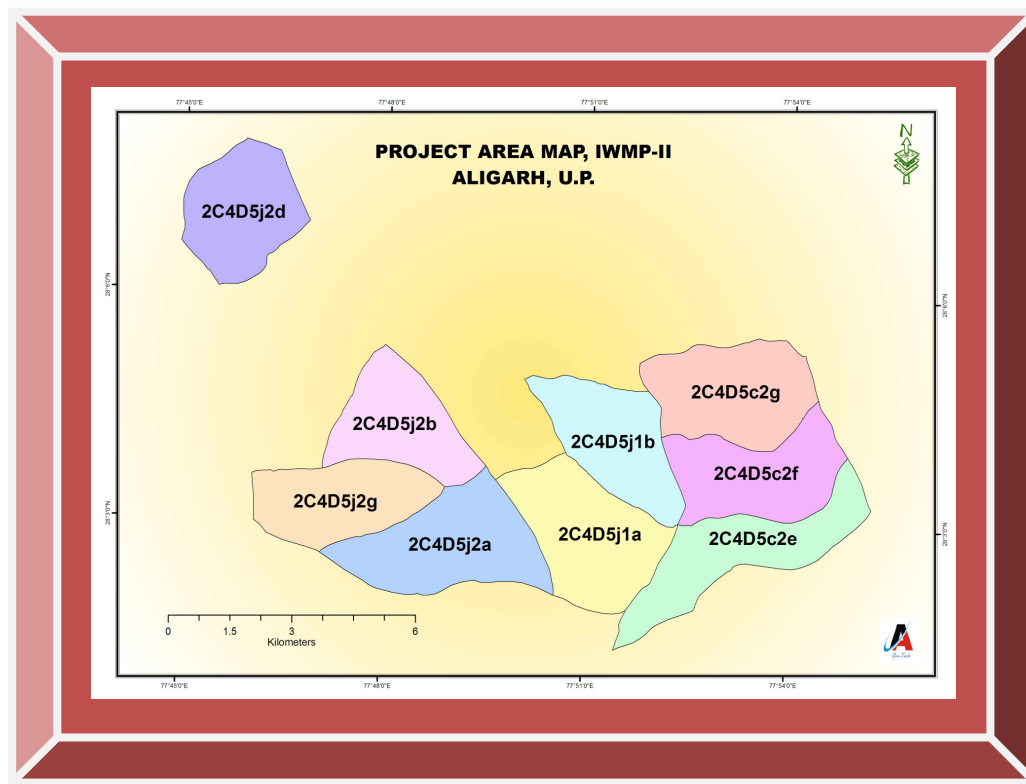


# DETAILED PROJECT REPORT (D.P.R.)

(I.W.M.P. 2<sup>nd</sup> – ALIGARH )

INTEGRATED WATERSHED MANAGEMENT PROGRAMME, KARWAN NADI BLOCK- CHANDAUS  
DISTRICT - ALIGARH (UTTAR PRADESH)



**Submitted to: -**

Department of Land Resource Ministry of  
Rural Development. Govt. of India



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

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Department of Land Development  
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## EXECUTIVE SUMMARY

The Karwan Nadi watershed project area consists of Fifty nine Villages i.e. Rampur Shahpur, Umri, Nagla Padam, Gangai, RoopNagar, Jalokhri, Imlahra, Augipur, Nagla Sarua, Nawab Pur, Cheemanpur, Jakhota, Block-Chandaus of district Aligarh, Uttar Pradesh. This watershed has been identified by the State Department under the scheme NWDPRRA through proper assessment of different parameters for watershed selection criteria (Annexure-VI). The Karwan Nadi watershed project is located in the south west of district Aligarh and lies between latitude  $28^{\circ} 1' 22.093''$  N to  $28^{\circ} 7' 58.553''$  N and  $77^{\circ} 44' 55.918''$  E to  $77^{\circ} 55' 14.594''$  E longitude. The district Aligarh is bounded by major rivers Ganga and Yamuna, from north east and north west. The altitude of district Aligarh is 188 meter above mean sea level. The total area falls in karwan nadi watershed project is 7254.582 ha.

The climate of the region, in general the blocks in the west are drier as compared to those in the east. The temperature rises as high as  $44.60^{\circ}\text{C}$  during summer and drops down to as low as  $4.80^{\circ}\text{C}$  during winters. The mean maximum and mean minimum temperature of district Aligarh is  $26.7^{\circ}\text{C}$  and  $15.5^{\circ}\text{C}$  respectively. Monsoon starts in July and runs to September. While in winter season, the region receives very few showers. The mean annual rainfall of the district of last five year is 434 mm, mean relative humidity 65%, Langs factor 25.6 mm per  $^{\circ}\text{C}$ . Thus the Climate of the district Aligarh is Semi-Arid. Served by numerous river and river lets, the more important being Ganga and Yamuna, few rivers like Karwan, Rutba and Kali which passes through the district and remain almost dry except in rainy season.

In general the entire area is an alluvial plain, with a gentle slope, near about 1% from north-west to south-east. There are serial natural depressions apart from those formed by the river valleys and drainage lines. Elevated sand ridges are also found especially in the west of the district.

Overall, these soils are characterized by their extreme depth, often several hundred feet, and a gray or grayish brown colour. Their texture varies from sandy, sandy loam to clay loam, Their structure is also variable, being loose, open and free draining in case of the sandy soils and compact impervious in case of the clayey soils.

Agriculture is the main occupation of the farmers of the selected watershed. The crops mainly raised in the district Bajra, Maize, mustard, Wheat, Potato, Vegetables, Guava, Mango, Rose, Moong, Arhar and Sugar cane. However, major area is covered under bajra, maize, wheat and mustard crops. While the farmers of watershed area are extensively depends on Rice, Wheat and Bajra.

Most of the lands are fallow during the Kharif season because of unavailability of assured irrigation. Only 15% area during Kharif season is cropped under the watershed area. While in Rabi season, it increase over the kharif and reached near about 65%. Thus, it clearly indicate that sustainable development of agriculture needs assured irrigation which managed by formation of watershed.

Natural vegetation of the watershed area is very poor. The vegetation is predominance are Vilayati Babul (*Prosopis juliflora*), Babul (*Acacia nilotica*). Occasional occurrence of Neem, Shisham, Anola etc. There is no grass land in the watershed. The patches of grasses are seen only on the bunds, road side, ridges etc.

The watershed areas are greatly affected by the soil erosion. Erosion occurred in this area mainly through Sheet erosion (about 60%) Rill erosion (about 26%) and Gully erosion (about 10%) of the total proposed area. This problem may be corrected by harvesting the additional water in existing water harvesting structures, which have lost most of their capacity due to siltation which results in creating new water bodies. The stored water in such structures, provided supplemental irrigation at critical growth stages of crops as well as fruit, orchards and forest tree. In agricultural land will treated with budgeting along with minor leveling. Waste land will be treated with the engineering measures like staggered trenches and a forestation etc.

**Budget for the various components is given below:-**

S.No.	Budget Component	Total (Rs. in)
A.	1. Administrative	64.750
	2. Monitoring	6.48
	3. Evaluation	6.48
B.	Preparatory Phases.	64.75
C.	Watershed Works	323.76
	(i) Livelihood programme	64.75
	(ii) Production system and micro enterprises.	84.17
D.	Consolidation Phase	32.38
	<b>Grand Total</b>	<b>647.520</b>

## **CHAPTER -1**

# **PROJECT BACKGROUND**

## 1.1 Basic Project Information:

The watershed with code No. 2C4D5j2d , 2C4D5j2b , 2C4D5j2g , 2C4D5j2a , 2C4D5j1a , 2C4D5j1b , 2C4D5c2g , 2C4D5c2e , 2C4D5c2f , having an area 7254.582 ha. Located in south-west part of the district Aligarh of Uttar Pradesh, has been taken up by the Bhoomi Sanraksham Adhikari, Ram Ganga Command Project, Aligarh (U.P.) for the development of catchment area under I.W.M.P. for rainfed areas (NWDPRAs) scheme financial by Ministry of Rural Development, Government of India. The watershed has been also taken up programme implementation comprising of development and management plan during next four years (2010-11 to 2014-15).

1.	Name of Project	-	<b>I.W.M.P., Aligarh-IIInd</b>
2.	Name of Block	-	Chandaus
3.	Name of District	-	Aligarh
4.	Name of State	-	Uttar Pradesh
5.	Name of Watershed	-	Karwan Nadi
6.	Longitude		77° 44' 55.918"E to 77° 55' 14.594"E
7.	Latitude		28° 1' 22.093N to 28° 7' 58.553"N
8.	Extent		15.55 km East to West and 10.25 km North to South
9.	Name of Concern Villages	-	Amritpur Bakhatpur, Anjana, Aogipur, Chandaus, Chiti, Chivanpur, Daurau Chandpur, Detakhurd, Diwahamidpur, Imlahara, Jahrana, Jalakha, Jalokhari, Kinhua, Mahgaura, Markhi, Mirpur Dahora, Nagala

			arua, Nagla Padam, Navabpur, Pisava, Rakrana, Ramnagar, Rampur Shahpur, Raseedpur Gorna, Raupur, Rupnagar, Sakipur, Shahpur, Sinhpur, Thanpur Khanpur, Umari, and Visara
10.	Code of Micro Watershed	-	<b>2C4D5j2d , 2C4D5j2b , 2C4D5j2g , 2C4D5j2a , 2C4D5j1a , 2C4D5j1b, 2C4D5c2g , 2C4D5c2e , 2C4D5c2f</b>
11.	Geographical Area of Project	-	7254.582 Ha.
12.	Proposed Area of Treated	-	5396.00
13.	Project Period	-	2010-11 to 2014-15
14.	Cost per hectare	-	Rs. 12000.00
15.	Total Cost of Project	-	647.52
16.	Proposed Man days	-	323700

## 1.2 Need of Watershed Development Programme:

- ❖ Development of clusters of micro watershed in holistic manner rather than piecemeal treatment in sporadic patches.
- ❖ Decentralization of decision-making processes by involving local panchayati raj Institutions, N.G.Os, Government Departments and the Watershed Community at the grassroots level.
- ❖ A three –tier approach addresses hilly/forest regions, intermediate tier or slopes and lastly, plains and flat areas.
- ❖ The scheme promotes locally available low cost technology.
- ❖ The scheme also aims at creating rural employment opportunities.

**Table no. 1: Weightage of the project :**

Project Name	Project Type	Weightage													
		i	ii	iii	iv	v	vi	vii	viii	ix	x	xi	xii	xiii	xiv
IWMP Aligarh II	IWMP	7.5	10	5	10	10	0	10	5	10	5	5	10	0	87.5



<b>Criteria</b>	<b>Maximum Score</b>	<b>Ranges &amp; Scores</b>			
Poverty index (% of poor to population)	10	Above 80 (10)	80 to 50 % (7.5)	50 to 20% (5)	Below 20% (2.5)
%ofSC/ST population	10	More than 40 % (10)	20 to 40 % (5)	Less than 20% (3)	
Actual wages	5	Actual wages are significantly lower than minimum wages (5)	Actual wages are equal to or higher than minimum wages (0)		
% of small and marginal farmers	10	More than 80 %(10)	50 to 80 % (5)	Less than 50 % (3)	
Ground water		Over exploited	Critical (3)	Sub critical (2)	Safe (0)
Status	5				
Moisture index/ DPAP/DDP Block	15	-66.7 & below (15) DDP Block	-33.3 to -66.6 (10) DPAP Block	0 to -32.2 (0) Non DPAP/DDP Block	

Area under rain-fed agriculture	15	More than 90 % (15)	80 to 90% (10)	70 to 80% (5)	Above 70% (Reject)
Drinking water	10	No source (10)	Problematic village (7.5)	Partially covered (5)	Fully covered (0)
Degraded land	15	High - above 20 % (15)	Medium -10 to 20 % (10)	Low- less than 10%ofTGA (5)	Fully covered (0)
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)	
Contiguity to another watershed that	10	Contiguous to previously treated	Contiguity within the micro	Neither contiguous to previously	

has already been developed/ treated		watershed & contiguity within the micro watersheds in the project (10)	watersheds in the project but non contiguous to previously treated watershed (5)	treated watershed nor contiguity within the micro watersheds in the project (0)	
Cluster approach in the plains (more than one contiguous micro watershed 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)	
Cluster approach in the hills (more than one contiguous micro-watersheds in the project)	15	Above 5 microwatersheds in cluster (15)	3 to 5 micro watersheds in cluster (10)	2 to 3 micro watersheds in cluster (5)	
	<b>150</b>	<b>150</b>	<b>90</b>	<b>41</b>	<b>2.5</b>

### 1.3 Criteria and weightage for selection of watershed:

Food sufficiency, economic growth and environmental security were identified as the major issues to be addressed in the watershed area. Some area has undulating topography and steep unstable slopes minor channel gradient and hence to moderate soil erosion. Effective soil depth is limited and spatially highly variable hampering good crop growth.

- Generate data on hydro-meterological, soil, nutrient and process related parameters at watershed level.

- To carry out modeling studies on watershed hydrology.
- To assess the impact of on-site and off-site management structures for soil and water management.
- Conservation, development and sustainable management of natural resources including their uses.
- Enhancement of agricultural production and productivity in a sustainable manner.
- Restoration of ecological balance in the degraded and fragile rain-fed ecosystem.
- Reduction in regional disparity between rain-fed and irrigated areas.
- Creation of sustainable employment opportunities for the rural community for livelihood security

#### **1.4 PROBLEM IDENTIFICATION AND PRIORITIZATION FOR WATERSHED**

**Table No.2: Problem Identification and Prioritization for Watershed**

<b>S. No.</b>	<b>Problem</b>	<b>Rank</b>
1.	Low production of field crops	1
2.	Lack of drinking water	8
3.	Lack of irrigation water	9
4.	Lack of fodder availability	7
5.	Non-availability of fuel wood	4
6.	Lack of inputs like quality seeds, fertilizer, pesticides etc.	3
7.	Lack of market facility	2

8.	Lack of medical, educational and transportation facilities	5
9.	Medical and Health care facilities for and low animal productivity.	6

## **1.5 OTHER DEVELOPMENT PROJECTS/ SCHEMES RUNNING IN THE PROJECT AREA IWMP -IIInd**

### **Developmental programmes projects/schemes running in the Project area :**

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

These programmes are :

1. Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS),
2. Swarnajayanti Gram Swarajgar Yojana (SGSY),
3. Indira Awas Yojana (IAY)
4. Integrated Watershed Management Programme in other areas of the district are under operation in the department of Agriculture.

## **CHAPTER – 2**

# **PROJECT IMPLEMENTING AGENCY**

## **2.1 Roles and Responsibilities of the Project Implementing Agency {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 arrangement. The PIA shall submit the periodical progress report to DWDU. The PIA shall also arrange physical, financial and social audit of the work undertaken. It will facilitate the mobilization of additional financial resource from other government programmes, such as MNREGA, BRGF, SCRY, National Horticulture Mission, Tribal, Welfare Schemes, Artificial Ground Water Recharging, Greening India, etc.

## **2.2 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 2WDU with the approval of SNLA in deserving cases keeping in view the practical field experience of the candidate. The WDT should be located as close as possible to the watershed project. At the same time, it must be ensured that the WDT should function in close collaboration with the team of experts at the district and state level. The expenses towards the salaries of the WDT members shall be charged from the administrative support to the PIA. DWDU will facilitate the training of the WDT members.

### Roles and Responsibilities of WDT:

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

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

### **2.3 SWOT Analysis of the project area**

#### **Strengths (S)**

- i. Cooperative work culture in traditional activities
- ii. Gose ethic ties
- iii. Road at the top as well as outlet of the watershed
- iv. Hare working man power
- v. Resource pool of crop genetics diversity tf.
- vi- Awareness of farmers about water: ned anagement programme
- vii. Well established CPR maintaining and sharing system
- viii. Good productivity of soil
- ix. Social outlook of the community towards iand -ess
- x. Establishment of KVK

### **Weakness (W)**

- i. Poor water management
- ii. Resource poor farmers
- iii. Out migration of youth
- iv. Fragile geography
- v. Fragmented land holding
- vi. Heavy infestation of wild animals
- vii. Problem of fuel and fodder
- viii. poor marketing and storage facility
- ix. Imbalance use of fertilizers
- x. Lack of high yielding varieties

### **Opportunities (O)**

- 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 d-y land horticulture
- vi. Potential for collective action and management of CPR

**Threats (T)**

- i. Prone to adverse climate like drought
- 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
- vi. Falling of water table

## STAFF AT PIA LEVEL

**Table No.3: Staff at PIA level**

S.No	Name	Designation	Qualification
1	2	3	4
1)	Shri Sheikh Ahmad Ali	Bhoomi Sanrakshan Adhikari	Intermediate , Civil Engg. Diploma
2)	,, Anil Kumar Gupta	Junior Engineer	Intermediate , Civil Engg. Diploma
3)	,, HeeraLal Meena	Draughtsman	B.A. Diploma in Draughtman Civil
4)	,, Ram autar	Accountant	M.Com.
5)	,, Bageshwar	Jr. Cleark	B.A.
6)	,, Bhagwan Das Gautam	Tracer	B.A.
7)	,, Lalit Mohan Pandey	Ziledar	Intermediate
8)	,, Babu Ram	Seench Paryavekshak	High School
9)	,, Puran Chand	Seench Paryavekshak	High School
10)	,, Udai Veer Singh	Seench Paryavekshak	Intermediate
11)	,, Suresh Pal Singh	Seench Paryavekshak	Intermediate
12)	,, Gajendr Pal Singh	Seench Paryavekshak	Intermediate
13)	,, Ram Swaroop Rawat	Seench Pal	B.A.
14)	,, Santosh Kumar Singh	Seench Pal	M.A.

15)	„ Harveer Singh	Seench Pal	Intermediate
18)	„ Raj Bahadur Singh	Seench Pal	High School
19)	„ Farman Ahmad	Munshi	Intermediate
20)	„ Bholamber	Driver	Jr.High School
21)	„ Mahaveer Singh	Iv-Class	Jr.High School
22)	„ Aziz Khan	Iv-Class	Jr.High School
23)	„ Ram Prasad	Iv-Class	Jr.High School
24)	„ Hari Om	Iv-Class	Jr.High School
25)	„ Lakhan Singh	Iv-Class/ Dak Runner	Intermediate

## आदेश

भारत सरकार ग्रामीण विकास मंत्रालय नई दिल्ली द्वारा जारी वाटरशेड विकास परियोजना के लिए समान मार्ग दर्शी सिद्धान्त – 2008 के पैरा 5.3 के अनुसार जनपद – अलीगढ़ में स्वीकृत परियोजना आई0डब्ल्यू0एम0पी0 अलीगढ़ प्रथम के समान मार्गदर्शी सिद्धान्त के अनुसार क्रियान्वयन हेतु निम्न प्रकार से जल संग्रहण विकास दल (पक्व) का गठन किया जाता है एवं आदेशित किया जाता है कि समान मार्गदर्शी सिद्धान्त के पैरा 5.4 के अनुसार कार्यवाही सुनिश्चित करें।

क्र०सं०	सदस्य का नाम	पदनाम	योग्यता	व्यावहारिक अनुभव	सम्बन्धित कार्यक्षेत्र
1	2	3	4	5	6
1.	डॉ. आर पी सिंह	वैज्ञानिक	एम एस सी (पी. एच.डी.)	किसान विकास केन्द्र छेरत अलीगढ़ में वरिष्ठ वैज्ञानिक	कृषि/एग्रोनामी
2.	श्री अनील कुमार गुप्ता	अवर अभियन्ता	डिप्लोमा (सिविल इं०)	परियोजनाओं के क्रियान्वयन में 25 वर्षों का अनुभव	भूमि एवं जल प्रबन्धन
3.	श्री प्रेमपाल सिंह	से० नि० स.भू.स. नि.	बी.एस.सी (ऑनर्स) एग्रोना.	भूमि एवं जल प्रबन्धन में 32 वर्षों का अनुभव	.. ..
4.	श्रीमती पुष्पा देवी	समाज सेविका	इण्टर मीडिएट	सामाजिक कार्यों में पाँच वर्षों का अनुभव	सामाजिक कार्य

भूमि संरक्षण अधिकारी, चण्ड।पट्ट

भूमि विकास एवं जल संसाधन विभाग

अलीगढ़।

कार्यालय – भूमि संरक्षण अधिकारी, भूमि विकास एवं जल संसाधन विभाग अलीगढ़।

पत्रांक: भू०सं०अ० / / प्रा०अनु० / आई०डब्ल्यू०एम०पी० / 10-11 / दिनांक

प्रतिलिपि:—

निम्नलिखित की सेवा में उपरोक्तानुसार सूचनार्थ प्रेषित।

1. वाटरशेड विकास दल ;पुष्पेन्द्र के समस्त सदस्यों को।  
उपनिदेशक, भूमि विकास एवं जल संसाधन विभाग अलीगढ़ मण्डल अलीगढ़।
2. परियोजना निदेशक, जिला ग्राम्य विकास अभिकरण, अलीगढ़।
3. मुख्य विकास अधिकारी, जनपद अलीगढ़।
4. जिलाधिकारी, जनपद अलीगढ़।
5. अध्यक्ष एवं प्रशासक, रामगंगा कमाण्ड परियोजना, कानपुर।
6. विशेष सचिव, भूमि विकास एवं जल संसाधन विभाग, उ०प्र० शासन, लखनऊ।

भूमि संरक्षण अधिकारी ;चण्ण।पुन्द्र

भूमि विकास एवं जल संसाधन विभाग

अलीगढ़।

## **CHAPTER -3**

# **BASIC INFORMATION OF THE PROJECT AREA**



### 3.1 Geography and Geo-Hydrology

#### 3.1.2. Land Use Pattern

The watershed has diversified land use namely agriculture, wasteland and others. The present land use and area under different categories in watershed is presented in **table No 7 & 8**, Map shown in Annexure Map.

