

**DETAIL PROJECT REPORT OF MICRO
WATERSHED PROJECT
UNDER**



**INTEGRATED WATERSHED MANAGEMENT
PROGRAMME
(IWMP J.P. NAGAR – III)
BLOCK – GANGESHWARI, DISTT – J.P. NAGAR (U.P.)
LAND DEVELOPMENT AND WATER RESOURCES DEPTT. (U.P.)**



Prepared by :

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CERTIFICATE

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

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

Soil Conservation Officer
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PROJECT AT A GLANCE

IWMP-II (J.P. NAGAR)

1	State	Uttar Pradesh
2	Distt.	J.P. NAGAR
3	Block	Gangeshwari
4	M.W.S. Code	2B5A7f1f, 2B5A7f1e, 2B5A7f1h, 2B5A7f1c, 2B5A7f1b
5	Name of M.W.S. Project	Alipur Khaddar, Soharka, Deemar Kheri, Basi Kalan, Sultanpur, Firojpur Gandavali, Agrolakhan, Mathana,
6	Involved Village	8
7	Geographical Area of M.W.S.	3604.01 ha.
8	Rainfed Area	2875
9	Treatable Area	2730
10	Weightage	95.50
11	Cost of Project	327.60
12	For the year	2010-11

Budget Components

S. No.	Components	Area (Ha.)	Cost (in Lacs)
1	2	3	4
1	Management Cost 12%	-	39.312
2	Preparatory Phase 10%	-	32.76
3	Watershed Work Phase	-	
	A- Watershed Development Works 50%	2730	163.80
	B- Livelihood Programme (Community Base) 10%	-	32.76
	C- Production System & Micro Enterprises 13%	-	42.588
4	Consolidation Phase 5%	-	16.38
	Total	2730	327.60

IWMP- III (2010-11) DISTRICT- J.P.nagar YEAR WISE PHASING OF IWMP WORKS

Area – Ha & Rs.in Lac

Sl. No	Particulars	1 st year (2009-10)		2 st year (2009-10)		3 st year (2009-10)		4 st year (2009-10)		5 st year (2009-10)		Total	
		Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.
1	Administrative cost 10%	6.552	-	6.552	-	6.552	-	6.552	-	6.552	-	32.76	-
2	Monitoring 1%	-	-	0.819	-	0.819	-	1.638	-	-	-	3.276	-
3	Evaluation 1%	-	-	0.819	-	0.819	-	1.638	-	-	-	3.276	-
4	Entry point activity 4%	13.104	-	-	-	-	-	-	-	-	-	13.104	-
5	Institution & capacity building 5%	1.638	-	6.552	-	6.552	-	1.638	-	-	-	16.38	-
6	DPR 1%	3.276	-	-	-	-	-	-	-	-	-	3.276	-
7	Watershed Dev.Works 50%	-	-	24.57	-	72.072	-	67.158	-	-	-	163.8	-
8	Livelihood activities 10%	-	-	13.104	-	9.828	-	9.828	-	-	-	32.76	-
9	Production System & micro Enterprises 13%	-	-	9.828	-	9.828	-	9.828	-	13.104	-	42.588	-
10	Consolidation phase 5%	-	-	-	-	-	-	-	-	16.38	-	16.38	-
11	TOTAL 100%	24.57	-	62.244	-	106.47	-	98.28	-	36.036	-	327.60	-

CHAPTER - 1

Executive Summary of the Project

Identified selected micro watershed project Alipur Khaddar, Soharka, Deemar Kheri, Basi Kalan, Sultanpur, Firojpur Gandavali, Agrolakhan, Mathana, is coded as 2B5A7f1f, 2B5A7f1e, 2B5A7f1h, 2B5A7f1c, 2B5A7f1b has been proposed from cluster of I.W.M.P. J.P. Nagar – III project in Gangeshwari Block district J.P. Nagar in the micro watershed which is located in the south of district J.P. Nagar on the east bank of River Ganga. It lies between $28^{\circ} -15'$ and 15° E Latitudes and $78^{\circ} -E$ and $78^{\circ} -5$ N Longitudes Covering area. Its altitudes ranges from 187 meter to 190 meter above the mean sea level Amraua Railway Station 184.11 m, Garh Railway station is 201.18 m above mean sea level is displayed. Project area of I.W.M.P. J.P. Nagar -III is lied in the Gangeshwari Block of J.P. Nagar District which is come in the western plan zone under semi arid area. The annual average rainfall is near to 397 mm which an average of 35 rainy days. Out of which about 85% is received during the mansoon season from July to September and very less rainfall is received in the winter season.

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

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

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

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

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

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

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

STEP-1 Secondary data collection:-During the five days visit programme in the micro watershed project with of all available documents of village label by approaching the Gram panchayat collected secondary data.

STEP-2 Village meeting & conducting PRA exercise:-Community meeting conducted on fix days for the consultation with villagers for the PRA Exercise. Participatory mode of the villages was positive indicated for the success of programm. With good in testing participation has been drawn social & resource map on ground & paper & discussed un various topics of problematic thoughts in the micro watershed.

- STEP-3 Socio economic survey:-** The resource organization of village level volunteers identified to conduct house hold socio economic survey/states.
- STEP-4 Probel typology analysis:-**Thoroughly analyzed the data & identified problem type as soil & moisture conservation, crop rotation, crop coverage, productivity, livelihoods, social issues & capacity building gaps etc. Problems discussed with the watershed committee & came up with alternative solution.
- STEP-5 Conduct of net participatory planning (NPP):-** The planning team visited together in the planning blocks on the scheduled date along with the beneficiaries of the villages & data gathered as for the participatory net planning.
- STEP-6 Productivity & livelihood planning exercise:-** For the product livelihood exercise, group discussion on various livelihood as Agriculture, Animal husbandry enterprise development held discussion with the villagers in the micro watershed.
- STEP-7 Institutional & capacity building :-** This plan is prepared based on the data available in the field and auscultations with the watershed committee.
- STEP-8 Data consolidation & documentation of DPR :-** After gathering all required information compiled collected data. Thoroughly discussed and finalized the expected outcomes and benefits specially in the respect of livelihood for different segments. These are the target and performers indicators for the micro watershed.
- STEP-9 Conduct of Gram Sabha obtaining approvals submissions of DPR.:-** After preparation of the draft DPR convened to Gram sabha and activities proposed expected outcomes benefits of implementing the programm are explained in case of any changes are proposed in the Gram sabha approval obtained by the Gram sabha and already singed of Mau paper.

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

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

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

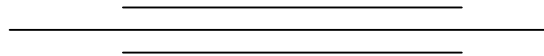


Table 1.2: Criteria and weight age for selection of watershed

S. No.	Criteria	Maximum Score	Range & Score			
1	Drinking water	15	Very poor Dependence on water supply through tanker (15)	Poor Partial availability within the periphery of 3-4 km (10)	Good Round the availability within the periphery of 3-4 km (5)	Very Good Round the year availability in watershed (0)
2	Irrigation	10	No irrigation (10)	Life saving irrigation (7.5)	Partial life saving irrigation (5)	Fully covered (0)
3	Degree of soil erosion	10	Severe (10)	Medium (7.5)	Low (5)	No erosion (0)
4	Water holding capacity	10	Very poor (10)	Poor (7.5)	Good (5)	Very Good (0)
5	Area under rainfed agriculture	15	More than 90% (15)	80 to 90 % (10)	70 to 80 % (5)	Below 70% (Reject) (0)
6	Status of field bund/contour bund / graded bund	10	Below 20 % (10)	50 to 20 % (7.5)	80 to 50 (5)	Above 80% (2.5)
7	Presence of hard rock below the land	15	Hard rock starts from 5 to 20 feet (15)	Hard rock starts from 21 to 50 feet (10)	Hard rock starts from 51 to 100 feet (5)	Deep soil depth (0)
8	Options for livelihood	10	Very poor (10)	Poor (7.5)	Good (5)	Very Good (0)
9	% of small and marginal farmers	10	More than 80% (10)	50 to 80 % (5)	Less than 50% (3)	
10	Degraded land	15	High above 50% (15)	Medium 25 to 50% (10)	Low less than 10 – 25 % (5)	Very low Less than 10% (0)
11	Ground water status	10	Very poor (10)	Poor (7.5)	Good (5)	Very Good (0)
12	Status of Technical Knowledge for improved farming systems	10	Very poor (10)	Poor (7.5)	Good (5)	Very Good (0)
13	Weather condition	15	Uncertain weather condition / Continuous drought for three years (15)	Drought comes one in five years (10)	Drought comes one in ten years (5)	Normal weather condition (0)
14	Poverty index (% of poor population)	10	Above 80% (10)	80 to 50 (7.5)	50 to 20 % (5)	Below 20 % (2.5)
15	Virginity (No treatment /intervention in last five years)	10	Above 80% (10)	80 to 50 (7.5)	50 to 20 % (5)	Below 20 % (2.5)
16	Productivity potential of land	15	Lands with low production & where productivity can be significantly enhanced with reasonable efforts (15)	Lands with moderate production & where productivity can be enhanced with reasonable efforts (10)	Lands with high production & where productivity can be marginally enhanced with reasonable efforts (5)	-
17	Organic carbon status	15	Very low (15)	Low (10)	Medium (5)	Normal (0)

Table 1.3: Weightage of the project

S. No.	Criteria	Weightage points
1	Drinking water	10
2	Irrigation	5
3	Degree of soil erosion	5
4	Water holding capacity	7.5
5	Area under rainfed agriculture	5
6	Status of field bund/contour bund / graded bund	10
7	Presence of hard rock below the land	10
8	Options for livelihood	10
9	% of small and marginal farmers	10
10	Degraded land	15
11	Ground water status	10
12	Status of Technical Knowledge for improved farming systems	10
13	Weather condition	15
14	Poverty index (% of poor population)	10
15	Virginity	10
16	Productivity potential of land	10
17	Organic carbon status	15
	Total Weightage (Out of total 205)	167.5
	Weightage Percentage	81.71

1.3 General Description of the Watershed

Micro-watersheds of IWMP-III is Mahawa. The total geographical area of the all micro-watersheds is 3604.01 ha; out of that only 2730.00 ha is the treatable area. More than 75 per cent area of the all micro-watersheds comes under agriculture. Remaining are habitation, road, hillocks, degraded land, water bodied, orchard, forest land, etc.

Table 1.4: Project at a Glance

S. No.	Particulars	Details
1.	Name of State	Uttar Pradesh
2.	Name of Project	IWMP- III
3.	Name of District	J.P. NAGAR
4.	No. of Projects of IWMP-III	5 Micro-watersheds
5.	Four Major reasons for selection of watershed	Erosion Nutrient loss Water scarcity Rainfed Degraded lands with multidirectional slopes Low productivity of crops and live stock
6.	Name, Address of PIA	Bhumi Sanrakshan Adhikari, Deptt. of Land Development & Water Resource, Ghaziabad
7.	Area of the Project (ha)	3604.01
8.	Area proposed to be treated (ha)	2730.00
9.	Year of Sanction	2010-2011
10.	Duration of Project	4 years
11.	Project Cost (Rs. In Lakh)	327.600

1.4 Details of ongoing watershed programme

Presently, no watershed development programme is going on in all micro-watersheds.

CHAPTER - 2

GENERAL DESCRIPTION OF PROJECT AREA

2.1 Location: The all micro-watershed is located in J.P. Nagar in Ghaziabad district. It is about 15-25 km from Ghaziabad.

2.2 Area: The total geographical area of the all micro-watersheds of IWMP-II is 14250.97 ha; out of that only 6945.00 ha is treatable. More than 94 per cent area of the micro-watershed are rainfed. About 15 per cent area has life saving irrigation mainly through open shallow dug wells and bore wells.

2.3 Agro-climatic characterization of IWMP-II Micro-Watershed

The agro-climate of the watershed is characterized by dry and hot summer, warm and moist rainy season and cool winter with occasional rain showers. Mean annual temperature ranges from 24 to 25 °C. The mean summer (April-May-June) temperature is 34 °C which may rise to a maximum of 46 to 49 °C during the month of May and June. The diurnal variation in temperature is quite high. The early rise in temperature during March-April accompanied with westerly winds reduces the humidity and causes desiccation of the *Rabi* crops, resulting in poor grain development. Details of drought is depicted in Table 2.1.

Table 2.1: Details of drought in the project area

Sr. No.	Particular	Porject	Years	Intensity	Periodicity
1.	Drought	IWMP-III	2004-05 2005-06 2006-07 2007-08	Severe Severe Severe Severe	Mentioned in section 2.4

2.4 Digital Elevation Model (DEM)

A DEM is a digital file of terrain elevations for ground positions. It is a raster representing the elevations of the ground and objects. Besides providing a source of elevation, the DEM may be used for topographic information, flow pattern, flood risk areas identification and to determine accessibility.

2.5 Slope of the micro-watershed

Slope and aspect of a region are vital parameters in deciding suitable land use, as the degree and direction of the slope decide the land use that it can support. Slope is also very important while determining the land irrigability and land capability classification and has direct bearing on runoff

2.6 Soil and Land Capability Classification

The total geographical area of the all micro-watersheds of IWMP-II is 14250.97 ha; out of that only 6945.00 ha is treatable. More than 75 per cent area of the all micro-watersheds comes under agriculture. Remaining are habitation, road, hillocks, degraded land, water bodied, orchard, forest land, etc. Most of the soil is sandy loam.

2.6.1 Soil Texture

Soil texture was assessed through feel method in the field and was classified as follows:

Textural class (symbol)	Capability class	Textural class	Capability class
Sand (s)	IV	Clay (c)	II/III
Loam (l)	I	Silt (si)	II
Sandy Clay (sc)	II	Sandy loam (l)	I
Sandy Clay Loam (scl)	I	Clay loam (cl)	I
Silty clay loam (sicl)	I	Silty loam (sil)	I
Silty clay (sic)	II	ls	I

2.6.2 Soil depth

Soil depth modifies the rooting system of plants which reflects on crop growth and yield and also the amount of soil water. Suggested land use capability classes for different depths are as follows:

Soil depth (cm)	Class symbol	Description	Land capability class
> 90	d ₅	Very deep	I
45-90.0	d ₄	Deep	II
22.5-45.00	d ₃	Moderately deep	III
7.5 – 22.5	d ₂	Shallow	IV
< 7.5	d ₁	Very shallow	VI, VII

2.6.3 Land slope

Soil and water losses from an area of the watershed are influenced by length of slope. This factor influenced the land capability classification. Accordingly, modified slope classes ranges and description with suggested capability classes are given as under.

Slope class	Slope range %	Description	Land capability class
A	0-1	Nearly level	I
B	1-3	Very gently sloping	II
C	3-5	Gently sloping	III
D	5-10	Moderately sloping	III
E	10-15	Strongly sloping	IV
F	15-25	Moderately steep to steep	IV
G	25-33	Steep	VI
H	33-50	Very steep	VII
I	Over 50	Very very steep	VIII

2.6.4 Degree of erosion

Assessment of soil erosion is made by ocular estimate which to some extent depends on the experience and personal judgment. While it is easy to pinpoint the menace of erosion in case of a very specific situation e.g. rill and gully erosion, but it may not be possible to distinguish and characterize the incidence of invisible forms e.g. sheet erosion. The erosion classes with their suggested LCC are given below:

Erosion class symbol	Description (degree of erosion)	Land capability class
e ₁	No erosion or slight erosion (upto 25% of A horizon is lost)	I & II
e ₂	Moderate erosion (50-70% A horizon is lost)	III
e ₃	Severe erosion (A horizon lost and B horizon exposed)	IV
e ₄	Very severe erosion (25-75% horizon lost)	VI & VII

2.6.5 Land capability sub-classes

- e – erosion hazards (main problem)
- w – wetness (excess water is the main problem)
- c – climate (temperature, rain and moisture)
- s – soil (shallow, salinity etc)

Considering all factors into account, Land Capability Classification (LCC) of the micro-watershed is finalized.

Chapter - 3

BASELINE SURVEY AND PARTICIPATORY RURAL APPRAISAL

Participatory rural appraisal (PRA) is a tool to appraise the socio-economic conditions along with all kind of resources available in the watershed through the active participation of the villagers. There are several tools and techniques of PRA. The PRA of all micro-watershed was conducted and described in the subsequent sections.

3.1. Social-Economic Analysis

Micro-watersheds of IWMP-III are Mahawa, LB Ganga. The total population of the micro-watersheds is about twenty one thousand. The demographic details of the micro-watersheds are as under:

Table 3.1: Demographic pattern of all micro-watershed

S.No.	Name of Project	No. of Families	Population			Total
			Male	Female	Children	
1	IWMP-III	4800	9780	8790	8280	26850
	Total		9780	8790	8280	26850

It is found that the micro-watershed is inhabited by different caste and class. In the micro-watershed, all farmers have their pucca house with well organized way in drainage and with electricity. There was no definite pattern of settlement based on housing structure. The watershed dwellers get drinking water from hand pumps and face severe scarcity during summer because of the deep water table. It was observed that the small and marginal farmers are not conscious about the education of children. The literacy of the MWS villages is not very low. The area is educated with all the facilities they have with their farming situations.

The main occupation of the MWS dwellers is agriculture and animal husbandry; the landless families generate income for their livelihood mainly from labour.

3.2 Transect Walk

The main objective of the transect is to understand and study the major land uses, topographical pattern, water resources, natural vegetation and different ecological zones by observing, interacting and discussing with the key informants.

Micro-Watershed Transact Walk

First Transact Walk



Particulars	Zone I	Zone II	Zone III
Land	Laomy sand	Loam	Sandy loam
Animal	Animals not grazed in the fields	Animals not grazed in the fields	Animals not grazed in the fields
Trees	Mangoes, Popular, Neem	Popular, Eucalyptus,	Mango, Popular, Eucalyptus
Bore Well	Deep water table	Deep water table	Deep Water table
Crops	Wheat, Potatoes	Wheat, Sugar cane	Wheat, Sugarcane
Drain / River	Plain area	Plain area	Plain area

3.3 Seasonality

3.3.1 Climate: The climate of all micro-watersheds is characterized by a mild summer and cold winter and is marked for high variability of rainfall year to year. There are primarily four seasons: – Dry Summer season – from March to May i.e. before advent of monsoon, moist summer season – from June to September (Monsoon) transition period - in October and November, which is the post monsoon period, and winter season – from December to February. August wettest month followed by July.

3.3.2 Crop and cropping pattern: The major crops cultivated in the micro-watershed area are wheat, sugarcane, mustard and barley in rabi season, while urd, moong, sorghum and maize in kharif season zaid season is also engaged in sugarcane growing. So cropping intensity of this area very much high to other areas of Uttar Pradesh, only problem is that ther water is going deep every day.

Out of total cultivated area of micro-watershed wheat alone occupied more than 45 per cent area. Rest of the area is occupied by others crops

3.3.3 Crop rotation: The following major crop rotation are being followed/

Sugarcane- Wheat (3 years rotation)

Wheat – Urd / Moong

Wheat – Maize / Sorghum

Wheat + Mustard – Moong – Green Manuring (one year)

3.3.4 Wheat production calendar: Wheat crops cover maximum area in all micro-watershed. Urd and moong are major pulse crop sown during monsoon season and entirely depends on rain. During *Rabi* season major crop is wheat and barley with sugarcane cultivation. The performance of *rabi* crops entirely depends on irrigation water which is going every day very low because of high use of water in high water requiring crops like sugarcane and wheat.

3.3.5 Crop calendar of Lentil at all micro-watersheds

	<i>Rabi</i>					<i>Kharif</i>				<i>Rabi</i>			
Crop cutting & Threshing			←→					←→					
Plant Protection								←→					
Irrigation	←→							←→					
Weed Management		←→						←→					
Tillage – Nirai & Gudai			←→					←→				No	
Land treatments										No			
Seed Treatments	←→	←→											
Sowing	←→	←→			←→	←→	←→	←→	←→	←→	←→		
Use Fertilizers		←→				←→				←→	←→		
Land Preparation and		←→				←→				←→	←→		
	January	February	March	April	May	June	July	August	Sept.	Oct.	Nov.	Dec.	

3.4 Availability of Fodder

Animal condition in all micro-watershed was found good due to availability of enough green fodder in the form of berseem and sorghum. It was observed that farmers of micro-watershed grow green fodder except like lucern, berseem, maize lobia etc. There is very good habit of animal production in the villages found and they are selling their milk to the Delhi market by the mediators. The area is have very good animal production to the other part of the state of Uttar Pradesah.

3.5 Demand of Energy for Agriculture

Maximum energy is required in agriculture for land preparation and for life saving irrigation followed by harvesting and threshing. Maximum fuel requirement is observed in the month of October followed by February to April. For preparation of food and other domestic preparation farmers use LPG, cow dung (upla) and fuel wood of different trees as well as stem of mustard. Some rich families also use LPG gas and Light heaters for food preparation.

3.6 Labour Requirement

Labour requirement was highest for agriculture operations in the month of October to March followed by July and August. Minimum labour was required in the month of September, May and June. Due to double cropping labour requirement is very high due to the sugarcane cultivation as well as other crops through out the year, there is no land is vacant in all seasons.

3.7 Money Requirement

Expenditure was relatively highest in the month of October followed by July and March with the corresponding increase in demand of agriculture production activities viz. fuel for agriculture, fertilizers, seeds and labour credit need.

3.8 Changing Trends

The analysis of changing trend revealed that the population, number of crops, fertilizer application follow increasing trend, while cropping intensity, water availability and milk production are in decreasing trend mainly due to deficit rainfall and low water holding capacity of soil in the watershed. Detailed trend for past, present and future is depicted in the Table 3.4.

Table 3.2: Changing trends in the micro-watershed

Particulars	Past	Present	Future
Population	**	****	*****
Water Availability	00	0	0000
Number of crops	###	#####	#####
Use of fertilizers	@	@@@	@@
Use of Bio fertilizers	Nil	Nil	+++
Cropping Intensity	\$\$	\$	\$\$\$
Food Quality	✦✦✦	✦	✦✦✦
Agriculture Production	△ △	△	△ △ △ △
Problems of Crops	○○	○○○○	○○○○○
No. of Animals			
Milk Production	✦✦✦	✦✦	✦✦✦✦
Milk availability	△△△△	△ △	△△△△△
Electricity	-	*	***
Technical Knowledge Availability	-	↕	↕↕↕
No. of Tractor	⊕	⊕⊕⊕	⊕⊕⊕⊕⊕
Employment	◇◇◇◇	◇◇	◇◇◇◇◇
Orchards	-	-	#####
Vegetable Production		△	△ △ △
Grass Land	+++++	++	++++

3.9 Family Livelihood Analysis

Livelihood analysis is a helpful tool to analyze farmer's aptitude and deciding their future plan. In our study we have categorised the farmers in the four groups on the basis of their income generated from different sources. The major source of income of big farmers is agriculture and few members of such family are also employed and generated extra income to his family kitty. For second groups 80 per cent income came from agriculture and rest 20 per cent from animal husbandry and other enterprises. Likewise the poor groups arranged their livelihood through *batai* by big farmers (50%) and rest 50% came from their own agriculture and animal husbandry (Buffaloes and Cows). However, very poor groups arranged their livelihood mainly from wages.

