Plain land	0.60	3.60	1.00	1.5:1	2.10
				Undulating land	1.00	4.00	1.00	1.5:1	2.50
			Gully Plug	At 3% or above 3% slope gully plug will be made between two drainage line with emergency temporary spill way					

5.2.2 PROPOSED LAND USE

Watershed management plan for IWMP-4th Sitapur watershed has been prepared with specific objectives of food sufficiency and income and employment generation with environmental security. In plan preparation due importance has been 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 are done as per farmers priorities revealed through PRA exercise.

Technological options were blended with the ITK based on the latest available research/ experiment findings for this region. Due attention has been given to the resource of the farmers and adjustments were made in capital intensive/high resource demanding technological outputs while

making them adoptable to the resource poor farmers. Emphasis has also been given on maximum use of farm yard manure. The proposed land use plan of the watershed has been indicated in table 5.

5.2.3 WATER RESOURCE DEVELOPMENT AND SOIL CONSERVATION MEASURES

Status of Present Water Resources Utilization

The micro watersheds are having seasonal water bodies on private as well as on community land. During good rainfall year these water bodies having full of water during kharif season. Before sowing of rabi season crops water from these water bodies is either used for supplementary irrigation for kharif crops or irrigating fields for rabi sowing. After releasing water from bodies, submergence area also put under cultivation for rabi crops.

Proposed plan for Irrigation Development of existing water resources

For efficient utilization of available water resources in the IWMP-4th watersheds, present system of irrigation and wastage of water need to be made more efficient from water management point of view by minimizing conveyance losses in the existing water courses. The up gradation of the existing system of irrigation will result in:

- a. Minimization of conveyance losses
- b. Increase in frequency of irrigation
- c. Adoption of high yielding varieties of crops, and
- d. Assured cultivation of cash Crops

- e. Drinking water problem will also solved
- f. Local eco system will also improved

5.3.1 Crop Diversification and intensification of production /Farming system:

Diversification means to grow such crops which are more remunerative in place of crops which are non-remunerative. This also includes to adopt such cropping system which brings more area under crops on sustainable basis without affecting soil health. The benefit of crop diversification is:

- (i) Increase in total production.
- (ii) More income from vegetable and flower.
- (iii) Use of available land resource as per L.C.C.
- (iv) Increase in employment.
- (v) Sustainable agricultural development.
- (vi) Environmental imbalances are overcome.
- (vii) Less water intensive crops in place of more water intensive crops.

Crop diversifications are of two types

- (I) Horizontal diversification: To include more crops in present cropping system.
- (II) Vertical diversification: It indicates the industrialization of crops such as preservation and canning etc.

5.3.2. Techniqus of diversification:

1. Waste Land development: To bring more land under agriculture.
2. Precision farming:..To use balance inputs as per soil health on scientific basis.
3. Water management to use water judiciously, use of suitable method of irrigation
4. Ground water management: To use ground water with surface water.
5. Watershed development: Refers to the conservation, regeneration and judicious uses of all recources(land, water, plants & animal and human being).
6. Cropping inensity: Bring land under cultivation in Summer, Rainy season and Winter season with an aim to increase intensity without deteriorating soil health be use for bio manure/bio agents, IPM. and IPNM
7. Protective Agriculture: Agriculture in controlled atmosphere which uses less water for vegetable cultivation (off season)

As per Land capability classifation an area of 8116 ha. Is suitable for agriculture purpose in the watershed. Presently the area under different crops in the watershed during kharif and rabi is as under.

Kharif crops:

Crop	Area (ha.)
(i)Paddy	2180
(ii)Arhar	30
(iii)Jowar/Bajra	40
(iv)Maize	08
(v)50%of Sugarcane	3338
(vi) Other Kharif oil seeds(Til)	20
Total area	5616

Rabi crops:

Crop	Area (ha.)
(i) Wheat	2093
(ii) Mustard	120
(iii) Lentil	5
(iv) Pea	19
(v) Potato	23
(vi) 50% of Sugarcane	3338
(vii) Rabi vegetable	10

Total of Rabi +Kharif =5608+5616 =11474

Cropping intensity 144.62% The desired level of productivity is about 68% of the State average.

The present cropping intensity indicates that there is about 55.5 % gap even to attain 200% intensity. It is therefore proposed to opt following cropping pattern in the watershed area.

Kharif crops:

Crop	Area (ha.)
(i)Paddy	3150
(ii) Maize	100
(iii) Arhar	50
(iv)Urd	50
(v) Til	100
(vi) 50%of Sugarcane	4500
(vii)Kharif vegetable	50
(viii) Other Kharif Fodder	100
(ix)Horticulture Flowers	16
Total area	8116

2- Intermediate crops:

Crop	Area(ha.)
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(i) Potato(Early)	100
(ii)Toria(85-90days)	100

3 Rabi Crops:

(i) Wheate	3000
(ii) Barley	50
(iii) Potato	100
(iv) Gram	75
(v) Pea	75
(vi) Lentil	50
(vii) Mustard	150
(viii)Ravi fodder	75
(ix) Flowers	25
(x) Rabi vegetables	16
(xi) Sugarcane (50%)	4500
Total area	8116

Thus cropping intensity increas from 144.62% to 200 %

Suitable varieties for the watershed area are(Source:Krashi Gyan Manjusha- 6th edition,Krashi

Vibhag,Lucknow)

A: **Paddy:-**

1. Unirrigated condition: Early maturity(100-120 days)

(a) Direct sowing: Govind Narendra-118. Narendra-97.

(b) Trans planting: Ashiwini

2. Irrigated condition: Early maturity (100-120 days)

(a) Transplanting: Ratna, Govind, Manhar, Narendra-80,IR-50,Saket-4.

:Medium maturity(120-140 days)

Sarju 52,Sambha mansori, Sita, Swarna, Pant dhan 4, Pant Dhan 10.

:Late maturity(>140 days)

Type 23, Sambha Mansoori, Swarna.

Scented rice:

Pusa Basmati-1,Ballabh Basmati-47. Malviya Sugandh Dhan 105 & 4-3, Narendra

Lalmati

: Saline-Alkaline soil:

Narendra Usar dhan-1,2 & C.S.R 10

Hybrid rice: Pant Sanker dhan1,3, Narendra Sanker dhan-2, Pro Agro 6201, 6444,

Narendra usar sanker dhan 3, Indira sona

Expected yield: Q/ha

Early maturity: 40-45 Q/ha
 Medium maturity: 50-60 Q/ha
 Late maturity 45-50 Q/ha
 Scented rice 35-45 Q/ha
 Usar dhan 50-60 Q/ha
 Hybrid varieties 75-80 Q/ha

B Wheat:

Suitable varieties for the watershed are
 Early sowing: (2nd fortnight of October to 1st fortnight Nov.)
 Unirrigated condition: K-9351, H.D 2888, Malviya 533
 Sowing time (First week Nov to 25 Nov.)
 PVW-343, UP 2338, K9107, K 9006, PVW 443, (Upto 25 Dec.)
 Malviya 234, HD 2643, K 9162, UP 2338
 Usar area: KRL 1-4, Raj 3077, Lok-1, KRL 19, KRL 210, KRL 213, Prasad.
 Expected yield: Early sowing,
 (Unirrigated condition): 35-45 Q/ha
 Early and timely sowing,
 (Irrigated condition): 55-60 Q/ha
 Late sowing 40-45 Q/ha

