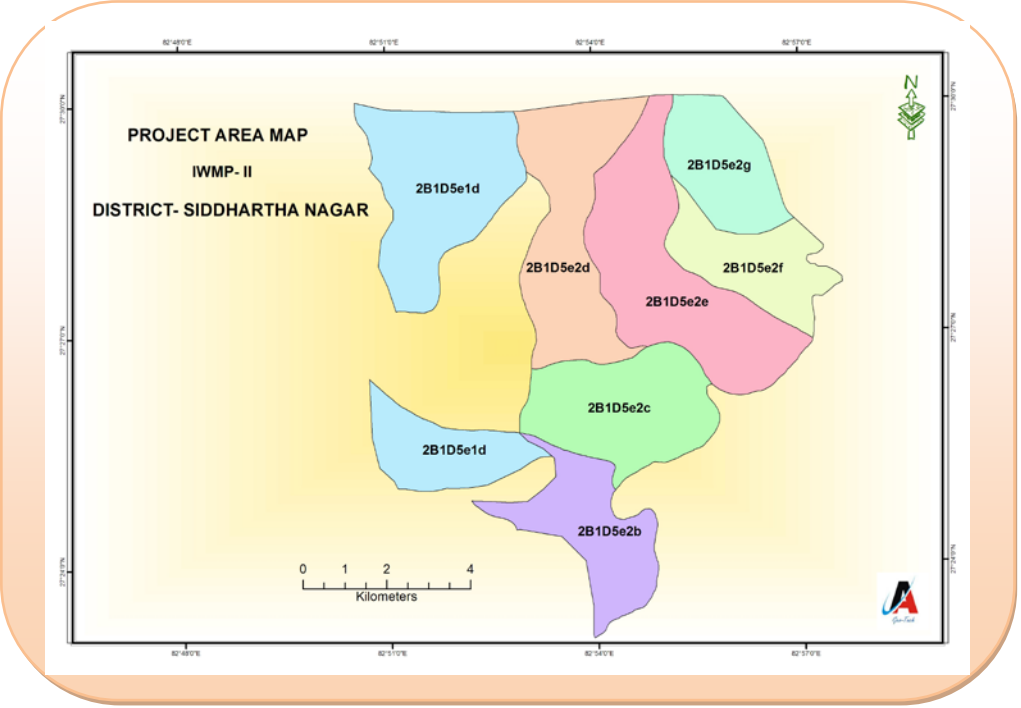
# DETAILED PROJECT REPORT (D.P.R.)

**(I.W.M.P. 2nd – SIDDTHARATHA NAGAR )**

**INTEGRATED WATERSHED MANAGEMENT PROGRAMME, BUDHI RAPTI BLOCK- BADHANI**

**DISTRICT - SIDDTHARATHA NAGAR (UTTAR PRADESH)**

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# EXCUTIVE SUMMARY

The Watershed comprises of seventy villages in Barhani Block of Sidharthnagar II[nd] District of Utter Pradesh. All these watersheds has been identified by the Land development and water resources by IWMP scheme proper prioritization of different parameter for watershed selection criteria Siddharthnagar. The watershed is located in the north west of Siddharthnagar District. Its lies between: Latitude is $27^0$ 23' 2.966"N to $27^0$ 30' 0.958"N and longitudes is $82^0$ 50' 34.022" E to $82^0$ 57' 36.628" E it's extent 10.67Km East to West and 12.85 Km North to South. (**2B1D5e1d, 2B1D5e2d, 2B1D5e2g, 2B1D5e2e, 2B1D5e2f, 2B1D5e1d, 2B1D5e2c, 2B1D5e2b**). Its altitude 100 to 175 M above the mean sea Level (MSL) The total area of watershed is 7669.00 ha., All these watershed are surrounded by the 23 grampanchayat. A watershed is the entire land areas which drain into a stream from its mouth. The watershed of a steam has not only area, but also depth extending from the top of the vegetation to the confining geologic strata beneath. It is a hydrologic unit. There is an infinite relationship between land & water. In simple words it can be refused to the divide separating one drainage basin from other. It is also used a synonym for catchments over or a drainage basin.

The intensification of land use in to traditional agricultural sifting is self deputing because it is exploitive the present agricultures practice greatly increase runoff is soil erosion; reduce ground water recharge, cause flood & sedimentation of reservoirs etc. As a result, the cultivated land resource base is shirking and its productive co capacity is diminishing.

Run off, erosion & drainage represent serious problems in may areas of semiarid tropics. These problems can be solved by evolving developmental programmers which take into consideration natural topography and drainage pattern of the land. The collection of excess water and its utilization to provide greater stability to rainfed agriculture appears to be a variable developmental alternative. The watershed is the natural frame work for resource development in relation to crop production.

The climate of the region is characterized as arid to semi arid with average annual rainfall ranges 1030mm annually with an average of 85 rainy days. Out of which above 85% is received during the monsoon season from July to September. The area received very less rainfall in the winter season. How ever temperature ranges from as high as 45ºc in the May- June to as low as 4.6.0ºc during December January the pattern of rainfall is highly erratic & maximum water goes as run off.

The most soils of targeted area are sodic in nature, where productivity is very low. PH of these soils ranges from 7.5 to 10. These soils are deficient in organic matter, water holding capacity & micronutrients. Improved greed's of animal & high yielding varieties of different crops, which have sodieness tolerance capacity like Usar Dhan 1 & 3 Daincha, Wheat, Barley, Beer, Bal & Anola, Guava have need to introduce, In spite of that 33% area of sandy clay loam in nature, which have good soil characteristics along with productivity.

Farming is the main occupation of the dwellers of the watershed. The major crops over Rice Wheat Bajra, Archer, Mustard, Sugarcane etc. raised most of the lands kept fallow during khariff because of irregular & uncertain rainfall during the rainy season; Rice & Wheat are the most pre dominant cropping system in the area. A tune off 46 % area under agricultural crop is covered during khariff season in the watershed. Among them various crops like race. Shares maximum area (10%) followed by Arhar (45%) Jowar (3%), Maize (3%) & sugarcane (2%).

Natural vegetation of watershed is not very scientific way. The Forest vegetation is far-dominant with shisham (*Dalbergia sissoo*) Karanj (*Dongamain global*), Mango (*Manjifera indica*) Babul (*Acacia lilotica*) Golar, Neem (*Azadirchta indica*) etc. There is no proper pasture in the watershed. Grass patches are seen only on the bunds, road side & other such palaces, the principal grasses are serpat, dub (Cynolon ducty bin) Kans.

The erosion is main problem of the watersheds is to be locked by harvesting additional water is existing water harvesting structure, which have lost most of their capacity due to siltation & creating new water bodies. Water stored in the water harvesting structures shall be properly recycled to provide supplemental irrigation of critical growth stages of crops & for the establishment of fruit orchards and forest trees.

In agricultural land will treated with bunding alongwith minor leveling. Waste land will be treated with the engineering measures like staggered trenchs and a forestation etc.

Budget for the various components is given as below –

| S.No. | Budge Component | Percentage | Total (Lakhs) |
|---|---|---|---|
| 1 | Management Cost | | |
| | a) Administration Cost | 10% | 57.744 |
| | b) Monitoring Cost | 1% | 5.7744 |
| | c) Evaluation | 1% | 5.7744 |
| | **Sub Total** | **12%** | **69.2928** |
| 2 | Preparatory Phase | | |
| | a) Entry Point Activities | 4% | 23.0976 |
| | b) Capacity building | 5% | 28.872 |
| | c) Preparation of DPR | 1% | 5.7744 |
| | **Sub Total** | **10%** | **57.744** |
| 3 | Watershed Works | 50% | 288.72 |
| 4 | Livelihood Activities | 10% | 57.744 |
| 5 | Production System and Micro-enterprises | 13% | 75.0672 |
| 6 | Consolidation Phase | 5% | 28.872 |
| | **Total** | | **450.4032** |
| | **Grant Total** | 100 % | **577.44** |

# PROJECT AT GLANCE

| | | |
|---|---|---|
| 1. | Name of Project | IWMP-II[nd] Siddharthnagar |
| 2. | Name of Block | Barhani |
| 3. | Name of District | Siddharthnagar |
| 4. | Name of State | Uttar Pradesh |
| 5. | Name of Micro Watershed | **8** |
| 6. | Name of Village under Micro Watershed | Baghi, Redwariya, kharikaura, Basantpura, Banchaura, Banchauri, Beni Nagar, Ganrakha, ManiKaura, Champapur, Kohdaura, Imlliya Janaubi, Baidauli, Basahiya, Ganeshpur, Panariya, Golhaura Mustahakam, Golhaura Ahatmali, Khankuiya Nankar Thusuri, Lohati, Charigawa, Chandai, Sumali, Sahinwar, Akherraiya, Jobkunda, Paki, Chandawa, Mohankola, Dhandhara, Bhelauli, Kamhariya, Jharuya, Halaura, Anawadih, Arri, Dhanaura Mustahakam, Dhanaura Ahatamali, Barhani, Sinhorarwa, Pipara, Kotiya, Dhandhari Kala, Dhandhari, Urf Gulari, Surzi, Kapasihakia, Alaga |
| 7. | Micro Watershed Code Selected | **2B1D5e1d, 2B1D5e2d, 2B1D5e2g, 2B1D5e2e, 2B1D5e2f, 2B1D5e1d, 2B1D5e2c, 2B1D5e2b** |
| 8. | Total Area of the Project | 7669.00 ha. |
| 9. | Proposed Area for Treatment | 4812.00 ha |
| 10 | Cost per hectare | Rs. 12000.00 per ha. |
| 11. | Project Period | 2010-11 to 2014-15 |
| 12. | Total cost of Project | 577.44 lacs |

# 1. PROJECT BACKGROUND

## 1.1 Project Background

The block Barhani of Sidhharthnagar district situated in Eastern Plane Zone of Uttar Pradesh. Block is lies in western part of the District and is about 50 km away from district head quarter on 0 km away from State Highway on Dhebarua to Sohratgarh road. The block come under agroclimatic zone Eastern Plain The watershed has been identified by the state department under Integrated Watershed Management Project (IWMP) scheme by proper prioritization of different parameter of watershed selection criteria (Annexure VI). The watershed is located in west side of Mau districts. It lies between $27^0$ N to $27^0$28 N Latitude and $84^0$ 45E to $83^0$10 E longitudes. Altitude range of this watershed is 100 to 170 m from above sea level (MSL). The total area of watershed is 7669.00 ha and treatable area is 4812.00 ha

**Table no.1: Basic Project information**

| Name of Project | District | Block | No of Village | No of MWS | Geographical Area | Proposed Area | Treatable Area | Cost (Rs in Lacs) |
|---|---|---|---|---|---|---|---|---|
| IWMP II[nd] | Siddharth nagar | Barhani | 48 | 8 | 7669 | 5062 | 4812 | 577.44 |

## 1.2 Need and Scope for Watershed Development

Watershed Development Prrogramme is prioritized on the basis of thirteen parameters namely poverty index, percentage of Sc/ST, Actual wages, Percentage of small and marginal farmers, Ground water status, Moisture index , Area under rain fed agriculture, Drinking water situation in the area, Percentage of degraded land, Productivity potential of the land, Continuity of another watershed that has already developed / treated, Cluster approach for plain and hilly terrain, Based on these thirteen parameter a compost ranking was given table no 2

## Table no.2: Weightage of the project

| Project Name | Project Type | Weightage | | | | | | | | | | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| IWMP-II[nd] | Eastern plain | i | ii | iii | iv | v | vi | vii | viii | ix | x | xi | xii | xiii | 77.5 |
| | | 7.5 | 5 | 5 | 10 | 0 | 0 | 15 | 5 | 10 | 5 | 5 | 10 | N.A. | |

## Table no 2.1 Criteria and weightage for selection of watershed

| S.No. | Criteria | Maximum Score | Ranges and Score | | | |
|---|---|---|---|---|---|---|
| i | Poverty index (% of poor to population) | 10 | Above 80% (10) | 80-50% (7.5) | 50-20% (5) | Below 20% (2.5) |
| ii | % of SC/ST Population | 10 | > 40 % (10) | 20-40 % (5) | < 20 % (3) | - |
| iii | Actual wages | 5 | Actual wages significantly lower than minimum wages (5) | Actual wages significantly higher than minimum wages (0) | - | - |
| iv | % of small and marginal farmers | 10 | > 80 % (10) | 50-80 % (5) | < 50 % (3) | - |
| v | Ground water status | 5 | Over exploitation (5) | Critical (3) | Sub critical (2) | Safe (0) |
| vi | Moisture index | 15 | -66.7 & below (15) | -33.3 to-66.6 (10) | 0 to -33.3 (0) | - |
| vii | Area under rainfed agriculture | 15 | > 90 % (15) | 80-90 % (10) | 70-80 % (5) | < 70% (Reject) |
| viii | Drinking water | 10 | No source (10) | Problematic village (7.5) | Partially recovered (5) | Fully covered(0) |
| ix | Degraded land | 15 | High-above 20% (15) | Medium-10-20% (10) | Low less than 10% (5) | - |
| x | Productivity potential of the land | 15 | Land with low production & where productivity can be significantly enhanced with reasonable efforts (15) | Land with moderate production & where productivity can be enhanced with reasonable efforts (10) | Land with high production & where productivity can be marginally enhanced with reasonable efforts (5) | - |
| xi | Contiguity to another watershed that has already been developed/treated | 10 | Contagious to previously treated watershed & contiguity within the micro watershed in the project (10) | Contiguity within the micro watershed in the project but non contagious to previously treated watershed (5) | Neither contagious to previously treated watershed nor contiguity within the micro watershed in the project(0) | - |
| xii | Cluster approach in the watershed | 15 | Above 6 micro watershed in the cluster (15) | 4 to 6 micro watershed in the cluster (15 | 2 to 6 micro watershed in the cluster (15 | - |
| Xiii | Cluster approach in the hills | 15 | Above 5 micro watershed in the cluster (15) | 3 to 5 micro watershed in the cluster (15 | 2 to 3 micro watershed in the cluster (15 | |

## 1.3 Objectives and Scope of Project

**a.** Conservation, development and sustainable management of natural resources including their use
**b.** Enhancement of agriculture production and productivity in a sustainable manner.
**c.** Restoration of ecological balance in the degraded and fragile rain-fed ecosystem.
**d.** Reduction in regional disparity between rain-fed and irrigated areas.
**e.** Creation of sustainable employment opportunities for the rural community for livelihood security.

## 1.4 Watershed Information

| S. No. | Name of the Project | Type of watershed | Micro watershed Name | Code | Area (ha) |
|---|---|---|---|---|---|
| 1 | IWMP II[nd] SIDDHARTHNAGAR | Micro watershed | KHARIKAURA | 2B1D5e1d | 769.00 |
| 2 | | Micro watershed | GANRAKHA | 2B1D5e1d | 356.00 |
| 3 | | Micro watershed | SASAHIYA | 2B1D5e2b | 488.00 |
| 4 | | Micro watershed | PANARIYA | 2B1D5e2c | 676.00 |
| 5 | | Micro watershed | CHANDAI | 2B1D5e2d | 736.00 |
| 6 | | Micro watershed | MOHANKALA | 2B1D5e2e | 940.00 |
| 7 | | Micro watershed | DHANAURA MUSTAHAKAM | 2B1D5e2f | 420.00 |
| 8 | | Micro watershed | SINHORAWA | 2B1D5e2g | 426.00 |
| | | | | **Total** | **4812.00** |

**Source: secondary data**

## 1.5 Status ofv previous watershed programmes & other development project/scheme in the watershed area

The IWMP II[nd] watershed area being very backword has been on top priority of a number of development projects. These programmes are mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS), Swarnjayanti Gram Swarojgar Yojna (SGSY), Indra Awas Yojna etc.