3.10 SWOT Analysis for Watershed Development Programme

Strength	
1.	Land comes under class II and III with slope from 0 to 5 % have good potential for high productivity
2.	Community are willing to make joint efforts for the development
3.	Loam and sandy loam soil in the MWS have very good potential of production
4.	Soil fertility is medium can improved with sustainability
5.	Soil depth in the village is deep enough.
6.	Due to good soil depth water harvesting measures will give better results in context to water holding capacity.
7.	Coordination among the people of village for livelihood improvement is a positive sign for their growth.
Weakness	
1.	Jangali Pigs are very big problem of the area
2.	Land holding is low in the area on the basis of population
3.	Nutritional status of sandy loam and loam is very low due to sheet erosion.
4.	Water scarce condition, low water table, water strata going down day to day due to mismanagement of natural resources.
5.	Less vegetal cover
Opportunities	
1.	Wide range of annual and perennial crops.
2.	Scope for diversification and alternate land use.
3.	Very good scope of regular employment opportunities to check out migration.
4.	Strengthening of existing irrigation system.
5.	Co-operation of the community.
Threats	
1.	Frequent droughts
2.	Natural calamity

3.11 SWOT analysis for Farming System Improvement

Strengths

- Comprises villages have loam and sandy loam soil managed with watershed approach have good potential of production. Possibilities of *in-situ* moisture conservation practices.
- Under the different slope ranges of micro-watershed could be easily treated with field bunds and have good potential of water storage in the MWS.
- Area can be utilized as bowl of vegetables and orchards.
- All the farming communities irrespective of their category have potential and attitude to work for the farming system improvement.
- Milk production and breed improvement possibilities are available by adoption of fodder cultivation and use of artificial insemination.

Weaknesses

- Water holding capacity is very low
- Nutritional status of soil is low
- Severe soil erosion during rainy season
- Forest plant density is very poor
- Field size are appropriate without bunding
- Tube wells having less discharge capacity
- Extra use of irrigation water or misuse of water in the form of irrigation
- No market information
- No knowledge of improved seed varieties of vegetables and fruits

Opportunities

- Possibilities of natural water harvesting in bunding with tube well recharging unit
- High possibilities crop diversification and alternate land use systems
- Possibilities of people's participation is very high
- Possibilities of organic farming and production
- Possibilities of animal based farming like improved cow, buffaloes, rabbit, etc.
- Possibilities of cottage industries much more with people participation.

Threats

- Uncertain and erratic behaviour of rains
- Population pressure
- Poverty level
- Soil health
- Poor marketing

3.12 SWOT Analysis for Involvement of Women

Strengths

- Most of the women farmers irrespective of their category have agriculture background
- Hard work by women in the farm fields
- Women's active involvement in farm related activities within and outside the household is significant feature and they are involved in most of the operation in agriculture including subsidiary enterprises like dairy and poultry etc.

Weaknesses

- Low level of literacy
- Limited knowledge of existing resources and their use mainly due to low level of exposure
- Lack of knowledge of banking and credit cooperatives. These sectors do not favour women as they do not have individual right on property
- Limitation of technically trained female extension workers. Even the available female workers do not impart knowledge on household activities, child care, nutrition etc.
- Unequal wages between male and female workers. No significant efforts have been made to generate women specific and women friendly farm technologies

Opportunities

- Making of self help groups with small savings and provision of loans by revolving fund on small enterprises related to the agriculture
- Equal wages for equal work.
- Awareness among the women to improve their skill and knowledge will be undertaken in the micro-watershed programme.
- Watershed development team has technical women to train women of watershed and availability of some voluntary organizations for the purpose

- More and more women are coming forward to carry out development work in micro-watershed
- Women's potentiality and capabilities have not been exploited due to lack of specific growth opportunities

Threats

- Change in social functioning and relationship
- Male farmers would have to provide opportunities to farm women for more interaction and contact with outsider agencies and groups. Women may demand freedom in decision making process in their families. For creating such environment, some of the old conservative cultural values, social custom and taboos may vanish.

Role of Women in the watershed programme

1. As a member of watershed committee.
2. As member of watershed development team
3. As a member and worker under self help groups for their livelihood improvement
4. Member of user group

3.13 Mobility analysis

The institution visited by the farmers frequently for their different enterprises are cooperative societies for fertilizers, Block Development Office, plant protection unit, veterinary hospital, electricity department, police station and agriculture department etc. The distances of different institution are given as follows:

3.14 Matrix ranking

Choice and priority of farmers can be analyzed by matrix ranking. Farmers are cultivating different types of crops viz. wheat, barley and sugarcane in rabi and sorghum, maize, urd, moong in kharif season with some part of vegetables growing and orchards of mangoes and other fruit plants like citrus, guava, papaya . Wheat was ranked first in *rabi* season followed by sugarcane and mustard, while in *kharif* season sorghum have the second ranking. Mustard sown as mixed with other crop. Women of the micro-watershed show their priority to knitting, weaving and tailoring. Among the different criterion for deciding suitable enterprises, easily salable items ranked first followed by self dependency and low cost, less labour requiring.

Rural youth of the micro-watershed show their priority to buffaloes (dairy) followed by poultry and seed production, organic farming, rabbit, vermi compost unit and nursery unit respectively. Among the different criterion for deciding suitable enterprises, less time taking ranked first followed by self dependency, more marketable and less labour requiring.

Priority of crops (Maximum ranking is 10 points)

Crop	Wheat	Sugarcane	Barley	Mustard	Urd	Sorghum	Maize	Moong	Vegetables
Standard									
More Profit	6	5	7	3	4	6	2	3	3
Suitability for rainfed condition	8	7	6	6	3	7	6	5	8
Less Insect/Pest & diseases	8	6	5	4	3	8	7	5	
Less risk	9	8	7	8	4	8	8	5	7
Less labour	8	8	7	8	5	7	8	7	7
Less weeds	6	5	6	6	5	8	7	5	6
No Irrigation required	10	7	3	4	2	6	6	7	7
Total	55	46	41	39	26	50	44	37	38
Rank	I	III	V	VI	IX	II	IV	VIII	VII

Livelihood Interest of Farm Women (Max. 10 point)

Livelihood options	Tailoring Stitching Weaving	Agarbatti / Candle & Dona Pattal, Rope making	Preservation Fruit & vegetable	Goat rearing	Poultry	Nursery	Organic Manure	Rabbit farming	Ranking
Standard									
Self dependency	8	4	6	7	6	5	6	7	II
More sellable	8	5	7	7	8	6	7	8	I
Less Labour	7	5	6	5	4	4	5	7	IV
Low cost	8	6	4	7	6	5	5	7	III
Less Time taking	9	5	5	5	5	4	4	5	V
Ranking	I	VII	V	III	IV	VIII	VI	II	

Livelihood Interest of Rural Youth (Max. 10 point)

Livelihood options	Vermi unit	Seed production / Bank	Dairy (Cow Buffaloes)	Goat rearing	Poultry	Nursery	Organic Manure	Rabbit farming	Ranking
Self dependency	5	6	8	9	7	5	5	4	II
More marketable	4	7	7	8	8	4	4	5	III
Less Labour	5	6	5	6	6	6	5	6	IV
Low cost	4	4	3	6	7	5	7	5	V
Less Time taking	7	6	7	9	8	4	6	6	I
Ranking	VII	IV	III	I	II	VIII	V	VI	

3.15 Rural People's Knowledge

Major occupation of the micro-watershed is agriculture and animal husbandry and several indigenous technical know how had been practiced by the villagers of micro-watershed which are listed below. Wide scale adoption of the ITKs in a participatory mode will help to increase and stabilize production in the micro-watershed.

A. In-situ moisture conservation practices

Indigenous/Local knowledge	Technical specification/ Improvements
<ul style="list-style-type: none"> • Summer ploughing is generally done • Summer ploughing with desi plough. 	<ul style="list-style-type: none"> • Summer ploughing is generally done across the slope of the field and sometimes along the slope in the month of April and May for increasing porosity and creating mini surface structure like ridge and furrows • There is less runoff and soil loss due to more infiltration and less evaporation due to breaking of the capillaries and pulverization of soil. • Availability of plant nutrients increases due to decomposition of crop residues, weeds etc. • The summer ploughing with either <i>desi</i> plough (99%) or tractor drawn cultivator (1%) is one of the most common practices in rainfed farming areas of the micro watershed.

<ul style="list-style-type: none"> • <i>Bundhi</i> (Earthen bund): formerly farmers of MWS area were doing this work, now this is not in working 	<ul style="list-style-type: none"> • These structures are generally used to retain upslope water and silt. Retention of water behind the <i>bundhi</i> increases infiltration in the field by enhancing opportunity time, increase soil moisture regime and reduces runoff and soil loss. • If <i>bundhi</i> is intact, there is deposition of silt behind the <i>bundhi</i> due to retention of surface runoff, which converts undulating field into nearly plain/level land, and the reclaimed land becomes more fertile. • <i>Bundhies</i> must be strengthened with grasses and legumes having good soil binding capacity like <i>Dichanthium annulatum</i>, <i>Cenchrus ciliaris</i>, <i>Cynodon dactylon</i>, <i>Stylosanthes hamata</i>, etc. These plants apart from stabilizing the bundhies are also very good source of fodder for the cattle.
<ul style="list-style-type: none"> • <i>Pucca Bandha</i> (Stone): Old pucca <i>bandhas</i> were visible in the area with poor condition, now this is not in working 	<ul style="list-style-type: none"> • MWS programme IWMP will executes this work. • Like <i>bundhies</i>, <i>bandhas</i> retain water and silt, enable uniform distribution of rainwater, which increases infiltration in the field by enhancing opportunity time, increases soil moisture regime, reduces runoff and soil loss, converts undulating field into nearly plain/level land, and makes the land fertile. • Most of these structures are unscientifically constructed, which has resulted in side cutting and damage.

B. Runoff management practices

Indigenous/Local knowledge	Technical specification/ Improvement / Interventions
<ul style="list-style-type: none"> • Talab (Pond) • Talab is an embankment type pond of various sizes (smaller ponds called <i>talai</i>) 	<ul style="list-style-type: none"> • The structure harvested huge amount of surface runoff, otherwise going waste, and thereby reduces soil loss and increases ground water recharge down below the open/tube well, and meets the water demand for irrigation,

constructed near human settlements or at depression site of village.	<p>animal and domestic consumptions.</p> <ul style="list-style-type: none"> • Bed silt of the <i>talabs/talais</i> can be used for soil fertility improvement and construction/repair/maintenance of mud houses by the farmers.
<ul style="list-style-type: none"> • <i>Sagar</i> (Submergence bund) are large submergence bunds constructed as a barrier across the slope of catchment with a provision of <i>nikas</i> (sluice) for removing excess water. 	<ul style="list-style-type: none"> • The harvested runoff from catchment is retained during the monsoon season behind the bund to recharge the soil profile. The harvested water is either lost through seepage and evaporation or it is drained out by September/October for sowing of <i>rabi</i> crops in the submerged area. • Deposition of fertile soil and increase in moisture regime gives 70-80% higher <i>rabi</i> crop yields as compare to adjoining land without submergence bund. • MWS programme IWMP will executes this work.

C. Crop production practices and animal husbandry

Indigenous/Local knowledge	Technical specification/ Improvement / Interventions
<ul style="list-style-type: none"> • Mixed cropping: Wheat and mustard in <i>rabi</i>. • Sorghum and Arhar mixed crop in <i>kharif</i>. 	<ul style="list-style-type: none"> • Crops area growing under set row system without any scientific approach. • Crops should be grown under row system. • An optimum plant density of different crops should be maintained.
<ul style="list-style-type: none"> • Use of <i>Ghurey ki khad</i> (un-decomposed FYM) 	<ul style="list-style-type: none"> • Farmers were using un-decomposed farm yard manure, which spread the weeds, insects/pest and disease incidence on the crop. • Use of Vermi-compost, NADEP compost, green manuring etc. should be encouraged.
<ul style="list-style-type: none"> • Shaking of plant (Vegetables) 	<ul style="list-style-type: none"> • During attack of <i>H. armigera</i> farmers shaking the plant.
<ul style="list-style-type: none"> • Use of Neem leaf & Kernel suspension 	<ul style="list-style-type: none"> • During the attack of different insect/pest on crops they use suspension of neem leaf and kernel as well.
<ul style="list-style-type: none"> • Use of neem leaf in the storage of pulses and cereals 	<ul style="list-style-type: none"> • Neem leaf suspension 10 kg leaf + 20 lit. water boiled when water remains 10 kg. This suspension used to treat the bags, room, windows and door where grains to be stored. Leaf of neem stored in shed for 10-15 days and used for grain storage approximate 50 to 100 gm per quintal of grain. • Grains should be fully dry and have only 10-12% moisture in it.
<ul style="list-style-type: none"> • Animal husbandry 	<ul style="list-style-type: none"> • They use 8 badi ilaichi (large cardamum) with 100 gm gur

<ul style="list-style-type: none"> - Use of 8 Badi Ilaichi for adult buffaloes and cow for curing of fever. - Rapeseed/Mustard seed used with curd/matha for gas/aphara in animals 	<p>and give two doses, one in the morning and one in the evening.</p> <ul style="list-style-type: none"> • 100 gm Rapeseed/Mustard seed crushed with stone and mixed in 2 lit. curd and matha for aphara and gas problem.
--	--

3.16 Problem Identification

During the process of collecting the important information related to the micro-watershed village's socio-economic status and different enterprises practiced by the villagers, certain problems which have adverse effect both directly and indirectly on their economy are identified after having detailed discussion with participatory farmers groups.

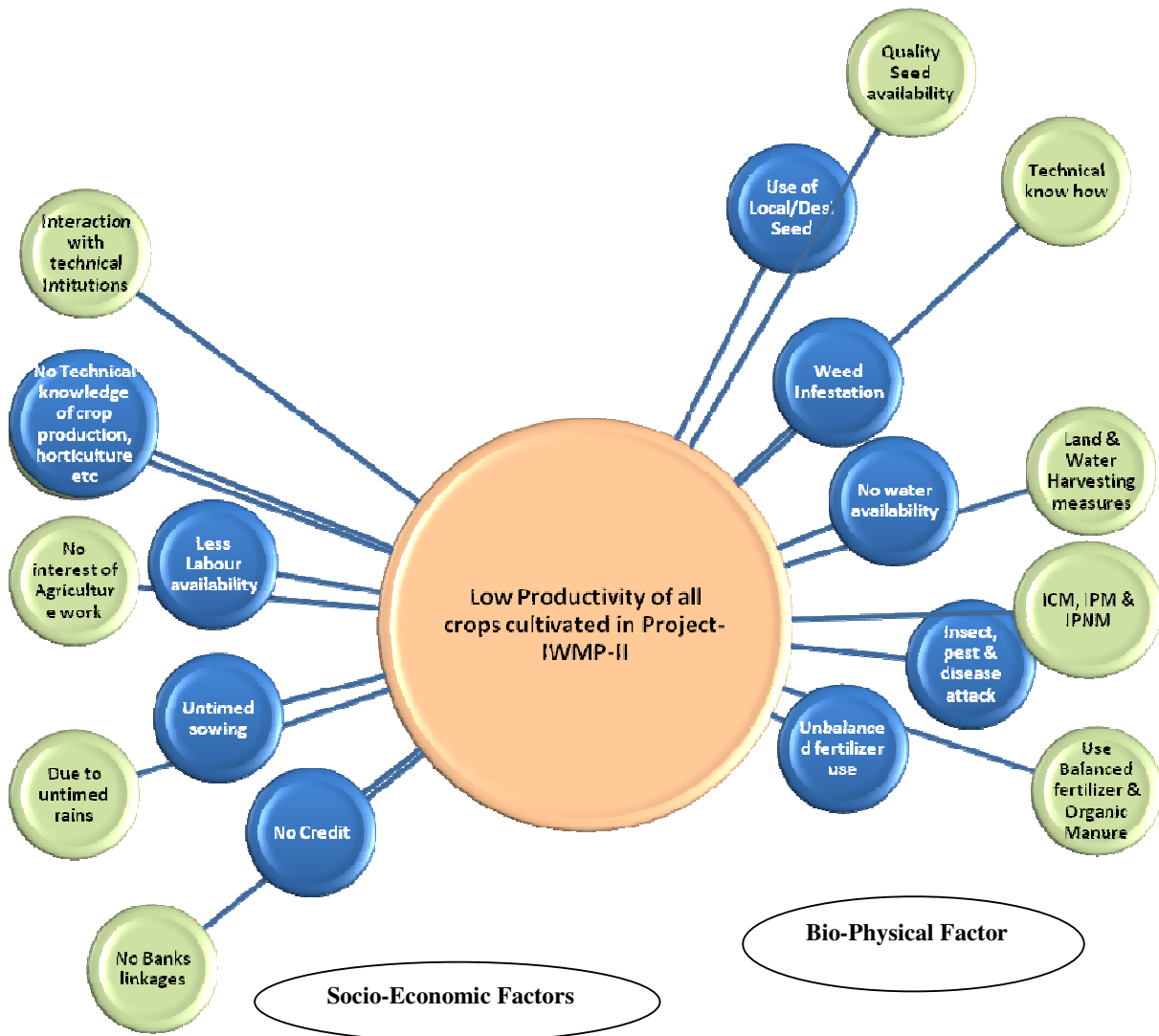
3.16.1 Prioritization of problems

Major factor responsible for low yield of all crops of micro-watershed

1. Mismanagement of natural resources
2. Low fertility due to water erosion
3. Uncertain and erratic rainfall
4. Low water holding capacity of soils
5. Heavy weed problem at initial stage of crop growth
6. Insect, pest and disease problem
7. Imbalance use of fertilizers
8. Use of local and desi varieties
9. Rat problem at maturity stage

3.16.2 Problem – cause analysis

Wheat is the major crop of the micro-watershed. During discussion it was narrated by the farmers of the area that production of wheat and other crops gradually reduced due to the low water availability. Problem mentioned by the farmers were heavy weed infestation at initial stage, use of local varieties, insects and pest, imbalance use of fertilizers, etc. Amongst these factors, low water availability is mainly responsible for low yield of all crops. There could be many more problems as mentioned above but of less significance.



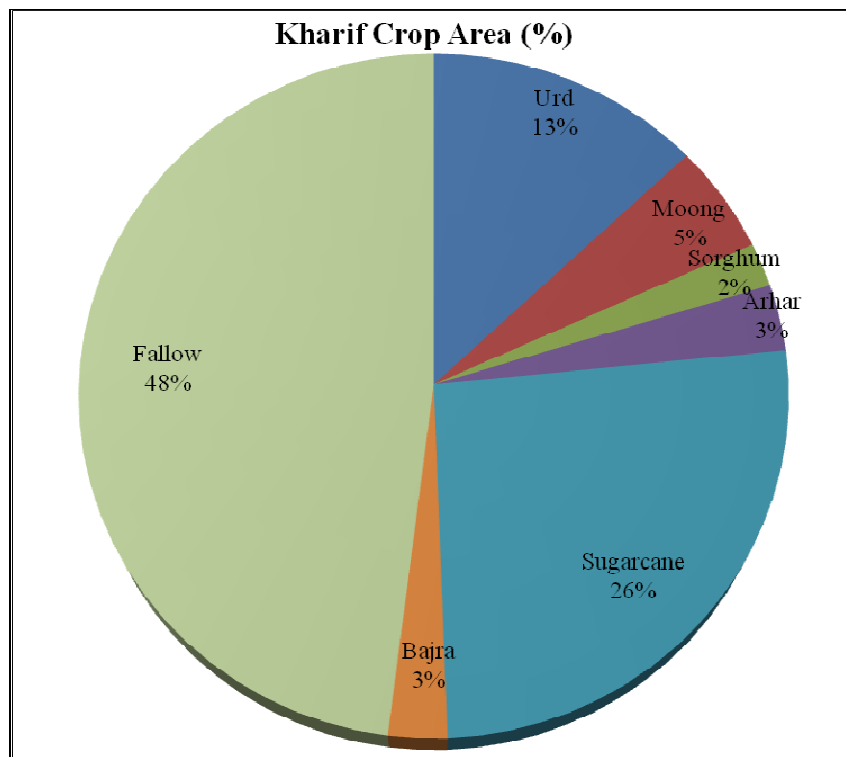
3.16.3 Area, production and productivity of kharif/ rabi/ summer season Crop

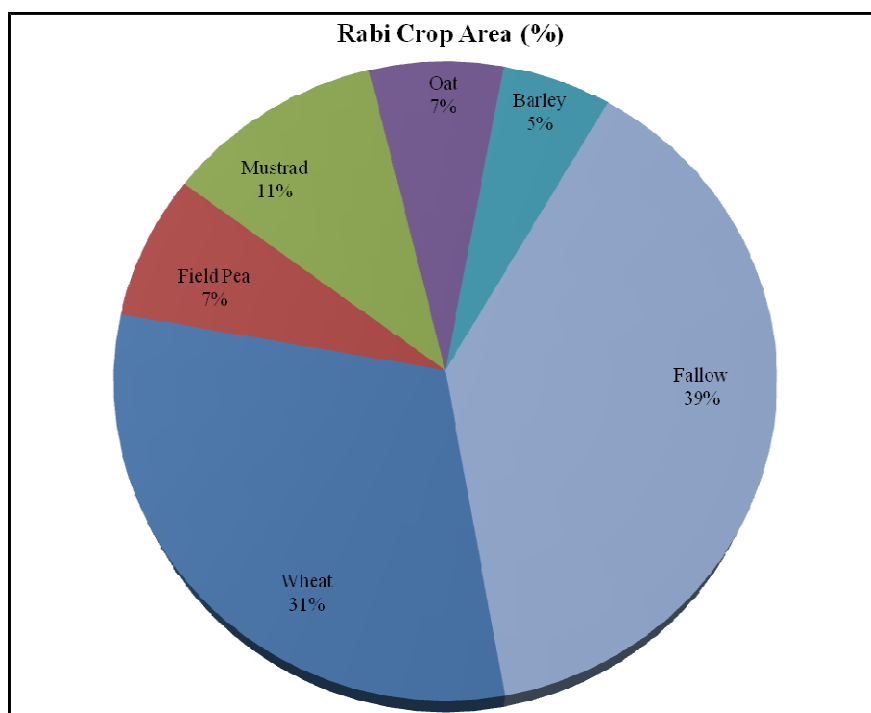
Area, production and productivity of different crops in the watershed is shown in Table 3.3.