Usar Soils 40-45 Q/ha

C Barley:

With shell: (Irrigated & unirrigated condition)

Jyoti, Azad, Haritima, Priti, Jagriti, Manjula, Narendra 1,2,3

Without shell

Geetanjali, Narendra 5

For Malt

Pragati, Ritambhara,

Expected yield: : Unirrigated & Late sowing

30-35 Q/ha

Irrigated & timely sowing

40-42 Q/ha

D- Sugarcane:

Early Maturity

COS 8436, 88230, 94755, 96268, COSe 00235M01235(Rapti) COSe -95447,

Medium & Late Maturity:

COS 767,8432,88216,97264,96275,97261,UP 0097,UP 39,Pant 84472,COSe 95447(Rasbhari)

Waterlodge condition:

P 9530,COSe 96436(Jalpari)

Usar Soil

COS 767,COS 94763

Expected Yield: 700 -900 Q/ha

D. Arhar (Pigeon Pea/Red gram)

Early varieties(130-170 days)

Paras,T21,Pusa 992,UPS-120

Late varieties(175-270 days)

Bahar,Amar,Narendra-1.Azad.PDA-11,Malviya, Narendra 2,

Expected Yield: 18-20 Q/ha Early varieties

30-32 Q/ha Late varieties

E. Urd (Black gram):

Type 9,Azad-1, Narendra Urd-1,PDU-1,Shekhar 1,3,Azad-3, Pant-31

Expected yield- 10-15 Q/ha.

F. Gram:

Desi varieties: timely sowing

Gujrat chana-4, Avrodhi, Pusa 256, Radhey, Adhar

Late Sowing

Pusa 372, Udai, Pant-G-186

Kabuli

Chamatkar, Subhra,Ujjawal,

Expected yield- 25-30 Q/ha.

G Pea

Rachna,shikha,Malviya-15.Pant 5, Sapna,Pusa Prabhat,

Expected yield- 25-30 Q/ha.

H. Lentil

Narendra-1,Pant 5,4,Pusa Vaibhav,Shekhar 2,3

Expected yield- 18-47 Q/ha.

I. Til (Sesame)

Type 4,12,18 Shekhar,Pragati,Tarun.

Expected yield- 6-8 Q/ha.

J. Toria (90-95 days)

Type 9,Bhawani, PT 303

Expected yield- 12-15 Q/ha.

K. Raie

Irrigated (125-135 days) Narendra Raie, Varuna, Kranti, Rohini,

Unirrigated- Vaibhav, Varuna (T 59)

Alkaline-Solaine soils- Narendra Raie, CS 52, 54,

Late Sowing- Ashirwad Vardan

Expected yield- 18-20Q/ha.

L. Potato:

Vegetables (70-80 days)

Kufri Chandramukhi, Kufri Bahar, Kufri Badshah, Kufri Lalima,

Expected yield- 200-250 Q/ha.

: For Preservation

Kufri Chipsona-1 (Hybrid MP/90-83)

Kufri Chipsona-2 (Hybrid MP/91-G)

Expected yield- 350-400 Q/ha.

M. Vegetables:

(i) Tomato (Rainy & winter):

Kashi Amrit, Kashi Anupam, Pusa, Kashi

Expected yield- 350-400 Q/ha.

(ii) Tomato (Round the Year):

Long varieties : 1BBL 9,Pant Samrat,
Green coloured: Samrat, Jiant,Banaras Jiant.
Expected yield- 350-400 Q/ha.
Hybrid long: Pusa hybrid-5
Hybrid Round: Kashi Sandesh, Pusa Hybrid-6
Expected yield600-700 Q/ha.

(iii)Cauliflower: Mid June-July (Early)

Pusa Dipali,Early Kuwari, Early Patna,Pant gobhi 2,3,Pusa Kartiki,Pusa Synthetic.
Expected yield300-400 Q/ha.
Mid August
Pant Subhra, Kalyan, Hissar 114. Narendra 1,Pusa Hybrid-2
Expected yield200-300 Q/ha.
Late(October)
Snowball 16,Pusa snowball 1,2, Vishwabharti,

(iv) Cabbage: Early (Mid September, Mid October)

Pride of India, Golden Anchor, Early Head, Meenakshi
Late(Mid October-Mid Nov.)
Mukta, Pusa Drumhead, Red cabbage, Pusa Hill Topper.
Expected yield(Early-Mid) 300-350 Q/ha.

(Late)) 350-450 Q/ha.

(v)Table Pea Early Varieties (October-Nov.)

Ageta 6,Archile,Pant Sabji Matar 3, Azad Pea 3,

Expected yield 50-60 Q/ha.

Late Verieties(October-Nov.)

Azad Pea 1, Jawahar Matar-1

Expected yield 100-125 Q/ha.

(vi) Onion

Kharif(June-July) Agrifound Dark red, Baswant 780,N-53

Expected yield 200-250 Q/ha.

Rabi(October-Nov.) Agrifound,Light red, Kalyanpur red,Pusa red,Nasik red.

Expected yield300-350 Q/ha.

(vii)Garlic Agrifound white,

Yamuna white,Yamuna white G-50,G 282

Expected yield150-200 Q/ha.

(viii) Capsicum: (Zaid & Kharif)

Pant c-1,Chanchal,Pusa Jwala,K5452(Dry),

Average Yield : 70 -90 Q/ha.

N. Maize:

Kharif:

Hybrid:Ganga 11, Daccan 107,Prakash, Pusa Hybrid-5. Malviya Hybrid

Average Yield : 40 -50 Q/ha.

Composite :Prabhat, Sweta,Pusa composite Naveen,Azad, Uttam,Pragati,Gaurav, Kanchan, Surya, Vivek-27.

Average Yield : 40 -45 Q/ha.

Rabi

Hybrid:Ganga-11.Duccan 103,105, Shaktiman-1.KH 5981, 5991

Average Yield : 70 -80 Q/ha.

Composite:Dhawal,Sharadmani, Shakti 1

Average Yield : 45 -50 Q/ha.

Popcorn:Amber Popcorn, Pearl Popcorn

Average Yield : 30-35 Q/ha.

Sweetcorn: Madhuri, Priya

Average Yield: Prepared Cobs

Fodder Maize: African Toll, J 1006.

O. Flowers

(i) Rose:

Hybrid; Crimson glory, Mister Lincon, John F. Kenedy, Jawahar, President Radhakrisnan, First Love, Ganga, Tata.

(ii) Merrygold:

African, Maxicon, French,

Hybrid: Naget, Treta, Pusa orange, Pusa basanti.

Average Yield : 125 -150 Q/ha.

(iii) Chrysanthemum (Guldaudi):

Reflaxed, Irregular, Korean, Decorative, Stelet.

Average Yield : 50 Q/ha.

(iv) Gladiolus:

Snow queen, Linconday, Pusa suhagin, Gold, Sylvia, Oskar lincon.

Average Yield : 1 Lakh to 1.25 Lakh spikes /ha

(v) Tuberose (Rajnigandha):

Single flowered, Semi double flowered, double flowered

Average Yield : Ist year 150- 200 Q/ha.

. 2nd year 200-250 Q/ha.

