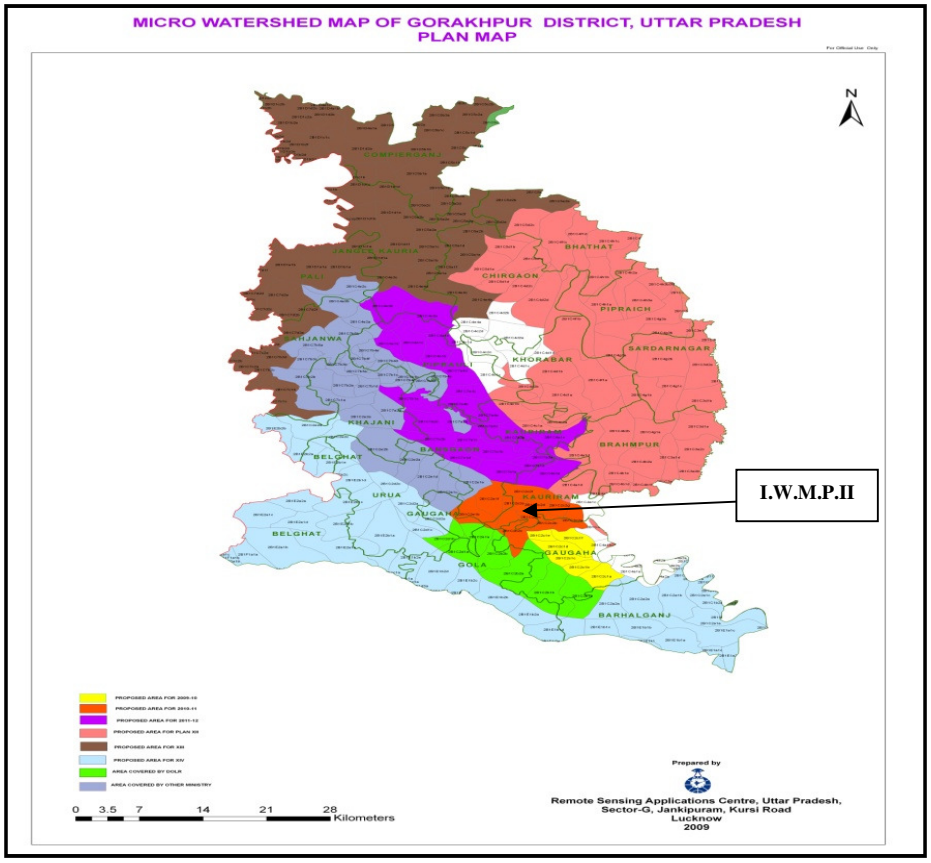
TABLE OF CONTENT

I.W.M.P.-II (2010-11) DISTRICT- GORAKHPUR (U.P.)

Name of the project	Weightage	No.of MWS	Geographical Area (ha)	Rainfed Area (ha)	Treatable area (ha)
I.W.M.P. - II (2010-11)	87.5	6	4483	4225	4100



PROJECT AT A GLANCE

1.	Name of Block	**Kaudiram & Gagaha**
2.	No. of Gram Panchayats	21
3.	Four reasons for selection of Watershed	i. Poverty index above 80% ii. Ground water status decrising iii. Area under rain-fed is more than 80% iv. Agriculture production is low
4.	Date of approval of watershed Development Plan by DRDA/DPC	19-10-2010
5.	Area proposed to be treated (ha.)	4100 ha
6.	Date of sanction of PPR & Date of release of Ist Instalment	10-03-2010 & 15-06-2010
7.	Project duration	2010-2011 to 2014-2015
8.	Project Cost (in lac.)	492.00
9.	Proposed mandays	209000

EXECUTIVE SUMMARY

BRIEF ABOUT AREA

Most of the Asian countries are rapidly coming to the recognition that land degradation is reaching serious proportions, causing damage to the national economy and lowering living standards. The consequences of inappropriate cultivation practices and other exploitative forms of land use are becoming manifest in the form of deep erosion gullies, bare and eroded grazing lands, over-clearing of vegetation, rising water tables, salinized soils and the movement and accumulation of sediment and erosion debris in streams and river channels.

The effects of land degradation are cumulative and far-reaching. Not only do they affect rural communities, but they also affect urban populations. Reduced agricultural productivity is often accompanied by an increase in the impact of water-related natural disasters which devastate rural and urban and communities alike.

Land degradation control is essential if future rural production is to be maintained and improved. Land restoration measures, involving soil erosion control, enhanced vegetative cover and water run-off management will help to preserve the remaining soil and vegetation resources and assist in mitigating the severity of natural disasters. However, much of the land degradation is already irreparable and no amount of effort can overcome the existing damage. Any productive soil which is already lost through erosion has already permanently left the system.

If land degradation is to be checked, there is a need for careful planning in the approach to the development and use of the land. Land and water are the two prime resources which are mainly responsible for the development of an area. If these are managed properly and judiciously, then sustainable development could be achieved in that particular area.

The Taraina watershed is located in the South-East of Gorakhpur district having micro-watershed code No. **2B1C2c2a, 2B1C2c2b, 2B1C2c2c, 2B1C2c2d, 2B1C2c2f, 2B1C2c2g**. It lies between 26^0 26'23' to 26^0 30'48'' Latitude and 83^0 23' 04'' to 83^0 28' 38'' Longitude. Its altitude ranges from 52 to 81 metre above the mean sea level (MSL). The total area of watershed is **4483** ha. This watershed has been identified by the state department under NWDPRA scheme by proper prioritization of different parameters for watershed selection criteria.

The Taraina watershed comprises of **99** villages namely Kothakhas, Udaipur, Piparpatti, Ahiraulikhurd, Tiplibanaras, Sisayal, Bhatpar, Jaiyapar, Bansipur, Basundiha, Nagwa, Masanpakar, Assanpakar, Pursauli, Guwar, Kutiyababu, Umtaha, Banakati, Viskarpur, Dimusa, Badihari, Paspurwa, Bhalwan, Jagarnathpur, Kandhabujurg, Kandhakhurd, Rampur, Jagdishpur, Kheswa, Manavkishunpur, Mehndarao, Banpurwa, Ekonabujurg, Mitanpur Bujurg, Salarpur, Chawariya khurd, Paresapar,Chawriya bujurg, Baidauli, Rajgarh, Adharipur, Harikhora, Nawadih, Ahiraoli, Dariya Bujurg, Gajari, Sauhradih, Dhamkapur, Dhausa, Bardiha, Dumuri, Bhawanpokhar, Mahuja, Mehandiya, Karhachak, Temha, Hatwa, Bansgagaha, Atkariya, Kauadil, Udiyanpur, Dhakwa, Raghunathpur, Mainseer, Borari, Karanrai, Tejpur, Rajpur, Baghmawa, Gajpur Ahtmali, Belwasahay, Ahiaulibujurg, Pakadi, Kohada, Bandhwa, Akusi, Rajnauli, Tekuwamadho, Tekuwadarji, Tekuachatur, Tekuabeer shah, Siyar Bujurg, Bela, Bishunpurwa, Siyarkhurd, Musaila, Parsadipur Urf Misrauli, Kanjarpar, Kopwa, Shiwrajpur, Khajuri, Padpurwa, Girdharpur Solanki, Kauaram Khurd, Kalechak, Piperdari, Pakari Dubey, Kanaicha, Dhaski, villages namely Kaudiram & Gagaha blocks of Gorakhpur district of Uttar Pradesh.

The watershed falls under the semi – arid region of Tropical climate. The average annual rain fall is 1393 mm. Most of the rainfall (about 85 %) is received during July to September rainfall is of moderate to high intensity. The Temperature ranges from as high as 46.6°c in the month of May – June to as low as 3.3°c in December - January.The climate of the region may be

divided into four seasons. The cold season from mid November to February is followed by the summer season from March to mid June. The period from mid June to the end of September is the south-west monsoon season and the October and the first half of November constitute the post-monsoon season.

The soils are mainly sandy, sandy loamy and clayey.

Agriculture is the main source of income of the farmers of the watershed. Kharif is the main crop in the study area Paddy, Arhar, Bajra and Maize are the main variety. The production of Paddy is 17.00q/ha which is very low due to delay in transplanting, weed infestation, poor seed & variety replacement rate. Decreasing factor productivity in rice wheat cropping system is a major challenge to accelerate the economy of farmer in the project area.

Natural vegetation of the watershed area is very poor due to agriculture dominancy. Occasionally Mango, Neem, Sheesham, ber tree are found in this area. There is no reserve pasture in the wasteland area. Due to Lack of the Irrigation water the rate of mortality of planted trees is very high. P.R.A. exercises conducted in the villages of watershed area revealed that inadequate irrigation facilities, low production of field crops.

It is expected that the implementation of different watershed management activities will bring down the run off and soil loss by 70% and 80% of their present level respectively. It is envisaged to increase the water and land utilization. The agricultural land will be treated with banding along with minor levelling. Waste land will be treated with the engineering measures like staggered trenches and a forestation etc.

INSTITUTIONAL ARRANGEMENT

The proposed watershed area has been identified by the state department under NWDPRA scheme by proper prioritization of different parameters for watershed selection criteria. The SLNA has nominated Bhoomi Sanrakshan Adhikari, Gorakhpur, as P.I.A for the afforesaid project. The area of watershed is proposed to be taken by Bhoomi Sanrakshan Adhikari, Department of land development & water resources, Gorakhpur, for integrated watershed management programme (IWMP) starting from the year 2010-11. The project will be completed in the year 2014-15.

SALIENT PROJECT ACTIVITIES

Watershed Development works including proposed engineering structures

Component	Physical		Financial	% of the bugdet
	Quantity in Mt./No.	Area in Ha	Total (Lakhs) Amount	
(A) (i)Construction of bunds (Field Bund,Contour Bund, Submergence Bund, Marginal Bund and Peripheral Bund)	1,66,100 mt	3135.00	99.900	50%
(B) (i)Construction and renovation of Water Harvesting Structure/ Bundhi ,Farm Pond	16 No.	500.00	50.000	
(ii) Drainage line treatment(Pucca structure/ Check Dam)	7 No.	-	28.000	
(C) Agroforestry & Horticululture (i) Rainfed horticulture with fencing	-	40.00	25.600	
(ii) Rainfed horticulture without fencing	-	400.00	40.000	
(iii) Afforestation & development of Silvi pastoral system	-	25.00	2.500	
Total		**4100.00**	**246.000**	**50%**

Livelihood Activities (community Based)

Component	Physical	Total (Lakhs) Amount	% of the bugdet
(a) Goat farming	15	49.200	10%
(b) Establishment of barmy compost	9		
(c) Nadaf compost	7		
(d) General merchant shop	8		
(e) Live stock development Activities	7		
(f)Poultry Farming	7		
Total	**53**	**49.200**	**10%**

YEAR WISE PHASING PHYSICAL & FINANCIAL ITEM WISE

S. No.	Item	1st Year (2010-11)		IInd Year (2011-12)		IIIrd Year (2012-13)		1Vth Year (2013-14)		Vth Year (2014-15)		Total	
		Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.
1	Administrative 10%	-	To meet out the administrative works/charges	9.840	As per column 4	13.284	As per column 4	13.284	As per column 4	12.792	As per column 4	49.200	-
2	Monitoring 1 %	-	Monitoring of the project	0.984	As per column 4	0.984	As per column 4	0.984	As per column 4	1.968	As per column 4	4.920	-
3	Evaluation 1 %	-	Evaluation of the project	1.476	As per column 4	0.984	As per column 4	0.984	As per column 4	1.476	As per column 4	4.920	-
4	Entry Point Activity 4%	19.680	Construction & Renovation of well, Krishak Vikas Munch, School boundary, old well , etc.	-	As per column 4	-	As per column 4	-	As per column 4	-	As per column 4	19.680	-
5	Institutional and Capacity building 5%	4.920	Training and exposure visit	9.840	As per column 4	3.690	As per column 4	3.690	As per column 4	2.407	As per column 4	24.600	-
6	D.P.R Preparation 1%	4.920	Preparation of DPR	-	As per column 4	-	As per column 4	-	As per column 4	-	As per column 4	4.920	-
7	Watershed Dev. Works 50%	-	Construction of Soil and water recharging structure, Agro forestry, horticulture etc	36.900	615.00	64.698	1078.00	64.698	1078.00	79.704	1329.00	246.000	4100.00
8	Livelihood & Income Generating 10%	-	Goat farming, Establishment of barmy compost, Nadaf compost, General merchant shop, Live stock development, Activities, Poultry Farming,	4.920	As per column 4	19.680	As per column 4	14.760	As per column 4	9.840	As per column 4	49.200	-
9	Production System development 13%	-	Farming system approach, animal husbandry, horticulture, vegetables growing, Silvi Pasture etc.	4.920	As per column 4	19.680	As per column 4	24.600	As per column 4	14.760	As per column 4	63.960	-
10	Consolidation Phase 5%	-	Consolidation activities	-	-	-	-	-	-	24.600	As per column 4	24.600	-
	Total	**29.520**		**68.880**	**615.00**	**123.000**	**1078.00**	**123.000**	**1078.00**	**147.600**	**1329.00**	**492.000**	**4100.00**

COMPONENT WISE BUDGET ALLOCATION OF THE IWMP-II OF GORAKHPUR

	Budget Component	Total (Lakhs)
A	**1.Administrative** **2. Monitoring** **3. Evaluation**	**49.20** **4.92** **4.92**
B	**Preparatory Phase** **1. Entry point activities** **2. Institution and capacity building** **3. Detailed Project Report(DPR)**	 **19.68** **24.6** **4.92**
C.	**WATERSHED WORKS PHASE** **1. Watershed development works,** **2. Livelihood activities for the asset less persons** **3. Production system and micro enterprises**	**246.00** **49.20** **63.96**
D.	**CONSOLIDATION PHASE**	**24.60**
	GRAND TOTAL	**492.00**

CONSERVATION AND WATER AND RESOURCE MANAGEMENT IN TARAINA WATERSHED, BLOCK – KAUDIRAM & GAGAHA, GORAKHPUR DISTRICT (UTTAR PRADESH)

TREATMENT AREA AND DETAILS

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

The main problem in a watershed is the soil erosion by rainfall. The run off water transport the sediments which may block the channel head, dam, reservoir and storage structures are the major problems faced in the project area and attempts made so far to overcome them. The other main problems in the selected watershed are : lack of awareness amongst the villagers about the deteriorating environmental condition of the area, 75% of the run off water makes it away to way towards Rapti and Ghaghra river through Taraina carrying fertile soil which has nutrients and this decreases soil fertility, there is a decline in the productivity of cereals, pulses and vegetable crops, dependency of farmers on the rain water. Therfore it is an urgent need, that rainwater should be harvested for crops and re-charged to improve the quality of the water.

WATERSHED WISE TREATMENT AREA

S. No.	Watershed Code	Total Area (ha)
1	2B1C2c2a	**1088.58**
2	2B1C2c2b	**561.23**
3	2B1C2c2c	**658.74**
4	2B1C2c2g	**616.65**
5	2B1C2c2d	**675.48**
6	2B1C2c2f	**882.32**
	Total	**4483.00**

FACE SHEET ABOUT BENCH MARK INDICATORS

Area Under Various LCC Classes

LCC class	Area ha
I	342.00
II	2490.00
III	1651.00
Total	**4483.00**

ACTION PLAN AT A GLANCE

The main points , involved in the preparation of detailed project report are: collection of data (spatial- non spatial) from gram panchayat and block lavel office have been done during field survey; Meetings were conducted between gram pradhan,and farmers of the project area ;Different groups for social mobilization like users group, Self help group, have been formed with the consultation of the members of watershed development team ; PRA exercises to be done for the detailed survey of the village assets have been done.

CHAPTER-1

INTRODUCTION & BACKGROUND

PROJECT BACKGROUND

The Indo-gangetic plains of U.P. have undergone stress for natural resources, which are witnessing degradation at an alarming rate. With the growing urge for decentralizing the practice of planning, it has become necessary to have a fresh look and scientific attitude for natural resources management. The watershed approach has conventionally aimed at treating degraded lands with the help of low cost and locality accessed technologies such as in-situ soil and moisture conservation measures, afforestation etc. and through a participatory approach that seeks to secure close involvement of the user communities. The broad objective was the promotion of the overall economic development and improvement of the socio-economic conditions of the resource poor sections of people inhabiting the programme areas. A comprehensive programme named Integrated Watershed Management Programme (IWMP-III) has been implemented under Common Guidelines on Watershed Development in 2008.

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

The Project area is a cluster of six (6) watersheds, with code No. **2B1C2c2a, 2B1C2c2b, 2B1C2c2c, 2B1C2c2d, 2B1C2c2f, 2B1C2c2g**, having area of 4483.00 ha is located in South East Part of Gorakhpur district of U.P. The area of watersheds is proposed to be taken up by Bhoomi Sanrakshan Adhikari, Department of land development & water resources

Gorakhpur for integrated watershed management programme (IWMP) starting from the year 20010-11. The project will be completed by 2014-15.

NEED AND SCOPE FOR WATERSHED DEVELOPMENT:

The main objectives are

(a) To control damage by run-off

(b) To manage and utilize run-off for useful purpose or soil conservation

(c)To increase infiltration of rain water

Main problem in watershed Area

The main problem in a watershed is the soil erosin by rainfall. The run off water transport the sediments which may block the channel head, dam, reservoir and storage structures are the major problems faced in the project area and attempts made so far to overcome them. Following are the main problem in the selected watershed.

(a) Lack of awareness amongst the villagers about the deteriorating environmental condition of the area.

(b) 75% of the run off water makes it away to way towards Rapti and Ghaghra through Taraina rivers carrying fertile soil with has nutrients and this decreases soil fertility, there is a decline in the productivity of cereals,pulses and vegetable crops.

(c) Due to over grazing, vegetative cover is declining on community land. There is no grasses and even shrub. Vegtation is vanishing, River carry a huge silt every year

(d) Due to continuous cutting of trees, overgrazing bushes and shrubs ecological balance of the area has been hardly distrubed.

(e) Due to increasing populasion pressure of man and animal there is camptition for collection of food, fodder and fuel resources.

(f) The ground water of the watershed area is smelly and oily hence irrigation is not possible by this ground water. Farmers depends on the rain water, which flows directly of Taraina river. Ther fore it is an urgent need, that rainwater should be harvested for crops and re-charged to improve the quality of the water.

WEIGHTAGE FOR SELECTION OF WATERSHED

Problem Identification and Prioritization:

Food sufficiency, economic growth and environmental security were identified as the major issues to be addressed in the watershed area. The area has flat topography hence highly prone to soil erosion. Lack of irrigation water is the greatest problem experienced by the people followed by low function of field crops, lack of fodder availability and low animal productivity.

.

Problems identified and prioritized during the transact walk and PRA exercises in all villages Kothakhas, Udaipur, Piparpatti, Ahiraulikhurd, Tiplibanaras, Sisayal, Bhatpar, Jaiyapar, Bansipur, Basundiha, Nagwa, Masanpakar, Assanpakar, Pursauli, Guwar, Kutiyababu, Umtaha, Banakati, Viskarpur, Dimusa, Badihari, Paspurwa, Bhalwan, Jagarnathpur, Kandhabujurg, Kandhakhurd, Rampur, Jagdishpur, Kheswa, Manavkishunpur, Mehndarao, Banpurwa, Ekonabujurg, Mitanpur Bujurg, Salarpur, Chawariya khurd, Paresapar,Chawriya bujurg, Baidauli, Rajgarh, Adharipur, Harikhora, Nawadih, Ahiraoli, Dariya Bujurg, Gajari, Sauhradih, Dhamkapur, Dhausa, Bardiha, Dumuri, Bhawanpokhar, Mahuja, Mehandiya, Karhachak, Temha, Hatwa, Bansgagaha, Atkariya, Kauadil, Udiyanpur, Dhakwa, Raghunathpur, Mainseer, Borari, Karanrai, Tejpur, Rajpur, Baghmawa, Gajpur Ahtmali, Belwasahay, Ahiaulibujurg, Pakadi, Kohada, Bandhwa, Akusi, Rajnauli, Tekuwamadho, Tekuwadarji, Tekuachatur, Tekuabeer shah, Siyar Bujurg, Bela, Bishunpurwa, Siyarkhurd, Musaila, Parsadipur Urf Misrauli,

Kanjarpar, Kopwa, Shiwrajpur, Khajuri, Padpurwa, Girdharpur Solanki, Kauaram Khurd, Kalechak, Piperdari, Pakari Dubey, Kanaicha, Dhaski,were pooled and a list of nine problems representing the whole watershed was prepared. Problems were ranked as per their total weightage in these villages.

PROBLEM IDENTIFICATION AND PRIORITIZATION FOR WATERSHED

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

STRENGTH, WEAKNESS, OPPORTUNITY AND THREAT (SWOT) ANALYSIS IS A USEFUL DECISION SUPPORT TOOL, A SWOT ANALYSIS OF THE WATERSHED IS PRESENTED IN TABLE

SWOT ANALYSIS OF THE WATERSHED

Strengths (S)	**Weakness (W)**
i. Cooperative work culture in traditional activities ii. Close ethic ties iii. Road at the top as well as outlet of the watershed iv. Hard working v. Resource pool of crop genetics diversity vi. Awareness of farmers about watershed management programme vii. Well established CPR maintaining and sharing system viii. Good productivity of soil ix. Social outlook of the community towards land less	i. Poor water management ii. Resource poor farmers iii. Out migration of youth iv. Low and erratic rainfall v. Fragile geography vi. Fragmented land holding vii. Heavy infestation of wild animals viii. Problem of fuel and fodder
Opportunities (O)	**Threats (T)**
i. Wide range of annual and perennial crops ii. Scope of regular employment opportunities to check out migration iii. Strengthening of existing irrigation system iv. Conducive climate for rainfed crop diversification v. Good scope for Agro forestry and dry land horticulture vi. Potential for collective action and management of CPR	i. Prone to adverse climate like Flood ii. High market risk iii. Social conflicts owing to PRI and WSM polices and local politics iv. Weak coordination among line departments v. Lack of expertise of implementing agency in different aspects of WSM

WEIGHTAGE OF THE PROJECT

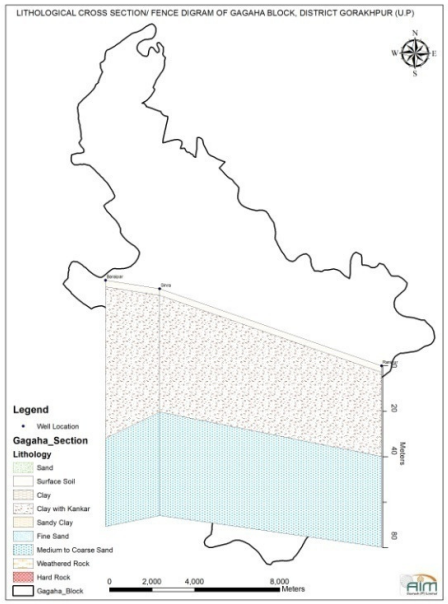
Project name	Project Type	Weightage												
IWMP Gorakhpur 2nd	IWMP	i	ii	iii	iv	v	vi	vii	viii	ix	x	xi	xii	xiii	xiv
		7.5	5	5	10	0	0	15	5	5	10	10	15	0	87.5

CRITERIA AND WEIGHTAGE FOR SELECTION OF WATERSHED

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

ix	Degraded land	15	High – above 20 % (15)	Medium – 10 to 20 % (10)	Low- less than 10 % of TGA (5)	
x	Productivity potential of the land	15	Lands with low production & where productivity can be significantly enhanced with reasonable efforts (15)	Lands with moderate production & where productivity can be enhanced with reasonable efforts (10)	Lands with high production & where productivity can be marginally enhanced with reasonable efforts (5)	
xi	Contiguity to another watershed that has already been developed/ treated	10	Contiguous to previously treated watershed & contiguity within the micro watersheds in the project (10)	Contiguity within the micro watersheds in the project but non contiguous to previously treated watershed (5)	Neither contiguous to previously treated watershed nor contiguity within the micro watersheds in the project (0)	
xii	Cluster approach in the plains (more than one contiguous micro-watersheds in the project)	15	Above 6 micro-watersheds in cluster (15)	4 to 6 micro watersheds in cluster (10)	2 to 4 micro watersheds in cluster (5)	
xiii	Cluster approach in the hills (more than one contiguous micro-watersheds in the project)	15	Above 5 micro-watersheds in cluster (15)	3 to 5 micro watersheds in cluster (10)	2 to 3 micro watersheds in cluster (5)	
	Total	**150**	**150**	**90**	**41**	**2.5**

Agriculture is the main source of income of the farmers of the watershed. Geological strata in the area vary between 22 and 80 meter. Depth to Ground Water in the area varies from 50 to 70 feet. Ground water in the area is sweet and fit for drinking.



Geological Strata

WATERSHED INFORMATION

Name Of the Project	No. of water sheds to be treated	Watershed Code	Watershed regime/type/order
IWMP 2nd Gorakhpur	6	**2B1C2c2a, 2B1C2c2b, 2B1C2c2c, 2B1C2c2d, 2B1C2c2f, 2B1C2c2g**	Micro Watershed

OTHER DEVELOPMENTAL PROJECTS/SCHEMES RUNNING IN THE VILLAGES.

These villages being very backward have been on top priority for a number of developmental projects. These programmes are Swarnajayanti Gram Swarojgar Yojana (SGSY) and Indira Awas Yojana (IAY). Integrated Watershed Management Programme in other areas of the district is under operation in the department of Agriculture. Gaugaha and gola blocks which come under Taraina watershed of the districts Gorakhpur were selected for I.W.D.P. program. This program was started in 2006-07 which is still going on. There were seven micro watersheds in Taraina watershed these are 2B1C2d1b, 2B1C2e1a, 2B1C2d1a, 2B1C2b2b, 2B1C2b2a, 2B1C2b1b, 2B1C2b1a.

Details of ongoing watershed/development programes are given as under:

Details on ongoing Development Programme

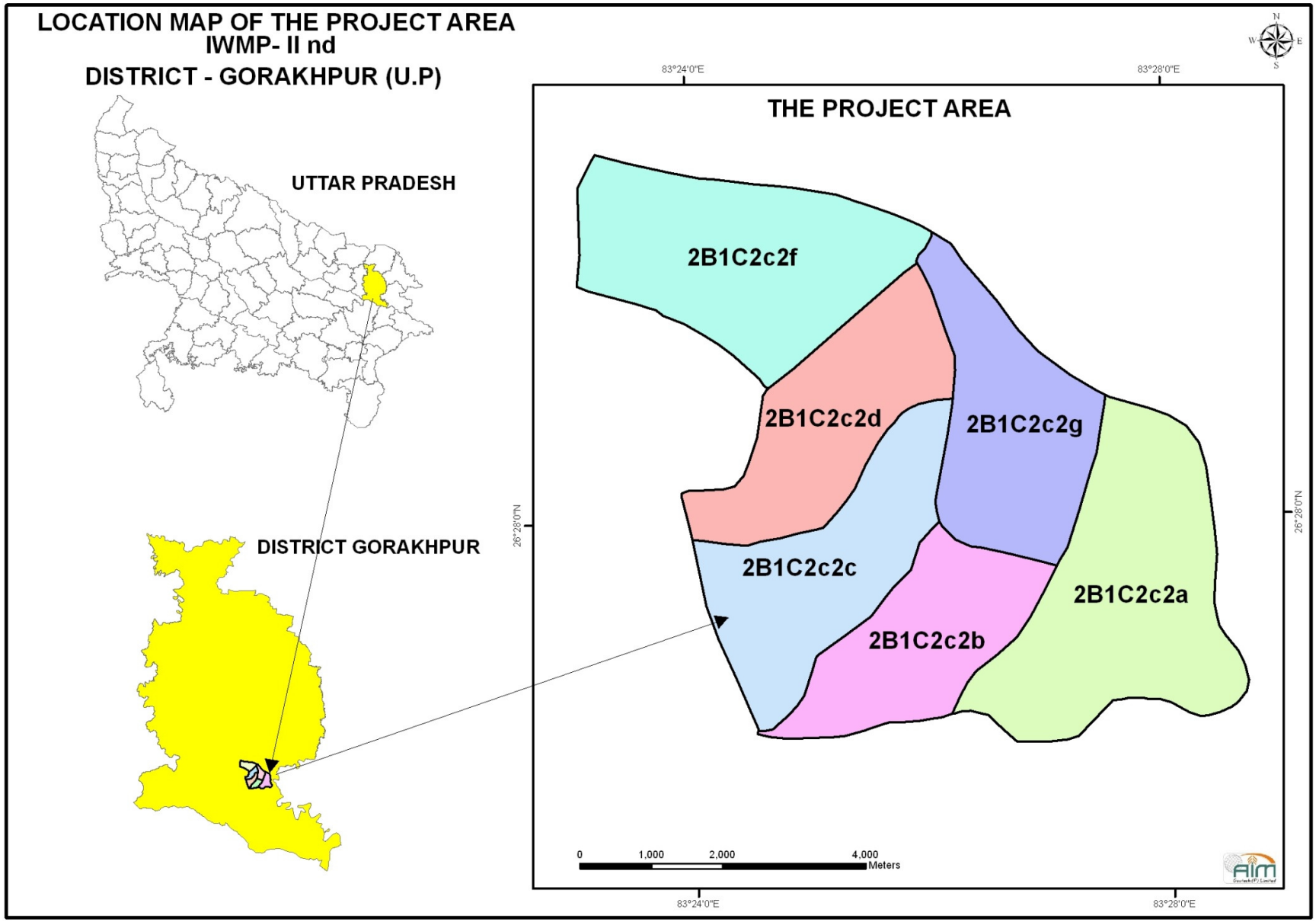
Sr. No.	Name of Programme	Impleme-nting agency	Objectives of the programme	Year of Commencement	Villages covered	Project Cost
1	Swarnajayanti Gram Swarojgar Yojana (SGSY)	DRDA	Farmulation of groups for weaker section of the BC/SC	On going	All the villages of the project area	-
2	Indira Awas Yojana (IAY)	DRDA	Provide low cast houses to the weaker section SC/ST	On going	All the villages of the project area	-
3	Integrated Watershed Devlopment Programme (IWDP)	B.S.A DOLR	To improvement of enviormental condition of the watershed	2006-07 to 2011-12	7 micro watershed	612.00 Lacs

Detail of Ongoing Watershed Programmes in the project area

Sr. No.	Name of Project	Year if Commencement	Villages covered	No. of Micro Watersheds	Watershed Code	Area under treatment	Funding Source	PIA	Status of completion
1	Integrated Watershed Devlopment Programme (IWDP)	2006-07-2011-12	142	7	2B1C2d1b 2B1C2e1a 2B1C2b2b 2B1C2d1a 2B1C2b2a 2B1C2b1b 2B1C2b1a	10200 ha.	DOLR	B.S.A DOLR Gorak-hpur	2011-2012
2	IWMP- I	2009-2010 to 2013- 2014	95	6	2B1C2c1a, 2B1C2c1b, 2B1C2c1c, 2B1C2c1d, 2B1C2c1e, 2B1C2c1f	3677 ha.	DOLR	B.S.A DOLR Gorak-hpur	2013-2014
3	IWMP- II	2010-2011 to 2014- 2015	112	6	2B1C2c2a, 2B1C2c2b, 2B1C2c2c, 2B1C2c2d, 2B1C2c2f, 2B1C2c2g	4100 ha	DOLR	B.S.A DOLR Gorak-hpur	2014-2015

CHAPTER – 2

GENERAL DESCRIPTION OF PROJECT AREA


LOCATION MAP OF THE PROJECT AREA
IWMP- II nd
DISTRICT - GORAKHPUR (U.P)
UTTAR PRADESH
DISTRICT GORAKHPUR
THE PROJECT AREA
2B1C2c2f
2B1C2c2d
2B1C2c2g
2B1C2c2c
2B1C2c2a
2B1C2c2b
83°24'0"E
83°28'0"E
26°28'0"N
0
1,000
2,000
4,000
Meters

LOCATION

The selected watershed, IWMP-III is located on Gorakhpur-Varanasi National Highway (NH-29) about 3-8 Km from the Taraina river, in Kaudiram, & Gagaha block of Gorakhpur district (U.P). The Block Kaudiram, & Gagaha is approximately 30-45 km away from district head quarter and the project area is situated with minimum distance of 5-15 km from Block head quarter as well as from about 5-15 km. from tahsil.

The project is a cluster of six (6) micro- watersheds with code No. **2B1C2c2a, 2B1C2c2b, 2B1C2c2c, 2B1C2c2d, 2B1C2c2f, 2B1C2c2g**, having an area of 4483 Ha, Out of which 4100 Ha, has been undertaken to be treated under Integrated Watershed Management Programme (IWMP) starting year 2010-2011. It falls in the South-Eastern part of Gorakhpur district of Uttar Pradesh. It is situated between 26^0 26'23'' to 26^0 30'48'' Latitude and 83^0 23' 04'' to 83^0 28' 38'' Longitude. There are 36 Gram panchayat and 99 revenue villages in the project.

AREA

GENERAL LANDUSE PATTERN OF THE PROJECT AREA

S. No	Name of District	No. of Micro-watershed	No. of Villages	Geographical Area	Rainfed Area	Land under agricultural use	Wasteland	
							Cultivable	Non- Cultivable
1	Gorakhpur	06	99	4483.00	4225.00	4100.00	1410.00	190.00

AGRO-CLIMATE CONDITIONS

The Agro-Climate Condition of the project area including the Agro-Climate Zone of the project I.W.M.P-III, Gorakhpur is briefly describe below.

DETAIL OF AGRO-CLIMATE CONDITIONS, I.W.M.P-II, GORAKHPUR

S. No.	Name of Project	Name of Agro-climate Zone covered	Area (Ha)	No. of the Villages	Major Soil Type (Ha)		Topography	Average Rainfall (mm)	Major crops	
					Type	Area (ha)			Name	Area (ha)
1	I.W.M.P-II, Gorakhpur	North Eastern Plain	4483.00	99	Sandy Loam	3840.00	Undulating	1220 mm	Paddy, Wheat	7010.00

PHYSIOGRAPHY

The project area is a part of ***Lower Rapti - Saryu deab,*** is a north central part of middle Ganga valley.. In this plain, rainfall during monsoon season accounts for about 90 per cent of the annual rainfall. There are also some low lying lands called Chaurs which remain submergd for considerable period of time. The river Ghaghara and Rapti carry huge quantity of silt during the floods and deposit the same in its bed owing to poor slope and this results in the tendency to meander and consequent inundation of vast area.The height above sea –level ranges from 81 meters in north-west to 52 meters in the south- east. The valleys of the larger rivers are not only depressed well below the general level of the country but are of considerable breadth. Thus there is a wide area of low land which is inundated in years of heavy rainfall. The study area is densely populated and most

parts of the land is available for cultivation. Most of the agricultural land is dependent on monsoon. The mineral products are few and unimportant. The minerals of commercial value are the nodular limestone conglomerate known as kankar.