Table 3.3: Area, production and productivity of kharif/rabi/summer season crops

S.No.	Name of Crop (Season wise)	Area (ha)	Production (quintal)	Productivity q/ha
1	Kharif Season (2008)			
	Urd	1852.63	21305.20	11.50
	Moong	741.05	7039.98	9.50
	Sorghum	296.42	2519.57	8.50 (+Fodder)
	Arhar	444.63	5557.88	12.50
	Sugarcane	3705.25	1667363.64	450
	Bajra	370.53	4298.09	11.60
	Average Productivity			83.9
	Total	7410.51	1708084.36	
	Kharif Single Crop area	296.42		
2	Rabi (2008-09)			
	Wheat	4269.59	199816.86	46.80
	Field Pea	1024.70	12911.24	12.60
	Mustard	1537.05	17676.11	11.50
	Oat	939.31	26300.68	28.0
	Barley	768.53	32969.78	42.90
	Average Productivity			28.4
	Total	8539.18	289674.67	
	Rabi Single Crop Area			
	A. Single crop area	296.42		
	B. Double crop area	15653.27		
3	Cropping Intensity		114.00	114.00
4	Summer Season	Nil	Nil	Nil
5	Vegetables			
a	Off seasonal			
	Cucumber	712.55	249392.0	350
	Bitter guard	570.04	171011.7	300
	Sponge guard	627.04	175572.0	280
	Bottle guard	513.03	205214.0	400
	Pumpkin	427.53	213764.6	500
	Average productivity			366.0
	Total	2850.19	1014954.2	
b	Seasonal			
	Tomato	498.78	224452.8	450

	Chilli	570.04	199513.6	350
	Raddish	463.16	254736.1	550
	Spinach	534.41	267205.7	500
	Coriander	427.53	149635.2	350
	Turnip	498.78	236922.4	475
	Beet root	570.04	273618.6	480
	Average productivity			450.7
	Total	3562.74	1606084.5	





Analysis of Problem

Table 3.4: Analysis of Problems with Regard to Existing Farming System (EFS)

Sl. No.	Type of enterprises/commodities	Combination of enterprises in EFS (P/S/T)	Specific problems with each enterprise	No. of affected persons (%)	Proposed solution	Reasons for non-adoption of proposed solution	Action
1.	Agricultural crops - Irrigated Wheat Sugarcane Barley Oat Mustard Arhar Sorghum Urd Moong	P	Less water availability Low nutrient status affect all crop production Use of old varieties Disease/Insect pest infestation Weed infestation	80	Improved method of crop production & resource conservation	Lack of Interest, Lack of Resource Management	Training & demonstration, Organizing of field days for improved varieties and cultivation practices

2.	Horticultural crops - Orchards - Vegetables - Floriculture	S	No Planned Orchards / Vegetable / Floriculture	-	-	-	Need Intensification
3.	Animal husbandry - Cows - Buffalows - Sheep - Goat - Pigs	S S S	Breed degradation, Anestrous problem, and low productivity of animals and fodder	775	Breed improvement through AI, feeding of minerals mixture, Fodder cultivation	Lack of Interest Lack of Resource Management	Training & demonstrations
4.	Fisheries	-	-	-	-	-	-
5.	Sericulture	-	-	-	-	-	-
6.	Poultry	-	-	-	-	-	-
7.	Bee keeping	-	-	-	-	-	-
8.	Duckeries	-	-	-	-	-	-
9.	Agriculture labour	T	Unskilled labour depends on Agriculture land	-	-	-	-
10.	Any other	-	-	-	-	-	-

P= Primary, S = Secondary, T = Tertiary

CHAPTER - 4

INSTITUTIONAL BUILDING AND PROJECT MANAGEMENT

4.1 Project Implementing Agency

The Project Implementing Agency (PIA) is Soil Conservation Officer, Department of Land Development and Water Resources, J.P.Nagar-II. The PIA was given responsibility to develop the micro-watershed by District Watershed Development Unit (DWDU) and State Level Nodal Agency (SLNA) considering its vast experiences in handling land and water management issues in the region. The PIA has well experienced trained and sufficient staff to handle the watershed management programme efficiently. Most of the staff of PIA has exposure of several watershed projects including Garhkundar-Dabar watershed, which is successfully implemented by NRCAF, Jhansi in Tikamgarh district of MP region and identified by Govt. of India as one of the most successful model of watershed in the country. In addition the PIA has access for technical backstopping from the ICAR viz. PDCSR Modipuram, SBBP Agriculture University Meerut, NRCAF, Jhansi, and KVK located at Mahamayanagar and Aligarh. Details of PIA are presented in subsequent section.

Table- 4.1: Details of Project Implementing Agency

Sr. No.	Particulars of PIA	
1	Name of organization	Department of Land Development and Water Resources, Uttar Pradesh
2	Designation & Address	Bhumi Sanrakshan Adhikari, Deptt. of Land Development & Water Resource, Ghaziabad
3	Telephone/Mobil No.	BSA- 9412418215 JE - JE -
4	Fax	NA
5	E-mail	NA

4.2 Watershed Committee

All micro-watershed will be developed in participatory mode. For the purpose of true participation of community, Watershed Committee (WC) has been elected in general meeting of Gram Sabha. Gram Sabha elected President and Secretary of the committee for smooth function. The By Laws of the WC had been prepared and registration under Societies Registration Act XXI, 1860 is in process. The WC will follow the By Laws in taking different interventions in the watershed for

its sustainable development. SHGs of landless people were also constituted to take up different micro-enterprises.

Table-4.2: Details of self help groups (SHGs) in the project area

Sr. No.	Name of the villages	Details of the SHGs	
		No. of SHGs	Major Activity
1	2B5A7f1f	25	Goat, dairy, seed production, vermi-compost, Seed production unit, mini dal mil, Masala making unit, rope making unit, nursery, Organic farming and nursery
2	2B5A7f1e		
3	2B5A7f1h		
4	2B5A7f1c		
5	2B5A7f1b		

Table-4.3: Details of User Groups (UGs) in the project area

Sr. No.	Name of the villages	Details of the UGs	
		No. of UGs	Major Activity
1	2B5A7f1f	28	Milk Production and Poultry production groups, Orchard & Agro-forestry groups, Orchard & Agro-forestry groups, Water user groups by producing the vegetable production and Medicinal plants.
2	2B5A7f1e		
3	2B5A7f1h		
4	2B5A7f1c		
5	2B5A7f1b		

Chapter - 5

MANAGEMENT/ACTION PLAN

5.1 Precise Identification of the Problem

Over exploitation of existing vegetation, expansion of agricultural activities on non-arable lands without due care of soil and water conservation and faulty cultural practices on medium to shallow deep black soils have resulted in wide spread erosion and land degradation. In many of the areas the parent rock is exposed. Even most of the agricultural lands have been converted to wasteland. Due to reduction in vegetal cover and no provision for surface water storage, all the rain water goes off, as such, ground water recharge is negligible causing slow growth of trees and low yield of crops. This situation can certainly be corrected by *in-situ* water harvesting and planting of trees on field bunds and wastelands. Thus, not only degradation process can be checked but also sustainable development can be achieved.

Watershed development has been agreed as the best approach for natural resource management through out the world. However, in the past certain watershed based development projects did not yield desired benefits because of partial treatments in catchments. This project envisages investigating location specific technologies for successful rehabilitating degraded lands in Western Uttar Pradesh region.

Integrated approach of development involving diverse societies through active people's participation has been visualized as key to success in overall development of rural society.

5.2 Technical Plan

The management/action plan for sustainable development of micro-watershed has been worked out and shown in map section. The detailed activities to be taken up are depicted in Table 5.1.

Following principles have been taken into account before preparing technical plan:

- Land capability classes and agro-climate of the region
- Measures to arrest land degradation
- Maximizing opportunity time for rain drops to facilitate deep infiltration into soil for better moisture conservation *in-situ* and ground water recharge.
- Rain water harvesting and surface storage of rain water
- Safe disposal of excess water

- Ensuring permanent vegetal cover as ultimate saviour of land and water and ensuring availability of fruit, fodder, fuel and small timber from the watershed
- Crop diversification and increasing cropping intensity.
- Maximizing productivity through improved package of practices
- Generation of employment
- Increasing economic returns
- Encouraging participatory rural approach and improvement in existing know-how of farmers
- Encouraging agro-based, house hold and self employment programmes so as to benefit landless people
- Cost effective and low input requiring technology
- Technology giving early dividends
- Suitable distribution of selected technology among the beneficiaries

5.2.1 Natural resources conservation interventions

To control the damaging runoff which is a cause of erosion from agricultural as well as non agricultural lands, structural measures are required. Following measure are recommended for watershed development in arable and non arable land. The estimate and detailed design of all kinds of interventions are given in Chapter 11, however, micro-enterprises for livelihoods are given in Chapter 7.

Engineering measures for degraded agricultural lands

- Contour bund/field bunds/graded bunds with suitable surplusing arrangements are proposed to prevent erosion of natural resources and improved the moisture regime of having slope mild slope.
- In the lower reach of the watershed, vegetative bunds of vetiver, munj, and other locally available grasses will be taken up.
- Excess runoff will be disposed off safely from the fields through grassed water ways and suitable structures.

Agronomical measures

Agronomical measures like contour farming, crop geometry, mulching, deep ploughing, strip, mixed and intercropping, crop rotation and residue management will be taken care in the watershed development programme.

Conservation measures for wasteland and degraded forests

- **Vegetative barriers:** It will be introduced to prevent soil erosion.
- **Drop structure on the ephemeral stream including outlet for drop spillway**
- **Field drainage structure**
- **Well recharge unit**
- **Recharge pit**
- **Farm Pond**

Rooftop harvesting

There are a large variety of ways in which rooftop rainwater harvesting can be used to recharge groundwater. The main advantage of this over the other techniques described for groundwater recharge is that it can be adopted by individuals. They are also relatively easy to construct, operate and maintain. The following methods can be used to recharge groundwater from rooftop harvesting:

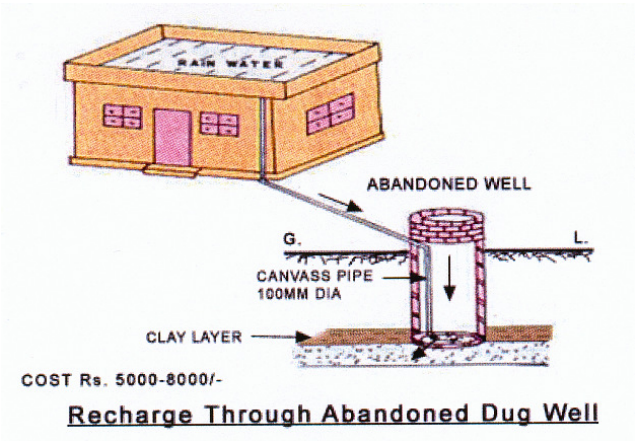
Approximate costs of common items of work in water harvesting

Activity	Unit	Rate(Rs)	
Excavation in soil	Cu.m	65.00	
Excavation in rock	Cu.m	110.00	
Brickwork with cement mortar(1:6)	Cu.m	1190.00	
Plain cement concrete (1:2:4)	Cu.m	1300.00	
Reinforced cement concrete (1:2:4)	Cu.m	11740.00	
Centering and shuttering	Sq.m	90.00	
GI piping	100 mm dia	Metre	375.00
	150 mm dia	Metre	590.00
PVC piping for rainwater pipes	110 mm dia	Metre	165.00
	200 mm dia	Metre	275.00
Making shallow soakway in soft soil (with 150 mm diameter PVC casing)	Metre	300.00	
Making deep recharge borewell using mechanical rotary drilling	Metre	1300.00	

**Rates may vary according to local SOR*

Abandoned dug well

Water to be recharged is guided through a pipe to the bottom of the dry/unused dug well. This is then allowed to percolate into the aquifer, recharging the groundwater. This method is suitable for large buildings having a roof area of more than 1000sq.m.

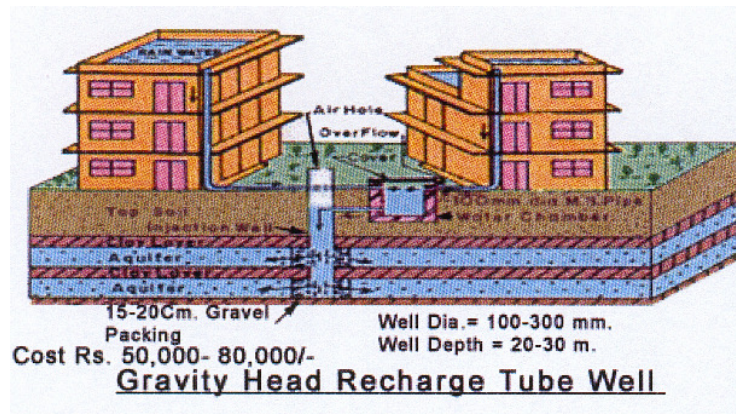
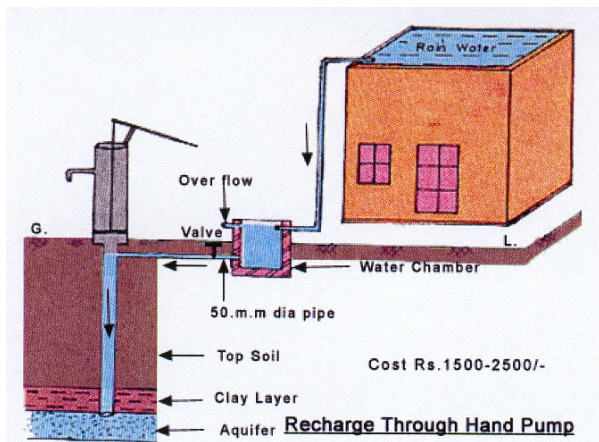


Abandoned/running hand pump

Water is diverted from the rooftop to the hand pump via a pipe of 50-100mm diameter. This method is suitable for small building with a roof area up to 150sq.m.

Gravity head recharge well

The collected rainwater is channelled to boreholes or tubewells located near the house and the water is allowed to recharge the groundwater under gravity. This method is particularly used where space is limiting or the aquifer is deep and overlain by impermeable strata.



Rain Water Harvesting in community land

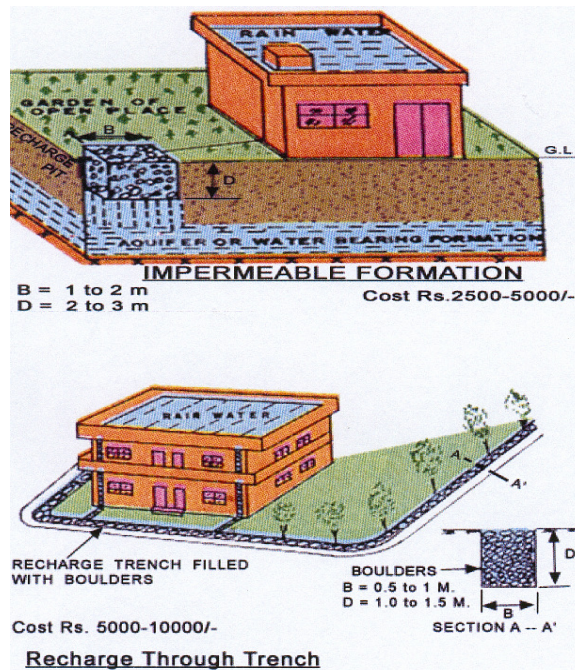
Dug Well 1 M. depth with borewell 10 M. depth

Sl.No.	Description	Quantity	Rate	Amount
1	Earth work excavation for percolation pit of 1 m. dia. 1 m. depth	1 m ³	41.00	41
2	Filling the pit with 40 mm size brick jelly for (0.7 m. depth)	0.6 m ³		188
			312.42	
3	Filling the pit with river sand for 0.3 m. depth	0.4 m ³	326.92	131
4	Perforated precast RCC slab 40 mm thick for covering the recharging well	1 m ²	175	175
5	Provision for drilling 250 mm dia. Bore well (for 10 m. depth) including pipe material	1 No.		50000
6	Filling the borewell with broken stone of 40 mm size	0.5 m ³		223
			445.36	
7	Provision for connecting the down pipes to the recharging well through 200 mm dia. PVC pipe including earth work excavation, laying, jointing and refilling	50 m	500	25000
8	Unforeseen items			4242
Total			Rs.	80000

Recharge pit

A 1-2m wide, 2-3m deep pit is constructed near the house. This pit is then filled with boulders and pebbles at the bottom, grading through gravel to sand at the top.

The water collected from the rooftop is diverted to the pit through a drain pipe and the water is allowed to percolate through the pit into the aquifer. This method has the advantage in that the rainwater is getting filtered before it enters into the aquifer system, therefore any contaminants are getting removed. The method is suitable for small buildings having a rooftop area of up to 100sq.m.



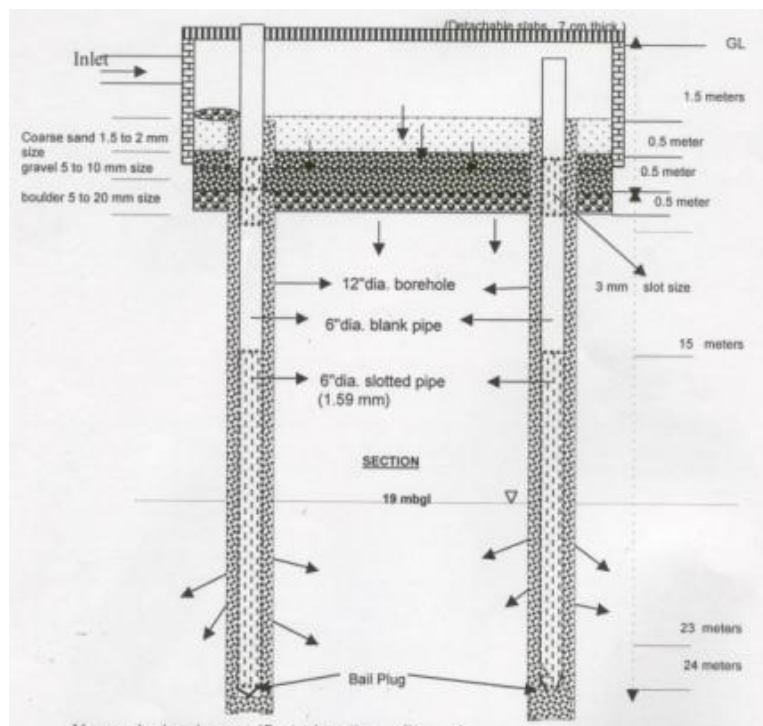
MODEL ESTIMATES :

**Rain Water Harvesting for Individual House of < 100 m²
(Recharging pit method)**

PIT SIZE 1 x 1 x 1 M.

Sl.No.	Description	Quantity	Rate*	Amount
1	Earth work excavation for percolation pit	3 m ³	120	360
2	Filling the pit with 40 mm size brick jelly	1.8 m ³	450	810
3	Filling the pit top with river sand	0.8 m ³	525	420
4	Perforated precast RCC Slab 40 mm thick for covering the pit	3 m ³	1200	3600
5	Connecting the drain pipe to the pit through 150 mm dia. PVC pipe including earth works, laying, joining and sand gravel packing	10 m	750 m	7500
6	Unforseen items			2100
				14790 or say Rs. 15000

*Rates may be changed according to local SOR



Recharge by injection wells

This is a direct sub-surface recharge technique and conveys water directly into the aquifer. As seen above this technique can be used in conjunction with rooftop harvesting. The following diagram shows recharge by injection wells.

The primary concern with this technique is that there is a potential for the groundwater to get contaminated, as it is by-passing the natural filtering action of the aquifer. There may also be problems with clogging of the aquifer by suspended solids, biological activity or chemical impurities. This technique is also more expensive to construct and much more difficult to maintain than any of the other recharge techniques described earlier.

MODEL ESTIMATE :

Rain Water Harvesting for cluster of residential area of micro-watershed (Injection well method) Dia = 1.5 M: Depth 5 M. Borewell depth 10 M.

Sl.No.	Description	Quantity	Rate	Amount
1	Earth work excavation in all soils for percolation pit including pipe laying 2 m. dia	30 m ³	41.00	1230
2	Laying precast RCC Ring of 1.5 m. dia	17 Nos.	300	5100
3	Filling the rings with brick jelly for 4 m. depth	8 m ³	312.42	2499
4	Filling the top portion of the rings with river sand for one meter depth	2 m ³	326.92	654
5	Provision for drilling 250 mm dia bore from 5 m to 15 m below ground level including cost of pipe			50000
6	Filling the outside portion of rings and inside the bore well with pebbles	8 m ³	1500	12000
7	Provision of supplying, laying and jointing 200 mm dia PVC Pipe	150 m ³	500/RM	75000
8	Provision of 150 mm dia borewell for 15 m. depth for monitoring the ground water table fluctuation			30000
9	Provision for perforated precast RCC cover slab of 10 cm. thick 1.5 m. dia			1500
10	Unforeseen items			7017
Total				Rs 185000

Capacity survey of the sites of weir structures was conducted and analyzed for water storage and submergence area using software Surfer.

5.3 Production System Interventions

Following interventions have been proposed for sustainable development of watershed.

5.3.1 Crop production improvement interventions

Crop improvement programme will be taken up on farmer's field with participatory approach on pulses, oilseeds, cereals, etc. Improved package of practices will be demonstrated on farmer's fields. Application of recommended doses of fertilizers, pesticides, weedicides and other practices to the crops was not practiced in the area and farmers rarely use these practices in integrated and balanced manner. For the improvement of productivity integrated crop management, integrated pest management and integrated nutrient management demonstrations should be included in the programme.

- Placement of basal dose of fertilizers at 8-10 cm depth in the root zone

- Application of multi-nutrient fertilizers to supplement the need of sulphur and other nutrients.
- Intercropping: Recommended intercropping systems like sorghum + pigeon pea, pigeon pea + black gram and soybean + pigeon pea are promising only under normal monsoon condition. Their productivity declines significantly if the monsoon gets delayed up to first week of August. Castor + green gram intercropping is an efficient intercropping system for delayed monsoon condition in black soil.

5.3.2 Horticulture/agroforestry development

Considering the importance of nutritional security and income generation, horticulture development programme will be emphasized in the area. Mango, guava, ber, and lemon based agroforestry interventions will be developed in 10 ha each in the watershed besides silvopastoral system. The detailed estimates are presented in Chapter 11.