**Table no. 4 Developmental Programmes running in the project area**

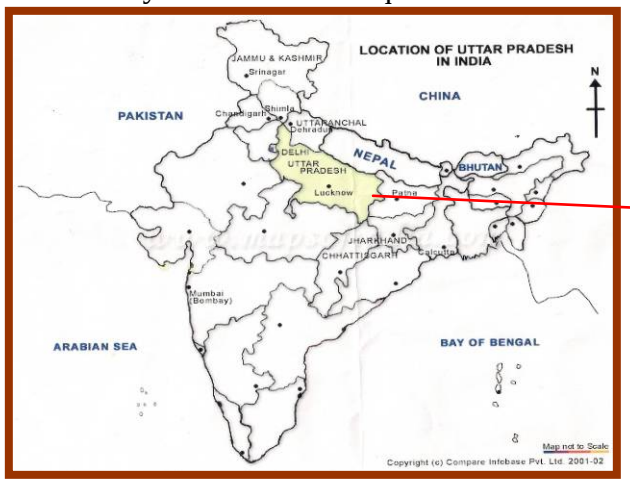
| S. No. | Name of Programmes/Scheme | Sponsored Agencies | Objectives | Commencement (year) | Village Covered |
|---|---|---|---|---|---|
| 1 | MGNREGS | Rural Development Dept. | Employment | 2009 | 58 |
| 2 | IAY | Rural Development Dept. | Housing | 2005 | 49 |
| 3 | SGSY | Rural Development Dept.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

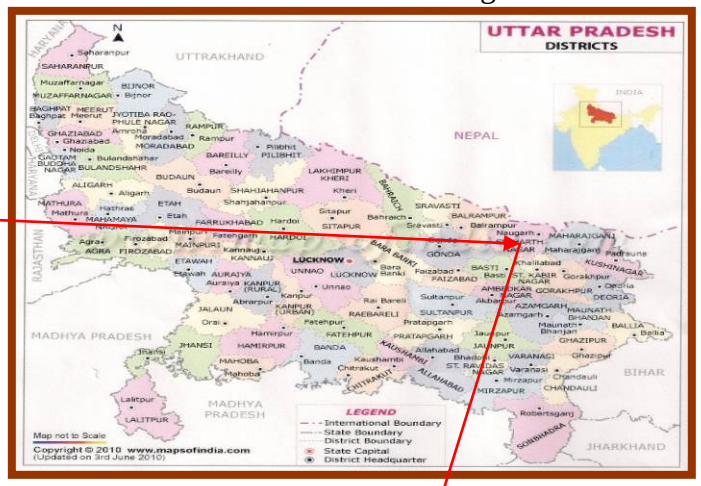
**Source: Primary data**

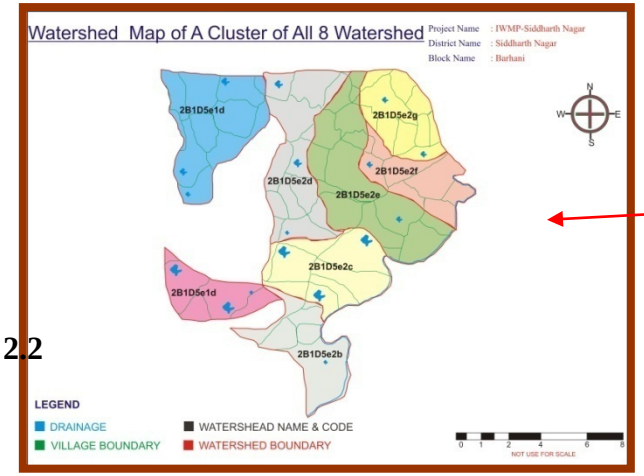
# 2. GENERAL DISCRIPTION OF THE WATERSHED

## 2.1 Location

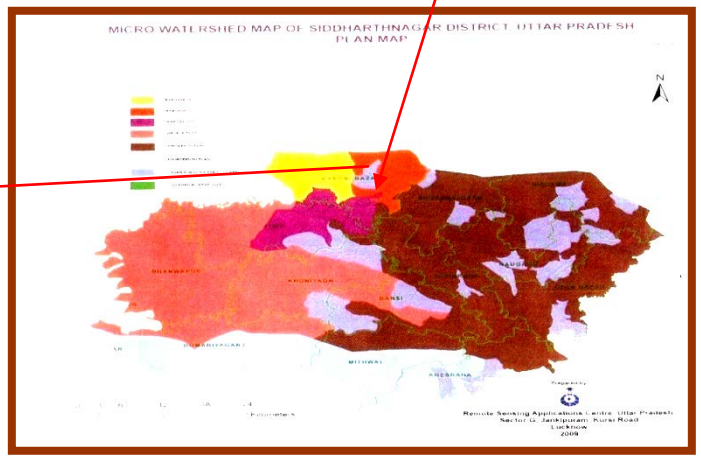
The nine watersheds in Barhani block of Siddharthngr District (U.P.) is located 20 to 25 Km away from District headquarters and 10 Km away from block headquarter situated between $27^0$ N to $27^028$ N Latitude and $84^0$ 45E to $83^010$ E longitudes.




## 2.2



## Land use Pattern

The IWMP II[nd] watersheds has diversified land uses namely agriculture, waste land (open scrub), seasonal water bodies etc. The varied present land use and area under different categories in watershed is shown in Table 6 & 7. The mixed land use followed in the watershed is almost similar in other parts of the U.P. During PRA exercise, the villagers prepared land use. One such map of village of IWMP II[nd] watershed is shown in table5.

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

**Area in hectare**

| S.N. | Name of Project | No of Micro Watershed | Geographical area | Forest Area | Agriculture land | Rain fed Area | Pasture land | Wastelands | | Treatable Area |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Cultivated | Uncultivable | |
| **1** | IWMP II[nd] | **8** | **7669** | **69** | **5545** | **5062** | **0.0** | **1965** | **90.00** | **4812.00** |

**Source: Primary data**

Various agricultural land uses in the watershed are extended to diversified land capabilities starting fro marginal to good class II lands. The watershed distinctly has three types of lands i.e. leveled, sloping and degraded and 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 5545.00 ha out of which 483.00 ha is irrigated while 5062.00 ha is under rain-fed agriculture. The water (both irrigated and drinking) is most scarce natural resource in the watershed. The problem of tube wells for irrigation of agricultural crops frequently leads to the drinking water problem to the farmers of watershed forcing them to carry drinking water from out side the watershed area. The agricultural field bunds are common in the watershed, however, they frequently breach on heavy rains adversely affecting the in situ percolation of rain water in the soils.

## 2.2 Physiography

Total area of the IWMP II[nd] Sddharthnagar is 5062.00 ha with treatable area 4812.00 ha. Elevation range and location of altogether nine micro watershed shed are given below above

**Table no. 6: Elevation range, longitude latitude, relief height difference etc***

| Location of watershed | | | | | | Elevation of watershed from MSL | | |
|---|---|---|---|---|---|---|---|---|
| **District** | **Mandal** | **Micro watershed** | **Habitation** | **Longitude** | **Latitudes** | **Highest** | **Lowest** | **Relief height difference** |
| Siddharthnagar | Basti | **2B1D5e1d KHARIKAURA** | KHARIKAURA, Redwariya, Kharikura, Basantpur, Banchaura, Banchauri | $84^0$44' 14" to $83^0$11'09" East | $28^0$11" to $27^0$28'20" North | 117 | 96 | 20 |
| Siddharthnagar | Basti | **2B1D5e1d GANRAKHA** | Ganrakha, Manikaura | $85^0$46' 30" to $83^0$10'15" East | $27^0$'36" to $27^0$26'43" North | 150 | 110 | 45 |
| Siddharthnagar | Basti | **2B1D5e2b NASAHIYA** | Champapur, Kohdaura, Imlliya janubi, Baidauli, Basahiya | $85^0$44' 45" to $83^0$10'20" East | $27^0$25" to $27^0$28'35" North | 110 | 95 | 15 |
| Siddharthnagar | Basti | **2B1D5e2c PANARIY** | Ganeshpur, Panariya, Golhaura Mustahakam, Golhaur Ahatmali | $85^0$46' 10" to $83^0$11'20" East | $27^0$12" to $27^0$29'20" North | 155 | 143 | 19 |
| Siddharthnagar | Basti | **2B1D5e2d CHANDAI** | Lohati Charigawa, Chandai, Sumali, Shainwar, Akheraiya | $84^0$47' 55" to $83^0$11'40" East | $27^0$42" to $27^0$29'30" North | 123 | 108 | 18 |
| Siddharthnagar | Basti | **2B1D5e2e MOHANKOLA** | Jobkunda, Paki, Chanawa, Mohan Kola, Dhandhara, Bhelauli | $84^0$46' 25" to $83^0$11'20" East | $27^0$11" to $27^0$29'25" North | 165 | 129 | 38 |
| Siddharthnagar | Basti | **2B1D5e2f DHANAURA M** | Anawadih, Arri, Dhanaura Mustahakam Dhanaura Ahatamali | $84^0$47' 20" to $83^0$11'10" East | $27^0$36" to $27^0$29'50" North | 160 | 129 | 35 |
| Siddharthnagar | Basti | **2B1D5e2g SINHORAWA** | Barhani, Sinhorawa, Pipara, Kotiya, Dhandhari Kala | $84^0$47' 35" to $83^0$13'15" East | $27^0$26" to $27^0$29'45" North | 165 | 134 | 29 |

**Source: Remote sensing Lknow.& GPS**

### 2.3.1 Major stream

The watershed is in the mid of IWMP II$^{nd}$ Siddharthnagar in the form of Gandak river having precipitous slop and drained in gully of Gandak river. About 4 % of watershed area has slopped more than 1% upright ridges. The top of the watershed exhibited extremely precipitous and manifesting moderate to severe erosion class. The lower portion of the watershed has moderate slope (less than 1 %). At the outlet of water shed small gullied are notice, covered with sparse vegetation. In Total (1$^{st}$ order -4 numbers, 2$^{nd}$ order-5 numbers and 3$^{rd}$ order-1 numbers) numbers of streams of different order are found in the watershed, with total stream length of 26100 m. Stream characteristics of watershed are presented in the table.

**Table No.7: Stream characteristics of watershed** (IWMP I$^{st}$ Siddharthnagar)

| Stream order | Stream number | Main stream length (M) |
|---|---|---|
| 1$^{st}$ order | 4 | 5800.00 |
| 2$^{nd}$ order | 5 | 7300.00 |
| 3$^{rd}$ order | 1 | 13000.00 |
| Total | 10 | 26100.00 |

## 2.4 Climate

The watershed falls under the semi-arid region of tropical climate. The average annual precipitation is 1020 mm spreading over 85 rainy days. Most of the rainfall (about 85 %) is received during July to September. The rainfall is of moderate to high intensity. The area receives on or scanty rainfall in the winter season. The temperature variation ranges from as high as 46$^{o}$C in the month of May- June to as low as 3.8$^{o}$C in December- January.

### 2.4.1 Climatic Condition

**Table no. 8: Climatic Condition**

| S. No. | Name of Project | Name of the block/ | No. of Micro Watershed | No. of revenue villages | Information | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Average Rainfall and rainy days (in mm) | | | | | | Temperature (c ) | | | Relative humidity (%) | | |
| | | | | | 2007 | | 2008 | | 2009 | | 2007 | 2008 | 2009 | 2007 | 2008 | 2009 |
| | | | | | Avg. in Mm | No. Of Days | Avg. in Mm | No. Of Days | Avg. in Mm | No. Of Days | Min-Max | Min-Max | Min-Max | Min-Max | Min-Max | Min-Max |
| 1 | IWMP 1I$^{nd}$ Siddharthnagar | Barhani | 8 | 48 | 1050 | 90 | 750 | 72 | 1020 | 92 | 38.00 | 37.9 | 35 | 85 | 85 | 82 |

## 2.5 Watershed Characteristics

### 2.5.1 Shape and Size

The watershed shape (IWMP II[nd] Siddharthnagar) is squire type. The maximum length and width of IWMP II[nd] Siddharthnagar the watershed are 16000 m and 10000 m, respectively with the length: width ratio 1.6/1

**Table no. 9: Shape and Size of watershade**

| S. N. | Micro watershed Name | Code | Area (ha) | Shape | Approximate size in meter | | Ratio Length: width |
|---|---|---|---|---|---|---|---|
| | | | | | Length | Width | |
| 1 | KHARIKAURA | 2B1D5e1d | 769.00 | Triangulr | 3500 | 1300 | 2.76:1 |
| 2 | GANRAKHA | 2B1D5e1d | 356.00 | Shoe shape | 5300 | 2000 | 2.65:1 |
| 3 | BASAHIYA | 2B1D5e2b | 488.00 | Cubical | 10000 | 1400 | 7.14:1 |
| 4 | PANARIYA | 2B1D5e2c | 676.00 | Circular | 4200 | 1750 | 5.06:1 |
| 5 | CHANDAI | 2B1D5e2d | 736.00 | Pentagonal | 2200 | 1700 | 1.29:1 |
| 6 | MOHANKALA | 2B1D5e2e | 940.00 | Squire | 2900 | 2550 | 1.14:1 |
| 7 | DHANAURA M. | 2B1D5e2f | 420.00 | Rectangular | 3000 | 2050 | 1.46:1 |
| 8 | SINHORAWA | 2B1D5e2g | 426.00 | Fork shape | 7000 | 2400 | 2.92:1 |

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

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

| S.No. | Project Name | Main stream | Drainage Density | Average Slope | Watershed Relief |
|---|---|---|---|---|---|
| 1 | IWMP II[nd] SIDDHARTHNAGAR | I-5800 meter<br>II- 7300 meter<br>III- 13000 meter | 0.90-1.20 meter/second | 0-4% | 4-71 meter |

## 2.6 Geomorphology and Soils

### 2.6.1 Geomorphology

The IWMP II[nd] Siddharthnagar watershed is located North-west side of the Siddharthnagar district. The entire watershed is topographically divided into three major landforms. Accordingly, the soils of watershed can be grouped into three major categories. Such as

- Plain land
- Sloppy land,
- Ravinous land

### 2.6.2 Sloppy Land-Sandy Loam

The topmost portion (western & northwest part) of the watershed is Sloppy land with occasional depressions of flat land. These soils are derived from the Sandy loam and are located at some height of around 10 feet. They have developed from typical alluvial soil slightly alkaline in nature with occasional thin layers of silt in small patches. Near the high level, the soils are coarse and underlying with hard sandstones. The soils of the upper level and very nearby adjoining areas are loamy sand to sand in texture. Depth is the major limitations of these soil groups. As move away upper level, the soil depth gradually increases along with clay content thereby improving the fertility. The soils are alluvial in colour with ferruginous concretions with slightly alkaline in reaction.

### 2.6.3 Fine textured alluvial soils

These soils are the most extensive soil group found in the IWMP I$^{st}$ Siddharthnagar watershed. The middle portion of watershed is relatively flat land with fine soil texture. These soils are grey in colour and are inherently high in fertility status. These grey soils are sticky with high pH and on drying develop numerous cracks and fissures. Soil texture is silty clay loam particularly in depressions and loam in the elevated portion. The 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 subsurface indurate pan of kankar of clay or mixtures of both locally called as Potni soils is prevalent, which impede the downward movement of water thereby creating problems of high runoff.

### 2.6.4 Coarse textured alluvial soils

These soils are lying mostly near the adjoining areas of Gandak 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 residual soils of the hill region. Rill and gully formation in some parts particularly near the outlet of watershed can be seen.

### 2.6.5 Drainage

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

# 3. BASELINE SURVEY

## 3.1. Socio Economic Condition

### 3.1.1 Demographic pattern

The total population of nine micro watershed are 53081 and 8500 house holds is with average family size is 6.73 person s.

**Table no. 11: Demographic pattern detail**

| S. No. | Name of Micro Watershed | Name of Villages | Total No of House Hold | Population | | | Population of SC/ST | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Male | Female | Total | Male | Female | Total |
| 1 | **2B1D5e1d KHARIKAURA** | KHARIKAURA, Redwariya, Kharikura, Basantpur, Banchaura, Banchauri, Beni Nagar | 980 | 3255 | 2658 | **5913** | 879 | 802 | **1681** |
| 2 | **2B1D5e1d GANRAKHA** | Ganrakha, Manikaura | 950 | 2950 | 2541 | **5491** | 666 | 584 | **1250** |
| 3 | **2B1D5e2b BASAHIYA** | Champapur, Kohdaura, Imlliya janubi, Baidauli, Basahiya | 820 | 2546 | 2460 | **5006** | 371 | 352 | **723** |
| 4 | **2B1D5e2c PANARIY** | Ganeshpur, Panariya, Golhaura Mustahakam, Golhaur Ahatmali, Khankuiya Nankar, Thusuri | 820 | 3265 | 2156 | **5421** | 379 | 368 | **747** |
| 5 | **2B1D5e2d CHANDAI** | Lohati Charigawa, Chandai, Sumali, Shainwar, Akheraiya, | 1520 | 4952 | 3569 | **8521** | 928 | 922 | **1850** |
| 6 | **2B1D5e2e MOHANKOLA** | Jobkunda, Paki, Chanawa, Mohan Kola, Dhandhara, Bhelauli, Kamhariya, Jharuya, Halaura | 1240 | 4750 | 4242 | **8992** | 889 | 778 | **1667** |
| 7 | **2B1D5e2f DHANAURA M** | Anawadih, Arri, Dhanaura Mustahakam Dhanaura Ahatamali | 1220 | 4646 | 4141 | **8787** | 406 | 400 | **806** |
| 8 | **2B1D5e2g SINHORAWA** | Barhani, Sinhorawa, Pipara, Kotiya, Dhandhari Kala, Dhandhari Urf Gulari, Surzi, Kapasihawa, Alaga | 950 | 2965 | 1985 | **4950** | 507 | 489 | **996** |
| | | **Total** | **8500** | **29329** | **23752** | **53081** | **5025** | **4695** | **9720** |

Source: District statistic magazine

### 3.1.2. Literacy rate

## Table no. 12: Literacy rate detail

| S. No. | Name of Micro Watershed | Name of Villages | Total population | % of Literacy | | |
|---|---|---|---|---|---|---|
| | | | | Male | Female | Total |
| 1 | **2B1D5e1d KHARIKAURA** | KHARIKAURA, Redwariya, Kharikura, Basantpur, Banchaura, Banchauri, Beni Nagar | **5913** | 65 | 45 | 55 |
| 2 | **2B1D5e1d GANRAKHA** | Ganrakha, Manikaura | **5491** | 50 | 40 | 45 |
| 3 | **2B1D5e2b BASAHIYA** | Champapur, Kohdaura, Imlliya janubi, Baidauli, Basahiya | **5006** | 52 | 46 | 49 |
| 4 | **2B1D5e2c PANARIY** | Ganeshpur, Panariya, Golhaura Mustahakam, Golhaur Ahatmali, Khankuiya Nankar, Thusuri | **5421** | 54 | 40 | 47 |
| 5 | **2B1D5e2d CHANDAI** | Lohati Charigawa, Chandai, Sumali, Shainwar, Akheraiya, | **8521** | 50 | 32 | 41 |
| 6 | **2B1D5e2e MOHANKOLA** | Jobkunda, Paki, Chanawa, Mohan Kola, Dhandhara, Bhelauli, Kamhariya, Jharuya, Halaura | **8992** | 60 | 50 | 55 |
| 7 | **2B1D5e2f DHANAURA M** | Anawadih, Arri, Dhanaura Mustahakam Dhanaura Ahatamali | **8787** | 61 | 49 | 55 |
| 8 | **2B1D5e2g SINHORAWA** | Barhani, Sinhorawa, Pipara, Kotiya, Dhandhari Kala, Dhandhari Urf Gulari, Surzi, Kapasihawa, Alaga | **4950** | 60 | 50 | 55 |
| | | **Total** | **53081** | **56.50** | **44.00** | **50.25** |