**Table 4: Present land under different categories in the watershed**

S. no	Name of Watershed /code no.	Name of concern village	Agriculture	Waste land				
				Waste land All type	Pasture	Forest	Others	Total
1	2	3	4	5	6	7	8	9
1	2C4D5j2d	Roop Nagar	626	59.78	-	-	51.00	736.780
2	2C4D5j2b	Cheeti)	577.91	56.326	-	-	67.00	701.36
3	2C4D5c2e	Nagla Salua	745.585	82.282	0.576	-	0.055	728.428
4	2C4D5j2g	Mahgaura	663.31	-	-	-	57.683	720.993
5	2C4D5j2a	Nagla Padam	752.55	85.124	-	-	104.00	941.674
6	2C4D5j1a	RamprShahpur	864.717	8.182	20.088	-	33.911	926.606
7	2C4D5j1b	Chandaus	682.37	660.282	-	-	3.942	746.602

8	2C4D5c2f	Imlahra	630.193	61.494	2.433	-	94.467	788.887
9	2C4D5c2	Augi Pur	694.845	86.695	13.398	-	68.084	863.606
		<b>Total</b>	<b>6237.48</b>	<b>501.165</b>	<b>36.495</b>	<b>-</b>	<b>480.482</b>	<b>7254.582</b>

**Table 5: Present land use of the watershed**

S.No	Land Use	Present
1	2	3
1	Agriculture	6237.48
a	Rain-fed	5396.00
	I Crop	5396.00
	II Agro-forestry	-
b	Irrigated	841.48
	I Assured	341.20
	II partial	500.28
2	Waste land	500.165

a	A forestation/forest	-
b	Pasture	36.495
c	Untreatable	-
3	Village land and others	480.482
	<b>Total</b>	<b>7254.582</b>

### 3.2. Geomorphology and Soils:-

In general, entire area is an alluvial plain, with a gentle slope from north-west to south - west. Watershed area is located at south - west end of the district. It's characterized with several natural depressions apart from those formed by the river valleys and drainage lines. Elevated sand ridges are also found specially in the west portion.

Topographically, the watershed lands are divided in to two groups. These are Plain lands and Moderate land.

#### *Major soil groups of district Aligarh*

**Table No:6 Major Soil Groups**

S.No.	Name of soil type	Distribution	Characteristics	Crop association
1.	Ganga Khadir (ganga loam Sand)	A narrow belt of recent alluvium along the river Ganga	Profile development immature, light to ash grey, sandy to silty loam, lime, soluble salts and Mg high, alkaline reaction, clay content low, drainage imperfect	Maize, Bajra, Wheat and Mustard
2.	Eastern upland (Aligarh loam)	Extends from kali Nadi to Ganga Khadir as far as the lower Ganga canal in west.	Profile development mature, light brown to deep brown, loam to sandy, loam texture, lime and soluble salts low, greater accumulation of Mg, neutral, good drainage	Maize, Bajra, Wheat, Gram and Mustard

3.	Central low land (Aligarh clay loam)	North to south & throughout the district parallel to river Ganga	Profile development mature, grey to dark grey with layer of gravel, loam of clayey loam, lime and soluble salts high, ph ranges from 7,0-8.0. and above, drainage very poor.	Rice, Wheat, maize
4.	Western upland (Aligarh Sandy loam)	The tract from Patwaha Nala in the welt of G.T. road in the east	The Mature soil. Brown to redish brown with no concretions, sandy to sandy loam, lime, soluble salts and Mg low, pH ranges from 6.8 to 7.5, excessive drainage	Jowar, Bajra, Wheat & Mustard
5.	Khadir (Yamuna sandy loam)	10 km, wide in the north and covers 4 km. in the south	The dark grey, clayey, lime, soluble salts and sesquioxides high. Drainage poor.	Rice, Berseem, Wheat
6.	Trans Yamuna Khadir (Yamuna silty clay loam)	Beyond Yamuna Khadir in the east almost parallel to the course of the river is the trans Yamuna, Khadir about 10 km long extending as far as Patwaha (Nala)	The mature soil, brownish red, loamy, sesquioxide, soluble salts, lime and Mg medium, pH ranges from 7.0 to 7.5, drainage restricted	Wheat, maize, Gram & Mustard

### **3.2.1 Fine textured alluvial soils:-**

These soils are the most extensive soil group found in the watershed. The middle portion of watershed is relatively flat land with fine soil texture. These soils are black in colour and are inherently high in fertility status. These black soils are calcareous and on drying develop numerous cracks and fissures. Soils of the lower horizon are invariably heavier than the surface, being a zone of compaction and invariably a zone of calcium carbonate accumulation in the form of *Kankar* nodules. A sub surface indurate pan of *kankar* or clay or mixtures of both are prevalent, which impede the downward movement of water there by creating problems of high run off.

### **3.2.2 Coarse textured alluvial soils**

These soils are lying mostly near the adjoining areas of Karwan River near the outlet and around the lower portion of foot hill of watershed. These soils are coarser in texture and are relatively poor in fertility status. The soils are loamy sand in texture.

These soils also occupy significant area of the watershed. The soils are derived from the alluvial deposit and also from resident soils of the hill region. Rill and gully formation in some parts particularly near the outlet of watershed can be seen.

**TABLE NO. 7: SOIL EROSION**

Cause	Type of erosion	Area affected (ha)	Run off (mm/ year)	Average soil loss (Tonnes/ ha/ year)
	Water erosion			
A	Sheet	3887.00	132.00	11.00
B	Rill	186.00		
C	Gully	241.00		
Sub-Total		6827.00		
Wind erosion		-	NA	
Total		7254.582	132.00	11.00

### **3.3 Location:-**

The Karwan Nadi watershed project in Chandaus block of district Aligarh, Uttar Pradesh is situated on Aligarh-Delhi high way (N.H.-1) about 35 km from Aligarh and 5 km from Chandaus block between Latitude 28° 1' 22.093N to 28° 7' 58.553"N and 77° 44' 55.918"E to 77° 55' 14.594"E longitude. The block chandaus is bounded by the another district- Buland Shahr.

### **3.4 Area and Elevation:-**

The total area which is bounded by the watershed project is 7254.582 ha. But the total area which is treated during these project is only 5396.0 ha. Highet of the projected area is 193 m above the mean sea level. Projected area covered the number of villages are namely Rampur Shahpur,Umri ,Nagla Padam ,Diwa hameed pur , RoopNagar , Jalokhri , Imlahra , Augipur ,Nagla Sarua ,Nawab Pur , Cheemanpur , Jakhota, Mahgaura , Anjana , Shahpur , Pisawa , Deta Khurd , Rampur Rakrana , Cheeti , Chandaus , Saqipur , Ram Nagar , Jalakha , Singh Pur , Rasheed pur Gorna , Amrit pur Bakht pur , Daurau Chand pur etc.

### **3.5. Shape:-**

The shape of the watershed area is some what square with tail like structure on the upper portion. . The maximum length and width of the watershed are near about 15-0 km 6.5 km , respectively with the length and width ratio is. 2.4:1.



### **3.6. Physiography:-**

A watershed is an area from which all water drains to a common point, making it an interesting unit for managing water and soil resources to enhance agricultural production through water conservation. Thus the watershed is situated between the end point of the Aligarh and starting point of the district Buladshahr having perceptuous slopes. and drain in to the river Karwan near Chandaus village. About 80% of the watershed area has slopes more than 1-2.5% and upright ridges. The top of the watershed exhibits extremely precipitous and manifesting moderate to severe erosion class. Average soil losses in these area is near about 15-18 tones /ha./year. The lower portion of the watershed has moderate slopes i.e. less than 2.5% At the outlet of the watershed small gullies are noticed, covereded with sparse of vegetation.

### **3.7. Climate Condition:-**

The watershed area comes under the semi-arid region of tropical climate. It is characterized by hot summer, cold winter and moderate rainy season. The average annual rainfall of the last five year is about 430mm. Most of the annual rainfall occurs through the south-west monsoon and the effective rainfall period is from late June to late September or some time up to the beginning of October. Few light showers are also received in winter. The mean wind velocity during the year is 4.0km/hour. The absolute maximum temperature is generally observed in the month of June i.e.47<sup>0</sup>-48<sup>0</sup>C and the absolute minimum temperature is normally recorded in month of January i.e. 2.2<sup>0</sup>C.

### 3.7.1. Drainage:-

Due to the prevalence of mild to steep slopes, sandy loam textured soil and presence of a number of drainage lines in the watershed, the drainage system is adequate. The watershed forms part of Ganga and Yamuna basin.

### 3.7.2. Vegetation:-

#### a) Natural Vegetation:-

Natural vegetation of the watershed is very poor. The forest vegetation is predominant with Vilyati Babul followed by Desi Babul. Few neem plants and Shish am are also found. There is no grassland. Grass Patches are seen only on the bunds, road side, ridges and other such places.

#### b) Horticulture:-

A few horticulture or commercial horticultural plantation in the area is observed along with few Scattered fruit plants.

#### c) Agro forestry:-

The watershed area does not have any forest.

### **3.8 Agriculture, Horticulture and Agro-forestry:-**

About 75% area of the watershed are used in agriculture. Both rain-fed and irrigated farming are practiced in the watershed. Mono cropping is dominant in rain-fed areas while double cropping is limited to the irrigated lands. Rain-fed farming is mostly mono cropping with low productivity and only 1/3 rd area under agriculture is cropped during Kharif season in the watershed. The green fodder production in watershed area through crops, grasses and limited forest trees is clearly inadequate for maintaining the proper health of the animals of watershed villages. The cultivated follow lands dominate in the watershed which contributes to accelerate soil erosion (15-18 tones/ha/year) as well as run off (180 mm./year) yields in the watershed.

Among rabi, farmers are using high yielding varieties of rabi crops. Imbalanced fertilizer use in rabi crops both under rain-fed and irrigated area, absence of sulphate containing fertilizers and in adequate pest control measures are some of the reasons of low productivity of these crops.

The organized orchards as well as forest area are widely lacking in the watershed, which is why, the majority of farmers of the watershed are facing considerate problem of fire wood. While the watershed has a good potential of fruit and forest tree cultivation in both the condition i.e. rain-fed as well as irrigated. Though the vegetable have good potential in the watershed however, their cultivation is limited to kitchen garden. Almost all tropical/ sub tropical vegetable may be successfully grown in the watershed.

### **3.9 Human Population:-**

The total population of the 36 villages in the watershed area is 103649 No, out of which 33183 are male, 28582 are female and 41884 are children. Of the total population 32.01percent are male and 27.575 percent are female. The male female ratio is reflected to be 1000: 869. This is mainly because of the lack of proper education and health services. The village wise details of rural population are given below.

**Table 8: Human population in the watershed**

s.n o.	Name of village	Population				Percentage			Total family no	SC family no
		Male	Female	Children	Total	Male	Female	Children		
1	2	3	4	5	6	7	8	9	10	11
1	2C4D5j2d (Roop Nagar)	7181	6294	12235	25710	27.94	24.48	47.58	4310	215
2	2C4D5j2b (Cheeti)	1026	848	1820	3694	27.78	22.97	49.25	614	34
3	2C4D5c2e (Nagla Salua)	6402	5492	1228	13122	26.54	22.76	50.70	4021	201
4.	2C4D5j2g (Mahgaura)	7468	6426	11530	25424	29.37	25.27	45.36	4218	210
5.	2C4D5j2a (Nagla Padam)	2772	2406	3722	8900	31.14	27.03	41.83	1420	78
6.	2C4D5j1a (Rampur Shahpyur)	3166	2640	3722	9528	37.12	30.95	31.93	1406	76
7.	2C4D5j1b (Chandaus)	681	585	1505	2771	22.54	19.36	58.10	601	30
8.	2C4D5c2f (Imlahra)	2472	2108	3794	8374	29.51	25.19	45.30	1385	71
9.	2C4D5c2g (Augi Pur)	2017	1783	2328	6128	32.91	29.09	38.00	1117	57
	<b>Total</b>	<b>33183</b>	<b>28582</b>	<b>41884</b>	<b>103649</b>	<b>32.015</b>	<b>27.575</b>	<b>40.409</b>	<b>19092</b>	<b>972</b>

### **3.10 Livestock Population:-**

As depicted in table -2, that the total live stock population is 22466 in the villages of the watershed area. Of the total livestock population 4848 Buffaloes, 395 Cows, 714 Bullocks, 6899 Goats and 6048 others. According to the data it is clearly exhibit that the farmers of the watershed area are preferred buffalo as milch animal compared to cow, while milk yield is very low. Goat are also preferred for milk as well as for meat purpose.

**Table9: Livestock Population in watershed**

S.no.	Name of village	Livestock Resolution					
		Buffaloes	Cows	Bullocks	Goats	Others	Total
1	2	3	4	5	6	7	8
1	2C4D5j2d (Roop Nagar)	987	745	246	1480	1260	4718
2	2C4D5j2b (Cheeti)	140	112	05	190	160	607
3	2C4D5c2e (Nagla Salua)	885	760	198	1380	1270	4501
4.	2C4D5j2g (Mahgaura)	875	788	190	1380	1286	4512
5.	2C4D5j2a (Nagla Padam)	408	335	18	565	486	1812
6.	2C4D5j1a (Rampr Shahpyur)	512	402	16	648	560	2138
7	2C4D5j1b (Chandaus)	135	98	04	198	155	590
8.	2C4D5c2f (Imlahra)	535	412	18	630	511	2106

9.	2C4D5c2g (Augi Pur)	371	305	19	428	360	1482
	<b>Total</b>	<b>4848</b>	<b>3957</b>	<b>714</b>	<b>6899</b>	<b>6048</b>	<b>22466</b>

### **3.11 Infrastructure Social feature:-**

All the ( 32 ) villages of the watershed area has moderate communication facilities and also approachable through motor able road. Literacy rate and percentage of literacy is up to the mark because mostly having education up to Inter College. Other facilities like post office, P.H.C, Bank, Vet Hospital. Cooperative societies and Market are falls within the 7 km distance, which is convenient to approach by the farmers.

**Table No.10:**

S. no	Name of village		Pakka Road	Electricity	Pr. School	Jr.High School	Inter College	Post Office	P.H.C	Bank	Vet Hosp	Coop Soc.	Mar Ket	Ag Service center
1	2		3	4	5	6	7	8	9	10	11	12	13	14
1	2C4D5j2d	Roop Nagar	√	√	√	√	1km	√	5km	5km	1km	1km	1km	1km
2	2C4D5j2b	Cheeti	√	√	√	√	5km	2km	5km	5km	5km	5km	5km	5km

3	2C4D5c2e	Nagla Salua	√	√	√	√	5km	5km	5km	5km	5km	5km	5km	5km
4	2C4D5j2g	Mahgaura	√	√	√	√	6km	√	6km	6km	6km	6km	6km	6km
5	2C4D5j2a	Nagla Padam	√	√	√	√	4km	√	4km	4km	4km	4km	4km	4km
6	2C4D5j1a	Rampr Shahpyur	√	√	√	√	4km	√	√	4km	4km	4km	4km	4km
7	2C4D5j1b	Chandaus	√	√	√	√	1.5km	1.5km	1.5km	1.5km	1.5km	1.5km	1.5km	1.5km
8	2C4D5c2f	Imlahra	√	√	√	1km	7km	2km	7km	6km	7km	7km	7km	7km
9	2C4D5c2g	Augi Pur	√	√	√	√	√	√	√	6km	6km	6km	6km	6km

### **3.12. Hydrological Data in the watershed area:-**

Village wise hydrological data of watershed area is given the below. It is evident from the table that it ranges in between 11.00m to 38m. depth, which is found only in the village Ailampur. Other wise it ranges upto 14 meter. Which is a good signe of exploring the ground water for agriculture as well as for drinking purpose.



**Table-11: Hydrological Data in the watershed Area**

S.No.	Name of village	Ground water state in the month of April to June	Particular Places
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
1	Roop Nagar	21.34	-
2	Cheeti	24.39	-
3	Nagla Salua	19.81	-
4	Mahgaura	15.20	-
5	Nagla Padam	16.50	-
6	Rampr Shahpyur	15.00	-
7	Chandaus	16.75	-
8	Imlahra	13.75	-
9	Augi Pur	13.5	-

### **3.13 Socio- Economic Profile**

#### **3.13.1 Means of Communication:-**

The watershed can be approached either from Aligarh via Chandaus through National Highway No.1. ( 35km) or from Delhi via Palwal road (125 km). All villages of the watershed are also interconnected by Pakka roads. The upper side of the watershed boundary touches the Bulandshahr district.

#### **3.13.2. Natural Resource Base:-**

Near about 80% area of the total 5396.00 ha. area of watershed is under rain-fed agriculture and about 10% area under cultivable waste land. No pasture and forest area are present in the watershed. Main source of irrigation are seasonal rainfall along with the ground water table.

#### **3.13.3 Importance of Development Institutions:-**

In the venn diagram, farmers perception was recorded for importance and role of different development institutions in relation to infrastructure in the village. Importance has been depicted with size of the circle and role with distance from village circle.

**TABLE NO. 12: LITERACYRATE**

S. No	Project/Village	Literacy					
		Total	%	Male	%	Female	%
01	IWMP-II		51.24 %	12548.00	68.33 %	9265.00	42.67 %

**MIGRATION PATTERN:**

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

**TABLE NO. 13: MIGRATION DETAILS**

S. No.	Project/Village	Total population	Migration			Migration by months			Main reason for migration	Income during migration / month
			Total	Male	Female	Up to 3 months	3-6 months	More than 6 months		
01	IWMP-II	24516.00	3112.00	1929.00	1183.00	912.00	1364.00	836.00	Lack of fodder	3500.00/month

**TABLE NO. 14: POVERTY-**

Sl. No.	Project/Village	Total BPL Household	BPL			% of BPL HH	Total Land less HH	% of land less HH
			0-16	16-20	Total			

01	IWMP-II	2225.00	597.00	1628.00	2225.00	35.01 %	1792.00	28.20
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### **INFRASTRUCTURE FACILITIES: -**

IWMP-II watershed is well connected with Aligarh & Bareilly, Ghaziabad with *pucca* roads. The village has electricity connectivity. village has a primary school with all facilities For middle and higher secondary education, the students have to go to Aligarh .which is about 56 kilometres away and for Higher Education students go to Bareilly.This also contributes to lower education level of the people. The village do not have a Primary Health Centre for which villagers have to go to Bulandshahar which is 25 Km. away.

### **3.14. Historical Timeline:-**

An historical timeline is the chronological record of important events in the history of the village which is useful in understanding its background in the context of the watershed. Historical timeline of the villages of the watershed were prepared through PRA.