Bio-fencing techniques

- A field bund, if existing, is made weed free before onset of monsoon and a trench (20 cm wide + 30 cm deep) is excavated on the outer side of the bund. If no bund exists, the soil excavated from the trench may be used to form the bund.
- Locally available bio-fencing species e.g. *Agave sisilana* or *Euphorbia tirucalli* planted on field bund in two staggered rows at a spacing of 50 cm x 50 cm.
- For *Agave*, generally root suckers are used as planting material while for *E. tirucalli*, stem cutting serve as a planting material.
- A fence gets well established in 3-4 years following standard package of practices for raising of *Agave* and *E. tirucalli*.
- The cost of bio-fencing varies from Rs 15-20 per running metre
- Compost formed from pruned material of bio-fence gives an additional income of Rs. 5 per running metre of bio-fence.

Table 5.2. Summary of proposed work plan in micro-watersheds*

S. No.	Activities	Nos.
1.	Preparatory Phase	
1.1	Entry Point Programme	
	Community development programmes	
1.2	Institution & Capacity building	As per Chapter 6
2.	Watershed Works Phase	
	Field /Graded / Compartmental Bunds(FB /GB/CB)	6945
	Field drainage structures	180
	Well recharge unit	180
	Recharge pit	180
	Fram pond	90
	Injection well	45
	Rain water harvesting	45
3.	Livelihood Activities	
	Small Scale Project	180
4.	Production System	
	Agriculture Production system	
	Demonstration**	180
	On Farm Testing**	45
	Seed Multiplication Units	45
	Horticulture	
	Demonstration	180
	On Farm Testing	180
	Nursery Unit	45
	Animal Husbandry	
	Demonstrations	180
	Local Tharparkar / Gir Bull Breeding	180
	Feed and fodder utilization Vaccinations	45
	Agroforestry	
	Aonla based	90 ha
	Guava based	90 ha
	Lemon based	90 ha
	Bael based	90 ha
	Ber based	90 ha
	Silvi pastoral system and others	90 ha
	Organic Farming	
	Vermi-compost/ VermiUnit	80
	NADEP/Compost / Organic preparations	80
	Organic Cultivation	80

*Nos. mentioned is tentative and it will depend on availability of fund

**Demonstration OFT details are given in Chapter 11.

CHAPTER - 6

CAPACITY BUILDING PLAN

The capacity building of various stake holders will be given very high priority as the watershed is to be developed in participatory mode. Capacity building initiative plays very important role in human resource development of model watershed to replicate and train other watershed resource persons. The capacity building initiatives include training to NARS, government officials, CBOs, farmers and PIAs through field days, hands-on trainings, and exposure visits to successful watersheds, training materials and etc. Need-based specialized training courses will be conducted. The details of the training are summarized in Table 6.1.

Table- 6.1: List of probable training institutes for capacity building

Sr. No.	Name of the Training Institute	Full Address with contact no, website & e-mail	Designation of the Head of Institute	Type of Institute	Area(s) of specialization
1.	WALMI	-	-	Research	Land and Water
2.	Central Soil & Water Conservation & Research Center Chhalesar Agra, NRCAF, Jhansi	Central Soil & Water Conservation & Research Center Chhalesar Agra,	Head	Research and training	Soil and water conservation
3.	NRCAF, Jhansi (ICAR)	Gwalior Road, Jhansi, 0510-2730214	Director	Research and Extension	Natural Resource management on watershed basis through AF Systems
4.	IGFRI, Jhansi (ICAR)	Gwalior Road	Director	Research and Extension	Livestock and fodder
5.	Govt. Poly-technique	Bulandshahar	Principal	State Govt.	Draft man training
6.	ITI	Bulandshahar	Principal	State Govt.	Draft man training
7.	District Udyog Kendra	Bulandshahar	Director	State Govt.	Livelihood trainings
8.	C. S. A. University of Ag. & Tech.,	Nawabganj, Kanpur	VC	Ag. University	Research & Extension

Table- 6.2: Training to stakeholders on participatory watershed management

Sl. No	Client Group	Title of the Programme/Duration / Time	Objectives	Coverage/Topics	Training Methodology	Training Institutions
1.	Watershed Committee Members / Watershed Secretaries /Presidents / Field Staff etc	Participatory watershed management Duration : 2 days on each topics	To familiarize the participants with various aspects of participatory management of watershed	Watershed concept, Salient features of guidelines, Organizing people's groups, Conducting meetings, Recording of proceedings, Office Management, Accounting Procedures, Book keepings and accounts, Maintenance of accounts and records, Participatory Planning, Preparation of schemes and estimates for SHGs, Implementation of works and activities, Assisting execution and recording of works, Effecting timely payments Awareness creation	Lectures on LCD Case discussion Group exercises CDs & LCD Show	KVK/ Research institutes/ NGOs

Table 6.3: Title of trainings to be organized for members of WC /WDT/field staff

<ul style="list-style-type: none"> • Durum wheat and low water requiring wheat varieties screening and ICM • Interest of groups identification and implementation in collective manner. • Applied Vermi-culture, NADEP and composting technologies for livelihood • Advance vegetable production techniques • Fish culture in water harvesting structures • Post harvest and value addition
<ul style="list-style-type: none"> • Advance oilseed production techniques. • Cultivation of medicinal and aromatic Plants. • Low cost feeding of milch animals • Integrated pest management in <i>kharif</i> and <i>rabi</i> pulses
<ul style="list-style-type: none"> • Goatary, Dairy, rabbit farming and poultry development. • Integrated crop management in pulses and oilseeds
<ul style="list-style-type: none"> • Advance pulse and oilseed production techniques • Advance extension skills and use of GIS and GPS in watershed • Training on information technology • Computer in agriculture marketing (internet) • Fabrication of gabion • Construction of low cost checkdam, well recharging unit • Monitoring and evaluation of impact of watershed management • Preparation of reports, leaflets, bulletins, etc. • Documentation of success stories • Development of nursery tech.

Table 6.4: Title of trainings to be organized for members of WC/SHGs/UGs/AGs/WDT at local level

Title of the Programme & Duration	Objectives	Coverage/Topics	Training Institutions/Methodologies
Orientation Program on Participatory Planning and Management	<ul style="list-style-type: none"> • To enhance the technical and managerial capability of participants 	<ul style="list-style-type: none"> • Watershed concept, need and program • Salient features of guidelines • Roles and Responsibilities • Leadership building • Conducting meeting • Farming systems approach • Participatory planning for developments • Preparation of group plan and Action Plan • Group Formation and Management • Conservation and Production measures • Management of CPR • Post Project Management of created assets • Financial Arrangements • INM,IPM Practices • Benefit sharing 	KVK/ Research institutes/ NGOs <ul style="list-style-type: none"> • Lecture-cum-discussions • Practical exercise • Demonstration • Video film show Field visit

Capacity building programme will be continuous. For the sake of convenience each year may be divided in two halves and training may be organized on the topics mentioned in table 6.5.

Table 6.5: Title of trainings to be organized for stakeholders

First half yearly programme

- Integrated Crop Management (ICM) of oilseeds and pulses of winter
- Integrated Crop Management (ICM in winter vegetables.
- Small Scale Dairy, goatary and poultry unit development for livelihood as option.
- Skill training on preservation of rural products (locally available) under household condition.
- Composite Fish Culture
- Production of Organic Mannure & their marketing
- Integrated pest management of wilt in pulses and gram pod borer in gram, yellow vein mosaic disease of urd and moong.
- Durum wheat and low water requiring wheat varieties screening and ICM
- Interest groups identification and implementation of units in collective manner.
- Applied Vermi-culture NADEP and composting technologies for livelihood and for sustainable development
- Integrated crop management in Groundnut and soybean
- Layout & plantation techniques of Aonla, Ber & Guava.
- Fodder production in *Kharif*
- Safe storage of grain and pulses
- Layout and construction / Rejuvenation of fishpond.

Second half yearly programme

- Integrated crop management in oilseed crops of *kharif & rabi* season
- Integrated crop management in vegetables of *kharif* season
- Green Fodder production in *Rabi*.
- Seed treatment and method of sowing in *Rabi* crops.
- Application of organic and inorganic fertilizers in fish culture ponds
- Soil and water conservation measures
- Control of collar rot disease in groundnut through seed treatment
- Integrated crop management in *Rabi* pulses.
- Integrated crop management in *Rabi* vegetables.
- Feeding technique of milch animals
- Balance use of feed fro fish production
- Low cost balanced feed for milch animals.

- Identification and eradication of weeds and predatory fish from pond.
- Seed treatment with bio-fertilizers
- Major disease and insect of mustard crop and their management

Table 6.6 Income and employment generating training programs for SHGs

- Seed production technologies for pulses, cereals and oilseed
- Preparation of organic manures
- Off season vegetable growing
- Back yard poultry farming
- Seasonal fruit (Guava, Ber, Aonla) and vegetables (Tomato, Cauliflower, Pea) preservation, packing and marketing
- Composite fish farming
- Bee keeping management techniques
- Value addition in pulses, oilseed, durum wheat (small scale)
- Use of computer and communication technology for agriculture marketing.
- Seed production of groundnut.
- Vegetable nursery management.
- Goatary management.
- Mini dal mill
- Value addition of different types of masala making, packing and marketing
- Integrated fish culture cum horticultural crops

Chapter - 7

PHASING OF WORKS, BUDGETING AND OPTIONS FOR LIVELIHOODS

7.1 Runoff

Design of any erosion measures is mainly dependent on runoff from a catchment. Therefore, estimation of probable runoff from any catchment is the first step towards designing and construction of soil and water conservation measures. Runoff is drainage of precipitation from a catchment, which flows out through its natural drainage system. After the occurrence of infiltration and other losses from the precipitation, the excess rainfall flows out through the small natural channels on the land surface to the main drainage channel. Such types of flows are called surface flows. A part of the infiltrated rainwater moves parallel to land surface as subsurface flow, and reappears on the surface at certain other points. Such flows are called interflows. The other part of the infiltrated water percolates downwards to ground water, and moves laterally to emerge in depressions and rivers, and joins the surface flow. This type of flow is called the subsurface flow or ground water flow.

Runoff is a rainfall driven process and depends upon biophysical characteristics of the catchments. Runoff estimation includes its volume and peak rate of flow volume. In designing spillways and outlets or waterways, peak rate of runoff is required while for assessing the storage in earthen dam, tanks and ponds etc. the estimates of runoff volumes are required. Another important variable of interest in drainage line treatment is the flow velocity that is required for determining scour pattern in the river bed and along the banks. In this way, various characteristics parameters of runoff are required for the design of soil and water conservation structures.

7.2 Methods of Runoff Computation

There are many methods available for runoff estimation. The most commonly adopted methods are the Curve Number method of the Soil Conservation Service of the USDA for estimation of both excess runoff volume and peak flow rate and the Rational method for the peak flow rate. Many empirical relationships are also widely used for estimation of flow rates. Runoff of the watershed was estimated using Curve Number Method.

7.2.1 Curve number method

The Curve Number method was developed for the determination of the rainfall excess of agricultural watersheds, on per storm basis.

$$Q = \frac{(p - 0.2S)^2}{P + 0.8S}$$

Where, Q= direct runoff, mm

P= storm rainfall, mm

S= a parameter for surface retention

The parameter S is defined as

$$S = \frac{25400}{CN} - 254$$

Where, CN = an arbitrary curve number varying from 0 to 100

The amount of rainfall (P) is also affected by duration. For design considerations, maximum runoff volume is required. It is established that minimum storm duration for flood estimation can be taken as 6 hours. But in certain conditions design rainfall for greater durations can also be taken.

7.3. Estimation of Runoff from the Watershed

Runoff from the watershed is estimated by Curve Number method of the Soil Conservation Service of the USDA It is estimated that runoff potential of the watershed varied from 17-25 per cent of average annual rainfall.

7.4. Runoff Volume to be harvested by Proposed Structures

Capacity survey of the structures was done and analysed with the help of software Surfer for storage volume and submerged area. Total runoff harvested (99258 cum), up to crest level by different structures in all micro-watersheds.

Table 7.2: Year wise financial phasing (Rs. In Lakh)

Sr. No.	Particulars	1st Year	2nd Year	3rd Year	4th Year	5th Year	Total
1	Administrative Cost-10%	6.552	6.552	6.552	6.552	6.552	32.760
2	Monitering-1%	1.900	1.900	-0.524			3.276
3	Evaluation-1%	-	1.638	-	1.638	-	3.276
4	Entry Point Activity-4%	13.104	-	-	-	-	13.104
5	Institution & Capacity Building-5%	6.552	6.552	3.276	-	-	16.380
6	DPR-1%	3.276	-	-	-	-	3.276
7	Watershed Dev. Work-50%	12.2850	40.950	57.330	53.235	-	163.800
8	Livelihood Activity-10%	3.276	6.552	9.828	13.104	-	32.760
9	Production System & Micro enterprises-13%	3.276	6.552	13.104	13.104	6.552	42.588
10	Consolidation-5%	-	-	-	-	16.380	16.380
	Total	50.221	70.696	89.566	87.633	29.484	327.600

Table 7.3. Details of budget for different interventions proposed*

S. No.	Activities	Nos./area	Amount (Rs. In Lakh)
1.	Preparatory Phase		
	Entry Point Programme	-	13.104
	Institution & Capacity building	As per details in chapter 6	16.380
	Total		29.48
2.	Watershed Works Phase		
	Field /Graded / Compartmental Bunds(FB /GB/CB)	2730 ha	163.80
	Field drainage structures	100	7.60
	Well recharge unit	100	5.60
	Recharge pit	50	7.50
	Fram pond	50	10.00
	Injection well	25	46.25
	Rain water harvesting	25	20.00
	Total		260.75
3.	Livelihood Activities	As per details in chapter 7	32.760
4.	Production System		
	Agriculture Production system		
	Demonstration**	100	5.00
	On Farm Testing**	25	25.00
	Seed Multiplication Units	25	30.71
	Horticulture		
	Demonstration	100	1.50
	On Farm Testing	100	25.00
	Nursery Unit	25	43.75
	Animal Husbandry		
	Demonstrations/Animal camps	100	25.00
	Local Tharparkar / Gir Bull Breeding	100	50.00
	Feed and fodder utilization		
	Vaccinations	25	6.25
	Agroforestry		
	Aonla based	50 ha	11.08
	Guava based	50 ha	10.83
	Lemon based	50 ha	11.64
	Bael based	50 ha	10.58
	Ber based	50 ha	11.86
	Silvi pastoral system	50 ha	19.10
	Total		287.29
	Total (1+2+3+4)		610.28

Note: The total outlay of the micro-watershed is Rs. 327.60 lakh, however, the estimate for proposed interventions is Rs. 610.28 lakh. The deficit will be make up through convergence of different development schemes viz. MNREGS, NHM, FSM, etc.

7.5 Livelihood Options for Village Groups / Community

1. Vermi-compost unit

Capacity – 100 metric tonn per year

S. No.	Head of Expenditure	Unit	Quantity	Rate (Rs.)	Total Amount (Rs.)
1.	Land	Sq. Meter	4000	50000.00	50000.00
2.	Platform	Sq. Meter	240	-	40000.00
3.	Shed (Angle iron & Asbestos Sheet)		240	-	120000.00
4.	Hand pump / Well	-	01	-	40000.00
5.	Dung	Metric ton	100	500	50000.00
6.	Red worms (<i>Eisina fetida</i>)	Quintal	01	25000	25000.00
7.	Chhanna (Manual)	-	01	8000	8000.00
8.	Weight/Kanta	-	01	-	4000.00
9.	Implements- Spade, Tasala, Hajara etc.	-	-	-	2000.00
10.	Other Expenses & Labour	-	-	-	25000.00
	Total				364000.00

Farmers share is 1- Land, 2- Plate form, 4- Hand pump/Well, 5- Dung & 10- Labour i.e Rs. 50000.00 + 40000.00 + 40000.00 + 50000.00 + 25000.00 = 205000.00 (Rs. Two lakh five thousand only). Remaining amount Rs. 1,14,250.970.00 (Rs. One lakh fifty eight thousand only) will be provided by the project. Term and condition is applied that vermicompost unit will run in participatory mode by the Groups i.e. made by farming community for their livelihood improvement.

Farmers share – 205000.00

Project Share - 114250.970.00

Total (Rs.) 364000.00

2. Nursery unit

S. No.	Head of Expenditure	Unit	Quantity	Rate (Rs.)	Total Amount (Rs.)
1.	Land	Acre	1/2	90000.00	45000.00
2.	Fencing				
a.	Barbed wire	Quintal	1.5	6600.00	9900.00
b.	Concrete polls	No.	53	275.00	14575.00
c.	Lobour	No.	20	100.00	2000.00
3.	Boring / Well	No.	01	40000.00	40000.00
4.	Beds preparation, irrigation channels etc.	-	-	-	10000.00
5.	Low cost poly house (Bareja)	No.	01	-	5000.00
6.	Implements- khurpi, Spade, hajara etc.	-	-	-	2000.00
7.	Polythene begs	Kg	150	100.00	15000.00
8.	Manure (FYM)	Ton	2	1500.00	30000.00
9.	Chemicals	-	-	-	1000.00
	Total				174475.00

Farmers share is 1- Land, 2- Labour, 3- Boring/Well, 5- Bed & irrigation channels i.e Rs. 45000.00 + 2000.00 + 40000.00 + 10000.00 = 97000.00 (Rs. Eightty seven thousand only). Remaining amount Rs. 77475.00 (Rs. Seventy seven thousand four hundred seventy five only) will be provided by the project. Term and condition is applied that Nursery unit will be run in participatory mode by the Groups i.e. made by farming community for their livelihood improvement.

Farmers share –	97000.00
Project Share -	77475.00
Total	174475.00

Month Wise Plan of Nursery Raising

Nursery development work takes six months to one year and monthly work for raising of plants is fixed. Here we detailed the plants in village condition of district Lalitpur (UP)

Months	Details of Plants & work
January	Collect the seeds of Sirash, Khair, Aonla, Teak, Bakain, Acacia, Amaltash plant from Forest Deppt. or other reliable sources
February	Seed Sowing – Bamboo, Shisham, Sirash, Gulmohar & Seed Treatment of Teak seed by Lime in pit
March	Plant Germinated Root Trainer in Polythene Bags for Shisham, Vilayati Babool and Aonla
April	Seed sowing should be done of Khair, Aonla, Bamboo and Arjun
May	Collect seeds of Kangi, Shemal and Gulmohar
June	One year or more old plant of Jamun, Kangi, Arjun and Shisham ready for the sale
July	For the next year Germination Plot should be prepared for the Ber, Gulmohar, Khair, Kathal, Jamun, Kangi, Neem etc. and germinated plants of two to three leaves should be transferred in to the Polythene bags
August	Sown seed in July transferred into the Polythene bags plots and Neem Seed should be cleaned from flesh and sown in the germinated plots.
September	Sowing of Neem, Kachnar, Acacia seeds etc. Polythene bags filling and collect seeds of Gauva
October	Polythene filling, Watering etc.
November	Polythene filling, Watering etc.
December	Polythene filling, Watering etc.

Seed collection and arrangement:

Months	Plants
January	Teak, Kagzi Neebu, Guava, Khair
February	Teak, Kagzi Neebu, Guava, Khair, Cutting of Teak, Aonla
March	Teak, Kagzi Neebu, Guava, Khair Cutting of Teak, Aonla
April	Khair, Aonla, Bamboo and Arjun
May	Collect seeds of Kangi, Shemal and Gulmohar
June	Subabool, Babool, Shemal, Bamboo, Neem, Sheesham,
July	Neem, Vilayati Babool, Sesbania

3. Goat kids project

Shed Cost : Made by locally available material

S.No.	Particulars	Amount
1.	Thatch Structure / Khapparel Shed (Size: 15 X 300 Feet) with partition for one male	
	1. Khapperrel / Bamboo	4000.00
	2. Thatch, Puwal etc.	1000.00
	3. Rope Band & Patera	500.00
	4. Periphery boundary Kacchi / Stone / Pacca	3000.00
	5. Miscellaneous	1500.00
	Total	10000.00

Input Involved

S.No.	Particulars	Amount
1.	Kids goat No.- 20 @ 1000 / female	20000.00
2.	Adult Male	3000.00
	Total	23000.00

Recurring Cost

S.No.	Particulars	Amount
1.	Labour- Grazing of Goat (Mandays yearly: One person /day @ Rs. 100 / day	36000.00
2.	Feed Cost (@ Rs 4000 / month Annually –)	48000.00
	Barley & Wheat under size	
	Chickpea under size	
	Green fodder (Leaf of subabool, lobia, grasses, legumes etc)	
	Wheat Straw	
3.	Medicines & Health care (FMD, Deworming & Vaccinations) annually charges and Training	6000.00
4.	Insurance (annually)	1200.00
	Total	91200.00
	Total Expenditure	124200.00

Farmers share is 1- Shed, 2- Labour, 3- Feed cost i.e Rs. 10000.00 + 36000.00 + 48000.00 = 94000.00 (Rs. Eightty four thousand only). Remaining amount Rs. 30200.00 (Rs. Thirty thousand and two hundred only) will be provided by the project. Term and condition is applied that Goat unit will be run in participatory mode by the Groups i.e. made by farming community for their livelihood improvement.

Farmers share – 94000.00

Project Share - 30200.00

Total 124200.00

4. Goat rearing project

Goats create employment to the rural poor including effective utilization of unpaid family labour. Goat rearing is going on in Western Uttar Pradesh with traditional grazing system; these include grazing on non-cultivated land, grazing on community land close to the villages. In this system animals are housed at night and let loose for grazing in the daytime with no supplementation with concentrate mixture. The production per animal is low but margin of profit is high as no investment is involved on feeding. Growing habits of grasses, development of pasture on non-cultivated lands is essential in participatory mode. Intensive production system where no grazing land is available the goats are reared on stall feeding. Under this system there is no risk of parasite infestation, maximum protection from adverse weather conditions, however, some space is provided for exercise. When sufficient grazing

area is not available supplementary feeding is done in form of concentration mixture or green and dry fodder.

The integration of livestock with crop production is a means of establishing sustainable system that aim to optimize resources use. The realization of such aims will maximize the degree of self-reliance of the system, since a variety of products will be obtained with minimum inputs to maintain soil fertility. The varied activities on the integration farm create employment opportunities for all members of the extended family. Use of native pasture, crop residue and fibrous agro products supplementary feeding whenever necessary for efficient rumen fermentation and high animal productivity. The tree crops are highly appropriate for this region. They capture a large amount of solar enery and they produce sustainable yield of biomass. They reduce erosion, improve soil structure and fertility and plant with shallow roots can be grown under the trees.