P. Fodder Crops:

(i) Jowar for Fodder:

During Zaid 1-15 February

Chari

During Kharif: 15-30 June

Multiple Cutting: PCH 106,855 F, FSH92079, MP Chari, Pusa Chari-23, Pro Agro

Average Fodder Production : 900 -1000 Q/ha.green fodder.

Single Cutting: PC-6,PC-9,UP Chari-1, UP Chari-2,Pant Chari-3

Average Fodder Production :250 -450 Q/ha.green fodder.

(ii)Barseem:

Sowing 1-15 October, 20-24 % Protien.

Verieties:Meskavi, Vardan, Pusa Jiant, JB-2,BL-10,BL-47

Average Fodder Production : 800 -1100 Q/ha.green fodder in 5-6 cutting.

(iii) Oat:

15 October-15 November,Drymatter 30-35%

Verieties: UPO 94, UPO-212,Flaming Gold, OL-9,FO 114,OS-6,OS-7,

Average Fodder Production: 500-550 Q/ha.in two cuttings.

(iv) Lucern:

Perennial Fodder crop: 15-20% Protien,1.5% Calcium,0.2% PhosphorusVitamin
A,B,D

Used for Silage or Hay.

Verieties: Type-1,Type-9,Anand-2,LLC-3,Sirsa-8,Sirsa-9,JS-244,Co-1,Chetak,
IGFRI-S-244, IGFRI-54

Average Fodder Production: 700-800 Q/ha.in 4-5 cuttings.

5.3.3. Package of Practices:

Package of practices beside varieties as enumerated in fore going paragraphs are:

- (I) Use of requied suitable quantity of certified/hybrid seeds and seed treatment with bio and chemical agents.
- (II) Use of Integrated Nutrient Management(IPNM) which requires as for as possible use of organic to commensurate about 50% nutrient need by organic means and rest by chamilical fertilizers.
- (III) Use of IPM techniques to control pest and diseases ie use of organic pesticides, herbicides till pest and diseases are below economic damage level and thereafter use of chemical insecticides in low concentration along with mechanical control measures.
- (IV) Judicious use of available irrigation water: use of suitable methods and latest technologies ie sprinkler and drip where possible. This is to be done at critical stages of plant growth.
- (V) Management and marketing of harvests the package of practices are given below inshort. For further details the staff of concerned department are available in the watershed area viz. agriculture horticulture, fishries and forest and WDT experts assistance whose should be taken and also the benefits of their schemes are to be driven in the watershed area.

Table- 44: Package of practices of important crops:

Sl. N o.	Crop	Sowing time	Seed rate Kg/ha	Seed Treatment (Bio/Chemical) per Kg seed	Fertilizer	Pest management	Planting distances (Cms)
1	Paddy	10-20June (Nursery)	Fine30 Kg Medium-40Kg Coarse- 40Kg Usar- 60 Kg Hybrid -20 Kg	For 25 Kg seed 4gm streptocylene or 40gm Plantomycine 125 gm Trichoduma	130 Kg Urea, 375 Kg SSP, 100 Kg MOP at the time of Transplanting Ist Topdressing 65 Kg urea 2nd Top dressing 65Kg urea	Use of IPM practices	2-3 plant,20X10 Hybrid 1-2 plant

2	Maize	25May- 15June	Hybrid 18-20 Kg Composite 20-25 Kg	3.00gm Thirum or 1.00 gm Psesedomonas Floresense	At the time of sowing -37 Kg urea, 130 Kg DAP, 100 KgMOP	Use of IPM practices	60X20-25
					Ist Topdressing 87 Kg urea 2nd Top dressing 87Kg urea		
3	Wheat	Nov.-Dec	100-125Kg	Thirum 2.5gm + Carbendazin 2.5gm/Kg	At the time of sowing -85 Kg urea, 130 Kg DAP, 67 KgMOP	Use of IPM practices	20-23Timely sown 15-18 Late sown
					Ist Topdressing 65 Kg urea 2nd Top dressing 65Kg urea		
4	Barley	15 October 7 November	80-100Kg	Thyrum 2.5gm + Carbendazin 2.5gm / Kg	At the time of sowing -42 Kg urea, 65 Kg DAP, 34Kg MOP	Use of IPM practices	18-20
					Topdressing 65 Kg urea		

5	Arhar	10-15June	12-15Kg	Tricoderma 3gm Vitavax 1gm Rhizobium culture		Use of IPM practices	60-75X 15-20 depth 4-5 cms
6	Black gram (Urd)	15June- 25 July	12-15Kg	Rhizobium culture treatment	32-44Kg. urea, 250Kg SSP at the time of sowing	Use of IPM practices	30-45 X10 cms depth 4-5 cm.
7	Gram	20 October to 10 Nov.	80-100Kg	Trichoderma 4gm + 1gm Vetavax Rhizobium culture treatment	At time of sowing 200 Kg. DAP & 200Kg Gypsum	Use of IPM practices	40-45 X10 cms.
8	Lentil	15 October -15Nov.	40-60Kg	Trichoderma 4gm + 1 gm Vetavax Rhizobium culture	44Kg Urea, 375 Kg SSP, 34Kg MOP + 25 Kg Zinc sulphate	Use of IPM practices	20-25X3for timely sown 15-20X3 for late sown

				treatment			
9	Pea	15-31 October for grains	100-125Kg	Rhizobium culture	312 Kg SSP	Use of IPM practices	30-35X10
		15October- 15Nov. for vegetable	Early 100- 125Kg Mid 80-100Kg				20-25X8
10	Repseeded & Mustard	Toria 15- 30 September	4Kg	2.5gm Thirum	Toria 100 Kg urea, 250Kg SSP, 34Kg MOP 100 Kg urea Top dressing	Use of IPM practices	30X10X15
		Raie Sarson 1- 20 October	5Kg		Raie Sarson 130 Kg urea, 250Kg SSP, 67Kg MOP 100 Kg urea Top dressing		
11	Sugar cane	Feb-March Spring cane	60q/ha (35000- 40000) set with eyes	Ariton 6% 250 gm, or Aglal 3%	At the time of sowing 80-100 Kg urea 130 KgDAP 84 KgMOP	(1)Use of IPM practices (2)Spring cane: Utrazine 2Kg(AI)	90Cms Depth 10 cm Sown: April 75 Cm,

		Winter cane October- 60q/ha (35000-40000) Sets with eyes		500gm in 100 Lt for 25 Qtl cane sets Soaking the sets in solustion for 5 minutes	Top dressing 130-160 Kg Urea 90 days after sowing for spring cane. For winter cane : top dressing after 110-120 days	after sowing 2,4-D,1Kg(AI) in 500-600 Lt.water, 30 days after sowing	May sown 60-65 Cm
Fodder Crop							
12	Jowar	Zaid 1-15 Feb Kharif 15-30June	Multi cut 25-30Kg small seed 25-30 Kg	Thirum 3gm or Trichoderma 5gm/Kg seed	At the time of sowing 130 Kg urea ,312 Kg SSP Top dressing 1st 65 Kg urea 2nd 65Kg urea	Use of IPM practices	30 Cms Line Depth 3-4 cm
			Single cut	Thirum 3gm or	At sowing 130 Kg urea, 250 Kg SSP		

				Trichoderma 5gm/Kg seed	Top dressing 65 Kg urea After 30 days		
13	Bersee m	1-15 October	25-30Kg+ 1-2 Kg musterd seed	Rhizobium culture	At sowing 44-65 Kg urea, 375-500 Kg SSP	-	Broad casting
14	Oat	15 October- 15Nov.	110-115 Broadcasting 75-80 In line late sowing 120-125 Kg	-	At sowing 130Kg urea ,250 Kg SSP 1st Top dressing At 47-25 days 47 Kg urea 2nd Top dressing 47 Kg urea	-	Line to line 20 cms
15	Lucer ne	1-15 October	Unline-15Kg Broadcasting 20-25Kg	Rhizobium culture	At sowing 44-45 Kg urea, 375-500 Kg SSP	-	Line to Line 25 cms.