Source: District statistic magazine

### 3.1.3. Migration pattern

**Table no. 13: Migration detail**

| S. No. | Name of Micro Watershed | No. of Villages | Total population | Migration | | | Migration by Month | | | Main reason for migration | Income during migration |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Total | Male | Female | <3Month | 3-6 Month | >6 month | | |
| 1 | **2B1D5e1d KHARIKAURA** | 7 | **5913** | 3580 | 2140 | 1440 | 1950 | 1473 | 114 | Employment | Rs 3500/ month |
| 2 | **2B1D5e1d GANRAKHA** | 2 | **5491** | 3755 | 2005 | 1750 | 2255 | 1620 | 78 | Employment | Rs 4500/ month |
| 3 | **2B1D5e2b BASAHIYA** | 5 | **5006** | 2148 | 1720 | 428 | 1285 | 638 | 210 | Employment | Rs 4500/ month |
| 4 | **2B1D5e2c PANARIY** | 6 | **5421** | 4460 | 3570 | 890 | 2688 | 1348 | 448 | Employment | Rs4000/ month |
| 5 | **2B1D5e2d CHANDAI** | 6 | **8521** | 1040 | 830 | 210 | 620 | 309 | 108 | Employment | Rs 4500/ month |
| 6 | **2B1D5e2e MOHANKOLA** | 9 | **8992** | 4460 | 3570 | 890 | 2680 | 1341 | 448 | Employment | Rs4000/ month |
| 7 | **2B1D5e2f DHANAURA M** | 4 | **8787** | 5950 | 4792 | 1158 | 3571 | 1780 | 590 | Employment | Rs 4500/ month |
| 8 | **2B1D5e2g SINHORAWA** | 9 | **4950** | 2060 | 1558 | 518 | 1240 | 621 | 206 | Employment | Rs 3500/ month |

Source : Secondary data

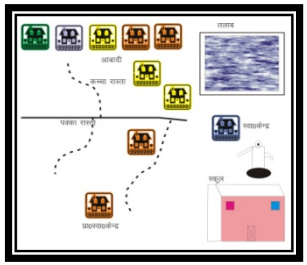
### 3.14 Infrastructure social features

**Table no.14: Details of infrastructure in the project area**

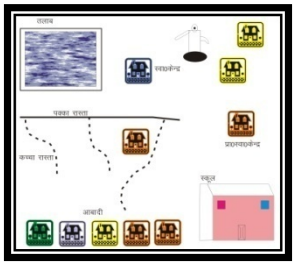
| S.No. | Parameters | Status | | | |
|---|---|---|---|---|---|
| (I) | No. of Villages connected to the main road by an all-weather road | 48 | | | |
| (ii) | No. of villages provided with electricity | 45 | | | |
| (iii) | No. of households without access to drinking water | 7850 | | | |
| (iv) | No. of educational institutions:<br>Primary (p)/Secondary(S)/ Higher secondary(HS)/ vocational Institution (VI) | (P)<br>42 | (S)<br>12 | (HS)<br>6 | (VI)<br>- |
| (v) | No. of villages with access to primary Health Center | 4 | | | |
| (vi) | No. of villages with access to Veterinary Dispensary | 10 | | | |
| (vii) | No. of villages with access to Post office | 14 | | | |
| (viii) | No. of villages with access to Banks | 4 | | | |
| (ix) | No. of villages with access to Markets/mandis | 11 | | | |
| (x) | No. of villages with access to Agro-industries | - | | | |
| (xi) | Total quantity of surplus milk | 2642 liter | | | |
| (xii) | No. of milk collection centers (e.g. Union(U)/Society(S)/ Private agency (PA)/ others (O) | (U)<br>No | (S)<br>No | (PA)<br>32 | (O) |
| (xiii) | No. of villages with access to anganwadi Center | 18 | | | |
| (xiv) | Any other facilities with no. of villages (please specify) | - | | | |

The IWMP II$^{nd}$ watersheds have moderate communication facilities and all fourty eight villages are approachable through motorable road. Literacy rate in the watershed is very low because all villages are having education upto junior high school. All the villages are electrified and have TV & telephonic connection. Nearest small market is at Barhani 10 km and nearest big market Siddharthnagar is about 35 km from the watershed. Religious and ritual features are almost common as in other part of the U.P. Small land holding (average less than 2.3 ha) with large family size (average 6.72 person) and more than 45% of the labour force of the total population living below poverty line indicate poor socio economic status of the watershed community. However, strong community spirit among the villager's show positive indication for the success of any programmed to be implemented in participatory mode. Traditionally the entire village community participates in the individual works. Various village features is shown in fig

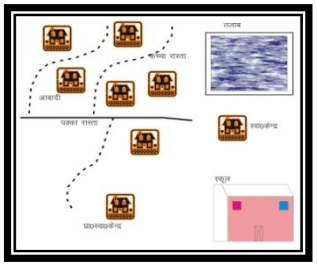
# VILLAGE SOCIAL MAP



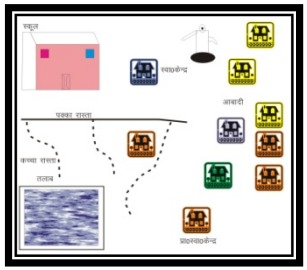
**KHARIKAURA**



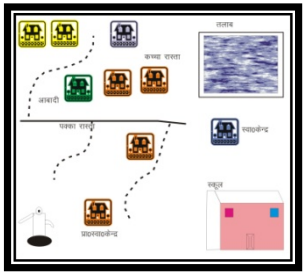
**GANRAKHA**



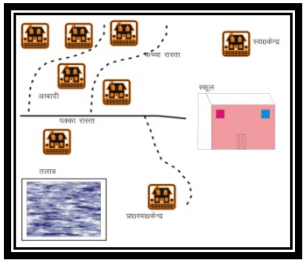
**BASAHIYA**



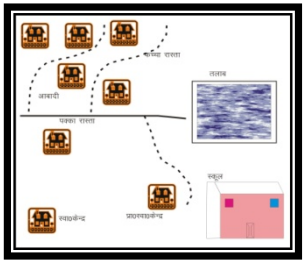
**PANARIYA**



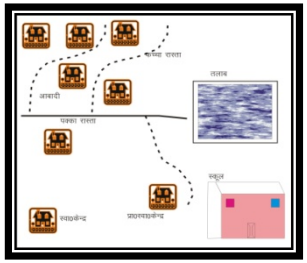
**CHANDAI**



**MOHAN KOLA**



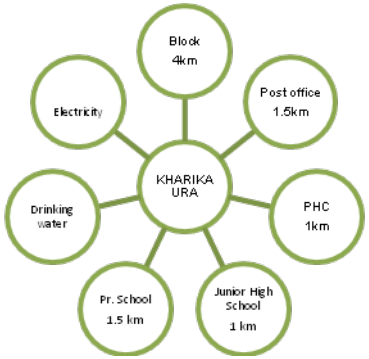
**DHANAURA M.**



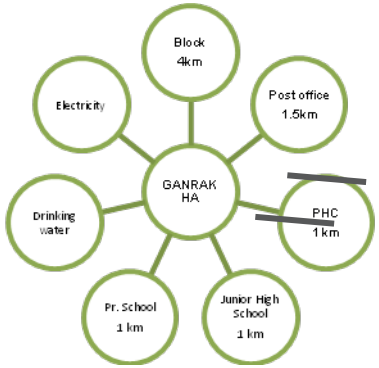
**SINHORAWA**

### 3.15 Venn diagram

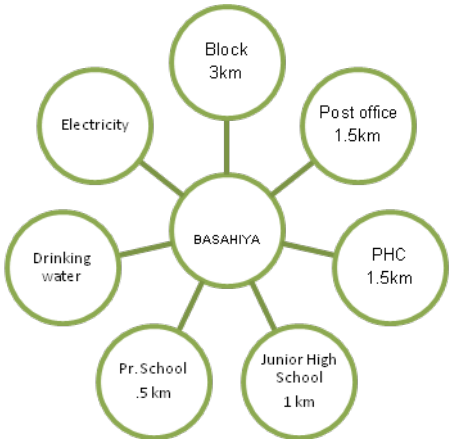
In the Venn diagram , farmers perceptions was recorded for importance and role of different development institution is relation to infrastructure development in the villages, importance has been depicted with size of circle and role with distance from the village circle. The Venn diagram of the IWMP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



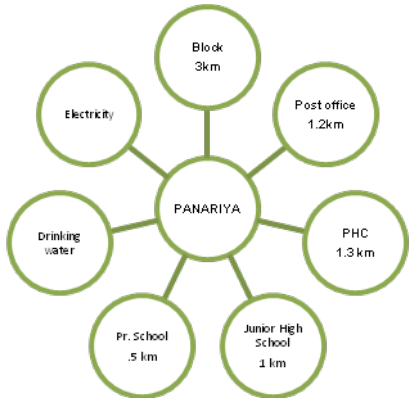

V
ENN DIGRAM OF VILAAGE KHARIKAURA



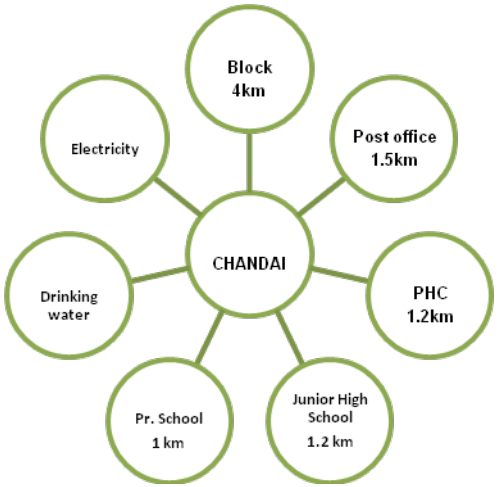

VENN DIGRAM OF VILAAGE GANRAKHA



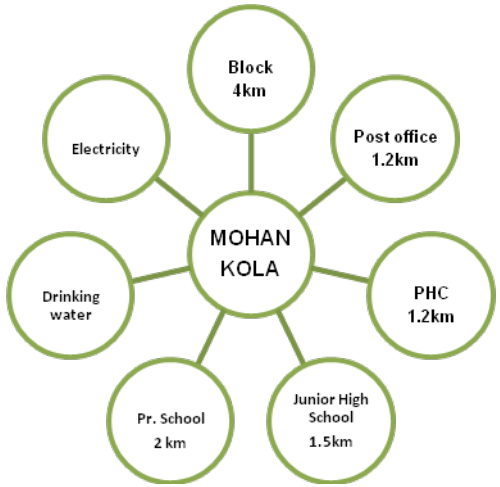

VENN DIGRAM OF VILAAGE BASAHIYA



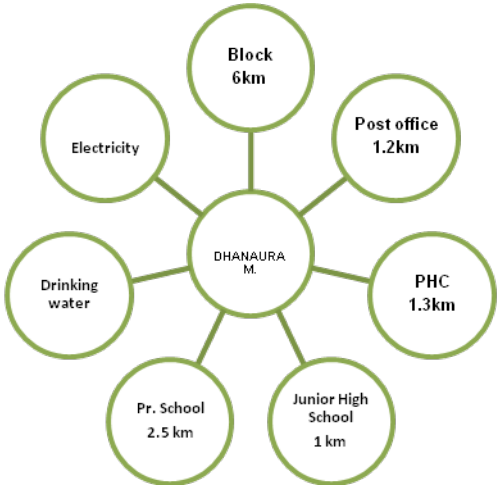

VENN DIGRAM OF VILAAGE PANARIYA

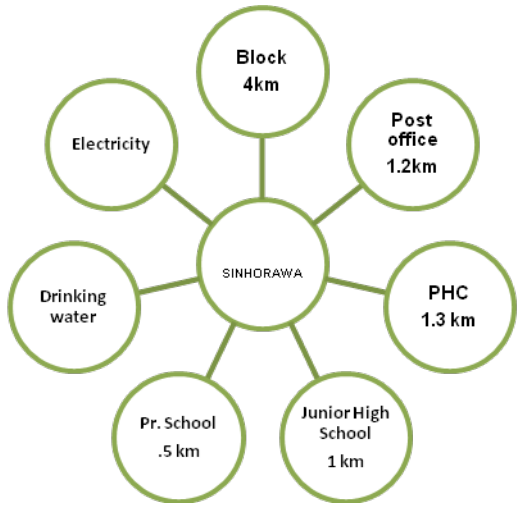



VENN DIGRAM OF VILAAGE CHANDAI




VENN DIGRAM OF VILAAGE MOHAN KOLA



VENN DIGRAM OF VILAAGE DHANAURA M. VENN DIGRAM OF VILAAGE SINHORAWA

### 3.1.6. Historical Timeline

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 nine watersheds of Siddharthnagar district. Historical timeline depicting important events in respect of different villages of the IWMP II$^{nd}$ watershed was prepared through PRA. Historical timeline for important villages are given in table .

| **Village-KHARIKAURA** | | **Village-GANRAKHA** | |
|---|---|---|---|
| **Year** | **Activities** | **Year** | **Activities** |
| 1700 | Established | 1710 | Established |
| 1960 | Construction Bandhi (water harvesting structure) | 1960 | Construction Bandhi (water harvesting structure) |
| 1965 | Opening up Primary School | 1985 | Opening up Primary School |
| 1976 | Introduction of Tractor | 1980 | Introduction of Tractor |
| 1978 | Establishment of Gobar gas plant | 1978 | Establishment of Gobar gas plant |
| 1979 | Kacha road | 1982 | Kacha road |
| 1985 | Introduction of thresher | 1984 | Introduction of thresher |
| 1986 | First Tube well | 1986 | First Tube well |
| 1992 | First motorcycle | 1991 | First motorcycle |
| 1994 | TV and DVD player | 1996 | TV and DVD player |
| 2001 | Electricity in the village | 2002 | Electricity in the village |
| 2004 | Bituminous road | 2003 | Bituminous road |
| 2006 | Temple renovation | 2007 | Temple renovation |
| 2009-10 | Planning for watershed project | 2009-10 | Planning for watershed project |
| **Village- BASAHIYA** | | **Village-PANARIYA** | |
| **Year** | **Activities** | **Year** | **Activities** |
| 1702 | Established | 1707 | Established |
| 1960 | Construction Bandhi (water harvesting structure) | 1965 | Construction Bandhi (water harvesting structure) |
| 1985 | Opening up Primary School | 1986 | Opening up Primary School |

| | | | |
|---|---|---|---|
| 1980 | Introduction of Tractor | 1985 | Introduction of Tractor |
| 1978 | Establishment of Gobar gas plant | 1980 | Establishment of Gobar gas plant |
| 1982 | Kacha road | 1982 | Kacha road |
| 1985 | Introduction of thresher | 1990 | Introduction of thresher |
| 1988 | First Tube well | 1992 | First Tube well |
| 1992 | First motorcycle | 1996 | First motorcycle |
| 1999 | TV and DVD player | 1999 | TV and DVD player |
| 2002 | Electricity in the village | 2002 | Electricity in the village |
| 2003 | Bituminous road | 2004 | Bituminous road |
| 2007 | Temple renovation | 2009-10 | Planning for watershed project |
| 2009-10 | Planning for watershed project | 1707 | Established |

| **Village- CHANDAI** | | **Village-MOHAN KOLA** | |
|---|---|---|---|
| **Year** | **Activities** | **Year** | **Activities** |
| 1810 | Established | 1712 | Established |
| 1962 | Construction Bandhi (water harvesting structure) | 1963 | Construction Bandhi (water harvesting structure) |
| 1984 | Opening up Primary School | 1985 | Opening up Primary School |
| 1985 | Introduction of Tractor | 1980 | Introduction of Tractor |
| 1980 | Establishment of Gobar gas plant | 1978 | Establishment of Gobar gas plant |
| 1982 | Kacha road | 1982 | Kacha road |
| 1989 | Introduction of thresher | 1987 | Introduction of thresher |
| 1991 | First Tube well | 1988 | First Tube well |
| 1993 | First motorcycle | 1992 | First motorcycle |
| 1998 | TV and DVD player | 1996 | TV and DVD player |
| 2004 | Electricity in the village | 2002 | Electricity in the village |
| 2006 | Bituminous road | 2003 | Bituminous road |
| 2009-10 | Planning for watershed project | 2007 | Temple renovation |
| 1810 | Established | 2009-10 | Planning for watershed project |

| **Village- DHANAURA M.** | | **Village-SINHORAWA** | |
|---|---|---|---|
| **Year** | **Avtivities** | **Year** | **Avtivities** |
| 1879 | Established | 1878 | Established |
| 1965 | Construction Bandhi (water harvesting structure) | 1968 | Construction Bandhi (water harvesting structure) |
| 1980 | Opening up Primary School | 1982 | Opening up Primary School |
| 1984 | Introduction of Tractor | 1981 | Introduction of Tractor |

| | | | |
|---|---|---|---|
| 1986 | Establishment of Gobar gas plant | 1985 | Establishment of Gobar gas plant |
| 1982 | Kacha road | 1983 | Kacha road |
| 1987 | Introduction of thresher | 1985 | Introduction of thresher |
| 1988 | First Tube well | 1984 | First Tube well |
| 1993 | First motorcycle | 1992 | First motorcycle |
| 1998 | TV and DVD player | 1995 | TV and DVD player |
| 2002 | Electricity in the village | 2002 | Electricity in the village |
| 2004 | Bituminous road | 2004 | Bituminous road |
| 2009-10 | Planning for watershed project | 2009-10 | Planning for watershed project |

Source : Secondary data

## 3.2. SOIL AND LAND USE

### 3.2.1 Soil morphology

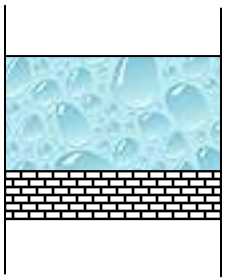
The nine watershed of IWMP II$^{nd}$ is located south west corner of the Siddharthnagar district. The entire watershed is topographically divided into three major landforms accordingly; the soils of watershed have been grouped in three major categories.