The soil in the district is light sandy or dense clay of yellowish brown colour. The sand found in the rivers is medium to coarse grained, greyish white to brownish in colour and is suitable for construction purposes.

ELEVATION RANGE, LONGITUDE LATITUDE, RELIEF, HEIGHT DIFFERENCE ETC.

S. No.	Detail s of the watershed	Names of Villages	Name of the Micro-watershed	Location		Elevation of watershed from Mean Sea level		
				Latitude (N)	Longitude (E)	Highest in Meters	Lowest in Meters	Relief Height Difference
1	**2B1C2c2a**	Mehandiya, Karhachak, Temha, Paspurwa, Guwar, Hatwa and others	Basudeeha	26^0 26' 17" to 26^0 28' 53"	83^0 26'09" to 83^0 28' 38"	81	52	29
2	**2B1C2c2b**	Karhachak, Temha, Pursauli, Masanpakar, Akusi,and others	Demusa	26^0 26' 23" to 26^0 27' 57"	83^0 24'32" to 83^0 27' 02"	72	61	11
3	**2B1C2c2c**	Akusi, Kutiyababu, Siyar Bujurg, Bhalwan, Bela, and others	Manaw Kishunpur	26^0 26' 25" to 26^0 28' 54"	83^0 24'01" to 83^0 26' 05"	80	65	15
4	**2B1C2c2g**	Masanpakar, Sisayal, Bhatpar, Bhalwan, and others	Jagarnath pur	26^0 27' 37" to 26^0 30' 09"	83^0 25'55" to 83^0 27'29"	83	63	20
5	**2B1C2c2d**	Manavkishunpur, Shiwrajpur, Rampur, Kheswa, Kandhakhurd, and others	Rajgarh	26^0 27' 51" to 26^0 29' 55"	83^0 23'54" to 83^0 26'14"	79	63	16
6	**2B1C2c2f**	Chawriya bujurg, Paresapar, Rajgarh, Mahuja, Pakari Dubey, Bhawanpokhar, and others	Dhausa	26^0 28' 59" to 26^0 30' 48"	83^0 23'04" to 83^0 29' 06"	74	63	11

CLIMATE

The climate of the northern portions of the district is conditioned to some extent by the proxity of the hills in the north and the terai swamps. The year may be divided into four seasons. The cold season from mid November to February is followed by the summer season from March to mid June. The period from mid June to the end of September is the south-west monsoon season and the October and the first half of November constitute the post-monsoon season.

Climatic condition of last five years

S. No.	Year	Average Rainfall (mm)	Highest Rainfall intensity in a day (mm)	Temperature (C)		Relative humidity %
			Max.	Min.	Max.	Min.
1	2006 - 2007	1280	-	3.0	42.2	93
2	2007 - 2008	1393	-	3.5	42.4	96
3	2008 -2009	1291	-	4.2	43.3	90
4	2009-2010	1172	-	3.8	42.6	94
5	2010-2011	1200	-	3.7	41.2	89

RAINFALL

The south-west monsoon usually arrives over the project area by about the middle of June and withdraws by the end of September. The average rainfall of the project area is 1220 mm. About 87 percent of the annual rainfall is recorded during the period June to September, July being the rainiest. The monsoon in the district generally advances from the south-west to the north-east. There is no large variation in the rainfall from year to year. In the 50 years period from 1901 to 1950 the heaviest

annual rainfall which was 130 per cent of the normal was recorded in 1936, while the lowest annual rainfall was in 1907 when it amounted to 54 percent of the normal. In the same 50 year period, there were 14 years when the annual rainfall was less than 80 per cent of the normal. Two consecutive years of rainfall less than 80 percent of the normal occurred twice and three and four consecutive years of such low rainfall occurred only once each.

On an average there are 55 rainy days (i.e. days with rain 2.5 mm. or more) in a year, the variation in different parts of the district is not much.

TEMPERATURE

The district has meteorological observatories at Gorakhpur. The data of Gorakhpur observatory may be taken as representative of the meteorological conditions in the district. From mid November there is a rapid fall in temperature. January is the coldest month with the mean daily maximum temperature at 22.8º C and the mean daily minimum temperature at 9.3º C. In association with cold waves in the wake of the western disturbances passing eastwards in the winter season, temperature tends to go down to a degree or two above the freezing point. Day temperature begins to rise rapidly after February. May is the hottest with mean daily maximum temperature at 38.4 C and the mean daily minimum at 25.1º C. With the advent of the monsoon by about the middle of June there is appreciable drop in the day temperature, however, the nights continue to be warm. In September there is a slight increase again in the day temperature but the night temperature decreases after September. With the withdrawal of monsoon by the beginning of October it decreases progressively.

HUMIDITY

During the monsoon and the post monsoon seasons the relative humidity are high ranging between 70 and 85 per cent. In the winter months humidity decreases and in summer the air is comparatively drier.

WIND VELOCITY

The Wind velocity of the Project area ranges from 4-10 Km/hr.

WATERSHED CHARACTERISTICS

SHAPE AND SIZE

All the six watersheds (IWMP – II, Gorakhpur) of the project area have more or less rectangle in shape. The direction of the slope in the project area is north- west to south east.

The maximum length and width of IWMP - II watershed, are 11673 m and 5971 m, respectively with the length: width ratio 1.95/1

SHAPE AND SIZE OF WATERSHED

S. N.	Micro watershed Code	Name of the Micro-watershed	Shape	Approximate size in meter		Ratio Length: width
				Length	Width	
1	**2B1C2c2a**	Basudiha	Rectangle	4869	3128	1.55:1
2	**2B1C2c2b**	Demusa	Rectangle	3517	1847	1.90:1

3	**2B1C2c2c**	Manaw KIshunpur	Rectangle	4093	2286	1.79:1
4	**2B1C2c2g**	Jagarnath pur	Rectangle	4156	2690	1.54:1
5	**2B1C2c2d**	Rajgarh	Rectangle	4451	2337	1.90:1
6	**2B1C2c2f**	Dhausa	Rectangle	4377	2458	1.78:1

GEOMORPHOLOGY

The area lies in the south-east of the District- Gorakhpur of Taraina Basin. The soil is mainly sandy loam soil which is easily transportable after detaching causing soil erosion by water erosion and wind erosion.

Details of soil erosion in the project area

1	2	3	4	5
Cause	Type of erosion	Area affected (ha)	Run off (mm/ year)	Average soil loss (Tonnes/ ha/ year)
Water erosion				
a	Sheet	3360	800	16.50
b	Rill	1210		
c	Gully	105		
Wind erosion		NA	-	-
Sub-Total		4675	800	16.50

SOILS

In the watershed area mainly four typos of soil named sandy, loam, Clay, clay loam, which are the main soil type of the region. Main crops are Wheat, Paddy which need more Nitrogen, Zinc & phosphorous. Therefore deficiency of Zinc occurs in this area.

DRAINAGE

Due to moderate to gentle slopes and presence of a number of drainage lines, drainage is adequate. The watershed forms part of the Taraina river.

CHAPTER-3

BASELINE SURVEY

A detailed baseline survey of the project area was conducted to the study major socioeconomic and biophysical constraints to sustainable crop production. The following information were collected:

SOCIO-ECONOMIC ANALYSIS OF THE PROJECT

In the proposed watershed management plan of watershed, proper blending of bio engineering measures will be applied on 50 % of the total watershed area. Based on the results of studies conducted in this region, it is estimated that more than 50 % of the watershed area will be treated and consequently the soil loss and runoff from the area is expected to be reduced by 70 % and 65 % respectively. The proposed land use plan will improve the land utilization index and crop diversification index significantly as compared to the existing one. It will help in maintaining ecosystem integrity on sustained basis along with improving the livelihood security of the farming community.

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

HUMAN POPULATION

The total population of villages of the watershed is 50096 out of which 25647 are males and 24449 are females with average family size of 7 persons and total no. of household are 8733.

DEMOGRAPHIC INFORMATION

NAME OF VILLAGES	VILLAGE CENSUS CODE	TOTAL HOUSE HOLDS	TOTAL POPULATION	POPULATION MALE'S	POPULATIONS FEMALE	TOTAL POPULATION S.C.	POPULATIONS MALE'S S. C.	POPUL-ATIONS FEMALES S.C.
Mehadiya	07960900	9	45	23	22	15	8	7
Karha chak	07962000	5	25	13	12	3	2	1
Temha	79614	12	46	24	22	12	6	6
Pachpurwa	79611	32	151	78	73	50	26	24
Gooar	79613	5	27	14	13	8	4	4
Hatwa	07962200	2	12	6	6	-	-	-
Basgagha	07961000	7	48	25	23	-	-	-
Atakaria	07959800	6	32	16	15	8	4	4
Kauwadil	07966900	120	602	304	296	150	78	72
odiyanpur	07966700	65	330	170	160	90	46	44
Dhakwa	07966800	78	380	192	188	125	70	55
Raghunathpur	07966500	60	310	160	150	80	40	40
Manseer	07960200	4	22	11	11	3	2	1
Karanray	07960300	62	312	160	152	90	49	41
Tejpur	07959600	102	558	290	132	92	48	44
Rajpur	07959700	70	384	200	184	102	58	44
Pursauli	07959500	132	726	370	356	122	68	54
Badhmawa	07961200	12	72	40	32	20	12	8
Gajpur Ahetmali	07948600	55	304	152	152	90	48	42
Belwa sahay	07948700	27	151	80	71	42	25	17

Ahirauli Buzurg	07948400	42	238	124	144	75	40	35
Piper Patti	07948200	9	46	24	22	14	8	6
Uday Pur	07948100	85	510	260	250	120	62	58
Tikuli Banaras	07948500	112	604	310	294	140	75	65
Khoptha khas	07947700	160	830	425	405	198	102	96
Ahirauli Khurd	07948300	12	64	34	30	16	9	7
Pakari	07948800	11	56	30	26	18	10	8
Asan Pakar	07950200	255	1300	660	640	325	170	155
Masan Pakar	07950100	213	1198	610	588	322	168	154
Basudiha	07949900	160	868	440	428	202	104	98
Kohara	07947100	44	264	140	124	80	44	36
Bandhwa	07947000	24	122	68	54	40	22	18
Basipar	07946900	65	352	182	170	102	55	47
Jayapar	07949700	42	218	112	106	68	46	32
Sisayal	07949400	182	930	470	460	298	155	143
Bhatpar	07949500	62	316	162	154	102	54	48
Akusi	07963700	119	670	340	330	210	112	98
Balihari	07961700	132	752	380	372	262	134	128
Rajnauli Buzurg	07963800	4	20	11	9	-	-	-
Tekua Madhaw	07963600	30	90	48	42	22	12	10
Tekua Darji	07963500	2	12	7	5	-	-	-
Tekua Chatur	07961800	80	434	220	214	122	64	58
Biskar pur	07961500	44	246	128	118	72	38	34
Umtaha	07959300	52	288	146	142	65	34	31
Tekua Birshah	07961900	62	372	190	182	122	68	54

Demusa	07961600	119	645	330	315	201	104	97
Kotia Babu	07959200	174	888	452	436	260	138	122
Siyar Buzurg	07956400	55	296	149	147	80	46	34
Bankati	07959400	24	129	68	61	32	18	14
Jagdishpur	07949300	706	3813	1922	1891	1255	630	625
Bhaluwal	07949200	361	2058	1038	1020	670	340	330
Bela	07957600	68	353	180	173	110	57	53
Mehanraw	07956500	92	469	238	231	134	70	64
Banpurwa	07956600	124	698	354	344	222	116	106
Bisunpurwa	07956700	64	180	169	116	64	62	46
Siyar Khurd	07956300	53	312	160	152	92	50	42
Musaila	07955900	48	249	130	119	78	40	38
Parsadipur urf Misrauli	07956000	44	237	124	113	72	38	34
Kanjarpal	07955400	4	22	13	9	-	-	-
Kopwa	07957100	60	180	98	82	72	38	34
Nawadih	07957200	28	145	75	70	40	22	18
Ekauna Buzurg	07959100	72	381	194	187	121	65	56
Manaw Kishunpur	07956200	226	1202	622	580	424	222	202
Shivrajpur	07956100	140	780	398	382	272	140	132
Rampur	07949100	157	882	452	430	298	154	144
Khesua	07951500	189	1023	522	501	332	171	161
Kaidaha Khurd	07951600	165	894	452	442	302	152	150
Khajuri	07956800	56	291	150	141	88	47	39
Nagwa	07950000	102	555	280	275	240	124	116

Padpurwa	07946200	172	929	470	459	312	160	152
Jagarnathpur	07951100	224	1240	635	605	411	212	199
Girdharpur Solanki	07945900	56	291	150	141	88	47	39
Kauwa Ram Khurd	07945800	180	972	490	482	352	180	172
Chawaria Buzurg	07950400	78	413	210	203	152	80	72
Adharipur	07954500	106	551	280	271	170	90	80
Kalechak	07955100	10	52	28	24	-	-	-
Piperdadi	07955200	40	212	110	102	30	18	12
Harikhoda	07954600	86	464	240	224	122	64	58
Salarpur	07949000	122	683	348	335	240	122	118
Mitanpur Buzurg	07948900	118	637	326	311	230	118	112
Rajgarh	07951300	190	1102	556	546	322	164	158
Kaidha Buzurg	07951400	78	436	222	214	132	70	62
Berauli	07951200	56	291	150	141	82	44	38
Chawaria Khurd	0795100	451	2438	1230	1208	622	324	298
Paresa par	07950900	102	540	275	235	128	68	60
Mahuja	07954000	142	795	402	393	270	140	130
Pakadi Dubey	07954000	16	80	42	38	-	-	-
Bhawan Pokhar	07953900	60	336	170	166	90	48	42
Dumari	07962100	102	550	280	270	172	90	82
Ahirauli	07950800	174	976	492	484	320	165	155
Kanaicha	07932600	38	205	106	99	52	30	22
Sohra Dih	07953400	173	978	493	485	320	165	155
Bardiha	07953700	157	882	452	430	298	154	144

Gajari	07953300	123	685	343	332	241	123	118
Dhamka pur	07953500	38	205	106	99	52	30	22
Dadiya Buzurg	07953200	78	452	230	222	162	84	78
Dhaski	07953000	22	102	54	48	20	12	8
Dhuasa	07953600	108	626	318	308	204	106	98
GRAND TOTAL		**8733**	**50096**	**25647**	**24449**	**14866**	**7864**	**7262**

MIGRATION STATUS

Labour migration in search of gainful employment is one of the major problems in the remote watershed in particular. People migrate during summer season to different parts of the state as daily wagers, agricultural labours and construction workers. The detail is given below.

MIGRATION STATUS (I.W.M.P-II) GORAKHPUR

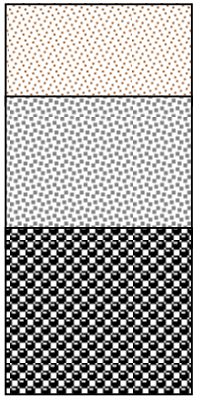
S.No.	No. of the villages	No. of persons migrating	No. of days per year of migration	Main reason for migration	Expected reduction in no. of persons migrating
1	101	1690	180	Due to Unemployment in village and high wages in city	970

SOIL AND LAND CAPABILITY CLASSIFICATION:

Soil Morphology: The study area is situated in the South-East of District-Gorakhpur. The entire watershed is topographically divided into three major land forms. Accordingly, the soils of watershed have been grouped in the three major categories.

1- Plain land
2- Moderate sloppy land
3- Strong

Soil Profile: A Representative Soil Profile



1-1.5 (Heavy texture clay-soil yellowish Brown in color)

5 -8m (Locally called "Clay")

7 –8 m(Sandy Clay)

Morphology of Typical Solid Profile of Watershed

Horizon	Depth(Cm)	Morphology
A	0-150	Yellowish brown in colour, clay content > 80%, soft and easily erodible when moist, hard when dry, high elasticity, Cracks occur when dried.
B	150-800	whitish brown in colour, very hard when dry, clay content > 60%
C	>800	(Black and sandy)

SOIL CHARACTERISTICS AND FERTILITY STATUS

Four types of soils are in the watershed area. The fertility status is about normal range due to production of major pulses crops. There is scarcity of phosphorus due to continuous growing of pulses. The four soil samples of each village, three for nutrients analysis and one for sulphur and micro nutrients analysis have been send to laboratory. After receiving the analysis report effort will be made to motivate the farmers to use nutrients and micronutrients according to the any analysis report. For this demonstration of crop in Kharif and Rabi both seasons have been proposed under agriculture production activity.

LAND CAPABILITY CLASSIFICATION (LCC)

Land capability classification is an interpretative grouping of lands made to show their relative suitabilities for various crops, pasture, forestry and wildlife and recreation. The inherent characteristics, limitations and risk of damage to the soils and also their response to manage-ment are taken into consideration for classifying them under various land capability classes.

Land capability class is the broadest category in the land capability classification system. Class codes I, II, III, IV, V, VI, VII, and VIII are used to represent arable and non-arable land as defined below.

Class I lands have slight limitations that restrict their use.

Class II lands have moderate limitations that reduce the choice of plants or require Land capability classification is an interpretative grouping of lands made to show their relative suitabilities for various crops, pasture, forestry and wildlife and recreation. The inherent characteristics, limitations and risk of damage to the soils and also their response to management are taken into consideration for classifying them under various land capability classes.

Land capability class is the broadest category in the land capability classification system. Class codes I, II, III, IV, V, VI, VII, and VIII are used to represent arable and non-arable land as defined below.

Class I lands have slight limitations that restrict their use.

Class II lands have moderate limitations that reduce the choice of plants or require moderate conservation practices

Class III lands have severe limitations that reduce the choice of plants or require special conservation practices, or both.

Class IV lands have very severe limitations that restrict the choice of plants or require very careful management, or both.

Classes V to VII cover lands that are unsuitable for agriculture but suitable for pasture.

Class VIII lands are suitable neither for agriculture nor for forestry and are best left for wildlife and recreation.

Land capability classes are divided into land capability subclasses, groupings of soils that have the same kind of limitations for agricultural use. Subclass codes used are e, w, s and c.

'e' represents susceptibility to erosion by water or wind,

'w' represents drainage difficulties including wetness or overflow,

's' represents soil limitations for plant growth and

'c' represents climatic limitations.

Land capability subclasses are subdivided into land capability units that are groupings of one or more individual soil map units having similar limitations or hazards. They are denoted by appending a numeral from 0 to 9 to the land capability subclass to specify the kind of limitation. The specific limitations are

– stony or rocky (0),

– erosion hazard/slope (1),

– coarse texture (2),

– fine texture (3),

– slowly permeable subsoil (4),

Land capability classification(LCC) is crucial for appropriate land use planting consisting of practiced like choice of vegetation /crops, tillage practices, use of scientific method of cultivation and desirous conservation practices, Detailed LCC Survey carried out in the watershed brought out the prevailing LCC classes as I,II,III,IV

CONCLUSION

The land capability classification of the watershed provides reasonable good information with regard to capability of soil, that could be used for agriculture, agri-horticulture, silvi-culture and pasture development. The majority of land form is coming under class II, which give an insight of good agriculture production potential of these watersheds. The productivity of these lands could be further enhanced by adoption of simple soil & water conservation measures like contour bunding *in-situ* moisture conservation practices. In class III submergence bund, marginal and peripheral bund are planned and in class IV, gully plugging structures, earthen check dam and water harvesting bunds are proposed with permanent Pucca Drop Spill Way structures.

SLOPE ANALYSIS:

The Project area has an uneven terrain with higher elevations on the north- West side of the watershed. Since slope is the most important terrain characteristic and plays a vital role in geomorphological and runoff processes, soil erosion and land use planning, it is very important to have an understanding of the spatial distribution for the development and management of both land and water resources. The general slope of the watershed is towards south - East. In the present study Seven (7) Slope classes were identified through the analysis of Aster Digital Elevation Model. One such map of Slope of the watershed is shown in Annexure Map.

PRESENT LAND USE IN THE WATERSHED

Spatial information on land use/land cover is a necessary prerequisite in planning, utilizing and management of natural resources. In the current days context of development planning, information on land use/land cover and the changes over a period of time attain prominence because of its primary requirement in all the planning activities. The present watershed Taraina have

varied land/use land cover categories as shown in table. One such map of land use/ land cover of the watershed is shown in Annexure Map.

THE LAND UNDER DIFFERENT CATEGORIES WITHIN WATERSHED

S. No.	Watershed Code	Name of villages falling in the watershed	Built-Up Land	Fallow land	Agriculture	Plantation	Water Bodies	Wasteland	Total
1	2B1C2c2a	Mehandiya,Karhachak,Temha, Paspurwa, Guwar, Hatwa, Bansgagaha, Atkariya, Kauadil,Udiyanpur,Dhakwa, Raghunathpur, Mainseer, Borari, Karanrai, Tejpur, Rajpur, Pursauli, Baghmawa, Gajpur ,Ahtmali, Belwasahay, Ahiaulibujurg, Piparpatti, Udaipur, Tiplibanaras, Kothakhas, Ahiraulikhurd, Pakadi, Masanpakar, Assanpakar, Basundiha, Kohada, Bandhwa, Bansipur, Jaiyapar, Sisayal, Bhatpar	38.49	3.75	1020.09	15.07	11.18	-	**1088.58**
2	2B1C2c2b	Karhachak , Temha, Pursauli, Masanpakar, Akusi, Rajnauli, Tekuwamadho,Tekuwadarji, Tekuachatur, Viskarpur, Umtaha, Tekuabeer shah, Dimusa, Kutiyababu, Siyar, Bujurg, Banakati, Jagdishpur, Badihari, Bhalwan,	28.01	13.75	495.50	9.76	12.47	1.74	**561.23**
3	2B1C2c2c	Akusi, Kutiyababu, Siyar Bujurg, Bhalwan, Bela, Bishunpurwa, Siyarkhurd, Musaila, Parsadipur Urf Misrauli, Kanjarpar, Kopwa, Nawadih, Manavkishunpur, Mehndarao, Banpurwa, Ekonabujurg, Mitanpur Bujurg, Shiwrajpur, Rampur, Kheswa, Kandhakhurd, Khajuri,	37.50	0.02	600.10	10.03	11.09	-	**658.74**

4	2B1C2c2g	Masanpakar, Sisayal, Bhatpar, Bhalwan, Jagdishpur, Kandhakhurd, Nagwa, Jagarnathpur, Padpurwa, Girdharpur Solanki, Kauaram Khurd, Chawriya bujurg	39.64	4.11	540.54	20.35	10.88	1.13	**616.65**
5	2B1C2c2d	Manavkishunpur, Shiwrajpur, Rampur, Kheswa, Kandhakhurd, Jagarnathpur, Chawriya bujurg, Adharipur, Kalechak, Piperdari, Harikhora, Salarpur, Mitanpur Bujurg, Rajgarh, Kandhabujurg, Baidauli,Chawariya khurd, Paresapar,	23.89	-	620.15	10.17	21.27	**-**	**675.48**
6	2B1C2c2f	Chawriya bujurg, Paresapar, Rajgarh, Mahuja, Pakari Dubey, Dumuri Bhawanpokhar, , Ahiraoli, Kanaicha, Sauhradih, Bardiha, Gajari, Dhamkapur,Dariya Bujurg, Dhaski, Dhausa,	24.17	1.44	823.62	17.71	15.38	**-**	**882.32**
		Total	**191.70**	**23.07**	**4100.00**	**83.09**	**82.27**	**2.87**	**4483.00**

PRESENT LANDUSE/LANDCOVER OF THE PROJECT AREA

S. No	Landuse	Area (ha)	%
1	Built-up land	191.70	4.29
2	Fallow Land	23.07	0.51
3	Agricultural Land	4100.00	91.46
4	Plantation	83.09	1.85
5	Water Bodies	82.27	1.83
6	Wasteland	2.87	0.06
Total		**4483.00**	**100**

DESCRIPTION

The present LU/LC map has been depicted through the satellite data of January,2010 (Google). A total no. of 6 major categories of LU/LC has been mapped.

BUILT-UP LAND

All the major settlement areas have been mapped under this category i.c Mehandiya,Karhachak,Temha, Paspurwa, Guwar, Karhachak , Temha, Pursauli, Masanpakar, Akusi, Kutiyababu, Siyar Bujurg, Bhalwan, Bela, Masanpakar, Sisayal, Bhatpar, Bhalwan, Jagdishpur, Manavkishunpur, Shiwrajpur, Rampur, Kheswa,Chawriya bujurg, Paresapar, Rajgarh, Mahuja, Pakari and the total area under category is 191.70 Hectare which is 4.29% of the total mapped area. Under this category road network and other built-up area has also been included.

WASTE LAND

Land which is deteriorating for lack of appropriate water and soil on account of natural causes comes under this category. The total area under this category comes about 2.87 Hectare which is 0.06 % of the total mapped area. The sub categories are like Salt affected land, Gullied/Ravenous Land, Scrub Land etc.

WATER BODIES

This category comprises area with surface water either impounded in the form of ponds, lake & reservoirs. The total area under this category is about 82.27 Hectare which is 1.83 % of the total mapped area.

PLANTATION

These areas are separable from crop land especially with the data acquired during rabi/zaid season. Plantations appear with different size and regular and sharp edges indication the presence of a fence around it. Depending on the location, they exhibit a disbursed or contiguous pattern. The total area under this category comes about 83.09 Hectare which is 1.85 % of the total mapped area.

AGRICULTRAL LAND

These are the lands primarily used for farming and for production of food; it includes land under the (irrigated and un-irrigated). Areas with standing crop as on the date of satellite overpass. Cropped areas are in varying shape and size in a contiguous and non contiguous pattern. They are widely distributed in different terrains; prominently appear in the irrigated areas irrespective of the source of irrigation. The study area is predominantly paddy producing area being its flatness in 2007-08 maximum production of paddy recorded in this region under the double crop area. Area under rabi crop is about 3112.00 Hectare of the total cropped area, area under Kharif crop is 2615.00 Hectare. It is important to know that the project area has maximum **two crop areas** i.e. **Kharif and Rabi**. The average size of the agricultural field is less than 0.5 Hectare. The total area under this category comes about 4100.00Hectare which is 91.46 % of the total mapped area.

FALLOW LAND

The current Fallow land has been mapped in the study area as viewed in the satellite scene. Actually the above category is a part of agriculture land which has left for sowing due to some reason by the farmers. The total area under this category comes about 23.07 Hectare which is 0.51 % of the total mapped area.

AGRICULTURE

Various agriculture land uses in the watershed are extended to diversified land capabilities starting from marginal to good class IInd lands. The watershed distinctly has three types of land i.e. levelled, sloping and degraded and undulating. The agriculture is practised on all these soil types though the productivity considerable varies. The water (both for irrigation and drinking) is most scarce natural resource in the watershed. The operation of tube wells for irrigation of agricultural crops frequently leads to the drinking water problem to the farmers for watershed.

The agricultural soils in the watershed have diversified texture i.e. clay, silty clay, sand mixed with gravel and loam which are located in patches throughout the watershed. Four types of sandy, loam, Clay, clay loam are the main soil of district-Gorakhpur. The heavy soils are almost kept fallow during rainy season. The irrigation water is conveyed in earthen channels and surface irrigation methods following mainly border method of free flooding method of irrigation by farmers in the watershed. The factors substantially reduce the water use efficiency of limited available and valuable irrigation water in the watershed. To test the quality of irrigation water samples of water of each selected village has sent to laboratory for testing.

CROP ROTATION

Single Cropping: Paddy, Arahar

Double Cropping: Wheat, Paddy

Table of Cropping Pattern in the project area :

S. No	Area under different Crops	Area (ha)
1	Single Crop Area (Rabi)	**2285**
2	Double Crop	**1600**
3	Multiple Crop	**215**
	Total	**4100**

PRESENT CROPPING INTENSITY:

The average cropping intencity in the project area, is

The villages of Kauriram & Gagha blocks **–**

145%

CROP PRODUCTIVITY

Food crop production is a major land based activity in the watershed. Traditional cultivation practices, coupled with poor quality seeds and long duration crops varieties result in low crop yields. Crops are taken under rainfed as well as irrigated conditions. The yield levels of rainfed crops are particularly very poor. Large variation has been noticed in productivity of wheat (9-19Qu./ha) and rice (14.5-31 Qu/ha.) under rainfed and irrigation, condition respectively. At present level of rainfed farming. The total produce from Rabi and Kharif crops obtained by a medium size of holding owning family can meet food requirements for upto 6 to 7 months only.The farmers also do not have suitable cropping systems to deal aberrant weather. Weeds impose

considerable constrant in producing of both Kharif and rabi crops under irrigation as well as rain-fed production system. Use of weedicide is rare in the watershed.

The mixed cropping is in practice in limited area with Kharif crops but it is not only irrational but also unscientific and beset with low productivity. Subsequent rabi crops in general are raised on residual soil moisture under rain-fed production system during past monsoon season. Imbalanced use of fertilizers is common in not only Rabi and Kharif crops but also in rain fed and irrigated production system. The recommended deep ploughing for enhanced in situ residual soil moisture conservation and higher production is also not followed in the watershed. The shallow ploughing tractors drawn tillage implements are available with the farmers in the watershed but deep ploughing implements yet need to be introduced.

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

INDIGENOUS TECHNOLOGICAL KNOWLEDGE: (I.T.K.)

Agriculture is an old age occupation which farmers have practiced and improved in their own manner to earn livelihood under the condition of area. The villagers have their traditional village ponds, practice of field bunding, production of Arhar crop on the bunds in paddy area which typically constitute agriculture related ITKs in the watershed. The indigenous farming technology in the watershed is observed to cover a vast spectrum of activities involving tillage, implement crop selection, storage of produce and value condition. Seed drill, seed comfort drills are used with tractor and Nai/chonga with

indigenous plough. These ITKs are eco-friendly, cost effective and involve use of local materials with farmers own wisdom. These techniques equip farmers with skills and strength to adopt to the prevailing adverse conditions.

HORTICULTURE

Horticulture plantations of mango, guava, lemon, etc. has been practiced by farmers. The sub-tropical fruits and vegetable have very good potential in the watershed. Organized orchard, commercial vegetable cultivation, horti-agriculture and other system of agro-forestry etc. have good potential in the watershed.

AGRO-FORESTRY

No special type of species grown in the watershed area. The argo-forestry interventions comprising of guava, jamun, lemon, ber, neem, peepal, bamboo etc. may be applied for benefit of the farmers under rain-fed production systems on level to sloppy and marginal agriculture using proper planting techniques and termite control measures. The multipurpose trees may also help in supplementing fire wood and fodder demands of the rural communities in the watershed and may be planted as hedge rows on rain-fed, marginal and degraded lands.

LIVESTOCK POPULATION

Total livestock population of the watershed is14480. Cows are preferred as milk animal, but milk yield is very low. Goats are also kept for milk as well as for meat purpose. The breakup of livestock population is as follows

LIVESTOCK POPULATION IN WATERSHED

livestock Resolution							
Buffaloes	Cows	Bullocks	Goat	Pig	Sheep	Others	Total
5700	5224	652	2300	404	200	-	14480

LIVELIHOOD

Out of the total population of 50096 in the watershed, a majority *i.e.* more than 80 % has farming as their major source of livelihood followed by 18 % labourers and 2 % service + business class.

INFRASTRUCTURE SOCIAL FEATURES

The watershed has moderate communication facilities and all 99 villages are approachable through motorable road. Literacy rate in the watershed is very low because except some village all villages are having education facilities up to Junior High School. All the villages are electrified and have telephonic connection. Small land holdings (average less than 0.1 ha) with large family size (average 6 person) and more than 50% of the labour force of the total population living below poverty line indicate poor socio-economic status of the watershed community However a strong community spirit among the village show a positive indication for the success of any programme implemented in a participatory mode. Traditionally, the entire village community participates in the individual's work needing labor such as sowing, harvesting, house construction works etc.