5.3.4. Crop demonstrations and economics:

Half hectare crop demonstrations are to be carried out in 210 number on the field of the farmers. These demonstration shall be eyes opener for the farmers whose productivity is much less than the district average. This crop demonstration shall also plan a leading role to attract other farmers to opt the same methodology/technology and inputs to get more productivity from sown crops. The cost of different components on crop demonstration are given in table below:

Table:45 Cost economics of different component on demonstration of crop.

Source: Department of Agriculture,U.P.

Cost: Rs

Sl. No	Crop	Labour	Animal	Mach-ine	Seed	Irrigation	Fertilizer	Seed treatment & IPM	Total Cost of cultivation	Cost of produce	Expected yield Per Ha/Rs	Cost of produce	Total return (Rs.)
1	Rice Normal	11900	130	2550	1310	2350	2041	4750	47531	1692	35	35000	36692
2	Grade	11900	130	2430	1650	2500	2037	4750	47897	2376	30	45000	47376

	A												
3	Basmati	11900	130	2770	2115	3000	1900	4750	47995	1890	25	50000	51890
4	Maize	5300	130	1950	332	650	907	1051	10320	1296	18	18000	19296
5	Urad (Black Gram)	3000	260	1482	558	500	121	1091	7012	343	8	14000	14343
6	Arhar (Red Gram)	9655	65	2008	649	719	444	1500	15040	2483	18	24000	26483
7	Sugar cane	21000	260	5250	4000	5000	5000	3000	43510	0	800	100000	103000
8	Wheat	5600	145	4961	2000	3984	3495	2000	18201	3724	45	45000	48724
9	Barley	4500	290	4418	1437	1695	2712	1000	16052	3446	40	40000	43446
10	Gram	3000	290	2871	1962	712	1401	1000	14736	517	15	30000	30517
11	Lentil	3000	290	2399	1391	371	1800	1000	12111	629	12	24000	24629
12	Rie/ Mustard	5100	435	3290	239	1617	1401	1000	9852	914	10	20000	20914
13	Pea	3000	145	3267	1620	1279	1850	1000	13531	670	20	30000	30670

5.3.4. Crop production

(i) Mulching and crop residue management

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

(ii) Green manuring

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

(iii) Vermi composting

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

(iv)Crop rotation and intercropping

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

(v)Bio-fertilizers

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

(vi)Tillage operations

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

(vii)Introduction of improved seeds of high yielding varieties (HYV)

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

(viii)Balanced fertilizer use

Inadequate and imbalanced fertilizer use in the Paddy,Arhar,Urd,sugarcane during kharif season

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

(ix)Control of insect pest and diseases

The management strategies to control these insect pests and diseases will also be demonstrated in the watershed for benefit of the growers. This includes Bioagents, Biopesticides and chemical pesticides.

(x)Management of the crop

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

(xi)Dry land Horticulture

In the land which are suitable for horticultural development,. Species like Bael, guava and Ber will be planted at suitable spacing in the watershed.

(xii)Agri-Horticulture

Anola and sahjan would be a suitable horticultural crop to the locality. Therefore, land in the farmers field shall be selected and brought under Agri-horti system..

Plantation :

(xiii)**Fuel wood plantation:** Land falling in the class-IV category in the watershed. will be planted with species like *Prosopis juliflora* *Acacia nilatica*, *Prosopis cineraria* and *Holoptelia integrifolia*.

Table. 46: Technical Details of Afforestation and Agro forestry Activities in 1ha

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

Table. 47: Cost Estimation for afforestation and Agro forestry activity in 1ha

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

Table. 48: Technical Details of Horticultural Activities in 1ha

Particulars	Value	Unit
Crop Name	<i>Aonla, bael Ber, Guava etc</i>	
Plant To Plant Spacing	8.00	M
Row to Row Spacing	8.00	M
Pit Length	1.00	M
Pit Width	1.00	M
Pit Depth	1.00	M
No. of Plants	156	Nos.
Plantation Area	1.00	ha.
No. of Plants per ha	1,56	Nos.
Gap Filling	20	%

Table. 49 : Cost Estimation for Horticultural Activities in 1ha

S. No	Description	No.	Length (m.)	Width (m.)	Depth (m.)	Unit	Quantity	Rate	Amount
1	Digging of pits for plants	156	1	1	1	Cum	1,56.00	10	1560.00
2	Plants samplings for plantation in Govt. pasture area, sampling not less than 30 cm. height	156				Nos.	1,56.00	10	1560.00
3	Transportation of plants from nursery	156				Nos.	1,56.00	2	312.00

	to camp site up to 15Km								
4	Loading and unloading of plants	156				Nos.	1,56.00	2	312.00
5	Rehandling of plants from camp site to actual planting site upto 200m.	156				Nos.	1,56.00	2	312.00
6	Cost of fertiliser & insecticides incl. application	156				Nos.	1,56.00	10	1560.00
7	Weeding and Hoeing two times (Twice in year)	156				Nos.	1,56.00	2.46	384.00
Total									6000.00

5.3.5 PRODUCTION SYSTEM AND MICRO ENTERPRIZES

PROPOSED EXTENSION STRATEGIES

The following feasible extension strategies have been proposed based on the analysis of data collected through PRA & related issues/problems in IWMP 2nd Sitapur district.

Strategies:

- A. Improvement of productivity and income of farmers in the existing enterprises and farming system.
- B. Diversification and intensification of existing farming system.
- C. Sustainability in productivity/income.
- D. Integrated nutrient management.
- E. Integrated pest management.

- F. Seed multiplication and replacement.
- G. Horticulture planting material
- H. Success story.
- I. Natural resources management.
- J. Issue for Policy consideration
- K. Farm mechanization.
- L. Marketing & Media strategies.
- M. Human Resource Development.
- N. Farmers Organization.
- O. Public Private Partnership.