### **3.15. Agriculture:-**

Various agricultural land uses in the watershed are extended to diversified land capabilities starting from marginal to good class II lands. The watershed distinctly has three types of lands i.e. leveled, sloping and degraded & undulating. The agriculture is practiced on all these soil types though the productivity considerably varies. The total area under agriculture in the watershed is about 4584 ha out of which 3667 ha is under rain-fed agriculture. The water (both irrigated and drinking) is most scarce natural resource in the watershed. The operation of tube wells for irrigation of agricultural crops frequently leads to the drinking water problem to the farmers of watershed forcing them to carry drinking water from outside the watershed area. The agricultural field bunds are common in the watershed, however, they frequently break on heavy rains adversely affecting the in situ percolation of rain water in the soils.

The agriculture soils in the watershed have diversified texture i.e. Loam sand, silt clay loam gravel Mixed texture which are located in patches throughout the watershed? The heavy soils are almost kept fallow during rainy season. The agricultural soils have hard calcium pan at variable depth. The irrigation water is conveyed in earthen channels and surface irrigation methods following mainly border method or flood method of irrigation by the farmers in the watershed. These factors substantially reduce the water use efficiency of limited available and valuable irrigation water in the watershed. The quality of irrigation water needs to be tested for assessing fitness of the quality for irrigation and other purposes.

### **One year rotation**

### **Mono cropping**

Fallow-mustard/wheat/gram/winter vegetables, bajra/jowar/black gram/green gram fallow.

### **Double cropping**

Bajra/jowar/black gram/green gram-mustard/wheat/gram/winter vegetables.

### **Irrigated agriculture**

### **One year rotation**

Bajra/jowar/black gram/green gram-mustard/wheat/winter vegetables

### **Crop productivity**

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

The mixed cropping is in practice in limited area with kharif crops like bajra and jowar but it is not only irrational but also particular are raised on residual soil moisture under rain-fed production system during post monsoon season. Imbalanced use of fertilizers is common in not only rabi and kharif crops but also rain-fed and irrigated production system.

The recommended deep plowing for enhanced in situ residual soil moisture conservation and higher production is also not followed in the watershed. The shallow plowing tractor drawn tillage implements are available with the farmers in the watershed but deep plowing implements yet need to be introduced.

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

### **3.16 Indigenous technological knowledge (ITK)**

Agriculture is an old traditional occupation, farmers in the watershed who have improves themselves with passage of the time according to their domestic need and technological reforms in the nearby areas. The villagers have their traditional village ponds, practice of field bunding which typically constitute agriculture related ITKs in the watershed.

### **3.17 Forest and Other Vegetation**

## **Forests**

There is considerable forest area 0.00 Hect. in the watershed.

## **Horticulture /Agro-forestry**

Less horticulture and loss Agro forestry practices were observed in the watershed.

### **3.18 Agro forestry**

The agro-forestry practices are highly lacking in the watershed though it has good potential under existing dispositions and may play a vital role particularly with respect to minimization of cropping risk, build up soil fertility and productivity, soil conservation- partly meeting out the fire wood demand of rrral community and moreover, optimizing the economical . The other agro-forestry systems like agri-silvi,agri-horti silvi-pastoral, and bind and boundary plantations also have good potential to cater the fire wood and fodder demands of the rural community in the watershed. The existing area under agro-forestry is almost negligible. Prosopis juliflora may be planted as block or sole plantation specifically on marginal and degraded lands in the watershed. The agro-forestry interventions comprising of ber. bail, aonla. guava. popular etc may be applied for benefit of the farmers under rain-fed to irrigated production systems on leveled to sloppy and marginal agricultural using proper planting techniques and termite control measures. The multipurpose trees may also help in supplementing fire wood and fodder demands of the rural community in the watershed and may be planted as hedge rows on rain-fed marginal and degraded lands.

### **3.19 Horticulture**



The fruit trees are in limited in number like Mango, guava, papaya, lemon, lime, ber, aonla as well as vegetables like cucurbits, okra, radish, tomato, cauliflower, cabbage, garlic, onion, brinjal, chilly but they are found surviving well in the watershed villages. The subtropical fruits and vegetables have very good potential in the watershed. Organized orchards, commercial vegetable cultivation, horti-agri and other systems of agro-forestry etc are lacking but have good potential in the watershed.

### **3.20 SOIL AND LAND CAPABILITY CLASSIFICATION**

#### **4.21.1 Soil morphology**

The watershed is located south west corner of the Maharajganj district. The entire watershed is Accordingly, the soils of watershed have been grouped in two major categories.

- i) Plain land
- ii) Undulated land

### **3.21 CLIMATE:**

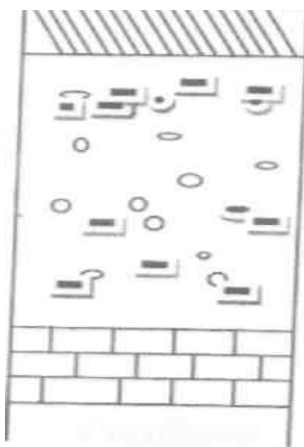
The climate condition of the project area is very differential in average. In the summer season temperature rises 46° and in the winter season it come down 3.5°. Precipitation average is 100-125 CM. it's 70% come out in June to Oct. month. And rest 30 percent in an other months.

### **3.22 Soil and Topography:**

The watershed falls in the Mid Plain agro-climatic Zone. This is characterized by the largest zone of highly productive alluvial soils, high fertility with intensive irrigation and increased cropping intensity. The soils vary widely from sandy loam to clay loam. The average rainfall of the zone is 900 mm and the temperature ranges from 3.2°C to 45°C. Monthly relative humidity ranges from 35% to 90% (annual mean 68%)

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

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



Soil profile- A representative soil profile

1.32 cm (Medium texture soil-yellowish brown in colour)

20 to 150 cm.

(Silty Clay loam, midly alkaline in reaction)

More than 150 cm.

Quarts and mica dominant minerals.

**Table 15. Morphology of a typical soil profile of the watershed (dominant soil)**

<b>Horizon</b>	<b>Depth (cm)</b>	<b>Morphology</b>
A	0-20 cm	Drack yellowish Brown in color, Silty loam faint friable non calcareous midly alkaline in reaction, lucky structure.
B	20-151 cm.	Silty clay loam midly alkaline in reaction sticky and plastic when wet, abundant medium pores.
C	More than 151 cm.	Silty clay loam midly alkaline in reaction sticky and plastic when wet, abundant medium pores.

### 3.23 Soil Characteristic and fertility status :

Soil characteristics pertaining to soil fertility of various classes occurring around different villages are given in Table.

**Table. 16: Soil Characteristics and Fertility Status**

Soil properties	LCC I	LCC II	LCC III/IV
Sand (%)	26.80	54.00	71.95
Silt (%)	25.10	18.50	21.30
Clay (%)	45.90	25.21	6.65
Texture	Clay Loam	Loamy Sand	Sandy Loam
pH (1:2)	7.25	7.30	7.16
EC (dSm <sup>-1</sup> )	0.15	0.13	0.14
Organic carbon (%)	0.36	0.32	0.22
Available N (kg ha <sup>-1</sup> )	368	310	241
Available P (kg ha <sup>-1</sup> )	12	10.00	7.85
Available K (kg ha <sup>-1</sup> )	310.10	292.70	266

*Historical time line of village (Roop Nagar)*

2C4D5j2d

Sl.No.	Activities	Year
1	2	3
1	Established	1890
2	Construction Bandhi (water harvesting structure)	-
3	Opening up primary school	1990
4	Introduction of Tractor	1985
5	Establishment of P.H.C.	-
6	Kachcha road	1905
7	Introduction of Thresher	1987
8	First Tube well/Diesel pump set	1985
9	First Motorcycle	1990
10	TV & DVD player	2000
11	Over head Tank for drinking water	-
12	Electrification of village	1999
13	Bituminous Road	2001
14	Temple renovation	-

15	Planning for watershed project	2010-11
16	Gobar Gas Plant	-

*Historical time line of Village ( Cheeti)*

**2C4D5j2b**

<b>Sl.No.</b>	<b>Activities</b>	<b>Year</b>
<b>1</b>	<b>2</b>	<b>3</b>
1	Established	1910
2	Construction Bandhi(water harvesting structure)	-
3	Opening up primary school	1991
4	Introduction of Tractor	1988
5	Establishment of P.H.C.	-
6	Kachcha road	1955
7	Introduction of Thresher	1990

8	First Tube well/Diesel pump set	1990
9	First Motorcycle	1985
10	TV & DVD player	2000
11	Over head Tank for drinking water	-
12	Electrification of village	2000
13	Bituminous Road	2003
14	Temple renovation	-
15	Planning for watershed project	2010-11

*Historical time line of village (Nagla Salua)*

2C4D5c2e

<b>Sl.No.</b>	<b>Activities</b>	<b>Year</b>
<b>1</b>	<b>2</b>	<b>3</b>
1	Established	1915
2	Construction Bandhi(water harvesting structure)	-
3	Opening up primary school	2000
4	Introduction of Tractor	1985
5	Establishment of P.H.C.	-
6	Kachcha road	1985
7	Introduction of Thresher	1987
8	First Tube well/Diesel pump set	1979
9	First Motorcycle	1987
10	TV & DVD player	1992
11	Over head Tank for drinking water	-



12	Electrification of village	1998
13	Bituminous Road	2002
14	Temple renovation	-
15	Planning for watershed project	2010-11

*Historical time line of village( Mahgaura)*

**2C4D5j2g**

<b>Sl.No.</b>	<b>Activities</b>	<b>Year</b>
<b>1</b>	<b>2</b>	<b>3</b>
1	Established	1511
2	Construction Bandhi (water harvesting structure)	-
3	Opening up primary school	1967
4	Introduction of Tractor	1960
5	Establishment of P.H.C.	-

6	Kachcha road	1960
7	Introduction of Thresher	1964
8	First Tube well/Diesel pump set	1960
9	First Motorcycle	1980
10	TV & DVD player	1985
11	Over head Tank for drinking water	-
12	Electrification of village	1960
13	Bituminous Road	1985
14	Temple renovation	-
15	Planning for watershed project	2010-11

*Historical time line of village (Nagla Padam)*

2C4D5j2a

<b>Sl.No.</b>	<b>Activities</b>	<b>Year</b>
<b>1</b>	<b>2</b>	<b>3</b>
1	Established	1811
2	Construction Bandhi(water harvesting structure)	-
3	Opening up primary school	1965
4	Introduction of Tractor	1965
5	Establishment of P.H.C.	2000
6	Kachcha road	1966
7	Introduction of Thresher	1967
8	First Tube well/Diesel pump set	1965
9	First Motorcycle	1968
10	TV & DVD player	1982
11	Over head Tank for drinking water	1962

12	Electrification of village	1972
13	Bituminous Road	1975
14	Temple renovation	-
15	Planning for watershed project	2010-11

*Historical time line of village( Rampur Shahpur)*

**2C4D5j1a**

<b>Sl.No.</b>	<b>Activities</b>	<b>Year</b>
<b>1</b>	<b>2</b>	<b>3</b>
1	Established	1800
2	Construction Bandhi (water harvesting structure)	-
3	Opening up primary school	1982
4	Introduction of Tractor	1981
5	Establishment of P.H.C.	1990
6	Kachcha road	1959

7	Introduction of Thresher	1986
8	First Tube well/Diesel pump set	1950
9	First Motorcycle	1985
10	TV & DVD player	1991
11	Over head Tank for drinking water	1991
12	Electrification of village	1977
13	Bituminous Road	1985
14	Temple renovation	-
15	Planning for watershed project	2010-11

*Historical time line of village( Chandaus)*

**2C4D5j1b**

<b>Sl.No.</b>	<b>Activities</b>	<b>Year</b>
<b>1</b>	<b>2</b>	<b>3</b>
1	Established	1700
2	Construction Bandhi(water harvesting structure)	-
3	Opening up primary school	1800
4	Introduction of Tractor	1980
5	Establishment of P.H.C.	1981
6	Kachcha road	1950
7	Introduction of Thresher	1985
8	First Tube well/Diesel pump set	1948
9	First Motorcycle	1983
10	TV & DVD player	1990

11	Over head Tank for drinking water	1950
12	Electrification of village	1963
13	Bituminous Road	1980
14	Temple renovation	1980
15	Planning for watershed project	2010-11

*Historical time line of village(Imlahra)*

2C4D5c2f

<b>Sl.No.</b>	<b>Activities</b>	<b>Year</b>
<b>1</b>	<b>2</b>	<b>3</b>
1	Established	1735
2	Construction Bandhi(water harvesting structure)	-
3	Opening up primary school	1982
4	Introduction of Tractor	1990

5	Establishment of P.H.C.	-
6	Kachcha road	1983
7	Introduction of Thresher	1990
8	First Tube well/Diesel pump set	1976
9	First Motorcycle	1986
10	TV & DVD player	1985
11	Over head Tank for drinking water	-
12	Electrification of village	1988
13	Bituminous Road	1995
14	Temple renovation	2008
15	Planning for watershed project	2010-11



*Historical time line of village ( Augi Pur)*

2C4D5c2g

<b>Sl.No.</b>	<b>Activities</b>	<b>Year</b>
<b>1</b>	<b>2</b>	<b>3</b>
1	Established	1710
2	Construction Bandhi(water harvesting structure)	-
3	Opening up primary school	1965
4	Introduction of Tractor	1965
5	Establishment of P.H.C.	2001
6	Kachcha road	1944
7	Introduction of Thresher	1990
8	First Tube well/Diesel pump set	1973
9	First Motorcycle	1985
10	TV & DVD player	1986
11	Over head Tank for drinking water	-

12	Electrification of village	1995
13	Bituminous Road	1947
14	Temple renovation	2005
15	Planning for watershed project	2010-11

### **3.24 Sustainability and environment security:-**

In the proposed watershed management plan of watershed, proper blending of bio engineering measures will be applied on 60% of the total watershed area. Based on the result of studies conducted in this region, it is estimated that more than 50% of the watershed area will be treated and consequently the soil and runoff from the area is expected to be reduced by 75% and 70% 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.

### 3.25 Economic Analysis:-

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

**Table-17 Source of Income**

S.no	Name of Village	Income Sources/no. of family						
		Agriculture	Labour	Pri. Sector Services	Govt. Sector Service	Shop	Landless Labour	Other
1	2	3	4	5	6	7	8	9
1	2C4D5j2d (Roop Nagar)	1015	585	790	230	19	138	-
2	2C4D5j2b (Cheeti)	105	35	34	54	12	35	-
3	2C4D5c2e (Nagla Salua)	821	510	310	27	11	32	-
4	2C4D5j2g (Mahgaura)	1100	625	850	300	20	150	-
5	2C4D5j2a (Nagla Padam)	1750	850	250	175	15	20	-
6	2C4D5j1a (Rampr Shahpyur)	350	400	150	5	5	10	-

7	2C4D5j1b (Chandaus)	125	15	10	5	7	5	-
8	2C4D5c2f (Imlahra)	240	270	150	50	08	-	-
9	2C4D5c2g (Augi Pur)	180	80	80	100	16	60	-
	<b>Total</b>	<b>5686</b>	<b>3370</b>	<b>2624</b>	<b>946</b>	<b>113</b>	<b>450</b>	-

**Table 18:- Economics of agriculture sector**

S.No.	Sector	Area (ha)	NPV (Rs.)	BC ratio
1	Irrigated agriculture	841.48	179569817	1:6:1
2	Rainfed agriculture	5396.00	877605302	1:2:1
3	<b>Total</b>	<b>6237.48</b>	<b>1057175119</b>	<b>1.4:1</b>

**Table 19.** Economic analysis of horticulture plantation in Agri-horti system at watershed. Project life is considered to be 25 years and discount rate for NPV estimation is 10%.

S.No.	Common Name	Scientific name	Area (ha)	NPV of Net Benefit	B:C Ratio
1	Aonla	Embelica officinal is	12	8946618	3.97:1
2	Ber	Zyziphus mauritiana	12	604704	2.8:1
3	Bael	Aegle marmelos	12	407724	2.84:1
	<b>Total</b>		<b>36</b>	<b>1859046</b>	<b>3.512</b>

**Agro Forestry/Fuel wood plantation**

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

**Table 20. *Food Sufficiency***

S.No.	Common Name	Scientific name	Area (ha)	NPV of Net Benefit	B:C Ratio
1	Vilayati Babul, Kanji, Papari, Shesome	<i>Prosopis</i>	307	4947340	2.11:1

**Table 21 Status of food requirement and availability per annum in watershed**

S.no.	Items	Require ment (q/yr)	Before project		Proposed	
			Availability (q/yr)	Deficit or surplus (q/yr)	Availability (q/yr)	Deficit o surplus (q/yr)
1	Cereals	101809	86537	(-) 15272	104305	(+) 2496
2	Pulses	20362	15271	(-) 15091	20465	(+) 103
3	Oil seeds	21958	19323	(-) 12627	22078	(+) 126
4	Vegetable	7905	6324	(-) 1581	10861	(+) 2956

**3.26 Employment Generation**

Labour migration in search of gainful employment is one the major problems in the remote watershed in particular. Casual employment opportunities to the tune of more than 0.35 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 174.524 lacs in the watershed.

### 3.27. Land Holding:-

The table given below indicate that the farmers of the watershed area are in marginal and small along with the scattered land holding at different places, which makes cultivation very difficult. Detailed farm families according to their size of land holdings are given in the table 3.

**Table:22 Distribution of Farm families according to their size of land holding**

s.no	Name & code No. of micro	Name of concern Village	Land Holding Classification				Percentage		
			Mar	Small	Other	Total	Mar	Small	Others
1	2	3	4	5	6	7	8	9	10
1	2C4D5j2d	Roop Nagar	545	389	219	1153	47	34	19
2	2C4D5j2b	Cheeti	125	76	69	270	46	28	26
3	2C4D5c2e	Nagla Salua	148	88	60	296	50	29.73	20.27
4	2C4D5j2g	Mahgaura	550	330	220	1100	50	30	20
5	2C4D5j2a	Nagla Padam	875	525	350	1750	50	30	20
6	2C4D5j1a	Rampr Shahpyur	200	150	50	400	50	37.50	12.50
7	2C4D5j1b	Chandaus	60	45	30	135	44.44	33.34	22.22
8	2C4D5c2f	Imlahra	200	119	80	399	50.12	29.82	20.06
9	2C4D5c2g	Augi Pur	168	102	67	337	49.85	20.27	19.88

### 3.28. Livelihood Pattern:

Out of the total population of 26548 of all the village, lie in watershed area, a majority i.e. more than 80% has farming as their major source of livelihood followed by 15%. Agricultural laborers + laborers and very few in service. The villagers earn their livelihood from animal husbandry and agriculture and during lean seasons they migrate for daily wage labourers in salt pans of Kanpur and as agriculture labour in other parts of the state. Another major occupation of the people is gum collection and Charcoal making using the wood of *prosopis* which they collect from the community land or forest.

**TABLE NO. 23: PER CAPITA INCOME**

Sl. No.	Project Name	Agriculture (in Rs.)	Animal husbandry (in Rs.)	Casual labour (in Rs.)	Others (in Rs.)	Total (in Rs.)
01	IWMP-II	4773.582	658.00	1892.00	231.00	7254.582



### **DEPENDENCE ON COMMON PROPERTY RESOURCE**

The vast majority of the denizens of this region depend on Common property resources. Most of them continue to live a virtually hand-to-mouth existence. Their pathetic poverty seems, in fact, to have further worsened in recent years, as their traditional pasture lands have been rapidly depleting due to over-grazing and persistent drought-like conditions in the region. But now, almost every family in this area supplements its measure income by felling the tree and burning its woods.

**TABLE NO.24: DEPENDENCE ON FOREST/CPR**

Sl. No.	Project/Village	Forest Wood marketing		Fodder		Total income (Rs)
		% sells	Income (Rs)	% sells	Income	
01	IWMP-II	0	Self Consumption	0.00	Self Consumption	0.00

**TABLE NO. 25: LIVELIHOOD PATTERN (OCCUPATIONAL DISTRIBUTION)**

S. No.	Project/ Village	Total workforce	Agriculture	Animal husbandry (AH)	Agriculture + AH	Casual labour	Services	Handicraft
01	IWMP-II	26548.00	11124.00	6670.00	2458.00	4351.00	1270.00	675.00

### **3.29. Dependency on Forest for fuel wood and fodder:-**

#### **(a) Fuel Woods:-**

Villagers in the villages do not use the latest appliances to meet their cooking energy requirement. The main source of fuel is cow dung cake, woody stem of arhar crop, mustard and maize crop. About 70-75 percent of the domestic energy requirement is met from agrobio products and cow dung cake. Rest is met from the forest outside the village as well as watershed boundary.