Village area and its location in the watershed

S. NO.	NAME OF VILLAGES	VILLAGE CENSUS CODE	PERCENTAGE AREA OF THE VILLAGE	AREA UNDER WATERSHED IN HECTARE	NEAREST TOWN/ BAZAR	
					NAME OF TOWN/ BAZAR	DISTANCE IN Kms
1	Mehadiya	07960900	0.4	21.75	KAURIRAM	3
2	Karha chak	07962000	0.23	10.46	KAURIRAM	2
3	Temha	07961400	0.39	17.75	KAURIRAM	3
4	Baspurwa	07961100	0.87	39.51	JANEPUR	3
5	Gooar	07961300	0.30	13.76	JANEPUR	3

6	Hatwa	07962200	0.07	3.42	KAURIRAM	3
7	Basgagha	07961000	0.52	23.84	KAURIRAM	2
8	Atakaria	07959800	0.38	17.3	KAURIRAM	2
9	Kauwadil	07966900	1.06	48.56	KAURIRAM	6
10	odiyanpur	07966700	0.58	26.63	KAURIRAM	5
11	Dhakwa	07966800	0.66	30.32	KAURIRAM	3
12	Raghunathpur	07966600	0.53	24.47	KAURIRAM	0
13	Manseer	07960200	0.03	1.52	KAURIRAM	3
14	Borari		70	33.1		
15	Karanray	07960300	0.52	24.06	KAURIRAM	3
16	Tejpur	07959600	0.88	40.11	KAURIRAM	5
17	Rajpur	07959700	0.91	41.52	KAURIRAM	9
18	Pursauli	07959500	2.9	132.12	KAURIRAM	4
19	Baghmaua	07961200	0.18	8.62	KAURIRAM	1
20	Gajpur Ahetmali	07948600	0.55	25.06	KAURIRAM	14
21	Belwa sahay	07948700	0.30	13.82	KAURIRAM	11
22	Ahirauli Buzurg	07948400	0.37	17.24	KAURIRAM	2
23	Piper Patti	07948200	0.21	9.77	GAGHA	4
24	Uday Pur	07948100	0.75	34.53	KAURIRAM	2
25	Tikuli Banaras	07948500	1.16	53.08	KAURIRAM	2
26	Khoptha khas	07947700	1.37	62.38	KAURIRAM	14
27	Ahirauli Khurd	07948300	0.07	3.46	KAURIRAM	15

28	Pakadi	07948800	0.8	3.76	KAURIRAM	11
29	Asan Pakar	07950200	2.26	102.95	KAURIRAM	3
30	Masan Pakar	07950100	2.04	93.0	KAURIRAM0	14
31	Basoodeeha	07949900	1.49	67.76	KAURIRAM	13
32	Kohara	07947100	0.26	11.92	KAURIRAM	13
33	Bandhwa	07947000	0.13	6.26	KAURIRAM	13
34	Basipar	07946900	0.34	67.5	MAJHGAWA	3
35	Jayapar	07949700	0.21	9.91	MAJHGAWA	1
36	Sisayal	07949400	1.68	76.58	GAGAHA	5
37	Bhatpar	07949500	0.59	26.96	KAURIRAM	17
38	Akusi	07963700	1.16	52.75	KAURIRAM	11
39	Balihari	07961700	1.46	66.83	GAGAHA	3
40	Rajnauli Buzurg	07963800	0.02	0.97	KAURIRAM	16
41	Tekua Madhaw	07963600	0.11	5.16	GAGAHA	3
42	Tekua Darji	07963500	0.001	.04	GAGAHA	3
43	Tekua Chatur	07961800	0.69	31.78	GAGAHA	3
44	Biskar pur	07961500	0.48	22.00	KAURIRAM	3
45	Umtaha	07959300	1.09	49.83	GAGAHA	3
46	Tekua Birsa	07961900	0.34	15.52	KAURIRAM	18
47	Demusa	07961600	1.07	48.81	KAURIRAM	17
48	Kotia Babu	07959200	1.84	83.81	KAURIRAM	17
49	Siyar Buzurg	07956400	0.53	24.38	GAGAHA	3

50	Bankati	07959400	0.13	6.32	GAGAHA	3
51	Jagdishpur	07949300	7.07	321.53	GAGAHA	4
52	Bhaluwan	07949200	3.46	157.68	GAGAHA	5
53	Bela	07957600	0.39	17.73	KAURIRAM	18
54	Mehdraon	07956500	0.46	20.95	GAGAHA	3
55	Banpurwa	07956600	1.15	52.75	KAURIRAM	23
56	Bisunpurwa	07956700	0.61	27.88	GAGAHA	3
57	Siyar Khurd	07956300	0.55	25.24	GAGAHA	3
58	Musaila	07955900	0.28	12.98	GAGAHA	5
59	Parsadipur urf Misrauli	07956000	0.25	11.40	KAURIRAM	3
60	Kanjarpal	07955400	0.03	1.77	GAGAHA	3
61	Kopwa	07957100	0.62	28.39	KAURIRAM	22
62	Nawadih Bujurg	07957200	0.16	7.45	GAGAHA	3
63	Ikauna Buzurg	07959100	0.73	33.33	GAGAHA	3
64	Manaw Kishunpur	07956200	2.39	108.86	KAURIRAM	3
65	Shivrajpur	07956100	1.36	61.95	KAURIRAM	3
66	Rampur	07949100	1.39	63.30	GAGAHA	1
67	Khesua	07951500	1.75	79.95	GAGAHA	1
68	Kaidaha Khurd	07951600	1.52	69.18	GAGAHA	1
69	Khajuri	07956800	0.32	14.89	KAURIRAM	25
70	Nagwa	07950000	1.08	49..54	GAGAHA	4
71	Padpurwa	07946200	1.8	82.15	KAURIRAM	3
72	Jagarnathpur	07951100	2.36	107.55	KAURIRAM	3
73	Girdharpur Solanki	07945900	0.42	19.41	KAURIRAM	3
74	Kauwa Ram Khurd	07945800	1.72	78.37	GAGAHA	3

75	Chawaria khurd	07950400	4.74	215.93	KAURIRAM	4
76	Adharipur	07954500	1.11	50.76	GAGAHA	1
77	Kalechak	07955100	0.08	3.95	KAURIRAM	3
78	Piperdadi	07955200	0.37	16.87	KAURIRAM	21
79	Harikhoda	0795460	0.98	44.59	GAGAHA	3
80	Salarpur	07949000	1.33	60.80	GAGAHA	1
81	Mitanpur Buzurg	07948900	1.24	56.59	KAURIRAM	21
82	Rajgarh	07951300	2.01	91.78	KAURIRAM	21
83	Kaidha Buzurg	07951400	0.77	35.21	KAURIRAM	21
84	Berauli	07951200	0.61	27.97	KAURIRAM	3
85	Chawaria Khurd	07951000	1.45	66.06	KAURIRAM	3
86	Paresa par	07950900	1.14	52.28	KAURIRAM	3
87	Mahuja	07954000	1.61	73.48	KAURIRAM	21
88	Pakadi Dubey	0795400	0.09	4.15	GAGAHA	1
89	Bhawan Pokhar	07953900	0.57	26.28	GAGAHA	1
90	Dumari	07962100	1.04	47.42	KAURIRAM	20
91	Ahirauli	07950800	1.82	83.17	KAURIRAM	3
92	Kanaicha	07932600	0.37	17.09	GAGAHA	0
93	Sohra Dih	07953400	1.78	81.15	KAURIRAM	21
94	Bardiha	07953700	1.66	75.93	KAURIRAM	21
95	Gajari	0795330	1.28	58.30	KAURIRAM	12
96	Dhamka pur	07953500	0.26	11.86	KAURIRAM	3
97	Dadiya Buzurg	07953200	0.80	36.52	KAURIRAM	5
98	Dhaski	07953000	0.11	5.32	KAURIRAM	4

99	Dhuasa	07953600	1.15	52.37	KAURIRAM	3
	GRAND TOTAL			**4353.48**		

IMPORTANCE OF DEVELOPMENT INSTITUTION

Farmer's perception was recorded for importance and role of different development institutions is relation to infrastructure development in the villages. Importance has been depicted with the size of the circle and role with distance from the village circle

DEPENDENCY ON FOREST FOR FUEL WOOD AND FODDER

a) Fuel wood

Villagers in the village do not use LPG to meet their cooking energy requirements. The main source of fuel is from cow dung cake, woody stem of Arhar crop and Mustard. About 60 to 65 percent of the domestic energy requirement is met from the agro-byproduct and cow dung cake. Rest is met out from the forest outside the village and watershed boundary. Most preferred fuel wood is Prosopis juliflora. Fuel wood is obtained from the forest of Prosopis juliflora standing along the river Taraina situated outside the watershed boundary.

b) Fodder:

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

LOW USE OF FERTILIZER PER UNIT CROPPED AREA

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

TRADITIONAL FARMING METHODS

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

LACK OF ADEQUATE FARM MACHINERY

Even today a large number of farmers in water shade area use wooden ploughs and bullocks. They don't have adequate machinery like seed drill. So, old machineries take more time in tillage practices.

LACK OF FINANCES FOR FARMERS

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

LACK OF GOOD QUALITY SEEDS AND FERTILIZERS

Good quality seed, fertilizer and pesticide are important factor in agriculture productivity. The use of good quality leads to higher land productivity. In watershed, however, there are two limitations in the use of fertilizer. First these fertilizers are most useful in irrigated condition. But in watershed 100 per cent of land depend on rainfall. mostly farmers use nitrogenous fertilizers especially urea. This has resulted in disproportionate use of fertilizer depleting the quality of land.

LACK OF OTHER FACILITIES SUCH AS STORAGE AND MARKETING

5-10% of agriculture product damage after harvesting due to scarcity of proper storage and proper market for sale. So he sells to local traders at the low prices. Farmers mainly face proper means of transportation and roads. And second problem is farmers don't have proper storage facilities.

HYDROLOGY AND WATER RESOURCE CATEGORIES

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

The precipitation that falls upon land & is the ultimate source for both the categories of water resources is dispersed in several ways. A sizeable portion is intercepted by the vegetal cover or temporarily detained in surface depressions.Most of it is later lost through evaporation. When the available interception or the depression storage are completely exhausted & when the rainfall intensity at the soil surface exceeds the infiltration capacity of the soils, the overland flow begins.Once the overland flow reaches a stream channel, it is called surface run-off, which together with other components of flow, forms the total run-off.

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

A second part of the precipitation which infiltrates is lost through evapo-transpiration via plant roots & thermal gradients just below the soil surface. A third part may remain above the water table in the zone of unsaturated flow.A fourth remaining part

percolates deeply into the ground-water.Part of this ground-water may eventually reach the stream channel & become the base flow of the stream. This portion is termed ground-water run-off or ground-water flow.

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

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

The above phase of the run-off cycle pinpoints the inflow components for the surface-as well as for the ground-water resources. It has to be appreciated that there is always a balance between the inflow factors making up water resources of a region, whether surface or ground, & the outflow components. The surface water resource of a given basin in excess of the withdrawal use is accounted for on the outflow side by one or more of the following factors:
*(i)*Stream outflow from the basin;
*(ii)*loss through evaporation;and
*(iii)*the influent recharge to the ground water.
Similarly, the unutilised ground-water resource of a basin is accounted for by the following outflow factors:
*(i)*Evapo-transpiration from the ground-water-table;
*(ii)*outflow to the neighbouring ground-water basin;
*(iii)*the effluent discharge to the streams;and
*(iv)*the addition to the ground-water storage.

The interrelationship between the surface-water & the ground-water resources is evident from the above analysis.The surface-water resources contribute to the ground-water recharge in various ways:
(i)by influent recharge from the streams;
(ii)by seepage from natural lakes,ponds,etc;
(iii)seepage from artificial storage reservoirs,canal systems,etc, &
(iv)return flow from irrigation. These factors presently contribute to about 25 percent of the country's total ground-water resources.

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

Factors Affecting Water Resources

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

1.Climatic Factors

A. Rainfall : its intensity,duration & distribution.
B. Snow
C. Evapo-transpiration

2.Physiographic Factors

A. Basic characteristics.
    1. Geometric factors : drainage area,shape,slope & stream density.
    2. Physical factors : land use, surface infiltration conditions,soil types,etc.

B. Channel characteristics : carrying capacity & storage capacity.

3.Geological Factors

A. Lithologic including composition, texture, sequenceof rock types & the thickness of rock formations.

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

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

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

SOIL AND MOISTURE CONSERVATION AND EFFICIENT USE OF WATER

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

A variety of essential soil moisture and water conservation technologies must be adopted to reduce the cost of irrigation, extend it throughout and promote sustainable small-scale irrigation on a watershed basis. These technologies are essential especially in drought-prone areas. Even though drought is a purely natural calamity caused by the failure of (monsoon) rain, it can be minimized by careful planning and operation. During good rainy years, excess rainwater should be stored in the soil and also underground using suitable soil moisture conservation measures and water harvesting structures on a watershed basis. This stored water can subsequently be used for irrigation. Total area in work proposed in the project area is 4100.00 ha.

Conceptual approach

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

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

standards for the inhabitants in the watershed area. It therefore involves restoration of the ecosystem, protecting and utilizing the locally available resources within a watershed to achieve sustainable development.

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

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

Appropriate structures and their functions

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

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

Soil and water conservation measures on a watershed basis

The engineering measures adopted differ with location, slope of the land, soil type, amount and intensity of rainfall. Depending on these parameters, the methods commonly used are contour trenching, contour stone walls, construction of temporary and permanent check dams and gully plugging structures. Additionally, percolation ponds, silt detention tanks and irrigation tanks are constructed to harvest water and recharge it to the groundwater for use in agriculture (irrigation). Farm ponds can also be constructed for every 4-5 ha in the watershed to provide protective/supplemental irrigation. Total above work proposed in project area are 4100.00 Ha.

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

Functions of the structures

Contour bunds will not only prevent soil erosion but also obstruct the flow of runoff water. Consequently, the obstructed water will increase the soil moisture and recharge the groundwater in the area.

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

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

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

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

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

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

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

PROBLEMS AND NEEDS

The main problem in a watershed is the soil erosion by rainfall. The run off water transport the sediments which may block the channel head, dam, reservoir and storage structures are the major problems faced in the project area and attempts made so far to overcome them. The other main problems in the selected watershed are : lack of awareness amongst the villagers about the deteriorating environmental condition of the area, 75% of the run off water makes it away to way towards Rapti and Ghaghara through Taraina rivers carrying fertile soil which has nutrients and this decreases soil fertility, there is a decline in the productivity of cereals, pulses and vegetable crops, dependency of farmers on the rain water. Therfore it is an urgent need, that rainwater should be harvested for crops and re-charged to improve the quality of the water.

Focused Group Discussion Demusa Village

Focused Group Discussion Dhunsa Village

Focused Group Discussion Dhunsa Village

Focused Group Discussion Dhunsa Village

Focused Group Discussion Jaggarnathpur Village

Focused Group Discussion Jaggarnathpur Village

Focused Group Discussion Jaggarnathpur Village

Focused Group Discussion Mano Kishunpur Village

Focused Group Discussion Mano Kishunpur Village

Focused Group Discussion Mano Kishunpur Village

Focused Group Discussion Rajgarh Village

Focused Group Discussion Rajgarh Village

CHAPTER - 4

INSTITUTION BUILDING & PROJECT MANAGEMENT

PROJECT IMPLEMENTING AGENCY (PIA)

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

Detail Staffing Pattern of PIA:

S.No.	Name	Desingnation	Qualification
1	Shri P.C.Verma	Bhoomi Sanrakshan Adhikari	Intermediate, Diploma in Ag. Engg..
2	,, R.K.Gupta	Junior Engineer	Intermediate, Diploma in Ag. Engg.
3	,, H.R.Verma	Accountant	M. Com
4	,, A.K.Gupta	Accountant	B.Com
5	,, Shambhu Prasad	Droughtman	High School
6	,, S. P. Sharma	Zeledar	B.A.
7	,, R.S.Shahi	Senior Clerk	Intermediate
8	,, R.P.Singh	Junior clerk	B.Com.
9	,, S.S.Upadyay	Junior clerk	Intermediate
10	,, Bachcha Yadav	Tracer	B.A.
11	" R.P. Mishra	Work Incharge	Intermediate
12	" B.L.Gautam	Work Incharge	Intermediate
13	" R.K Varma	Work Incharge	Intermediate

14	" S.C Tiwari	Work Incharge	B.A.
15	" R.K Dubey	Work Incharge	Intermediate
16	" Sri Bhagwan	Work Incharge	Intermediate
17	" Sri Ramvinay Kumar	Work Incharge	Bsc.
18	" J.P Pandey	Sinch Pal	B.A
19	" Jai Shankar singh	Driver	Highschool
20	" Harendra Shukla	Ivth Class	Intermediate
21	"Shambhu Singh	Ivth Class	Junior Highschool
22	" Ram Jeet Yadav	Ivth Class	Intermediate
23	" Dal Bahadur	Ivth Class	Primary
24	" Mithai Lal	Ivth Class	Primary
25	Smt. Ramkali	Ivth Class	Primary

Roles and Responsibilities of the PIA

The project Implementing Agency(PIA) will provide necessary technical guidance to the Gram Panchayat for preparation of development plans for the watershed through Participatory Rural Appraisal(PRA) exercise, undertake community organization and training for the village communities, supervise watershed development activities, inspect and authenticate project accounts, encourage adoption of low cost technologies and build upon indigenous technical knowledge, monitor and review the overall project implementation and set up institutional arrangements for post-project operation and maintenance and further development of the assets created during the project period.

The PIA, after careful scrutiny, shall submit the action plan for watershed development project for approval of the DWDU/DRDA and other arrangements. The PIA shall submit the periodical progress report to DWDU. The PIA shall also arrange physical, financial and social audit of the work undertaken. It will facilitate the mobilization of additional financial resource from other government programs, such as NREGA, BRGF, SGRY, National Horticulture Mission, Tribal Welfare Schemes, Artificial Ground Water Recharging, Greening India, etc.

WATERSHED DEVELOPMENT TEAM:

The WDT is an integral part of the PIA and will be set up by the PIA. Each WDT should have at least four members, broadly with knowledge and experience in agriculture, soil science, water management, social mobilization and institutional building. At least one of the WDT members should be a woman. The WDT members should preferably have a professional degree. However, the qualification can be relaxed by the DWDU with the approval of SNLA in deserving cases keeping in view the practical field experience of the candidate. The WDT should be located as close as possible to the watershed project. At the same time, it must be ensured that the WDT should function in close collaboration with the team of experts at the district and state level. The expenses towards the salaries of the WDT members shall be charged from the administrative support to the PIA. DWDU will facilitate the training of the WDT members.

As per new common guideline direction/instruction given in Para 5.3 point 40 P. I. A. has been constituted Watershed Development Team as given below:

Watershed Development Team

S. No.	Subject	Name of Member of WDT	Address	Qualification	Designation	Experience
1	Agriculture	K.K. Singh	Vill & Post-Karwal urf Majhgawa, Gorakhpur	B. Sc. (Agriculture)	Kisan Mitra	Broad knowledge and experience in Agricultural work since 15 years
2	Soil Science	Dr. M. P Singh	K.V.K.-Balipar, Gorakhpur	M. Sc (Agriculture)	Scientist	Experience in Departmental work since 10 years
3	Social Mobilization	Smt. Chitra W/o Sanjay Kumar	c/o Sri R.M Yadav H No 98,Daudpur,Gorakhpur	M.A Sociology	Teacher	Four years teaching experience
4	Water Management	S. P. Sharma	Vill-Kuawal Kalan (Harpurbudhat),Gorakhpur	B. Sc. (Agriculture)	A. S. C. I.(Retd. from Dept of Agriculture	Broad knowledge and experience in Agriculture Extension, soil conservation and water management
5.	Capacity Building	Sri. Braj Mohan Yadav	Vill.- Ghora Deor, Post Sabhadar Khurd, Gorakhpur	M. Sc. (Ext.)	Trainer	Experience in Rural development and Extension

Roles and Responsibilities of WDT:

The WDT will guide the watershed committee (WC) in the formulation of the watershed action plan. An indicative list of the roles and responsibilities of the WDT would include among other s, the following.

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

WATERSHED COMMITTEES (WC)

S. No	Names of WCs	Date of Registration as a Society (dd/mm/yyyy)	Name of the Watershed member	Designation	M /F	S C	S T	S F	M F	L F	Land -Less	U G	SH G	G P	Any Other	Educational Qualification	Function (s) assigned #
1	Basudiha 2B1C2c2a	Under Process	Sri Dinesh	President	M			√							√	High School	A & D
			Sri Anil Rai	Secretary	M				√			√				*Intermediate*	C & H
			Sri Dhodahi	Member	M	√					√		√			Primary	E
			Sri Sakhajeet	Member	M						√		√			Primary	E & F
			Sri BudhiRam	Member	M				√					√		Primary	E
			Sri Sangam	Member	M						√				√	Primary	E
			Sri Mithlesh	Member	M						√				√	Primary	E
			Sri Shivraj	Member	M						√		√			Primary	I & F
			Sri Sheshnath	Member	M				√			√				Primary	B & E
			Sri Basant	Member	M	√			√				√			Primary	E
			Smt Rajkumari	Member	F	√		√					√			Primary	E
			Shri P.D. Singh	Work incharge	M										√	B.sc	A & D

S. No	Names of WCs	Date of Registration as a Society (dd/mm/yyyy)	Name of the Watershed member	Designation	M /F	SC	ST	SF	MF	LF	Land-Less	UG	SHG	GP	Any Other	Educational Qualification	Function (s) assigned#
2	Demusa 2B1C2c2b	Under Process	Sri Tappe Singh	President	M				√			√			√	M.A.	A & D
			Sri Radhey Shyam	Secretary	M			√				√				High School	C & H
			Sri Rajendra Gupta	Member	M				√			√				Primary	B
			Sri Raj pati	Member	M						√		√			Primary	E & F
			Smt Jhinki	Member	F				√						√	Primary	A
			Sri Brijesh	Member	M				√			√				Primary	A
			Sri Ramsakal	Member	M			√				√				Primary	E& I
			Sri Surendra Singh	Member	M			√							√	Primary	E
			Sri Chandrabhan Yadav	Member	M			√				√				Primary	E
			Sri Sharad	Member	M	√					√				√	Primary	E
			Smt Malti devi	Member	F	√					√		√			Primary	E
			Sri P.D. Singh	Work incharge	M										√	B.sc	A & D

S. No	Names of WCs	Date of Registration as a Society (dd/mm/yyyy)	Name of the Watershed member	Designation	M/F	SC	ST	SF	MF	LF	Land-Less	UG	SHG	GP	Any Other	Educational Qualification	Function (s) assigned#
3	Mano Kishunpur 2B1C2c2c	Under Process	Sri Pappu Chand	President	M			√				√				High School	A & D
			SriLalsen sahi	Secretary	M			√						√		*Intermediate*	C & H
			Sri Sunil Chandra	Member	M			√				√				B.A.	E
			Sri Shukhlal Yadav	Member	M				√			√				B.A.	E
			Sri Ramdhayan Yadav	Member	M				√					√		*Intermediate*	A & B
			Sri Ramvilas Yadav	Member	M				√			√				J.High School	E
			Sri RAju Sahi	Member	M				√			√				*Intermediate*	E
			Sri Ajay Mishra	Member	M				√					√		*Intermediate*	E
			Sri Nandu	Member	M	√						√				J. High School	E
			Sri Jitendra	Member	M	√					√		√			J. High School	E
			ShriMannu	Member	M	√					√		√			High School	E
			Shri R.P. Mishra	Work incharge	M										√	*Intermediate*	A & D

S. No	Names of WCs	Date of Registration as a Society (dd/mm/yyyy)	Name of the Watershed member	Designation	M/F	SC	ST	SF	MF	LF	Land-Less	UG	SHG	GP	Any Other	Educational Qualification	Function (s) assigned#
4	Jagarnath pur 2B1C2c2g	Under Process	Smt. Girja Devi	President	M				√						√	Intermediate	A & D
			Sri Chandra Shekhar	Secretary	M				√			√				Intermediate	C & H
			Sri Ramsarn	Member	M	√			√			√				High School	E
			Sri Mithilesh	Member	M	√			√			√				J.High School	E
			Sri Suptar	Member	M	√			√						√	Primary	F
			Sri Santbali	Member	M				√			√				High School	E
			Sri Rajaram	Member	M				√			√				J.High School	E
			Sri Ramu	Member	M				√							High School	B & E
			Sri Garib	Member	M	√			√						√	Primary	E
			Shri Santosh Pandey	Member	M				√			√				Intermediate	I & E
			Shri Ram singhasan Maurya	Member	M				√						√	J.High School	E
			Sri Ramkishun						√				√			High School	
			Sri Harihar			√			√				√			High School	
			Shri R.K. Dubey	Work incharge	M										√	Intermediate	A & D

S. No	Names of WCs	Date of Registration as a Society (dd/mm/yyyy)	Name of the Watershed member	Designation	M/F	SC	ST	SF	MF	LF	Land-Less	UG	SHG	GP	Any Other	Educational Qualification	Function (s) assigned#
5	Raj Garh 2B1C2c2d	Under Process	Sri Rampati	President	M	√		√							√	High School	A & D
			Shri Suresh Pal	Secretary	M				√			√				B.A.	C & H
			Sri Mante Yadav	Member	M				√			√				High School	B
			Sri Akalu	Member	M	√		√					√			J.High School	A
			Sri Ram Bhawan	Member	M	√		√							√	J.High School	E & F
			Sri Kailash	Member	M			√				√				J.High School	E & A
			Sri Pawan Yadav	Member	M				√			√				High School	E
			Sri. Rakesh	Member	M	√					√		√			J.High School	E
			Shri. Ram Samuj	Member	M			√						√		J.High School	I & E
			Shri Aniruddh	Member	M					√		√				High School	-
			Shri Surya Bhan	Member	M					√					√	J.High School	E
			Shri B.L. Gautam	Work incharge	M										√	Intermediate	A & E

S. No	Names of WCs	Date of Registration as a Society (dd/mm/yyyy)	Name of the Watershed member	Designation	M /F	S C	S T	S F	M F	L F	Land-Less	U G	SH G	G P	Any Other	Educational Qualification	Function (s) assigned#
6	Dhausa 2B1C2c2f	Under Process	Shri Ajay Kr. Pal	President	M			√							√	M.A.	A & D
			Shri Ramprabesh Yadav	Secretary	M				√			√				M.A.	C & H
			Sri Chhavilal Yadav	Member	M				√			√				J.High School	E
			Sri Gopal	Member	M	√					√				√	Intermediate	E
			Smt. Arvind	Member	M				√			√				Intermediate	E
			Shri Panne Lal Chaudhary	Member	M			√				√				J.High School	E
			Sri Amarnath Yadav	Member	M						√				√	High School	E
			Shri RAmesh	Member	M	√					√		√			J.High School	E
			Shri. Ramdarash Yadav	Member	M				√			√				High School	E
			Shri Uttam Kumar	Member	M	√			√		√				√	High School	E
			Smt. Gita devi	Member	F	√					√				√	J.High School	E
			Shri B.L. Gautam	Work incharge	M										√	Intermediate	A & D

SELF HELP GROUP

Self Help Groups are motivated, small homogenous groups organized together through credit and thrift activities. Self help group initiative especially for women, help uplift their livelihood. Generally self help groups include landless and poor women. Before formation of the SHGs, during PRA activities, Focused Group Discussions (FGDs) were held with the women, which came up with the following observations:

a) Lack of proper credit facilities due to low intervention of formal financial credit institution.
b) Excessive exploitation of weaker section by money lenders
c) Lack of attitude for saving among poor people
d) Lack of knowledge on credit and thrift activity and banking.

DETAILS OF SELF HELP GROUP IN PROJECT AREA IWMP-II, GORAKHPUR

S. No.	Name of Project (M.W.S.)	Code No. (M.W.S.)	Name of S.H.G.	Occupation of S.H.G.	Name of Chairman & No. Members
1.	Basudeeha	2B1C2c2a	Deeh S.H.G Basudeeha	Goat Farming	Shri Thirath S/o Shuk Lal & 10 other member
2.	Basudeeha	2B1C2c2a	Laxhmi mahila S.H.G Basudeeha	Goat Farming	Smt. Shanti w/o Tirath & 9 other member
3.	Basudeeha	2B1C2c2a	Maa Samay S.H.G. Rajpur	Goat Farming	Shri Premsagar S/o Shyamlal & 10 other member
4.	Basudeeha	2B1C2c2a	Maa Durga Mahila S.H.G. Rajpur	Goat Farming	Smt. Sonmati W/o Moti Lal & 10 other member
5.	Demusa	2B1C2c2b	Shankar S.H.G. Demusa	Goat Farming	Shri Ram Ishwar S/o Murari & 10 other members
6.	Mano Kishunpur	2B1C2c2c	Bajrang S.H.G. Manokishunpur	Dairy	Shri Mannu S/o Ram Nagina & 10 other members
7	Jagarnathpur	2B1C2c2g	Santoshi S.H.G. Jagarnathpur	Dairy	Shri Rajendra S/o Baijnath & 9 other members
8	Rajgarh	2B1C2c2d	Under Progress	-	-
9	Dhausa	2B1C2c2f	Under Progress	-	-

User Group

User Groups are normally formed to manage an activity or asset created under the programme on a long term basis. The user group collects user charges from their members, oversee the works and manage the benefits.

It was decided that each group would formulate certain internal rules and have a feeling of ownership with community spirit.

USERS GROUP DETAILS IN PROJECT AREA – IWMP-II GORAKHPUR

S. No.	Name of Project (M.W.S.)	Cod No. (M.W.S.)	No of U.G.	No. of Cultivators
1.	Basudeeha	2B1C2c2a	10	2505
2.	Demusa	2B1C2c2b	6	1150
3.	Mano Kishunpur	2B1C2c2c	7	1415
4.	Jagarnathpur	2B1C2c2g	7	1332
5.	Rajgarh	2B1C2c2d	8	1958
6.	Dhausa	2B1C2c2f	8	1370
	TOTAL			9730

INSTITUTIONAL ARRANGEMENT AT PROJECT LEVEL:

The SLNA would evolve appropriate mechanisms for selecting and approving the PIAs, who would be responsible for implementation of watershed projects in different districts. These PIAs may include relevant line departments, Autonomous organizations under State/Central Governments, Government Institutes/Research bodies, Intermediate Panchayats, Voluntary Organizations (VOS).

However, the following criteria may be observed in the selection of these PIAs:

1- They should preferably have prior experience in watershed related aspects or management of watershed development projects.
2- They should be prepared to constitute dedicated Watershed Development Teams.

Selected PIAs will sign a contract/MOU with the concerned DWSUs/District Level Committee as referred in para29 that will spell out well –defined annual outcomes, against which the performance of each PIA will be monitored each year and evaluated on a regular basis by institutional evaluators from a panel approved by the SLNA/Departmental Nodal Agency at the central level.

Each PIA must put in position a dedicated watershed development team (WDT) with the approval of DWDU. The WDT will be hired on contract/deputation. Transfer etc for a term not exceeding the project period. The composition of the WDT will be indicated in the contract/MOU. No programme funds for DPR and watershed works under any circumstances should be released to either the PIA or Watershed Committee (WC) unless the composition of the WDT has been clearly indicated in the MOU/contract and the team members are fully in place.

CHAPTER – 5

MANAGEMENT / ACTION PLAN

PROBLEM AND NEED OF THE AREA

Integrated Watershed Development Programme is aimed at the socio-economic upliftment of the dwellers of watershed area and to create trust about the programme to be implemented so that they can coordinate in participatory mode for success of the programme. As per the New Common Guidelines total financial outlay for entry point activities is 4% of the total project cost. To increase the per capita availability of drinking water, older wells of the village will be renovated as well as the chabootra will be constructed, to increase the irrigation water availability, older Bund which already exists but not functioning will be reconstructed/renovated. Repairing and maintenance of water bodies have been proposed on priority basis. Schools lies in the watershed area will be equipped with drinking water facility and extracurricular activities will be promoted among the children's of the water by supplying sport goods to the schools. For environmental purpose in the villages, tree planting will be done. Construction of Well Repairing, Krishak Vikas Munch, Approach Road (Brick Soling), Boundry Wall, Water Recharging Tank will be completed. Total estimated cost for these activities is Rs. 19.680 Lakh.

Entry Point activity (EPA)

EPA activities are taken up under watershed projects to build a rapport with the village community at the beginning of the project; generally, certain important works which are in urgent demand of the local community are taken up. A group Discussion was conducted with watershed Development Committee regarding the EPA activity, It was conveyed to the WC that an amount of Rs. 19.680 was allotted for EPA activity, which was 4 per cent of total allocated budget. The villagers discussed various activities which they felt is important but after a brief discussion it was conveyed to them that only those activities can be taken,

which revive the common natural resources. It was also taken into priority that there should be an instrument of convergence which will result in sustainability of activities.

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

S.No.	Name of Micro Watershed		Amount earmarked for EPA in Lacs	Entry Point Activities Planned
	Name of Project	Micro Watershed code		
1.	Basudeeha	2B1C2c2a	4.392	A)Well Repairing B)Krishak Vikas Munch C)Approach Road (Brick Soling) D)Water recharging pits E)Boundry wall F)Hand Pump Reparing
2.	Demusa	2B1C2c2b	2.520	
3.	Mano Kishunpur	2B1C2c2c	3.000	
4.	Jagarnathpur	2B1C2c2g	2.856	
5.	Rajgarh	2B1C2c2d	2.832	
6.	Dhausa	2B1C2c2f	4.080	
	Total	_	19.680	

WATER HARVESTING STRUCTURES•WATER, ENERGY AND RESOURCE CONSERVATION

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

- Increase the time of concentration.
- Break a long slope into several short ones.

- Protection of drainage channels against damage.
- Prevent excessive soil and water losses.

Watershed Development works is proposed to be taken up from 2nd year of the initiation of the project. These works are proposed to be taken up from village to village. And allocation of Rs 268.20 Lakh & 50% of the total cost has been made for watershed development works

CONTOUR , MARGINAL AND PERIPHERAL BUND

Contour bunding is effective for erosion control and moisture conservation measures in dry areas having less than 2% slope to reduce the length of slope. Contour bund will be constructed against the slope in the treatment area. Marginal bund is the engineering structure to reduce the volume and speed of runoff. Those locations where their is a change in slope and soil texture. Peripheral bund will constructed along with the nala bank.

WATER HARVESTING STRUCTURE/CHECK DAM

These structure of built of masonry. Check dams have been proposed constructed in big gullies/ravines carrying relatively high run of and sediment load. Water stored in check dams will be utilized as source of irrigation water during post Monsoon season.

AGRO FORESTRY

Land will be taken from the waste land falling in the class-VII category in the watershed. The Eucalyptus and Sagon plants planted by the farmers.

DRY LAND HORTICULTURE

Lawn will be taken for the plantation of fruit trees like Guava, Mango will be planted at suitable spacing in the watershed.

AREA TREATMENT PLAN

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

1. Constructions of bunds (Field bund, contour bund, submergence bund, Marginal & peripheral).
2. Renovation of Existing Bund for in-situ moisture conservation.
3. Rain fed Horticulture with and without fencing.
4. Construction of recharge Filter.
5. Construction of new & renovation of Existing structures/ gully plugs/Check dams.
6. Afforestation and development of silvi– pastoral system.
7. Drainage line treatment (pucca structures, gully plug, check dams).

PASTURE MANAGEMENT

Introduction: The sound animal industry in any country centers around good quality feed and fodders. The livestock population in India is nearly 15%of the total livestock population of the world, tough we have only 2% of the world's geographical area. The project on for green and dry fodder requirement in India has been estimated at 1061 and 590 million by 2010 A-D, while the present feed and fodder resources in the country can meet only 4% of the requirement. The grazing intensity is very high i.e., 26 adult cattle unit (ACU)/ha as against 0.8 ACU in the developing countries.

The importance of grasses for protection and production, the two aspects of soil and water conservation is well known. Grass is unique in that it is the only resource utilized in situ by grazing. A "grassland" or more appropriately, a "range" is defined as "the areas which are predominantly covered with grasses or grass like plants and are primarily utilized as for age for grazing animals or used as hay." The grasslands are the major sources of food to the animals.

Pasture Management: All grazing areas are referred to as pastures, but ore specifically the term is applied to cultivated grassland used for grazing. Thus pastures are artificial grasslands with or without non-grass vegetation (such as legumes) that are created with selected high forage-yielding grass and legume species and with inputs like fertilizers and irrigation and carefully managed to exclude all other vegetation. Pastures are usually fenced and used either for grazing, for gay and silage making or for both.