1 Sloppy land

2 Plain land

3 Ravinous land

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



1-1.5 m (heavy texture soil-black in colour)

5-6m (Locally called Pathrili soil- clay mixed with $CaCo_3$)

Parent material/Regolith/bed rock (sand stone)

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

**Table no. 15: Morphology of a typical soil profile of micro watershed (dominant soil)**

| Horizon | Depth (cm) | Morphology |
|---|---|---|
| A | 0-150 | Light grayish colour 28% with free $NaCO_3$, Sticky when moist, hard when dry, high elasticity, fissures and cracks, occasional occurrence of free calcium carbonate granules ph 8.3-8.7 |
| B | 150-600 | Whitish-yellow in colour, high effervescence with dilute NaOH. very fine mixed with free CaCO3 and granules, very hard when dry, compact & indurate hard pan, restricting development of root and downward water transmission (locally called as Potni soil) |
| C | > 600 | White and white sandstone, Regolith (Parent material) |

### 3.2.3. Soil characteristics and fertility status

**Table no. 15.1: Soil characteristics and Fertility Status up to 6"**

| Soil Properties | LCC I | LCC II | LCC III |
|---|---|---|---|
| Sand (%) | 47.04 | 75.04 | 73.04 |
| Silt (%) | 24.6 | 18.6 | 20.3 |
| Clay (%) | 28.36 | 6.36 | 6.66 |

| | | | |
|---|---|---|---|
| Texture | Sandy clay loam | Loamy sand | Loamy sand |
| pH (1:2) | 8.41 | 8.67 | 6.85 |
| EC(dS m-1) | 0.47 | 0.12 | 0.16 |
| Organic carbon(%) | 0.37 | 0.12 | 0.19 |
| Available N (kg ha-1) | 316 | 173 | 224 |
| Available P (kg ha-1) | 29 | 15 | 5-8 |
| Available K (kg ha-1) | 189 | 325 | 230 |

* values correspond to soil fraction <2mm

### 3.2.4. Land Capability Classification (LCC)

Land capability classification was done to classify the soils in different groups based upon the limitations and to emphasize prevailing in the watershed under different kinds of soils. Initially reconnaissance survey was carried out for entire watershed in order to find out the different topo-sequences, landforms, soil depth and erosion hazards. This was followed by the detailed investigation of selected landforms to bring out the LCC classes of the Micro Watershed. Three classes of land capability namely II, III and IV were demarcated in the IWMP II$^{nd}$ watersheds. The areas under different classes are sown in table  and figure.

**Table no. 16: Area under different land capability class under micro watersheds**

| **Land Capability Class** | **Area (ha)** |
|---|---|
| I | 1924.80 |
| II | 1443.60 |
| III | 962.40 |
| IV | 481.20 |
| **Total** | **4812.00** |

#### 3.2.4.1. Land capability class I (White)

This group is one of the most extensive LCC class of the watershed. This group of soil is occupying around 1924.80 ha of the watershed area. The soils are clay loam or silty clay loam in texture in alkaline in nature. The land under this class is nearly level to mild sloping (1 %). The soils are deep and erosion hazard is slight. Most of the productive agriculture land comes under class I. A considerable area of watershed is seasonally waterlogged comes under this LCC clas, primarily found near the earthen check. These areas are subject to eater logging in most part of the year. The lands are almost flat, silty clay or clay loam in texture, deep and very mild slopping. These lands have no major limitations other occasional water logging. During rabi season, the water is drained out and cultivation is carried out. These lands potentially very productive but due to water logging the rainy season, it could not be brought out under cultivation during the kharif season. The mapping unit for this class is given as under.

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

### 3.2.4.2 Land capability class II (whitish yellow)

A considerable area of watershed i.e. 1443.60 ha is under class II. This class is found in lower portion i.e. near the outlet of watershed. The soils are coarser in texture (loamy sand/sand), deep, susceptible to erosion hazard and undulating in topography. Rill and initiation of gully can be seen near the outlet of the watershed. mapping unit for this class is as follows.

Land capability class IIe=Is-d5-e3.IVes= Is-d3/D-e3 (Foot hill soil)

### 3.2.4.4. Land capability class III/IV (Greysh yellow)

These lands are occupying an area of 962.40 ha of the watershed. This class of land is mostly found in hilly terrain of watershed. The soils are found under this class. Class III and IV are intermixed in near top of the watershed. Mostly class IV (481.20 ha) lands are located on topes, where soil depth is almost negligible. Soils with admixture of gravels/rock fragments are found in these classes of lands. The mapping unit for this class of land is as follows:

Land capability class IIIe= gls-d1/H/I-e4

### 3.2.4.5. Mapping units symbol

Soil depth (cm)d5->90 cm;d3=22.5-45.0;d17.5 cm

Texture cl-clay loam; Is- loamy sand; gls-gravelly loamy sand

Slope (%) B-1-3;C-3-5;D-d-10%;H-25-33;I-33-50

Erosion e1-25% of A horizon lost; e2-50-75% of a horizon lost e4-50-75% B horizon lost.

### 3.2.4.6 Detail of soil Erosion in the Project Area

**Table no. 16 a**

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|

| Cause | Type Of erosion | Area affected (h) | Run Off (mm/year) | Average soil loss (Tonnes/ha/year) |
|---|---|---|---|---|
| Water erosion | | IWMP-II | | |
| a | Sheet | 2407 | 963.20 MM | 16.51 |
| b | Rill | 1703 | | |
| c | Gully | 952 | | |
| Sub-Total | | 5062 | 963.20 MM | |
| Wind erosion | | | NA | |
| **Total** | | **5062** | **963.20 MM** | **16.51** |

### 3.3. Land Use Pattern

#### 3.3.1 Land holding

Majority of the farmers are in the category of marginal (< 1 ha) and small (1-2 ha) with average land holding of about 2.2 ha. These small land holding are further scattered at different places, which makes cultivation very difficult. Distribution of farm families according to the size of the land holdings are given in the table.

**Table no. 17: Distribution of farm families according to their size of landings**.

| S.N. | Name of Micro Watershed | Name of Villages | Land holding | | | |
|---|---|---|---|---|---|---|
| | | | Marginal (<1 ha) | Small (1-2 ha) | Large (>2 ha) | Total |
| 1 | **2B1D5e1d KHARIKAURA** | KHARIKAURA, Redwariya, Kharikura, Basantpur, Banchaura, Banchauri, Beni Nagar | 250 | 590 | 80 | **920** |
| 2 | **2B1D5e1d GANRAKHA** | Ganrakha, Manikaura | 450 | 250 | 30 | **730** |
| 3 | **2B1D5e2b BASAHIYA** | Champapur, Kohdaura, Imlliya janubi, Baidauli, Basahiya | 110 | 480 | 185 | **775** |
| 4 | **2B1D5e2c PANARIY** | Ganeshpur, Panariya, Golhaura Mustahakam, Golhaur Ahatmali, Khankuiya Nankar, Thusuri | 90 | 500 | 80 | **670** |
| 5 | **2B1D5e2d CHANDAI** | Lohati Charigawa, Chandai, Sumali, Shainwar, Akheraiya, | 480 | 870 | 140 | **1490** |

| | | | | | | |
|---|---|---|---|---|---|---|
| 6 | **2B1D5e2e MOHANKOLA** | Jobkunda, Paki, Chanawa, Mohan Kola, Dhandhara, Bhelauli, Kamhariya, Jharuya, Halaura | 300 | 700 | 70 | **1070** |
| 7 | **2B1D5e2f DHANAURA M** | Anawadih, Arri, Dhanaura Mustahakam Dhanaura Ahatamali | 380 | 650 | 60 | **1090** |
| 8 | **2B1D5e2g SINHORAWA** | Barhani, Sinhorawa, Pipara, Kotiya, Dhandhari Kala, Dhandhari Urf Gulari, Surzi, Kapasihawa, Alaga | 490 | 300 | 26 | **816** |
| | **Total** | | **2550** | **4340** | **671** | **7561** |

Source : District statistic magazine

### 3.3.2. Land Use

The IWMP II[nd] watersheds has diversified land uses namely agriculture, waste land (open scrub), seasonal water bodies etc. The varied present land use and area under different categories in watershed is shown in Table 6 & 7. The mixed land use followed in the watershed is almost similar in other parts of the U.P. During PRA exercise, the villagers prepared land use. One such map of village of IWMP II[nd] watershed is shown in table

**Table no 18: Land use pattern**

**Area in hectare**

| S.N. | Name of Project | No of Micro Watershed | Geographical area | Forest Area | Agriculture land | Rain fed Area | Pasture land | Wastelands | | Treatable Area |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Cultivated | Uncultivable | |
| **1** | IWMP II[nd] | **8** | **7669** | **69** | **5545** | **5062** | **0** | **1965** | **90.00** | **4812** |

Source : District statistic magazine

#### 3.3.2.1 Agriculture

Various agricultural land uses in the watershed are extended to diversified land capabilities starting fro marginal to good class II lands. The watershed distinctly has three types of lands i.e. leveled, sloping and degraded and 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 5545.00 ha out of which 483.00 ha is irrigated while 5062.00 ha is under rain-fed agriculture. The water (both irrigated and drinking) is most scarce natural resource in the watershed. The problem of tube wells for irrigation of agricultural crops frequently leads to the drinking water problem to the farmers of watershed forcing them to carry drinking water from out side the watershed area. The agricultural field bunds are common in the watershed, however, they frequently breach on heavy rains adversely affecting the in situ percolation of rain water in the soils.

The agriculture soils in the watershed have diversified texture i.e. loam sand, silty clay loam and boulder mixed textures which are located in patches through out the watershed. The heavy soils are almost kept fallow during rainy season. The agricultural soils also have hard calcium pan at variable depths. The irrigation water is conveyed in earthen channels and surface irrigation methods following mainly border method or 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.

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

**One year rotation**

**Single cropping**

Fallow- mustard/wheat/gram/lentil/winter vegetables, Paddy/ bajra/jowar/sesame/black gram/ greem gram,- fallow.

**Double cropping**

Paddy/ Bajra/ jowar/ sesame/black gram/gram gram- mustard/wheat/gram/lentil/winter vegetables

**Irrigated agriculture**

**One year rotation**

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

### 3.3.2.2. Crop Productivity

**Table no. 19 Production and productivities of important commodities in IWMP II$^{nd}$ Siddharthnagar**

| Sl. | Name of Crop | 2005 | | | 2006 | | | 2007 | | | 2008 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | A (Ha.) | P (Tons) | Y (Qt Ha) | A (Ha.) | P (Tons) | Y (Qt Ha) | A (Ha.) | P (Tons) | Y (Qt. /Ha) | A (Ha.) | P (Tons) | Y (Qt. /Ha) |
| 1 | **Paddy** | 4966.00 | 149277.96 | 30.06 | 4966.00 | 153946.00 | 31.00 | 4966.00 | 163878.00 | 33.00 | 4966.00 | 173810.00 | 35.00 |
| 2. | **Wheat** | 3569.00 | 103501.00 | 29.00 | 3569.00 | 107070.00 | 30.00 | 3569.00 | 114208.00 | 32.00 | 3569.00 | 107070.00 | 30.00 |
| 3. | **Mustard** | 180.00 | 1440.00 | 8.00 | 180.00 | 1710.00 | 9.50 | 180.00 | 1620.00 | 9.00 | 180.00 | 1440.00 | 8.00 |
| 4. | **Lentil** | 70.00 | 560.00 | 8.00 | 70.00 | 665.00 | 9.50 | 70.00 | 560.00 | 8.00 | 70.00 | 525.00 | 7.50 |
| 5. | **Pea** | 88.00 | 440.00 | 5.00 | 88.00 | 704.00 | 8.00 | 88.00 | 748.00 | 8.50 | 88.00 | 792.00 | 9.00 |
| 6. | **Potato** | 58.00 | 8236.00 | 142.00 | 58.00 | 8584.00 | 148.00 | 58.00 | 8990.00 | 155.00 | 58.00 | 9396.00 | 162.00 |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7. | **Sugarcane** | 2.00 | 354.00 | 177.00 | 2.00 | 354.00 | 177.00 | 2.00 | 364.00 | 182.00 | 2.00 | 380.00 | 190.00 |
| 8. | **Banana** | 4966.00 | 149277.96 | 30.06 | 4966.00 | 153946.00 | 31.00 | 4966.00 | 163878.00 | 33.00 | 4966.00 | 173810.00 | 35.00 |

Source : District statistic magazine

The agricultural productivity is primarily driven by the amount and distribution of rain water specifically during two cropping seasons i.e. rabi and kharif. Productivity of kharif crops is also affected by the late onset or early withdrawal of monsoon as well as intermittent droughts of variable duration and intensity. The farmers also do not have suitable cropping systems to deal aberrant weather. Weeds impose considerable constraint in productivity of both kharif and rabi crops under irrigated ad well as 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 unscientific and beset with low productivity. Subsequent rabi crops in general and mustard crop in particular are raised on residual soil moisture under rain-fed production system during post mansoon season. Imbalanced use of fertilizers is common in not only rabi and kharif crops but also in rain-fed and irrigated production system. The recommended deep plowing for enhanced in situ residual soil moisture conservation and higher production is also not followed in the watershed. The shallow ploughing tractor drawn tillage implements are available with the farmers in the watershed but deep ploughing implements yet 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 ferilizers, soil and water conservation measures, use of brought up or in situ mulches are widely lacking in the watershed. The soil and water conservation measures are limited to mechanical/earthen measures created by the state Govt. agencies. Conservation agronomical measures like seeding and plowing across the slope, weed mulching, agro-forestry, vegetative barriers etc also completely lack in the watershed.

### 3.3.2.3. Indigenous technological knowledge (ITK)

The agriculture is an old traditional practice of farmers in the watershed who have improved themselves with passage of the time according to their domestic need and technological reforms in the nearby areas. The villagers have their traditional village ponds,

practice of field bunding which typically constitute agriculture related ITKs in the watershed. The mustard being a cash/fire wood crop of the watershed is being cultivated in self designed manner by the farmers. However, limited fertilizer application specifically the DAP came in to practice since about 20 years.

### 3.4 Horticulture

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

## 3.5 Live Stock Population

Total livestock population of the IWMP II$^{nd}$ watersheds is 9665 bufallow is preferred as milch animal compared to cow, but milk yield is very low. Goats are also kept for milk as well as for meat purpose. The detail of live stock population is given in table below

**Table no. 20: Live stock population**

| S. N. | Name of Micro Watershed | Name of Villages | Buffaloes | Cows | Bullocks | Goat | Sheep | Total |
|---|---|---|---|---|---|---|---|---|
| 1 | **2B1D5e1d KHARIKAURA** | KHARIKAURA, Redwariya, Kharikura, Basantpur, Banchaura, Banchauri, Beni Nagar | **852** | **150** | **8** | **60** | **15** | **1085** |
| 2 | **2B1D5e1d GANRAKHA** | Ganrakha, Manikaura | **1526** | **761** | **15** | **50** | **40** | **2392** |
| 3 | **2B1D5e2b BASAHIYA** | Champapur, Kohdaura, Imlliya janubi, Baidauli, Basahiya | **2562** | **1025** | **4** | **2200** | **110** | **5901** |
| 4 | **2B1D5e2c PANARIY** | Ganeshpur, Panariya, Golhaura Mustahakam, Golhaur Ahatmali, Khankuiya Nankar, Thusuri | **1890** | **1560** | **3** | **1895** | **80** | **5428** |
| 5 | **2B1D5e2d CHANDAI** | Lohati Charigawa, Chandai, Sumali, Shainwar, Akheraiya, | **500** | **600** | **-** | **700** | **30** | **1830** |
| 6 | **2B1D5e2e MOHANKOLA** | Jobkunda, Paki, Chanawa, Mohan Kola, Dhandhara, Bhelauli, Kamhariya, Jharuya, Halaura | **654** | **750** | **-** | **475** | **30** | **1909** |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 7 | **2B1D5e2f DHANAURA M** | Anawadih, Arri, Dhanaura Mustahakam Dhanaura Ahatamali | **425** | **465** | **-** | **352** | **42** | **1284** |
| 8 | **2B1D5e2g SINHORAWA** | Barhani, Sinhorawa, Pipara, Kotiya, Dhandhari Kala, Dhandhari Urf Gulari, Surzi, Kapasihawa, Alaga | **1256** | **1526** | **-** | **1000** | **-** | **3782** |
| | | **Total** | **9665** | **6837** | **30** | **6732** | **347** | **23611** |

Source : District statistic magazine and secondary data

### 3.6 Fisheries

Commercial fish farming was not done by the farmers of in IWMP II$^{nd}$ , but there is a big scope for fish farming in these area. Aware farmers gated 25.00q/ha production, it was very low.

### 3.7. Forest and other Vegetation

#### 3.7.1. Forests

The watershed has no forest area only some wild trees are found in scattered manner.

#### 3.7.2. Horticulture/ Agro-forestry

No horticulture and Agro forestry practices were observed in the watershed.

#### 3.7.3. Agro-forestry

The agro-forestry practices are highly lacking in the watershed though it has good potential under existing dispositions and may play a vital role particularly with respect to minimization of cropping risk, build up soil fertility and productivity, soil conservation, partly meeting out the fire wood demand of rural community and moreover, optimizing the economical return from system as a whole under typical semi arid climate in the watershed. The other agro-forestry systems like agri-silvi, silvi-pastoral, bund and boundary plantations also have good potential to cater the fire wood and fodder demands of the rural community in the watershed. The existing area under agro-forestry is almost negligible. Prosopis 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 to benefit of the farmers under rain-fed to irrigated production systems on leveled to sloping 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.