#### **(b) Fodder:-**

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

### **3.30. Labour requirement:-**

Labour requirement is found to be the maximum during Oct-Nov, when the harvesting of Kharif crops and sowing of rabi crops are done simultaneous. The crucial period are march-April when coinciding harvesting and threshing of rabi crops and July/Aug when sowing of Kharif crops take place.

### **3.31. Crop Calendar:-**

The present crop calendar in the watershed area compares of Fallow-Mustard

Fallow-Wheat, Bajra-Wheat, Bajra-Mustard, Jawar-Wheat, Jawar-Mustard, Blackgram-Wheat, Blackgram – Mustard, Green gram-Wheat, Green gram- Mustard etc. Fallow –Mustard is the most prevailing crop rotations both in the rain-fed and irrigated condition in the watershed. Vegetable cultivation, fruit plantation and traditional agro-forestry system are lacking widely in the watershed. A very limited vegetable cultivation in the watershed.

### **3.32. Farmers Preference:-**

**Agriculture:-** Mustard and bajra. After that wheat.

**Fruit trees:-** Ber, Anala, Guava and Bael

**Fodder trees:-** Nil.

The marketing facilities, lack of follow up modern scientific package of practices of crops having potential in the watershed, socio-economic factors etc were found to be most important factors deciding the preference of farmers pertaining to selection and cultivation of crops, fruit and other fodder trees in the watershed.

### **3.33. COMPARATIVE DATA OF THE CROP PRODUCTIVITY OF THE AREA: PROJECT AREA VS. DISTRICT VS. STATE VS. COUNTRY VS. WORLD:**

“The term productivity in general means the total output per unit of factor input. For example land productivity means output per hectare of land. Productivity is an average and is calculated by dividing the total output of a particular crop by the total cultivated area under that crop.”

Data are made available by the Baseline survey (for IWMP-II), Handbook of Agriculture, ICAR publication 2001(For Censex data ), and Final district plan (DAP) of Dept. of Agriculture . The results indicate that IWMP-II village has very low productivity compared to world, India, U.P & Aligarh.

The productivity is low not only because that the land is unproductive or the farmer's lack the skills to manage their crop but also due lack to of source of irrigation, salty water and scarcity of rain.

The IWMP-II village comes under arid zone. So farmers grow crop according to the rainfall. If they get good rainfall they generally grow high value crops like Paddy, Wheat, mustard, Arhar,Alsi,Barli Bengal gram etc. In case of low rainfall they go for sorghum, castor, and pearl millet. So we can say that monsoon decides cropping patterns of IWMP-II village.

## **CHAPTER -4**

# **WATERSHED ACITIVITIES**

## MANAGEMENT /ACTION PLAN

### PREPARATORY PHASE

#### Entry Point Activities

Integrated Watershed Development Programme II<sup>nd</sup> is aimed at the socio economic up liftments of the dweller of watershed area and to create trust about the programme to be implemented so that they can coordinate in participatory mode for the success of the programme. As per the new common guidelines total financial outlay for the entry point activities is 4 % of the total project cost. To increase the per capita availability of drinking water older wells of the village will be renovated as well as pacca jagat will be constructed, to increase the irrigation water availability older bundhies which are already existed but not functioning will be reconstructed/ renovated. Repairing and maintenance of water bodies have been proposed on priority basis. School lies in the watershed areas will be equipped with drinking water facility I. To approach watershed village construction and repairing of damaged pulia has also been proposed and construction of women bathrooms besides hand pump or wells. Total estimated cost for these activities is Rs 25.90 Lacs.

(All financial figures in lacs Rs.)

S.no.	Names of the Villages	Amount earmarked for EPA	Entry point Activities planned	Estimated cost	Expected outcome	Name of agency which selected the EPA#	Expected month & year of completion (mm/yyyy)
1	2	3	4	5	6	7	8
1	<b>2C4D5j2d</b>	2.65	Repair of well/ Pacca jagat-2	1.000	-	WC, PIA, WDT	March, 2011
			Repairing of damaged Pulia-1	0.300	-	WC, PIA, WDT	March, 2011
			Traveler Tin shed-1	1.000	-	WC, PIA, WDT	March, 2011
			Repairing of P.School Class Room	0.350	-	WC, PIA, WDT	March, 2011

2	<b>2C4D5c2g</b>	3.10	Repair of well/ Pacca jagat-2	1.000	-	WC, PIA, WDT	March, 2011
			Repairing of damaged Pulia-3	0.900	-	WC, PIA, WDT	March, 2011
			Traveler Tin shed-1	1.000	-	WC, PIA, WDT	March, 2011
			Repairing of P.School Class Room	0.200			
3	<b>2C4D5j2b</b>	2.50	Repair of well/ Vikash Munch-2	1.000	-	WC, PIA, WDT	March, 2011
			Repairing of damaged Pulia-1	0.300	-	WC, PIA, WDT	March, 2011
			Repairing of P.School Class Room	0.200	-	WC, PIA, WDT	March, 2011
			Traveler Tin shed-1	1.000	-	WC, PIA, WDT	March, 2011

1	2	3	4	5	6	7	8
4	<b>2C4D5j1b</b>	2.66	Repair of well/ Vikash Munch-2	1.000	-	WC, PIA, WDT	March, 2011
			Repairing of damaged Pulia-4	1.200	-	WC, PIA, WDT	March, 2011
			Repairing of P.School Class Room	0.460	-	WC, PIA, WDT	March, 2011
5	<b>2C4D5c2f</b>	2.82	Repair of well/ Vikash Munch-2	1.000	-	WC, PIA, WDT	March, 2011
			Repairing of damaged Pulia-1	0.300	-	WC, PIA, WDT	March, 2011

			Repairing of Pnchayat ghar	0.520	-	WC, PIA, WDT	March, 2011
			Traveler Tin shed-1	1.000	-	WC, PIA, WDT	March, 2011
6	<b>2C4D5j1a</b>	3.31	Repair of well/ Vikash Munch-2	1.000	-	WC, PIA, WDT	March, 2011
			Repairing of damaged Pulia-3	0.900	-	WC, PIA, WDT	March, 2011
			Repairing of Pnchayat ghar	0.410	-	WC, PIA, WDT	March, 2011
			Traveler Tin shed-1	1.000	-	WC, PIA, WDT	March, 2011
7	<b>2C4D5j2g</b>	2.56	Repair of well/ Vikash Munch-1	1.000	-	WC, PIA, WDT	March, 2011
			Repairing of damaged Pulia-4	1.200		WC, PIA, WDT	March, 2011
			Repairing of Pnchayat ghar	0.360		WC, PIA, WDT	March, 2011
8	<b>2C4D5c2e</b>	2.95	Repair of well/ Vikash Munch-2	1.000	-	WC, PIA, WDT	March, 2011
			Repairing of damaged Pulia-2	0.600	-	WC, PIA, WDT	March, 2011
			Repairing of Pnchayat ghar	0.350	-	WC, PIA, WDT	March, 2011
			Traveler Tin shed-1	1.000	-	WC, PIA, WDT	March, 2011
9	<b>2C4D5j2a</b>	3.35	Repair of well/ Vikash Munch-2	1.000	-	WC, PIA, WDT	March, 2011
			Repairing of damaged Pulia-3	0.900	-	WC, PIA, WDT	March, 2011
			Repairing of Pnchayat ghar	0.450	-	WC, PIA, WDT	March, 2011
			Traveler Tin shed-1	1.000	-	WC, PIA, WDT	March, 2011
<b>Total</b>		<b>25.90</b>		<b>25.90</b>			

# was the EPA selected by Gram Panchayat/WC/PIA/WDT/Any other (please specify)



## **Watershed Activities:**

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

### **4.1 Scientific Planning:-**

#### **1. Cluster Approach:-**

xi. This envisages integrated development of Geo-hydrological unit ie. Treatment of cluster of micro-watershed The IWMP- II Aligarh Project consist 7 micro watershed namely 2B4A3a1c, 2B4A3a1b, 2B4A3a1a, 2B4A3c1a, 2B4A3b1a, 2B4A4d3c, 2B4A4e3a.

#### **Base line Survey**

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

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

### **3. Participatory Rural Appraisal (PRA)**

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

#### **4.2 Use of GIS and Remote sensing for planning**

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

##### **a) Prioritization**

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

## **b) Planning**

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

## **c) Hydrological modeling**

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

**Table-26: Scientific Criteria**

<b>Scientific Criteria /Input Used</b>	<b>Whether Scientific Criteria was Used</b>
<b>(A) (A) Planning</b>	
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	Yes
Ridge to Valley treatment	Yes
Online IT connectivity between	Yes
(1) Project and DRDA cell/ZP	Yes
(2)DRDA and SLNA	Yes
(3) SLNA and DoLR	Yes
Availability of GIS layers	--

Availability of <i>GIS</i> 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
Integrated coupled analyzer/ near infrared visible spectroscopy/ medium spectroscopy for high speed soil nutrient analysis	Yes
Normalized difference vegetation index (NDVT)#	Yes
Weather Station	--
<b>(B) Inputs</b>	Yes
Bio-pesticides	Yes
<b>Organic manures</b>	Yes

Vermicompost	Yes
Bio-fertilizer	Yes
Water saving devices	Yes
Mechanized tools/ implements	Yes
Bio-fencing	Yes
Nutrient budgeting	Yes
Automatic water level recorders & sediment samplers	Yes
Any other (please specify)	Yes

### Details of Self Help Groups( SHGs ) in Project Area

#### I.W.M.P-II –Aligarh

**Table-27: Self Help Groups**

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	Total no. of member
1	2	3	4	5	6	7
1.	Imlehra	2C4D5c3f	Jay Bajrang Bali	Dairy	Shri Barkat Khan	11

2.	Augipur	2C4D5c2g	Ma Durga	Dairy	„ Chetan Raj	11
3.	Chandaus	2C4D5j1b	Ma Durga	Dairy	„ Jagdish	11
4.	Rampur Shahpur	2C4D5j1a	Jay Bajrang Bali	Dairy	„ Nouseh Khan	11
5.	Roop Nagar	2C4D5j2d	Booph Singh	Dairy	„ Vinod	10
	„ „	„ „	Shiv Shankar	Machli palan	„ Kali Charan	10
	„ „	„ „	Laxmi bai	Silai	„ Urmila Devi	10
6.	Cheeti	2C4D5j2b	Shiv Shankar	Dairy	„ Prempal	10
7.	Nagla Salua	2C4D5c2e	Laxmi Bai	Dairy	„ Jugan Singh	10
	„ „	„ „	Shiv Shankar	Dairy	„ Balishter Singh	10
8.	Mahgaura	2C4D5j2g	Mahatma Ghandhi	Dairy	„ Dheer Singh	10
	„ „	„	Om Shiv	Dairy	„ Nasheer Khan	10
	„ „	„	Ganga	Dairy	„ Naranjan Singh	10
	„ „	„	Shambli	Dairy	„ Pappu Khan	10
9.	Nagla Padam	2C4D5j2a	Ambedkar	Dairy	„ Ompal Singh	10
	„ „	„	Krishna	Pig	„AnilKumar Chouhan	8
	„ „	„	Baba	Dairy	„ Rajeev	11
	„ „	„	Agni	Dairy	Shrimati Gulsara	5

## Users Group Details in Project Area

### IWMP-II Aligarh

**Table-28: Users Group Details**

S.No	Name of project (M.W.S)	Cod. No. (M.W.S)	Area in Hect.	Name of U.G.	Name of Group leader & No. of Cultivation
1.	<b>Imlehra</b>	2C4D5c2f	788.887	No.1.	Shri Ramji Lal 21
	”	”	”	No.2.	,, Ram Pratap Singh 21
	”	”	”	No.3.	,, Inderjeet Singh 25
	”	”	”	No.4.	,, Sureshpal Singh 20
	”	”	”	No.5.	,, Duarka Prashad 11
	”	”	”	No.6.	,, Rhade Sham 30
	”	”	”	No.7.	,, Jeruddin 35
	”	”	”	No.8.	,, Girraj Prashad 35
	”	”	”	No.9.	,, Mohan Lal 30
	”	”	”	No.10.	,, Shri Krishan 35
	”	”	”	No.11.	,, Mahendra Kumar 30
	”	”	”	No.12.	,, Rehman Khan 32
	”	”	”	No.13.	,, Barkat Khan 35



	”	”	”	No.14.	„ Om Prakash	37
2.	<b>Augipur</b>	2C4D5c2g	863.606	No.1.	Shri Mangal Singh	20
	”	”	”	No.2.	„ Surajpal	18
	”	”	”	No.3.	„ Raj Veer Singh	19
	”	”	”	No.4.	„ Jaypal Singh	23
	”	”	”	No.5.	„ Charan Singh	25
	”	”	”	No.6.	„ Babu Singh	25
	”	”	”	No.7.	„ Sateypal Singh	21
	”	”	”	No.8.	„ Subedar Singh	24
	”	”	”	No.9.	„ Ajay Pratap Singh	30
	”	”	”	No.10.	„ Gopal Singh	27
	”	”	”	No.11.	„ Ramsaran Singh	28
	”	”	”	No.12.	„ Girvar Singh	25
	”	”	”	No.13.	„ Raj Kumar Singh	28
3.	<b>Chandaus</b>	2C4D5j1b	746.602	No.1.	Shri Darampal Singh	16
	”	”	”	No.2.	„ Rampal Singh	17
	”	”	”	No.3.	„ Raispal	9
	”	”	”	No.4.	„ Chetrapal Singh	18

	”	”	”	No.5.	„ Satehpal Singh	26
	”	”	”	No.6.	„ Suranjan	24
	”	”	”	No.7.	„ Gyarshi Prashad	20
	”	”	”	No.8.	„ Veerpal	22
	”	”	”	No.9.	„ Suan Singh	20
	”	”	”	No.10.	„ Chandrapal	18
	”	”	”	No.11.	„ Mahendra Singh	22
	”	”	”	No.12.	„ Jeetpal	15
	”	”	”	No.13.	„ Jayarti Prashad	18
	<b>Cheemanpur</b>	”	135.37	No.1.	„ Manoj Kumar	24
	”	”	”	No.2.	„ Shivcharan	33
	”	”	”	No.3.	„ Anar Devi	25
	”	”	”	No.4.	„ Tejveer	32
	”	”	”	No.5.	„ Rajveer	21
	”	”	”	No.6.	„ Sumit Kumar	32
	”	”	”	No.7.	„ Munshi Kumar	31
	”	”	”	No.8.	„ Vijaypal	30
	”	”	”	No.9.	„ Rohitash Kumar	23

	”	”	”	No.10.	„ Yogindra Singh	38
	”	”	”	No.11.	„ Mohan Lal	35
	”	”	”	No.12.	„ Ganga Prashad	34
4.	<b>Rampur Shahpur</b>	2C4D5j1a	926.606	No.1.	„ Om Prakash	11
	”	”	”	No.2.	„ Natthi Singh	19
	”	”	”	No.3.	„ Khan Chand	40
	”	”	”	No.4.	„ Manjoor Ali	27
	”	”	”	No.5.	„ Sudarrani Chouhan	27
	”	”	”	No.6.	„ Parveen Begum	52
	”	”	”	No.7.	„ Sultan Khan	40
	”	”	”	No.8.	„ Santosh Kumar	44
	”	”	”	No.9.	„ Jamshed Khan	37
	”	”	”	No.10.	„ Dhyaanpal Singh	51
	”	”	”	No.11.	„ Iqbal Khan	58
	”	”	”	No.12.	„ Hamja Ali	46
	”	”	”	No.13.	„ Tanveer Khan	42
	”	”	”	No.14.	„ Jagaliya	50
	”	”	”	No.15.	„ Saleem	40

	”	”	”	No.16.	,, Gori devi	45
	”	”	”	No.17.	,, Hameedan	30
	”	”	”	No.18.	,, Fateh Mohammad	40
	”	”	”	No.19.	,, Hoshiyaar	37
	”	”	”	No.20.	,, Khachere Khan	41
	”	”	”	No.21.	,, Kurrond	48
	”	”	”	No.22.	,, Saleem Khan	51
	”	”	”	No.23.	,, Kayyum Khan	29
	”	”	”	No.24.	,, Abdul Rahim	43
	”	”	”	No.25.	,, Islam	38
	”	”	”	No.26.	,, Munim Khan	35
	”	”	”	No.27.	,, Nafeesha Begum	44
	”	”	”	No.28.	,, Yasin Begum	41
	”	”	”	No.29.	,, Mohammad Noor	31
	”	”	”	No.30.	,, Waseem	42
	”	”	”	No.31.	,, Zahid Ali	50
	”	”	”	No.32.	,, Babu Khan	40
5.	<b>Nagla Padam</b>	2C4D5j2a	941.374	No.1	,, Rajpal Singh	30

	”	”	”	No.2	„ Veer pal	25
	”	”	”	No.3	„ Ralveer	35
	”	”	”	No.4	„ Udai Veer	40
	”	”	”	No.5	„ Kaushakendr	35
	”	”	”	No.6	„ Sardar	35
	”	”	”	No.7	„ Rajkumar	40
6.	<b>Mahgaura</b>	2C4D5j2g	720.993	No.1	„ Waheed Khan	30
	”	”	”	No.2	„ Raghubar dayal Sharma	35
	”	”	”	No.3	„ Om Parkash Sharma	25
	”	”	”	No.4	„ Malkhan Singh	30
	”	”	”	No.5	„ Naseer Khan	35
	”	”	”	No.6	„ Kishan Lal Sharma	35
	”	”	”	No.7	„ Rakesh Sharma	35
7.	<b>Roop Nagar</b>	2C4D5j2d	736.780	No.1	„ Gangadhar Singh	32
	”	”	”	No.2	„ Veerpal	36
	”	”	”	No.3	„ Itvarilal	27
	”	”	”	No.4	„ Karuti Ram	32
	”	”	”	No.5	„ Veer Singh	34

	”	”	”	No.6	„ Jal Singh	33
	”	”	”	No.7	„ Chetram Singh	
				No.8	„ Prem Raj Singh	34
8.	<b>Cheeti</b>	2C4D5j2b	701.236	No.1	„ Ram Veer	28
	”	”	”	No.2	„ Sukhveer	35
	”	”	”	No.3	„ Chove Singh	36
	”	”	”	No.4	„ Chutku	34
	”	”	”	No.5	„ Selendar Sharma	35
	”	”	”	No.6	„ Charan Singh	32
	”	”	”	No.7	„ Prem Singh	35
	”	”	”	No.8	„ Mohan Singh	31
9.	<b>Nagla Salua</b>	2C4D5c2e	828.498	No.1	„ Kuwarpal Singh	36
	”	”	”	No.2	„ Pratab Singh	32
	”	”	”	No.3	„ Zaheer Khan	34
	”	”	”	No.4	„ Hashrat Ali	28
	”	”	”	No.5	„ Jugan Singh	25
	”	”	”	No.6	„ Islam Nabi	35
	”	”	”	No.7	„ Kalu	33