Intensive Fodder Production: In areas where the major enterprise of the farmers centers around the milk production. Continuous supply of green fodder round the year is the basis for success of such as industry. Under the aegis of ICAR's all India coordinated Research Project on Forage Crops, several highly productive fodder cropping system have been tested and recommendations made for their general use. For central region important intensive crop rotations are presented as given below

Zone wise crop rotations	Green fodder yield(t / ha)
Central region	
1- Hybrid napier +Cowpea-Berseem+Japanrape	286.3
2- Maize+Cowper-Jowar-Berseem+Japanrape	197.2
3- Jawar+Cowper-Berseem+Japanrape-Jawer+Cowpea	168.6

Conservation on of Forages: In order to sustain animal production, it is essential that the optimum feeding should be maintained round the year. In India, we have two seasons, rainy season and winter season, when surplus quantities of green fodder is available-country to this there are 2 to 3 months of lean periods(October-November and April to July) when the fodder availability to animals is at its low. In the summer months, it is difficult even to meet the maintenance requirements of the animals. Stage of maturity to feed the animals adequately during the lean period. The conservation of forages could be done in the form of silage from cultivated fodders (legumes and cereals) and also pasture grasses. Forages could also be conserved in the form of hay when dried to its nutrients. This feed stuff is quantitatively important from both maintenance and nutritional point of view.

Agro-forestry system for fodder production: A number of fodder trees play an important role in human food security through their function as animal food sources, especially as drought services. Agro-forestry systems consisting of such tress and animals and/or pasture are called Silvo-Pastoral system.

Silvi-Pasture (or Silvo-Pastoral system) is the most promising alternate land use system which integrates multipurpose trees, shrubs, legumes and grasses mostly on non-arable, degraded and marginal lands for optimizing land productivity. It helps in conservation of vegetation, soil and nutrients and provides forage, timber and fuel wood on a sustainable basis.

Potentials of Semi-arid region for different forage production systems.

Region	Forge Production Systems
Semi arid	Integration of Agro-Silvi-Pasture, dry land agriculture on cultivated lands. Forage-cum-Copping forming on the marginal and sub marginal lands with intercropping dry lands cereals and legumes

ROLE OF GRASSLAND IN SOIL CONSERVATION

The grass plant itself protects the soil from the forces of water erosion including the impact of rain drops and surface flow. Grass acts a spring cushion intercepting and broking up the falling rain drops in their way down. Conducting the water down the blades and stems of the plants and finally allowing it to reach the ground as fine sprays without disturbing the surface. Clamps of grass plants, in a mechanical way, obstruct-flowing water and reduce its rate of flow.

In fact to control soil erosion whatever technique is adopted, there are four approaches to deal with the problem:

1- To condition the soil to make it resistant to determent and transportation and create more absorptive surface layer.
2- To cover the soil so that it is protected from the impact of wind and rain drops.
3- To decrease the velocity of wind or runoff water.
4- To provide safe disposal outlet for surplus run off.

Grass in the nature highly efficient device to protect the soil from destructive forces like rain, wind etc. Grass and legumes increase the aggregation of soil particles; improve soil structure and water holding capacity of the soil. Grasses gives quicker protection to eroded lands. To establish gully sides, water ways, gully head and check dams. Grass is perhaps the most effective and economical tool. It can put to various uses in soil conservation:

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

HORTICULTURE DEVELOPMENT FOR WATERSHED MANAGEMENT

Horticulture is an important component of land use management. Now India is the second largest producer of fruits in the world after Brazil.

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

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

(A) Basic constraints

1- Lack of suitable agro-techniques for degraded lands

2- Lack of trained resource persons

3- Inadequate dissemination of the technologies

4- Lack of community approach

5- High biotic interference

6- Lack of infrastructure including marketing.

(B) Soil constraints

1- Poor nutrient status of the soil

2- Physical impediment

3- Moisture stress / water logging / inadequate drainage.

(C) Plant related constraints

1- Problem of plant establishment

2- Physiological disorders

3- Fruit drop and poor productivity

4- Incidence of insects-pests.

However , apart from the above mentioned constraints, the measure bottleneck in horticulture development are poor technological advancements, high initial establishment cost, high input demand , timely operation and seasonal shortage of labours, etc.

CONCEPTS AND ADVANTAGES OF CONSERVATION HORTICULTURE

Conservation horticulture or horticulture land use based on soil and water conservation principle is a suitable alternative for utilization and management of land under rainfed conditions. Thus horticulture development in watershed management appears to be the most appropriate technique for sustained productivity as well as for restoration of degraded lands. In fact, horticulture system meet all the basic needs-food, fruits, fodder, fuel and timber besides, providing employment and sustaining a number of products for industries.

The fruit trees grown with crops can provide fuel from pruned shoots and dried branches, leaf fodder for animals and leaf litter that can be utilized as mulch material and organic matter the leaf litter of deciduous fruit trees not only protects the top soil from the impact of raindrops but also improve soil structure, reduces evapotranspiration, increases infiltration and add to the nutrient status of soil. Therefore conservation based horticulture land use system assumes great significance as fruit trees on degraded lands provide higher returns and offer alternative opportunity in non-arable areas where cropping may not be possible.

Horticulture Practices (For plantation)

Some of the important practices are given below:

1- Selection of Suitable Fruits Types:

For the success of conservation horticulture, selection of hardy varieties resistant to diseases and pests and use of local or other hardy root stocks for raising fruit-trees is of great importance. The major part of the reproductive cycle ie. Period from

flowering to fruiting must also fall during maximum water availability period and the root ripening must be completed before the onset of dry summer (April-May).

Ber, Guava, Karonda, Bel, Amla, Lemon, and Phalsa etc. are the plants which fulfill this requirement and all these fruit plants are most suitable for this region.

2-Planting Techniques:

For degraded lands, pits should be dug of 1m x 1m x 1m size, the excavated soil is mixed with Farmyard Manure (FYM) @ 5-10kg/pit with doses of potash and phosphorous and some insecticide / pesticide (numicide / aldrex) for prevention of white ant. Planting of the fruits plants should be done with the onset of monsoon.

3-Use of Root Stokes:

Budding and grafting on the wild root stock gives benefit of the establishment root and in turn provides better quality fruits with high field potential. For example, Ziziphun mauritiana, a wild ber can be successful budded with scion of improved cultivars, This practice is only successful where sizable patch of wild root stock is available. The budded/grafted stock needs intensive management as it is required to be protected from the wild animals, birds, insects, pests etc. The wild root stock develops efficient top root to provide moisture and nutrients to the scion. Amla. Bel is other examples of raising the improved cultivation the wild root stock.

4-In Site Water Harvesting:

Since on slopy lands, runoff water is considerably higher, therefore, it should be harvested and used. The run off can be utilized for growing fruit plants in such a way that each tree in the established plants is at the time of fruit setting and fruiting. Moisture available at this critical period improves the fruit yield.

Runoff water will be harvested and stored in tanks during the rains. The stored water will be utilized at the time when the fruit trees show moisture stress during dry months. Counter trenches will dug between the rows of fruit trees because this is effective in conserving moisture and providing soil erosion.

5-Mulching:

Mulching is practiced to conserve moisture. It prevents the loss of moisture by evaporation and improve water intake by the soils. Various organic (Straw, hay, manure, tree leaves, dry wads) Mulches are used for mulching. Use of plastic mulch has been taken in rainfed and dryfarrming conditions to increase the productivity by minimizing evapotranspiration losses.

6-Drip Irrigation:

Drip irrigation saves water by 40 to 70 percent and two to three times mare area can be irrigated with the same amount of available water. It has the advantages that it ensures uniform distribution of water, provides perfect control over water application and minimizing the losses during convergence and seepage.

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

S.No.	Particular	No.	L	B	D/H	Quantity	Rate	Amount
1	Earth work in digging	1	1.0	1.0	1.00	1.00	37.00	37.00
2	Cost of FYM, in Kg/pit	1	-	-	-	10Kg	10.00	100.00
3	Filling of pits mixed with FYM and soil	1	1.0	1.0	1.0	1.00	37.00	37.00
4	Cost of plants	1	-	-	-	1	26.00	26.00
Total								**200.00**
Say								**Rs. 200.00**

ESTIMATE FOR SILVI-PASTORAL SYSTEM (RS. ha^{-1}) PLANTATIONS (800 PLANTS ha^{1})

Sl. No.	Particulars of work		Rate (Rs.)	Cost (Rs.)	Remarks
1-	Clear felling or bush clearance of area protected Infected with *Lantana* etc. including Cost of burning	LS		550.00	The area is to be through biofencing
2-	Soil working –earth work, digging of Pits/holes 60 cm deep, 30cm dia -800 Nos. Including cost of refilling and trenching (400 trenches/ha)	LS		6085.00	
3-	Cost of seedlings for 900 nos. and grass seeding /legumes seeds and planning/sowing	-		2050.00	Rs.2.00 per
4-	Weeding and hoeing (2 Nos.)	LS		300.00	
	Total			**8985**	
	Maintenance 2nd year 15% of the 1st year expenditure including being up of 1st year failure				
	Grand total **Say**			**10,335.00** **10,350.00**	

Estimate of Orchard Development in the Watersheds Per Hectare (With Fencing)

S.No.	Particulars	Quantity	Rate	Amount	Remarks
A. Horticulture					
1.	Soil working 1m x 1m x 1m size pits (270nos.) including cost of refilling	270.00 cum	36.66/cum	9898.20	Since, the project is to be operated in a participatory mode, contribution in the form of labour input for pit digging, FYM and its applications, weeding and hoeing are to be provided by the participating farmers, hence the costs are not included in the estimates.
2.	Application of Farmyard Manure, including cost		L.S.	450.00	
3.	Cost of NPK mixture, neemicide @ 250 gm/plant		L.S.	400.00	
4.	Cost of plants (including 15% etc. for mortality) including transportation and planting	310 nos.	15.00/Plant	4650.00	
5.	Casualty replacement @ 10% of item No. 4 & 5			465.00	
6.	Cost of 2 weedings and hoeing		1.00/Plant	540	
7.	Contingency and unforeseen (3%)			492.00	
	Total			**Rs. 6,007.00**	
	Say			**Rs. 6,000.00**	
	Maintenance cost 2nd year onwards – 15 % of 1st year cost			900.00	
	For next 5 years i.e., Rs. 900 x 5			4500.00	
	Total Cost			**Rs. 10,500.00**	
	Say			**Rs. 10,500.00**	
B. Agro-Horticulture (cost per ha)					
1.	Cost of raising 270 plants up to 5 years @ Rs. 10,000.00			10500.00	The remarks mentioned under Horticulture are also applicable for Agro-Horticulture.
2.	Cost of raising agricultural crops @ Rs. 5,000 per hectare per year			5000.00	
3.	Fencing			45300.00	
	Total			**Rs. 60,800.00**	

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

S.No.	Particulars	Quantity	Rate	Amount	Remarks
A. Horticulture					
1.	Soil working 1m x 1m x 1m size pits (270nos.) including cost of refilling	270.00 cum	36.66/cum	9898.20	Since, the project is to be operated in a participatory mode, contribution in the form of labour input for pit digging, FYM and its applications, weeding and hoeing are to be provided by the participating farmers, hence the costs are not included in the estimates.
2.	Application of Farmyard Manure, including cost		L.S.	450.00	
3.	Cost of NPK mixture, neemicide @ 250 gm/plant		L.S.	400.00	
4.	Cost of plants (including 15% etc. for mortality) including transportation and planting	310 nos.	15.00/Plant	4650.00	
5.	Casualty replacement @ 10% of item No. 4 & 5			465.00	
6.	Cost of 2 weedings and hoeing		1.00/Plant	540	
7.	Contingency and unforeseen (3%)			492.00	
	Total			**Rs. 6,007.00**	
	Say			**Rs. 6,000.00**	
	Maintenance cost 2nd year onwards – 15 % of 1st year cost			900.00	
	For next 5 years i.e., Rs. 900 x 5			4500.00	
	Total Cost			**Rs. 10,500.00**	
	Say			**Rs. 10,500.00**	
B. Agro-Horticulture (cost per ha)					
1.	Cost of raising 270 plants up to 5 years @ Rs. 10,000.00			10500.00	The remarks mentioned under Horticulture are also applicable for Agro-Horticulture.
2.	Cost of raising agricultural crops @ Rs. 5,000 per hectare per year			5000.00	
	Total			**Rs. 15,500.00**	

DRAWING AND DETAIL ESTIMATE OF LIVELIHOOD PROGRAMME IN WATERSHED WORK PHASE

DAIRYING AND LIVESTOCK DEVELOPMENT

In income generating activities through Self Help Group, landless and marginal farmers are advised to use three or four cows of *JURSEE* breed or two or three buffalos of *MURRA* breed, for their good life.

Establishment of Goat Units for S.H.G.'s formed in I.W.M.P. III, Project

District Gorakhpur is situated in Eastern plain region where the number of sheep is very less and they are small in nature. Goat population is appreciable and in fact, it is the major source of livelihood for poor people of the district.

In the state, on an average, 16 kg of meat is obtained from a goat, if they are dewormmed twice, there shall be increment of 4 kg in meat on an average, benefiting the farmers of the state.

Deworming and vitamins, mineral- supplement to the goats shall enhance their productivity and also improve anti-body response and protection level through vaccination, i.e., importance in efficiency of vaccination. More productivity and assured health and low mortality shall result into adoption of more farmers to goat farming with the formation of more S.H.G.'s and in turn availability of goats for processing units.

Goat excreta shall be of immense help in enrichment of soil fertility.

Establishment of Goat Units for S.H.G.'s

Eastern plain region, due to the Agro-climate conditions and land pattern is favorable for goat husbandry. Goats thrive well in dry and semi-dry climate with bushes and thorny vegetation. Presently in this area, farmers rear goats for their livelihood. If goat husbandry would be transformed to intensive husbandry, there shall be more economic stability of farmers, more profit sharing and availability of running capital for future expansion. Keeping in view the above facts, goat units shall be formed in the area in intensive way.

40 Goat Units are proposed in I.W.M.P. III, Project for S.H.G. One unit constituting 10 goats and 1 buck will be distributed to one S.H.G.

A register of S.H.G. will be maintained by Secretary of S.H.G. in the supervision of W.D.T. member. The details of beneficiaries of S.H.G. including the breed of goat reared, breeding and feeding status, deworming status, deaths, post mortem conducted claim settlement and working status of unit will be maintained in the register.

Preferences shall be given in consecutive years in purchasing the goats and bucks for new units, from old units for which database maintained shall be of use and it should be assured by buy back arrangement.

Financial Component

S.No.	Component	Amount
1.	Cost of 10 goats of improved breed (not less than 6 months of age) @ Rs. 3200.00 each	32000.00
2.	Cost of 1 buck of improved breed @ Rs. 5000.00	5000.00
3.	Cost of insurance @ 11.63 / unit	4070.00
4.	Feed cost for 3 months @ 250 gm/ day for goats @ Rs. 11.84/ 250 gm	2930.40
5.	Provision of deworming, mineral and vitamin supplement, treatment, vaccination @ Rs.160/ animal	1760.00
6.	The expense including monitoring expenses, register and records @ Rs. 170.00/ unit	170.00
	Total	**Rs. 45,930.40**
		Say Rs. 46,000.00

Estimate of Livestock Development Activities

Total number of female animals: Buffalo - **5860**

Cow - **5320**

Total - 10180

1. Artificial Insemination (A.I.): 33% of total animals per year, i.e., 4125 (say 3400 nos.)

Amount required for A.I. by BAIF @ 100.00/ animal.

Total Amount - Rs. 4,12,500

2. Vaccination: Total number of animals in I.W.M.P. III - 20530 nos.

1. H.S. + B.Q.	@ 5.50	112915.00	
2. F.M.D.	@10.50	2,15,565.00	
	(Twice in a year)		

Total Amount - Rs. 3,28,480.00

3. Deworming:

Adult animals -	19500			
Child animals -	2000			
Albendazole for	19500 animals	@ 40.56	7,90,920.00	
	2000 child animals	@20.28	40,560.00	

Total Amount - Rs. 8,31,480.00

4. Mineral Mixture: Agrimine Forte Chelated for 15700 animals @ 115.00 Rs. 18,05,500.00

GRAND TOTAL - Rs. 25,45,500.00

DRAWING AND DETAIL EATIMATE OF LIVLIHOOD WATERSHED WORK PHASE

PREPARATION OF COMPOST BY NADEF & BURMY METHOD

Nadef is the name of inventor of this method. In this method glazed pit of brick masonry above Ground level is made as shown in the drying. In this method by using a little quantity of cow during, and crop residue, leaf of trees, straw and other organic materials. The method of filling up the pit is below.

First of all best soil of pond or field is spread in the bottom of pit as least 3" thickness and then one layer of 6" thickness and other agriculture waste is made then best soil is spread on it and on this layer the liquid made of cow dung is spread to wet the crop residue, straw etc. this method is repeated until the pit is net completely filled up. On the top layer of this material a bulk is made and then the pit is closed by earthen gara. Water is spread on the top of bulk and from glazed side weekly. This process is repeated to moist the filling material always. The decomposition in filling material started and within six month filled material becomes compost khad.

ESTIMATE OF 'BARMY' COMPOST PIT'S

DETAIL'S OF MEASURMENT

Brick Work In Bed	3.50 x 1.50 x 0.11	= 0.577 Cmt.
,, ,, ,, Long Wall	2 x 3.50 x 0.23 x 0.32	= 0.515 ,,
,, ,, ,, Short Wall	2 x 1.00 x 0.23 x 0.23	= 0.147 ,,
	Total B.W.	**= 1.239 Cmt.**
Plaster Work In Bed	3.00 x 1.00	= 3.000 Sq.mt.
,, ,, ,, Long Wall	2 x 3.00 x 0.32	= 1.920 ,, ,,
,, ,, ,, Long Wall	2 x 3.50 x 0.23	= 1.610 ,, ,,
,, ,, ,, Long Wall	2 x 3.50 x 0.40	= 2.800 ,, ,,
,, ,, ,, Short Wall	2 x 1.00 x 0.32	= 0.640 ,, ,,
,, ,, ,, Short Wall	2. x 1.00 x 0.23	= 0.460 ,, ,,
,, ,, ,, Short Wall	2 x 1.50 x 0.40	= 1.200 ,, ,,
	Total P.W.	**=11.630 Sq.mt.**

MATERIAL & LABOUR ANALYSIS

S. No.	Name Of The Work	Quantity	Unit	Brick's (In No.'s)		Cement(In Bag's)		Moram(In Cmt.)		Messon(In No.'s)		Labour(In No.'s)	
				Rate Per Cmt./ Sq.mt.	No.'s Of Brick	Rate Per Cmt./ Sq.mt.	No.'s Of Bag	Rate Per Cmt./ Sq.mt.	Cmt.	Rate Per Cmt./ Sq.mt	No.'s Of Messon	Rate Per Messon	No.'s Of Labour
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**
1.	Brick Work	1.239	Cmt.	500	620	1.80	2.23	0.275	0.340	1.00	1.23	2.00	2.46
2.	Plaster Work	11.630	Sq. mt.	-	-	0.11	1.27	0.015	0.174	8.00	1.45	1.50	2.17
Total		**-**	**-**	**-**	**620**	**-**	**3.50**	**-**	**0.514**	**-**	**2.68**	**-**	**4.63**

Say Bricks 650 Nos. Cement 3.5 Bags, Moram 0.50 cmt, Messon 3 Nos., Labour 5 No.s

COST ANALYSIS

1. Brick	650 No.'s	@ 4600/-	Per Thousand	= Rs.2,990.00
2. Cement	3.50 Bag's	@ 320/-	Per Bag's	= Rs. 1120.00
3. Moram	0.50 Cmt.	@ 2600/-	Per Cmt.	= Rs. 1300.00
4. Messon	3.00 No.'s	@ 250/-	Per Messon	= Rs. 750.00
5. Labour	5.00 No.'s	@ 100/-	Per Labour	= Rs. 500.00
			Total Cost	**= Rs.6,660.00** **Say Rs.6,700.00**

ESTIMATE OF 'NADEP' COMPOST PIT'S

DETAIL'S OF MEASURMENT

Brick Work In Bed	4.00 x 2.50 x 0.11 = 1.100 Cmt.	
,, ,, ,, Long Wall	2 x 4.00 x 0.23 x 1.00 = 1.840 ,,	
,, ,, ,, Short Wall	2 x 2.00 x 0.23 x 1.00 = 0.920 ,,	
	Total B.W.	**= 3.860 ,,**
Deduction Of BrickWork	2 x 3 x 8 x 0.15 x 0.23 x 0.08 = 0.132 ,,	
	2 x 3 x 4 x 0.15 x 0.23 x 0.08 = 0.066 ,,	
	Total Deduction	**= 0.198 ,,**
	Total Net B.W.	**=3.662 Cmt.**
Plaster Work In Bed	3.50 x 1.90	= 6.650 Sq.mt.
	Total P.W	**= 6.650 Sq.mt.**

MATERIAL & LABOUR ANALYSIS

S. No.	Name Of The Work	Quantity	Unit	Brick's (In No.'s)		Cement(In Bag's)		Moram(In Cmt.)		Messon(In No.'s)		Labour(In No.'s)	
				Rate Per Cmt./ Sq.mt.	No.'s Of Brick	Rate Per Cmt./ Sq.mt.	No.'s Of Bag	Rate Per Cmt./ Sq.mt.	Cmt.	Rate Per Cmt./ Sq.mt.	No.'s Of Messon	Rate Per Messon	No.'s Of Labour
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**
1.	Brick Work	3.662	Cmt.	500	1831	1.80	6.59	0.275	1.007	1.00	3.66	2.00	7.32
2.	Plaster Work	6.650	Sq. mt.	-	-	0.11	0.73	0.015	0.099	8.00	0.83	1.50	1.24
Total		**-**	**-**	**-**	**1831**	**-**	**7.32**	**-**	**1.106**	**-**	**4.49**	**-**	**8.56**

Say Bricks 1850 Nos. Cement 7 Bags, Moram 1.20 cmt, Messon 5 Nos., Labour 9 No.s

COST ANALYSIS

1. Brick 1850 No.'s @ 4600/- Per Thousand = Rs. 8510.00
2. Cement 7.00 Bag's @ 320/- Per Bag's = Rs. 2240.00
3. Moram 1.20 Cmt. @ 2600/- Per Cmt. = Rs. 2,860.00
4. Messon 5.0 No.'s @ 250/- Per Messon = Rs. 1,250.00
5. Labour 9. 0 No.'s @ 100/- Per Labour = Rs. 900.00

Total Cost = Rs. 15,760.00 Say Rs. 15,800.00

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

DEMONSTRATION OF WHEAT

1- Variety recommended for District-Gorakhpur
Irrigated-W.H-542
Unirrigated –K-8027, k-5351(Mandakini)
Kathia-Raj 1555
2- Seed rate -100 -125 Kg/hectare
3- Requirement of fertilizers/ha N-125 Kg, P-70-75 Kg, K-70-75 Kg

ESTIMATE OF DEMONSTRATION OF WHEAT IN WATERSHED (PER ha)

S.No.	Particulars	Quantity	Rate	Amount	Remark
1	Tillage operation or preparation of field for sowing	1.0ha	1000.00/ha	1000.00	Since the project is to be operated in a participatory Mode, contribution in form of the tillage, sowing, irrigation and harvesting done by farmer is not included in the estimates
2	Cost of seed	100.00kg	18.00/kg	1800.00	
3	Sowing by seed drill	1.0ha	1000.00/ha	1000.00	
4	D.A.P. 18:46	160kg	573.00/ 50 kg	1833.60	
5	Urea	210kg	270.00/ 50 kg	1134.00	
6	Potash(M.O.P.)	150kg	300.00/50kg	900.00	
7	Irrigation(three irrigation)	1.00ha	650.00/ha	650.00	
8	Harvesting	1.00ha	2000.00/ha	2000.00	
Total				**5667.60**	
Say				**5700.00**	

Hence demonstration cost of wheat /ha is Rs. 5700.00

DEMONSTRATION OF GRAM IN WATERSHED AREA (per ha)

1- Variety - irrigated – vdai,KWR-108,
Rainfed – J.G-315, Avrodhi
2- Seed rate/ha -50-55kg
3- Fertilizer requirement/ha N-25.0 kg, P-80 kg, K-30 kg
4-

ESTIMATE FOR DEMONSTRATION OF GRAM(PER ha)

S.No.	Particulars	Quantity	Rate	Amount	Remark
1	Tillage operation in preparation of field and seed sowing	1.0ha (twice)	1000.00/ha	2000.00	Since the project is to be operated in participatory Mode, contribution by the farmer in the form of tillage, sowing operation, sowing and harvesting is not included in the estimates.
2	Cost of seed	55kg	90/kg	4950.00	
3	D.A.P	175kg	573.00/ 50 kg	2005.50	
4	M.O.P.	65kg	300.00/50kg	390.00	
5	Medicine	1.00ha	Lump sum	1250.00	
6	Harvesting	1.00ha	700.00/ha	700	
Total				**8595.50**	
Say				**Rs. 8600.00**	

Hence per hectare of demonstration –Rs. 8600.00

DEMONSTRATION OF ARHAR IN WATERSHED AREA(PER ha)

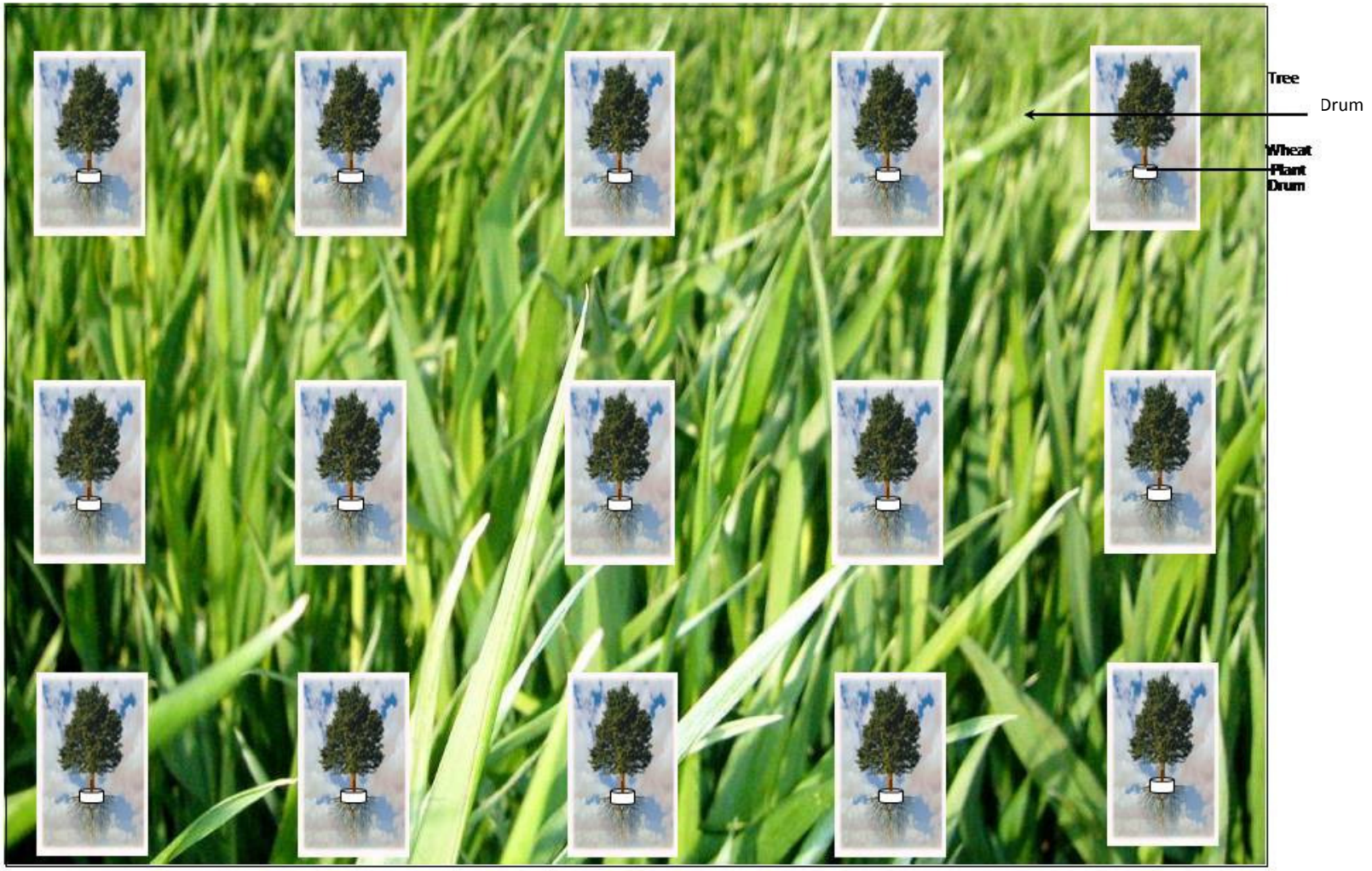
1- Variety - Malviya-13, narendra-1, Amar
2- Seed rate/ha -30 kg
3- Requirement of fertilizers/ha N-20.0 kg, P-50 kg, K-40 kg

ESTIMATE FOR DEMONSTRATION OF ARHAR (PER ha)

S.No.	Particulars	Quantity	Rate	Amount	Remark
1	Tillage operation in preparation of field and seed sowing	1.0ha	1000.00/ha	2000.00	Since the project is to be operated in participatory M0de, contribution by the farmer in the form of tillage, operation, sowing and harvesting provided by participating farmers, hence this cost is not included in the estimates.
2	Cost of seed	30.0kg	120.00/kg	3600.00	
3	Nitrogen N.P.K 16:32:16	190.0kg	470.00/50kg	1786.00	
4	Urea	-	-	-	
5	M.O.P.	-	-	-	
6	Harvesting	1.00 ha	650.00	650.00	
7	Medicine	1.00 ha	Lump sum	1000.00	
Total				**6386.00**	
Say				**Rs. 6400.00**	

Hence per hectare of demonstration –Rs. 6400.00

DEMONSTRATION OF AGRO-FORESTRY / HORTICULTURE



DEMONSTRATION OF AGRO-HORTICULTURE USING PLASTIC DRUM OF 2OO LITRES CAPACITY

District Gorakhpur is situated in Eastern U.P. region where there is scarcity of water and in summer temperature rises up to 51°c causing upper layer of fields dry and therefore mortality rate of plants is very high. Farmers usually like to grow grain crops only. They are not interested in horticulture because of less holding. The production of crops decreases below the tree.

Therefore to promote horticulture with crops a demonstration model using plastic drums for horticulture is made. Mainly crops roots go in to the soil up to "4-5" in cereal crops and "6-9" in pulses. Using plastic drums the plants will be planted 50-60 cm below the ground level which is below the root zone of crops. Therefore trees will not able to take nutrients from upper layer of fields and there will no effect of plants on crops.

In summer season up to 1 to 1.50m depth of soil becomes dry causes more mortality rate of plants, using drums plants are planted below 50-60 from Ground level and in rainy and winter season up to February roots of plants goes below 2.10m below where moisture will be available and plants will be safe in summer also. Using barbed wire fencing the plants will be protected.

Therefore, it is hoped that farmers will adapt this procedure for Agro-forestry and will become prosperous.

DETAIL ESTIMATE OF DEMONSTRATION OF HORTICULTURE AND MIXED CROPPING

For 1.00 Hectare

S.No.	Description of Work	No.	L.	B.	D./H.	Quantity
1.	Earth work in cutting	156	3.14 x 1.20	-	1.35	793.54
	Trench	156	1.50	0.75	0.75	131.62
	Fencing Poll	133	0.20	0.20	0.20	1.064
	Total					**926.22 cum**
2.	Farm yard manure	156x10				1560 kg
3.	Filling of earth work with farm yard manure	156	3.14 x 1.00	-	1.20	587.80 cum
4.	C.C.W. 1:2:4 for fencing poll	133	0.20	0.20	0.20	1.064 cum
5.	Angle iron for poll	133	1.80	-	-	239.40 m
6.	Barbed wire	3	400	-	-	1200.00 m
7.	Plants	156	-	-	-	156 nos.
8.	Plastic drums (200 litre)	156	-	-	-	156 nos.