Structures

Made by locally available material

S.No.	Particulars	Amount
1.	Thatch Structure / Khapparel Shed (Size: 15 X 300 Feet) with partition for one male	
	1. Khapperrel / Bamboo	4000.00
	2. Thatch, Puwal etc.	1000.00
	3. Rope Band & Patera	500.00
	4. Periphery boundary Kacchi / Stone / Pacca	3000.00
	5. Miscellaneous	1500.00
	Total	10000.00

2. Input involved

S.No.	Particulars	Amount
1.	Adult Female No.- 10 @ 3000 / female	30000.00
2.	Adult Male	3000.00
	Total	33000.00

3. Recurring Cost

S.No.	Particulars	Amount
1.	Grazing of Goat (Mandate yearly: One person /day @ Rs. 100 / day	36000.00
2.	Feed Cost (@ Rs 4000 / month Annually –)	48000.00
	Barley & Wheat under size	
	Chickpea under size	
	Green fodder (Leaf of subabool, lobia, grasses, legumes etc)	
	Wheat Straw	
3.	Medicines & Health care (FMD, Deworming & Vaccinations) annually charges	6000.00
4.	Insurance (annually)	1200.00
	Total	91200.00

Total Expenditure 1, 2 & 3 = 134,200.00

Output / Receipts from Goat Rearing Project

S.No.	Particulars	Amount
	i. Milk Production:	
1.	Milk Production (10 Goat) (5 Month @ 1 lit / day / Goat = 1500 lit Sale @ Rs. 15/lit)	22500.00
2.	Milk Production (4 Month) = 1200 lit @ Rs. 15/lit	18000.00
	Total	40,500.00
	B. Selling of Goat Kids (From six Month to 12 year)	
3.	First Production (after six month from starting) Average two kids (Assumed that ratio of male & female is 50:50) 10 male to be sale @ Rs. 1800 / kid 10 Female kids retain for next rearing (Rate calculated for next unit)	18000.00 30000.00
4.	Second Production (Av. two kids/ goat) 10 Old Stock Production – 20 kids (assumed that ratio of male & female is 50:50) a. 10 Male sale @ Rs. 1500 / kid b. 10 Female kids for next rearing @ 2000 / kid	15000.00 20000.00
	Total	83000.00
	C. Goat Manure	
5.	After one year 50 q (if not grazed) if grazing is going on then vermi-compost / NADEP Unit is compulsory with each unit	15000.00
	D. Permanent Parent Stock	
6.	11 Parent - one unit @ Rs. 4000 / Goat	44000.00
	Total	182500.00

Note:

- Two Unit of Goat will be separated from this Unit after 14 months that input cost is included in lower side in respect of rates, which are prevailing in the market.
- Next Two units will be further distributed to the Participatory groups.
- One Acre of waste land will produce complete feed for one unit by the growing of Subabool (*Luceana leucocephala*) and grasses (Dhabroo, Dinanath etc.)
- Growing of grasses and legumes on earthen work is compulsory (*Stylosanthes hamata*, Dina Nath, Dhabroo, *Cenchrus ciliaris*, etc.)
- Farmers share is 50% of above cost

Net Return from Goat Rearing Project: 182,500 – 134200 = 48,300.00

Feeding cost should be included in net return if complete watershed approach adopted, so this return will be just double.

Information related to the Goat Rearing

1. Research Institute:

Central Goat Research Institute,
Farah, Makdoom,
Mathura U.P.

2. Local Market for Parent Materials: Jamunapari & Barberi

1. Chaura, Kalpi, Jalaun U.P.
2. Kosi, Mathura
3. Pukhranya, Kanpur, Dehat

5. Project on Cultivation of Medicinal & Aromatic Plants:

Name of Crop: Ashwaganda, Sarpgandha, Allovera (Gvarpatha)

Unit Economics:

Land Requirement: Five ha (Participatory)

Machinery & Apparatus: Spade, Bucket, Moter (Pump) etc. – 30,000.00

Input required:

a. Seed & Planting material -	15,000.00
b. Manure -	20,000.00
c. Miscellaneous -	5,000.00
Total	40,000.00

Recurring Cost:

Electric / Pump set (Diesel etc.) 15,000.00

Worker & Labours

S. No.	Particulars	No.	Amount (Rs)
1.	Full time Labour	01 @ Rs. 100 / day	2600.00
2.	Casual Labour	05 for 20 days @ Rs. 100 / day	10000.00
	Total		12600.00

Other Expenditure:

a. Transportation	-	10,000.00
b. Maintenance & Storage etc.	-	10000.00
c. Stationary & Poster etc.	-	5000.00
Total		25000.00

Total Unit Cost

1. Machinery	-	30,000.00
2. Input -	-	40,000.00
3. Worker & labour	-	12600.00
4. Other Expenditure	-	25000.00
Total Expenditure		107600.00

Unit Profit

Total production from one ha is about Rs.	250,000.00
Yearly Income from Unit	142400.00

Address for Seed & Other Material used in Unit

1. Central Institute of Medicinal & Aromatic Plants (CIMAP)

P.O. – Ram Sagar, Mishara Nagar , Lucknow

6. Masala Grinding Project

1. Land Requirement; 1000 Sq Feet Rent Rs. 1500.00 per Month

2. Capacity: 300 working days
6480 kg Chilly Powder
6000 kg Coriander Powder
6150 kg Haldi
1200 kg Garam Masal
Job Work

3. Machinery Required

S.No.	Particulars	No.	Rate	Total Amount (Rs)
1.	Pulverizer (5 horse power)	01	37000.00	37000.00
2.	Packaging Machine	01	12000.00	12000.00
3.	Taraju, Bant etc	01	4500.00	4500.00
4.	Electrification	01	3500.00	3500.00
	Total			57000.00

Working Capital / Month

4. Raw Material

S. No.	Items	Quantity	Rate	Amount (Rs)
1.	Chilly	540 kg	40 / kg	21600.00
2.	Haldi	580 kg	30 kg	17400.00
3.	Coriander	500 kg	35	17500.00
4.	Jeera	20 kg		5500.00
5.	Badi Ilaichi	30 kg		3500.00
6.	Kali Mirch	40 kg		9500.00
7.	Dal Chinni	30 kg		5000.00
8.	Laong	20 kg		2800.00
9.	Packaging Material	12.00		2500.00
	Total			85300.00

Workers & Labours

1. Skilled Labour 01 @ Rs. 185 / day	5550.00
2. Helper 02 @ Rs. 100 / Day	6000.00
Total	11550.00

5. Utilities Expenditure per Month

1. Electricity Expenditure	1000.00
2. Water etc.	1000.00
Total	2000.00

6. Other Expenditure per Month

1. Rent	1500.00
2. Postage / Stationary Expenditure	500.00
3. TA. Transportation etc.	2000.00
4. Insurance	500.00
5. Administrative expenses	1200.00
Total	5700.00

Capital Required per Month

1. Raw Material	85300.00
2. Worker & Labour	11550.00
3. Utilities Exp.	2000.00
4. Other Exp	5700.00
Total	104550.00

Total Project Cost

A. Machinery & Tools	57000.00
B. Capital Running	104550.00
Total	161550.00

Entrepreneur Share – 50 %

Implementing agency share - 50 %

Assumed Profit

Particulars	Quantity	Rate	Amount (Rs)
Coriander Powder	6000 kg	Rs 60 / kg	360000.00
Michi Powder	6480	Rs 65 / kg	421200.00
Haldi Powder	6150 kg	55 / kg	382800.00
Garam Masal	1200	165 / kg	192000.00
Job work			150000.00
	Total		1506000.00

7. Oil Expeller Project

1. Land Requirement; 1250 Sq Feet Rent Rs. 1200.00 per Month

2. Capacity: 300 working days

50 kg Mustard / hour

40 % Job Work

3. Machinery Required

S.No.	Particulars	No.	Rate	Total Amount (Rs)
1.	Oil Expeller (6 Volt Ave. 50 kg / hr) 7 HP Motor	01	48000	48000.00
2.	Filter Press	01	15000.00	15000.00
3.	Shaft, Patta etc.	-	7500.00	7500.00
4.	Electrification & furniture	-	15000.00	15000.00
	Total			85500.00

Working Capital / Month

4. Raw Material

S. No.	Items	Quantity	Rate	Amount (Rs)
1.	Mustard	4500 kg	18 / kg	81000.00
	Total			81000.00

5. Workers & Labours

1. Skilled Labour 01 @ Rs. 185 / day	5550.00
2. Helper 01 @ Rs. 100 / Day	2600.00
Total	8150.00

6. Utilities Expenditure per Month

1. Electricity Expenditure	3500.00
2. Water etc.	1000.00
Total	4500.00

7. Other Expenditure per Month

1. Rent	1200.00
2. Postage / Stationary Expenditure	500.00
3. TA. Transportation etc.	2000.00
4. Insurance	500.00
5. Administrative expenses	1200.00
Total	5400.00

8. Capital Required per Month

1. Raw Material	81000.00
2. Worker & Labour	8150.00
3. Utilities Exp.	4500.00
4. Other Exp	5400.00
Total	99050.00

Total Project Cost

A. Machinery & Tools	85500.00
B. Capital Running	99050.00
Total	184550.00

Entrepreneur Share	- 50 %
Implementing agency share	- 50 %

Assumed Profit

Particulars	Quantity	Rate	Amount (Rs)
Mustard Oil	19440	Rs 60 / kg	1166400.00
Cake	34590	Rs15 / kg	518850.00
Job Work	-	-	550000.00
	Total		2235250.00

8. Papad Making Unit

1. Land Requirement; 1000 Sq Feet Rent Rs. 1000.00 per Month

2. Capacity: 300 working days
6150 kg urd Papad
4620 kg Moong Papad

3. Machinery Required

S.No.	Particulars	No.	Rate	Total Amount (Rs)
1.	Papad Making Machine (with ¼ HP motor)	01	28000.00	28000.00
2.	Aata mixing machine (with motor)	01	25000.00	25000.00
3.	Loi making Machine (with motor)	01	27000.00	27000.00
4.	Loi Pressing Machine hand running	01	3500.00	3500.00
5.	Other Pans & Apparatus	-	-	5000.00
6.	Electrification	-	-	7500.00
7.	Furniture & Other	-	-	7500.00
	Total			103500.00

Working Capital / Month

4. Raw Material

S. No.	Items	Quantity	Rate	Amount (Rs)
1.	Moong Aata	350 kg	30 kg	10500.00
2.	Urd Aata	495 kg	35 kg	17352.00
3.	Jeera	20 kg	55 kg	1100.00
4.	Papad Khar	33 kg	20 / kg	660.00
5.	Salt	33 kg	10 / kh	330.00
6.	Hing	1 kg		150.00
7.	Lal Mich, Kali Mirch,			2000.00
8.	Other packing material			5000.00
	Total			37092.00

Workers & Labours

1. Skilled Labour 01 @ Rs. 185 / day	5550.00
2. Helper 02 @ Rs. 100 / Day	5200.00
Total	10750.00

5. Utilities Expenditure per Month

1. Electricity Expenditure	750.00
2. Water etc.	1000.00
Total	1750.00

6. Other Expenditure per Month

1. Rent	1000.00
2. Postage / Stationary Expenditure	500.00
3. TA. Transportation etc.	2000.00
4. Insurance	500.00
5. Administrative expenses	1200.00
Total	5200.00

7. Capital Required per Month

1. Raw Material	37092.00
2. Worker & Labour	10750.00
3. Utilities Exp.	1750.00
4. Other Exp	5200.00
Total	54792.00

Total Project Cost

A. Machinery & Tools	103500.00
B. Capital Running	54792.00
Total	158292.00

Entrepreneur Share – 50 %

Implementing agency share - 50 %

Assumed Profit

Particulars	Quantity	Rate	Amount (Rs)
Moong Papad	4620 kg	Rs 66 / kg	304920.00
Urd Papad	6150 kg	Rs75 / kg	522000.00
	Total		826920.00

9. Wooden Furniture Unit

1. Land Requirement; 40 X 20 Feet Rent Rs. 2000.00 per Month

2. Capacity: 300 working days

3. Machinery Required

S.No.	Particulars	No.	Rate	Total Amount (Rs)
1.	Aari , Rabdha, Hammer, etc.	-	-	18000.00
2.	Small Aara Machine (1/2 HP Motor)	01	38000.00	38000.00
4.	Other Pans etc.	-	-	5000.00
	Total			61000.00

Working Capital / Month

4. Raw Material

S. No.	Items	Quantity	Rate	Amount (Rs)
1.	Sheesham, Teak wood etc.	-	-	150000.00
2.	Keel, Pench, Primar, etc.	-	-	12000.00
3.	Favicole, Ply wood, Sun Mica eyc.	-	-	25000.00
	Total			248000.00

5. Workers & Labours

1. skilled Karigar @ 250 / Day	7500.00
2. Labour 02 @ Rs. 100 / Day	5200.00
Total	12700.00

6. Other Expenditure per Month

1. Rent	2000.00
2. Postage / Stationary Expenditure	500.00
3. TA. Transportation etc.	2000.00
4. Insurance	500.00
5. Administrative expenses & Sale Rapper etc.	2500.00
Total	7500.00

7. Capital Required per Month

1. Raw Material	248000.00
2. Worker & Labour	12700.00
3. Other Exp	7500.00
Total	268200.00

Total Project Cost

A. Machinery & Tools	61000.00
B. Capital Running	268200.00
Total	329200.00

Entrepreneur Share	- 50 %
Implementing agency share	- 50 %

Assumed Profit

Particulars	Quantity	Rate	Amount (Rs)
Furniture made	-	Per month	2,62000.00
	300 days / Years		2620000.00
	Total		800000.00

10. Mini Dal Mill Unit

1. Land Requirement; 1250 Sq Feet Rent Rs. 1200.00 per Month

2. Capacity: 300 working days

10 quintal / day

40 % Job work (Community Basis)

3. Machinery Required

S.No.	Particulars	No.	Rate	Total Amount (Rs)
1.	Mini Dal Mill (IIPR Kanpur)	01	42000	42000.00
2.	Other Utensils	-	-	5000.00
3.	Shaft, Patta etc.	-	7500.00	7500.00
4.	Other (electric etc.)	-	-	3000.00
	Total			57500.00

Working Capital / Month

4. Raw Material

S. No.	Items	Quantity	Rate	Amount (Rs)
1.	Urd, Moong, chickpea, Pea	100 q	2500 / q	250000.00
	Total			250000.00

5. Workers & Labours

1. Skilled Labour 01 @ Rs. 185 / day 5550.00

2. Helper 01 @ Rs. 100 / Day 2600.00

Total 8150.00

6. Utilities Expenditure per Month

1. Electricity Expenditure 3500.00

2. Sailling 7 Drying etc 7500.00

Total 11000.00

7. Other Expenditure per Month

1. Rent 1200.00

2. Postage / Stationary Expenditure 500.00

3. TA. Transportation etc. 2000.00

4. Insurance 500.00

5. Administrative expenses 1200.00

Total 5400.00

8. Capital Required per Month

1. Raw Material	250000.00
2. Worker & Labour	8150.00
3. Utilities Exp.	11000.00
4. Other Exp	5400.00
Total	274550.00

Total Project Cost

A. Machinery & Tools	57500.00
B. Capital Running	274550.00
Total	332050.00

Entrepreneur Share	- 50 %
Implementing agency share	- 50 %

Assumed Profit

Particulars	Quantity	Rate	Amount (Rs)
Dal of different kind	1500 q	Rs Ave 3000 / q	4500000.00
Job Work	-	-	500000.00
	Total		5000000.00

11. Small Dairy Farm Unit

1. Land Requirement;

5 Buffaloes/Cows Unit Requires: 400 Sq Feet covered area (thatched) made by local material and Approximately 1000 sq feet open area
Rent Rs. 2000.00 per Month

2. Capacity: 5 Animal Unit

3. Live Stock & Machinery Required

S.No.	Particulars	No.	Rate	Total Amount (Rs)
1.	Buffaloes / Cows (Murra/ Tharparkar)	05/05	30000 / animal	150000.00
2.	Milk Can	06	500	3000.00
3.	Balty	10	150	1500.00
4.	Chaff cutter (with Motor)	01	3500	3000.00
5.	Other pans etc.	-	-	2000.00
	Total			159500.00

Working Capital / Month

4. Raw Material

S. No.	Items	Quantity	Rate	Amount (Rs)
1.	Bhusa / month	20 quintal	180 / q	3600.00
2.	Green Fodder / Concentrate Feed etc.	6 kg/ Buffalo & 4 kg / Cow Appro. 1000 kg	10 kg	10000.00
	Total			13600.00

5. Workers & Labours

1. Skilled Labour 01 @ Rs. 185 / day	5550.00
2. Helper 02 @ Rs. 100 / Day	2600.00
Total	8150.00

6. Other Expenditure per Month

1. Rent	2000.00
2. Postage / Stationary Expenditure	500.00
3. TA. Transportation etc.	2000.00
4. Insurance	1200.00
5. Administrative expenses	1200.00
Total	6900.00

7. Capital Required per Month

1. Raw Material	13600.00
2. Worker & Labour	8150.00
3. Other Exp	6900.00
Total	28650.00

Total Project Cost

A. Live Stock & Machinery/Tools	159500.00
B. Capital Running	28650.00
Total	188150.00

Entrepreneur Share – 50 %

Implementing agency share - 50 %

Assumed Profit

Particulars	Quantity	Rate	Amount (Rs)
Milk sale (peak)	9000 lit	Rs 15 / lit.	135000.00
Dry Spell	4500 lit	Rs. 15 / lit	67500.00
	Total		202500.00

12. Small Poultry Unit

A. Capital Investment

1. Broiler House Tubular Structure

Approximately 1000 sq @ Rs 100 / sq feet = 1,00,000.00

2. Broiler Apparatus

a. Adult Feeder 25 Nos.	@ Rs. 250 / No.	6250.00
b. Chick Feeder 25 Nos.	@ 75 / No.	1875.00
3. Brooder Automatic 03 Nos.	@ Rs. 1250 / No.	3750.00
4. Electric Fitting etc.		7500.00
Total		119375.00

B. Working Capital:

1. 1000 chicks one day old @ 12 / Chick	12000.00	
2. Balanced Broiler Feed for 45 days @ 2.5 gm/ chick Rs. 6.00 / kg	15,000.00	
3. Poultry Litter (wooden Powder)	2500.00	
4. Medicines	2000.00	
5. Transport	1000.00	
6. Working Staff & labour	5500.00	
7. Other Expenses	5000.00	
Total		43000.00

Total Unit Cost

1. Capital Investment –	119375.00	
2. Working Capital -	43000.00	
Total		162375.00

Entrepreneur Share – 50 %

Implementing agency share - 50 %

Returns

1. Broiler 1000 Birds (Live weight –1.30 kg) @ Rs. 70 / Bird	70000.00	
2. Poultry Manure	1500.00	
3. Feed Blank Gunny Bags	2500.00	
Total		74000.00

Total Five Crops will made in a year, So Net Return = 3,70,000.00

13. Motor Mechanic Workshop

1. Land Requirement; 1250 Sq Feet Rent Rs. 1200.00 per Month
2. Capacity: 300 working days

3. Machinery Required

S.No.	Particulars	No.	Rate	Total Amount (Rs)
1.	Instruments			50000.00
2.	Shed etc	-	-	50000.00
	Total			100000.00

4. Workers & Labours

1. Skilled Labour 01 @ Rs. 185 / day	5550.00
2. Helper 01 @ Rs. 100 / Day	2600.00
Total	8150.00

5. Utilities Expenditure per Month

1. Electricity Expenditure	3500.00
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6. Other Expenditure per Month

1. Rent	1200.00
2. Postage / Stationary Expenditure	500.00
3. TA. Transportation etc.	2000.00
4. Insurance	500.00
5. Administrative expenses	1200.00
Total	5400.00

7. Capital Required per Month

1. Worker & Labour	8150.00
2. Utilities Exp.	3500.00
3. Other Exp	5400.00
Total	17050.00

Total Project Cost

A. Machinery & Tools	100000.00
B. Capital Running	17050.00
Total	117050.00

Entrepreneur Share	- 50 %
Implementing agency share	- 50 %

Assumed Profit

Particulars	Quantity	Rate	Amount (Rs)
Job work	Rs. 20000/Month		240000.00
	Total		240000.00

14. Barber Shop

1. Shop area / rent ; Rs. 100.00 per Month
 2. Capacity: 300 working days
 3. Machinery Required

S.No.	Particulars	No.	Rate	Total Amount (Rs)
1.	Instruments & Mirrors etc.			50000.00
2.	Shed etc	-	-	50000.00
	Total			100000.00

4. Workers & Labours

1. Skilled Labour 01 @ Rs. 185 / day 5550.00

5. Utilities Expenditure per Month

1. Electricity Expenditure 3500.00

6. Other Expenditure per Month

1. Rent 1000.00
 4. Insurance 500.00

Total 1500.00

7. Capital Required per Month

1. Worker & Labour 5550.00
 2. Utilities Exp. 3500.00
 3. Other Exp 1500.00

Total 10550.00

Total Project Cost

- A. Machinery & Tools 100000.00
 B. Capital Running 10550.00
- Total 110550.00**

- Entrepreneur Share – 50 %
 Implementing agency share - 50 %

Assumed Profit

Particulars	Quantity	Rate	Amount (Rs)
Job work	Rs. 1500/Month		180000.00
	Total		180000.00

15. Rope making Unit (Linseed)

1. Land Requirement; ½ acre
2. Capacity: 300 working days
3. Machinery, raw material & Building Required

S.No.	Particulars	No.	Rate	Total Amount (Rs)
1.	Rope making machine	01	35000	35000.00
2.	Decomposing structure	01	25000	25000.00
3.	Shed cum office	01	25000	25000.00
4.	Raw material (linseed stem)	20 ton	6000/ton	60000.00
	Total			145000-00

4. Workers & Labours

1. Skilled Labour 01 @ Rs. 185 / day 5550.00
 2. Helper 01 @ Rs. 100 / Day 2600.00
- Total 8150.00**

5. Utilities Expenditure per Month

1. Electricity Expenditure 3500.00

6. Other Expenditure per Month

1. Rent 1200.00
 2. Postage / Stationary Expenditure 500.00
 3. TA. Transportation etc. 2000.00
 4. Insurance 500.00
 5. Administrative expenses & marketing 1800.00
- Total 6000.00**

7. Capital Required per Month

1. Worker & Labour 8150.00
 2. Utilities Exp. 3500.00
 3. Other Exp 6000.00
- Total 17650.00**

Total Project Cost

- A. Machinery & Tools 145000.00
 - B. Capital Running 17650.00
- Total 162650.00**

Entrepreneur Share – 50 %

Implementing agency share - 50 %

Assumed Profit

Particulars	Quantity	Rate	Amount (Rs)
Rope	15 ton rope / yr	12000 / ton	180000.00
Job work	-		50000.00
	Total		230000.00

16. Organic Product Unit

S. No	Particulars	Description
1	Cereals	Duram Wheat – as grown by the local growers on small groups basis
2	Pulses	Chickpea, pea, lentil, Urd, Moong and Arhar
3	Fruits	Aonla

Above crops to be identified according to the Agro climatic situation (Land, situations, irrigations etc)

Work Plan

1. Identification of commodities groups
2. Informations of groups and their land and farming system approach
3. Certification process
4. Practices for organic growing

Certification Charges For Five Years

S.No.	Details of Certification	Amount (Rs)
1	1 st year – Travel & Inspection 7000 / day	49000.00
	Report Preparation	5000.00
	Certification	5000.00
	Others (Stationary etc)	1000.00
	Total	60000.00
2.	2 nd year	60000.00
3	3 rd year	60000.00
4	4 th Year	60000.00
5	5 th year	Self by the groups
	Total	240000.00
	PIA Share – 50 %	120000.00
	Group Share – 50 %	120000.00

17. Seed Production and Seed Bank

Existing Problem: Seed replacement

S. No.	Particulars	Analysis of Problem	
		1.	Quality of Seed
2.	Availability of Seed	Untimely	Effect the Yield of crops
3.	Seed Rate (at the time of sowing)	Higher 1.5 to 2.0 times then recommendation	Money loss
4.	Productivity	Very Low	Lack of awareness about seed and ICM
5.	Replacement rate of Seed	Nil	Low productivity

Objectives:

1. To improve the quality of uncertified seed (farmer's seed) or Truthful seed at village level.
2. To increase the production and productivity.
3. To create awareness among the farmers about quality seed, seed rate and method of sowing.
4. To generate employment for unemployed rural youth.
5. To save grain for extra use and income.
6. Multiplication of seed of newly released varieties suitable for microclimate.