	”	”	”	No.8	„ Sateveer Singh	37
	”	”	”	No.9	„ Ummed Ali	36

## Entry Point Activities (EPA):

### PHASING OF WORKS (FINANCIAL & PHYSICAL)

#### DESIGN OF CONTOUR BUND

Type of Soil	-Sandy Loan
Rain fall	-24hr in cm -25 cm
Field Stop -1%	
Vertical Interval (VI)	$= [s/3+2] \times 0.3$ $= [1/3+2] \times 0.3$ $= 0.70 \text{ m}$
Horizontal Interval (HI)	$= 100 \times V.I/s$ $= 100 \times 0.7/1$
Height of bund h	$= \sqrt{(Re \times VI) / 50}$ Re=maximum rainfall in cm $= \sqrt{(25 \times 0.7) / 50}$ $= \sqrt{0.35}$



$$= 0.59$$

**Say 0.60 m**

Taking top width of bund 0.50 m and side slope 1.5:1

$$\text{Then base of Bund} = .45 + (.1.5 \times .60) \times 2$$

$$= .45 + 1.80 = 2.25 \text{ m}$$

$$\text{Cross-Section of bund} = \frac{.45 + 2.25}{2} \times .6 = .81$$

$$\text{Length of bund} = 100 \text{ s/V.I.}$$

$$= 100 \times 1/0.70$$

$$= 142.85 \text{ m/ha}$$

**Say 150 m/ha**

$$\text{Earth work/ha} = 150 \times .81 = 121.5 \text{ cmt}$$

$$\text{Rate} = 33.33/\text{cum}$$

$$\text{Cost Rs./ha} = 121.5 \times 33.33$$

$$= 4049.59$$

**Say 4050/**

### TYPICAL SECTION OF FIELD BUND

Top width	= 0.45 m
Side slope	= 1.5:1
Height of bund	= 0.50 m
Bottom Width	= 1.95 m
Cross section	= $(0.45 + 1.95) \times 0.50/2 = 0.60$
Length per hector	= 250 m
Earth work	= $250 \times 0.60 = 150$ cmt
Rate	= 33.33/cmt
Cost	= Rs. 4999.60 say 5000/-
Cost per hectare	= Rs. 5000/-

**TYPICAL SECTION OF P.B., M.B., S.B.**

Top width	= .50
Side slope	= 1.5:1
Height	= .70 m
Bottom	= 2.60 m
Cross section	$= (.50 + 2.60) \times \frac{.70}{2} = 1.085$
Rate	= 33.33/ cmt
Cost /meter	= 36.16

**TYPICAL SECTION OF EARTHEN GULLY PLUG**

Top width	= 1.50 m
Side slope	= 2:1
Height	= 2.00

Bottom Width = 9.5 m

Cross section =  $\frac{1.5+9.5}{2} \times 2 = 11$

Rate = 37.33/cmt

Cost per meter = Rs. 410.63

**Say 411.00**

### TYPICAL SECTION OF CHECK DAM

Top width = 2.50 m

Side slope = 2:1

Height = 2 m

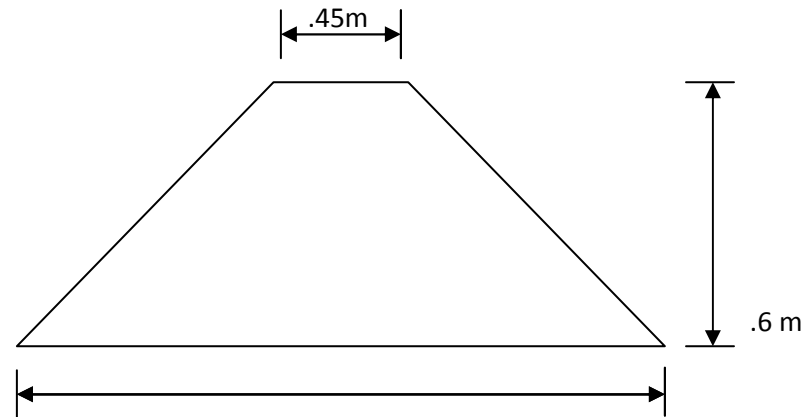
Bottom Width = 10.50 m

Rate = 37.33/ m<sup>3</sup>

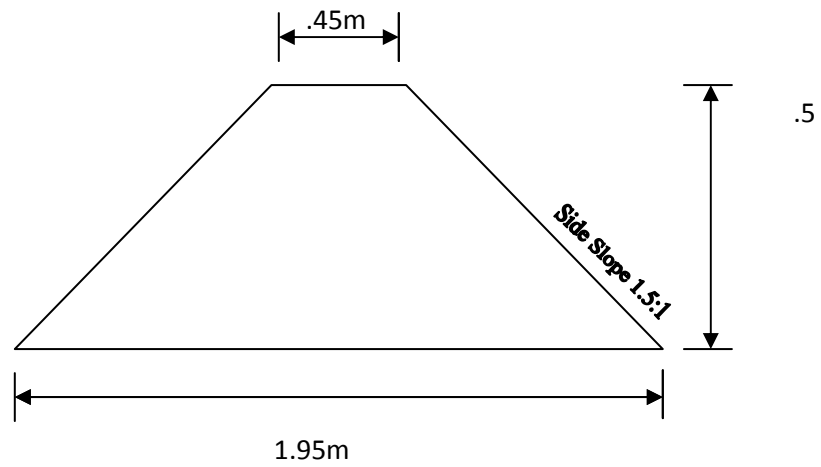
Cross Section =  $\frac{2.50 + 10.00}{2} \times 2.0 = 12.50$

Cost/meter = 466.62

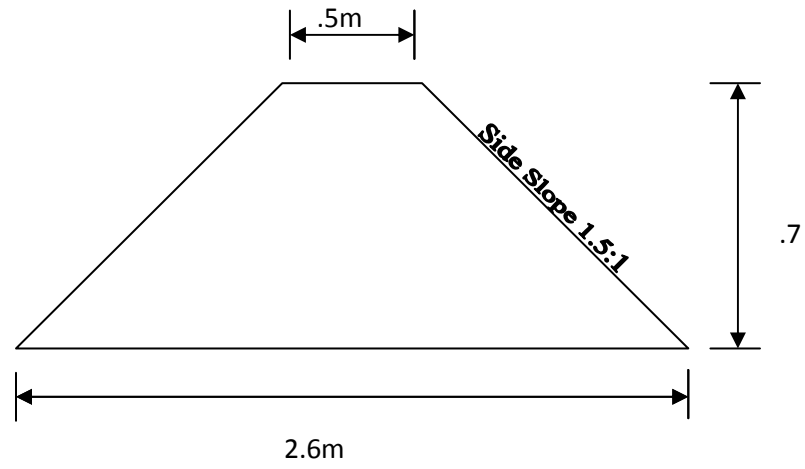
**DRAWING OF CONTOUR BUND**



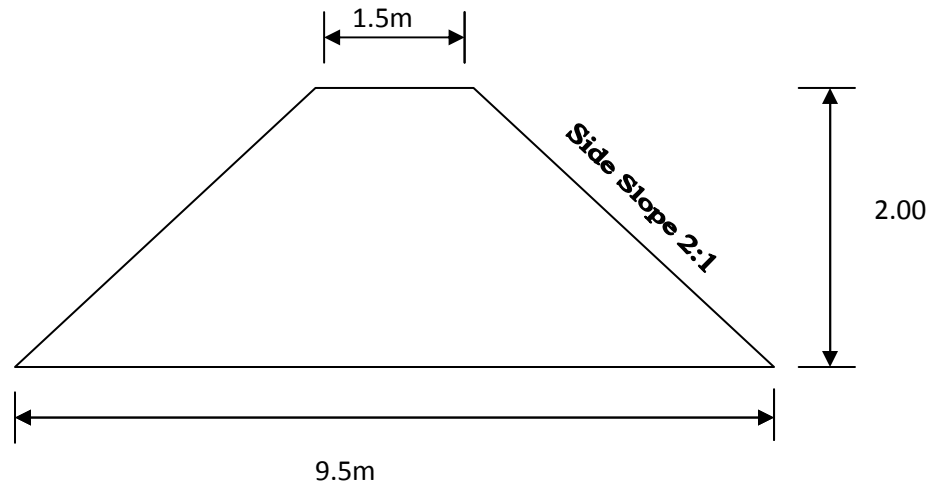
**DRAWING OF FIELD BUND**



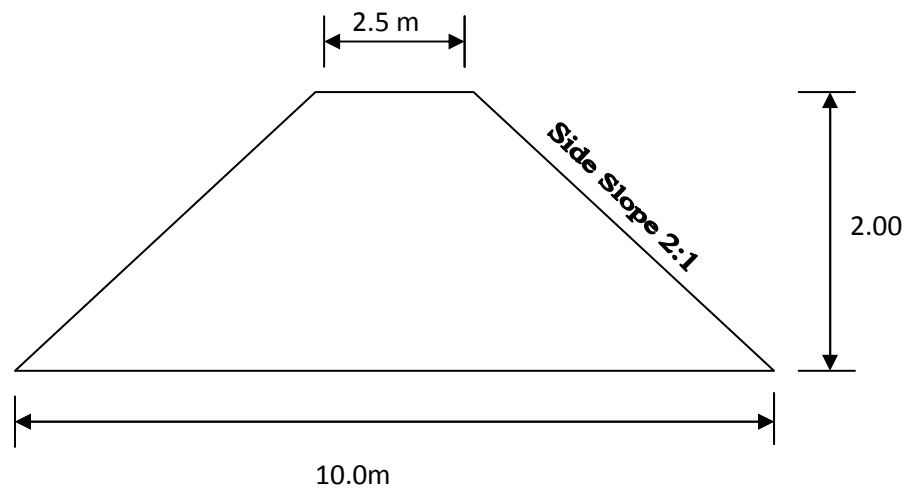
**DRAWING OF P.B.,**



**DRAWING OF EARTHEN GULLY PLUG**



**DRAWING OF CHECK DAM**





Estimating & Costing of Arch Culvert 1 Meter Span

S.No	Particulars	Nos	Length (mts)	Width (mts)	Height / Depth (mts)	Quantity	Remark
1.	<b>Earth work excavation in foundation</b> Abutment						
(i)	Wing wall	1	5.50	1.50	1.00	8.25	
(ii)		4	1.20	9.00	1.00	<u>4.80</u>	
						<b><u>13.05</u></b>	
2.	<b>C.C work (1:4:8) cement sand Mortar With Brick Ballast</b>						
(i)	C.C work in foundation in wall	2	5.20	.90	0.15	1.40	
(ii)	C.C work in Span Bed	1	5.00	1.00	0.15	0.75	
(iii)	C.C work in foundation of wing wall	4	1.10	0.50	0.15	<u>0.08</u>	
						<b><u>2.23</u></b>	
3.	<b>Brick work in (1:4) Ist class brick with cement sand mortar</b>						
	Foundation Ist step						

(i)	Foundation IInd step	2	5.00	0.60	.32	1.99	
(ii)	Brick work in side wall	2	5.10	0.46	0.32	1.50	
(iii)	Brick on Eadge flooring in Bed	2	5.00	0.35	1.00	3.5	
(iv)	Brick work in Arch	1	5.00	1.00	0.11	0.55	
(v)	Brick work in foundation in wing wall	1	5.30	1.50	0.11	0.58	
(vi)	Brick work in Arch side filling top side	4	1.00	0.35	1.46	2.04	
(vii)	Brick work on top flooring of Arch	2	0.50	0.23	0.32	0.07	
(viii)	Parapet wall	1	5.00	1.50	0.11	0.82	
(ix)		2	3.00	0.35	0.50	<u>1.05</u>	
						<b><u>12.10</u></b>	
4.	<b>Struck pointing (1:3)</b>						
(i)	Front side of wing wall	2	1.35	1.50		4.05 sq.mt	
(ii)	Front of upon Arch Side	2	1.00	0.50		1.00 „	
(iii)	Parapet Top	2	3.00	0.35		2.10 „	
(iv)	Parapet inner side	2	3.00	0.50		3.00	
(v)	Inner side of Arch + wall	1	5.00	3.00		<u>15.00</u>	
						<b><u>25.15</u></b>	
5.	<b>Earth in side filling</b>						

(i)	Outer Wall side	2	5.50	.50	1.00	5.50	
(ii)	Inner Wall side	1	1.00	1.00	1.00	<u>1.00</u>	
						<b><u>6.50</u></b>	

**Analysis of Material**

S.No.	Particulars	Quantity	Brick	Cement	Course Sand	Brick ballast
1.	Cement concrete work	2.23 m <sup>3</sup>		7.50	1.02	2.07
2.	Brick work (1:4 ) cement & course sand	12.10 m <sup>3</sup>	5566	21.78	3.26	
3.	Struck pointing( 1:3 ) cement course sand	25.15 m <sup>2</sup>	-	1.17	.11	
	<b>Total</b>		5566	30.00	4.39	2.07

### Cost of Material

1.	Brick	5566 @ 3800/- per thousand	= 21150.00
2.	Cement	30 bag @ 260	= 7800.00
3.	Course sand	4.39 m <sup>3</sup> @ 1600	= 7024.00
4.	Brick ballast	2.07 @ 1500	= <u>3100.00</u>
	<b>Total</b>		<b><u>39074.00</u></b>

### Total cost of culvert

1.	Total cost of material	39074
2.	Labour Cost 20% of	7814
	<b>Total</b>	<b>46888 say 46900/-</b>

### Design and Estimate of Drain

1. Measure and find the actual depth as per side up stream and down stream side depth of Drain and fix the bed of drain as per slop maintain 3% to 5%.

### Discharge of drain:-

As per Irrigation department 8 cusec water discharge per second per sq mile 1640 acre 656 hectars.

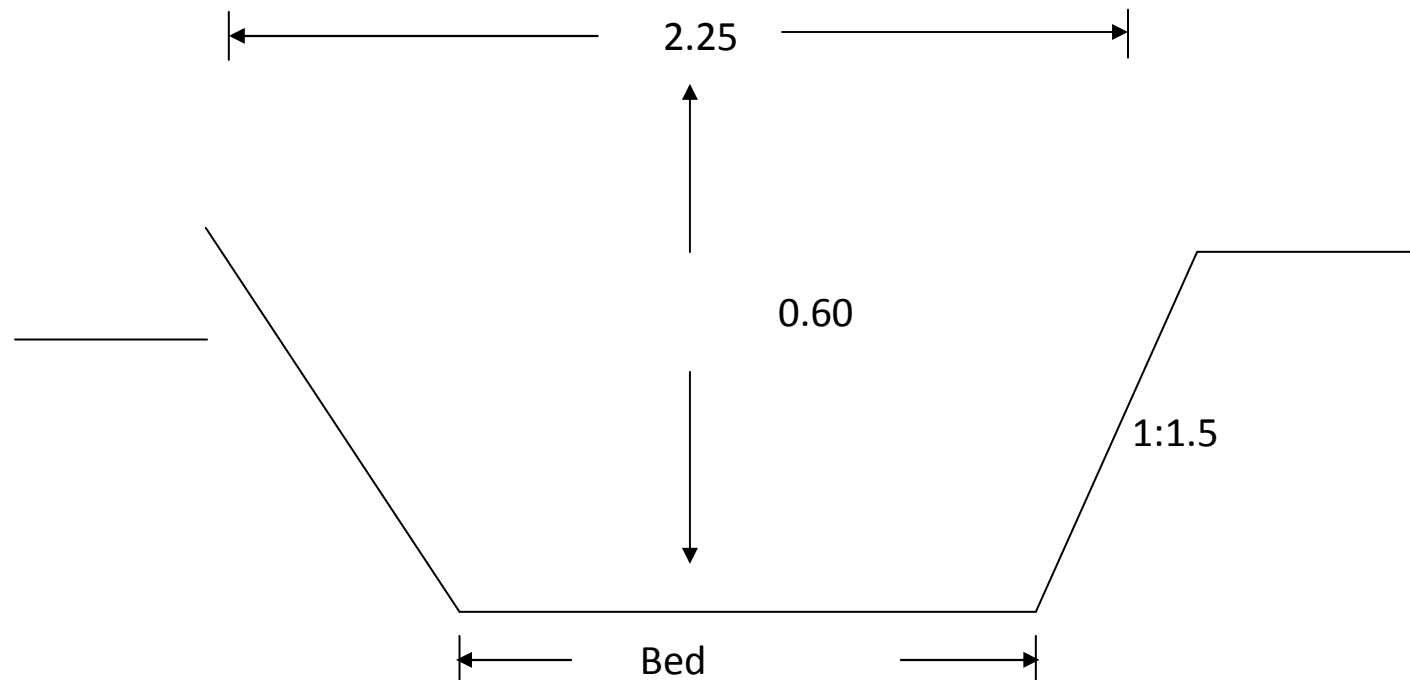
Assume the side slop always 1.5:1 and slop % of drain remain up stream depth – down stream depth = Actual slop % of Drain maintain be slop % 3% to 5% to constrict the Pucca structure for maintain the slop % and depth of fall.

### Design and Cross section of Drain:-

First of all fix the Bed and determine the Depth of drain fixed as per slop %.

Top width:  $(2 \times \text{Depth} \times 1.5 + \text{Bed})$

Cross Section:  $\frac{\text{Top width} \times \text{Bed}}{2} \times \text{depth / height.}$



**Estimate & cost of Material chute spillway outlet for (safly Water Disposal With (Analysis of Material)**

S.no	Particulars	Nos	Dimension (mt.)			Quantity of Works			
			Lengt h	Breadt h	Height/ Depth	C.C (cmt)	B.w (cmt)	Plaster (Sq.mt)	E.w (cmt)
1.	<u>Earth Work Excavation in foundation</u>								
(i)	Headwall upstream side	1	2.75	0.75	0.60	-	-	-	1.44
(ii)	Conduit Bed	1	2.00	1.50	0.50	-	-	-	1.50
(iii)	Down side wall	1	2.00	0.75	0.60	-	-	-	0.90
2.	<u>Cement concrete work in foundation</u>  <u>(1:4:8) Cement, Sand with Brick Ballast</u>								
(i)	Headwall foundation	1	2.15	0.40	0.10	0.086	-	-	-
(ii)	Conduite Bed under Brick on Edge flooring	1	2.00	1.10	0.10	0.22	-	-	-
(iii)	Down side wall	1	1.70	0.40	0.10	0.060	-	-	-
3	<u>Ist class Brick work (1:4) cement &amp; sand</u> <u>Mortar</u>								

(i)	Head wall foundation I step	1	2.10	0.44	0.11	-	0.101	-	-
(ii)	Head wall foundation 2 <sup>nd</sup> Step	1	2.05	0.35	0.15	-	0.107	-	-
(iii)	Head wall Extension	2	2.00	0.23	0.32	-	0.294	-	-
(iv)	Conduit bed (Brick on Edge flooring)	1	2.00	0.05	0.11	-	0.231	-	-
(v)	Conduit wall Straight (Side wall	2	0.70	0.23	0.32	-	0.103	-	-
(vi)	Conduit wall sloppy (Side wall)	2	1.27	0.23	0.25	-	0.146	-	-
(vii)	Down side wall foundation Ist Step	1	1.65	0.46	0.11	-	0.083	-	-
(viii)	Down side wall foundation 2 <sup>nd</sup> step	1	1.60	0.35	0.15	-	0.084	-	-
(ix)	Downstream side wall	2	0.50	0.23	0.32	-	0.073	-	-
(x)	Toe wall	1	0.50	0.23	0.11	-	0.012	-	-
4.	<u>12 MM Thick plaster (1:4) cement &amp; Sand Mortar</u>								
(i)	Head wall extension (Front Side)	2	1.05	0.45	-	-	-	0.94	-
(ii)	Head wall Extension upper side, Top + Back	2	0.60	0.30	-	-	-	0.36	-
(iii)	Conduite straight wall (inner, Top + back)	2	0.70	0.62	-	-	-	0.86	-

(iv)	Conduite sloppy wall (inner, Top + Back)	2	1.27	0.55	-	-	-	1.39	-
(v)	Conduite Bed	1	2.50	0.50	-	-	-	1.25	-
(vi)	Down side wall (Front surface + Side)	2	1.00	0.32	-	-	-	0.64	-
(vii)	Down side wall (Top +Side)	2	0.50	0.25	-	-	-	0.25	-
5.	<u>Earth Work in side filling</u>								
(i)	Head wall side	1	2.75	0.25	0.70	-	-	-	0.48
(ii)	Exetension wall Back	2	0.50	0.25	0.70	-	-	-	0.17
(iii)	Conduite straight + sloppy or kharanja bed.	2	2.00	0.25	0.50	-	-	-	0.50
(iv)	Down side wall	2	2.00	0.25	0.60	-	-	-	0.60
	<b>Grand Total</b>					<b>0.374</b>	<b>1.234</b>	<b>5.69</b>	<b>5.59</b>