CONSUMPTION OF MATERIALS

S.No.	Description of Work	Quantity	Farmyard Manure (kg)	Cement Bags (nos)	Coarse Sand (cum)	G.S.Grit 10-20 mm	Angle Iron (m)	Barbed Wire (kg)	Planting Drum (nos)
1.	C.C.W. 1:2:4	1.064 cum	-	6.49	0.446	0.883	-	-	-
2.	Angle iron	239.4 m	-	-	-	-	239.40	-	-
3.	Barbed wire	1200.0 m	-	-	-	-	-	1200.0	-
4.	Farmyard manure	1560.0 kg	1560 kg	-	-	-	-	-	-
5.	Plastic drum	156 nos.	-	-	-	-	-	-	156
Total			**1560.0 kg**	**6.49**	**0.446**	**0.883**	**239.40**	**1200.0**	**156**
Say			**1560.0 kg**	**6.50 bags**	**0.450 cum**	**0.900 cum**	**240.00**	**1200.0 m**	**156**

COST OF MATERIALS

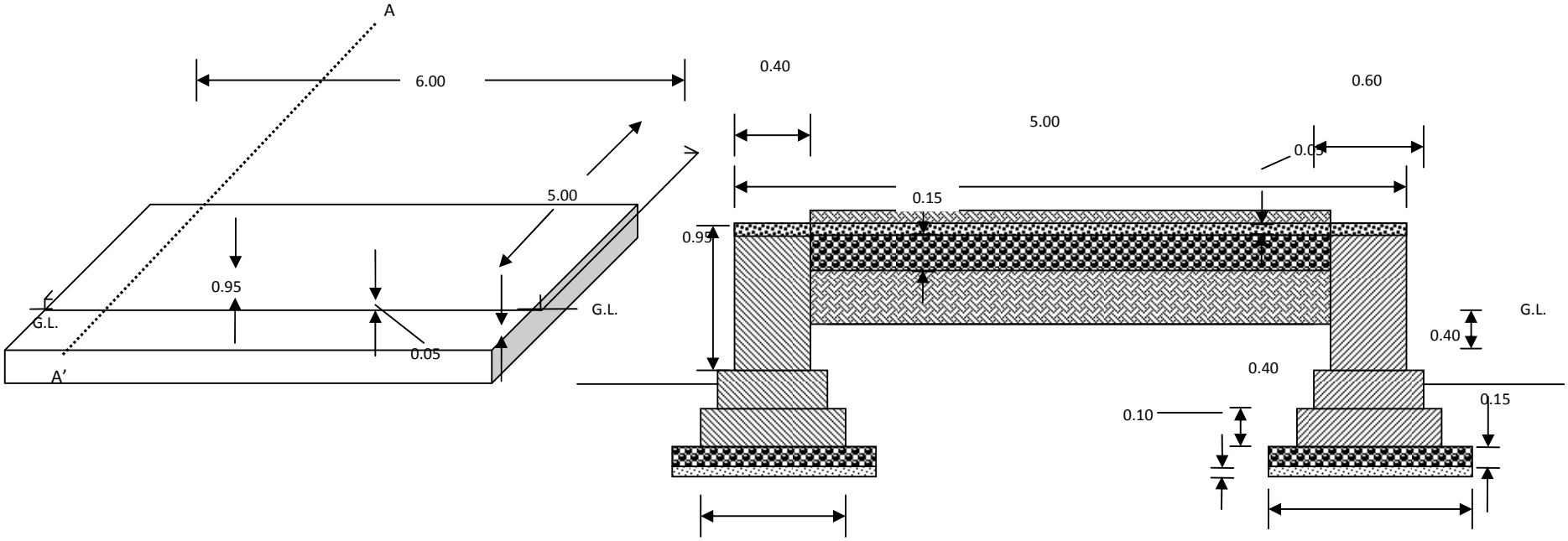
S.No.	Particulars	Quantity	Rate	Amount
1.	Farm yard manure	1560.0 kg	15.00/kg	23400.00
2.	Barbed wire	1200.0 m/120.0 kg	80.00/kg	9600.00
3.	Angle iron	240.00 m/840 kg	50.00/kg	42000.00
4.	Plastic drum	156 nos	800.00 each	124800.00
5.	Cement	6.50 bags	320.00/bag	2080.00
6.	Coarse sand	0.450 cum	2600.00/cum	1170.00
7.	G.S.Grit 10-20 mm	0.900 cum	1600.00/cum	1440.00
8.	Plants	156 nos	26.00 each	4056.00
Total				**Rs. 2,08,546.00**

LABOUR CHARGES

S.No.	Particulars	Quantity	Rate	Amount
1.	Earth work	1514.02 cum	37.00/cum	56018.74
2.	C.C.W. 1:2:4	1.064 cum	520.00/cum	553.28
3.	Fixing of angle iron	10 Man Days	370/Man Day	3700.00
4.	Fixing of barbed wire	15 Man Days	120/Man Day	1800.00
Total				**Rs. 62,072.02**

Total Expenditure	
1. Cost of materials	**2,08,546.00**
2. Labour Charges	**62,072.02**
Total	**Rs. 2,70,618.02**
Say	**Rs. 2,70,600.00 only**

DRAWING OF KRISHAK VIKAS MANCH



DESCRIPTION

DESCRIPTION

ISOMETRIC VIEW OF PLATFORM (CHABUTRA)

SECTION AT A-A'

1. C.C.W. - 1:4:8.
2. R.R. Stone masonry- 1:4
3. Plastering- 1:4
4. Raised Pointing- 1:3.

DETAIL ESTIMATE OF KRISHAK VIKAS MANCH

S.No.	Description of Work	No.	L.	B.	D/H	Quantity
1.	Earth work in foundation				1.10	
	Long Wall Short Wall	2	8.00	1.20 1.20	1.10	21.12
		2	4.00			10.56
	Total					**31.68 cum**
2.	Laying of Sand Long Wall					1.32
	Short Wall	2	6.60	1.00 1.00	0.10 0.10	0.72
		2	3.60			
	Total					**2.04 cum**
3.	C.C.W. 1:4:8 Long Wall					
	Short Wall	2	6.60	1.00 1.00	0.15 0.15	1.98
		2	3.60			1.08
	Total					**3.06 cum**
4.	Stone masonary work 1:4 in foundation & super structure					
	1st Footing.					
	Long Wall	2	6.40	0.80	0.40	4.096
	Short Wall	2	3.80	0.80	0.40	2.432
	2nd Footing					
	Long Wall	2	6.20	0.60	0.40	2.976
	Short Wall **Super**	2	4.00	0.60	0.40	1.920
	Structure					
	Long Wall	2	6.00	0.40	0.90	4.320
	Short Wall	2	4.20	0.40	0.90	3.024
	Total					**18.768 cum**

5.	Earth work in filling	1	5.20	4.20	0.75	16.38 cum
6.	C.C.W. 1:4:8	1	5.20	4.20	0.15	3.276 cum
7.	C.C.W. 1:2:4	1	6.00	5.00	0.05	1.500 cum
8.	Raised Pointing 1:3					
	Long Wall	2	6.00	-	0.90	10.80
	Short Wall	2	5.00	-	0.90	9.00
Total						**19.80 m^2**

ABSTRACT OF WORK

1.	Earth Work	31.68 + 16.38	48.06 cum
2.	Sand Laying		2.040 cum
3.	C.C.W. 1:4:8	3.060 + 3.276	6.336 cum
4.	Stone masonary 1:4		18.568 cum
5.	C.C.W. 1:2:4		1.500 cum
6.	Raised Pointing 1:3		19.80 m^2

CONSUMPTION OF MATERIALS

S.No.	Particulars	Quantity	Cement (cum)	Coarse Sand (cum)	Khanda (cum)	G.S.B. 25-40 mm (cum)	Stone Grit 10-20 mm (cum)
1.	Sand Laying	2.040 cum	-	2.040	-	-	-
2.	C.C.W 1:4:8	6.336 cum	21.54	2.851	-	5.892	-
3.	Stone Masonary	18.768 cum	45.04	6.381	18.768	-	-
4.	C.C.W. 1:2:4	1.500 cum	9.15	0.630	-	-	1.275
5.	Raised Pointing	19.800 m^2	0.91	0.093	-	-	-
Total			**76.64**	**11.995**	**18.768**	**5.892**	**1.275**
Say			**77 Bags**	**12.000**	**18.768**	**5.900**	**1.280**

COST OF MATERIALS

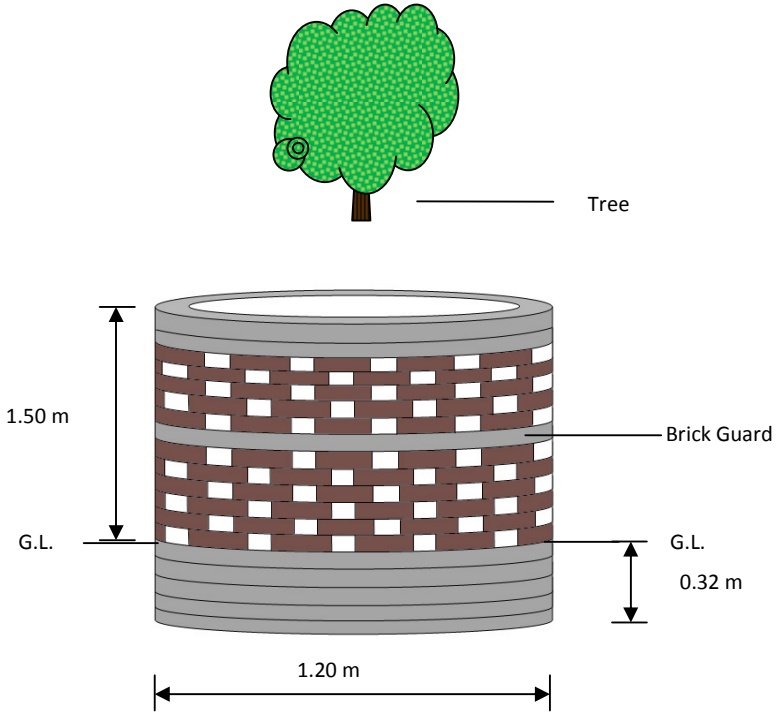
S.No.	Particulars	Quantity	Rate	Amount
1.	Cement	77 Bags	255/Bag	19635.00
2.	Coarse Sand	12.00 cum	910.00/cum	10920.00
3.	Khanda	18.768 cum	1025.00/cum	19237.20
4.	G.S.B. 25-40 mm	5.900 cum	855.00/cum	5044.00
5.	G.S. Grit 10-20 mm	1.280 cum	1250.00/cum	1600.00
Total				**Rs. 56,436.20**

LABOUR CHARGES

S.No.	Particulars	Quantity	Rate	Amount
1.	Earth Work	48.06 cum	36.66/cum	1761.87
2.	Sand Laying	2.060 cum	33.33/cum	68.65
3.	C.C.W. 1:4:8	6.336 cum	494.00/cum	3129.98
4.	C.C.W. 1:2:4	1.500 cum	494.00/cum	741.00
5.	R/R Stone Masonary 1:4	18.768 cum	370.00/cum	6944.16
6.	Raised Pointing 1:3	19.800 m^2	51.61/cum	1021.87
7.	Curing Charges	18.768 cum	25.00/cum	469.20
8.	Chowkidar	6 Man Days	100.00/Man Day	600.00
Total				**Rs. 14,736.73**

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

DRAWING OF BRICK GUARD



DESCRIPTION.

1. Brick work = 1:4.
2. Plastering = 1:4.
3. Thickness of wall = 0.11 m.
4. Total height of brick guard = 0.32 + 1.50 = 1.82 m.
5. Diameter = 1.2 m.

DETAIL ESTIMATE OF BRICK GUARD

S.No.	Description of work	No.	L	B	D/H	Quantity	
1.	Earthwork for tree	1	0.60	0.60	0.60	0.216	
	In foundation	1	3.14x1.09	0.20	0.30	0.205	
Total						**0.421**	
2.	Brick work 1:4					Solid	Glazed
	In foundation	1	3.14x1.09	0.11	0.40	0.151	-
	In super structure with glazed	1	3.14x1.09	0.11	0.48	-	0.181
	Solid	1	3.14x1.09	0.11	0.08	-	0.030
	Glazed	1	3.14x1.09	0.11	0.40	-	0.151
	Solid	1	3.14x1.09	0.11	0.16	0.060	-
Total						**0.211**	**0.362**
3.	Plastering 1:4	1	3.14x1.20	-	0.07	0.264	
		1	3.14x1.20	-	0.15	0.565	
		1	3.14x1.09	-	0.07	0.239	
Total						**1.068 m^2**	

CONSUMPTION OF MATERIALS

S.No.	Description of work	Quantity	Brick Nos.	Cement Bags	Coarse Sand
1.	Brick work 11 cm thick 1:4 Brick work glazed	0.211 cum 0.362 cum	100 86	0.29 0.25	0.050 0.043
2.	Plastering 1:4	1.068 m^2	-	0.11	0.016
Total			**186**	**0.65**	**0.109**
Say			**190**	**0.65**	**0.110 cum**

COST OF MATERIALS

S. No.	Particulars	Quantity	Rate	Amount
1.	Brick I^{st} class	190 nos.	3650.00	693.50
2.	Cement	0.65 Bags	255.00	165.75
3.	Coarse sand	0.110 cum	910.00	100.10
Total				**Rs. 959.35**

LABOUR CHARGES

S. No.	Particulars	Quantity	Rate	Amount
1.	Earth work	0.421 cum	39.16/cum	16.48
2.	Brick work	0.391 cum	370.00/cum	144.67
3.	Plastering	1.068 m^2	40.00/m^2	42.72
Total				**Rs. 203.87**

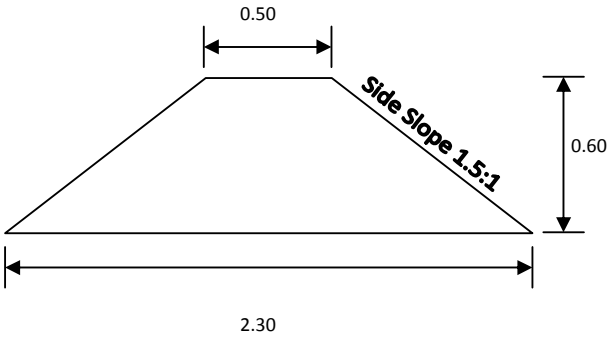
Head load and transportation 20% of material cost - Rs. 191.87

Total Expenditure		
1.	Material	2822.50
2.	Labour	1093.87
3.	Head load and transportation	1083.63
Total		**Rs. 5000.00**
		Say Rs. 5000.00 only.

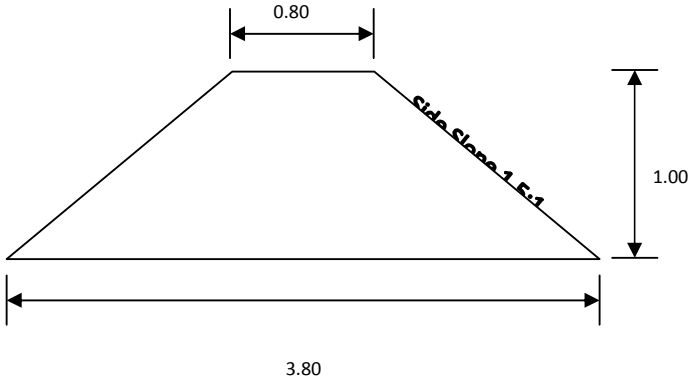
DETAILS ESTIMATE OF WATERSHED DEVELOPMENT WORK PHASE

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

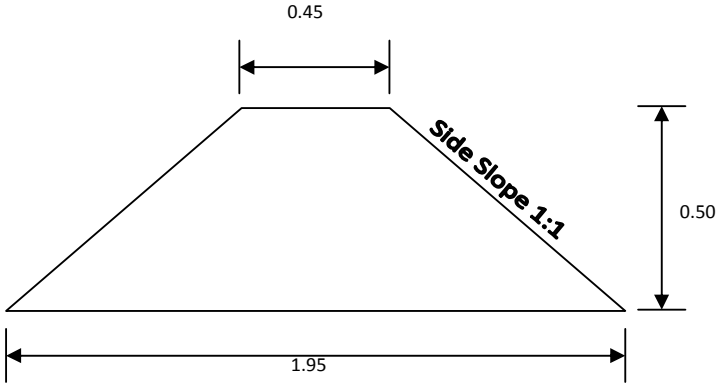
(Not to Scale)



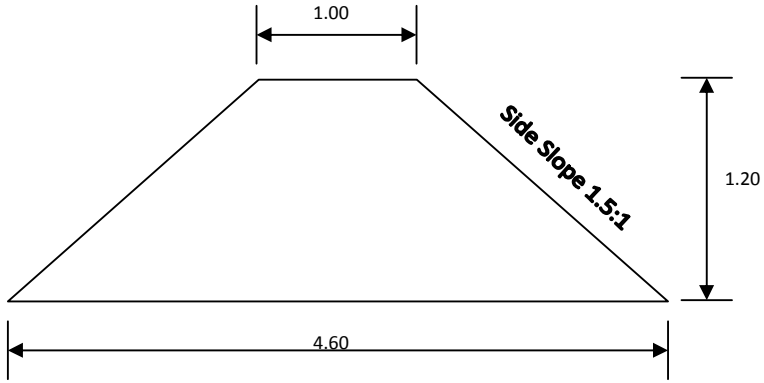
(C.B., Cross-Section – 0. 84 m^2)



(M.B., Cross-Section – 3.36m^2)



(Field Bund, Cross-Section – 0.60 m^2)



(S.B. /P.B., Cross-Section – 2.30 m^2)

(All dimensions in Metre)

Technical specification of Watershed work

Technical Specification of field Bund .

Particular	Value	Unit
Top Width	0.45	M
Height	0.50	M
Side slope	1.5:1	-
Bottom width	1.95	M
Cross section	0.60	M^2
Length /Ha	180.00	M
Earth work	108.00	CUM
Cost/ Ha	3518.00	Rs.

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

Particular	Value	Unit
Top Width	0.50	m
Height	0.60	m
Side Slope	1.5:1	-
Base of bund	2.30	m
Cross section	0.84	m^2
Length of bund/ha	120	m
Earth work	100.80	m^3
Cost/ Ha	3283.00	Rs..

Technical Specification of Submergence bund

Particular	Value	Unit
Top Width	0.80	m
Height of Bund	1.00	m
Side Slop	1.5:1	-
Base width	3.80	m
Cross section	2.30	m^2
Length of bund/ha	100.00	m
Earth work	230.00	cum
Cost/ Ha	7491.00	Rs.

Technical Specification of Marginal bund

Particular	Value	Unit
Top Width	1.00	m
Height of bund	1.20	m
Side Slop	1.5:1	-
Bottom width	4.60	m^2
Cross section	3.36	m^3
Cost/ metre	109.43 say Rs. 110.00	Rs..

DESIGN, DRAWING & ESTIMATE OF SPILLWAY CHECK DAM FOR 30.00 HA CATCHMENT AREA

Design of Drop Spillway to be constructed at a place in a gully having width of 4.0 m and catchment area 30 ha net drop 1.5 m Taking rainfall intensity for duration equal to time of concentration of watershed and design return period of 25 years , as 120mm/hr. The coefficient of runoff for the watershed is 0.3.

1. Hydrologic design- The design peak runoff rate (m^3/s) for the watershed from Rational formula is given as:

$$Q = \frac{C.I.A.}{360} = \frac{0.3 \times 120 \times 30.0}{360} = 3.0 \ m^3/s$$

2. Hydraulic design- The maximum discharge capacity of the rectangular weir given by

$$Q = \frac{1.711 \ L \ H^{3/2}}{(1.1+0.01 \ F)}$$

To find suitable value of L & H

Let us assume L = 3.0 m (since width of gulley is 4.00 m)

$$3.0 = \frac{1.711 \ L \ H^{3/2}}{(1.1+0.01 \times 1.5)} = \frac{1.711 \ L \ H^{3/2}}{(1.1+0.15)}$$

$$L \ H^{3/2} = \frac{3.00 \times 1.25}{1.711}$$

$$H^{3/2} = \frac{3.75}{1.711 \times 3} = 0.73$$

$$H = (0.73)^{2/3} = 0.80 \ m$$

Test: $L / h = 3.00/0.80 = 3.75 \geq 2.0$ hence O.K.

$h / f = \frac{0.80}{1.50} = 0.53 \leq$ which is approximately 0.50. Hence, O.K.

Hence the designed hydraulic dimensions of the Spillway are:

Crest Length (L) = 3.00 m

Weir depth (h) = 0.80 m

3. Structural design –

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

E = 3x0.80+0.6 or 1.5x1.50

E = 3.0 m or 2.25 m

Head wall extension = 3.0 m

2- Length of apron basin $L_B = f (2.28\ h/f + 0.54) = 1.5 (2.28 \times \frac{0.8}{1.5} + 0.54)$

$= 1.50 (1.216 + 0.54) = 1.5 \times 1.756$

$= 2.634$ m says 2.63 m

3- Height of end sill , $S = \frac{h}{3} = \frac{0.80}{3} = 0.26$ m

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

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

= 2 x 0.80 or [1.50+0.80+0.26 – (2.63+0.10)/2]

= 1.6 or [2.56 – 1.365]

= 1.6 or 1.195

adopt J = 1.60 m

5- M = 2 (f + 1.33 h - J) = 2 (1.50 + 1.33 x 0.80 – 1.60) = 2 (2.564 – 1.60)

= 1.928 m

6- K = (L_B + 0.1) - M = (2.63 + 0.1) – 1.93

= 0.80 m

Toe and cut off walls

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

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

= 0.473 x 1.442

= 0.68 m

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

= 1.5 x 0.68

= 1.02 m

Depth of cutoff /Toe wall = 1.02 m

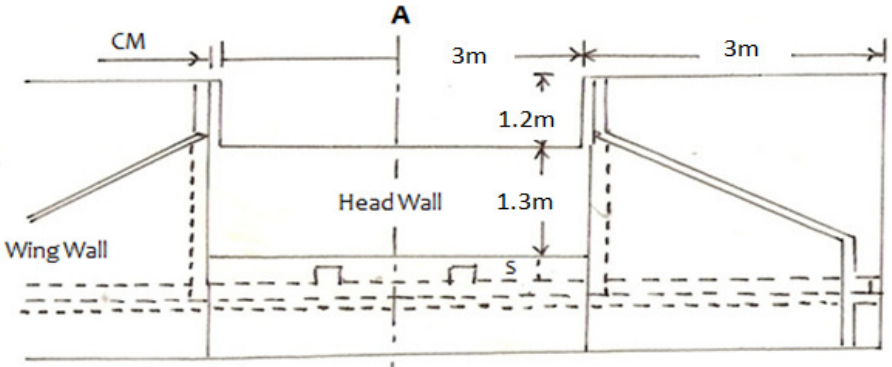
Apron thickness: For an over fall of 1.50 m. The Apron thickness in concrete construction is 0.30 m since the structure is constructed in masonry, the Apron thickness will be 0.30 x 1.50 = 0.45 m

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

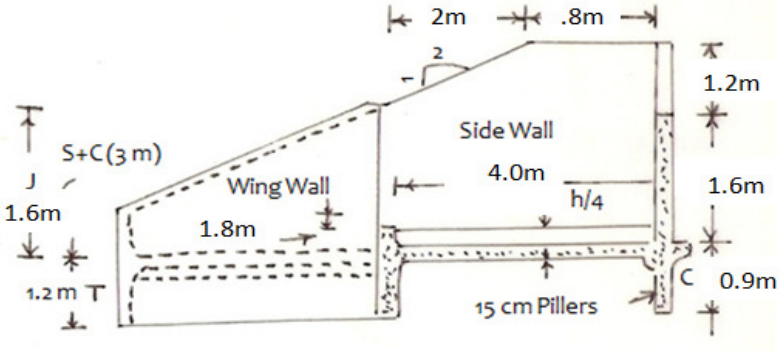
Description	**Thickness of wall**	
	Top width	**Bottom width**
Head wall	0.45	1.33
Side wall	0.30	1.10
Wing wall and head wall extension	0.30	0.80

DRAWING OF SPILLWAY CHECK DAM OF CREST LENGTH 3.0 m

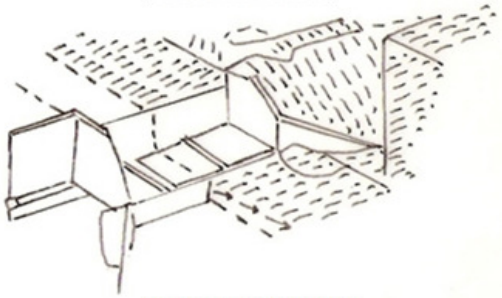
Not to Scale



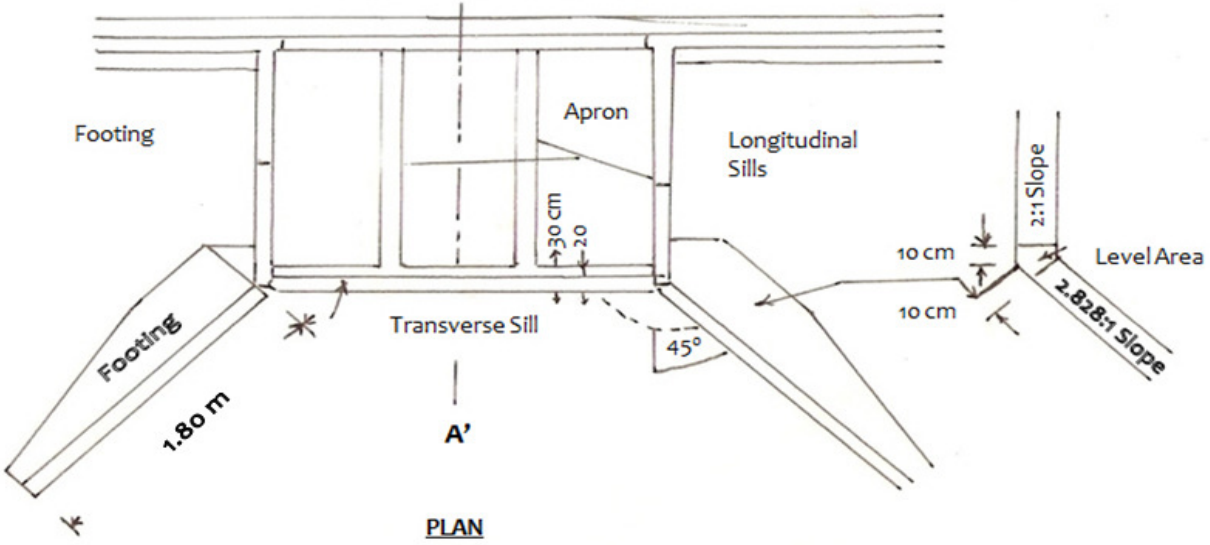
DOWN STREAM ELEVATION



SECTION ON A-A'



PERSPECTIVE VIEW



PLAN

1. Earth work in cutting in foundation

S.No.	Description of work	No.	L	B	D/H	Quantity
1	Side wall	2	3.40	1.20	1.20	9.792
2	Head wall	1	3.00	1.60	1.20	5.760
3	Head wall extension	2	3.00	1.00	1.20	7.200
4	Wing wall	2	1.80	1.20	1.20	5.184
5	Toe wall	1	3.00	1.00	1.20	3.600
6	Cut off wall	1	9.00	1.00	1.20	10.800
7	Apron	1	3.00	2.65	0.80	6.480
8	Earthen Bund Both Side	2	100.00	4.00+7.00/2	1.50	1650.00
					Total	1698.816 cum
					Say	1700.00 cum

2. Laying of sand in the bed of foundation

S.No.	**Description of work**	**No.**	**L**	**B**	**D/H**	**Quantity**
1	Side wall	2	3.40	1.00	0.15	1.020
2	Head wall	1	3.00	0.60	0.15	0.270

3	Wing wall	2	1.80	1.00	0.15	0.540
4	Toe wall	1	3.00	0.80	0.15	0.360
5	Cut off wall	1	9.00	1.00	0.15	1.350
6	Apron	1	3.00	2.70	0.15	1.215
					Total	4.755 cum
					Say	5.00 cum

3. C.C.W. 1: 3: 6 in foundation

S.No.	Description of work	No.	L	B	D/H	Quantity
1	Cut off wall	1	9.00	1.00	0.20	1.800
2	Head wall	1	3.00	0.60	0.20	0.360
3	Side wall	2	3.40	1.00	0.20	1.360
4	Wing wall	2	1.80	1.00	0.20	0.720
5	Toe wall	1	3.00	0.80	0.20	0.480
6	Apron	1	3.00	2.20	0.20	1.620
			Total			6.340 cum
			Say			6.500 cum

4. Brick masonry 1:4

S.No.	Description of work	No.	L	B	D/H	Quantity
1	Cut off wall	1	9.00	1.00	0.90	8.100
2	Head wall	1	3.00	1.50	0.90	4.050
		1	3.00	(1.50+0.50) /2	1.50	4.500
3	Head wall extension	2	3.00	0.80	0.45	2.160
		2	3.00	0.60	0.45	1.620
		2	3.00	0.60	0.60	2.160
		2	3.00	0.50	0.60	1.800
		2	3.00	0.40	1.30	3.120
4	Side wall	2	3.40	1.00	0.45	3.060
		2	3.60	0.80	0.45	2.592
		2	3.80	0.60	0.60	2.736
		2	3.90	0.50	1.00	3.900
		2	(4.00+1.40) /2	0.40	1.50	3.240
5	Wing wall	2	1.80	1.00	0.45	1.620
		2	1.80	0.80	0.45	1.296
		2	1.80	0.50	(1.60+0) /2	1.440
6	Toe wall	1	3.00	0.80	0.45	1.080
		1	3.00	0.60	0.45	0.810
		1	3.00	0.40	0.30	0.360
7	Apron	1	3.00	2.70	0.45	3.645
8	Longitudinal sill	2	2.60	0.20	0.45	0.468
					Total	53.757 cum
					Say	54.000 cum

5. Tuck Pointing 1:3

S.No.	Description of work	No.	L	B	D/H	Quantity
1	Head wall	1	3.00	-	1.00	3.00
		1	3.00	-	1.18	3.54
2	Side wall	2	3.40	-	1.60	10.88
		2	(1.40+3.40)/2	-	1.50	7.20
3	Head wall extension	2	3.00	-	1.50	9.00
4	Wing wall	2	1.80	-	(1.60+0)/2	2.88
					Total	36.50 m^2
					Say	37.00 m^2

CONSUMPTION OF MATERIALS

S.No.	Particulars	Quantity	Cement (Bags)	Fine Sand (cum)	Bricks No.	G.S.B 25-40 mm (cum)	Moram (cum)
1	Sand laying	5.000 cum	-	5.00	-	-	-
2	C.C.W. 1:3:6	6.500 cum	29.25	-	-	5.85	2.92
3	B/M 1:4	54.000cum	108.00	-	27000	-	14.85
4	Raised Pointing 1:3	37.000 m^2	1.11	-	-	-	0.18
		Total	138.36	5.00	27000	5.85	17.95
		Say	140.00	5.00	27000	6.00	18.00

COST OF MATERIALS

S.N0	Name of materials	Quantity	Rate	Amount
1	Cement (Bags)	140	260.00	36400.00
2	Coarse sand (cum)	18.00	2600.00	46800.00
3	Brick (No.)	27000	4600.00	124200.00
4	G.S.B. 25-40 mm (cum)	6.00	3000.00	18000.00
5	Fine Sand (cum)	5.00	1200.00	6000.00
Total				**231400.00**

LABOUR CHARGE

S.No.	Particulars	Quantity	Rate	Amount
1.	Earth Work	1700.00 cum	50.00/cum	85000.00
2.	Sand Laying	5.00 cum	40.00/cum	200.00
3.	C.C.W. 1:3:6	6.50 cum	550.00/cum	3575.00
4.	B/w 1:4	54.00 cum	450.00/cum	24300.00
5.	Raised Pointing	37.00 m^2	60.00/m^2	2220.00
6.	Curing	54.00 cum	30.00/cum	1620.00
7.	Chowkidar	20 Man Days	100.00/Man Day	2000.00
8.	Head load & local transportation cost 21.5% cost of material Rs. 231400	-	-	49751.00
	Total			**Rs. 168666.00**

Total Expenditure	
1. Cost of materials	231400.00
2. Labour Charges	168666.00
Total	**Rs. 400066.00**
	Say Rs. 400000.00 only

DRAWING AND DETAIL EATIMATE OF LIVLIHOOD WATERSHED WORK PHASE

PREPARATION OF COMPOST BY NADEF & BURMY METHOD

Nadef is the name of inventor of this method. In this method glazed pit of brick masonry above Ground level is made as shown in the drying. In this method by using a little quantity of cow during, and crop residue, leaf of trees, straw and other organic materials. The method of filling up the pit is below.

First of all best soil of pond or field is spread in the bottom of pit as least 3" thickness and then one layer of 6" thickness and other agriculture waste is made then best soil is spread on it and on this layer the liquid made of cow dung is spread to wet the crop residue, straw etc. this method is repeated until the pit is net completely filled up. On the top layer of this material a bulk is made and then the pit is closed by earthen gara. Water is spread on the top of bulk and from glazed side weekly. This process is repeated to moist the filling material always. The decomposition in filling material started and within six month filled material becomes compost khad.

ESTIMATE OF 'BARMY' COMPOST PIT'S

DETAIL'S OF MEASURMENT

Brick Work In Bed	3.50 x 1.50 x 0.11	= 0.577 Cmt.
,, ,, ,, Long Wall	2 x 3.50 x 0.23 x 0.32	= 0.515 ,,
,, ,, ,, Short Wall	2 x 1.00 x 0.23 x 0.23	= 0.147 ,,
	Total B.W.	**= 1.239 Cmt.**
Plaster Work In Bed	3.00 x 1.00	= 3.000 Sq.mt.
,, ,, ,, Long Wall	2 x 3.00 x 0.32	= 1.920 ,, ,,
,, ,, ,, Long Wall	2 x 3.50 x 0.23	= 1.610 ,, ,,
,, ,, ,, Long Wall	2 x 3.50 x 0.40	= 2.800 ,, ,,
,, ,, ,, Short Wall	2 x 1.00 x 0.32	= 0.640 ,, ,,
,, ,, ,, Short Wall	2. x 1.00 x 0.23	= 0.460 ,, ,,
,, ,, ,, Short Wall	2 x 1.50 x 0.40	= 1.200 ,, ,,
	Total P.W.	**=11.630 Sq.mt.**

MATERIAL & LABOUR ANALYSIS

S. No.	Name Of The Work	Quantity	Unit	Brick's (In No.'s)		Cement(In Bag's)		Moram(In Cmt.)		Messon(In No.'s)		Labour(In No.'s)	
				Rate Per Cmt./ Sq.mt.	No.'s Of Brick	Rate Per Cmt./ Sq.mt.	No.'s Of Bag	Rate Per Cmt./ Sq.mt.	Cmt.	Rate Per Cmt./ Sq.mt	No.'s Of Messon	Rate Per Messon	No.'s Of Labour
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**
1.	Brick Work	1.239	Cmt.	500	620	1.80	2.23	0.275	0.340	1.00	1.23	2.00	2.46
2.	Plaster Work	11.630	Sq. mt.	-	-	0.11	1.27	0.015	0.174	8.00	1.45	1.50	2.17
Total		**-**	**-**	**-**	**620**	**-**	**3.50**	**-**	**0.514**	**-**	**2.68**	**-**	**4.63**

Say Bricks 650 Nos. Cement 3.5 Bags, Moram 0.50 cmt, Messon 3 Nos., Labour 5 No.s

COST ANALYSIS

1. Brick	650 No.'s	@ 4600/-	Per Thousand	= Rs.2,990.00
2. Cement	3.50 Bag's	@ 260/-	Per Bag's	= Rs. 910.00
3. Moram	0.50 Cmt.	@ 2600/-	Per Cmt.	= Rs. 1300.00
4. Messon	3.00 No.'s	@ 250/-	Per Messon	= Rs. 750.00
5. Labour	5.00 No.'s	@ 100/-	Per Labour	= Rs. 500.00
		Total Cost	**= Rs.6,450.00**	**Say Rs.6,450.00**

ESTIMATE OF 'NADEP' COMPOST PIT'S

DETAIL'S OF MEASURMENT

Brick Work In Bed 4.00 x 2.50 x 0.11 = 1.100 Cmt.

,, ,, ,, Long Wall 2 x 4.00 x 0.23 x 1.00 = 1.840 ,,

,, ,, ,, Short Wall 2 x 2.00 x 0.23 x 1.00 = 0.920 ,,

Total B.W. = 3.860 ,,

Deduction Of BrickWork 2 x 3 x 8 x 0.15 x 0.23 x 0.08 = 0.132 ,,

2 x 3 x 4 x 0.15 x 0.23 x 0.08 = 0.066 ,,

Total Deduction = 0.198 ,,

Total Net B.W. =3.662 Cmt.