**Conclusions**

The land capability classification of IWMP II$^{nd}$ watershed provides reasonable good information with regard to capability of soil, that could be used for agriculture, agri-horticulture, silviculture and pasture development. The majority of land form is coming under class II, which give an insight of good agriculture production potential of this watershed. The productivity of these lands could be further enhanced by adoption of simple soil & water conservation measures like mild leveling, bunding, diversion drain and in-situ moisture conservation practices. The reasonable area is under class III indicating greater potential of this watershed for forestry and pasture development. The major physical limitations in case of agriculture soils are the sub soil hardness, low water infiltrability and slope. In case of area under topes of watershed, the most pronounced limitation of soil depth was noticed followed by severe erosion hazard and coarse soil texture. A small portion of watershed is under seasonally waterlogged. The soils under waterlogged area could be used for some other beneficial farming activities during the kharif season also.

## 3.8 Livelihood Pattern

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

**Table no. 21: Livelihood pattern (Occupational Distribution)**

| S. N. | Name of Micro Watershed | Total Workforce | Agriculture | A. Husbandry | Agriculture + A. Husbadary | Casual Labour | Service | Handcraft | Daily wage labour |
|---|---|---|---|---|---|---|---|---|---|
| 1 | **2B1D5e1d KHARIKAURA** | 3584 | 2115 | 615 | 615 | 1010 | 5 | 3 | 840 |
| 2 | **2B1D5e1d GANRAKHA** | 3750 | 2410 | 1110 | 2110 | 3045 | 12 | 7 | 742 |
| 3 | **2B1D5e2b BASAHIYA** | 2138 | 2135 | 912 | 912 | 1245 | 8 | 4 | 231 |
| 4 | **2B1D5e2c PANARIY** | 4468 | 3450 | 670 | 670 | 982 | 2 | 6 | 123 |
| 5 | **2B1D5e2d CHANDAI** | 1049 | 970 | 120 | 120 | 472 | 14 | 5 | 258 |
| 6 | **2B1D5e2e MOHANKOLA** | 4468 | 2112 | 210 | 210 | 956 | 1 | 6 | 847 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 7 | **2B1D5e2f DHANAURA M** | 5952 | 3876 | 815 | 815 | 889 | 4 | 2 | 1212 |
| 8 | **2B1D5e2g SINHORAWA** | 2068 | 989 | 455 | 455 | 850 | 8 | 6 | 240 |

### 3.8.1. Per capita income

**Table no. 22: Per capita income in IWMP 1st Siddharthnagar**

| S. no. | Name of Project | Agriculture (Rs) | A. Husbandry (Rs) | Casual labour (Rs) | Others (Rs) | Total (Rs) |
|---|---|---|---|---|---|---|
| 1 | IWMP IInd Siddharthnagar | 6496.50 | 5123.50 | 4265.00 | 3310.00 | 19194.00 |

Source : District statistic magazine and secondary data

## 3.9 Hydrology and water resource

### 3.9.1. Table no 23: Hydrology status

| S.No. | Name of Project | Item | Unit of measurement | Status |
|---|---|---|---|---|
| 1 | IWMP IInd Siddharthnagar | Status of water table | Meters | 6-7 |
| 2 | | Ground water structures repaired/ rejuvenated | No. | - |
| 3 | | Quality of drinking water | Quality | Poor |
| 4 | | Availability of drinking water | Days | 300 |
| 5 | | Irrigation potential | % | 4 |

### 3.9.2. Water Resource

**Table no. 24: Information about water resources**

| S. N. | Name of Micro Watershed | Canal | | Wells/Borewells | | Tubewells | | Ponds | | Govt. handpump | | Pvt. handpumps | | Others | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | D | N | D | N | D | N | D | N | D | N | D | N | D | N |
| 1 | **2B1D5e1d KHARIKAURA** | **-** | **-** | **325** | **4** | **250** | **3** | **310** | **5** | **235** | **12** | **284** | **26** | **-** | **-** |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | **2B1D5e1d GANRAKHA** | **-** | **-** | **325** | **7** | **250** | **5** | **310** | **7** | **235** | **18** | **284** | **42** | **-** | **-** |
| 3 | **2B1D5e2b BASAHIYA** | **-** | **-** | **325** | **2** | **250** | **2** | **310** | **9** | **235** | **14** | **284** | **10** | **-** | **-** |
| 4 | **2B1D5e2c PANARIY** | **-** | **-** | **325** | **9** | **250** | **3** | **310** | **6** | **235** | **18** | **284** | **12** | **-** | **-** |
| 5 | **2B1D5e2d CHANDAI** | **-** | **-** | **325** | **4** | **250** | **3** | **310** | **5** | **235** | **12** | **260** | **26** | **-** | **-** |
| 6 | **2B1D5e2e MOHANKOLA** | **-** | **-** | **325** | **7** | **250** | **5** | **310** | **7** | **235** | **18** | **284** | **32** | **-** | **-** |
| 7 | **2B1D5e2f DHANAURA M** | **-** | **-** | **325** | **4** | **250** | **3** | **310** | **5** | **235** | **12** | **260** | **26** | **-** | **-** |
| 8 | **2B1D5e2g SINHORAWA** | **-** | **-** | **325** | **7** | **250** | **5** | **310** | **7** | **235** | **18** | **284** | **32** | **-** | **-** |

**D= Availability of water in days** **N= Number**

Source : District statistic magazine and secondary data

## 3.10 PROBLEMS AND NEEDS OF THE AREA

### 3.10.1 Problem Identification and prioritization

Food sufficiency, economic growth and environmental security ware identified as the major issues to be addressed in the watershed area. The area has undulating topography, steep unstable slopes, and excessive channel gradient and hence highly prone to soil erosion. Effective soil depth is limited and spatially highly variable hampering good crop growth (Table 11).

Problems identified and prioritized during the transact walk and PRA exercises in all the villages of this IWMP I$^{st}$ watershed were pooled and a list of nine problems representing the whole watershed was prepared. Problems were ranked as per their total weight age in the three villages. Lack of irrigation water was the greatest problem experienced by the people followed by low production of filed crops, lack of fodder availability and low animal productivity (Annexure- I).

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

**Table no. 25: Problem identification and prioritization for Micro Watersheds**

| S. No. | Problem | Rank |
|---|---|---|
| 1 | Low production of field crops | 2 |

| | | |
|---|---|---|
| 2 | Lack of drinking water | 3 |
| 3 | Lack of irrigation water | 1 |
| 4 | Low production of fish | 5 |
| 5 | Non-availability of fuel wood | 7 |
| 6 | Lack of inputs like quality seeds, fertilizer, pesticides ets. | 9 |
| 7 | Lack of market facility | 8 |
| 8 | Lack of medical, educational and transportation facilities | 4 |
| 9 | Medical and Health care facilities for milching animals and low productivity. | 6 |

**Table no. 26: SWOT analysis of the Micro Watersheds**

| Strengths (S) | | Weakness (W) | |
|---|---|---|---|
| 1 | Cooperative work culture in traditional activities. | 1 | Poor water management |
| 2 | Close ethic ties | 2 | Resource poor farmers |
| 3 | Road at ehe top as well as outlet of the watershed | 3 | Out migration of youth |
| 4 | Hard working | 4 | Low and erratic rainfall |
| 5 | Resource pool of crop genetics siversity | 5 | Fragile geology |
| 6 | Awareness of farmers about watershed management programme | 6 | Fragmented land holding |
| 7 | Well established CPR maintaining and sharing system | 7 | Heavy infestation of wild animals |
| 8 | Stall feeding of animals | 8 | Problem of fuel and fodder |
| 9 | Well maintained seasonal water bodies | 9 | Shallow soil depth and with high percentage of gravel |
| 10 | Social outlook of the community towards land less | | |
| **Opportunities (O)** | | **Threats (T)** | |

| | | | |
|---|---|---|---|
| 1 | Wide range of annual and perennial crops | 1 | Prone to adverse climate like drought |
| 2 | Scope of regular employment opportunities to check out migration | 2 | High market risk |
| 3 | Strengthening of existing irrigation system | 3 | Social conflicts owing to PRI and WSM polices and local politics |
| 4 | Conducive climate for rainfed crop diversification | 4 | Weak coordination among line departments |
| 5 | Good scope for Agro forestry and dry land horticulture | 5 | Lack of expertise of implementing agency in different aspects of WSM |
| 6 | Potential for collective action and management of CPR | | |

# 4. INSTITUTION BUILDING AND PROJECT MANAGEMENT

## 4.1 Participatory Rural Appraisal (PRA)

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

## 4.2 Social Mobilization and Community Organization

**Table no. 27: Physical outlays oh PIA,U.G., S.H.G., W.D.T. and W.C.**

| S. No. | Name of watershed | Code No. | U.G. (No.) | SHG (No.) | WDT (No.) | PIA | WC (No.) |
|---|---|---|---|---|---|---|---|
| 1 | KHARIKAURA | 2B1D5e1d | 4 | 1 | 1 | 1 | 1 |
| 2 | GANRAKHA | 2B1D5e1d | 3 | 3 | | | 1 |
| 3 | BASAHIYA | 2B1D5e2b | 3 | 7 | | | 1 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 4 | PANARIYA | 2B1D5e2c | 3 | 3 | | | 1 |
| 5 | CHANDAI | 2B1D5e2d | 3 | 1 | | | 1 |
| 6 | MOHANKALA | 2B1D5e2e | 3 | 3 | | | 1 |
| 7 | DHANAURA MUSTAHAKAM | 2B1D5e2f | 3 | 3 | | | 1 |
| 8 | SINHORAWA | 2B1D5e2g | 3 | 2 | | | 1 |

### 4.2.1 Watershed Committee

Watershed committee has been constituted in all eight nos of micro-watersheds partially by WDT and Gram Sabha village of micro watershed. These committees are registered under society Registration Act 1860. Capacity building trainings will be given to the watershed committee by WDT. The watershed committee has a pivotal role to play during and after the project implementation period. Detail of W.C. is given below

**Table no. 28: Details of Watershed Committees (WC)**

| S. No. | Name of WCs | Date of Registration as a Society | Name | Designation | M/F | SC | ST | SF | MF | LF | Landless | UG | SHG | GP | Any other | Ed. qualification | Function (s) assigned # |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | **2B1D5e1d KHARIKAURA** | Under Progress | **Ji Bhullu** | President | M | | | | 1 | | | | | | | | A,B, E |
| | | | **Kalpnath Shukla** | Secretary | M | | | | 1 | | | | | | | | C, D, G |
| | | | **10 Members** | Member | M/F | 2 | | 3 | 2 | 1 | 4 | 1 | | | | | H, I |
| 2 | **2B1D5e1d GANRAKHA** | | **Ramdin** | President | M | | | | 1 | | | | | | | | A,B, E |
| | | | **R. C. Srivastva** | Secretary | M | | | | 1 | | | | | | | | C, D, G |
| | | | **10 members** | Member | M/F | 2 | | 3 | 2 | 2 | 4 | 1 | | | | | H, I |
| 3 | **2B1D5e2b BASAHIYA** | | **Smt Vidyawati** | President | F | | | | 1 | | | | | | | | A,B, E |
| | | | **Shambhoo Yadava** | Secretary | M | | | | 1 | | | | | | | | C, D, G |
| | | | **10 members** | Member | M/F | 2 | | 3 | 2 | 1 | 4 | 1 | | | | | H, I |
| 4 | **2B1D5e2c PANARIYA** | | **Smt Agarmati** | President | F | | | | 1 | | | | | | | | A,B, E |
| | | | **R P singh** | Secretary | M | | | | 1 | | | | | | | | C, D, G |
| | | | **10 members** | Member | M/F | 2 | | 3 | 2 | 1 | 4 | 1 | | | | | H, I |
| 5 | **2B1D5e2d CHANDAI** | | **Chund Ram** | President | F | | | | 1 | | | | | | | | A,B, E |
| | | | **R P Chaudhari** | Secretary | M | | | | 1 | | | | | | | | C, D, G |
| | | | **10 members** | Member | M/F | 2 | | 3 | 2 | 1 | 4 | 1 | | | | | H, I |
| 6 | **2B1D5e2e MOHANKOLA** | | **Smt A Khatoon** | President | F | | | | 1 | | | | | | | | A,B, E |
| | | | **Shambhoo yadava** | Secretary | M | | | | 1 | | | | | | | | C, D, G |
| | | | **10 members** | Member | M/F | 2 | | 3 | 2 | 1 | 4 | 1 | | | | | H, I |
| 7 | **2B1D5e2f** | | **K K Jaisawal** | President | F | | | | 1 | | | | | | | | A,B, E |
| | | | **H N Kushwaha** | Secretary | M | | | | 1 | | | | | | | | C, D, G |

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **DHANAURA** | | **10 members** | Member | M/F | 2 | | 3 | 2 | 1 | 4 | 1 | | | | | H, I |
| 8 | **2B1D5e2g SINHORAWA** | | **Pahupati** | President | F | | | | 1 | | | | | | | | A,B, E |
| | | | **S N Upadhyay** | Secretary | M | | | | 1 | | | | | | | | C, D, G |
| | | | **10 members** | Member | M/F | 2 | | 3 | 2 | 1 | 4 | 1 | | | | | H, I |

# # In column 17, only the letter assigned, as below, needs to be typed, except for 'J', where the type may be specifically mentioned.

| | | | |
|---|---|---|---|
| A | PNP and PRA | B | Planning |
| C | Maintenance of Accounts | D | Signing of cheques and making payments |
| E | Supervision of Construction activities | F | Cost Estimation |
| G | Verification & Measurement | H | Record of labour employed |
| I | Social Audit | J | Any other (please specity). |

### 4.2.2 Watershed Development Team

As per as common guide line direction/ instruction given in para 5.3 point 40 P.I.A. has been constitute watershed development team as given below

**Table no.29 : Details of Watershed Development Teams (WDTs) in the project area**

| *S. No.* | *Name of the PIA* | *Name of the project* | *Names of WDT members* | *M/F* | *Age* | *Qualification/ Experience* | *Description of professional training* | *Role/ Function##* | *Date of appointment of WDT member* |
|---|---|---|---|---|---|---|---|---|---|
| **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** |
| **1** | **Bhomi Sanrakshan Adhikari Land development and water resources Department Mau (U.P.)** | **IWMP II$^{nd}$** | Narayan Prasad | M | 55 | Intermeadite, | Ag. Enng. Diploma | - | Under Progress |
| | | | Indrajeet Singh | M | 53 | Intermeadite | Civil Enng. Diploma | C.D.F. | |
| | | | Sanjay Awasthi | M | 51 | Intermeadite | Ag. Enng. Diploma | J B | |
| | | | Sumbhu Yadav | M | 48 | B.Sc Ag. | Field Worker | JB | |
| | | | Jhigur Ram | M | 50 | B.Sc Ag. | Field Worker | JB | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | S.P. Maurya | M | 26 | B.Sc Ag. | Agriculture | E | |
| | | | Piyush Mishra | M | 35 | M.Sc Ag. | Soil Scince | E | |
| | | | Kranti Kumar | M | 28 | B.Sc Ag. | Water Horwesting | E | |
| | | | Kr. Puja Srivastava | F | 25 | B.A. Scology & H.Scince | Social Mobizer | A | |

# M – Male, F- Female

# # In column 8, only the letter, assigned as below, needs to be typed, except for '3', where the type may be specifically mentioned.

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

### 4.2.3 Self Help Group

The constitution of Self Help Groups have been constituted by W.C. in all micro watershed for generating income & improved their social status with the help and financial support through scheme by technical support of P.I.A., detail of 24 $SHG_s$ is given below

**Table no. 30 SHG detail**

| S.No. | Names of Watershed | Total no. of registered SHGs | | | | No. of Members | | | | No. of SC/ST in each category | | | No. of BPL in each category | | | Date of formation of SHGs |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | With only Men | With only Women | With Both | Total | Categories | M | F | Total | M | F | Total | M | F | Total | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
| 1. | **2B1D5e1d KHARIKAURA** | 0 | 0 | 1 | 1 | (i) Landless | 2 | 2 | 4 | 1 | 1 | 2 | 1 | 1 | 2 | Under Progress |
| | | | | | | (ii) SF | 3 | - | 3 | - | - | - | - | - | - | |
| | | | | | | (iii) MF | 2 | - | 2 | - | - | - | - | - | - | |
| | | | | | | (iv) LF | 1 | - | 1 | - | - | - | - | - | - | |
| | **Total** | **0** | **0** | **1** | **1** | | **8** | **2** | **10** | **1** | **1** | **2** | **1** | **1** | **2** | |
| 2 | **2B1D5e1d GANRAKHA** | 0 | 0 | 3 | 3 | (i) Landless | 5 | 2 | 7 | 2 | 1 | 3 | 5 | 2 | 7 | |
| | | | | | | (ii) SF | 12 | 3 | 15 | 4 | 1 | 5 | 3 | 1 | 4 | |
| | | | | | | (iii) MF | 7 | - | 7 | 2 | - | 2 | 3 | - | 3 | |