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

Table 50: Agriculture Production

Crop	Critical Gap	Strategic issue	Strategies
1	2	3	4
1 Wheat	Yield stagnation	Use of recommended certified seed and recommended quantity, Weed management, Popularizing Seed production programme, Popularizing Organic farming	Demonstration, Exposure visits, Training
	Use of Non untreated	Encouraging sowing with treated seeds	Demonstration, Exposure

2. Paddy	seeds		visits, Training
	Non judicious use of Irrigation water	Irrigation water management	Demonstration, Exposure visits, Training
	Imbalance use of Fertilizer	To promote IPNM	Demonstration, Soil testing, Exposure visits, - Training
	Un Availability of Quality Seed	In crease seed replacement ratio Promote seed production Programme	Demonstration, Exposure visits, Training
	1. Improper nursery raising	-Raised seed beds	Demonstration, Exposure visits, Training
	2. Inadequate Pest and disease management	Popularization of Integrated pest and disease management(IPM)	- Demonstration - Exposure visits - Training
	3. Weed management	Populazation of mechanical chemical methodology	Demonstration, Exposure visits, Training
1	4. Injudicious use of water	Irrigated management	Demonstration, Exposure visits, Training
3. Maize	1. Non adoption of seed treatment	Application of seed treatment	Demonstration, Exposure visits, Training
	2. Excess application of fertilizes	Use of recommended dose of fertilizer	Demonstration, Exposure visits, Training
	3. Use of Micro nutrients	Use of recommended quantity of micro nutrients	Demonstration, Exposure visits, Training
	4. Non adoption of hand pollination	Following hand pollination	Demonstration, Exposure visits, Training

	practices			
4. Mustard	1. Higher plant population	Popularization of plant population technique	Demonstration, visits, Training	Exposure
	2. Low production	-Suitable agronomical practices will be popularized	Demonstration, visits, Training	Exposure
	3. Imbalance use of fertilizer	-Use of balanced fertilizer promote, use of sulphur	Demonstration, visits, Training	Exposure
	4. Pest & disease management	-Adoption of proper pest and disease management practice	Demonstration, visits, Training	Exposure
	5. Post harvest technology	Popularization of improved storage method	Demonstration, visits, Training	Exposure
5. Lentil	1. Yield stagnation	Timely sown, line sown, seed rate as per recommendation	Demonstration, visits, Training	Exposure
	2. Imbalance use of fertilizers	Popularization of phosphatic fertilizer	Demonstration, visits, Training	Exposure
		3. Low quantity of F.Y.M.	Use of recommended practice of F.Y.M.	Demonstration, visits, Training
6. Sugarcane	1. Late sowing	Timely sowing	Demonstration, visits, Training	Exposure
	2. Non application of	Application of fertilizer in required dose	Demonstration, visits, Training	Exposure

	fertilizers	and seed treatment before sowing	visits, Training	
	3. Excess application of fertilizers	Use of recommended dose of fertilizer, Popularization of recommended dose of F.Y.M./Green Manure	Demonstration, visits, Training	Exposure
	4. Use of Micro Nutrients	Use of recommended quantity of micro nutrients	Demonstration, visits, Training	Exposure
	5. Inadequate pest and disease management	Adoption of IPM	Demonstration, visits, Training	Exposure
	6. Injudicious use of water	Irrigation management	Demonstration, visits, Training	Exposure

Table no. 51: Horticultural Production:-

(1)Pota to	I. Un Identified verities	Popularization of Identified Recommended verities	Demonstration, visits, Training	Exposure
	2. No seed treatment	Adoption of recommended seed treatment	Demonstration, visits, Training	Exposure
	3. Non use of Micro nutrients	-Application of recommended Micro	Demonstration, visits, Training	Exposure

		nutrients	visits, Training
	4. Non Adoption of pest and disease management	Use of IPM techniques	Demonstration, Exposure visits, Training
(2)Tomato	1. No seed treatment	Adoption of recommended seed treatment	Demonstration, Exposure visits, Training
	2. Imbalance use of fertilizers	Application of recommended dose of fertilizers(1PNM)	Demonstration, Exposure visits, Training
	3. Low quantity use of F.Y.M.	Adoption of recommended doseOf F.Y.M.	Demonstration, Exposure visits, Training
	4. Inadequate plant protection measure	Popularization of recommended plant protection techniques	Demonstration, Exposure visits, Training
(3)Banana	1. Low quantity use of F.Y.M.	Use of Recommended dose of F.Y.M	Demonstration, Exposure visits, Training
	2. No seed treatment	Popularization of bio agents, <i>Tricoderma</i> and <i>Pseudomonas</i>	Demonstration, Exposure visits, Training

		For seed treatments	
	3. Inadequate plant protection technique	Popularization of plant protection technique	Demonstration, Exposure visits, Training

Table. 58: ANIMAL HUSBANDRY

Animal	Critical gap	Strategy	Activities
Cow & Bufallow	a) Artificial Insemination partial adoption of AI	a) Improving knowledge about advantage and disadvantages of AI	a) Awareness campaign b) Ensure the availability of technical staff. c) Ensure the availability of semen f) Conducting fertility improvement camps. g) Conducting camps for castration of scrub bulls at village level h) Providing wide mouth cry can & 1 Lit. Thermos for easy transportation of semen to remote villages
	b) Unavailable of quality fodder feed.	Improving the knowledge about animal production capacity and its fodder requirement	a) Organizing awareness camp about animal production capacity, its requirements and dairy economics. b) ensure the supply of good quality fodder seeds. c) Demonstration of conservation of

			fodder by silage making
	c) Minerals & vitamins. Full gap in adoption of feeding	Motivating farmers about importance of minerals & vitamins.	a) Intensify the awareness programmers about importance of feeding minerals & vitamins by promoting stall feeding
	d) Inter-calving period is long period	Awarding about “a calf a year”	a) Awareness camp for reduction calving period
	e) Health care gap in health care management	Providing knowledge about animal health and hygiene	a) organizing awareness programme about animal health & hygiene through trainings and field visits. b) Awareness campaign about animal health camps
	f) General management Partial gap in Adoption of general. Management	Technology dissemination about animal management and its importance	a organizing awareness programme about animal management through training and field visits.
	g) Average milk yield. Full gap in average milk yield.	Technology dissemination about complete dairy management	By providing awareness about complete dairy management
Goat, Goat	a) Breed up gradation	Awareness about feed and fodder management	a) Providing awareness programme through training and field visits. b) Refresher training course to technical
	b) Feed management Partial adoption of feed management	Awareness about feed and fodder management	a) Providing awareness programme about the feed and fodder requirement of the animal.

			b) Intesify the supply of fodder seeds
	d) Health care -gap in health care management -non adoption of deworming schedule	-Popularizing the importance of deworming. - Providing knowledge about animal health and hygiene	a) awareness camp about importance of deworming b) Conducting deworming comps c) Organizing awareness programme about animal health and hygiene through training and field visit.
	d) General Management - Partial gap in adoption of general management	- Technology dissemination about animal management and its importance	- Organizing awareness programme about animal management through training and field visit

Table. 52: Fish Production

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

		process the fish	
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Table.53: Details of allied/ other activities (Total of the production system and micro enterprises intervention)