Plaster Work In Bed 3.50 x 1.90 = 6.650 Sq.mt.

Total P.W = 6.650 Sq.mt.

MATERIAL & LABOUR ANALYSIS

S. No.	Name Of The Work	Quantity	Unit	Brick's (In No.'s)		Cement(In Bag's)		Moram(In Cmt.)		Messon(In No.'s)		Labour(In No.'s)	
				Rate Per Cmt./ Sq.mt.	No.'s Of Brick	Rate Per Cmt./ Sq.mt.	No.'s Of Bag	Rate Per Cmt./ Sq.mt.	Cmt.	Rate Per Cmt./ Sq.mt.	No.'s Of Messon	Rate Per Messon	No.'s of Labour
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**
1.	Brick Work	3.662	Cmt.	500	1831	1.80	6.59	0.275	1.007	1.00	3.66	2.00	7.32
2.	Plaster Work	6.650	Sq. mt.	-	-	0.11	0.73	0.015	0.099	8.00	0.83	1.50	1.24
Total		**-**	**-**	**-**	**1831**	**-**	**7.32**	**-**	**1.106**	**-**	**4.49**	**-**	**8.56**

Say Bricks 1850 Nos. Cement 7 Bags, Moram 1.20 cmt, Messon 5 Nos., Labour 9 No.s

COST ANALYSIS

1. Brick	1850 No.'s	@	4600/-	Per Thousand	= Rs. 8510.00
2.Cement	7.00 Bag's	@	260/-	Per Bag's	= Rs. 1,820.00
3. Moram	1.20 Cmt.	@	2600/-	Per Cmt.	= Rs. 2,860.00
4. Messon	5.0 No.'s	@	250/-	Per Messon	= Rs. 1,250.00
5. Labour	9. 0 No.'s	@	100/-	Per Labour	= Rs. 900.00

Total Cost = Rs. 15,600.00 Say Rs. 15,600.00

DAIRY WORK

In income generating activities through Self Help Group, landless and marginal farmers are advised to use three or four cows of *SANKER* breed or two or three buffalos of *MURRA* breed, for their good life.

Establishment of Goat Units for S.H.G.'s formed in I.W.M.P. II Gorakhpur

Project

District Gorakhpur is situated in eastern Uttar Pradesh where the number of sheep is very less and they are small in nature. Goat population is appreciable and in fact, it is the major source of livelihood for poor people of the district.

In the state, on an average, 16 kg of meat is obtained from a goat, if they are de-wormed twice, there shall be increment of 4 kg in meat on an average, benefiting the farmers of the state.

De-worming and vitamins, mineral- supplement to the goats shall enhance their productivity and also improve anti-body response and protection level through vaccination, i.e., importance in efficiency of vaccination. More productivity and assured health and low mortality shall result into adoption of more farmers to goat farming with the formation of more S.H.G.'s and in turn availability of goats for processing units.

Goat excreta shall be of immense help in enrichment of soil fertility.

Establishment of Goat Units for S.H.G.'s

This region, due to the geo-climate conditions and land pattern is favourable for goat husbandry. Goats thrive well in dry and semi-dry climate with bushes and thorny vegetation. Presently in this area, farmers rear goats for their livelihood. If goat husbandry would be transformed to intensive husbandry, there shall be more economic stability of farmers, more profit sharing and availability of running capital for future expansion. Keeping in view the above facts, goat units shall be formed in the area in intensive way.

Goat Units are proposed in I.W.M.P. IInd Project for S.H.G. One unit constituting 10 goats and 1 buck will be distributed to one S.H.G.

A register of S.H.G. will be maintained by Secretary of S.H.G. in the supervision of W.D.T. member. The details of beneficiaries of S.H.G. including the breed of goat reared, breeding and feeding status, de-worming status, deaths, post mortem conducted claim settlement and working status of unit will be maintained in the register.

Preferences shall be given in consecutive years in purchasing the goats and bucks for new units, from old units for which database maintained shall be of use and it should be assured by buy back arrangement.

Financial Component

S.No.	Component	Amount
1.	Cost of 10 goats of improved breed (not less than 6 months of age) @ Rs. 3000.00 each	30000.00
2.	Cost of 1 buck of improved breed @ Rs. 5000.00	5000.00
3.	Cost of insurance @ 11.63 / unit	4070.00
4.	Feed cost for 3 months @ 250 gm/ day for goats @ Rs. 11.84/ 250 gm	2930.40
5.	Provision of de-worming, mineral and vitamin supplement, treatment, vaccination @ Rs.160/ animal	1760.00
6.	The expense including monitoring expenses, register and records @ Rs. 170.00/ unit	170.00
	Total	**Rs. 43,930.40**
		Say Rs. 43,950.00

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

DEMONSTRATION OF WHEAT

4- Variety recommended for District-Gorakhpur
Irrigated-W.H-542
Unirrigated –K-8027, k-5351(Mandakini)
Kathia-Raj 1555

5- Seed rate -100 -125 Kg/hectare

6- Requirement of fertilizers/ha N-125 Kg, P-70-75 Kg, K-70-75 Kg

ESTIMATE OF DEMONSTRATION OF WHEAT IN WATERSHED (PER ha)

S.No.	Particulars	Quantity	Rate	Amount	Remark
1	Tillage operation or preparation of field for sowing	1.0ha	1000.00/ha	1000.00	Since the project is to be operated in a participatory Mode, contribution in form of the tillage, sowing, irrigation and harvesting done by farmer is not included in the estimates
2	Cost of seed	100.00kg	18.00/kg	1800.00	
3	Sowing by seed drill	1.0ha	1000.00/ha	1000.00	
4	D.A.P. 18:46	160kg	573.00/ 50 kg	1833.60	
5	Urea	210kg	270.00/ 50 kg	1134.00	
6	Potash(M.O.P.)	150kg	300.00/50kg	900.00	
7	Irrigation(three irrigation)	1.00ha	650.00/ha	650.00	
8	Harvesting	1.00ha	2000.00/ha	2000.00	
Total				**5667.60**	
Say				**5700.00**	

Hence demonstration cost of wheat /ha is Rs. 5700.00

DEMONSTRATION OF GRAM IN WATERSHED AREA (per ha)

5- Variety - irrigated – vdai,KWR-108,
Rainfed – J.G-315, Avrodhi
6- Seed rate/ha -50-55kg
7- Fertilizer requirement/ha N-25.0 kg, P-80 kg, K-30 kg
8-

ESTIMATE FOR DEMONSTRATION OF GRAM(PER ha)

S.No.	Particulars	Quantity	Rate	Amount	Remark
1	Tillage operation in preparation of field and seed sowing	1.0ha (twice)	1000.00/ha	2000.00	Since the project is to be operated in participatory Mode, contribution by the farmer in the form of tillage, sowing operation, sowing and harvesting is not included in the estimates.
2	Cost of seed	55kg	90/kg	4950.00	
3	D.A.P	175kg	573.00/ 50 kg	2005.50	
4	M.O.P.	65kg	300.00/50kg	390.00	
5	Medicine	1.00ha	Lump sum	1250.00	
6	Harvesting	1.00ha	700.00/ha	700	
Total				**8595.50**	
Say				**Rs. 8600.00**	

Hence per hectare of demonstration –Rs. 8600.00

DEMONSTRATION OF ARHAR IN WATERSHED AREA(PER ha)

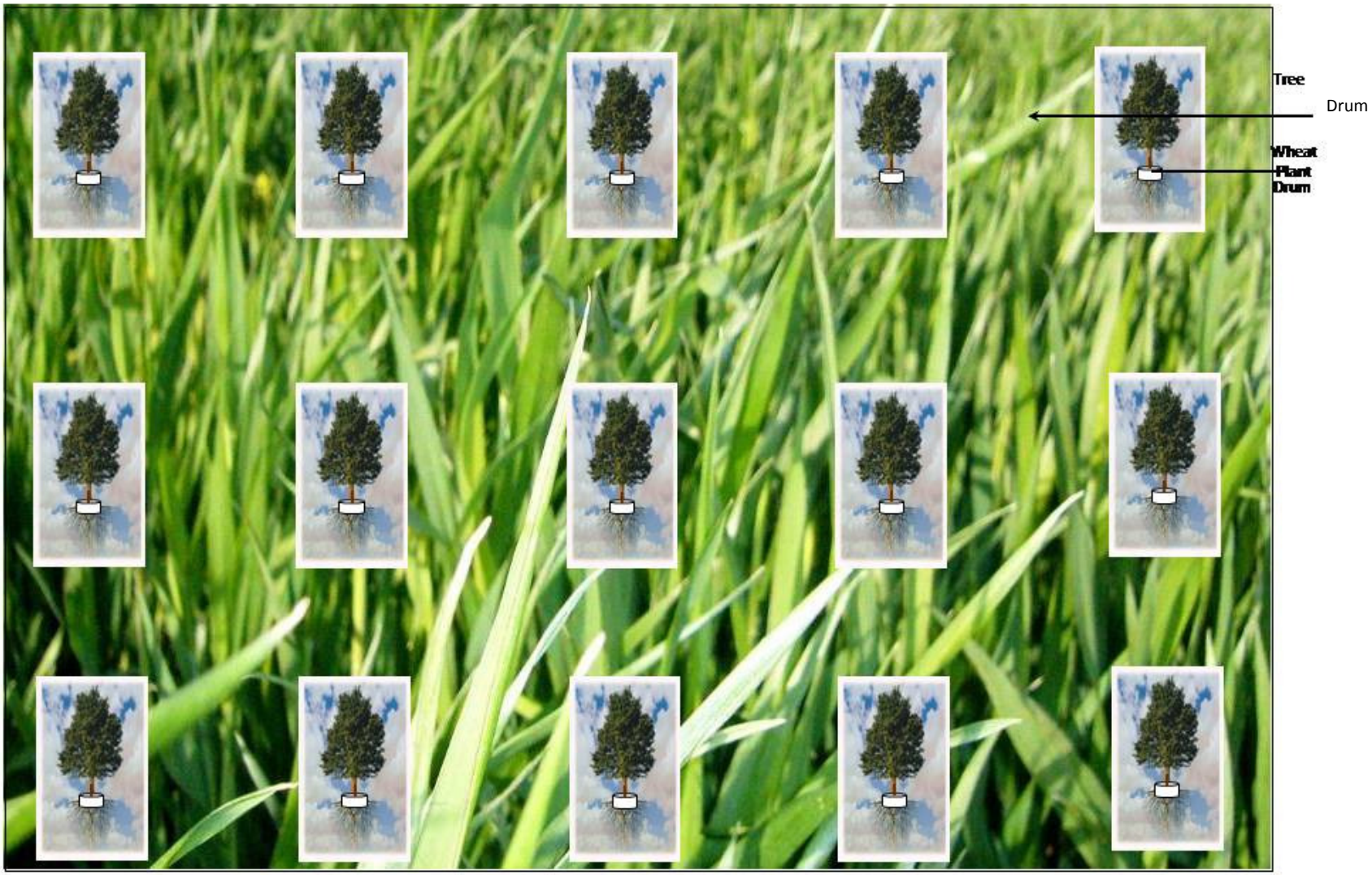
4- Variety - Malviya-13, narendra-1, Amar
5- Seed rate/ha -30 kg
6- Requirement of fertilizers/ha N-20.0 kg, P-50 kg, K-40 kg

ESTIMATE FOR DEMONSTRATION OF ARHAR (PER ha)

S.No.	Particulars	Quantity	Rate	Amount	Remark
1	Tillage operation in preparation of field and seed sowing	1.0ha	1000.00/ha	2000.00	Since the project is to be operated in participatory M0de, contribution by the farmer in the form of tillage, operation, sowing and harvesting provided by participating farmers, hence this cost is not included in the estimates.
2	Cost of seed	30.0kg	120.00/kg	3600.00	
3	Nitrogen N.P.K 16:32:16	190.0kg	470.00/50kg	1786.00	
4	Urea	-	-	-	
5	M.O.P.	-	-	-	
6	Harvesting	1.00 ha	650.00	650.00	
7	Medicine	1.00 ha	Lump sum	1000.00	
Total				**6386.00**	
Say				**Rs. 6400.00**	

Hence per hectare of demonstration –Rs. 6400.00

DEMONSTRATION OF AGRO-FORESTRY / HORTICULTURE



DEMONSTRATION OF AGRO-HORTICULTURE USING PLASTIC DRUM OF 2OO LITRES CAPACITY

District Gorakhpur is situated in Eastern U.P. region where there is scarcity of water and in summer temperature rises up to 51°c causing upper layer of fields dry and therefore mortality rate of plants is very high. Farmers usually like to grow grain crops only. They are not interested in horticulture because of less holding. The production of crops decreases below the tree.

Therefore to promote horticulture with crops a demonstration model using plastic drums for horticulture is made. Mainly crops roots go in to the soil up to "4-5" in cereal crops and "6-9" in pulses. Using plastic drums the plants will be planted 50-60 cm below the ground level which is below the root zone of crops. Therefore trees will not able to take nutrients from upper layer of fields and there will no effect of plants on crops.

In summer season up to 1 to 1.50m depth of soil becomes dry causes more mortality rate of plants, using drums plants are planted below 50-60 from Ground level and in rainy and winter season up to February roots of plants goes below 2.10m below where moisture will be available and plants will be safe in summer also. Using barbed wire fencing the plants will be protected.

Therefore, it is hoped that farmers will adapt this procedure for Agro-forestry and will become prosperous.

DETAIL ESTIMATE OF DEMONSTRATION OF HORTICULTURE AND MIXED CROPPING

For 1.00 Hectare

S.No.	Description of Work	No.	L.	B.	D./H.	Quantity
1.	Earth work in cutting	156	3.14 x 1.20	-	1.35	793.54
	Trench	156	1.50	0.75	0.75	131.62
	Fencing Poll	133	0.20	0.20	0.20	1.064
	Total					**926.22 cum**
2.	Farm yard manure	156x10				1560 kg

3.	Filling of earth work with farm yard manure	156	3.14 x 1.00	-	1.20	587.80 cum
4.	C.C.W. 1:2:4 for fencing poll	133	0.20	0.20	0.20	1.064 cum
5.	Angle iron for poll	133	1.80	-	-	239.40 m
6.	Barbed wire	3	400	-	-	1200.00 m
7.	Plants	156	-	-	-	156 nos.
8.	Plastic drums (200 litre)	156	-	-	-	156 nos.

CONSUMPTION OF MATERIALS

S.No.	Description of Work	Quantity	Farmyard Manure (kg)	Cement Bags (nos)	Coarse Sand (cum)	G.S.Grit 10-20 mm	Angle Iron (m)	Barbed Wire (kg)	Planting Drum (nos)
1.	C.C.W. 1:2:4	1.064 cum	-	6.49	0.446	0.883	-	-	-
2.	Angle iron	239.4 m	-	-	-	-	239.40	-	-
3.	Barbed wire	1200.0 m	-	-	-	-	-	1200.0	-
4.	Farmyard manure	1560.0 kg	1560 kg	-	-	-	-	-	-
5.	Plastic drum	156 nos.	-	-	-	-	-	-	156
Total			**1560.0 kg**	**6.49**	**0.446**	**0.883**	**239.40**	**1200.0**	**156**
Say			**1560.0 kg**	**6.50 bags**	**0.450 cum**	**0.900 cum**	**239.40**	**1200.0 m**	**156**

COST OF MATERIALS

S.No.	Particulars	Quantity	Rate	Amount
1.	Farm yard manure	1560.0 kg	10.00/kg	15600.00
2.	Barbed wire	1200.0 m/120.0 kg	60.50/kg	7260.00

3.	Angle iron	239.40 m/785 kg	40.50/kg	31792.50
4.	Plastic drum	156 nos	690.00 each	107640.00
5.	Cement	6.50 bags	255.00/bag	1657.50
6.	Coarse sand	0.450 cum	910.00/cum	409.50
7.	G.S.Grit 10-20 mm	0.900 cum	1250.00/cum	1125.00
8.	Plants	156 nos	18.00 each	2808.00
Total				**Rs. 1,68,292.50**

LABOUR CHARGES

S.No.	Particulars	Quantity	Rate	Amount
1.	Earth work	1514.02 cum	36.66/cum	55503.97
2.	C.C.W. 1:2:4	1.064 cum	492.00/cum	523.88
3.	Fixing of angle iron	10 Man Days	100/Man Day	1000.00
4.	Fixing of barbed wire	15 Man Days	100/Man Day	1500.00
Total				**Rs. 58,527.85**

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

Estimate of Orchard Development in the Watersheds Per Hectare (With Fencing)

S.No.	Particulars	Quantity	Rate	Amount	Remarks
A. Horticulture					
1.	Soil working 1m x 1m x 1m size pits (270nos.) including cost of refilling	270.00 cum	36.66/cum	9898.20	Since, the project is to be operated in a participatory mode, contribution in the form of labour input for pit digging, FYM and its applications, weeding and hoeing are to be provided by the participating farmers, hence the costs are not included in the estimates.
2.	Application of Farmyard Manure, including cost		L.S.	450.00	
3.	Cost of NPK mixture, neemicide @ 250 gm/plant		L.S.	400.00	
4.	Cost of plants (including 15% etc. for mortality) including transportation and planting	310 nos.	15.00/Plant	4650.00	
5.	Casualty replacement @ 10% of item No. 4 & 5			465.00	
6.	Cost of 2 weedings and hoeing		1.00/Plant	540	
7.	Contingency and unforeseen (3%)			492.00	
	Total			**Rs. 6,007.00**	
	Say			**Rs. 6,000.00**	
	Maintenance cost 2nd year onwards – 15 % of 1st year cost			900.00	
	For next 5 years i.e., Rs. 900 x 5			4500.00	
	Total Cost			**Rs. 10,500.00**	
	Say			**Rs. 10,500.00**	
B. Agro-Horticulture (cost per ha)					
1.	Cost of raising 270 plants up to 5 years @ Rs. 10,000.00			10500.00	The remarks mentioned under Horticulture are also applicable for Agro-Horticulture.
2.	Cost of raising agricultural crops @ Rs. 5,000 per hectare per year			5000.00	
3.	Fencing			45300.00	
	Total			**Rs. 60,800.00**	

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

S.No.	Particulars	Quantity	Rate	Amount	Remarks
A. Horticulture					
1.	Soil working 1m x 1m x 1m size pits (270nos.) including cost of refilling	270.00 cum	36.66/cum	9898.20	Since, the project is to be operated in a participatory mode, contribution in the form of labour input for pit digging, FYM and its applications, weeding and hoeing are to be provided by the participating farmers, hence the costs are not included in the estimates.
2.	Application of Farmyard Manure, including cost		L.S.	450.00	
3.	Cost of NPK mixture, neemicide @ 250 gm/plant		L.S.	400.00	
4.	Cost of plants (including 15% etc. for mortality) including transportation and planting	310 nos.	15.00/Plant	4650.00	
5.	Casualty replacement @ 10% of item No. 4 & 5			465.00	
6.	Cost of 2 weedings and hoeing		1.00/Plant	540	
7.	Contingency and unforeseen (3%)			492.00	
	Total			**Rs. 6,007.00**	
	Say			**Rs. 6,000.00**	
	Maintenance cost 2nd year onwards – 15 % of 1st year cost			900.00	
	For next 5 years i.e., Rs. 900 x 5			4500.00	
	Total Cost			**Rs. 10,500.00**	
	Say			**Rs. 10,500.00**	
B. Agro-Horticulture (cost per ha)					
1.	Cost of raising 270 plants up to 5 years @ Rs. 10,000.00			10500.00	The remarks mentioned under Horticulture are also applicable for Agro-Horticulture.
2.	Cost of raising agricultural crops @ Rs. 5,000 per hectare per year			5000.00	
	Total			**Rs. 15,500.00**	

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

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

ESTIMATE FOR SILVI-PASTORAL SYSTEM (RS. ha^{-1}) PLANTATIONS (800 PLANTS ha^{1})

Sl. No.	Particulars of work		Rate (Rs.)	Cost (Rs.)	Remarks
5-	Clear felling or bush clearance of area protected Infected with *Lantana* etc. including Cost of burning	LS		600.00	The area is to be through bio-fencing
6-	Soil working –earth work, digging of Pits/holes 60 cm deep, 30cm dia -800 Nos. Including cost of refilling and trenching (400 trenches/ha)	LS		5800.00	
7-	Cost of seedlings for 900 nos. and grass seeding /legumes seeds and planning/sowing	-		2000.00	Rs.2.00 per
8-	Weeding and hoeing (2 Nos.)	LS		300.00	
	Total			**8700.00**	
	Maintenance 2^{nd} year 15% of the 1^{st} year expenditure including being up of 1^{st} year failure			1305.00	

CHAPTER – 6

CAPACITY BUILDING

CAPACITY BUILDING

Capacity Building is the process of assisting the group or individuals to identify and address issues and gain the insights, knowledge and experience needed to solve problems and implement change. There is a realization in the development sector that there is a need to appraise the success of development interventions by going beyond the conventional development targets and measures of success (e.g. in the form of commodities, goods and services) to take into account improvements to human potential. Capacity building of stakeholders is also increasingly viewed as an important factor in developmental projects that involve participation of stakeholders at all levels for effective implementation of projects. In I.W.M.P. - II ,Gorakhpur, financial outlay of Rs. 24.600 lacs have been proposed for capacity building, which is 5% of the total project cost.

Scope of capacity building at Project Area

- Alternative Land Use Plan
- Scientific technique of Soil and Moisture conservation
- Improved and Scientific agriculture practices
- Fodder development and Management
- Forestation
- Meteorological Information
- Dairy Development and Management
- Rural Craft
- Income Generation Activities
- Stitching
- Food Processing
- Post Harvest management practices

CAPACITY BUILDING INSTITUTION

S. No.	Name of the Training Institute	Full Address with contact no., website & e-mail	Type of Institute#	Area(s) of speciali-zation$	Accreditation details	Trainings		
						Reference Year	No. of Trainings Assigned	No. of Trainees to be Trained
1	Deen Dayal Gram Vikas Sansthan	Bakshi Ka Talab, Lucknow	Research Institutes	Agriculture/ Horticulture/ Animal Husbandry	Govt. of U. P.	2012-2014	3	40
2	Acharya Narendra Dev Agril. University	Faizabad	University	Agriculture/ Horticulture/ Animal Husbandry	Govt. of U. P.	2012-2014	3	70
3	Aim Geotech (P) Ltd.	L.G.F. 11 & 12, Swaroop Arcade, Kapoorthala, Aliganj, Lucknow	NGO	Remote Sensing/GIS Capacity Building	Society Reg. Act	2010-2015	2	80
4	Land Devlopment & Water Resource Devlopment Training Institute	Beli Kala Lucknow	Training Institute	Watershed Devlopment	Govt. Of U.P.	2010-2014	4	60

INSTITUTIONAL ARRANGEMENT & CAPACITY BUILDING IN THE PROJECTS

S. No.	Project Stake holders	No. of Stake holders	Total no. of persons	No. of persons trained so far	No. of Persons to be trained	Sources of funding for training, BSA Unit or DOLR or others		Name & Address of Training institute
						DOLR	BSA unit or others	
1	Distinct Data centre	1	3	-	3	DOLR	BSA unit	UPLDWR Training Centre, Belikala, Lucknow
2	PIA	1	25	3	22	DOLR	BSA unit	Acharya Narendra Dev, Training Centre, Faizabad
3	WDTs	1	9	4	5	DOLR	BSA unit	Belikala Faizabad Walmi Lucknow
4	W.Cs	6	66	-	66	DOLR	BSA unit	District Level
5	GPs	21	42	-	42	DOLR	BSA unit	District Level
6	SHG	9	99	-	99	DOLR	BSA unit	District Level
7	U.G.S.	46	950	-	950	DOLR	BSA unit	District Level
8	Community	-	-	-	-	DOLR	BSA unit	District Level
9	Any others	-	-	-	-	DOLR	BSA unit	District Level

CHAPTER -7
PHASING OF PROGRAMME & BUDGETING

WATERSHED ACTIVITIES

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

SCIENTIFIC PLANNING

Cluster Approach

This envisages integrated development of Geo-hydrological unit i.e. Treatment of cluster of micro –watershed. The IWMP-II, Gorakhpur Project consist of 6 micro watersheds.

Base line Survey

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

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

Participatory Rural Appraisal (PRA)

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

Use of GIS And Remote Sensing For Planning

Use of various GIS and Remote Sensing Technologies has been promoted at various stages of watershed development.

Prioritization

Geographical Information System (GIS) has been used for prioritization process. Various maps were created using spatial and non spatial data like Geo-morphological maps, Soil data, Crop productivity data, Meteorological data, BPL Population, SC/ST population, Ground water Status, Drinking water situation, Slope percent. These were all given proper weightage according to the DoLR specification. This will be helpful for effective dissemination of information on land and water resources to the users.

Planning

An action plan matrix was formulated by State Level Nodal Agency (SLNA) taking into account various features like the slope percent, Soil Depth, Soil Texture, Soil erosion in the area for wasteland, forest land and agricultural land. Global positioning System (GPS) was used to identify each and every water conservation structures available in the project area. This was used to create a map. Contour Map of vertical interval of 1.0 meter at a scale of 1:4000 was used for identifying various locations for soil and water conservation structures. GIS study is used to identify the area require the degree of concentration for the implementation of Watershed Plan.

Hydrological modeling

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

Details of Scientific Planning and Inputs in IWMP projects

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

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

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

YEAR WISE PHASING OF WORKS (PHYSICAL & FINANCIAL)

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

Component wise & Year wise Phasing of Physical & Financial Outlay (IWMP-II Gorakhpur)

S. No.	Component	% of Budget	Ist Year		IInd Year		IIIrd Year		IV Year		V Year		Total	
			P	F	P	F	P	F	P	F	P	F	P	F
1. A.	**Administration Cost** **TA & DA, POL/Hiring of vehicles/ office and payment of electricity and Phone bill etc. computer, stationary and office consumable and contingency.**	10%	-	-	-	9.840	-	13.284	-	13.284	-	12.792	-	49.200
B.	Monitoring	1%	-	-	-	0.984	-	0.984	-	0.984	-	1.968	-	4.920
C.	Evaluation	1%	-	-	-	1.476	-	0.984	-	0.984		1.476	-	4.920
Sub Total		12%	-	-	-	12.300	-	15.252	-	15.252	-	16.236	-	59.040
2. A.	**Preparatory Phases** Entry Point Activities, like well repairing, Kisan vikash munch & brick soling Road	4%	-	19.680	-	-	-	-	-	-	-	-	-	19.680
B.	Capacity Building	5%	-	4.920	-	9.840	-	3.690	-	3.690	-	2.460	-	24.600
C.	Preparation of DPR	1%	-	4.920	-	-	-	-	-	-	-	-	-	4.920
	Sub Total	10%	-	29.520	-	9.840	-	3.690	-	3.690	-			49.200

3.	**Watershed works**	**50%**	**-**	**-**	425.00	15.200	791.00	22.5198	792.00	22.698	1127.00	39.404	3135.00	99.900
A.	**Soil & moisture conservation**													
	Construction of Bunds. (graded bund, contour bund, field Bund, Marzinal bund & Peripheral Bundh)													
B.	**Water Resources Development**													
	(i)New and Renovation of exitising Water Harvesting Structure/ Gully plug/Chak Dam/Ponds etc.		-	-	125.00	12.500	140.00	14.000	110.00	11.000	125.00	12.500	500.00	50.000
	(ii)Drainage line treatment(Pucca structure/ Check Dam)		-	-	-	-	2 No.	8.000	2 No.	8.000	3 No.	12.000	7 No.	28.000
C.	**Agroforestry**													
	(i)Rainfed horticulture with fencing		-	-	5.00	3.200	10.00	6.400	10.00	6.400	15.00	9.600	40.00	25.600
	(ii)Rainfed horticulture without fencing		-	-	60.00	6.000	130.00	13.000	160.00	16.000	50.00	5.000	400.00	40.000
	(iii)Aforestation & development of Silvi_pastoral system		-	-	-	-	7.00	0.700	6.00	0.600	12.00	1.200	25.00	2.500
Sub Total		**50%**	**-**	**-**	615.00	36.900	1078.00	64.698	1078.00	64.698	1329.00	79.704	4100.00	246.000

4.	**Livelihood Activities** **Income generating Activities through SHGs for landless and Marginal formers (Goat farming, Establish of barmy compost, nadaf compost ,General merchant shop & live stock development Activities)**	**10%**	**-**	-	-	4.920	-	19.680	**-**	14.760	**-**	9.840	**-**	49.200
Sub Total		**10%**	**-**	-	-	4.920	-	19.680	**-**	14.760	**-**	9.840	**-**	49.200
5.	**Production System & Micro enterprises** **Demonstration and assessment of improved composting system as:** **Seed, Chemical Fertilizer/ Bio Fertilizer, Pest Control, Advance Agriculture Equipment and Production of compost**	**13%**	**-**	**-**	-	4.920	-	19.680	-	24.600	**-**	14.760	**-**	63.960
Sub Total		**13%**	**-**	**-**	-	4.920	-	19.680	-	24.600	**-**	14.760	**-**	63.960
6.	**Consolidation Phase**	**5%**	**-**	**-**	**-**	-	-	-	-	-	-	24.600	**-**	24.600
Sub total		**5%**	**-**	**-**	**-**	-	-	-	-	-	-	24.600	**-**	24.600
Grand Total		**100%**	**-**	**29.520**	**615.00**	**68.880**	**1078.00**	**123.000**	**1078.00**	**123.000**	**1329.00**	**147.600**	**4100.00**	**492.000**

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

Activity related to livelihood by self help groups (SHGS) in the Project area (Proposed)

S.N.	Name of watershed	No. Of Groups						Proposed outlay (Rs. In lakh)	Expected annual income per SHG (Rs. In lakh)	Remark
		Poultry	Goat rearing	Animal Farming	General merchant shop	other	Total Groups			
1.	Basudeeha	-	4	-	2	2	8	49.200	0.25 to 0.40	From Project Period
2.	Demusa	-	3	1	3	2	9			
3.	Mano Kishunpur	-	4	2	2	2	10			
4.	Jagarnathpur	-	3	2	2	2	9			
5.	Rajgarh	1	2	1	3	2	9			
6.	Dhausa	1	2	-	3	2	8			
	Total	**2**	**18**	**6**	**15**	**12**	**53**	**49.200**	**55.00**	

CHAPTER -8
CONSOLIDATION / EXIT STRATEGY

PLANS FOR MONITORING AND EVALUATION

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

Yet another component of the Web-based GIS system is the Mobile based Monitoring & Evaluation System, which will help the ground staff alias WDTs (Watershed Development Team) to transmit information from the ground level to the central server. Also, any higher-up official in charge of the project can obtain information regarding the project area on the project area on their mobile phone by means of an SMS. The system works in the following manner. The WDT equipped with a GPS

instrument marks the latitude-longitude information of various treatment areas during the DPR. The probable sites are then transferred onto the central server. During the works phase, any progress in the treatment areas is reported to the server by means of an SMS by the WDT. Similarly, any nodal officer or higher-up official can view the progress in a project by means of summarized reports generated over frequent periods of time.

PLANS AND PROJECT MANAGEMENT

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

WATERSHED DEVELOPMENT FUND

The major source of financial assistance after post implementation period is Watershed Development Fund. The contribution of it will comes mainly from the fund generated .

USER CHARGES

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

SUSTAINABILITY AND ENVIRONMENT SECURITY

In the proposed watershed management plan of I.W.M.P.-II watershed, proper blending of bio engineering measures will be applied on 60% of the total watershed area. Based on the results of studies conducted in this region, it is estimated that more 50% of the watershed area will be treated and consequently the soil loss and runoff from the area is expected to be reduced by 70% and 65% respectively. The proposed land use plan will improve the land utilization index and crop diversification index significantly as compared to the existing one. It will help in maintaining ecosystem integrity on sustained basis along with improving the livelihood security of the farming community.

ECONOMIC ANALYSIS

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

AGRICULTURE

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

HORTICULTURE

The Economic analysis of horticulture plantation in agri-horticulture system at I.W.M.P.- II watershed. Project life is considered to be 25 years and discount rate for NPV estimation is 10%

FOREST/ FUEL WOOD PLANTATION

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

FOOD SUFFICIENCY

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

RATIO OF COST AND PRFOIT

STATUS BEFORE WORK

S. No.	Name of Cereal	Area in hectare	Production /Hect./Quintal	InvestCost/hect.	Rate/Quintal.	Net profit/hect.	Total Net profit.
1.	Paddy	2400.00	18.00	4000.00	800.00	10400.00	24960000.00
2.	Arhar	450.00	5.00	2300.00	3500.00	15200.00	6840000.00
3.	Maize	50.00	8.00	2600.00	900.00	4600.00	230000.00
4.	Wheat	3000.00	20.00	4200.00	1000.00	15800.00	47400000.00
5.	Mustard	120.00	8.00	2600.00	2000.00	13400.00	1608000.00
	Total	**6020.00**					**81038000.00**

Status After Work:

S. No.	Name of Cereal	Area in hectare	Production /Hect./Quintal	InvestCost/hect.	Rate/Quintal.	Net profit/hect.	Total Net profit.
1.	Paddy	2900.00	20.00	4000.00	800.00	12000.00	34800000.00
2.	Arhar	590.00	6.00	2300.00	3500.00	18700.00	11033000.00
3.	Maize	80.00	10.00	2600.00	900.00	6400.00	512000.00
4.	Wheat	3500.00	22.00	4200.00	1000.00	17800.00	62300000.00
5.	Mustard	180.00	12.00	2600.00	2000.00	21400.00	3852000.00
	Total	**7250.00**					**112497000.00**

Bhoomi Sanrakshan after the treatment of Land	–	**112497000.00**
Bhoomi Sanrakshan before the treatment of Land	-	**81038000.00**
Net Profit	-	31459000.00
Ratio of cost profit ratio	-	**112497000.00 = 1:1.38**
		81038000.00

The above ratio clearly indicated that the conservation of land is extremely profitable.

CHAPTER -9
EXPECTED OUTCOME

EMPLOYMENT

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

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

Labor migration in search of gainful employment is one of the major problems in the remote watershed in particular. Causal employment opportunities to the tune of more than 0.60 lacs will be generated during the implementation of the project activities. However, the changes in land use pattern and adoption of other subsidiary enterprises will generate employment opportunities for persons of 1.80 lacs in the watershed.