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | (iv) LF | 3 | - | 4 | - | - | - | - | - | - | |
| | **Total** | **0** | **0** | **3** | **3** | | **27** | **5** | **32** | **8** | **2** | **10** | **11** | **3** | **14** | |
| 3 | **2B1D5e2b BASAHIYA** | 0 | 0 | 7 | 7 | (i) Landless | 15 | 5 | 20 | 5 | 2 | 7 | 7 | 2 | 9 | |
| | | | | | | (ii) SF | 30 | 5 | 35 | 4 | 2 | 6 | 3 | 2 | 5 | |
| | | | | | | (iii) MF | 10 | - | 5 | 3 | - | 3 | 2 | - | 2 | |
| | | | | | | (iv) LF | 12 | 1 | 4 | - | - | - | - | - | - | |
| | **Total** | **0** | **0** | **7** | **7** | | **67** | **11** | **78** | **12** | **4** | **16** | **12** | **4** | **16** | |
| 4 | **2B1D5e2c PANARIYA** | 0 | 0 | 3 | 3 | (i) Landless | 5 | 2 | 7 | 2 | 1 | 3 | 5 | 2 | 7 | |
| | | | | | | (ii) SF | 12 | 3 | 15 | 4 | 1 | 5 | 3 | 1 | 4 | |
| | | | | | | (iii) MF | 7 | - | 7 | 2 | - | 2 | 3 | - | 3 | |
| | | | | | | (iv) LF | 3 | - | 4 | - | - | - | - | - | - | |
| | **Total** | **0** | **0** | **3** | **3** | | **27** | **5** | **32** | **8** | **2** | **10** | **11** | **3** | **14** | |

| **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** | **13** | **14** | **15** | **16** | **17** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | **2B1D5e2d CHANDAI** | 0 | 0 | 3 | 3 | (i) Landless | 5 | 2 | 7 | 2 | 1 | 3 | 5 | 2 | 7 | Under Progress |
| | | | | | | (ii) SF | 12 | 3 | 15 | 4 | 1 | 5 | 3 | 1 | 4 | |
| | | | | | | (iii) MF | 7 | - | 7 | 2 | - | 2 | 3 | - | 3 | |
| | | | | | | (iv) LF | 3 | - | 4 | - | - | - | - | - | - | |
| | **Total** | **0** | **0** | **3** | **3** | | **27** | **5** | **32** | **8** | **2** | **10** | **11** | **3** | **14** | |
| 6 | **2B1D5e2e MOHAN KOLA** | 0 | 0 | 3 | 3 | (i) Landless | 5 | 2 | 7 | 2 | 1 | 3 | 5 | 2 | 7 | |
| | | | | | | (ii) SF | 12 | 3 | 15 | 4 | 1 | 5 | 3 | 1 | 4 | |
| | | | | | | (iii) MF | 7 | - | 7 | 2 | - | 2 | 3 | - | 3 | |
| | | | | | | (iv) LF | 3 | - | 4 | - | - | - | - | - | - | |
| | **Total** | **0** | **0** | **3** | **3** | | **27** | **5** | **32** | **8** | **2** | **10** | **11** | **3** | **14** | |
| 7 | **2B1D5e2f DHANAURA M.** | 0 | 0 | 3 | 3 | (i) Landless | 6 | 2 | 8 | 2 | 1 | 3 | 5 | 2 | 7 | |
| | | | | | | (ii) SF | 11 | 4 | 15 | 4 | 1 | 5 | 3 | 1 | 4 | |
| | | | | | | (iii) MF | 7 | - | 7 | 2 | - | 2 | 3 | - | 3 | |

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | (iv) LF | 3 | - | 4 | - | - | - | - | - | - | |
| | **Total** | **0** | **0** | **3** | **3** | | **28** | **5** | **33** | **8** | **2** | **10** | **11** | **3** | **14** | |
| 8 | **2B1D5e2g SINHORAWA** | 0 | 1 | 2 | 3 | (i) Landless | 5 | 11 | 16 | 8 | 9 | 3 | 5 | 2 | 7 | |
| | | | | | | (ii) SF | 12 | 3 | 15 | 4 | 1 | 5 | 3 | 1 | 4 | |
| | | | | | | (iii) MF | 7 | - | 7 | 2 | - | 2 | 3 | - | 3 | |
| | | | | | | (iv) LF | 3 | - | 4 | - | - | - | - | - | - | |
| | **Total** | **0** | **1** | **2** | **3** | | **27** | **19** | **46** | **14** | **11** | **10** | **11** | **3** | **14** | |

(M- Male, F- Female)

### 4.2.4 User Group

The following user's group are identified and constituted in all micro watershed committee in presence of Watershed Development Team for implementation of watershed work proper use and management of all engineering and vegetative measure to be creating/ constructing under watershed through scheme. Detail of user's group are given below

**Table no. 31: UGs detail**

| S.No. | Names of Watershed | Total no. of registered UGs | | | | No. of Members | | | | No. of SC/ST in each category | | | No. of BPL in each category | | | Date of formation of UGs |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | With only Men | With only Women | With Both | Total | Categories | M | F | Total | M | F | Total | M | F | Total | |
| **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** | **13** | **14** | **15** | **16** | **17** |
| 1. | **2B1D5e1d KHARIKAURA** | 0 | 1 | 2 | 3 | (i) Landless | 5 | 11 | 16 | 8 | 9 | 3 | 5 | 2 | 7 | UNDER PROCESS |
| | | | | | | (ii) SF | 12 | 3 | 15 | 4 | 1 | 5 | 3 | 1 | 4 | |
| | | | | | | (iii) MF | 7 | - | 7 | 2 | - | 2 | 3 | - | 3 | |
| | | | | | | (iv) LF | 3 | - | 4 | - | - | - | - | - | - | |
| | **Total** | **0** | **1** | **2** | **3** | | **27** | **19** | **46** | **14** | **11** | **10** | **11** | **3** | **14** | |
| 2 | **2B1D5e1d GANRAKHA** | 0 | 0 | 3 | 3 | (i) Landless | 5 | 2 | 7 | 2 | 1 | 3 | 5 | 2 | 7 | |
| | | | | | | (ii) SF | 12 | 3 | 15 | 4 | 1 | 5 | 3 | 1 | 4 | |

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | (iii) MF | 7 | - | 7 | 2 | - | 2 | 3 | - | 3 | |
| | | | | | | (iv) LF | 3 | - | 4 | - | - | - | - | - | - | |
| | **Total** | **0** | **0** | **3** | **3** | | **27** | **5** | **32** | **8** | **2** | **10** | **11** | **3** | **14** | |
| 3 | **2B1D5e2b BASAHIYA** | 0 | 0 | 3 | 3 | (i) Landless | 7 | 3 | 10 | 3 | 2 | 5 | 5 | 2 | 7 | |
| | | | | | | (ii) SF | 11 | 5 | 16 | 4 | 2 | 6 | 3 | 2 | 5 | |
| | | | | | | (iii) MF | 5 | - | 5 | 3 | - | 3 | 2 | - | 2 | |
| | | | | | | (iv) LF | 3 | 1 | 4 | - | - | - | - | - | - | |
| | **Total** | **0** | **0** | **3** | **3** | | **26** | **9** | **35** | **10** | **4** | **14** | **10** | **4** | **14** | |
| 4 | **2B1D5e2c PANARIYA** | 0 | 0 | 3 | 3 | (i) Landless | 5 | 2 | 7 | 2 | 1 | 3 | 5 | 2 | 7 | |
| | | | | | | (ii) SF | 12 | 3 | 15 | 4 | 1 | 5 | 3 | 1 | 4 | |
| | | | | | | (iii) MF | 7 | - | 7 | 2 | - | 2 | 3 | - | 3 | |
| | | | | | | (iv) LF | 3 | - | 4 | - | - | - | - | - | - | |
| | **Total** | **0** | **0** | **3** | **3** | | **27** | **5** | **32** | **8** | **2** | **10** | **11** | **3** | **14** | |

| **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** | **13** | **14** | **15** | **16** | **17** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | **2B1D5e2d CHANDAI** | 0 | 0 | 3 | 3 | (i) Landless | 5 | 2 | 7 | 2 | 1 | 3 | 5 | 2 | 7 | UNDER PROCESS |
| | | | | | | (ii) SF | 12 | 3 | 15 | 4 | 1 | 5 | 3 | 1 | 4 | |
| | | | | | | (iii) MF | 7 | - | 7 | 2 | - | 2 | 3 | - | 3 | |
| | | | | | | (iv) LF | 3 | - | 4 | - | - | - | - | - | - | |
| | **Total** | **0** | **0** | **3** | **3** | | **27** | **5** | **32** | **8** | **2** | **10** | **11** | **3** | **14** | |
| 6 | **2B1D5e2e MOHAN KOLA** | 0 | 0 | 1 | 1 | (i) Landless | 2 | 2 | 4 | 1 | 1 | 2 | 1 | 1 | 2 | |
| | | | | | | (ii) SF | 3 | - | 3 | - | - | - | - | - | - | |
| | | | | | | (iii) MF | 2 | - | 2 | - | - | - | - | - | - | |
| | | | | | | (iv) LF | 1 | - | 1 | - | - | - | - | - | - | |
| | **Total** | **0** | **0** | **3** | **3** | | **27** | **5** | **32** | **8** | **2** | **10** | **11** | **3** | **14** | |
| 7 | **2B1D5e2f DHANAURA M.** | 0 | 0 | 3 | 3 | (i) Landless | 6 | 2 | 8 | 2 | 1 | 3 | 5 | 2 | 7 | |
| | | | | | | (ii) SF | 11 | 4 | 15 | 4 | 1 | 5 | 3 | 1 | 4 | |
| | | | | | | (iii) MF | 7 | - | 7 | 2 | - | 2 | 3 | - | 3 | |
| | | | | | | (iv) LF | 3 | - | 4 | - | - | - | - | - | - | |
| | **Total** | **0** | **0** | **3** | **3** | | **28** | **5** | **33** | **8** | **2** | **10** | **11** | **3** | **14** | |

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8 | **2B1D5e2g SINHORAWA** | 0 | 1 | 2 | 3 | (i) Landless | 5 | 11 | 16 | 8 | 9 | 3 | 5 | 2 | 7 | |
| | | | | | | (ii) SF | 12 | 3 | 15 | 4 | 1 | 5 | 3 | 1 | 4 | |
| | | | | | | (iii) MF | 7 | - | 7 | 2 | - | 2 | 3 | - | 3 | |
| | | | | | | (iv) LF | 3 | - | 4 | - | - | - | - | - | - | |
| | **Total** | **0** | **0** | **3** | **3** | | **27** | **19** | **46** | **14** | **11** | **10** | **11** | **3** | **14** | |

(M- Male, F- Female)

### 4.2.5 <u>Focused group discussion</u>

# FOCUSSED GROUP DISSCUSSION

## 4.3 PROJECT IMPLEMENTING AGENCIES

U.P. Government, Land Development Water Resources Department Section-1 Lucknow has nominated as PIA to Bhoomi Sanrakshhan Unit, Land Development Water Resources Department Siddharthnagar for IWMP II[nd] vide letter no-666(10)/54-1-10-1(9)02008 dated 25-05-2010

**Table no. 32: Project Implementing Agency (PIA)**

| S.No. | Particulars of PIA | |
|---|---|---|
| (i) | Date of selection of PIA | 25.05.2011 |
| (ii) | Type of organization | Govt. organization |
| (iii) | Name of organization # | DoLR |
| (iv) | Designation & Address | BSA, IWDP, Siddharthnagar |
| (v) | Telephone | 09838827439 |
| (vi) | Fax` | |
| (vii) | E-Mail | iwmp_siddharthnagarup@rediffmail.com |

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

| | | | |
|---|---|---|---|
| A | Line Dept. | B | Autonomous organization |
| C | Govt. Institute | D | Research Bodies |
| E | Zila Parishad | F | Intermediate Panchayat |

G Voluntary Organisations H Any other (please specify).

## 4.4 Project Implementation Strategy

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

### 4.4.1 Scientific Planning

**i) Cluster Approach**

This envisages a broader vision of Geo-hydrological unit which involves treating a cluster of micro watershed. The IWMP II$^{nd}$ Siddharthnagar watershed project consist of nine micro watershed

**ii) Base line Survey**

To access 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 *PIA.* Household census survey includes a detailed questionnaire which was 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 IWMP-II$^{nd}$, average milk production of the cattle and various schemes running and their benefits. Bio-physical survey was undertaken to identify various natural resources available in the village. It included the soil typology, well in the area, crop taken in the field, Cropping pattern, fertilizer used and various sources of irrigation in the field.

**iii) Participatory Rural Appraisal (PRA)**

The past experience of watershed has given tremendous input to focus on creating accountability of the stakeholders towards the programme. This has created an emphasis to include all the stakeholder communities and their local and indigenous Technological Knowledge (ITK) while planning for any activity. Participatory approach provides a new path for planning, implementing, and monitoring and post- withdrawal activities with a complete accountability of the stakeholders. Various PRA techniques like resource mapping, social

mapping, and season calendars were used to understand the physical and social orientation of the village in general and watershed in specific. These tools put the villagers in ease than the complicated questionnaires. Various tools like Matrix ranking, Venn diagram were used to identify various local vegetations (apt for afforestation) , Fodders crops , various institution and their significance in the life of the farmers

**iv) Use of GIS and Remote sensing for planning**

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

**a) Prioritization**

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

**b) Planning**

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

**c) Hydrological modelling**

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

**Table no. 33: Details of Scientific Planning and Inputs in IWMP projects**

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

| | |
|---|---|
| Online IT connectivity between | |
| (1) Project and DRDA cell/ZP | Yes |
| (2) DRDA and SLNA | Yes |
| (3) SLNA and DoLR | Yes |
| Availability of GIS layers | |
| 1. Cadastral map | Yes |
| 2. Village boundaries | Yes |
| 3. Drainage | Yes |
| 4. Soil (Soil nutrient status) | Yes |
| 5. Land use | Yes |
| 6. Ground water status | Yes |

| **1** | **2** |
|---|---|
| 7. Watershed boundaries | Yes |
| 8. Activity | Yes |
| Crop simulation models# | No |
| Integrated coupled analyzer/ near infrared visible spectroscopy/ medium spectroscopy for high speed soil nutrient analysis | No |
| Normalized difference vegetation index (NDVI)# | No |
| Weather Station | |
| **(B) Inputs** | No |
| 1. Bio-pesticides | No |
| 2. Organic manures | Yes |
| 3. Vermicompost | Yes |
| 4. Bio-fertilizer | Yes |

| | |
|---|---|
| 5. Water saving devices | Yes |
| 6. Mechanized tools/ implements | Yes |
| 7. Bio-fencing | Yes |
| 8. Nutrient budgeting | No |
| 9. Automatic water level recorders & sediment samplers | No |

## 4.5 Convergence of watershed programmes

4.5.1 Earthen bund, contour bund, percolation tank, injection well will be made in watershed area convergence with MNREGS

4.5.2 Soil health card, crop demonstration, kisan gosthi, kisan mela, farmer's school also organized in watershed area under many scheme of department of Agriculture.

4.5.3 Composite fish farming or mixed fish farming popularized in this area with Department of fisheries.

4.5.4 Animal health camp, fodder development, vaccination work also made through Veterinary Department.

4.5.5 Aforestation in project area also done with Forest Department.

4.5.6 Dry land horticulture also convergence with department of horticulture.

**Table no. 34 : Details of Convergence of other Schemes in the Project area with IWMP Project**

| S.No. | Name of the MW | Names of Departments with Schemes converging with IWMP* | Fund made available to IWMP project due to convergence (Rs. In lakh) | Was this fund included in Rs. 12,000/15,000 Per ha | | Name of activity/task/structure undertaken with converged funds | Reference no. of activity/task/structure in DPR | Level at which decision for convergence was taken $ |
|---|---|---|---|---|---|---|---|---|
| | | | | Yes | No | (a) Structures (b) Livelihoods (c) Production System | | |
| **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** |
| 1 | **2B1D5e1d KHARIKAURA** | MNREGS | 4.00 | | No | **a** | **5** | DRDA |
| | | DA | 0.40 | | No | **b, c** | **5** | PIA |
| | | DHO | 0.10 | | No | **b, c** | **5** | PIA |
| | | DF | 0.20 | | No | **b, c** | **5** | PIA |
| | | F | 0.30 | | No | **b, c** | **5** | PIA |
| | | **Total** | **5.00** | | No | | | |
| 2 | **2B1D5e1d GANRAKHA** | MNREGS | 15.00 | | No | **a** | **5** | DRDA |
| | | DA | 1.50 | | No | **b, c** | **5** | PIA |
| | | DHO | 0.30 | | No | **b, c** | **5** | PIA |
| | | DF | 0.40 | | No | **b, c** | **5** | PIA |
| | | F | 0.30 | | No | **b, c** | **5** | PIA |
| | | **Total** | **17.50** | | No | | | |
| 3 | **2B1D5e2b** | MNREGS | 17.00 | | No | **a** | **5** | DRDA |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **BASAHIYA** | DA | 1.70 | | No | **b, c** | **5** | PIA |
| | | DHO | 0.50 | | No | **b, c** | **5** | PIA |
| | | DF | 0.50 | | No | **b, c** | **5** | PIA |
| | | F | 0.30 | | No | **b, c** | **5** | PIA |
| | | **Total** | **19.00** | | No | | | |
| 4 | **2B1D5e2c PANARIYA** | MNREGS | 14.00 | | No | **a** | **5** | DRDA |
| | | DA | 1.40 | | No | **b, c** | **5** | PIA |
| | | DHO | 0.30 | | No | **b, c** | **5** | PIA |
| | | DF | 0.40 | | No | **b, c** | **5** | PIA |
| | | F | 0.45 | | No | **b, c** | **5** | PIA |
| | | **Total** | **16.55** | | No | | | |
| 5 | **2B1D5e2d CHANDAI** | MNREGS | 5.00 | | No | **a** | **5** | DRDA |
| | | DA | 0.50 | | No | **b, c** | **5** | PIA |
| | | DHO | 0.20 | | No | **b, c** | **5** | PIA |
| | | DF | 0.20 | | No | **b, c** | **5** | PIA |
| | | F | 0.20 | | No | **b, c** | **5** | PIA |
| | | **Total** | **6.10** | | No | | | |

| **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** |
|---|---|---|---|---|---|---|---|---|
| 6 | **2B1D5e2e MOHAN KOLA** | MNREGS | 8.00 | | No | **a** | **5** | DRDA |
| | | DA | 0.60 | | No | **b, c** | **5** | PIA |
| | | DHO | 0.30 | | No | **b, c** | **5** | PIA |
| | | DF | 0.30 | | No | **b, c** | **5** | PIA |
| | | F | 0.25 | | No | **b, c** | **5** | PIA |
| | | **Total** | **9.45** | | No | | | |
| 7 | **2B1D5e2f DHANAURA M.** | MNREGS | 11.00 | | No | **a** | **5** | DRDA |
| | | DA | 0.90 | | No | **b, c** | **5** | PIA |
| | | DHO | 0.40 | | No | **b, c** | **5** | PIA |
| | | DF | 0.45 | | No | **b, c** | **5** | PIA |
| | | F | 0.60 | | No | **b, c** | **5** | PIA |
| | | **Total** | **13.35** | | No | | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 8 | **2B1D5e2g SINHORAWA** | MNREGS | 20.50 | | No | **a** | **5** | DRDA |
| | | DA | 1.60 | | No | **b, c** | **5** | PIA |
| | | DHO | 0.50 | | No | **b, c** | **5** | PIA |
| | | DF | 0.50 | | No | **b, c** | **5** | PIA |
| | | F | 0.60 | | No | **b, c** | **5** | PIA |
| | | **Total** | **22.70** | | No | | | |
| | | **Grand Total** | **109.65** | | No | | | |

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

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

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

# 5. MANAGEMENT /ACTION PLAN

## 5.1 PREPARATORY PHASE

### 5.1.1 Entry Point Activities

Integrated Watershed Development Programme II$^{nd}$ 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 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 23.09 Lacs.