Work Plan:

1. Formation of advisory committees
2. Selection of farmers for seed production in groups.
3. Selection of land according to crops requirement.
4. Arrangement of seed before the main season from different universities / states.
5. Field visits of farmers for truthful seed and for certification by certified agencies
6. Marketing of seed by groups or e marketing.

Seed Multiplication Table

S. No.	Crop	Required seed (q/ha)	Productivity q/ha	Area sown (ha)	Required seed (q)
1.	Durum Wheat	1.00	18.00	40	40.00
2.	Chickpea	1.00	12.00	20	20.00
3.	Field Pea	1.00	12.00	20	20.00
4.	Lentil	0.60	11.00	20	12.00
5.	Urd	0.50	4.00	10	5.00
6.	Moong	0.50	4.00	10	5.00

Input Required

1. Seed:

S. No.	Crop	Required seed (in quintal)	Approximately Rate of Seed (Rs./q)	Amount (Rs.)
1.	Durum Wheat	40.00	2500	100000
2.	Chickpea	20.00	6500	130000
3.	Field Pea	20.00	5400	108000
4.	Lentil	12.00	6000	72000
5.	Urd	5.00	5500	27500
6.	Moong	5.00	5600	28000
	Total			465500

2. Cost of Cultivation: From sowing to harvesting all activities should be done by the individual farmer under the Self help group.

3. Drying, Sorting & Cleaning at village level:

10 Labour Rs. @ 100 for one day for each crop for one ha produce for wheat

5 labour Rs. @ 100 for one day for each crop for one ha produce for pulses

Crop	Area (ha)	Labour for one ha	Amount (Rs.)
Durum Wheat	40.00	1000	40000.00
Chickpea	20.00	500	10000.00
Field Pea	20.00	500	10000.00
Lentil	12.00	500	6000.00
Urd	5.00	500	2500.00
Moong	5.00	500	2500.00
Total	102		71000.00

4. Registration Fees (@ Rs 450 /ha 414250.97.00

5. Packaging (hand Sieving machine) **5500.00**

6. Jute Bags (bags of 40 kg Total No. 3430) **51450.00**

7. Transportation & services charges etc. 20000.00

Total 122850.00

Income from one Unit & Area Expansion with good productivity

S. No.	Crop	Production	Rate / q	Total Amount (Rs.)	Area can be sown
1.	Durum Wheat	720	2000	1440000	720
2.	Chickpea	240	5000	1200000	240
3.	Field Pea	240	4500	1080000	240
4.	Lentil	132	4500	594000	220
5.	Urd	20	4000	80000	40
6.	Moong	20	4200	84000	40
	Total	1372		4478000	1500

- At least 2 units will be established in the whole cluster of watershed by the self help groups.

- Interested SHGs will be preferred and village community work for seed bank and deposit seeds for higher production and increasing the area of the watershed under the cluster approach.
- The production from seed production unit will be used as seed bank by SHGs and other villagers of productivity enhancement. The SHGs will get money from other farmers on behalf of their seed and the benefited farmers will take an oath to spread these seed for higher productivity in the watershed to other farmers.

Outcomes from Seed Production & Seed Bank programme

S. No.	Crop	Production	Total Amount (Rs.)	Two unit in cluster	Area can be sown (ha)
1.	Durum Wheat	720	1440000	2880000	1440
2.	Chickpea	240	1200000	2400000	480
3.	Field Pea	240	1080000	2160000	480
4.	Lentil	132	594000	1188000	440
5.	Urd	20	80000	160000	80
6.	Moong	20	84000	168000	80
	Total	1372	4478000	8956000	3000.00

- It is very clear from the production of seed and their bank which will run in participatory mode in the watershed

Chapter - 8

MONITORING AND IMPACT EVALUATION

8.1 Plan for Monitoring

Monitoring of the project will be done at each stage and it will be carried out for both, process and outcome. Some community members will be trained and will be involved in participatory monitoring of various parameters and processes and the crop yields. The interventions, expenditure and other information will be displayed in the watershed villages through wall writings. Besides trained community members, PIA/DWDU will also monitor the physical and financial progress of watershed development programme. Frontier technologies viz. GIS and Remote Sensing techniques will be used by the PIA/DWDU for monitoring and evaluation. The PIA shall submit quarterly progress reports (countersigned by the Watershed Committee (WC) President) to the DWDU for further submission to the SLNA. Sustainable and unbiased monitoring will be ensured by involving an independent agency. About 1 per cent of the total budget will be used on this activity.

8.1 Plan for Evaluation

Watershed development activities bring about both tangible and intangible benefits. In order to quantify the benefits, impact analysis has been proposed.

8.1.1 Theme :

It is presumed that as a consequence of watershed development activities there will be noticeable change in socio-economic status of inhabitants, cropping intensity, ground water recharge, crop diversification, fuel, fodder and small timber availability, livestock composition and milk production, etc. These indicators can be gauged over bench mark data both at the beginning and at the end of the project within the watershed.

8.1.2 Observations

The following indicators will be taken into account for quantitative and qualitative assessment. For the purpose, detailed questionnaires will be prepared and field observations will be carried out.

1. Duration of availability of drinking water/irrigation and groundwater recharge
2. Irrigation frequency and area under irrigation
3. Changes in cropping pattern and cropping systems in the farmers fields along with productivity and incomes
4. Soil health

5. Satellite monitoring for vegetation cover and other parameters
6. Fuel, fodder and small timber availability
7. Livestock composition and productivity
8. Periodic pest and disease monitoring will be done in major crops
9. Socio-economic aspects including resource inventory

Following indices will also be worked out as qualitative indicators of the watershed development:

- Land Improvement Index (LII)
- Crop Diversification Index (CDI)
- Cultivated Land Utilization Index (CLUI)
- Crop Fertilization Index (CFI)
- Induced Watershed Eco-Index (IWEI)

The concurrent and post-project monitoring and evaluation would be conducted to assess the status of watershed related interventions. It will be done by an independent agency having similar experiences. About 1 per cent of the total budget will also be used on evaluation.

Chapter - 9

CONSOLIDATION AND WITHDRAWAL STRATEGY

9. Consolidation and Withdrawal Strategy

Success of any program depends on sustainability of the various watershed interventions and sustainability can only be achieved through active participation of community. Active participation and cooperation of community can be ensured by building their capacities through exposures and trainings. From the beginning emphasis will be on capacity building and empowerment of stakeholders. The Watershed Committee, SHGs, Area Groups, Users Group and other CBOs will be established, trained, and strengthened to continue development after withdrawal of PIA. By building economic activities through CBOs community participation will be sustained. The PR&D approach along with demand driven interventions will reduce dependency on subsidies. Contributions from the community will be ensured for the entire activities to develop sense of belongingness and these contributions will be deposited to the account of Watershed Development Fund. Watershed Development Fund will also be strengthening through donations from the individual and institutions and the CBOs will be trained to run watershed as business model on sustainable basis. The tangible economic benefits along with empowerment and hand holding by PIA will empower the CBOs to develop and sustain the watershed activities after withdrawal of the PIA. Community organizations will withdraw the money from the WDF to maintain the asset created during the implementation phase. The consolidation phase will also include writing of project completion report, documentation of success stories, making films, leaflets, bulletins and the lessons learnt. The expenditure will be done as per the Common Guidelines for Watershed Development Projects 2008.

Chapter - 10

DESIGN AND ESTIMATES OF ACTIVITIES

11.1 Crop Demonstration and On Farm Testing

11.1.1 Demonstration

Demonstration on Integrated Crop Management												
1 Name of Crop	Wheat											
2 Area under each Demonstration	0.4 ha											
3 Total Area of Demonstration	5 ha											
4 Number of User Groups	13											
5 Situation	Irrigated											
A Thematic Area	Improved Varieties/High Yielding/Crop Cultural Practices											
S.No.	Details of Demonstration				Unit	Zaid	Kharif	Rabi	Rate/Unit/(Rs)	Per ha Amount	Amount/Demonstration	Remark
1.	Name of Varieties	UP-2338,WH-542,PBW-343,502,550,K-9006,307										
2.	Sowing Time	October Last Week										
3.	Required Seed	Seed Rate			Kg			10	20	2000	1000	By PIA
4.	Land Preparation	Two ploughing Tractor			hr	Rs 450/hr	2	2	450	900	450	By User
5.	Sowing Bullock/Seeddril					1 hr		1	450	450	225	By User
B	Thematic Area	Weed Management										
1.	Interculture Operation											
2.	Use Weedicide	Total	UPL	RS 1200/ha		One spray at 28-33 DAS			1200	1200	600	By PIA
C	Thematic Area	Integrated Plant Nutrient Management										

1	Use of FYM	30 tom/ha			6 trolly	600/trolly			6	600	3600	1800	By User
2	Use of Vermicompost	20 q/ha				150/q			20	150	3000	1500	By PIA
3	Use of NEDAP Compost					100/q			30	100	3000	1500	By PIA/UG
4	Bio Fertilizers/Bio-agents												
i)	Azatobactor + PSB	12 Pkt Azatobactor+12 Pkt PSB				Seed treatment			24	7	168	84	By PIA
ii)	Azatobactor + PSB	10 pkt + 10 pkt +10 q vermicompost					Bio-agent		20	7	140	70	By PIA
	Trichoderma	1 kg					Vermi		10	150	1500	750	By PIA
							Trichoderma		1	135	135	67.5	By PIA
5.	Reccomended dose of fertilizers												
	60:40:30 NPK												
i)	DAP	3 Bags	475 per bag						3	475	1425	712.5	By PIA
ii)	Urea	3 Bags	275 per bag						3	275	825	412.5	By PIA
iii)	M/P	2 Bags	350 per bag						2	350	700	350	By PIA
iv)	Two foliar Spray of 2% Urea	Cost included above											
D	Thematic Area	Integrated Pest Management											
1	Spray of Neem Seed Kernal	Two sprays							2	175	350	175	By Uger
2	Mataka Khad	15 lit/kg Gobar+Neemleaf+water+Desi cow urine+2 kg Molasis mix & Deco							2	80	160	80	By PIA
E	Thematic Area	Harvesting/Threshing											
1	Harvesting								1	1200	1200	600	By User
2	Threshing								1	2200	2200	1100	By User
F	Thematic Area	Storage											
1	Technology of Storage								1	550	550	275	By PIA

Total	Grand									23503	11751.5	
Total amount of 5 ha											146893.75	

Demonstration on Integrated Crop Management												
1 Name of Crop	Paddy											
2 Area under each Demonstration	0.5 ha											
3 Total Area of Demonstration	5 ha											
4 Number of User Groups	10											
5 Situation	Irrigated											
A Thematic Area	Improved Varieties/High Yielding/Crop Cultural Practices											
S.No.	Details of Demonstration				Unit	Zaid	Kharif	Rabi	Rate/Unit/(Rs)	Per ha Amount	Amount/Demonstration	Remark
1.	Name of Varieties	Ratna, Govind, Manhar, Pant Dhan 10, 4, 12, Sarju 52, Cented t-3, Pusa Basmati-1, Malviya Sugandh-105										
2.	Sowing Time	June Last Week										
3.	Required Seed	Seed Rate			Kg			35	40	1400	700	By PIA
4.	Land Preparation	Two ploughing	Tractor		hr	Rs 450/hr	2 hr	2	450	900	450	By User
5.	Sowing Bullock/Seeddril					1 hr		1	450	450	225	By User
B	Thematic Area	Weed Management										
1.	Interculture Operation											
2.	Use Weedicide	Total	UPL	RS 1200/ha		One spray at 28-33 DAS			1200	1200	600	By PIA
C	Thematic Area	Integrated Plant Nutrient Management										
1	Use of FYM	30 tom/ha		6 trolley	600/trolley			6	600	3600	1800	By User
2	Use of Vermicompost	20 q/ha			150/q			20	150	3000	1500	By PIA
3	Use of NEDAP Compost				100/q			30	100	3000	1500	By PIA/UG

4	Bio Fertilizers/Bio-agents												
i)	Azotobactor + PSB	12 Pkt Azotobactor+12 Pkt PSB			Seed treatment			24	7	168	84	By PIA	
ii)	Azotobactor + PSB	10 pkt + 10 pkt +10 q vermicompost				Bio-agent		20	7	140	70	By PIA	
	Trichoderma	1 kg				Vermi		10	150	1500	750	By PIA	
						Trichoderma		1	135	135	67.5	By PIA	
5.	Reccomended dose of fertilizers												
	120:60:60 NPK												
i)	DAP	3 Bags	475 per bag					3	475	1425	712.5	By PIA	
ii)	Urea	3 Bags	275 per bag					3	275	825	412.5	By PIA	
iii)	M/P	2 Bags	350 per bag					2	350	700	350	By PIA	
iv)	Two foliar Spray of 2% Urea	Cost included above											
D	Thematic Area	Integrated Pest Management											
1	Spray of Neem Seed Kernal	Two sprays						2	175	350	175	By Uger	
2	Mataka Khad	15 lit/kg Gobar+Neemleaf+water+Desi cow urine+2 kg Molasis mix & Deco						2	80	160	80	By PIA	
E	Thematic Area	Harvesting/Threshing											
1	Harvesting							1	1200	1200	600	By User	
2	Threshing							1	2200	2200	1100	By User	
F	Thematic Area	Storage											
1	Technology of Storage							1	550	550	275	By PIA	
	Grand Total									2290	11451.5		
	Total amount of 5 ha									3	114515		

Demonstration on Integrated Crop Management																		
1 Name of Crop	Hybrid Paddy																	
2 Area under each Demonstration	0.5 ha																	
3 Total Area of Demonstration	5 ha																	
4 Number of User Groups	10																	
5 Situation	Irrigated																	
A Thematic Area	Improved Varieties/High Yielding/Crop Cultural Practices																	
S.No. Details of Demonstration						Unit	Zaid	Kharif	Rabi	Rate/Unit/(Rs)	Per ha Amount	Amount/Demonstration	Remark					
1. Name of Varieties	JKRH-401, Pant Shankar Dhan-1, Narendra Shankar Dhan-2, PHB-71, Pro Agro-6444, Pusa RH-10, RH-204, DRRH-2																	
2. Sowing Time	June Last Week																	
3. Required Seed	Seed Rate					Kg		16		130	2080	1040	By PIA					
4. Land Preparation	Two ploughing Tractor					hr	Rs 450/hr		2	450	900	450	By User					
5. Sowing Bullock/Seeddril							1 hr		1	450	450	225	By User					
B Thematic Area	Weed Management																	
1. Interculture Operation																		
2. Use Weedicide	Total					UPL				RS 1200/ha		One spray at 28-33 DAS		1200	1200	600	By PIA	
C Thematic Area	Integrated Plant Nutrient Management																	
1. Use of FYM	30 tom/ha						6 trolly	600/trolly										By User
2. Use of Vermicompost	20 q/ha							150/q										By PIA
3. Use of NEDAP Compost								100/q										By PIA/UG

4	Bio Fertilizers/Bio-agents												
i)	Azotobactor + PSB	12 Pkt Azotobactor+12 Pkt PSB				Seed treatment		24	7	168	84	By PIA	
ii)	Azotobactor + PSB	10 pkt + 10 pkt +10 q vermicompost				Bio-agent		20	7	140	70	By PIA	
	Trichoderma	1 kg				Vermi		10	150	1500	750	By PIA	
						Trichoderma		1	135	135	67.5	By PIA	
5.	Reccomended dose of fertilizers												
	150:75:75 NPK												
i)	DAP	3.5 Bags	475 per bag					3.5	475	1662.5	831.25	By PIA	
ii)	Urea	3.5 Bags	275 per bag					3.5	275	962.5	481.25	By PIA	
iii)	M/P	2.5 Bags	350 per bag					2.5	350	875	437.5	By PIA	
iv)	Zinc Sulphate	25 kg/ha	50 per kg					25	50	1250			
D	Thematic Area	Integrated Pest Management											
1	Spray of Neem Seed Kernal	Two sprays						2	175	350	175	By Uger	
2	Mataka Khad	15 lit/kg Gobar+Neemleaf+water+Desi cow urine+2 kg Molasis mix & Deco						2	80	160	80	By PIA	
E	Thematic Area	Harvesting/Threshing											
1	Harvesting							1	1200	1200	600	By User	
2	Threshing							1	2200	2200	1100	By User	
F	Thematic Area	Storage											
1	Technology of Storage							1	550	550	275	By PIA	
	Grand Total									25383	12691.5		
	Total amount of 5 ha										126915		

Demonstration on Integrated Crop Management													
1 Name of Crop	Cabbage												
2 Area under each Demonstration	0.5 ha												
3 Total Area of Demonstration	5 ha												
4 Number of User Groups	10												
5 Situation	Irrigated												
A Thematic Area	Improved Varieties/High Yielding/Crop Cultural Practices												
S.No. Details of Demonstration					Unit	Zaid	Kha rif	Ra bi	Rate/ Unit/(Rs)	Per ha Amount	Amount/ Demonstration	Remark	
1. Name of Varieties	Early-Pride of India, Golden Acre, Early Drumhead Late - Late drumhead, Mukta, Pusa drumhead												
2. Sowing Time	October												
3. Required Seed	Seed Rate				Kg			0.5	14000	7000	3500	By PIA	
4. Land Preparation	Two ploughing Tractor				hr	Rs 450/hr 2 hr		2	450	900	450	By User	
5. Sowing Bullock/Seeddril						1 hr		1	450	450	225	By User	
B Thematic Area	Weed Management												
1. Interculture Operation													
2. Use Weedicide	Total	UPL				RS 1200/ha	One spray at 28-33 DAS		1200	1200	600	By PIA	
C Thematic Area	Integrated Plant Nutrient Management												
1 Use of FYM	30 tom/ha					6 trolly	600/trolly		6	600	3600	1800	By User
2 Use of Vermicompost	20 q/ha						150/q		20	150	3000	1500	By PIA
3 Use of NEDAP Compost							100/q		30	100	3000	1500	By PIA/UG

4	Bio Fertilizers/Bio-agents												
i)	Azotobactor + PSB	12 Pkt Azotobactor+12 Pkt PSB			Seed treatment			24	7	168	84	By PIA	
ii)	Azotobactor + PSB	10 pkt + 10 pkt +10 q vermicompost				Bio-agent		20	7	140	70	By PIA	
	Trichoderma	1 kg				Vermi		10	150	1500	750	By PIA	
						Trichoderma		1	135	135	67.5	By PIA	
5.	Reccomended dose of fertilizers												
	120:60:60 NPK												
i)	DAP	2.5 Bags	475 per bag					2.5	475	1187.5	593.75	By PIA	
ii)	Urea	2.5 Bags	275 per bag					2.5	275	687.5	343.75	By PIA	
iii)	M/P	2 Bags	350 per bag					2	350	700	350	By PIA	
D	Thematic Area	Integrated Pest Management											
1	Spray of Neem Seed Kernal	Two sprays						2	175	350	175	By Uger	
2	Mataka Khad	15 lit/kg Gobar+Neemleaf+water+Desi cow urine+2 kg Molasis mix & Deco						2	80	160	80	By PIA	
E	Thematic Area	Harvesting/Threshing											
1	Harvesting							1	1200	1200	600	By User	
2	Threshing							1	2200	2200	1100	By User	
F	Thematic Area	Storage											
1	Technology of Storage							1	550	550	275	By PIA	
Total	Grand									28128	14064		
Total amount of 5 ha											140640		

Demonstration on Integrated Crop Management													
1 Name of Crop	Gladiolus												
2 Area under each Demonstration	0.5 ha												
3 Total Area of Demonstration	5 ha												
4 Number of User Groups	10												
5 Situation	Irrigated												
A Thematic Area	Improved Varieties/High Yielding/Crop Cultural Practices												
S.No. Details of Demonstration						Unit	Zaid	Kharif	Rabi	Rate/Unit/(Rs)	Per ha Amount	Amount/Demonstration	Remark
1. Name of Varieties	Snow queen, Silviya, Gold, Oscar, Rose Spider												
2. Sowing Time	September to October												
3. Required Seed	Seed Rate					Kg			2000	1	2000	100000	By PIA
4. Land Preparation	Two ploughing Tractor					hr	Rs 450/hr		2	450	900	450	By User
5. Sowing Bullock/Seeddril							1 hr		1	450	450	225	By User
B Thematic Area	Weed Management												
1. Interculture Operation													
2. Use Weedicide	Total	UPL				RS 1200/ha	One spray at 28-33 DAS			1200	1200	600	By PIA
C Thematic Area	Integrated Plant Nutrient Management												
1 Use of FYM	30 tom/ha					6 trolly	600/trolly		6	600	3600	1800	By User
2 Use of Vermicompost	20 q/ha						150/q		20	150	3000	1500	By PIA
3 Use of NEDAP Compost							100/q		30	100	3000	1500	By PIA/U