EXPECTED EMPLOYMENT RELATED OUTCOMES

S.No.	No. of the Villages	Wage employment										Self employment				
		No. of mandays (Lakhs)					No. Of beneficiaries					No. Of beneficiaries				
		SC	ST	Others	Women	Total	SC	ST	Others	Women	Total	SC	ST	Others	Women	Total
1	99	0.562	0	1.772	0.050	2.384	3550	0	6610	0	10160	350	0	480	130	960

MIGRATION

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

DETAILS OF MIGRATION (I.W.M.P. - III) GORAKHPUR

Name of the Project	No. of persons migrating	No. of days per year of migration	Main reason for migration	Expected reduction in no. of persons migrating
I.W.M.P.- II	1690	180	Due to Unemployment in Villages and Wages in City	970

VEGETATION/ CROP RELATED OUTCOMES

It is expected that after compilation of the project, the crop productivity of Rice-Wheat will certainly enhance, It would be around Paddy (30.00 qt/ha),Wheat (42.00 qt/ha). There will be an improvement in soil health of the study area after conservation measures.

MAJOR CROPS GROWN AND THEIR PRODUCTIVITY IN THE PROJECT AREA

S. N.	Names of the crop	Current status		Expected Post-Project Status	
		Area (ha)	Productivity (kg/ha)	Area(ha)	Productivity(kg /ha)
1	Kharif Paddy	2820	1700	2950	2100
2	Arhar	460	500	550	700
3	Maize	70	800	90	1100
4	Rabi Wheat	3530	2000	3840	2400
5	Mustard	110	800	170	1200

6	Zaid/Other season	20	400	80	600
7	**Total**	**7010**	**-**	**7680**	**-**

FOOD SUFFICIENCY

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

STATUS OF FOOD REQUIREMENT AND AVAILABILITY PER ANNUM IN WATERSHED

Sr. No.	Items	Requirement (q/yr)	Before project		Proposed	
			Availability (q/yr)	Deficit or surplus (q/yr)	Availability (q/yr)	Deficit or surplus (q/yr)
1	Cereals	68800	57500	-11300	72000	+ 3200
2	Pulses	22000	20100	- 1900	23500	+ 1500
3	Oil seeds	2750	2060	-690	2880	+ 130
4	Vegetable	33000	30400	- 2600	35000	+ 2000

WATER RELATED OUTCOMES

The ground water quality of the project area is found to be suitable as per drinking water standard (IS:10500) the average pH value ranges from 7.2 to 7.8, the Electric conductivity of the ground water varies from 957 to 1125 us/cm . The overall analysis of the ground water shows that the water is suitable for the drinking purpose. The water level in the project area ranges from 6.0 to 7.0 metre.

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

STATUS OF DRINKING WATER

S. N.	No. of the villages	Availability of drinking water (no. of months in a year)		Quality of drinking water	
		Pre-project	Expected Post-Project	Pre-project	Expected Post-Project
1	99	10months Easily & 2 Months Crisis	12 months Easily	Smelly & Oily Water	Pure

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

S. N.	No. of the villages	Sources	Pre-project	Expected Post-Project	Remarks
1	99	Open wells	6.05	5.75	-

LIVESTOCK RELATED OUTCOMES

The village has quite a good of livestock population. These include cows, bullocks, buffaloes, goats. The interventions like provision of good quality cows and buffaloes, the establishment of a fodder bank and other such related activities would spur up

the dairy development in the village. It is expected that the post project period would see a substantial increase in livestock population and yield from them.

FOREST/VEGETATIVE COVER RELATED OUTCOMES

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

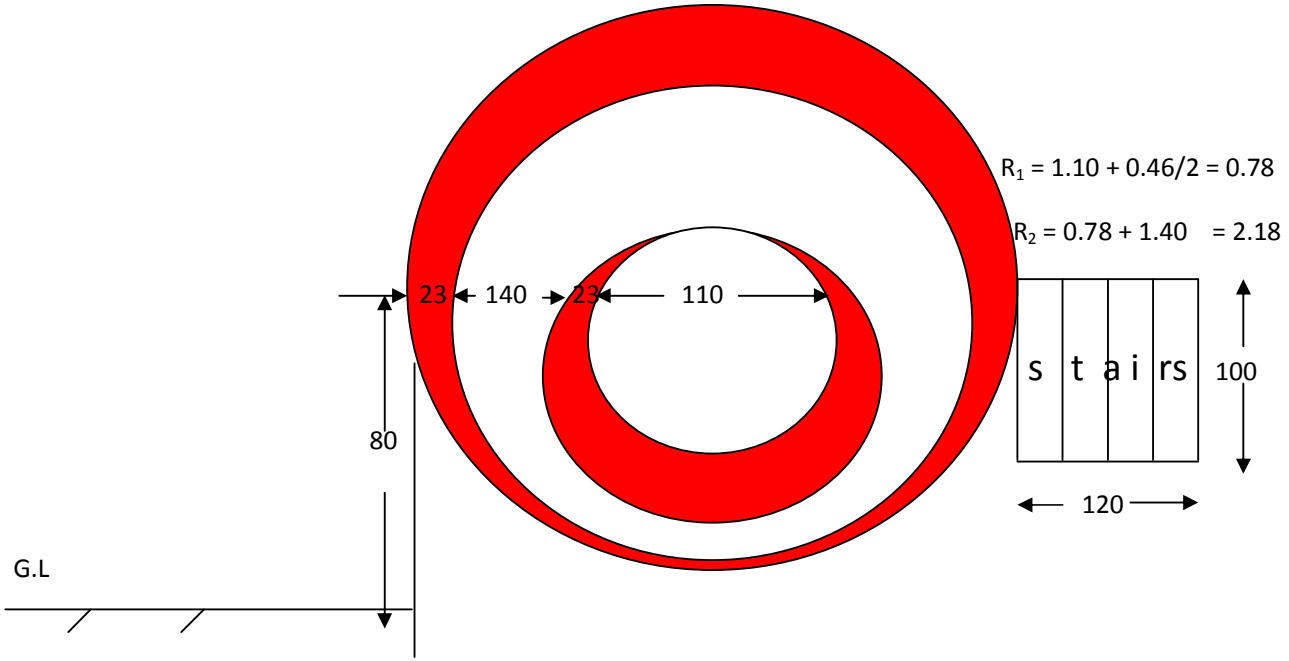
EXPECTED /ESTIMATED OUTCOMES OF IWMP-II (2010-2011), GORAKHPUR

S.No.	Name of the Distict	Item	Unit of Measurement	Pre-project Status	Expected Post-project Status
1	2	3	4	5	6
1.	Gorakhpur	Status of water table	Meter	6.05	5.75
2.		Grand water sturcture repaird/ rejuvenated	-	-	-
3.		Quality of drinking water	-	Smelly & Oily water	Pur water
4.		Availability of drining water	Meter	11months	12 Months
5.		Increase in irrigation potential			
		Change in cropping/land use pattern	-	Paddy & others	Double Cropping
6.		Area under agriculture crop	Hector	4100	4500
		i- Area under single crop	Hector	2285	3829
		ii- Area under double crop	Hector	1600	2014
		iii- Area under multiple crop	Hector	215	515

		iv-Cropping Intensity	Ha	-	-
7.		Increase in area under vegetation	Hector	175	250
8.		Increase in area under horticulture	Hector	165	300
9.		Increase in area under fuel & fodder	Hector	3.50	9.0
10.		Increase in milk production	%	3	4
11.		No. of SHGs	No.	-	53
12.		Increase in no. of livelihoods	No.	-	54
13.		Migration	%	18	10
14.		SHG Federation formed	No.	-	-
15.		Credit Linkage with banks	-	-	-

CHAPTER -10
COST NORMS & DESIGN
STRUCTURE PROPOSED

DETAIL ESTIMATE OF VILLAGE WELL REPAIR



Earth Work $\pi(r_1^2-r_2^2)$ x h

3.14 (0.60-4.75) x 0.80

3.14 x 4.15 x 0.80 = 10.42

C.C. Work :-

Top of Well Jagat $\pi(r_1^2-r_2^2)$ x h

3.14x 4.15 x 0.10

1.303

Brick Work :-

On top floor $\pi(r_1^2-r_2^2)$ x h

3.14 x 4.15 x0.11

in outer wall 2π r x width x height

2 x 3.14 x 2.18 x 0.23 x 0.80

= 2.519

inner wall 2π r x width x height

2 x 3.14 x 0.55 x 0.23 x 1.10

= 0.873

Plaster Work :-

In side of inner wall - 2π r x lenght

2 x 3.14 x 0.55 x 5.00

= 17.27

out side of outer wall - 2π r h

2 x 3.14 x2.41 x 0.80

= 12.10

top floor $\pi(r_1^2-r_2^2)$

3.14 x 0.78 x 0.78 – 2.41 x 2.41

= 16.32

Stair of well

Earth Work

1.00 x 1.20 x 0.20

= 0.24

Brick Work

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

Plaster Work

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

Requirement of Material & labours

Sl.no,	Item	Quantity	Unit	Material				labors	
				Brick 1st class 23x11x7 (No's)	Coarse Sand (Cu.mt)	Cement (Bags)	Brick Ballast (Cu.mt)	Masons (No's)	Labours (No's)
1	Earth Work	10.66	Cu.mt.	-	-	-	-		3.47
2.	C.C.Work 1:4:8	1.303	,,	-	0.60	4.43	1.21	0.26	5.99
3.	Brick Work 1:4	5.407	,,	2703	1.48	9.73	-	5.40	10.80
4.	Plaster Work 1:4	48.39	Sq. mt.	-	0.72	5.32	-	6.04	9.07
5.	Curing for 7 days	-	-	-	-	-	-		7
	Total	-	-	2703	2.80	19.48	1.21	11.70	36.34
	Say			2700	3.00	20.00	1.25	12.00	37.00

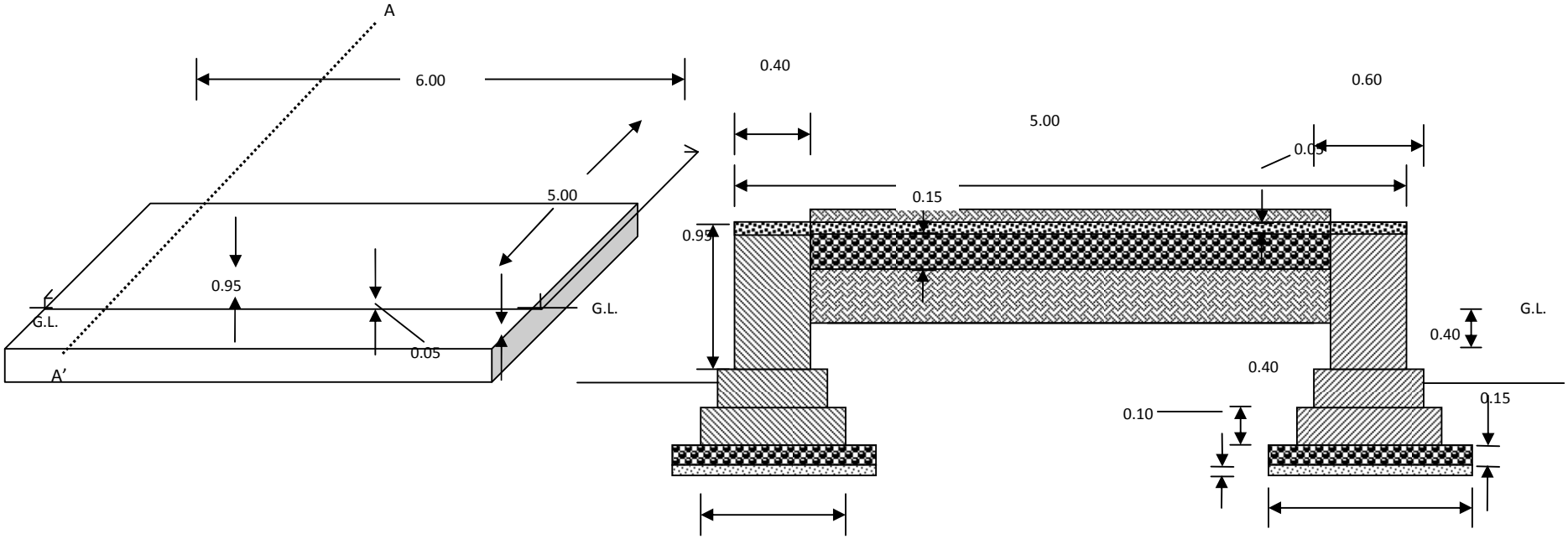
Cost of Material & Labour

Sl.no.	Item	Quantity	Rate	Unit	Amount
	Material Cost				
1	Brick 1st class 11x23x7	2700	4600/=	1000 Bricks	12420.00
2	Coarse Sand (Banda)	3.00	2600/=	Cu.mt.	7800.00

3	Portland Cement	20.00	320/=	Bag	6400.00
4.	Brick Ballast	1.25	1000/=	Cu.mts.	1250.00
5.	Hume pipe 300mm x 2.50 mts.	3	1500/=	Nos.	4500.00
	Sub Total				**32370.00**
	Labor cost				
1	Mason	12.00	250/=	Each	3000.00
2.	Labor	37.00	120/=	Each	4440.00
3.	Hume pipe fixing	3	300/=	each pipe	900.00
	Sub Total				**8340.00**
	T&P Charge 2% cost of Material				**647.40**
	Total cost				**41357.40**

Say Rs. 41400

DRAWING OF KRISHAK VIKAS MANCH



DESCRIPTION

DESCRIPTION

ISOMETRIC VIEW OF PLATFORM (CHABUTRA)

SECTION AT A-A'

5. C.C.W. - 1:4:8.
6. Brick masonry- 1:4
7. Plastering- 1:4

DETAIL ESTIMATE OF KRISHAK VIKAS MANCH

S.No.	Description of Work	No.	L.	B.	D/H	Quantity
1.	Earth work in foundation					
	Long Wall Short	2	8.00	1.20	1.10	21.12
	Wall	2	4.00	1.20	1.10	10.56
	Total					**31.68 cum**
2.	Laying of Sand					
	Long Wall	2	6.60	1.00	0.10	1.32
	Short Wall	2	3.60	1.00	0.10	0.72
	Total					**2.04 cum**
3.	C.C.W. 1:4:8					
	Long Wall	2	6.60	1.00	0.15	1.98
	Short Wall	2	3.60	1.00	0.15	1.08
	Total					**3.06 cum**
4.	Brick masonary work 1:4 in foundation & super structure					
	1st Footing.					
	Long Wall	2	6.40	0.47	0.40	1.203
	Short Wall	2	3.80	0.47	0.40	0.714
	2nd Footing					
	Long Wall	2	6.20	0.35	0.40	0.868
	Short Wall	2	4.00	0.35	0.40	0.560
	Super Structure					
	Long Wall	2	6.00	0.23	0.90	1.242
	Short Wall	2	4.20	0.23	0.90	0.869
	Total					**5.456 cum**
5.	Earth work in filling	1	5.20	4.20	0.75	16.38 cum
6.	C.C.W. 1:4:8	1	5.20	4.20	0.15	3.276 cum

7.	C.C.W. 1:2:4	1	6.00	5.00	0.05	1.500 cum
8.	Plaster Work Long Wall Short Wall	2 2	6.00 5.00	- -	0.90 0.90	10.80 m^2 9.00 m^2
	Total					19.80 m^2

ABSTRACT OF WORK

1.	Earth Work in Digging	32.00 cum
2	Eart Work in Filling by Carriage	17.00cum
3.	Sand Laying	2.04 cum
4.	C.C.W. 1:4:8	6.336 cum
5.	Brick masonary 1:4	5.456 cum
6.	C.C.W. 1:2:4	1.500 cum
7.	Plastering	19.80 m^2

CONSUMPTION OF MATERIALS

S.No.	Particulars	Quantity	Cement (Bags)	Coarse Sand (cum)	Brick(No's)	G.S.B. 25-40 mm (cum)	Stone Grit 10-20 mm (cum)
1.	Sand Laying	2.040 cum	-	2.040	-	-	-
2.	C.C.W 1:4:8	6.336 cum	21.54	2.851	-	5.892	-
3.	Brick Masonary	5.456cum	10.91	1.500	2728	-	-
4.	C.C.W. 1:2:4	1.500 cum	9.15	0.630	-	-	1.275
5.	Plastering	19.800 m^2	2.17	0.297	-	-	-
Total			**43.77**	**7.318**	**2728**	**5.892**	**1.275**
Say			**44.00 Bags**	**7.500**	**2750**	**6.000**	**1.300**

COST OF MATERIALS

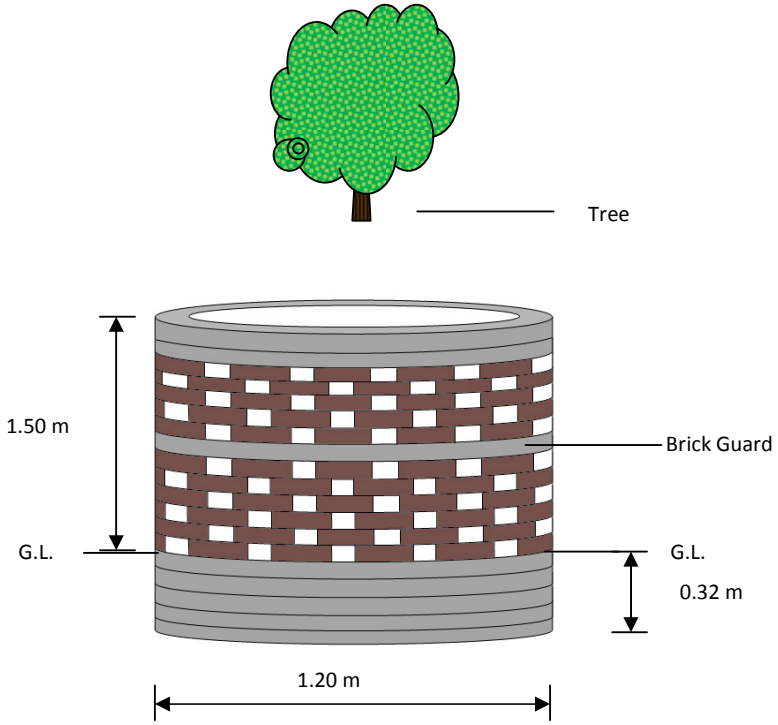
S.No.	Particulars	Quantity	Rate	Amount
1.	Cement	44.00 Bags	320/Bags	14080.00
2.	Coarse Sand	7.50 cum	2600.00/cum	19500.00
3.	Bricks	2750 No's	4600.00/No's	12650.00
4.	G.S.B. 25-40 mm	6.000 cum	1000.00/cum	6000.00
5.	G.S. Grit 10-20 mm	1.300 cum	1600.00/cum	2080.00
Total				**Rs. 54310.00**

LABOUR CHARGES

S.No.	Particulars	Quantity	Rate	Amount
1.	Earth Work in Digging	32.00 cum	37.00/cum	1184.00
2.	Earth Work in Filling by Carriage	17.00 cum	350.00/cum	5950.00
3.	Sand Laying	2.040 cum	41.00/cum	81.60
4.	C.C.W. 1:4:8	6.336 cum	550.00/cum	3484.80
5.	C.C.W. 1:2:4	1.500 cum	550.00/cum	825.00
6.	R/R Brick Masonary 1:4	5.456 cum	370.00/cum	2018.72
7.	Plastering 1:4	19.800 m^2	55.00/cum	1089.00
8.	Curing & Other Charges L . S	5.456 cum	100.00/cum	545.60
9.	Chowkidar	6 Man Days	120.00/Man Day	720.00
Total				**Rs. 15898.72**

Total Expenditure	
1. Cost of Materials	**Rs. 54310.00**
2. Labour Charges	**Rs. 15898.72**
Total	**Rs. 70208.72**
Say	**Rs. 70,200 only**

DRAWING OF BRICK GUARD



DESCRIPTION.

1. Brick work = 1:4.
2. Plastering = 1:4.
3. Thickness of wall = 0.11 m.
4. Total height of brick guard = 0.32 + 1.50 = 1.82 m.
5. Diameter = 1.2 m.

DETAIL ESTIMATE OF BRICK GUARD

S.No.	Description of work	No.	L	B	D/H	Quantity	
1.	Earthwork for tree	1	0.60	0.60	0.60	0.216	
	In foundation	1	3.14x1.09	0.20	0.30	0.205	
Total						**0.421**	
2.	Brick work 1:4					Solid	Glazed
	In foundation	1	3.14x1.09	0.11	0.40	0.151	-
	In super structure with glazed	1	3.14x1.09	0.11	0.48	-	0.181
	Solid	1	3.14x1.09	0.11	0.08	-	0.030
	Glazed	1	3.14x1.09	0.11	0.40	-	0.151
	Solid	1	3.14x1.09	0.11	0.16	0.060	-
Total						**0.211**	**0.362**
3.	Plastering 1:4	1	3.14x1.20	-	0.07	0.264	
		1	3.14x1.20	-	0.15	0.565	
		1	3.14x1.09	-	0.07	0.239	
Total						**1.068 m^2**	

CONSUMPTION OF MATERIALS

S.No.	Description of work	Quantity	Brick Nos.	Cement Bags	Coarse Sand
1.	Brick work 11 cm thick 1:4 Brick work glazed	0.211 cum 0.362 cum	100 86	0.29 0.25	0.050 0.043
2.	Plastering 1:4	1.068 m^2	-	0.11	0.016
Total			**186**	**0.65**	**0.109**
Say			**200**	**0.75**	**0.110 cum**

COST OF MATERIALS

S.No.	Particulars	Quantity	Rate	Amount
1.	Brick I^{st} class	200nos.	4600.00	920.00
2.	Cement	0.75 Bags	320.00	240.00
3.	Coarse sand	0.110 cum	2600.00	286.00
Total				**Rs. 1446.00**

LABOUR CHARGES

S.No.	Particulars	Quantity	Rate	Amount
1.	Earth work	0.421 cum	37.00/cum	15.57
2.	Brick work	0.391 cum	370.00/cum	144.67
3.	Plastering	1.068 m^2	55.00/m^2	58.74
Total				**Rs. 218.98**

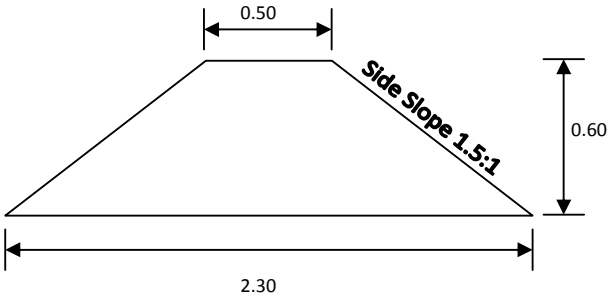
Head load and transportation L.S. - Rs. 335.00

Total Expenditure		
1.	Material	1446.00
2.	Labour	218.98
3.	Head load and transportation	335.00
Total		**Rs. 1999.98**
		Say Rs. 2000.00 only.

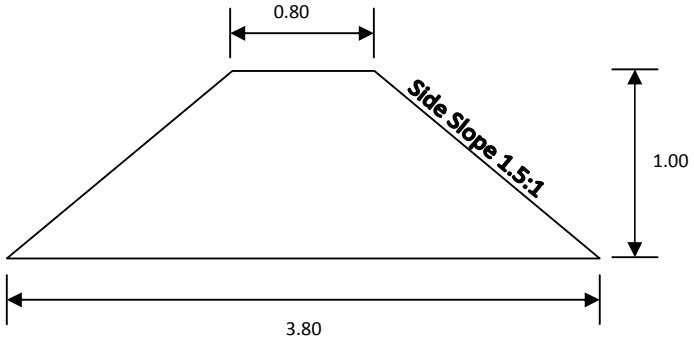
DETAILS ESTIMATE OF WATERSHED DEVELOPMENT WORK PHASE

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

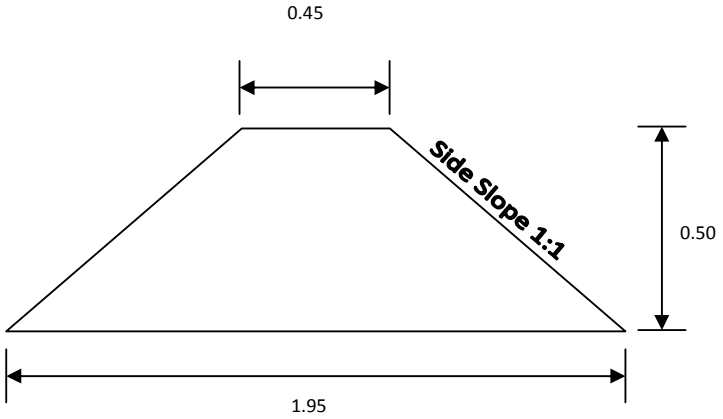
(Not to Scale)



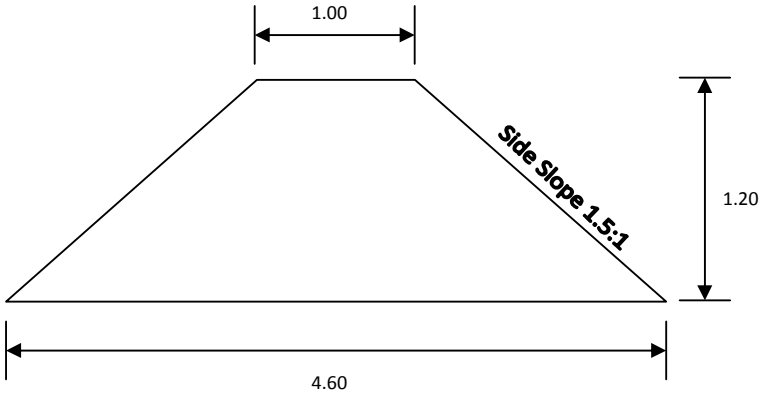
(C.B., Cross-Section – 0. 84 m^2)



(M.B., Cross-Section – 3.36m^2)



(Field Bund, Cross-Section – 0.60 m^2)



(S.B. /P.B., Cross-Section – 2.30 m^2)

(All dimensions in Metre)

Technical specification of Watershed work

Technical Specification of field Bund .

Particular	Value	Unit
Top Width	0.45	M
Height	0.50	M
Side slope	1.5:1	-
Bottom width	1.95	M
Cross section	0.60	M^2
Length /Ha	180.00	M
Earth work	108.00	CUM
Cost/ Ha	3518.00	Rs.

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

Particular	Value	Unit
Top Width	0.50	m
Height	0.60	m
Side Slope	1.5:1	-
Base of bund	2.30	m
Cross section	0.84	m^2
Length of bund/ha	120	m
Earth work	100.80	m^3
Cost/ Ha	3283.00	Rs..

Technical Specification of Submergence bund

Particular	Value	Unit
Top Width	0.80	m
Height of Bund	1.00	m
Side Slop	1.5:1	-
Base width	3.80	m
Cross section	2.30	m^2
Length of bund/ha	100.00	m
Earth work	230.00	cum
Cost/ Ha	7491.00	Rs.

Technical Specification of Marginal bund

Particular	Value	Unit
Top Width	1.00	m
Height of bund	1.20	m
Side Slop	1.5:1	-
Bottom width	4.60	m^2
Cross section	3.36	m^3
Cost/ metre	109.43 say Rs. 110.00	Rs..

DESIGN, DRAWING & ESTIMATE OF SPILLWAY CHECK DAM FOR 30.00 HA CATCHMENT AREA

Design of Drop Spillway to be constructed at a place in a gully having width of 4.0 m and catchment area 30 ha net drop 1.5 m Taking rainfall intensity for duration equal to time of concentration of watershed and design return period of 25 years , as 120mm/hr. The coefficient of runoff for the watershed is 0.3.

1. Hydrologic design- The design peak runoff rate (m^3/s) for the watershed from Rational formula is given as:

$$Q = \frac{C.I.A.}{360} = \frac{0.3 \times 120 \times 30.0}{360} = 3.0 \ m^3/s$$

2. Hydraulic design- The maximum discharge capacity of the rectangular weir given by

$$Q = \frac{1.711 \ L \ H^{3/2}}{(1.1+0.01 \ F)}$$

To find suitable value of L & H

Let us assume L = 3.0 m (since width of gulley is 4.00 m)

$$3.0 = \frac{1.711 \ L \ H^{3/2}}{(1.1+0.01 \times 1.5)} = \frac{1.711 \ L \ H^{3/2}}{(1.1+0.15)}$$

$$L \ H^{3/2} = \frac{3.00 \times 1.25}{1.711}$$

$$H^{3/2} = \frac{3.75}{1.711 \times 3} = 0.73$$

` $H = (0.73)^{2/3} = 0.80$ m

Test: $L / h = 3.00/0.80 = 3.75 \geq 2.0$ hence O.K.

$h / f = \frac{0.80}{1.50} = 0.53 \leq$ which is approximately 0.50. Hence, O.K.

Hence the designed hydraulic dimensions of the Spillway are:

Crest Length (L) = 3.00 m

Weir depth (h) = 0.80 m

3. Structural design –

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

E = 3x0.80+0.6 or 1.5x1.50

E = 3.0 m or 2.25 m

Head wall extension = 3.0 m

2- Length of apron basin L_B = f (2.28 h/f +0.54) = 1.5 (2.28 x $\frac{0.8}{1.5}$ + 0.54)

= 1.50 (1.216 + 0.54) = 1.5 x 1.756

= 2.634 m says 2.63 m

3- Height of end sill , S = $\frac{h}{3}$ = $\frac{0.80}{3}$ = 0.26 m

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

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

= 2 x 0.80 or [1.50+0.80+0.26 – (2.63+0.10)/2]

= 1.6 or [2.56 – 1.365]

= 1.6 or 1.195

adopt J = 1.60 m

5- M = 2 (f + 1.33 h - J) = 2 (1.50 + 1.33 x 0.80 – 1.60) = 2 (2.564 – 1.60)

= 1.928 m

6- K = (L_B + 0.1) - M = (2.63 + 0.1) – 1.93

= 0.80 m

Toe and cut off walls

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

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

= 0.473 x 1.442

= 0.68 m

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

= 1.5 x 0.68

= 1.02 m

Depth of cutoff /Toe wall = 1.02 m

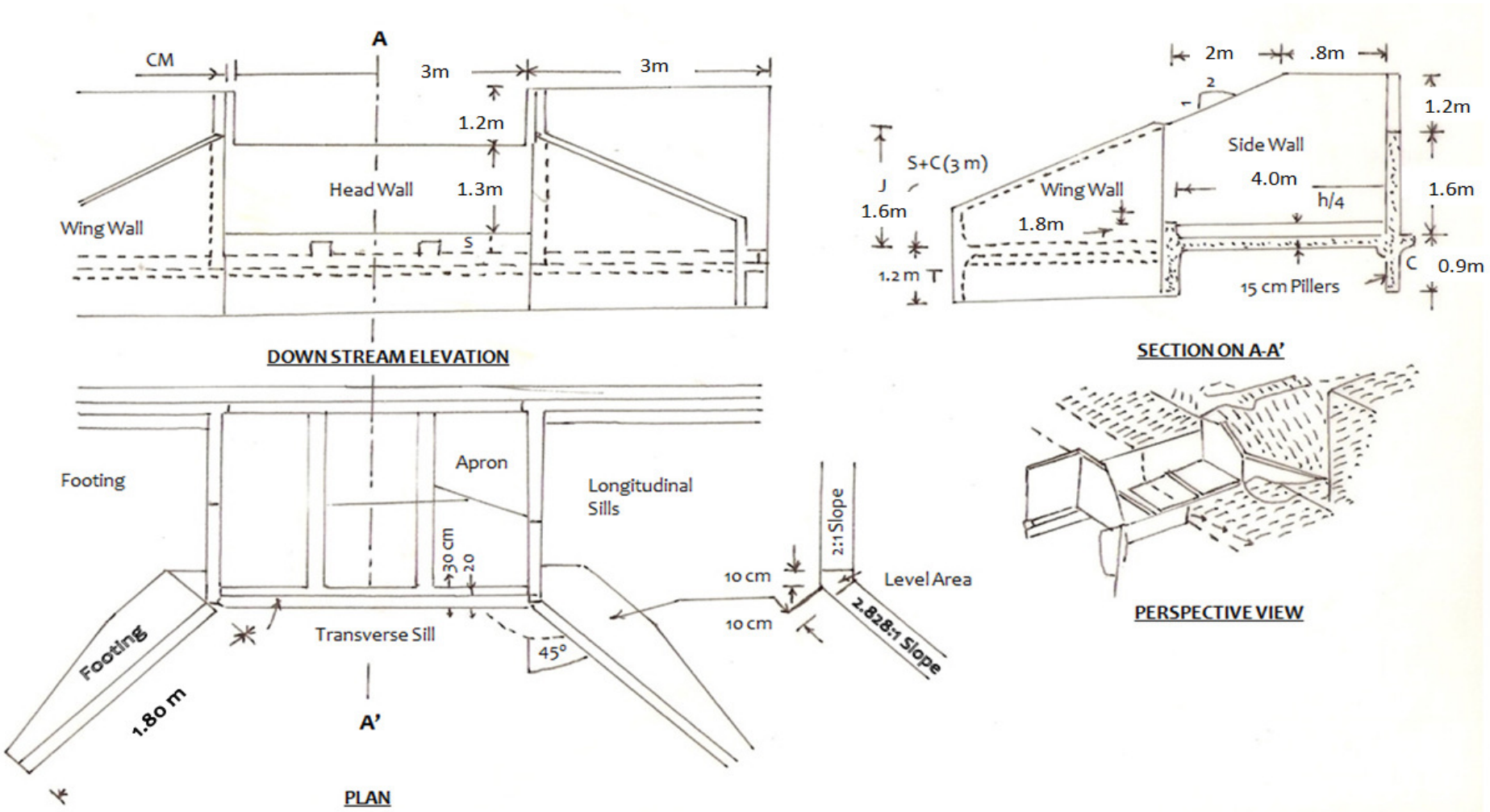
Apron thickness: For an over fall of 1.50 m. The Apron thickness in concrete construction is 0.30 m since the structure is constructed in masonry, the Apron thickness will be 0.30 x 1.50 = 0.45 m

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

Description	**Thickness of wall**	
	Top width	**Bottom width**
Head wall	0.45	1.33
Side wall	0.30	1.10
Wing wall and head wall extension	0.30	0.80