**Table no. 36: Entry point activities (EPA)**

(All financial figures in lacs Rs.)

| S.no. | Names of the | Amount | Entry point Activities planned | Estimated | Expected | Name of agency | Expected month |
|---|---|---|---|---|---|---|---|

| | Villages | earmarked for EPA | | cost | outcome | which selected the EPA# | & year of completion (mm/yyyy) |
|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 1 | **2B1D5e1d KHARIKAURA (with 7 village)** | 3.69 | Vikash Munch | 1.000 | - | WC, PIA, WDT | 2011 |
| | | | Repairing of damaged Pulia-1 | 0.300 | - | WC, PIA, WDT | 2011 |
| | | | P-School Boundary Wall | 2.39 | - | WC, PIA, WDT | 2011 |
| 2 | **2B1D5e1d GANRAKHA (with 2 village)** | 1.70 | Vikash Munch | 1.000 | - | WC, PIA, WDT | 2011 |
| | | | Drainge Chanal | 0.700 | - | WC, PIA, WDT | 2011 |
| 3 | **2B1D5e2b BASAHIYA (with 5 village)** | 2.34 | Vikash Munch | 1.000 | - | WC, PIA, WDT | 2011 |
| | | | Repairing of damaged Pulia-5 | 1.340 | - | WC, PIA, WDT | 2011 |

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|
| 4 | **2B1D5e2c PANARIYA (with 6 village)** | 3.24 | Vikash Munch | 1.000 | - | WC, PIA, WDT | 2011 |
| | | | Trewlar Tin Shed | 1.000 | - | WC, PIA, WDT | 2011 |
| | | | Repairing of Damaged Pulia-2 | 0.500 | - | WC, PIA, WDT | 2011 |
| | | | Pepair of dell | 0.740 | - | WC, PIA, WDT | 2011 |
| 5 | **2B1D5e2d CHANDAI (with 6 village)** | 3.53 | Vikash Munch | 1.000 | - | WC, PIA, WDT | 2011 |
| | | | Repairing of damaged Pulia-3 | 0.750 | - | WC, PIA, WDT | 2011 |
| | | | Drainge Chanal | 1.780 | - | WC, PIA, WDT | 2011 |
| | | | Repairing of P.School Class Room | 0.330 | - | WC, PIA, WDT | 2011 |
| 6 | **2B1D5e2e** | 4.51 | Vikash Munch -2 | 2.000 | - | WC, PIA, WDT | 2011 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | **MOHAN KOLA (with 9 village)** | | Repairing of damaged Pulia-5 | 1.350 | - | WC, PIA, WDT | 2011 |
| | | | Drainge Chanal | 1.160 | - | WC, PIA, WDT | 2011 |
| 7 | **2B1D5e2f DHANAURA M. (with 4 village)** | 2.03 | Vikash Munch | 1.000 | - | WC, PIA, WDT | 2011 |
| | | | Trewlar Tin Shed | 1.030 | | WC, PIA, WDT | 2011 |
| 8 | **2B1D5e2g SINHORAWA (with 9 village)** | 2.05 | Vikash Munch | 1.000 | - | WC, PIA, WDT | 2011 |
| | | | Repairing of damaged Pulia-4 | 1.050 | - | WC, PIA, WDT | 2011 |
| | **Total** | **23.09** | | **23.09** | | | |

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

**Table no. 37: Other activities of preparatory phase**

| S. No | Item | Initiation of village level institution | Capacity building | IEC activities | Baseline survey | Hydro-geological survey | Identifying technical support agencies | Resource agreements | Preparation of DPR | Evaluation of DPR | Any other (please specify) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **1** | **Estimated cost** | 0.872 | 26.00 | 2.00 | 2.8872 | 1.15488 | - | - | 1.15488 | 0.57744 | - |
| **2** | **Status of the activity #** | Under Complete | Under Complete | Under Complete | Complete | Complete | Complete | | Complete | - | |
| **3** | **Expected month & year of completion (mm/yyyy)** | , 2011 | 2011 | 2011 | 2010 | 2010 | 2010 | - | 2010 | - | |

### 5.1.2 Institution and Capacity Building

### 5.1.2.1 Institution

**Table no. 38: List of approved Training Institutes for capacity Building in the project area**

| S.No. | Name of the Training Institute | Full Address with contact no., website & e-mail | Name & Designation of the | Type of Institute | Area (s) of specialization | Accreditation details |
|---|---|---|---|---|---|---|

| | | | Head of Institute | | | |
|---|---|---|---|---|---|---|
| 1 | Krishi Vigyan Kendra | Siddharthnagar (UP) | Programme Co-ordinator | Research Extension & | Agriculture, Horticulture, A. Husbandry, Fisheries, | GOI |
| 1 | Krishi Vigyan Kendra | Pilkhi haldharpur Mau(UP), Naveen_hamraj@memory.com 09451891755 | Programme Co-ordinator | Research Extension & | Agriculture, Horticulture, A. Husbandry, Fisheries, Entrepreneurship, Livelihood and Capacity building etc | GOI |
| 2 | Directorate of Seed Reasearch | DSR, Kusmaur, Mau (U.P.), 0547-2530080, http//www.icar.org.in.nbaim/indexhtm | Director, Dr. Mandal | Research | Agriculture | GOI |
| 3 | NBAIM | NBAIM, Kusmaur, Mau (U.P.), 0547-2530080, http//www.icar.org.in.nbaim/indexhtm | Director, Dr. D.K.Arora | Research | Agriculture | GOI |
| 4 | Gramsthali Sikshha Parishad | 29 rajrajeshwari nagar colony, Gilat Bajar, Sidharthnagar-221002, abhaigkp@rediffmail.com, +91532107394 | President, Dr R. K. Singh | NGO | Capacity Buildings, Production System | NGO |
| 5 | G.K.S.S. | SA-19/13 K-2 Janak nagar, Pandeypur Sidharthanagar, +919838001699 Ashwini.yes21@gmail.com | President, Dr. A.K. Singh | NGO | Capacity Buildings, Production System | NGO |

## 5.1.2.2 Capacity Building

Capacity building and training are the most important components of watershed management programme both for the field level project staff/ officers and functionaries of people institutions i.e. watershed community. Apart from enhancing technical skill of the project staff, this would also provide opportunities to community members to develop their capacity as the feature custodians of the programmes after project's withdrawal. IWMP II$^{nd}$ Siddharthnagar financial outlay for capacity buildings is 5% (Rs. 28.872) of the total project cost, out of which Rs 0.872 will be expanded for initition of village level institution.

**Table no 39 : Capacity Building activities in the project**

| S.No. | Project Stakeholders | Total no. of persons | No. of persons trained so far | No. of persons of be trained | Sources of funding for training | | Name and Address of the Institute |
|---|---|---|---|---|---|---|---|
| | | | | | a) DoLR | b) any other | |

| | | | | during current financial year | | (pl. specify) | where Trained |
|---|---|---|---|---|---|---|---|
| 1 | PIAs | 8 | 2 | 8 | **DoLR** | | KVK, GSP,GKSS |
| 2 | WDTs | 32 | 12 | 32 | **DoLR** | | KVK, GSP,GKSS |
| 3 | UGs | 155 | 52 | 155 | **DoLR** | | KVK, GSP,GKSS |
| 4 | SHGs | 180 | 42 | 180 | **DoLR** | | KVK, GSP,GKSS |
| 5 | WCs | 17 | 5 | 17 | **DoLR** | | KVK, GSP,GKSS |
| 6 | GPs | 22 | - | 22 | **DoLR** | | KVK, GSP,GKSS |
| 7 | Community | 1200 | - | 1200 | **DoLR** | | KVK, GSP,GKSS |
| 8 | Others (pl. specify) | | | | | | |

**Table no 40: Detail of activities undertaken**

| Strategy | Proposed activity | No. of Units | Unit cost | Total Cost |
|---|---|---|---|---|
| Capacity building Activities | Stakeholders - Scientists Interaction, | 15 | 0.10 | 1.00 |
| | Training (2 days) | 100 | 0.05 | 5.00 |
| | Vocational/employment Generation Training (5-10 days) | 100 | 0.10 | 10.00 |
| | In-service Training. (3 days) | 20 | 0.10 | 2.00 |
| | Exposure visit within State | 5 | 0.20 | 1.00 |
| | Exposure visit out of State | 6 | 0.50 | 3.00 |
| | Field days | 10 | 0.20 | 2.00 |
| | Workshop | 2 | 1.00 | 2.00 |
| | **Total** | | | **26.00** |

**Table no 41 : Information, Education & Communication (IEC) activities in the project area**

| S.no. | Activity | Executing agency | Estimated expenditure (Rs.) | Expected Outcome (may quantify wherever possible) |
|---|---|---|---|---|
| 1 | Street plays | Local Drama Groups | 50000.00 | Awareness about importance of watershed project |
| 2 | Video Shows | IWMP, Siddharthnagar | 50000.00 | |
| 3 | Pamphlets and Poster | IWMP, Siddharthnagar | 50000.00 | |
| 4 | Banners and Hoardings | IWMP, Siddharthnagar | 50000.00 | |
| | | **Total** | **200000.00** | |

### 5.1.3 Detail Project Report

See table no. 37.

## 5.2 WORK PHASE

## 5.2.1 Soil and moisture conservation

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

- Increase the time of concentration.
- Break a long slope into short ones.
- Protection of drainage channel against damage.
- Prevent excessive soil and water losses.

1. **Ridge Area Treatment Plans:**

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

**A. Contour Bunding:**

Contour bunding is and effective in erosion control and moisture conservation in dry areas having less than 2 % slop to reduce the length of slope. Contour bund constructed against the slope in 975.00 ha of lands with total estimated cost of Rs. 58.46 lacs

**B. Graded Bund (Marginal and Peripheral Bund):**

Marginal bunds are the engineering structure to reduce the volume and speed of runoff. Those locations where change in slope and soil texture founded there is peripheral bund will be constructed along with nala bank. Total proposed treatable area is 860.00 ha with financial outlay of Rs. 51.97 lacs

**C. Submergence Bundhies and Gully Plug:**

Submergence bundhies will be constructed at middle reaches of watershed have in lesser slop. However, gully plug structure has been proposed to be formed on upper reaches / I$^{st}$ order stream. Total propsed area for the structures jointly is 325.00 ha with total financial outlay of Rs. 19.49 lacs.

This generally includes water conservation or surface water storage structures. This being highly labour intensive, will involve more of manual labour; so, funds from National Rural Employment Guarantee Scheme (NREGS) can be taken.

**2. Water Harvesting bundhies:**

Water harvesting bundhies are primarily aimed at collecting and storing any form of water enter through rainfall, runoff or subsurface flow for multiple purpose. There will be 75 water harvesting bundhies with farm ponds

structure on 2406.00 ha of land will be constructed on lower reaches of the watershed. Estimated financial outlay is Rs. 75.41 lacs.

**3. Agroforestry:**

About 70.00 ha lands will be taken from the waste land faling in the class-VII category in the watershed. These lands will be planted with subabool in which urd, moong, til etc planted as intercrop, subabool will be used as fuel as well as fodder

**4. Dry Land Horticulture**

About 170.00 ha area will take for the plantation of fruit trees like aonla, bael, ber, karaunda, mango, will be planted at suitable spacing in the watershed.

**Table no 42 : Activities related to Surface Water resources in the project areas @**

| S. No | Names of villages | Type of structures | Pre-project | | | Proposed target | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Augmentation/repair of existing structures | | | | Construction of new structures | | | | Total target | | | |
| | | | No. | Area rrigated (ha) | Storage capacity | No. | Area rrigated (ha) | Storage capacity (lit) | Estimated cost (Rs in laks) | No. | Area rrigated (ha) | Storage capacity (lit) | Estimated cost(Rs in laks) | Area rrigated (ha) | Storage capacity (lit) | Estimated cost (Rs in laks) |
| 1 | 2B1D5e1d KHARIKAURA | (ii) Pond | 2 | 10 | 10000 | 2 | 15 | 15000 | 2.00 | 15 | 15 | 15000 | 4.000 | 30.00 | 30000 | 6.00 |
| | | (iv) Injection well | - | - | - | - | - | - | - | 9 | - | 9000 | 0.225 | - | 9000 | 0.225 |
| 2 | 2B1D5e1d GANRAKHA | (ii) Pond | 2 | 10 | 10000 | 2 | 15 | 15000 | 2.00 | 30 | 30 | 30000 | 8.00 | 45.00 | 45000 | 10.00 |
| | | (iv) Injection well | - | - | - | - | - | - | - | 26 | - | 26000 | 0.65 | - | 26000 | 0.65 |
| 3 | 2B1D5e2b BASAHIYA | (ii) Pond | 8 | 40 | 40000 | 8 | 60 | 60000 | 8.00 | 45 | 45 | 45000 | 12.00 | 105.00 | 105000 | 20.00 |
| | | (iv) Injection well | - | - | - | - | - | - | - | 46 | - | 46000 | 1.15 | - | 46000 | 1.15 |
| 4 | 2B1D5e2c PANARIYA | (ii) Pond | 3 | 15 | 15000 | 3 | 22.5 | 22500 | 3.00 | 15 | 15 | 15000 | 4.000 | 37.5 | 37500 | 7.00 |
| | | (iv) Injection well | - | - | - | - | - | - | - | 6 | - | 6000 | 0.15 | - | 6000 | 0.15 |
| 5 | 2B1D5e2d | (ii) Pond | 3 | 15 | 15000 | 3 | 22.5 | 22500 | 3.00 | - | - | - | - | 22.5 | 22500 | 3.00 |

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **CHANDAI** | **(iv) Injection well** | - | - | - | - | - | - | - | 3 | - | 3000 | 0.075 | - | 3000 | 0.075 |
| **6** | **2B1D5e2e MOHANKOLA** | **(ii) Pond** | 3 | 15 | 15000 | 3 | 22.5 | 22500 | 3.00 | 15 | 15 | 15000 | 4.000 | 37.5 | 37500 | 7.00 |
| | | **(iv) Injection well** | - | - | - | - | - | - | - | 26 | - | 26000 | 0.65 | - | 26000 | 0.65 |
| **7** | **2B1D5e2f DHANAURAM.** | **(ii) Pond** | 2 | 10 | 10000 | 2 | 15 | 15000 | 2.00 | 15 | 15 | 15000 | 4.000 | 30.00 | 30000 | 6.00 |
| | | **(iv) Injection well** | - | - | - | - | - | - | - | 32 | - | 32000 | 0.81 | - | 32000 | 0.81 |
| **8** | **2B1D5e2g SINHORAWA** | **(ii) Pond** | 5 | 25 | 25000 | 5 | 37.5 | 37500 | 5.00 | 30 | 30 | 30000 | 8.00 | 67.5 | 67500 | 13.00 |
| | | **(iv) Injection well** | - | - | - | - | - | - | - | 38 | - | 38000 | 0.95 | - | 38000 | 0.095 |
| | | **Total** | **28** | **140** | **140000** | **28** | **210** | **210000** | **28** | **351** | **165** | **351000** | **48.66** | **375** | **561000** | **34.855** |

@ 50 % work will be done on public asset and 50% done on community asset.

## Table no. 43: Technical detail of Farm Ponds and Injection Well

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

## Table no 44: Activities related to recharging ground water resources in the project areas @

| S. No. | Names of villages | Type of structures | Pre-project | | Proposed target | | | | | | | | Expected month & year of completion (mm/yyyy) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | No. | Area rrigated (ha) | Augmentation/repair of existing structures | | | Construction of new structures | | | Total target | | |
| | | | | | No. | Area rrigated (ha) | Estimated cost | No. | Area rrigated (ha) | Estimated cost | Area rrigated (ha) | Estimated cost | |
| **1** | **2B1D5e1d KHARIKAURA** | **(i) Open wells** | 2 | 1.00 | 2 | 2.00 | 0.12 | - | - | - | 2.00 | 0.12 | 2012 |
| | | **(ii) Bore wells** | 2 | 2.00 | 2 | 8.00 | 0.48 | - | - | - | 8.00 | 0.48 | 2012 |
| **2** | **2B1D5e1d GANRAKHA** | **(i) Open wells** | 2 | 1.00 | 2 | 5.00 | 0.30 | - | - | - | 5.00 | 0.30 | 2012 |
| | | **(ii) Bore wells** | 5 | 5.00 | 5 | 20.00 | 1.20 | - | - | - | 20.00 | 1.20 | 2012 |
| **3** | **2B1D5e2b BASAHIYA** | **(i) Open wells** | 1 | 0.50 | 1 | 2.00 | 0.12 | - | - | - | 2.00 | 0.12 | 2012 |
| | | **(ii) Bore wells** | 4 | 4.00 | 4 | 18.00 | 1.08 | - | - | - | 18.00 | 1.08 | 2012 |
| **4** | **2B1D5e2c PANARIYA** | **(i) Open wells** | 3 | 1.50 | 2 | 4.00 | 0.24 | - | - | - | 4.00 | 0.24 | 2012 |
| | | **(ii) Bore wells** | 6 | 6.00 | 3 | 11.00 | 0.66 | - | - | - | 11.00 | 6.00 | 2012 |
| **5** | **2B1D5e2d** | **(i) Open wells** | 1 | 0.50 | 1 | 2.00 | 0.12 | - | - | - | 2.00 | 0.12 | 2012 |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **CHANDAI** | **(ii) Bore wells** | 3 | 3.00 | 3 | 18.00 | 1.08 | - | - | - | 18.00 | 1.08 | 2012 |
| **6** | **2B1D5e2e MOHANKOLA** | **(i) Open wells** | - | - | - | - | - | - | - | - | - | - | 2012 |
| | | **(ii) Bore wells** | 7 | 7.00 | 2 | 10.00 | 0.60 | - | - | - | 10.00 | 6.00 | 2012 |
| **7** | **2B1D5e2f DHANAURA M.** | **(i) Open wells** | 2 | 1.00 | 2 | 5.00 | 0.30 | - | - | - | 5.00 | 0.30 | 2012 |
| | | **(ii) Bore wells** | 2 | 5.00 | 3 | 10.00 | 0.60 | - | - | - | 10.00 | 0.60 | 2012 |
| **8** | **2B1D5e2g SINHORAWA** | **(i) Open wells** | 2 | 1.00 | 2 | 5.00 | 0.30 | - | - | - | 5.00 | 0.30 | 2012 |
| | | **(ii) Bore wells** | 5 | 10.00 | 5 | 30.00 | 1.80 | - | - | - | 30.00 | 1.80 | 2012 |
| | | **Total for the project** | **47** | **48.5** | **39** | **150** | **9** | | | | **150** | **19.74** | |

Above all the assets only 20 % under community and rest related with private sector.