## Material Required

### Analysis of Material

S.no	Particulars	Quantity	Bricks no.	Cement Bags no.	Course sand Cmt.	Bricks ballast cmt	Remark
1.	Cement concrete work (1:4:8) cement & Sand with Brick ballast cement required @ 3,40 bags. Sandor Morum @ 0.46 cmt & Brick Ballast @ 0.93 cmt for 1cmt. C.c. work.	0.374 Cmt	-	1.27	0.17	0.35	-
2.	Brick work (1:4) cement & Sand Mortar cement @ 2 Bags & Sand @ 0.275 cmt and Brick required @ 500 Nos for 1cmt B.W.	1.234 cmt	617	2.47	0.34	-	-
3.	Plaster work 12MM thick (1:4) cement required @ 0.11 Bags and Sand @ 0.015 cmt for 1Smt plaster work.	5.69 Smt	-	0.63	0.08	-	-
Total			617	4.37 or say	0.59 or say	0.35	-
Brick required 370 No for 1 cmt Brick ballast = 0.35 x 370 = 130			130	4.50	0.60		
<b>Grand Total</b>			<b>747</b>	<b>4.50</b>	<b>0.60</b>		

**Material Cost**

(1) Brick @ 3800 per 1000 Nos	= 3800 x 747	=	2829.
(2) Cement @ 260 per Bag	= 260 x 4.50	=	1170.
(3) Course Sand 0.60 cmt	= 1600 x 0.60	=	<u>960.</u>
	<b>Total</b>		<b><u>4968</u></b>

**Cost of Labour**

(1) Mistri	= 2 x 170	=	340
(2) Unskilled labour	= 13 x 100	=	<u>1300</u>
	<b>Total</b>		<b><u>1640</u></b>

Total Cost of Structure	<hr/> <b>6608.00</b> <hr/>
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**Table No-29: Sample Estimate for Nursery Establishment**

S.No.	Items	Unit	Quantity	Rate	Amount
1	New Nursury Survey, Clarance lovelling	Hect	1.00	100/-	100.00
2	Tillage work upto 0.30 mts.		1.00	525/-	525.00
3	Bunding & Partition, Channel, road, (10x1.25 mts.) and mixing	Hect	1.00	525/-	525.00
4	Preparation of seed showing	No.	800	12/-	9600.00
5	Seed Showing in Bags	No.	20,000	15.80/000	316.00
6	Plantation Development in Bags.	No.	800	0.16	128.00
7	Purchasing of soil, sand & FYM (30x40cm) for Bags.	Cmt.	194	966.37	18747.58
8	Pesticide mixing in Bags.	No.	20000	3600/000	72000.00
9	Pesticide purchasing & Utilization.	No.	20000	10.89/000 12.90/000	475.80
10	Irrigation & sowing of seed (Preparation of Pricks)	No.	20000	88/000	1760.00
11	Printing work	No.	20000	90/000	1800.00
12	Changing of Place & yading	No.	20000	124/000	2480.00
13	Changing place after 6 month	No.	20000	84/000	16800.00

14	Mirai & Gudai of Bags	No.	20000	27/000	540.00
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**Detail Estimate for 1.00 Hect. Afforestation work in Project Aligarh – IWMP Aligarh-Ii**

S.No.	Detail of work	Unit	Quantity	Rate	Amount
1	2	3	4	5	6
1.	Safety Tranching at Border of area (1.20-1.0 x 0.90)	Running	500.00	34.48	17240.00
2.	Clearance of Plantation Spot area	Hect.	1.00	157.00	157.00
3.	Excavation Of Pits (0.60m X0.60mX0.60m)	Nos.	1000	7.16	7160.00
4.	Purchasing of Farmyard manure (0.50 ct./fit)	Cu	500.00	8.50	4250.00
5.	Filling of pits with mixing farmyard manure. (0.60mX0.60mX0.60m)	Nos.	1000	0.80	800.00
6.	Cartage for Plants ith 3% loss	Nos.	1030	3.93	4047.90
7.	Local Cartage of Plants	Nos.	1000	1.412	1412.00
8.	Plantation work	Nos.	1000	4.30	4300.00
9.	Irrigation of Plants (16 tunes)	Nos.	16000	2.299	36784.00

10.	Multering & Trillage of Plant (4 tunes)	Nos.	4000	0.52	2080.00
11.	Urea & Pesticides spray *2 tunes)	Nos.	2000	0.50	1000.00
12.	Plantation labour (July to March)	Nos.	78x1	100.00	7800.00
13.	Purchasing of Plants.	Nos.	1000	50.00	50000.00
14.	Steel Board for Identification.	Nos.	1	1800.00	1800.00
	<b>Total</b>	-	-	-	<b>138831.00</b>

*Sample Estimate of Horticulture Programme in Private Land*

1. Name of Pland: Nimbu
2. Row to row distance – 6 mts.
3. Plant to Plant distance – 6 mts.
4. Plants Area – 1.00 hect.
5. Plant Population – 278 Nos.

Estimate for 1.00 hect Area.

<b>S.No.</b>	<b>Items</b>	<b>Unit</b>	<b>Qty.</b>	<b>Rate</b>	<b>Amount</b>
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>
1.	Pit alignment	Nos	278	0.16/pits	44.48
2.	Excavation of foundation (0.60x0.60x0.60)	Nos	278	3.40/pits	945.20
3.	Filling of Pit with Fertilizers	Nos	278	0.60/pits	166.80
4.	Purchase of seed ling	Nos	278	50.00/pits	139.00

	with transportation.				
5.	FYM with Insecticides.	Nos	278	0.80/pits	222.40
6.	Plantation of seed ling.	Nos	278	4.30/pits	1995.40
7.	Display Board	Nos	1 Nos.	1800 each	1800.00
	Total				5500 Rs

*Sample Estimate for Production System & Micro Enterprises.*

Estimate for demonstration: 40% amount Expend in Kharif Crop & 60% Amount Expert in Rabi Crops Against Allocated Fund for Production system & Micro Enterprises.

Management:

- A. Integrated Nutrient Management use 50% (FYM + Bio fertilizers)
- B. Integrated Weed & paste management. 50% Chemical fertilizers.
- C. Water Application.
- D. Selection of seed - Draugh resistance high yielding variety.

Selected Crops in Kharif & Rabi Season-

Kharif – Bajra, Til, Moong, Urd, Fodder Bajara, Dhaincha.

Rabi - Mustard, Wheat, lentil, Gram, Jou, (fodder),bardeem.

Cast per hect. demonstration for Kharif Crops.

S.No.	Items	Name of Kharif crops/per hect. Cast.				
		Bajra	Til	Urd	Moong	Bajara Fodder
1	2	3	4	5	6	7
1	Qty. of seed.	6 kg.	4 kg.	15	15	15-20
	Seed / kg	200 Rs kg.	150 Rs.	125 Rs.	100 Rs.	200 Rs.
	Cast of seed	1200	600	1875	1500	3000
2	Use of fertilizer					
	Qty of Urea in kg	80	15	4.50	4.50	85
	Rates/kg	5.30	5.30	5.30	5.30	5.30
	Amount	424.00	79.50	23.85	23.85	450.50
	Qty. of DAP in kg	65	45	45	45	65
	Rates/kg	10.50	10.50	1.50	10.50	10.50



	Amount	682.50	472.50	472.50	475.50	682.50
	Qty. of MOP in kg	35	25	17.50	17.50	35
	Rate	5.10	5.10	5.10	5.10	5.10
	Amount	178.50	127.50	89.25	89.25	178.50
3	Paste & weed manager 2500 Rs./hect.	2500	2500.00	2500	2500	2500.00
4	Water Application	-	-	-	-	-
	Pur hect.	4985	3779.50	4960.60	4588.60	6811.50
	<b>Total</b>	<b>5000</b>	<b>3800.00</b>	<b>5000.00</b>	<b>4600.00</b>	<b>6800.00</b>

### Cost per hect. demonstration for Rabi crops.

S.no.	Items	Name of Rabi crops/per hect. Cost..					
		Mustard	Wheat	Lentil	Gram	Jou	Barseen
1	2	3	4	5	6	7	8
1	Qty. of seed	4.5 kg.	120-130 kg.	50 kg	15	100 kg	30 kg
	Seed / Kg	160 rs kg.	22 Rs.	125 Rs.	100 Rs.	20 Rs.	120 Rs.
	Cast of seed	640.00	2640	6250	1500	2000	5100
2	Use of Fertilizer						
	Qty of Urea in kg	85 kg	105	-	-	87.50	26 kg
	Rates/kg	5.30	5.30	5.30	5.30	5.30	5.30
	Amount	450.50	556.50	-	-	463.75	137.80
	Qty. of DAP in kg	65 kg	65 kg	65 kg	65 kg	55 kg	45 kg
	Rates / kg	10.50	10.50	10.50	10.50	10.50	10.50
	Amount	682.50	682.50	682.50	682.50	577.50	472.50
	Qty. of MOP in kg	35	35 kg	25 kg	25 kg	42.50 kg	17 kg
	Rate	5.10	5.10	5.10	5.10	5.10	5.10
	Amount	86.70	178.50	127.50	127.50	216.75	86.75

3	Paste & weed manager 2500 Rs./hect	2500	2500	2500	2500	2500.00	2500.00
4	Water Application	3000	7500	1500	1500	1500	20000
	Total cast/hect	7359.00	14057.57	11060.00	14810.00	7258.00	28297.00
	<b>Total</b>	<b>5000</b>	<b>3800.00</b>	<b>11000.00</b>	<b>15,000.00</b>	<b>7300.00</b>	<b>28000.00</b>

**ESTIMATE AND COST OF MATERIAL**

**BRICK SOALING**

**For 100mt length & 4mt. width**

S.No.	Items	Dimension (mt)				Quantity.	Rate	Amount
		No.	L	B	D/H			
1	E/w In cutting or filling In Road	1 x 1	100.00	$\frac{4.00 + 5.00}{2}$	0.60	270.00 Cum	33.33	8999
2.	Add Extra for cartage E/w.	Same As Item No 1				270.00 cum	61.00 p cum	16470.00
3.	Supply of Bricks at site	1 x 1	100.00	4.00	-	400.00 m <sup>2</sup> no.59 Brick per m <sup>2</sup> = 23600.00	3800.00/ thousand	89680.00
4.	Laying of S.O.B Bricks at site	Same	As	Item	No 1	400 m <sup>2</sup>	30	12000.00
5.	Supply of fixing of shine board	1 x 1				1 No	5000.00 Each	5000.00
	<b>Total</b>							<b>132150.00</b>

**Rate / m<sup>2</sup> Rs. 330.00**

**DETAIL ESTIMATE OF INDIA MARK –II HAND PUMP FOR DISTRICT – ALIGARH I.W.M.P –ii**

S.No.	Description of work	Unit	Quantity	Rate	Amount
1	Transportation of rig machine, hand Pump material. P.V.C. Pipe strainer and cement from store to work site.	Work	1	3000.00	2500.00
2	Supply of material to install Hand Pump i- Lowering and installation of India mark-II Hand Pump with G.I. Pipe & connecting road. ii- 140 mm P.V.C. Pipe 8kg/cm <sup>2</sup> . iii- medium G.I. Pipe of the 32 mm $\varnothing$	No.  metre metre	1  20 30	5380.00  240.00 202.90	5380.00  4800.00 6087.00
3	Boring work by D.T.H. Rig machine and lowering of P.V.C. assembling	Metre	50	300.00	15000.00
4	Development of Hand Pump after installation	Work	1	100.00	100.00
5	Construction of Platform of 1.86 m $\varnothing$	Work	1	2525.00	2525.00
6	Construction of channel with all material and labour	Metre	3	125.00	375.00
7	Embossing work	Work		50.00	50.00

8	Water testing work	Work		400.00	400.00
				<b>Total</b>	<b>Rs. 36767</b>
				<b>Says</b>	<b>Rs. 36800</b>

**DETAIL ESTIMATE OF KRISHAK VIKAS MANCH**

S. No.	Description of work	No.	L.	B.	D/H	Quantity
1.	Earth work in foundation					
	Long Wall	2	8.00	1.20	1.10	21.12
	Short Wall	2	4.00	1.20	1.10	10.56
2.	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
3.	Brick work 1:4 in foundation & super structure					
	<b>Ist Footing.</b>					
	Long wall	2	6.40	0.80	0.40	4.096
	Short Wall	2	3.80	0.80	0.40	2.432

	<b>2<sup>nd</sup> Footing</b>					
	Long Wall	2	0.60	0.60	0.40	2.976
	Short Wall	2	0.60	0.60	0.40	1.920
	<b>Super Structure</b>	2	6.00	0.40	0.90	4.320
	Long Wall	2	4.20	0.40	0.90	3.024
	Short Wall					
<b>Total</b>						<b>18.768 cum</b>
4.	Earth work in filling	1	5.20	4.20	0.75	16.38 cum
5.	C.C.W. 1:4:8	1	5.20	4.20	0.15	3.276 cum
6.	C.C.W. 1:2:4	1	6.00	5.00	0.05	1.500 cum
7.	Raised Pointing 1:3					
	Long Wall	2	6.00	-	0.90	10.80
	Short Wall	2	5.00	-	0.90	9.00
<b>Total</b>						<b>19.80 m<sup>2</sup></b>

### **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.	Brick work 1:4		18.568
5.	C.C.W. 1:2:4		1.599 cum
6.	Raised Pointing 1:3		19.80 m <sup>2</sup>

### **CONSUMPTION OF MATERIALS**

S.No.	Particulars	Quantity	Cement (Cum)	Coarse Sand (cum)	Brick	Brick Ballast	Stone Grit 10-20 mm (cum)
1.	C.C.W 1:4:8	6.336 cum	21.54	2.851	-	5.892	-
2	Brick work	18.568	33.42	5.01	9284	-	-



3	C.C.W. 1:2:4	1.500 cum	9.15	0.630	-	-	1.275
4	Raised Pointing	19.800 m <sup>2</sup>	0.91	0.093	-	-	-
	<b>Total</b>		<b>65.02</b>	<b>8.49</b>	<b>19284</b>	<b>5.892</b>	<b>1.275</b>
	<b>Say</b>		<b>65</b>	<b>8.50</b>	<b>18.76</b>	<b>5.900</b>	<b>1.280</b>

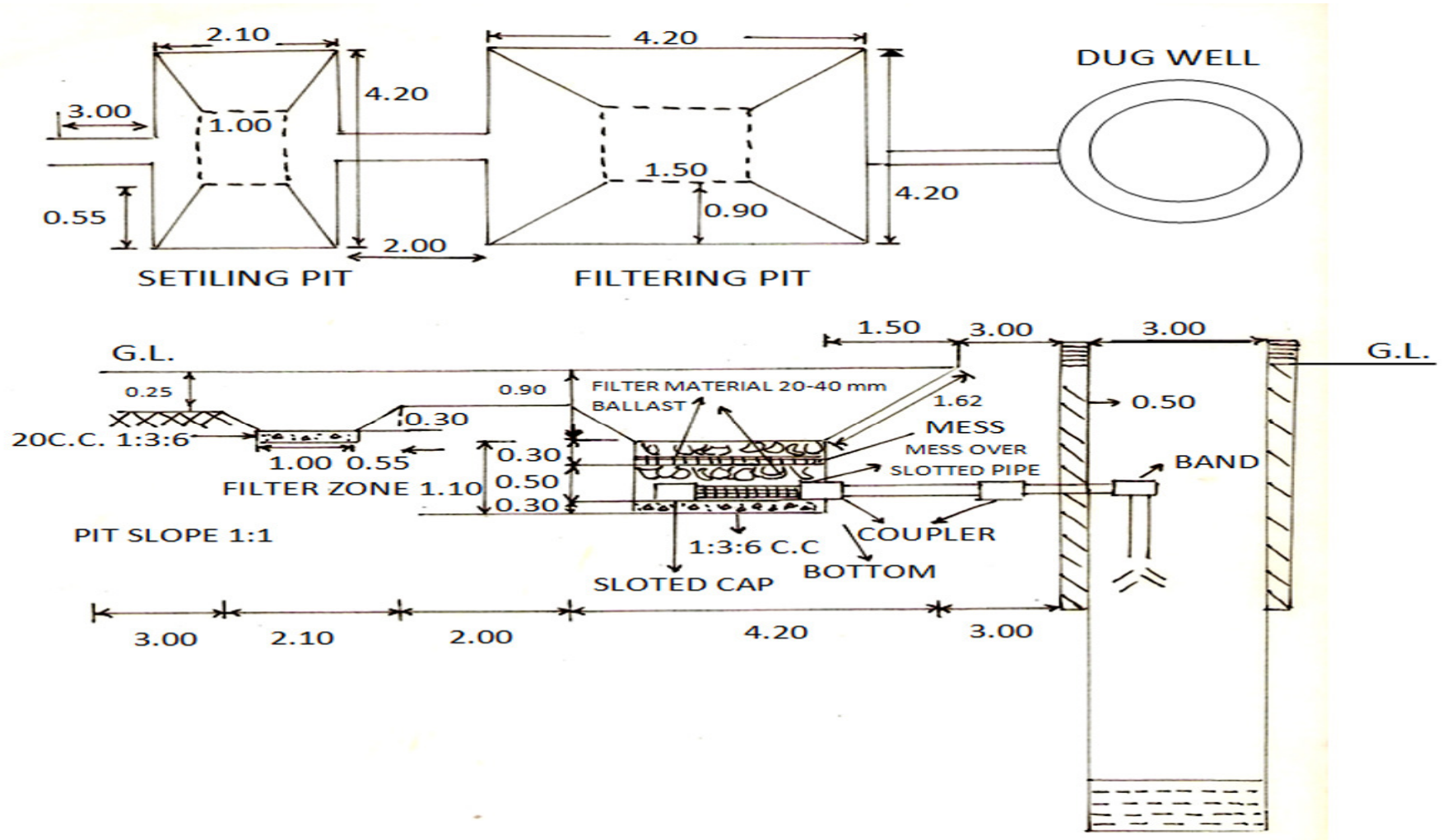
*COST OF MATERIAL*

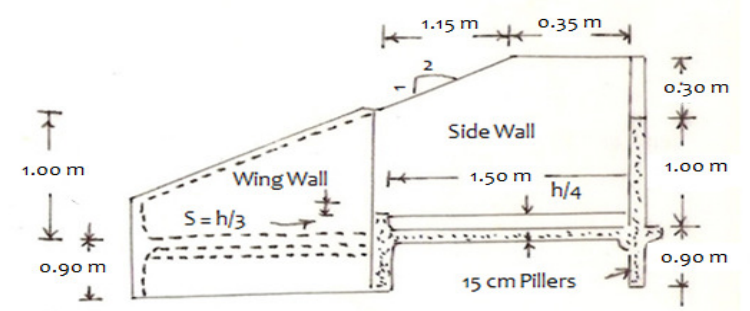
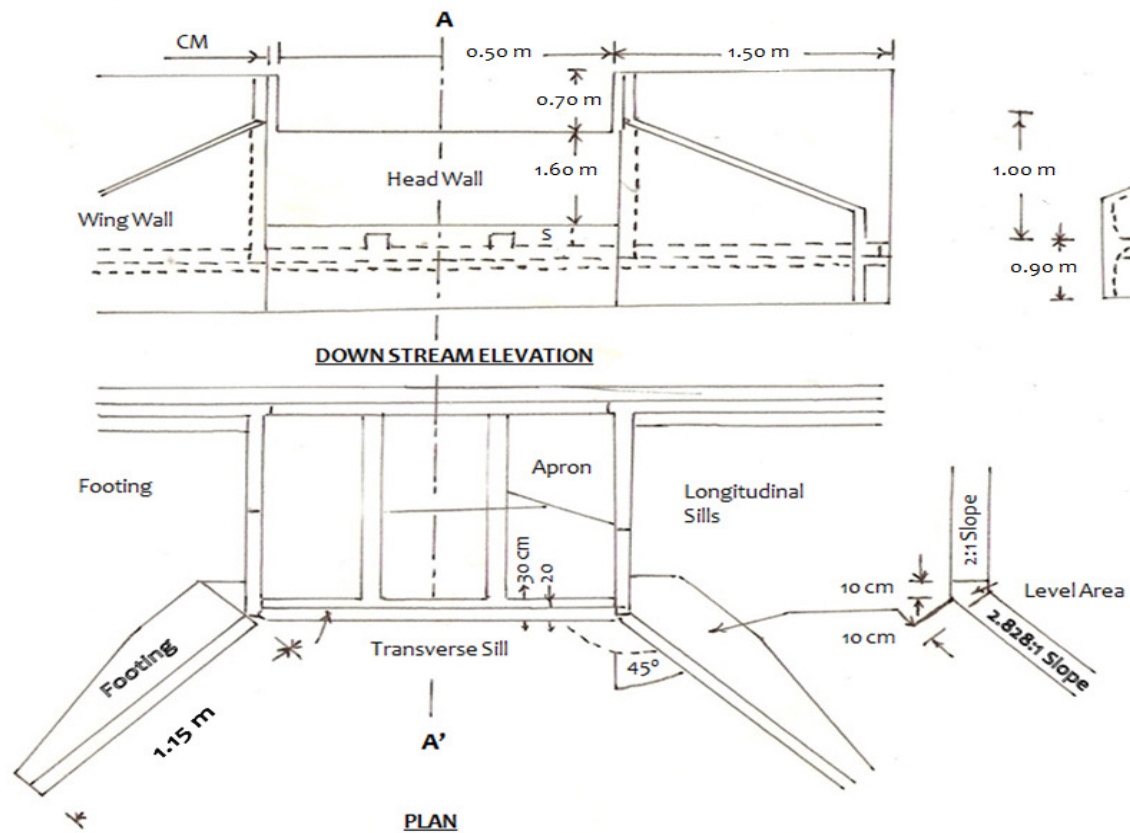
S.No.	Particulars	Quantity	Rate	Amount
1.	Cement	65	260/BAG	16900
2.	Carse Sand	8.5	1600 /cmt	13600
3.	Brick	9284	3800/thousand	35279
4.	Brick ballast	5.900 cum	855.00/cum	5044.00
5.	Stone Grit 10-20 mm (cum)	1.280 cum	1400	1792
	<b>Total</b>			<b>72615</b>
	<b>Say</b>			<b>72700</b>