DRAWING OF SPILLWAY CHECK DAM OF CREST LENGTH 3.0 m

Not to Scale



All Dimensions in Metre

DETAIL ESTIMATE FOR SPILLWAY CHECK DAM OF CREST LENGTH 3.00 METRES

1. Earth work in cutting in foundation

S.No.	Description of work	No.	L	B	D/H	Quantity
1	Side wall	2	3.40	1.20	1.20	9.792
2	Head wall	1	3.00	1.60	1.20	5.760
3	Head wall extension	2	3.00	1.00	1.20	7.200
4	Wing wall	2	1.80	1.20	1.20	5.184
5	Toe wall	1	3.00	1.00	1.20	3.600
6	Cut off wall	1	9.00	1.00	1.20	10.800
7	Apron	1	3.00	2.65	0.80	6.480
8	Earthen Bund Both Side	2	100.00	4.00+7.00/2	1.50	1650.00
					Total	1698.816 cum
					Say	1700.00 cum

2. Laying of sand in the bed of foundation

S.No.	**Description of work**	**No.**	**L**	**B**	**D/H**	**Quantity**
1	Side wall	2	3.40	1.00	0.15	1.020
2	Head wall	1	3.00	0.60	0.15	0.270
3	Wing wall	2	1.80	1.00	0.15	0.540
4	Toe wall	1	3.00	0.80	0.15	0.360
5	Cut off wall	1	9.00	1.00	0.15	1.350
6	Apron	1	3.00	2.70	0.15	1.215

Total	4.755 cum
Say	5.00 cum

3. C.C.W. 1: 3: 6 in foundation

S.No.	Description of work	No.	L	B	D/H	Quantity
1	Cut off wall	1	9.00	1.00	0.20	1.800
2	Head wall	1	3.00	0.60	0.20	0.360
3	Side wall	2	3.40	1.00	0.20	1.360
4	Wing wall	2	1.80	1.00	0.20	0.720
5	Toe wall	1	3.00	0.80	0.20	0.480
6	Apron	1	3.00	2.20	0.20	1.620
Total						6.340 cum
Say						6.500 cum

4. Brick masonry 1:4

S.No.	Description of work	No.	L	B	D/H	Quantity
1	Cut off wall	1	9.00	1.00	0.90	8.100
2	Head wall	1	3.00	1.50	0.90	4.050
		1	3.00	(1.50+0.50) /2	1.50	4.500
3	Head wall extension	2	3.00	0.80	0.45	2.160
		2	3.00	0.60	0.45	1.620
		2	3.00	0.60	0.60	2.160

		2	3.00	0.50	0.60	1.800
		2	3.00	0.40	1.30	3.120
4	Side wall	2	3.40	1.00	0.45	3.060
		2	3.60	0.80	0.45	2.592
		2	3.80	0.60	0.60	2.736
		2	3.90	0.50	1.00	3.900
		2	(4.00+1.40) /2	0.40	1.50	3.240
5	Wing wall	2	1.80	1.00	0.45	1.620
		2	1.80	0.80	0.45	1.296
		2	1.80	0.50	(1.60+0) /2	1.440
6	Toe wall	1	3.00	0.80	0.45	1.080
		1	3.00	0.60	0.45	0.810
		1	3.00	0.40	0.30	0.360
7	Apron	1	3.00	2.70	0.45	3.645
8	Longitudinal sill	2	2.60	0.20	0.45	0.468
					Total	53.757 cum
					Say	54.000 cum

5. Tuck Pointing 1:3

S.No.	Description of work	No.	L	B	D/H	Quantity
1	Head wall	1	3.00	-	1.00	3.00
		1	3.00	-	1.18	3.54
2	Side wall	2	3.40	-	1.60	10.88
		2	(1.40+3.40)/2	-	1.50	7.20
3	Head wall extension	2	3.00	-	1.50	9.00
4	Wing wall	2	1.80	-	(1.60+0)/2	2.88
					Total	36.50 m^2
					Say	37.00 m^2

CONSUMPTION OF MATERIALS

S.No.	Particulars	Quantity	Cement (Bags)	Fine Sand (cum)	Bricks No.	G.S.B 25-40 mm (cum)	Moram (cum)
1	Sand laying	5.000 cum	-	5.00	-	-	-
2	C.C.W. 1:3:6	6.500 cum	29.25	-	-	5.85	2.92
3	B/M 1:4	54.000cum	108.00	-	27000	-	14.85
4	Raised Pointing 1:3	37.000 m^2	1.11	-	-	-	0.18
		Total	138.36	5.00	27000	5.85	17.95
		Say	140.00	5.00	27000	6.00	18.00

COST OF MATERIALS

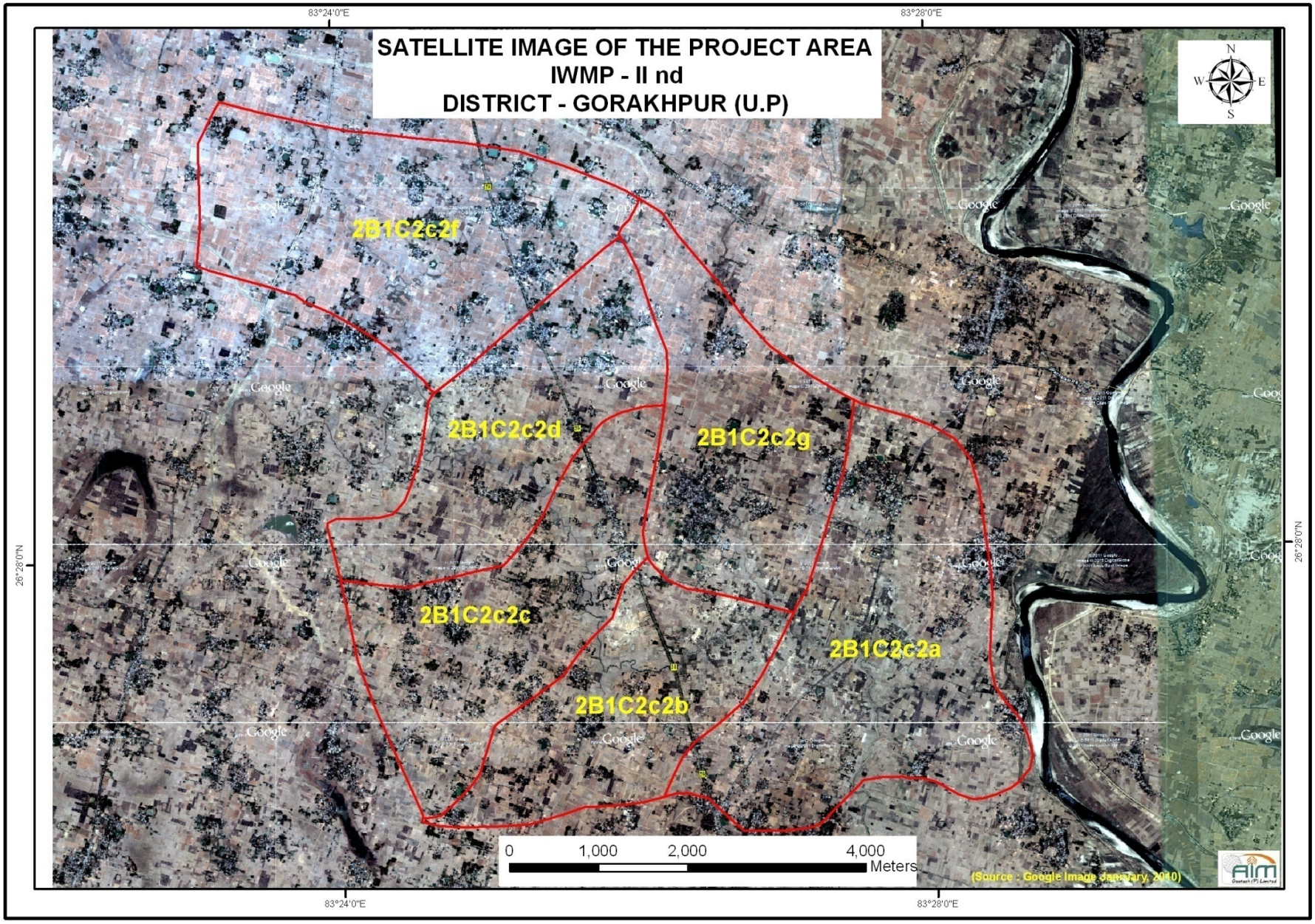
S.N0	Name of materials	Quantity	Rate	Amount
1	Cement (Bags)	140	260.00	36400.00
2	Coarse sand (cum)	18.00	2600.00	46800.00
3	Brick (No.)	27000	4600.00	124200.00
4	G.S.B. 25-40 mm (cum)	6.00	3000.00	18000.00
5	Fine Sand (cum)	5.00	1200.00	6000.00
Total				**231400.00**

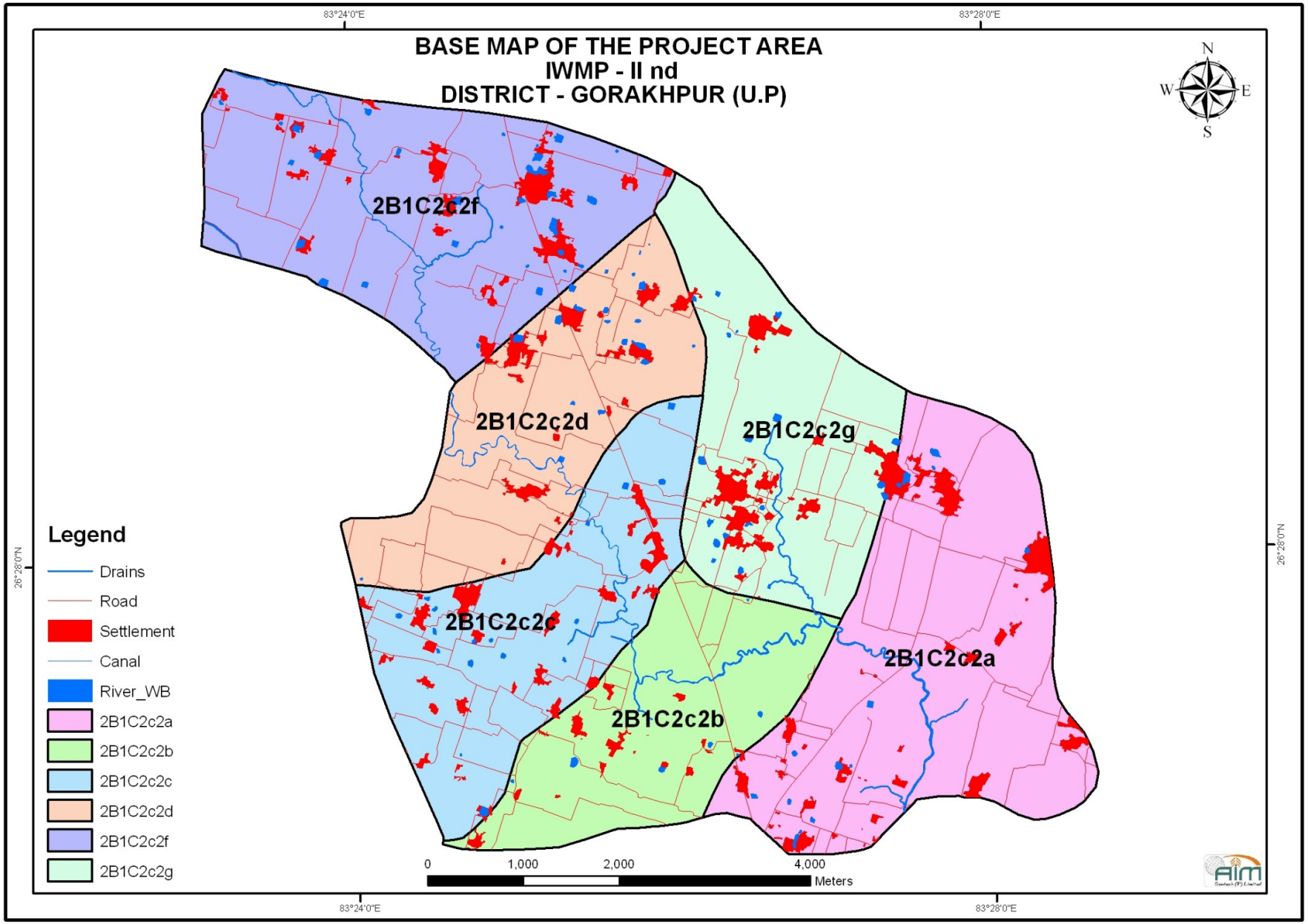
LABOUR CHARGE

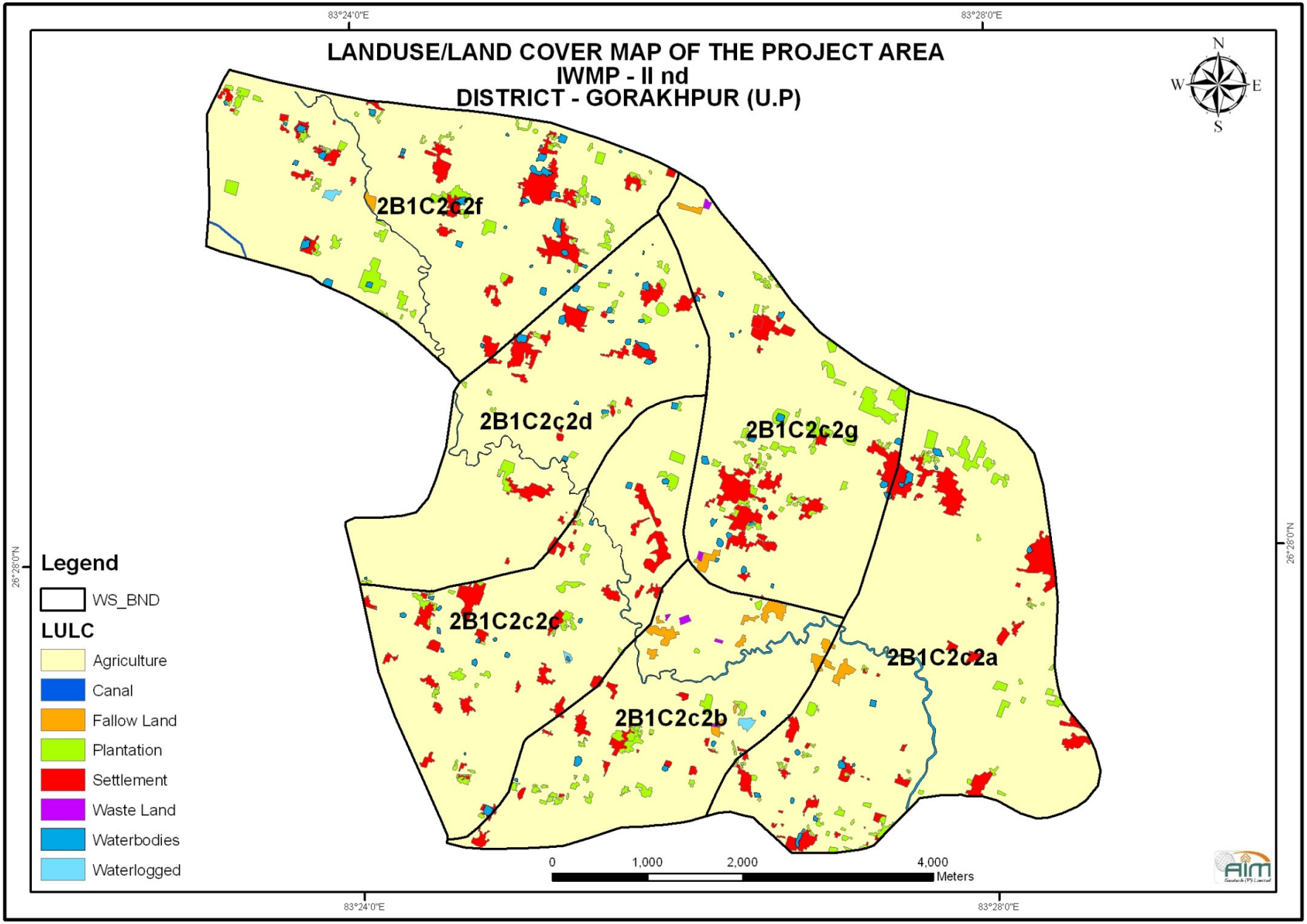
S.No.	Particulars	Quantity	Rate	Amount
1.	Earth Work	1700.00 cum	50.00/cum	85000.00
2.	Sand Laying	5.00 cum	40.00/cum	200.00
3.	C.C.W. 1:3:6	6.50 cum	550.00/cum	3575.00
4.	B/w 1:4	54.00 cum	450.00/cum	24300.00
5.	Raised Pointing	37.00 m^2	60.00/m^2	2220.00
6.	Curing	54.00 cum	30.00/cum	1620.00
7.	Chowkidar	20 Man Days	100.00/Man Day	2000.00
8.	Head load & local transportation cost 21.5% cost of material Rs. 231400	-	-	49751.00
	Total			**Rs. 168666.00**

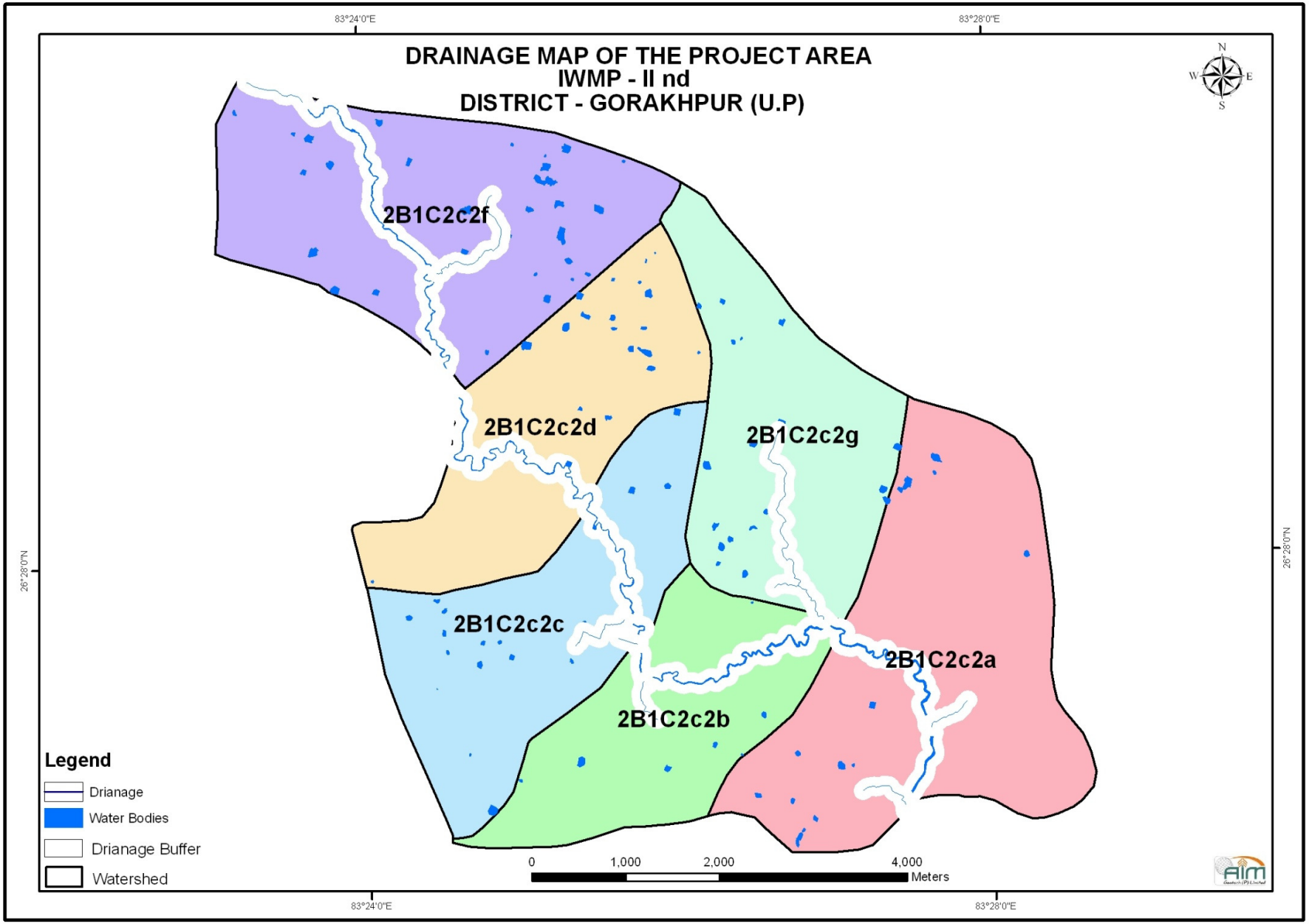
Total Expenditure	
1. Cost of materials	231400.00
2. Labour Charges	168666.00
Total	**Rs. 400066.00**
	Say Rs. 400000.00 only

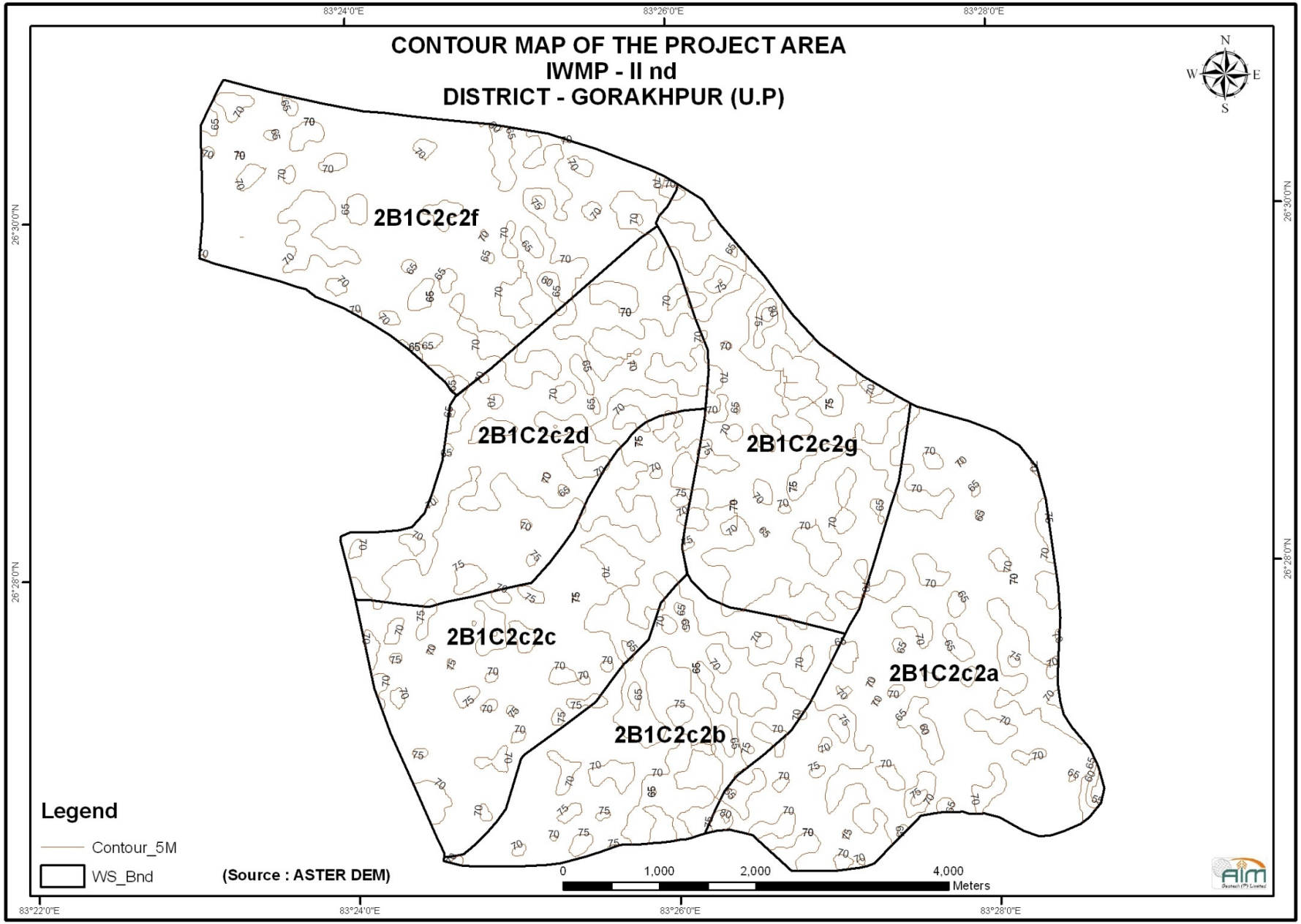
MAPS

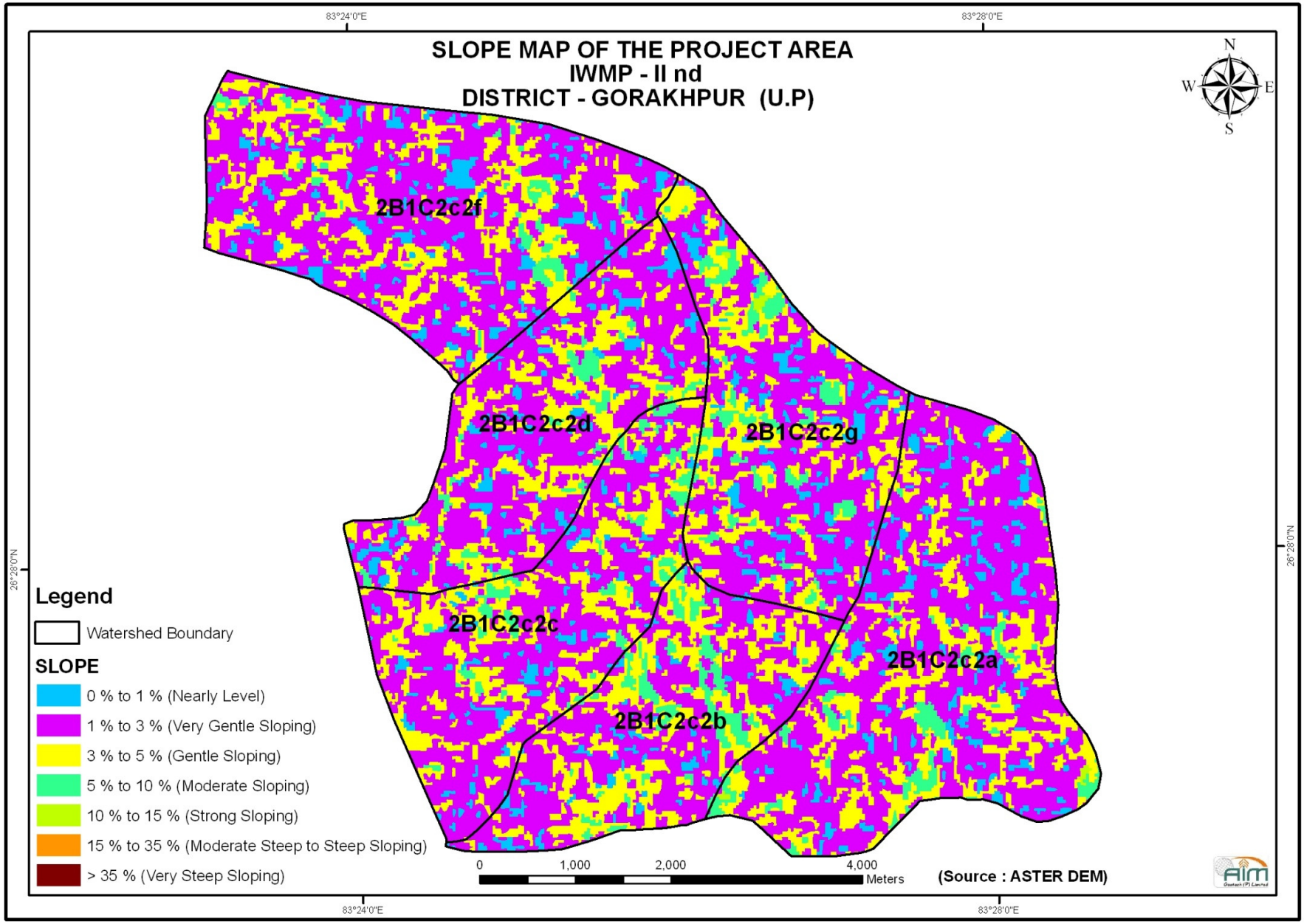

SATELLITE IMAGE OF THE PROJECT AREA
IWMP - II nd
DISTRICT - GORAKHPUR (U.P)
83°24'0"E
83°28'0"E
26°28'0"N
N
S
E
W
2B1C2c2f
2B1C2c2d
2B1C2c2g
2B1C2c2c
2B1C2c2a
2B1C2c2b
0
1,000
2,000
4,000
Meters
(Source : Google Image January, 2010)


BASE MAP OF THE PROJECT AREA
IWMP - II nd
DISTRICT - GORAKHPUR (U.P)
83°24'0"E
83°28'0"E
26°28'0"N
N
W
E
S
2B1C2c2f
2B1C2c2d
2B1C2c2g
2B1C2c2c
2B1C2c2a
2B1C2c2b
Legend
Drains
Road
Settlement
Canal
River_WB
2B1C2c2a
2B1C2c2b
2B1C2c2c
2B1C2c2d
2B1C2c2f
2B1C2c2g
0
1,000
2,000
4,000
Meters


LANDUSE/LAND COVER MAP OF THE PROJECT AREA
IWMP - II nd
DISTRICT - GORAKHPUR (U.P)
83°24'0"E
83°28'0"E
26°28'0"N
N
S
E
W
2B1C2c2f
2B1C2c2d
2B1C2c2g
2B1C2c2c
2B1C2c2a
2B1C2c2b
Legend
WS_BND
LULC
Agriculture
Canal
Fallow Land
Plantation
Settlement
Waste Land
Waterbodies
Waterlogged
0
1,000
2,000
4,000
Meters


DRAINAGE MAP OF THE PROJECT AREA
IWMP - II nd
DISTRICT - GORAKHPUR (U.P)
83°24'0"E
83°28'0"E
26°28'0"N
N
W
E
S
2B1C2c2f
2B1C2c2d
2B1C2c2g
2B1C2c2c
2B1C2c2a
2B1C2c2b
Legend
Drianage
Water Bodies
Drianage Buffer
Watershed
0
1,000
2,000
4,000
Meters


CONTOUR MAP OF THE PROJECT AREA
IWMP - II nd
DISTRICT - GORAKHPUR (U.P)
N
S
E
W
83°24'0"E
83°26'0"E
83°28'0"E
83°22'0"E
26°30'0"N
26°28'0"N
2B1C2c2f
2B1C2c2d
2B1C2c2g
2B1C2c2c
2B1C2c2a
2B1C2c2b
Legend
Contour_5M
WS_Bnd
(Source : ASTER DEM)
0
1,000
2,000
4,000
Meters


SLOPE MAP OF THE PROJECT AREA
IWMP - II nd
DISTRICT - GORAKHPUR (U.P)
83°24'0"E
83°28'0"E
26°28'0"N
N
W
E
S
2B1C2c2f
2B1C2c2d
2B1C2c2g
2B1C2c2c
2B1C2c2a
2B1C2c2b
Legend
Watershed Boundary
SLOPE
0 % to 1 % (Nearly Level)
1 % to 3 % (Very Gentle Sloping)
3 % to 5 % (Gentle Sloping)
5 % to 10 % (Moderate Sloping)
10 % to 15 % (Strong Sloping)
15 % to 35 % (Moderate Steep to Steep Sloping)
> 35 % (Very Steep Sloping)
0
1,000
2,000
4,000
Meters
(Source : ASTER DEM)

Preparation of DPR

Detail Project Report of Integrated Watershed Management Programme IWMP-IInd of Gorakhpur had been prepared through base line/ bench Mark survey for physiography climate, soil, land use, vegetation, hydrology and socio economic data analysis. PRA have been exercised to collect primary data, secondary data have been collected from Revenue, Statistics department, Statistical Magazine of the district, Gorakhpur, development block Gagaha and Kaudiram, Topo sheet (1 : 50000) survey of India- Deheradoon and technical & specific input and health with preparation and drafting of detail project report.

S.No.	Name	Designation
1.	Mr. LIM Rao	Sr. Scientist, AIM Geotech (Pvt) Ltd L.G.F. 11 & 12 Swaroop Arcade Kapoorthala, Aliganj, Lucknow
2.	Mr. A.K Srivastava	Scientist, AIM Geotech (Pvt) Ltd L.G.F. 11 & 12 Swaroop Arcade Kapoorthala, Aliganj, Lucknow
3.	Mr. Vikas Gupta	Scientist, AIM Geotech (Pvt) Ltd L.G.F. 11 & 12 Swaroop Arcade Kapoorthala, Aliganj, Lucknow
4.	Mr. P. C. Verma	Bhoomi Sanrakshan Adhikari IWMP-1st Gorakhpur
5.	Mr. R. K. Gupta	Junior Engineer IWMP-1st Gorakhpur
6.	Mr. Hans Ram Verma	Accountant IWMP-II, Gorakhpur
7.	Mr. Ashok Kumar Gupta	Accountant IWMP- II, Gorakhpur
8.	Mr. Shambu Prasad	Draughtsman IWMP- II, Gorakhpur
9.	Mr. B. L. Gautam	Work Incharge IWMP- II, Gorakhpur
10.	Mr. R. P. Mishra	Work Incharge IWMP- II, Gorakhpur
11.	Mr. R. K. Verma	Work Incharge IWMP- II,Gorakhpur
12.	Mr. S. C. Tiwari	Work Incharge IWMP- II, Gorakhpur
13.	Mr. R. K. Dubey	Work Incharge IWMP- II, Gorakhpur
14.	Mr. Ram Vinay Kumar	Work Incharge IWMP- II, Gorakhpur
15.	Mr. Sri Bhagwan	Work Incharge IWMP- II, Gorakhpur
16.	Mr. Bachcha Yadav	Tracer

DPR PLAN ABSTRACT

The collection of all the relevant data of watershed area and the possible option and solution are described with the help of feedback of focused discussion and detailed perspective plan for the watershed area with year wise and activity wise summarized for the DPR plan abstract for 5 years (2010-11 to 2014-15).

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

Prepared By :

Bhoomi Sanrakshan Adhikari
Dept. of Land Development & Water Resources
District – Gorakhpur

Technically Approved By:

Deputy Director
Dept. of Land Development & Water Resources
Region – Gorakhpur

Physically & Financially Approved:

Project Director
District Rural Development Authority
District – Gorakhpur

Chief Development Officer
District – Gorakhpur