															G	
4	Bio Fertilizers/Bio-agents															
i)	Azotobacter + PSB	12 Pkt Azotobacter+12 Pkt PSB				Seed treatment						24	7	168	84	By PIA
ii)	Azotobacter + PSB	10 pkt + 10 pkt +10 q vermicompost					Bio-agent					20	7	140	70	By PIA
	Trichoderma	1 kg					Vermi					10	150	1500	750	By PIA
							Trichoderma					1	135	135	67.5	By PIA
5.	Reccomended dose of fertilizers															
	200:400:200 NPK															
i)	DAP	17 Bags	475 per bag									17	475	8075	4037.5	By PIA
ii)	Urea	4 Bags	275 per bag									4	275	1100	550	By PIA
iii)	M/P	6 Bags	350 per bag									6	350	2100	1050	By PIA
D	Thematic Area	Integrated Pest Management														
1	Spray of Neem Seed Kernal	Two sprays										2	175	350	175	By Uger
2	Mataka Khad	15 lit/kg Gobar+Neemleaf+water+Desi cow urine+2 kg Molasis mix & Deco										2	80	160	80	By PIA
E	Thematic Area	Harvesting/Threshing														
1	Harvesting											1	1200	1200	600	By User
2	Threshing											1	2200	2200	1100	By User
F	Thematic Area	Storage														
1	Technology of Storage											1	550	550	275	By PIA
Grand Total	Total amount of 5 ha													229828	114914	
															1149140	

Demonstration on Integrated Crop Management													
1 Name of Crop	Barley												
2 Area under each Demonstration	0.5 ha												
3 Total Area of Demonstration	5 ha												
4 Number of User Groups	10												
5 Situation	Irrigated												
A Thematic Area	Improved Varieties/High Yielding/Crop Cultural Practices												
S.No. Details of Demonstration						Unit	Zaid	Kharif	Rabi	Rate/Unit/(Rs)	Per ha Amount	Amount/Demonstration	Remark
1. Name of Varieties	K-409,K-287, Ritambara, Praati, dwr-28, Rekha Late - Jyoti, Manjula, RsS-6, DL-88												
2. Sowing Time	Mid November												
3. Required Seed	Seed Rate					Kg			100	20	2000	1000	By PIA
4. Land Preparation	Two ploughing Tractor					hr	Rs 450/hr	2 hr	2	450	900	450	By User
5. Sowing Bullock/Seeddril							1 hr		1	450	450	225	By User
B Thematic Area	Weed Management												
1. Interculture Operation													
2. Use Weedicide	Total	UPL			RS 1200/ha		One spray at 28-33 DAS			1200	1200	600	By PIA
C Thematic Area	Integrated Plant Nutrient Management												
1. Use of FYM	30 tom/ha					6 trolley	600/trolley		6	600	3600	1800	By User
2. Use of Vermicompost	20 q/ha						150/q		20	150	3000	1500	By PIA
3. Use of NEDAP Compost							100/q		30	100	3000	1500	By PIA/U

												G
4	Bio Fertilizers/Bio-agents											
i)	Azotobactor + PSB	12 Pkt Azotobactor+12 Pkt PSB			Seed treatment			24	7	168	84	By PIA
ii)	Azotobactor + PSB	10 pkt + 10 pkt +10 q vermicompost				Bio-agent		20	7	140	70	By PIA
	Trichoderma	1 kg				Vermi		10	150	1500	750	By PIA
						Trichoderma		1	135	135	67.5	By PIA
5.	Recommened dose of fertilizers											
	60:40:30 NPK											
i)	DAP	3 Bags	475 per bag					3	475	1425	712.5	By PIA
ii)	Urea	3 Bags	275 per bag					3	275	825	412.5	By PIA
iii)	M/P	30 kg/ha	350 per bag					2	350	700	350	By PIA
D	Thematic Area	Integrated Pest Management										
1	Spray of Neem Seed Kernal	Two sprays						2	175	350	175	By Uger
2	Mataka Khad	15 lit/kg Gobar+Neemleaf+water+Desi cow urine+2 kg Molasis mix & Deco						2	80	160	80	By PIA
E	Thematic Area	Harvesting/Threshing										
1	Harvesting							1	1200	1200	600	By User
2	Threshing							1	2200	2200	1100	By User
F	Thematic Area	Storage										
1	Technology of Storage							1	550	550	275	By PIA
Grand Total	Total amount of 5 ha									23503	11751.5	
											117515	

Demonstration on Integrated Crop Management												
1 Name of Crop	Sugarcane											
2 Area under each Demonstration	0.5 ha											
3 Total Area of Demonstration	5 ha											
4 Number of User Groups	10											
5 Situation	Irrigated											
A Thematic Area	Improved Varieties/High Yielding/Crop Cultural Practices											
S.No. Details of Demonstration					Unit	Zaid	Kharif	Rabi	Rate/Unit/(Rs)	Per ha Amount	Amount/Demonstration	Remark
1. Name of Varieties	Early- CoJ-64,CoS-8436,88230,95255 Mid & Late- CoS-92263,91230,94257,UP-39											
2. Sowing Time	Sharad Kalin- September Last Week Basant Kalin- March											
3. Required Seed	Seed Rate (Rabi & Zaid both- 55 qtls (3 eyes sets)				Qtl			55	300	16500	8250	By PIA
4. Land Preparation	Two ploughing Tractor				hr	Rs 450/hr 2 hr		2	450	900	450	By User
5. Sowing Bullock/Seed drill						1 hr		1	450	450	225	By User
B Thematic Area	Weed Management											
1. Interculture Operation												
2. Use Weedicide	Total	UPL		RS 1200/ha		One spray at 28-33 DAS			1200	1200	600	By PIA
C Thematic Area	Integrated Plant Nutrient Management											
1 Use of FYM	30 tom/ha			6 trolley	600/trolley			6	600	3600	1800	By User
2 Use of Vermicompost	20 q/ha				150/q			20	150	3000	1500	By PIA
3 Use of NEDAP Compost					100/q			30	100	3000	1500	By PIA/U

												G
4	Bio Fertilizers/Bio-agents											
i)	Azatobactor + PSB	12 Pkt Azatobactor+12 Pkt PSB				Seed treatment		24	7	168	84	By PIA
ii)	Azatobactor + PSB	10 pkt + 10 pkt +10 q vermicompost				Bio-agent		20	7	140	70	By PIA
	Trichoderma	1 kg				Vermi		10	150	1500	750	By PIA
						Trichoderma		1	135	135	67.5	By PIA
5.	Reccomended dose of fertilizers											
	150:60:30 NPK											
i)	DAP	2.5 Bags	475 per bag					2.5	475	1187.5	593.75	By PIA
ii)	Urea	3 Bags	275 per bag					3	275	825	412.5	By PIA
iii)	M/P	1 bag	350 per bag					1	350	350	175	By PIA
iv)	Zinc Sulphate	25 kg/ha	50 per kg					25	50	1250		
D	Thematic Area	Integrated Pest Management										
1	Spray of Neem Seed Kernal	Two sprays						2	175	350	175	By Uger
2	Mataka Khad	15 lit/kg Gobar+Neemleaf+water+Desi cow urine+2 kg Molasis mix & Deco						2	80	160	80	By PIA
E	Thematic Area	Harvesting/Threshing										
1	Harvesting							1	1200	1200	600	By User
2	Threshing							1	2200	2200	1100	By User
F	Thematic Area	Storage										
1	Technology of Storage							1	550	550	275	By PIA
Total	Grand									3866.5	19332.75	
Total amount of 5 ha											193327.5	

Demonstration on Integrated Crop Management												
1 Name of Crop	Potato											
2 Area under each Demonstration	0.5 ha											
3 Total Area of Demonstration	5 ha											
4 Number of User Groups	10											
5 Situation	Irrigated											
A Thematic Area	Improved Varieties/High Yielding/Crop Cultural Practices											
S.No. Details of Demonstration					Unit	Zaid	Kharif	Rabi	Rate/Unit/(Rs)	Per ha Amount	Amount/Demonstration	Remark
1. Name of Varieties	Kufri Chandramukhi, Kufri Bahar, Kufri Badshah, Kufri Lalwia, Kufri Anand											
2. Sowing Time	March Last Week											
3. Required Seed	Seed Rate				Qtl			35		700	24500	By PIA
4. Land Preparation	Two ploughing Tractor				hr	Rs 450/hr 2 hr		2	450	900	450	By User
5. Sowing Bullock/Seeddril						1 hr		1	450	450	225	By User
B Thematic Area	Weed Management											
1. Interculture Operation												
2. Use Weedicide	Total	UPL		RS 1200/ha		One spray at 28-33 DAS			1200	1200	600	By PIA
C Thematic Area	Integrated Plant Nutrient Management											
1 Use of FYM	30 tom/ha			6 trolly	600/trolly			6	600	3600	1800	By User
2 Use of Vermicompost	20 q/ha				150/q			20	150	3000	1500	By PIA
3 Use of NEDAP Compost					100/q			30	100	3000	1500	By PIA/UG

4	Bio Fertilizers/Bio-agents												
i)	Azotobactor + PSB	12 Pkt Azotobactor+12 Pkt PSB			Seed treatment			24	7	168	84	By PIA	
ii)	Azotobactor + PSB	10 pkt + 10 pkt +10 q vermicompost				Bio-agent		20	7	140	70	By PIA	
	Trichoderma	1 kg				Vermi		10	150	1500	750	By PIA	
						Trichoderma		1	135	135	67.5	By PIA	
5.	Reccomended dose of fertilizers												
	180:80:100 NPK												
i)	DAP	3.5 Bags	475 per bag					3.5	475	1662.5	831.25	By PIA	
ii)	Urea	4.5 Bags	275 per bag					4.5	275	1237.5	618.75	By PIA	
iii)	M/P	3 Bags	350 per bag					3	350	1050	525	By PIA	
iv)	Zinc Sulphate	25 kg/ha	50 per kg					25	50	1250			
D	Thematic Area	Integrated Pest Management											
1	Spray of Neem Seed Kernal	Two sprays						2	175	350	175	By Uger	
2	Mataka Khad	15 lit/kg Gobar+Neemleaf+water+Desi cow urine+2 kg Molasis mix & Deco						2	80	160	80	By PIA	
E	Thematic Area	Harvesting/Threshing											
1	Harvesting							1	1200	1200	600	By User	
2	Threshing							1	2200	2200	1100	By User	
F	Thematic Area	Storage											
1	Technology of Storage							1	550	550	275	By PIA	
	Grand Total									24453	12226.5		
	Total amount of 5 ha										122265		

11.1.2 On Farm Testing

S. No	Name of Problem	Selected Enterprise
1.	Low yield of pulses and oilseed	ICM in pulses and oilseeds
2.	Low yield of wheat and durum wheat	ICM and early maturing and high yielding varieties of wheat and durum wheat
3.	Low income (Planned interculture crops not grown)	Interculture crops with different crops and aonla, and ber.
4.	Low yield of fish	Stocking of exotic fish
5.	Low milk production	Balance feeding and disease management
6.	Inbreeding in cow	Natural breed improvement
7.	Disease in goat and sheep	Vaccination

OFT – 01

1. Crop : Wheat
2. Problem identified : Low yield due to weed infestation
3. Title : Screening of effective weedicides
4. Farmers practice : No weedicides used
5. Details of technologies selected for assessment and refinement
6. Treatments : T₁ - Farmers Practice (: No weedicides)
: T₂ - Total
: T₃ - sulfosulfuron
7. Farming situation : irrigated
8. No. of farmers : 05
9. Initial input : weedicides
10. Observations : Yield (q/ha)

- 11. Area : C:B ratio
: 4000 Sq. Meter
- 12. Cost of input : Rs. 1200
- 13. Total cost : Rs. 6000

OFT – 02

- 1. Crop : Sugarcane
- 2. Problem identified : Low yield due to red rot
- 3. Title : Screening of effective fungicides
- 4. Farmers practice : No use of fungicides
- 5. Treatments : T₁- Farmers Practice (No Use)
: T₂ –Blitox-50
:T₃ –Fungi Hit
- 6. Farming situation : Irrigated
- 7. No. of farmers : 05
- 8. Initial input : Fungicides
- 9. Performance indicators Yield (q/ha)
C:B ratio
- 10. Area : 4000 Sq. Meter
- 11. Cost of input : Rs 1500 per location
- 12. Total cost : Rs. 7500

OFT – 03

- 1. Crop: : Lentil
- 2. Problem identified: : Low yield of Lentil (using local varieties)
- 3. Title: : Evaluation of high yielding varieties
- 4. Farmers practice : Use of local varieties

Treatment:	: T ₁ - Farmers practice (local variety)
	: T ₂ - DPL-62
	: T ₃ - DPL 54
5. Farming situation	: Irrigated
6. No. of farmers	: 05
7. Initial input	: Seed
8. Performance indicators	
	: Yield (q /ha)
	: C B Ratio
9. Area	: One Acre
10. Cost of input	: Rs. 2000
11. Total cost	: Rs. 10000

OFT – 4

1. Crop	: Linseed
2. Problem identified	: Mixed crop with chickpea and lentil (Low yield)
3. Title	: Screening of high yielding varieties
4. Farmers practices	: Sowing of mixed
5. Details of technologies selected for assessment and refinement	

Treatment	: T ₁ - Farmers Practice
	: T ₂ - Padmini
	: T ₃ - Parwati
6. Farming situation	: Irrigated
7. No. of farmers	: 05
8. Sources of Technology	: C. S. A. University of Ag., & Tech., Kanpur
9. Initial input	: Seed
10. Performance indicators	: 1) Yield (q/ha)

- 11. Area : 2) C B ratio
- 12. Cost of input : One acre per location
- 13. Total cost: : Rs. 1500
- 13. Total cost: : Rs. 7500

OFT – 5

- 1. Crop / Enterprises : Til
- 2. Problem identified : Low yield of sesamum
- 3. Title : Selection of high yielding varieties
- 4. Farming situation : Rainfed
- 5. Farmers practice : Local varieties
- 6. Details of technologies selected for assessment/refinement
 - Treatment : T₁ - Farmers Practice
 - : T₂ - Shekhar
 - : T₃ - Pragati
- 7. Sources of technology : C. S. A. University of Agric. & Tech., Kanpur
- 8. No. of farmers : 10
- 9. Critical input : Seed
- 10. Performance indicators :
 - : 1) Yield (q/ha)
 - : 2) C:B ratio
- 11. Area : One acre
- 12. Cost of input : Rs. 250
- 13. Total cost : Rs. 2500

OFT – 6

1. Crop / Enterprises : Arhar (Pigeon pea)
2. Problem Identified : Long duration crop with mixed with sorghum
3. Title : Introduction of short duration pigeon pea varieties
4. Farming situation : Rainfed
5. Farmers practice : Long duration varieties
6. Details of technologies selected for assessment/refinement
7. Treatment : T₁- Farmers Practice
: T₂- UPAS 150
: T₃- Narendra -1
8. No. of farmers : 05
9. Critical input : Seed
10. Performance indicators : Yield (q/ha)
: C.B. ratio
11. Area : One acre per location
12. Cost of input : Rs. 500
13. Total cost : Rs. 2500

OFT – 7

1. Crop / Enterprises : Maize
2. Problem Identified : Low yield
3. Title : Integrated Plant Nutrient Management
4. Farming situation : Irrigated
5. Farmers practice : Imbalance use of fertilizers

6. Details of technologies selected for assessment/refinement
7. Treatment : T₁- Farmers Practice (as above)
: T₂- 20 q/ha vermicompost + RDF
: T₃ 30 q/ha NADEP compost + RDF+ PSV
8. No. of farmers : 05
9. Critical input : Seed
10. Performance indicators : Yield (q/ha)
: C.B. ratio
11. Area : One acre per location
12. Cost of input : Rs. 2500
13. Total cost : Rs. 12500

OFT – 8

1. Crop / Enterprises : Hybrid Maize
2. Problem Identified : Use of desi varieties
3. Title : Introducing high yielding varieties
4. Farming situation : Irrigated
5. Farmers practice : Use of local varieties
6. Details of technologies selected for assessment/refinement
7. Treatment : T₁- Farmers Practice (local var.)
: T₂- Ganga -11
: T₃ - Shaktiman -1
8. No. of farmers : 05
9. Critical input : Seed
10. Performance indicators : Yield (q/ha)
: C.B. ratio

- 11. Area : One acre per location
- 12. Cost of input : Rs. 1000
- 13. Total cost : Rs. 5000

OFT – 9

- 1. Crop / Enterprises : Tomato
- 2. Problem Identified : Low yield due to Leaf curl disease
- 3. Title : Nursery raising in line on raised bed with net
- 4. Farming situation : Irrigated
- 5. Farmers practice : Broadcasting of seed in plots
- 6. Details of technologies selected for assessment/refinement
- 7. Treatment : T₁- Farmers Practice (as above)
: T₂- Raised nursery bed line sowing with net
: T₃ - Monocrotophos 2 ml/lit of water at 15 days interval
- 8. No. of farmers : 05
- 9. Critical input : Net and Insecticide
- 10. Performance indicators : Yield (q/ha)
: C.B. ratio
- 11. Area : One acre per location
- 12. Cost of input : Rs. 1000
- 13. Total cost : Rs. 5000

OFT – 10

- 1. Crop/Enterprises : Animal Husbandry

2. Problem identified : High mortality due to the endoparasites
3. Title : Effect of deworming practices on mortality in kids.
4. Details of technologies selected for assessment and refinement :
 - Treatment: : T₁- Farmers Practice (No Deworming)
 - : T₂-First deworming at 10 days deworming with cubazin
 - Second deworming at one month age with piperazine
 - Third deworming at two month age with Nelwarm
 - Fourth deworming at three month age with Zenil flue drench or Destrodin tab.
5. No. of kids : 05 herds (Each herds containing 10-15 kids)
6. Sources of Technology : IVRI, Bareilly
7. Initial input : Deworming
8. Production system and thematic area : Disease Management
9. Performance indicators : 1) Kid mortality
 - : 2) Body weight gain (at 3 and 6 month age)
 - : 3) Occurrence of other associated health problems, if any
 - : 4) C: B ratio
10. Cost of input : Rs. 1500
11. Total cost : Rs. 7500

OFT – 11

1. Crop : Sorghum
2. Problem identified : Low yield of sorghum
3. Title : Assessment of dual purpose sorghum varieties
4. Farmers practice : Local varieties
5. Details of technologies selected for assessment and refinement

Treatment	: T ₁ - Farmers practice (Local var.)
	: T ₂ - CSH 16 (hybrid)
	: T ₃ - Varsha (composite)
6. Farming situation	: Rainfed
7. No. of farmers	: 10
8. Sources of Technology	: C.S.A. University of Ag. And Tech. Knapur
9. Initial input	: Seed
10. No. of Farmers	: 10
11. Performance indicators	: 1) Yield
	: 2) Economic – Cost : Benefit Ratio
	: 3) Social – Acceptability
12. Cost of input	: Rs. 1200
13. Total cost	: Rs. 12000

OFT – 12

1. Crop	: Chickpea
2. Problem identified	: Pod borer infestation in gram
3. Title	: Effect of pod borer control measures on yield of gram.
4. Farmers practices	: No control measures
5. Details of technologies selected for assessment and refinement	

Treatment

	: T ₁ - Farmers practice (No control measures)
	: T ₂ - Spray of NPV @ 250 LE / ha at 50 DAS
	: T ₃ - Spray of Manocrotophos 36EC @ 1 lit /ha at 65 DAS
6. Farming situation	: Irrigated
7. No. of location	: 05

- 8. Sources of Technology : C. S. A. University of Ag. Tech., Kanpur
- 9. Initial input : NPV and Monocrotophos
- 10. Production system and thematic area : Integrated pest management
- 11. Area : 2500 sq. m per location
- 14. Performance indicators :2) Yield (q/ha)
: 3) C:B ratio
- 12. Cost of input : Rs. 1200
- 13. Total cost : Rs. 6000

OFT- 13

- 1. Crop : Wheat
- 2. Problem identified : Low Yield
- 3. Title : Assessment of wheat varieties in local condition
- 4. Farmers practices : Local varieties
- 5. Details of technologies selected for assessment and refinement
- 6. Treatment:
 - T₁ : Farmers practice (Local varieties)
 - T₂ : PBW 343
 - T₃ : Deva (K-9107)
- 7. Farming situation : Irrigated
- 8. No. of location : 05
- 9. Sources of Technology : CSA University, Kanpur
- 10. Initial input : Seed
- 11. Area : One acre
- 12. Performance indicators : Yield (q/ha)
C:B ratio

14. Cost of input : Rs 1500/ location

15. Total of cost : Rs. 7500

OFT- 14

1. Crop : Wheat

2. Problem identified : Low Yield due to imbalance use of fertilizers

3. Title : IPNM

4. Farmers practices : Imbalance use of Urea and DAP

5. Details of technologies selected for assessment and refinement

Treatment: T₁ : Farmers practice (Imbalance use of fertilizers)
T₂ : 20 q/ha vermicompost + RDF + Azotobactor + PSV
T₃ : 20 q/ha NADEP + RDF +Azotobactor + PSV

6. Farming situation : Irrigated

7. No. of location : 05

8. Sources of Technology : C. S. A. University of Ag. Tech., Kanpur

9. Initial input : Seed

10. Area : One acre / location

11. Performance indicators : Yield (q/ha)

C:B ratio

12. Cost of input : Rs 2500 / location

13. Total of cost : Rs. 12500

11. 2 Engineering Measures for Natural Resource Conservation

Suitability of any conservation measures depend upon slope, rainfall, soil type and depth, water holding capacity, location of impervious layer, agricultural practices, power/equipments used and economics. Following measures will be taken up to enhance the productivity on sustainable basis.

- Field / graded/ Compartmental bunds

It is proposed to intercept the runoff flowing down the slope to conserve moisture as well as reduce runoff.

- Earthen marginal/peripheral/submergence bund

- **Well recharge unit**

Open shallow dug wells are the only means of irrigation in the watershed. Therefore, well recharge unit is proposed in 10 wells of the watershed. Its estimated cost is Approximately Rs. 10000.00.

- **Agroforestry Systems**

Growing of crops in combination with woody perennial on same piece of land is called agroforestry and it is economically viable and way out to increase the permanent vegetal cover. The estimates for aonla, guava, lemon, bael, ber and silvi-pastoral systems are presented in Table 11.1 to 11.6.