**TOTAL EXPENDITURE**

1.	Cost of Materials	72700.00
2.	Lab our Charge 20%	14540.00
	<b>Total</b>	<b>87240.00</b>

## DRAWING OF RECHARGING DUG WELL





## DETAILS OF MEASUREMENT (DUG WELLS RECHARGING)

S.No.	Name of Work	No.	L B D/H	Unit	Quantity
1.	Earth work in excavation hard soil mixed with <i>kanker</i> gravel, etc. in foundation.				
a	Settling pit (i) Long Wall	4	0.65 x 1.75 x 0.10/2	M <sup>3</sup>	0.09
		2	1.50 x 0.62 x 0.75	M <sup>3</sup>	1.39
	(ii) Short Wall	4	0.55 x 0.75/2 x 0.10	M <sup>3</sup>	0.08
		2	1.00 x 0.55 x 0.75	M <sup>3</sup>	0.82
b	Filtering pit	8	1.85 x 1.00 x 1.00 x /2 x 0.10	M <sup>3</sup>	1.19
		2	1.50 x 1.62 x 0.90	M <sup>3</sup>	4.37
c	Drain-Filter zone	1	1.50 x 1.50 x 1.10	M <sup>3</sup>	2.47
		1	7.10 x 0.75 x 0.25	M <sup>3</sup>	1.86
d	Excavation for laying of P.V.C. pipe & filling after laying of P.V.C. pipe				
		1	4.35 x 2.00 x 0.80	M <sup>3</sup>	6.96
		1	1.35 x 0.90 x 2.00/2	M <sup>3</sup>	1.21
		1	3.00 x 2.00 x 0.90	M <sup>3</sup>	5.40
	Total				25.84
2	C.C. in 1:3:6 settling pit	1	1.00 x 1.50 x 0.20	M <sup>3</sup>	0.30
	Filtering pit filter zone	1	1.50 x 1.50 x 0.30	M <sup>3</sup>	0.67
	Drain –Filter Zone	1	7.00 x 0.75 x 0.10	M <sup>3</sup>	0.52

				M <sup>3</sup>	1.49
3	Cut- Stone work 1:4				
a	Settling pit Long wall	4	1.05 x 0.55 x 0.10/2		0.11
		2	1.50 x 0.62 x 0.05		0.09
	Settling pit Short wall	4	0.55 x 0.55 x 0.10/2		0.06
		2	1.00 x 0.62 x 0.05		0.06
b	Filtering pit	8	1.85 x 1.62 x 0.05/2		0.60
		2	1.50 x 1.62 x 0.05		0.24
				M <sup>3</sup>	1.16
4	Plaster work 1:2				
	Drain-Bottom	1	7.00 x 0.25	M <sup>2</sup>	1.75
	Drain-Side	2	7.00 x 0.25	M <sup>2</sup>	3.50
	Selting base	1	1.50 x 1.00	M <sup>2</sup>	1.50
	Filtering base	1	1.50 x 1.50	M <sup>2</sup>	2.25
	Total			M <sup>2</sup>	9.00
5	Supply & Fixing of 110 mm P.V.C. Pipe	1	6.00	M	6.00
6	Slotted cap of 110 mm P.V.C.	1		No.	1.00
7	P.V.C. Bend 110 mm	1		No.	1.00
8	P.V.C. coupler 110 mm	1x2		No.	2.00
9	Mesh ss S/F between	1x2		Job	2.00
10	S/O Stone sign board	1		Job	1.00
11	Filter Material of 20-40 mm blast	1	1.50 x 1.50 x 0.80	M <sup>3</sup>	1.80

12	Slotted pipe P.V.C. 110 mm	1	1 x 1	M	1.00
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### **ABSTRACT OF COST OF THE RECHARGING WELL**

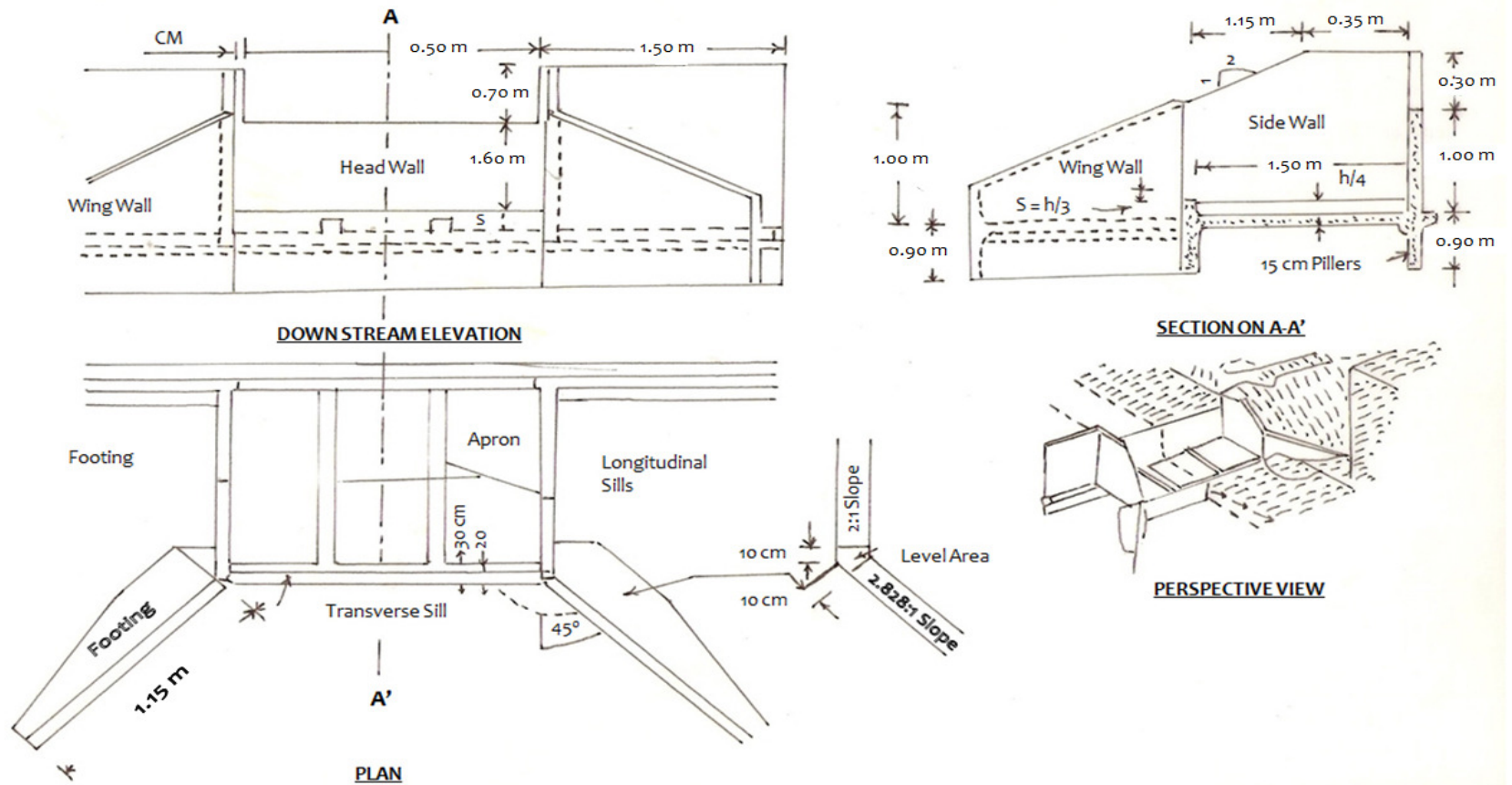
S.No.	Name of Work	Quantity	Unit	Rate	Amount
1.	Earth Work	25.84	M <sup>3</sup>	36.36	947.29
2.	C.C.W. Work in 1:3:6	1.49	M <sup>3</sup>	2766.00	4121.34
3.	Laying Stone Supply & fixing	1.16	M <sup>3</sup>	4000.00	4640.00
4.	Plaster work in 1:2	9.00	M <sup>3</sup>	81.98	737.80
5.	S/F of 110 mm P.V.C. pipe	6.00	R.M	150.00	900.00
6.	Slotted Cap 110 mm P.V.C	1	No.	150.00	150.00
7.	P.V.C. bend 10 mm	1	No.	130.00	130.00
8.	P.V.C. Coupler 110 mm	2	No.	100.00	200.00
9.	Mesh ss S/F between	2	Job	100.00	200.00
10.	S/O fixing of sign board	1	Job	1850.00	1850.00
11.	Filter material 20-40 mm blast	1.8	M <sup>3</sup>	855.00	1539.00
12.	Slotted P.V.C. pipe 110 mm	1	R.M.	250.00	250.00
<b>Total</b>					<b>Rs. 15,665.43</b>
<b>Say</b>					<b>Rs.15,670.00 only</b>

## DRAWING OF SPILLWAY OF CREST LENGTH 0.5 m

All Dimensions in Metre

Scale

Not to





## DESIGN OF DROP SPILLWAY FOR 1.00 HA CATCHMENT AREA

Design of Drop Spillway to be constructed at a place in a gully having width of 1.0 m and catchment area 1.00 ha and net drop 0.50 m Taking rainfall intensity for duration equal to time of concentration of watershed and design return period of 25 years , as 120mm/hr. The coefficient of runoff for the watershed is 0.3.

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

$$Q = \frac{C.I.A.}{360} = \frac{0.3 \times 120 \times 1.00}{360} = 36/360 = 0.10 \text{ cum/second}$$

2. **HYDRAULIC DESIGN**- The maximum discharge capacity of the rectangular weir given by

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

To find suitable value of L & H

Let us assume  $L = 0.50 \text{ m}$  (since width of gully is 1.00 m)

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

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

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

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

$$\text{Test: } L/h = \frac{0.50}{0.25} = 2.0 \geq 2.0 \text{ hence O.K.}$$

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

### 3. STRUCTURAL DESIGN –

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

$$E = 3 \times 0.5 + 0.6 \quad \text{or} \quad 1.5 \times 0.50$$

$$E = 2.10 \text{ m} \quad \text{or} \quad 0.75 \text{ m}$$

Adopted 2.10 m

2- Length of apron basin  $L_B = f (2.28 h/f + 0.54) = 0.50 (2.20 \times \underline{0.5} + 0.54)$

0.5

$$= 0.50 \times 2.74 = 1.37 \text{ m says } 1.40 \text{ m}$$

3- Height of end sill ,  $S = \frac{h}{3} = \frac{0.50}{3} = 0.16 \text{ m says } 0.20 \text{ m}$

$$\frac{0.50}{3}$$

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

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

$$= 2 \times 0.50 \text{ or } [0.50 + 0.50 + 0.16 - (1.37 + 0.10)/2]$$

$$= 1.0 \text{ or } [1.16 - 0.735]$$

$$= 1.0 \text{ or } 0.425$$

adopt  $J = 1.00 \text{ m}$

5-  $M = 2 (f + 1.33 h - J) = 2 (0.50 + 1.33 \times 0.25 - 1.00)$

$$= 2 \times (-0.167) = -0.335 \text{ m}$$

6-  $K = (L_B + 0.1) - M = (1.37 + 0.1) - 0.335$

$$= 1.47 - 0.335$$

$$= 1.135 \text{ m}$$

Toe and cut off walls

$$\begin{aligned} \text{Normal scour depth (N S D)} &= 0.473 \times (Q/f)^{1/3} \\ &= 0.473 \times (0.1/1)^{1/3} \\ &= 0.473 \times 0.464 \\ &= 0.219 \end{aligned}$$

$$\begin{aligned} \text{Maximum Scour depth (M S D)} &= 1.5 \times \text{N S D} \\ &= 1.5 \times 0.219 \end{aligned}$$

$$= 0.328 \text{ m}$$

says 0.35 m Depth of cutoff /Toe wall = 0.35 m

**APRON THICKNESS** : For an over fall of 0.5 m. The Apron thickness in concrete construction is 0.20 m since the structure is constructed in masonry, the Apron thickness will be  $0.20 \times 1.50 = 0.30 \text{ m}$

**WALL THICKNESS**: The thickness of different wall of the structure (masonry construction) is given below:

Description	Thickness of wall	
	Top width	Bottom width
Head wall	0.40	1.00
Side wall	0.30	0.80
Wing wall and head wall extension	0.30	0.60

### **DETAIL ESTIMATE OF DROP SPILLWAY OF CREST LENGTH 0.5 METRE**

#### 1. Earth work in cutting in foundation

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

7	Apron	1	0.50	1.50	0.60	0.45
Total						13.23 cum

### **2. LAYING OF SAND IN THE BED OF FOUNDATION**

S.No.	Description of work	No.	L	B	D/H	Quantity
1	Side wall	2	1.50	1.00	0.10	0.300
2	Head wall	1	0.50	0.40	0.10	0.020
3	Wing wall	2	1.15	0.80	0.10	0.184
4	Toe wall	1	0.50	0.80	0.10	0.040
5	Cut off wall	1	4.70	0.80	0.10	0.376
6	Apron	1	0.50	1.50	0.10	0.075
Total						0.995 cum

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

S.No.	Description of work	No.	L	B	D/H	Quantity
1	Cut off wall	1	4.7	0.80	0.15	0.564
2	Head wall	1	0.50	0.40	0.15	0.030
3	Side wall	2	1.50	1.00	0.15	0.450
4	Wing wall	2	1.15	0.80	0.15	0.276

5	Toe wall	1	0.50	0.80	0.15	0.060
6	Apron	1	0.50	1.50	0.15	0.112
Total						1.492 cum

#### **4. R/R STONE MASONRY 1:4**

S.No.	Description of work	No.	L	B	D/H	Quantity
1	Cut off wall	1	4.70	0.80	0.45	1.692
		1	4.70	0.60	0.45	1.269
2	Head wall	1	0.50	1.10	0.45	0.247
		1	0.50	1.00	0.45	0.225
		1	0.50	(0.40 + 1.00) / 2	0.60	0.180
3	Head wall extension	2	2.10	0.80	0.45	1.512
		2	2.10	0.60	0.45	1.134
		2	2.10	0.60	0.60	1.512
		2	2.10	0.40	0.70	1.176
4	Side wall	2	1.50	1.00	0.45	1.350
		2	1.50	0.80	0.45	1.080
		2	1.50	0.80	0.60	1.440
		2	1.50	0.60	0.40	0.720
		2	(0.35 + 1.50) / 2	0.40	0.30	0.222
5	Wing wall	2	1.15	0.80	0.45	0.828
		2	1.15	0.60	0.45	0.621
		2	1.15	0.40	(1.00 + 0) / 2	0.460

6	Toe wall	1	0.50	0.80	0.45	0.180
		1	0.50	0.60	0.45	0.135
		1	0.50	0.40	0.20	0.040
7	Apron	1	0.50	1.50	0.45	0.337
Total						16.360 cum

### **5. C.C.W. 1:2:4 ON THE WALL**

S.No.	Description of work	No.	L	B	D/H	Quantity
1	Head wall	1	0.50	0.40	0.025	0.005
2	Side wall	2	0.35	0.40	0.025	0.007
		2	1.18	0.40	0.025	0.023
3	Head wall extension	2	2.10	0.40	0.025	0.042
4	Wing wall	2	1.52	0.40	0.025	0.030
5	Toe Wall	1	0.50	0.40	0.025	0.005
6	Apron	1	0.50	1.50	0.025	0.018
Total						0.130 cum

### **6. RAISED POINTING 1:3**

S.No.	Description of work	No.	L	B	D/H	Quantity
1	Head wall	1	0.50	-	0.60	0.30
		1	0.50	-	0.84	0.42
2	Side wall	2	1.50	-	1.00	3.00
		2	$(0.35 + 1.50) / 2$	-	0.30	0.55
3	Head wall extension	2	2.10	-	1.00	4.20
4	Wing wall	2	1.15	-	$(1.00 + 0) / 2$	1.15
Total						9.62 m <sup>2</sup>

### **CONSUMPTION OF MATERIALS**

S.No.	Particulars	Quantity	Cement (Bags)	Coarse Sand (cum)	Khanda (cum)	G.S.B 25-40 mm (cum)	G.S. Grit 10-20 mm (cum)
1.	Sand laying	0.995 cum	-	0.995	-	-	-
2.	C.C.W. 1:3:6	1.492 cum	6.41	0.671	-	1.342-	-
3.	R/R Stone Masonry	16.360 cum	39.26	5.562	16.36	-	-
4.	C.C.W. 1:2:4	0.130 cum	0.79	0.054	-	-	0.110
5.	Raised Pointing 1:3	9.62 m <sup>2</sup>	0.44	0.045	-	-	-
<b>Total</b>			<b>46.90</b>	<b>7.327</b>	<b>16.36</b>	<b>1.342</b>	<b>0.110</b>
<b>Say</b>			<b>47 Bags</b>				

## **COST OF MATERIALS**

<b>S.NO</b>	<b>Name of materials</b>	<b>Quantity</b>	<b>Rate</b>	<b>Amount</b>
1.	Cement	47 Bags	255.00/bag	11985.00
2.	Coarse sand	7.327 cum	910.00/cum	6667.57
3.	Stone Khanda	16.36 cum	1025.00/cum	16769.00
4.	G.S.B. 25-40 mm	1.342 cum	855.00/cum	1147.41
5.	Grit 10-20 mm	0.110 cum	1250.00/cum	137.50
<b>Total</b>				<b>Rs. 36,706.48</b>