Sl. No.	Name of the villages	Name of activity	Type of land			Executing agency	Total target	
			(i) Private	(ii) Community	(iii) Others (pl. specify)		Estimated cost (Rs. In lakh)	Expected month & year of completion
1	2	3	4	5	6	7	8	9
A. PRODUCTION SYSTEM AND MICRENTERPRIZES INERVENTION (50 % BUDGET OF EACH INTERVENTION USE AS REVOLVING FUND AND 50 % USE AS TRAINING & TRAINING MATERIALS)								
	Ghagra 2B1H2a1b	Milk Collection Centre	-	Community	-	SHG	2.00	March, 2015
		Bee Keeping	-	Community	-	SHG	2.00	March, 2015
		Fruit preservation	-	Community	-	SHG	2.00	March, 2015
		Small ruminants (Goatry)	-	Community	-	SHG	3.00	March, 2015
		Fisheries	-	Community	-	SHG	3.00	March, 2015
		Portable	-	-	-	SHG	3.00	March,

		hatchery						2015
		Nursery raising	-	Community	-	SHG	3.00	March, 2015
		Rural craft		Community	-	SHG	3.00	March, 2015
		Animal Nutrient	Private	-	-	UG	0.024	March, 2015
	Total						21.024	
	Ghagra 2B1H2a2a	Bee Keeping	-	Community	-	SHG	2.00	March, 2015
		Fruit preservation	-	Community	-	SHG	2.00	March, 2015
		Fisheries	-	Community	-	SHG	3.00	March, 2015
		Nursery raising	-	Community	-	SHG	3.00	March, 2015
		Medicinal Plant	Private	-	-	SHG	3.00	March, 2015
		Rural craft	-	Community	-	SHG	3.00	March, 2015
		Animal Nutrient	Private	-	-	UG	0.716	March, 2015
	Total						16.024	

Table 54: Activities related production system and micro enterprizes intervention by Self Help Groups (SHGs) in the Project areas

Sl.no.	Name of Villages	Name of the Activities	Per Unit Cost	Total Cost
1	Kamapur	1.Dairy milk Production(Buffaw Keeping) 2.Goat and pig keeping 3. Swing & Embroidery 4.Fisheries 5. Candle Industry 6.Rice Polisher &Kirana Store 7.NEDEP & VERMI Compost Unit 8.Livestock(Fodder Development	1.1050	66.018
2	Rajapur			
3	Dharampur			
4	Mithmani			
5	Kotra			
6	Budhanpur			
7	Pachghara			
8	Jalalpur,			
9	Mahmoodpur Bazar			
10.	Saraiya kala			
11.	Nakara			
12.	Hailatpur,			
13	Parsehara,			
14	Tewra			
15	Bharkudi			
16	Essepur			
17	Kalhapur			
18	Mahmdapur			
19	Bannikaralla			
20	Pura Dasapur			
21	Intedaha			

47	Mauzuddinpur		
23	Guresh		
24			

6. CAPACITY BUILDING

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

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

Scope of capacity building at IWMP 4th

- 1 Alternative Land Use Plan
- 2 Scientific technique of Soil and Moisture conservation
- 3 Improved and Scientific agriculture practices

- 4 Fodder development and Management
- 5 Afforestation
- 6 Meteorological Information
- 7 Dairy Development and Management
- 8 Rural Craft
- 9 Income Generation Activities
- 10 Stitching
- 11 Food and fruit ,Processing preservation and canning
- 12 Post Harvest management practices
- 13 Fish Production

Capacity building and training are the most important components of watershed management programme both for the field level project staff/ officers and functionaries of people institutions i.e. watershed community. Apart from enhancing technical skill of the project staff, this would also provide opportunities to community members to develop their capacity as the future custodians of the programmes after project's withdrawal. IWMP 4th Sitapur financial outlay for capacity buildings is 5% (Rs. 33.018) of the total project cost, out of which Rs 2.00 will be spent on initiation of village level institution.

Table 55 : Capacity Building activities in the project

INSTITUTIONAL ARRANGEMENT & CAPACITY BUILDING IN THE PROJECT

Sl.no.	Project Stake holders	No of Stake holders	Total no. of persons	No. of persons to be trained so far	No. of person to be trained	Sources of funding for training, BSA Unit or DoLR or others		Name & address of Training Institute
						DoLR	BSA Unit or others	
1	District Data Center							
2	PIA.	1	1	1	1		1	Bakshi Ka Talab, WALMI Lucknow.
3	WDTs	1	8	3	8		5	WALMI Lucknow.
4	W.Cs.	15	150	-	150		-	
5	GPs	-	-	-	-		-	
6	SHG	15	180	-	180		-	
7	UG	36	396	-	396		-	
8	Community	-	-	-	-		-	
9	Any others	-	-	-	-		-	

Table 56.1: Detail of activities undertaken

Strategy	Proposed activity	No. of Units	Unit cost	Total Cost (Lakh Rs.)
	Stakeholders - Scientists Interaction,	15	0.10	1.50
	Training (2 days) for Stake holders	100	0.05	5.00
	Vocational/employment Generation Training (5-10 days)	20	0.10	2.00
	In-service Training. (3 days)	10	0.10	1.00
	Exposure visit within State	5	0.50	2.50
	Exposure visit out of State	4	2.00	8.00
	Field days	10	0.20	2.00
	Workshop	5	0.58	2.90
	Total			24.90

Chapter- 5

Budgeting

FUNDING OF THE PROJECT

Table . 57 : Funding for the IWMP- IV Project * (All financial figures in lakh Rs.)

S. No	Name of Project	IWMP fund		Funds from other sources in addition to IWMP funds										Total
		Central share	State share	Convergence funds		PPP		Community		Institutional finance		Others (pl. specify)		
				Name of Scheme	Amount	Name of Private sector	Financial contribution	Name	Financial contribution	Name	Financial contribution	Name	Financial contribution	
1	IWMP 4 th	717.876	79.764	-	-	-	-	-	-	-	-	-	-	797.64

*For detail please see table no. 69 it is additional budget and not included in fund budget (Rs. 12000.00).

this budget will be use in watershed area according requirement and need during work phase by PIA.

7.2 YEAR WISE PHASING OF WORK (Physical and Financial)

Phasing of various works/ activities during different year of the project for treatable area 6766 out of proposed area 7613.presented in

Table.

Table. 57: PHASING OF WORK (FINANCIAL & PHYSICAL)

1. Financial Outlays.

S.No.	Component	Unit	Quantity	Unit Cost (Lakhs)	1 st Year (Lakhs)	2 nd Year (Lakhs)	3 rd Year (Lakhs)	4 th Year (Lakhs)	5 th Year (Lakhs)	Total (Lakh)
A.	MANAGEMENT COSTS									
	Administrative cost- TD & DA, POL/ Hiring of vehicles/ Office and payment of electricity and phone bill, etc. computer, stationary and office consumable and contingency				-	15.9528	21.13746	21.13746	21.53628	79.764
	Expert for monitoring and evaluation.	Nos	NA	NA	-	3.9882	2.99115	2.99115	5.9823	15.9528
	Sub Total				-	19.941	24.12861	24.12861	27.51858	15.9528
B.	PREPARATORY PHASES									
	(1.) Entry point Activities									
	a. Chabutara	Nos	21	0.400	8.40	-	-	-	-	8.40
	b- Well repairing	Nos	46	0.195	8.97	-	-	-	-	8.97
	c. Village Drain	Km t.	0.100	5.678	0.5678	-	-	-	-	0.5678
	h. Culverts.	Nos	6	0.195	1.17	-	-	-	-	1.17
	k. Repairing of Community Road	Km ts	13.366	0.9575	12.7978	-	-	-	-	12.7978
	Sub Total				31.9056	-	-	-	-	31.9056
	(2.) Institutional and Capacity Building	-	-	-	7.9764	15.9528	5.9823	5.9823	3.9882	39.882
	(3.) Detail Project Report				7.9764	-	-	-	-	7.9764
	Sub Total				15.9528	15.9528	5.9823	5.9823	3.9882	47.8584
C.	WATERSHED WORKS									