Table 11.1.: Estimate for development of aonla based agroforestry systems (100 trees/ha)

S.N.	Work items	Cost/unit (Rs.)	Amount (Rs./ha)
1.	Digging of pits of 0.75x0.75x0.75 m ³	25.00	2500.00
2.	Average of cost of planting material	20.00	2000.00
3.	Carriage charges from nursery to the planting site	2.50	250.00
4.	Cost of planting+1 st watering	4.00/plant	400.00
5.	Cost of raising agricultural crops @ Rs. 15,000.00 ha ⁻¹ yr ⁻¹	15000.00	15000.00
6.	Miscellaneous	Lump sump	2000.00
		G. Total	22150.00

Table 11.2: Estimate for development of guava based agroforestry systems (100 trees/ha)

S.N.	Work items	Cost/unit (Rs.)	Amount (Rs./ha)
1.	Digging of pits of 0.75x0.75x0.75 m ³	25.00	2500.00
2.	An average of cost of planting material	15.00	1500.00
3.	Carriage charges from nursery to the planting site	2.50	250.00
4.	Cost of planting+1 st watering	4.00/plant	400.00
5.	Cost of raising agricultural crops @ Rs. 15,000.00 ha ⁻¹ yr ⁻¹	15000.00	15000.00
6.	Miscellaneous	Lump sump	2000.00
		G. Total	21650.00

Table 11.3: Estimate for development of lemon based agroforestry systems (150 trees/ha)

S.N.	Work items	Cost/unit (Rs.)	Amount (Rs./ha)
1.	Digging of pits of 0.75x0.75x0.75 m ³	25.00	3750.00
2.	Average of cost of planting material	7.00	1050.00
3.	Carriage charges from nursery to the planting site	2.50	375.00
4.	Cost of planting+1 st watering	4.00/plant	600.00
5.	Cost of raising agricultural crops @ Rs. 15,000.00 ha ⁻¹ yr ⁻¹	15000.00	15000.00
6.	Miscellaneous	Lump sump	2500.00
		G. Total	23275.00

Table 11.4: Estimate for development of bael based agroforestry systems (100 trees/ha)

S.N.	Work items	Cost/unit (Rs.)	Amount (Rs./ha)
1.	Digging of pits of 0.75x0.75x0.75 m ³	25.00	2500.00
2.	Average of cost of planting material	10.00	1000.00
3.	Carriage charges from nursery to the planting site	2.50	250.00
4.	Cost of planting+1 st watering	4.00/plant	400.00
5.	Cost of raising agricultural crops @ Rs. 15,000.00 ha ⁻¹ yr ⁻¹	15000.00	15000.00
6.	Miscellaneous	Lump sump	2000.00
		G. Total	21150.00

Table 11.5: Estimate for development of ber based agroforestry systems (150 trees/ha)

S.N.	Work items	Cost/unit (Rs.)	Amount (Rs./ha)
1.	Digging of pits of 0.75x0.75x0.75 m ³	25.00	3750.00
2.	Average of cost of planting material	10.00	1500.00
3.	Carriage charges from nursery to the planting site	2.50	375.00
4.	Cost of planting+1 st watering	4.00/plant	600.00
5.	Cost of raising agricultural crops @ Rs. 15,000.00 ha ⁻¹ yr ⁻¹	15000.00	15000.00
6.	Miscellaneous	Lump sump	2500.00
		G. Total	23725.00

Table 11.6: Estimate for development of silvopastoral systems (400 trees/ha)

S.N.	Work items	Cost/unit (Rs.)	Amount (Rs./ha)
1.	Digging of pits of 0.6x0.6x0.6 m ³	13.00	5200.00
2.	Average of cost of planting material	7.00	2800.00
3.	Carriage charges from nursery to the planting site	2.50	1000.00
4.	Cost of planting+1 st watering	3.00/plant	1200.00
5.	Cost of raising pasture @ Rs. 25,000.00 ha ⁻¹ yr ⁻¹ (About 38000 slips of different grasses will be required)	25000.00	25000.00
6.	Miscellaneous	Lump sump	3000.00
		G. Total	38200.00

Table 11.7: Details of peripheral/marginal/submergence bund under 3-5 per cent slope

Area under Treatment (ha)	Top width	Height	Bottom width	Cross Section (m ²)	Length (m)	Earthwork (cum)	Rate (Rs.)	Amount (Rs.)	Man days
	0.50	0.45	1.85	0.53	10160	3965.63	39.16	155293.88	1553
	0.50	0.25	1.25	0.22	3500	765.63	39.16	29981.88	300
	0.50	0.45	1.85	0.53	6780	2643.75	39.16	103529.25	1035
	0.50	0.50	2.00	0.63	8400	3875.00	39.16	151745.00	1517
	0.60	0.65	2.55	1.02	10300	7780.50	39.16	304684.38	3047
	0.60	0.60	2.40	0.90	11520	7650.00	39.16	299574.00	2996
	0.60	0.75	2.85	1.29	6100	5821.88	39.16	227984.63	2280
	0.45	0.55	2.10	0.70	5300	2734.88	39.16	107097.71	1071
	0.45	0.40	1.65	0.42	7860	2436.00	39.16	95393.76	954
	0.45	0.42	1.71	0.45	9210	3084.48	39.16	120788.24	1208
6945	0.50	0.48	1.94	0.59	10160	4392.00	39.16	171990.72	1720

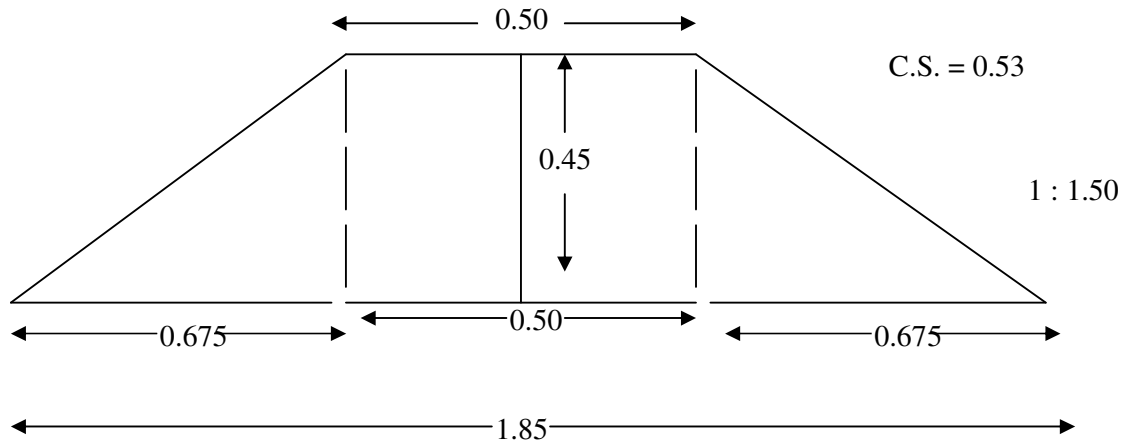


Fig. 1: Field Bunds: Cross Section – 0.53 (Not to Scale)

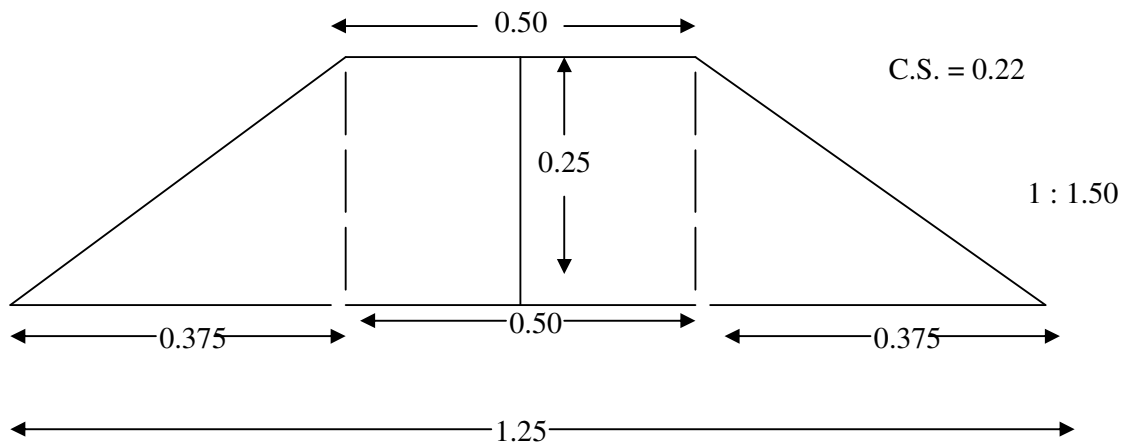


Fig. 2: Field Bunds: Cross Section – 0.22 (Not to Scale)

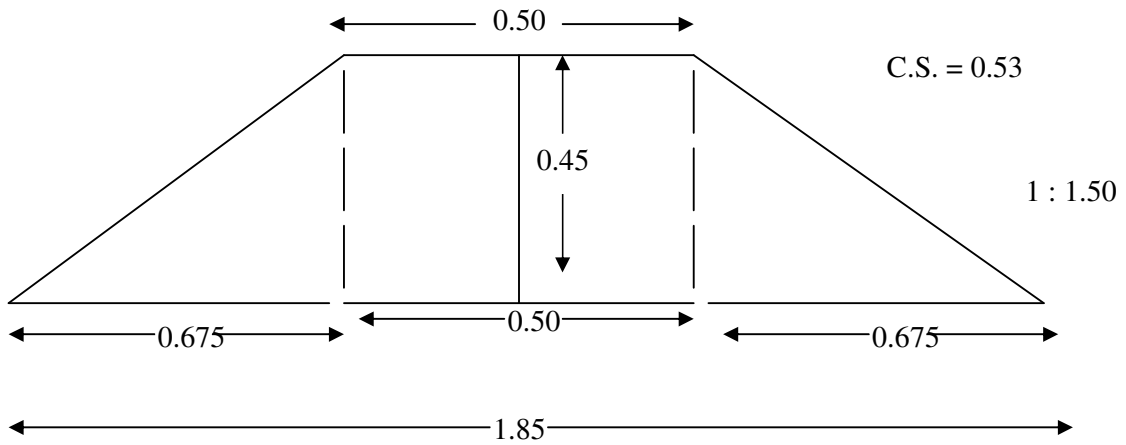


Fig. 3: Field Bunds: Cross Section – 0.53 (Not to Scale)

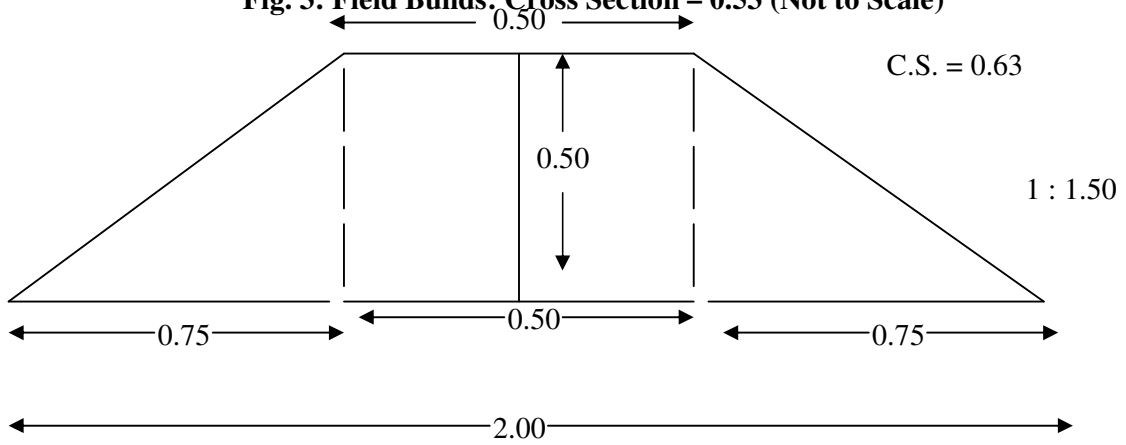


Fig.4: Field Bunds: Cross Section – 0.63 (Not to Scale)

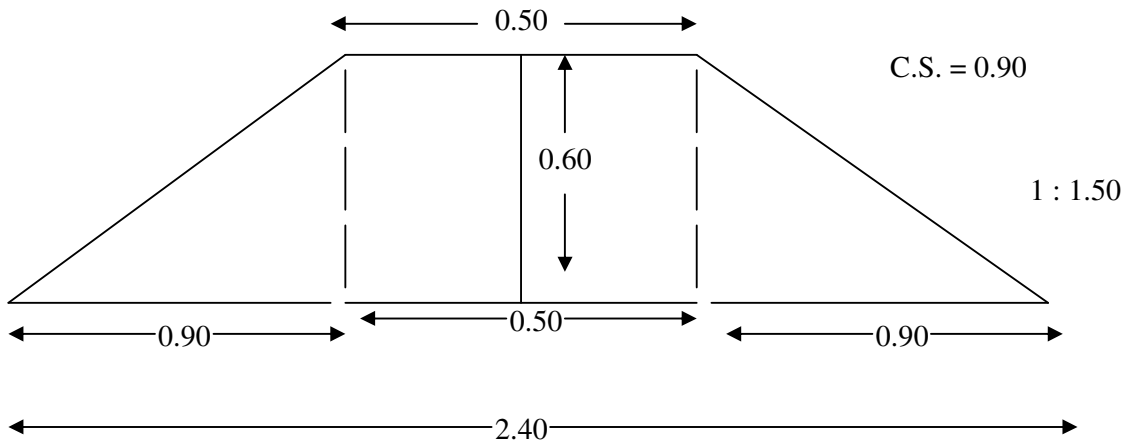


Fig.5: Field Bunds: Cross Section – 1.02 (Not to Scale)

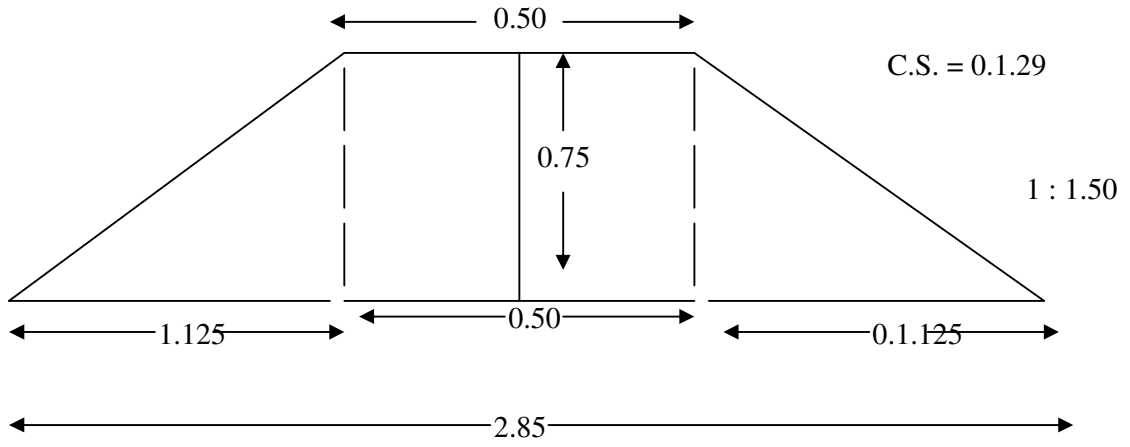


Fig. 6: Field Bunds: Cross Section – 0.90 (Not to Scale)

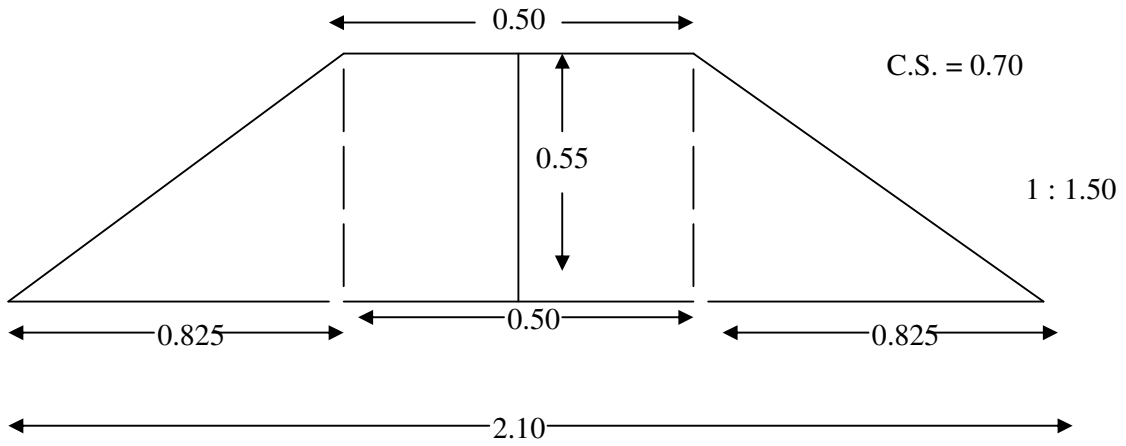


Fig. 7: Field Bunds: Cross Section – 1.29 (Not to Scale)

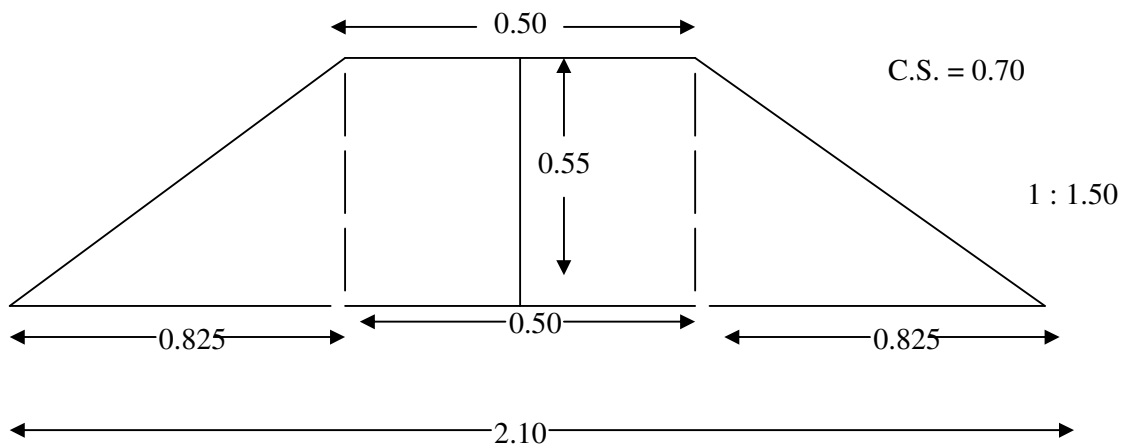


Fig. 8: Field Bunds: Cross Section – 0.70 (Not to Scale)

EXPECTED PROJECT OUTCOME

10.1 Employment Generation and Checking Migration

There had been very heavy migration from Western Uttar Pradesh region. It is as high as 39% against an average migration rate of 11%, in other regions of Uttar Pradesh towards northern part of the country, specially the states of Delhi, Punjab and Haryana, as agriculture labours, factory workers, rickshaw pullers etc. The major reason attributed to high rate of migration is continuous drought in the region and absence of any other alternate livelihood opportunity, in spite of several anti-poverty programmes.

Due to watershed management the cropping intensity will be increased by around 23 per cent, in turn acreage in agricultural activities will be increased by about 2500 ha. Therefore, an additional employment of about 125000 man days will be generated annually. Therefore, no migration in search of livelihoods is expected after implementation of watershed programme.

10.2 Other Expected Outcome*

The following tangible benefits are expected after implementation of the project:

- Runoff will be reduced by about 30 per cent, however soil and nutrient loss may be reduced up to 40 per cent from the watershed.
- Irrigation intensity may be increased to 50 per cent from present 15 per cent life saving irrigation.
- Surface water in nallah may be available for more than 10 months against 4-5 months at present.
- Average ground water recharge of about 4 m may be easily obtained after implementation of the programme
- Productivity of crops may be increased by about 20 per cent
- Significant saving of seeds may be obtained through crop demonstration with improved package of practices
- During implementation phase about 10000 mandays will be created through the soil and water conservation measures and crop/agroforestry interventions.
- The B C ratio of the projects varied in the range of 3.21 to 4.09.
- ***Above mentioned outcomes are based on the meta analysis of 636 watershed projects throughout the country done by ICRISAT, Hyderabad and practical experience of watershed management in Western Uttar Pradesh region.**

10.3 Questions to be answered

This project will answer the following questions:

1. Will the measures taken for water harvesting sufficient enough to recharge the perched water table?
2. Will the soil and water conservation practices be helpful in combating drought?
3. Will alternate land use such as agroforestry land use system result in self reliance/prosperity in drought prone areas?
4. Can the strategies based on watershed basis yield fruitful results?
5. Response of the villagers towards the project and their participation in sustaining developed resources after withdrawal of the project?
6. Will the formation of SHGs will help in savings and generation of self employment?
7. Will the watershed programmes improve the socio-economic conditions of the stake holders?
8. Will the watershed programme helps in capacity building of the stake holders for dissemination of various activities of watershed programme?
9. Will it sustain after project withdrawal?

10.4 Problems that could be solved as a results of this project/study

Following problems can be tackled in the proposed watershed:

1. Solving the problems of shortage of fuel, fodder, fruit and small timber requirement of villagers.
2. Creating water resources for ground water recharge availability of surface water for animal drinking and nistar purposes.
3. Increasing fertilizer consumption and improving NPK consumption ratio.
4. Optimizing crop productivity by putting more area under HYV and irrigation.
5. Increasing cropping intensity.
6. Promoting dairying through increased fodder availability.
7. Improving basic amenities and facilities like health, education, drinking water etc.
8. Increasing per capita income and thereby standard of living of farming community.
9. Increasing co-operative membership.
10. Increasing self employment.
11. Improving living standard of society.

Expected/Estimated outcome of IWMP-II (2010-11)

1	2	3	4	5
Sl. no.	Item	Unit	Pre project status	Post project status
1	Status of water table	Mt	10-11	8-10
2	Ground water Structures repaired/rejuvenated	No.	-	-
3	Quality of Drinking water	Quality	Hard + Soft	Soft
4	Availability of Drinking Water	months	10	12
5	Increase in irrigated area	%	35	45
Change in cropping/land use pattern		-	-	-
6	Area under Agriculture crop	-	-	-
	(i) Area under Single crop	Ha	715	307
	(ii) Area under Double crop	Ha	2518	2478
	(iii) Area under Multiple crop	Ha	95	315
	(iv) Cropping intensity	%	64%	81%
7	Increase in area under Vegetation (tree cover)	Ha	32	69
8	Increase in area under Horticulture	Ha	17	35
9	Area under fuel & Fodder	Ha	7	11
10	Increase in Milk Production	Litter par animal	4-5 Lt	7-8 Lt
11	No of SHGs	-	-	24
12	Increase in livelihood	Rs/cap/Annum	24500	35500
13	Migration	%	2	1
14	SHG federations formed		-	-
15	Credit linkage with Banks		-	29