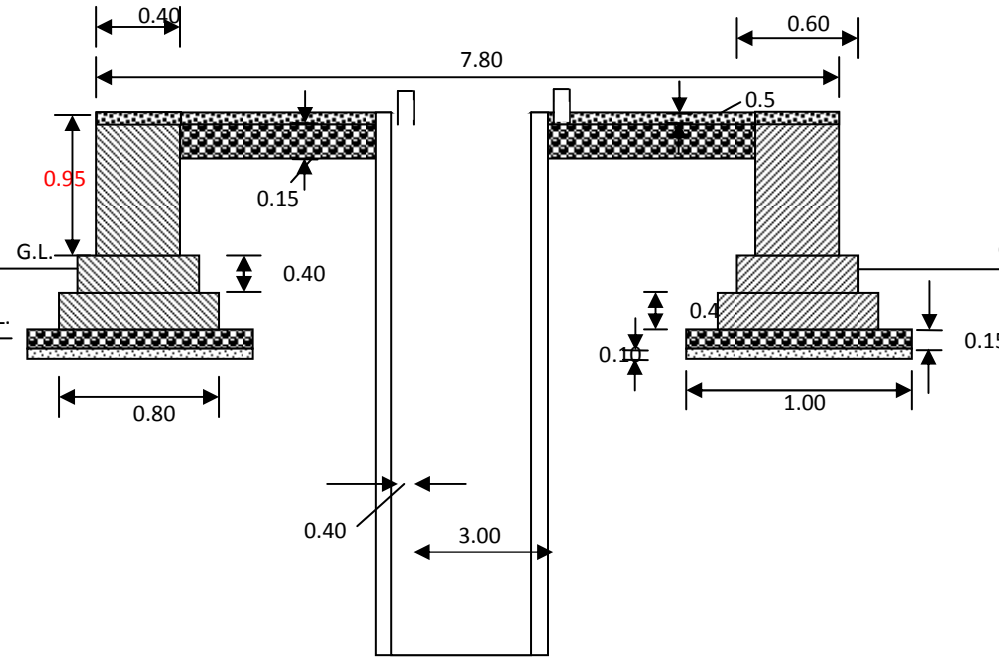
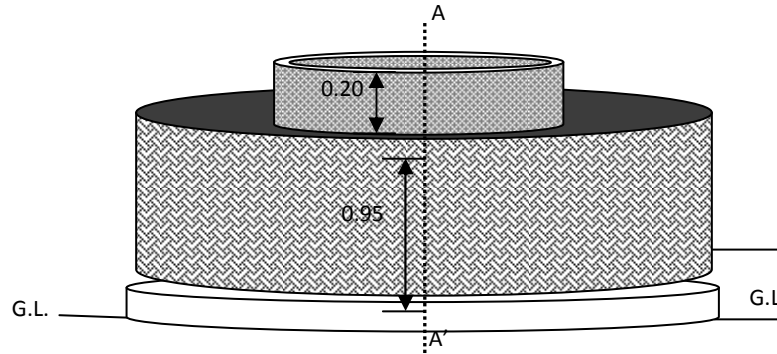
## **LABOUR CHARGE**

<b>S.No.</b>	<b>Particulars</b>	<b>Quantity</b>	<b>Rate</b>	<b>Amount</b>
1.	Earth Work	13.23 cum	36.66/cum	485.01
2.	Sand Laying	0.995 cum	33.33/cum	33.16
3.	C.C.W. 1:3:6	1.492 cum	494/cum	737.04
4.	Stone masonry	16.36 cum	370/cum	6053.20
5.	C.C.W. 1:2:4	0.130 cum	494/cum	64.22
6.	Raised Pointing	9.62 m <sup>2</sup>	51.61/m <sup>2</sup>	496.48

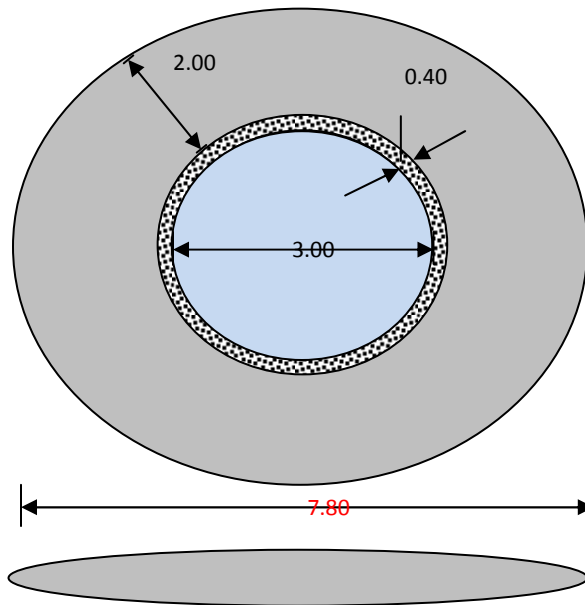


7.	Curing	16.36 cum	25.00/cum	409.00
8.	Chowkidar	6 Man Days	100.00/Man Day	600.00
9.	Head load & local transportation cost 10% cost of material	-	-	3670.64
	<b>Total</b>			Rs. 12,548.75
Total Expenditure of 0.50 m Crest wall				
1. Cost of materials		36706.48		
2. Labour Charges		12548.75		
<b>Total</b>		<b>Rs. 49,255.23</b>		
<b>Say Rs. 49,300.00 only</b>				

## DRAWING OF WELL



### ISOMETRIC VIEW OF WELL



PLAN

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

### DESCRIPTION

**DETAIL ESTIMATE OF JAGAT OF WELL**

S.No.	Description of Work	No.	L	B	D/H	Quantity
1.	Earth work in foundation	1	3.14 x 7.4	1.20	1.00	27.88
2.	Laying of sand	1	3.14 x 7.4	1.00	0.10	2.32
3.	C.C.W. 1:4:8	1	3.14 x 7.4	1.00	0.15	3.48
4.	R/R Stone masonry 1:4	1	3.14 x 7.4	0.80	0.40	7.43
			3.14 x 7.4	0.60	0.40	5.57
			3.14 x 7.4	0.40	0.90	8.36
			3.14 x 3.4	0.40	0.20	0.85
						22.21
5.	Filling of earth work	1	3.14 x 5.4	1.60	0.75	20.34
6.	C.C.W. 1:4:8	1	3.14 x 5.4	1.60	0.15	4.06
7.	C.C.W. 1:2:4	1	$\{(3.14 \times 7.8 \times 7.8)/4 - (3.14 \times 3.8 \times 3.8)/4\} \times 0.05$			1.821
8.	Raised pointing	1	3.14 x 7.8	-	0.90	22.04

**CONSUMPTION OF MATERIALS**

S.No.	Description of Work	Quantity	Cement Bags	Coarse Sand (cum)	Khanda (cum)	G.S.B. 25-40 mm (cum)	Grit 10-20 mm (cum)
1.	Sand Laying	2.32 cum	-	2.320	-	-	-
2.	C.C.W. 1:4:8 (4.06 + 3.48)	7.54 cum	25.63	3.393	-	7.012	-
3.	Stone masonry 1:4	22.21 cum	53.30	7.551	22.21	-	-
4.	C.C.W. 1:2:4	1.821 cum	11.10	0.764	-	-	1.547
5.	Raised Pointing	22.04 m <sup>2</sup>	1.01	0.103	-	-	-
<b>Total</b>			<b>91.04</b>	<b>14.131</b>	<b>22.21</b>	<b>7.012</b>	<b>1.547</b>
<b>Say</b>			<b>91 bags</b>	<b>14.13 cum</b>	<b>22.20</b>	<b>7.01</b>	<b>1.55</b>

**COST OF MATERIALS**

S.No.	Particulars	Quantity	Rate	Amount
1.	Cement	91 Bags	255.00/bag	23205.00
2.	Coarse Sand	14.13 cum	910.00/cum	12858.30
3.	Khanda	20.20 cum	1025.00/cum	22755.00
4.	Granite Stone Ballast 25-40 mm	7.01 cum	855/cum	5993.55
5.	Granite Stone Grit 10-20 mm	1.55 cum	1250.00/cum	1937.50
<b>Total</b>				<b>Rs. 66,749.00</b>

### LABOUR CHARGES

S.No.	Particulars	Quantity	Rate	Amount
1.	Earth Work	48.22 cum	36.66/cum	1769.01
2.	Sand Laying	2.32 cum	33.33/cum	77.32
3.	C.C.W. 1:4:8	7.54 cum	492.00/cum	3709.68
4.	C.C.W. 1:2:4	1.821 cum	492.00/cum	894.11
5.	Stone Masonary	22.210 cum	370.00/cum	8217.70
6.	Raised Pointing	22.04 m <sup>2</sup>	51.61/m <sup>2</sup>	7.48
7.	Curing 22.21	22.210 cum	25.00/cum	555.25
8.	Chowkidar	13 Man days	100.00/man day	1300.00
9.	Head load & transportation charges 10% of cost of materials			6674.90
<b>Total</b>				<b>Rs. 24,335.45</b>

<b>TOTAL EXPENDITURE of Floor of Well</b>	
1. Cost of materials	66,749.00
2. Labour charges & transportation	24,335.45
<b>Total</b>	<b>Rs. 91,084.45</b>
<b>Say Rs. 91,100.00 only</b>	

**CHAPTER- 5**

**BUDGETING**

## Financial outlays

**Table. 29 Year wise financial outlays (Lakh Rs.)**

S.No	Component	Unit	Unit cost (Rs.)	1 <sup>st</sup> year 2010-11	2 <sup>nd</sup> year 2011-12	3 <sup>rd</sup> year 2012-13	4 <sup>th</sup> year 2013-14	5 <sup>th</sup> year 2014-15	Total
<b>A</b>	<b>ADMINISTRATIVE COSTS</b>			-	-	-	-		-
	Administrative cost- TA & DA, POL/Hiring of vehicles/office and payment of electricity and phone bill etc. computer, stationary and office consumable and Contingency 10%	S		16.18	16.18	10.79	10.80	10.80	<b>64.75</b>
	<b>D.P.R. PREPRATION</b> 1%			4.48	2.00	-	-	-	<b>6.48</b>
	Expert for monitoring and evaluation 2%			3.592	3.592	2.592	1.592	1.592	<b>12.96</b>
	<b>Sub Total</b>								<b>84.19</b>
<b>B</b>	<b>PREPARATORY PHSES</b>								
	Entry Point Activities like improvement in drinking water system, school, water harvesting & approach road etc. 4%			25.90	-	-	-	-	<b>25.90</b>
	Institutional and capacity building			10.00	8.09	8.09	3.19	3.00	<b>32.37</b>
	<b>Sub Total</b>								<b>58.37</b>
<b>C</b>	<b>WATERSHED WORKS</b>			64.75	64.75	64.75	64.75	64.70	<b>323.76</b>
<b>a</b>	Soil & water conservation works								

1.	Contour & field bunding			21.90	21.90	21.90	21.90	21.94	<b>109.54</b>
2.	Field bund			13.50	13.50	13.50	13.50	13.52	<b>67.52</b>
3.	Peripheral bund/marginal bund			8.24	8.24	8.24	8.24	8.25	<b>41.21</b>
4.	Gully plug/C.D.			4.06	4.60	4.60	4.60	4.60	<b>23.00</b>
	<b>Sub Total</b>								
b.	Water harvesting & water resources works								
1.	Water harvesting bund/Earthen check dam.								
2.	Check dam								
3.	Ponds			-	5.72	5.72	5.72	5.73	<b>22.89</b>
c.	<b>Afforestation works</b>								
1.	Horticulture works			60	0.60	.60	.60	.61	<b>3.01</b>
2.	Agroforestry works			0.74	0.74	0.74	0.74	0.74	<b>3.70</b>
d.	<b>Pucca Structure</b>			10.57	10.57	10.57	10.57	10.61	<b>52.89</b>
	<b>Sub Total</b>			<b>16.49</b>	<b>16.49</b>	<b>16.49</b>	<b>16.49</b>	<b>16.53</b>	<b>82.49</b>
<b>D.</b>	<b>LIVINGHOOD PROGRAMME (Community based)</b>								
	Income generating activities through SHG's for landless and marginal farmers and livetocks development works.								<b>64.75</b>
<b>E</b>	<b>PRODUCTIN SYSTEM AND MICRO ENTERPRISES</b>								



	Crop production, diversification of agriculture and introduction of agro-forestry and Demonstration of improved composting system			16.83	16.83	16.83	16.83	16.85	<b>86.17</b>
	<b>Sub Total</b>								
<b>F</b>	<b>CONSOLIDATION PHASE</b>								<b>32.38</b>
	<b>GRAND TOTAL</b>								<b>647.52</b>

**Table No-30: Year wise Phasing Physical & Financial item wise:-**

S.n o	Item	%	Physical (Year wise area in ha.)						Financial (Year wise Rs in Lacs)					
			10-11	11-12	12-13	13-14	14-15	Total	10-11	11-12	12-13	13-14	14-15	Total
1.	Administrative	10	-	-	-	-		-	5.00	16.18	16.18	16.18	11.212	64.752
2.	D.P.R. preparation	1	-	-	-	-		-	6.475	-	-	-	-	6.475
3.	Monitoring	1	-	-	-	-		-	-	1.618	1.618	1.618	1.621	6.475
4.	Evaluation	1	-	-	-	-		-	-	1.618	1.618	1.618	1.621	6.475
5.	Entry Point activities	4	-	-	-	-		-	25.90	-	-	-	-	25.90

6.	Institutional and capacity building	5	-	-	-	-		-	-	11.00	11.00	6.00	4.376	32.376
7.	Watershed work	50	-	1320	1320	1320	1436	5396	-	80.00	80.00	80.00	83.76	323.760
8.	Lively hoods Income generating	10	-	-	-	-		-	-	64.75	-	-	-	64.752
9.	Production system development	13	-	-	-	-		-	-	21.00	21.00	21.00	21.1776	84.1776
10.	Consolidation Phase	5	-	-	-	-		-	-				32.376	32.376
	<b>Total</b>													<b>647520</b>

**-:Budget for the various components is given below:-**

S.No.	Budget Component	Total (Rs. in)
A.	1. Administrative	64.750
	2. Monitoring	6.48
	3. Evaluation	6.48
B.	Preparatory Phases.	64.75
C.	Watershed Works	323.76
	(i) Livelihood programme	64.75
	(ii) Production system and micro enterprises.	84.17
D.	Consolidation Phase	32.38
	<b>Grand Total</b>	<b>647.520</b>

1. Watershed area : 7254.582
2. Treatable area : 5396.00
3. Total expenditure on project : 647.520

## **CHAPTER- 6**

# **EXPECTED OUTCOME**

## EXPECTED OUTCOMES

### 6.1 EMPLOYMENT

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

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

**TABLE NO. 31: EMPLOYMENT IN PROJECT AREA**

Sl. NO.	Names of Project	Wage employment										Self employment				
		No. of mandays					No. of beneficiaries					No. of beneficiaries				
		SC	ST	Others	Women	Total	SC	ST	Others	Women	Total	SC	ST	Others	Women	Total
01	IWMP-II	11561	-	61157	10406	83124	2452	-	702	1012	3154	307	-	95	205	402

## **6.2.MIGRATION**

Low rainfall results in very little fodder availability in the locality. The relatively well off farmers bring fodder from Chitra koot (approximately 50 kms away) collectively; but the resource poor cannot afford it. On account of agriculture and animal husbandry providing only part time employment for some part of the year, the people migrate for a better half of the year for wage labour.

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

**TABLE NO. 32: DETAILS OF SEASONAL MIGRATION FROM PROJECT AREA**

Sl. No.	Names of villages	No. of persons migrating		No. of days per year of migration	
		Pre-project	Expected post project	Pre-project	Expected post project
01	IWMP-II	1352.00	451.00	176.00	60.00

### **6.3 GROUND WATER TABLE**

Rainfall has been scanty but demand for ground water has been increasing all the time. The ground water table thus has depleted over the years. Presently it stands at 7.40 m.

Proper water harvesting structures and percolation tanks would go a long way in increasing water table depth from 7.40 m in the pre-project level to 7.40 m in the post project period.

**TABLE NO. 33: DETAILS OF AVERAGE GROUND WATER TABLE DEPTH IN THE PROJECT AREAS (IN METERS)**

Sl. No.	Names of Villages	Sources	Pre-Project level	Expected Increase/decrease (Post- Project)
01	IWMP-II	Open wells	7.40	7.40
		Bore wells	Na	Na
		Others (specify)	Na	Na

## **6.4 DRINKING WATER**

The villages has 10 dug wells on which they depend for their drinking water. Many an effort at finding sweet water at different other places in the same village has failed. India marka hand pump is constituted by State Govt. for availability of proper drinking water.but they have no satisfactory results.

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

**TABLE NO. 34: STATUS OF DRINKING WATER**

Sl. No.	Names of Project	Availability of drinking water (no. of months in a year)		Quality of drinking water		Comments
		Pre-project	Expected post project	Pre-project	Expected post project	
01	IWMP-II	9	13	Average TDS	Potable	



## 6.5 CROPS

Agriculture primarily depends upon water; but this is what is lacking in IWMP-II village. The surface water is scanty due to low rainfall and ground water which is unfit for crop production.

All this can change with the integrated land and water management during the watershed project. The planned earthen bunds would prevent the water and also help percolate water underground, and preserve some moisture in the soil. This will help in additional area coming under cultivation and increasing productivity too. The farmers can take more than one season of crops. Different varieties of crops can be taken.

**TABLE NO.35 : DETAILS OF CROP AREA AND YIELD IN THE PROJECT AREA**

Name of Project	Name of crops	Pre-project		Expected Post-project	
		Area (ha)	Average Yield (Qtl) per ha.	Area (ha)	Average Yield per ha (qtl)
IWMP-II	<b>Kharif</b>	-	-	-	-
	<b>Paidy</b>		16.42		16.50
	Jowar	-	6.44	-	6.00
	Bajra	-	11.37	-	12.10
	Arhar	-	8.21	-	9.30
	<b>Rabi</b>	-		-	

	<b>Wheate</b>		15.30		15.30
	Chana	-	6.20	-	8.25
	Masoor	-	7.65	-	8.65
	Wheat	-	7.85	-	11.05

## **6.6 HORTICULTURE**

**TABLE NO. 36: AREA UNDER HORTICULTURE**

Sl. No.	Name of Project	Existing area under horticulture (ha)	Area under horticulture proposed to be covered through IWMP
01	IWMP-II	0	97.00

## **6.7 VEGETATIVE COVER**

There is negligible area under tree cover. The village has a forest area of 795.00 ha which consists of only Amla, Mahua, Neem, Babool, Dhak. Trees like Neem and Babool & Dhak are seen just here and there, not concentrated in any area.

It is planned that 1310 ha land to be covered under new plantation.

**TABLE NO. 37: FOREST/VEGETATIVE COVER**

Sl. No.	Name of Project	Existing area under tree cover (ha)	Area under tree cover proposed
1	IWMP-II	524.00	1162.00

**6.8 LIVESTOCK**

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

**Table No.-38: LOGICAL FRAMEWORK ANALYSIS**

Components	Activities	Outputs	Effect	Impact
<b>Village Institution Formation</b>	§ Formation of Watershed Committee, User Group	§ One Watershed Committee each village	§ Project can be implemented and managed in a democratic and participatory way ensuring equity.	§ Unity and prosperity in the village management.
		§ Number of User group depending on the coverage of particular intervention		§ People's Participation and positive perception towards the programme

<b>Strengthening Village Institutions</b>	§ Organise training and awareness programme for Village institutions	§ awareness camps to be organised.	§ Quality of management of common resources improved.
	§ Capacity building workshops and exposure visits User Group and Watershed Committee	§ trainings and exposure visits UGs and WCs to be held	§ Quality of distribution of benefits between people improved.
	§ Facilitating and monitoring the functioning of UGs and WCs	§ Capacity building workshops to be organised	§ Increased awareness amongst women about village resources.
	§ Strengthen linkages between UGs and WCs and Panchayat Institutions.	§ 1 Federations of UGs and WC to be formed.	§ Women participation enhanced in decision-making of GVCs.
	§ Gender sensitisation of UGs and WCs to increase inclusiveness of samuh decision-making.		§ Involvement of youth and children in village development increased.
§ Sensitise village communities to involve children and youth in development.			

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

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

	plan, execute and monitor activities	staff	§ Availability of drinking water enhanced	
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<b>Women's Socio-political and economic empowerment</b>	§ Formation & Strengthening of women's SHG groups	§ Women's SHG groups to be formed	§ Enhanced capacities of leaders of women's group in taking initiatives to solve problems at different levels.	§ Position of women in household, community, society (politically, socially and economically ) as perceived by women and community at large
	§ Capacity building of womenfolk	§ Federation of Women's SHGs to be formed	§ Improved access to credit for livelihood purposes.	§ Performance enhancement of SHGs in terms of participation, decision-making, leadership and fund management.

<p>§ Capacity building of SHG leaders and accountants</p>	<p>§ Trainings to be conducted for preparation of woollen products from sheep and goats</p>	<p>§ Increased household income.</p>	<p>§ Equality &amp; Equity in gender relations at home</p>
<p>§ Linking SHGs with external financial institutions</p>			<p>(decision making, expenditure, children's education, health)</p>



**CHAPTER -7**

**QUALITY AND SUSTAINABILITY  
ISSUES**

## **7- QUALITY & SUSTAINABILITY ISSUES**

### **7.1-PLANS FOR MONITORING & EVALUATION**

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

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

## **7.2 PLANS FOR PROJECT MANAGEMENT:**

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

### **7.3 WATERSHED DEVELOPMENT FUND:**

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

### **7.4 USER CHARGES:**

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

## **CHAPTER- 8**

# **THEMATIC MAPS**