	(1.) Watershed Development Works									
	a. Construction of Bunds (Field Bund, Contour Bund, Submergence Bund, Marginal Bund and Peripheral Bund)	ha	5620.	0.042	21.176	27.676	27.676	27.676	27.676	131.88
	b. Renovation of the Existing Bund for insitu soil Moisture Conservation	ha	290.00	0.045	2.61	2.61	2.61	2.61	2.61	13.05
	Rainfed Horticulture with Fencing	ha.	8.00	0.608	0.9728	0.9728	0.9728	0.9728	0.9728	4.864
	Rainfed Horticulture without Fencing	ha	160.00	0.150	-	6.00	6.00	6.00	6.00	24.000
	Total of Rainfed Horticulture	ha	3598.00		24.7588	37.2588	37.2588	37.2588	37.2588	173.794
	e. New and Renovation of Existing Water Harvesting Structure/ Gully Plug/ Chek Dam	ha	415.00	0.120	7.5064	10.5734	10.5734	10.5734	10.5734	49.80
	f. Afforestation and Development of Silvi-pastoral System	ha	28.00	0.068	0.3808	0.3808	0.3808	0.3808	0.3808	1.904
	g. Drainage Line Treatment (Pucca Structure / Gully Plug and Chek Dam)	nos	14	1.68	4.704	4.704	4.704	4.704	4.704	23.502
	Sub Total				37.35	52.9125	52.9125	52.9125	52.9125	249.00
	(2.) Livelihood Programme (Community Based)									
	Income Generating Activities through S.H.G.'s for Landless and Marginal Farmers									
	a. Establishment of Nadeef-Compost Units	nos	85	0.104	0.884	1.989	1.989	1.989	1.989	8.84
	b. Dairy Work	nos	26	0.500	1.30	2.925	2.925	2.925	2.925	13.00
	c. Goat-keeping	nos	26	1.142	2.4695	2.284	2.4695	2.4695	2.4695	11.42
	d. General Merchant Shop	nos	13		0.325	0.731	0.731	0.731	0.732	3.250
	e. Livestock Development Activities				1.329	2.99	2.99	2.99	2.991	13.29
	Sub Total				-	7.9764	31.9056	23.9292	15.9528	79.764
	(3.) Production System and Micro-Enterprises									
	a. Crop Production, Diversification of Agriculture	ha	31.50	0.5975	-	1.4478	5.7911	7.2389	4.3434	18.8212

	b. Introduction of Agro-forestry / Horticulture	ha	27.40	2.26	-	4.7634	19.0536	23.8169	14.2901	61.9240
	c. Demonstration of Green Manuring	ha	3701.29	0.0062	-	1.7652	7.0609	8.8262	5.2956	47.9480
	Sub Total				-	7.9764	31.9056	39.882	23.9292	103.6932
D.	CONSOLIDATION PHASE	-	-	-	-	-	-	-	39.882	39.882
	GRAND TOTAL				47.8584	111.6696	198.81177	199.21059	240.08964	797.64

Chapter- 6

Expected Outcome

EXPECTED OUTCOMES

Table.58. Expected/Estimated Outcomes (IWMP-4th)-Sitapur

S. No .	Name of the District	Item	Unit of measurement	Pre-project Status	Expected Post-project Status	Remarks
1	SITAPUR	Status of water table	Meters	7.5 to 8.00	5-6	
2		Ground water structures repaired/rejuvenated/constructed	No.	-	70	
3		Quality of drinking water	Quality	General	Safe and Good	
4		Availability of drinking water	Days	365	365	
5		Increase in irrigation potential	%	3	6	
6		Change in cropping/ land use pattern	Cropping pattern	Single/double	Double/multiple	
7		Area under agricultural crop Total	Ha	8116	8116	
8		i Area under single crop	Ha	1976	-	
9		ii Area under double crop	Ha	6038	8116	
10		ii Area under multiple crop	Ha	98.00	305.00	
11		Net increase in crop production per Ha	Ha	16.25	28.25	
12		Increase in area under vegetation	Ha	2.20	5.00	
13		Increase in area under horticulture	Ha	-	20.00	
14		Increase in area under fuel & fodder	Ha	66	80	
15		Increase in milk production	Av.lit/day/	1.75	3.10	

			cattle			
16		No. of SHGs	No.	-	86	
17		Increase in no. of livelihoods activities	No.	5	15	
18		Increase in income(per capita)	Rs.	8850.00	14000.00	
19		Migration	%	9.00	5.00	
20		Credit linkage with banks	No.	8	32	
21		Resource use agreements	%	Agreed	100% as required	
47		WDF collection & management	%	5-10	100% collection during project period	
		Summary of lessons learnt				

6.1 EMPLOYMENT

Employment has always been a problem in the village. The principal occupations of the people are dry land agriculture, animal husbandry and casual labour work. However, rain fall being very limited and erratic, agriculture suffers, i.e. at best they can take only a single crop, which keeps them partially engaged for about 4 months. Lack of fodder makes animal husbandry very difficult and non

remunerative. Thus the people mainly depend upon casual labour, either in the village itself or outside it.

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

Table 72: Employment in Project area

S. N o.	No. of villages	Wage employment										Self employment				
		No. of man days					No. of beneficiaries					No. of beneficiaries				
		SC	S T	Othe rs	Wome n	Tot al	SC	S T	Othe rs	Women	Tota l	SC	S T	Others	Wome n	Tota l
1	23 (IWMP -4 th)	1.98	-	1.99	0.02	3.99	725	-	1100	114	1939	102	-	125	32	259

6.2. Migration

Low rainfall results in very little fodder availability in the locality. On account of agriculture and animal husbandry providing only part time employment for some part of the year, the people migrate for

a better half of the year for wage labour. Employment opportunities in the local area as mentioned above will ensure lessening seasonal migration from the area.

Table. 73: Details of seasonal migration from Project area

S.No.	No. of villages	No. of persons migration	No. of days per year of migration	Major reason(s) for migration	For reduced migration identify major activities of IWMP responsible		
					(a) Structures	(b) Livelihoods	
1	IWMP-4 th (23 VILLAGES)	508	413	Unemployment & high Wage rate in City	Structure	Livelihood	475

6.3 Drinking water

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

Table. 74: Status of Drinking water

		Availability of drinking water (no. of months in a year)		Quality of drinking water		Comments
		Pre-project	Expected Post project	Pre-project	Expected Post-project	
1	IWMP-4 th (23 village)	12 month	12 month	General water	Good water	-

6.4 Vegetative cover

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

Table. 75: Forest/vegetative cover

S. No.	Name of Village	Existing area under tree cover (ha)	Area under tree cover proposed
1	IWMP-4 th (23village)	-	671.00 Ha

Horticulture

The subtropical fruits and vegetables have very good potential in the watershed. The fruit trees has limited in number area like mango, guava, , lemon, lime, ber, aoula, bael as vegetables like

cucurbits, radish, tomato, cauliflower cabbage, garlic, onion, brinjal, chilly, but they are found surviving well in the watershed villages. Organized orchards, commercial vegetable cultivation, horti-agri and other systems of agro-forestry etc are lacking but have good potential in the water shed. For the improvement of Horticultural programme GOUP are giving subsidies for raising nurseries like the following:

S.No	Programme	Subsidy
1	Establishment of 'Aadarsh' Nursery(2-4Ha)	50% of investment cost or maximum upto 12.50 lakh 4 Ha credit linked Bank aided subsidy
2	Establishment of 'Small' Nursery(1Ha)	50% of investment cost or maximum upto 3.125 lakh Ha credit linked Bank aided subsidy
3	Cold storage units	40% of cost investment or maximum upto 120.00 lakh credit linked Bank aided subsidy
4	Primary Processing unit	40% of investment cost or maximum upto 9.60 lakh credit linked Bank aided subsidy
5	Low cost preservation unit (Establishment of new unit)	50% of investment cost or maximum upto 1.00 lakh linked Bank aided subsidy
6	Low cost onion storage house	50% of investment cost or maximum upto 0.50 lakh linked Bank aided subsidy
7	Functional infra-structure for collection sorting, grading & packing	40% of investment cost or maximum upto 6.00 lakh credit linked Bank aided subsidy

Source: Govt. Publications

6.5 Livestock

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

Table. 76: Details of livestock in the project areas (for fluids please mention in litres, for solids please mention in kgs. and income in Rs.)

S. no.	Name of MW	Type of animal	Pre Projected			Expected Post Projected			
			No	Yield	Income	No	Yield	Income	
1	IWMP-4 th (47 village)	Buffalow	2527	2.33lit/animal	20.00/day	11786	4.00lit/animal	30.00/day	
		Cow	1132	1.84lit/animal	16.00/day	7668	3.004lit/animal	25.00/day	
		Sheep	50	10kg/animal	2000.00/animal	7681	20kg/animal	4000.00/animal	
		Goats	930	8 kg/animal	1600.00/animal	405	16 kg/animal	3200.00/animal	
		Pigs	710	20 kg/animal	2000.00/animal	710	50 kg/animal	10000.00/animal	
		Poultry	-	0.75kg/bird	150.00/bird	-	0.75kg/bird	300.00/bird	
		Fish	-	10.73 q/ha	15000.00/ha	-	50.00 q/ha	75000.00/ha	

Table no. 64: Backward and Forward Linkage

S. No.	Project	Type of Marketing Facility	Pre-project (no.)	During the project (no.)	Post-project (no.)
1	23 villages in IWMP 4 th	Backward linkages			
		Seed certification	1	1	1
		Seed supply system	30	32	48
		Fertilizer supply system	12	18	20
		Pesticide supply system	6	6	10
		Credit institutions	Bank-5	Bank-7	Bank-10
		Water supply	-	-	-
		Extension services	3	3	12
		Nurseries	1	1	12
		Tools/machinery suppliers	-	-	2
		Price Support system	-	-	4
		Labour	-	-	-
		Any other (please specify)	-	-	-
		Forward linkages			
		Harvesting/threshing machinery	4	8	12
		Storage (including cold storage)	1	1	4
		Road network			
		Transport facilities	-	-	-
		Markets / Mandis	8	9	12
		Agro and other Industries	1	5	6
		Milk and other collection centres	-	2	6

	Labour	-	-	-
	Hatchery (Portable)	-	5	8
	Vermi-compost unit	-	2	5
	Animal Mineral Mixture	-	-	50 gm/day/animal

Chapter- 7

Quality and Sustainability Issue

CONSOLIDATION / WITHDRAWAL STRATEGY

7.1 Plans for Monitoring and Evaluation

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

Yet another component of the Web-based GIS system is the Mobile based Monitoring & Evaluation

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

7.1.2 Plans for Project management:

The Project management of any watershed programme is very important. It mainly depends upon the community organization and the village level institutes. In IWMP 4th Sitapur watershed committee and various user group have been formulated for post project operation and maintenance of assets created during project period. Major emphasis will be on equity and sustainable benefit of the project even after implementation stage. A proper link-up will be built during project period with various institutes and capacity building organization. They will act as a major kingpin during post implementation for scaling up the successful experience during project.

7.1.3 Watershed Development Fund:

The major source of financial assistance after post implementation period is watershed Development Fund. This is mandatory conditions selection of villages for watershed project is peoples contribution towards WDF. This will be 10% of cost of NRMWorks executed on private lands only. In case of SC/ST, SF, MF the minimum contribution shall be 5% of NRM works excuted on their lands. The contribution of it will comes mainly from users for their uses of assets created in the watershed.

7.1.4 User Charges:

Various user groups will be formed in village. These user groups will collect user charges according to the agreement signed during the formation of user group. These funds will be transferred to the WDF funds. The secretary of watershed committee (WC) shall maintain the records of the fund.

7.3 Sustainability and environmental security

In the proposed in the management plan of IWMP-4th watershed that proper blending of bio engineering measures will be applied on the watershed area. Based on the results of studies conducted in this region, it is estimated that more 50% of the watershed area will be treated and consequently the soil loss and runoff from the area is expected to be reduced by 70%. The proposed land use plan will improve the land utilization index and crop diversification index significantly as compared to the existing one. It will help in maintaining ecosystem on sustained basis along with improving the livelihood security

of the farming community.

7.4 Economic Analysis

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

7.4.1 Agriculture

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

Table 68: Economics of agriculture sector

S.No	Sector	Area (ha)	NPV (Rs.)	BC ratio
1	Irrigated agriculture	3792	105680396	1.6:1
2	Rainfed agriculture	4608	46764736	1.2:1
3	Total	8400	152442632	1.4:1

7.4.2 Horticulture

Economic analysis of horticulture plantation in agri-horti system at IWMP 4th watershed Project life is considered to be 25 years and discount rate for NPV estimation is 10%

Table 69: Economics of Horticulture sector

S.No .	Common Name	Scientific name	Area (ha)	NPV of net venefit (Rs.)	BC ratio
1	Amla	Embelica officinalis	10	176287	3.97:1
2	Ber	Zyziphus mauritiana	05	41993	2.81:1
3	Bael	Aegle marmelos	05	27401	2.84:1
	Total		20	245681	3.512

7.4.3 Forest/ Fuel wood plantation

Economic analysis of fuel wood plantation at IWMP-4th watershed. Project life is considered to be 25 years and discount rate for NPV estimation is 10%

Table. 70: Economics of aforestation sector

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

7.4.4 Food sufficiency

Achieving self sufficiency in food production is one of the prime objectives of the project. The status of food requirement and production before and after the project is presented in Table below. As per WHO norms per capita consumption per day is 533 gms of cereal & 40 gram of pulses + oil seeds. On this basis the yearly consumption of cereals and pulses +oil seeds is estimated to be 2.02 Qtls/year and 0.146 Qtl/year per capita respectively.

Table 71: Status of food requirement and availability per annum in IWMP-4th watershed for population of 24766

Sl. No	Items	Requirement (q/ yr.)	Before project		Proposed	
			Availability (q/yr)	Deficit or surplus (q/yr)	Availability (q/yr)	Deficit(-) or surplus (+) (q/yr)
1	Cereals	36500	29560	-6940	45000	+8500
2	Pulses	12166	8470	-3696	12500	+334
3	Oil seeds	8111	5680	-2431	8500	+389
4	Vegetable	47812	16765	-6047	27000	+4188

Chapter- 8

Mapping