**Table 45: Activities executed by User Groups in the Project @**

| S.no | Names of Project | Major activities | | | | No. of UGs involved | Estimated Cost (Rs.) | Amount of WDF to be collected (Rs.) |
|---|---|---|---|---|---|---|---|---|
| | | Structure/activity proposed | | | Expected month & year of completion (mm/yyyy) | | | |
| | | Type | No.# | Treatment | | | | |
| 1 | IWMP II[nd] | Structure work | | Enginering | 2015 | 30 | 280.00 laks | 14.00 lakh |

**Table no 46 : Details of engineering structures in watershed works**

| S.No. | Names of villages | Name of structure | Type of treatment | | | Type of land | | | Executing agency | Total target | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | (i) Ridge area (R) | (ii) Drainage line (D) | (iii) Land dev. (L) | (i) Private | (ii) Community | (iii) Others (pl. specify) | (i)UG (ii) SHG (iii) Others (pl. specify) | No. of units (no./cu.m./ rmt) | Estimated cost (Rs. In lakh) | | | | Expected month & year of completion (mm/yyyy) |
| | | | | | | | | | | | M | W | O | T | |
| **1** | **2B1D5e1d KHARIKAURA** | **Contour bunding** | **R** | **-** | **-** | **P** | **C** | **-** | **UG &DoLR** | **132.01** | | | | **4.00** | **2012** |
| | | **Graded bunding** | **-** | **D** | **-** | **-** | **C** | | **UG &DoLR** | **66.00** | | | | **2.00** | **2012** |
| | | **Gully plug** | **-** | **D** | **-** | **-** | **C** | **-** | **UG &DoLR** | **69.63** | | | | **2.11** | **2014** |
| | | **Field bunds** | **-** | **-** | **L** | **P** | **C** | **-** | **UG &DoLR** | **92.73** | | | | **2.81** | **2014** |
| **2** | **2B1D5e1d GANRAKHA** | **Contour bunding** | **R** | **-** | **-** | | **P** | **-** | **UG &DoLR** | **264.03** | | | | **8.00** | **2012** |
| | | **Graded bunding** | **-** | **D** | **-** | **-** | **C** | | **UG &DoLR** | **169.63** | | | | **5.14** | **2012** |
| | | **Gully plug** | **-** | **D** | **-** | **-** | **C** | **-** | **UG &DoLR** | **105.61** | | | | **3.20** | **2014** |
| | | **Field bunds** | **-** | **-** | **L** | **P** | **C** | **-** | **UG &DoLR** | **102.31** | | | | **3.10** | **2014** |
| **3** | **2B1D5e2b BASAHIYA** | **Contour bunding** | **R** | **-** | **-** | | **P** | **-** | **UG &DoLR** | **528.05** | | | | **8.00** | **2012** |
| | | **Graded bunding** | **-** | **D** | **-** | **-** | **C** | | **UG &DoLR** | **312.87** | | | | **5.48** | **2012** |
| | | **Gully plug** | **-** | **D** | **-** | **-** | **C** | **-** | **UG &DoLR** | **168.31** | | | | **5.10** | **2014** |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | **Field bunds** | **-** | **-** | **L** | **P** | **C** | **-** | **UG &DoLR** | **170.95** | | | | **5.18** | **2014** |
| **4** | **2B1D5e2c PANARIYA** | **Contour bunding** | **R** | **-** | **-** | | **P** | **-** | **UG &DoLR** | **151.81** | | | | **4.60** | **2012** |
| | | **Graded bunding** | **-** | **D** | **-** | **-** | **C** | | **UG &DoLR** | **110.56** | | | | **3.35** | **2012** |
| | | **Gully plug** | **-** | **D** | **-** | **-** | **C** | **-** | **UG &DoLR** | **65.01** | | | | **1.97** | **2014** |
| | | **Field bunds** | **-** | **-** | **L** | **P** | **C** | **-** | **UG &DoLR** | **108.25** | | | | **3.28** | **2014** |
| **5** | **2B1D5e2d CHANDAI** | **Contour bunding** | **R** | **-** | **-** | | **P** | **-** | **UG &DoLR** | **73.59** | | | | **2.23** | **2012** |
| | | **Graded bunding** | **-** | **D** | **-** | **-** | **C** | | **UG &DoLR** | **70.62** | | | | **2.14** | **2012** |
| | | **Gully plug** | **-** | **D** | **-** | **-** | **C** | **-** | **UG &DoLR** | **34.32** | | | | **1.04** | **2014** |
| | | **Field bunds** | **-** | **-** | **L** | **P** | **C** | **-** | **UG &DoLR** | **47.19** | | | | **1.43** | **2014** |
| **6** | **2B1D5e2e MOHANKOLA** | **Contour bunding** | **R** | **-** | **-** | | **P** | **-** | **UG &DoLR** | **174.25** | | | | **5.28** | **2012** |
| | | **Graded bunding** | **-** | **D** | **-** | **-** | **C** | | **UG &DoLR** | **110.56** | | | | **3.35** | **2012** |
| | | **Gully plug** | **-** | **D** | **-** | **-** | **C** | **-** | **UG &DoLR** | **65.01** | | | | **1.97** | **2014** |
| | | **Field bunds** | **-** | **-** | **L** | **P** | **C** | **-** | **UG &DoLR** | **85.80** | | | | **2.60** | **2014** |
| **7** | **2B1D5e2f DHANAURA M.** | **Contour bunding** | **R** | **-** | **-** | | **P** | **-** | **UG &DoLR** | **198.01** | | | | **4.00** | **2012** |
| | | **Graded bunding** | **-** | **D** | **-** | **-** | **C** | | **UG &DoLR** | **85.47** | | | | **2.50** | **2012** |
| | | **Gully plug** | **-** | **D** | **-** | **-** | **C** | **-** | **UG &DoLR** | **50.82** | | | | **1.54** | **2014** |
| | | **Field bunds** | **-** | **-** | **L** | **P** | **C** | **-** | **UG &DoLR** | **37.95** | | | | **1.15** | **2014** |
| **8** | **2B1D5e2g SINHORAWA** | **Contour bunding** | **R** | **-** | **-** | | **P** | **-** | **UG &DoLR** | **396.03** | | | | **7.00** | **2012** |
| | | **Graded bunding** | **-** | **D** | **-** | **-** | **C** | | **UG &DoLR** | **285.82** | | | | **3.60** | **2012** |
| | | **Gully plug** | **-** | **D** | **-** | **-** | **C** | **-** | **UG &DoLR** | **148.51** | | | | **4.50** | **2014** |
| | | **Field bunds** | **-** | **-** | **L** | **P** | **C** | **-** | **UG &DoLR** | **193.39** | | | | **5.86** | **2014** |
| | **Total** | | | | | | | | | **4675.1** | | | | **117.51** | |

(M- Materials, W- wages, O- others, T- Total)

**Table no 48: Total Treatment of Micro Watershed of IWMP IInd**

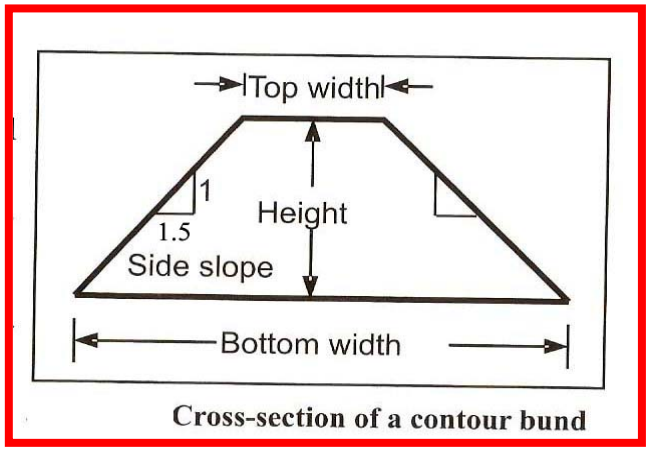
| S.N. | Watershed Reaches | Proposed Work | Treatable Area (ha.) | CMT | Rate (Rs/CMT) | Proposed Cost (Rs in lacs) |
|---|---|---|---|---|---|---|
| 1 | Upper Reaches | Contour Bund | 975.00 | | 30.30 | 58.46 |
| | | Guly Plug | 325.00 | | 35.70 | 19.49 |
| 2 | Middle Reaches | Graded Bund (Marginal bund, Peripheral bund, Submergance bund, earthen check dam) | 866.00 | | 35.71 | 51.97 |
| | | Agroforestry/ Horticulture | 240.00 | | 60000/ha | 14.44 |
| 3 | Lower Reaches/ Drinage | Water Harvesting Bundhi | 2406 | | 35.71 | 75.41 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | Line Treatment | Open well, Bore well | | * | 2 | 14.00 |
| | | Farm Ponds, Injection well | | * | * | 54.95 |
| | | **Total** | **4812.00** | | | **288.72** |

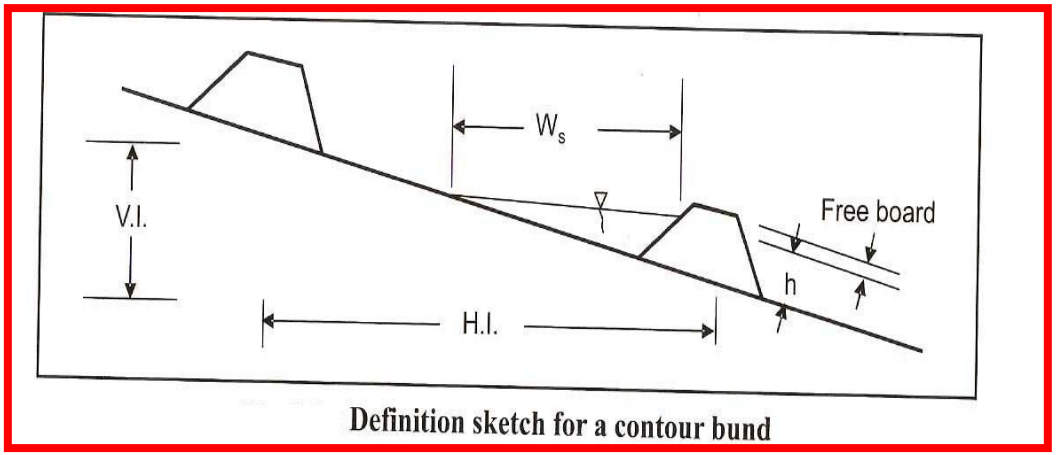
* details in table no 42 and 44

**Table no 49: Technical detail of engineering works in project area**

| S. No. | Project | No of villages | Type of bund | Type of soil | Particulars (meter) | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Top | Base | Height | Slope | Cross section |
| 1 | IWMP 1I[nd] | 48 | Field Bund | Normal | 0.30 | 1.65 | 0.45 | 1.5:1 | 0.438 |
| | | | Contour Bund | Clay | 0.45 | 1.65 | 0.60 | 1.0:1 | 0.63 |
| | | | | Loam | 0.45 | 2.25 | 0.60 | 1.5:1 | 0.81 |
| | | | | Sandy | 0.45 | 2.85 | 0.60 | 2.0:1 | 0.99 |
| | | | Marginal/CRB & peripheral Bund | Plain land | 0.60 | 3.60 | 1.00 | 1.5:1 | 2.10 |
| | | | | Undulating land | 1.00 | 4.00 | 1.00 | 1.5:1 | 2.50 |
| | | | Gully Plug | At 3% or above3 % slope gully plug will be made between two drainage line with emergency temporary spill way | | | | | |



Cross-section of a contour bund

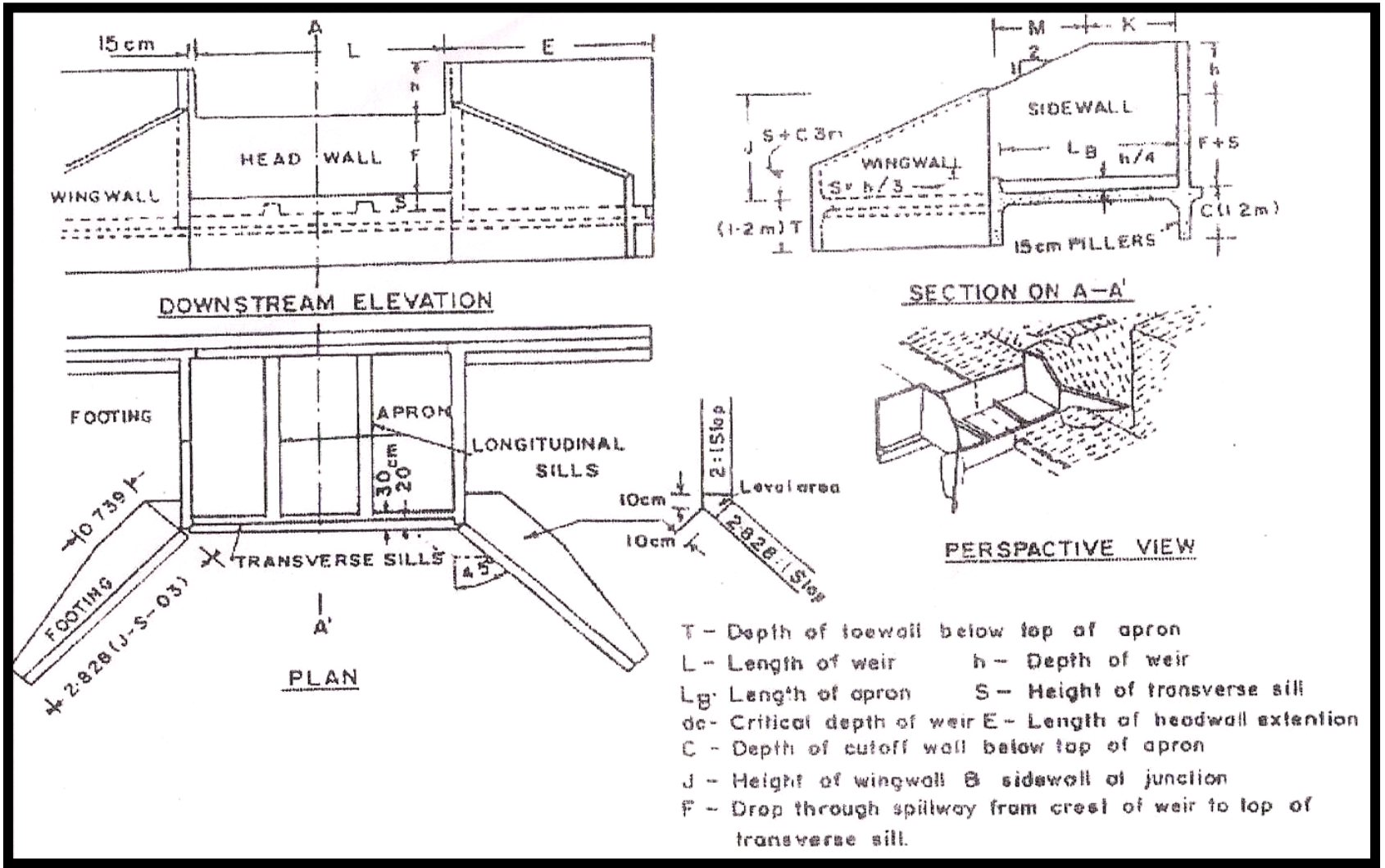


Definition sketch for a contour bund

PERIPHERAL BUND
कन्टूर बन्ड

AFORESTATION
मार्जिनल बन्ड

पेरिफेरल बन्ड




T – Depth of toewall below top of apron
L – Length of weir h – Depth of weir
Lg – Length of apron S – Height of transverse sill
dc – Critical depth of weir E – Length of headwall extention
C – Depth of cutoff wall below top of apron
J – Height of wingwall & sidewall at junction
F – Drop through spillway from crest of weir to top of transverse sill.

# NOMENCLATUR AND SYMBOLS OF TYPICAL DROP SPILLWAY

चेक डैम (डाउन स्ट्रीम)

जल संचय बंधी

कूप मरम्मत एवं प्लेटफार्म निमार्ण

जल संचय बंधी ड्राप स्पील वे स्ट्रक्चर के साथ

### 5.2.2 PROPOSED LAND USE

Watershed management plan for IWMP-II[nd] Siddharthnagar watershed was prepared with specific objectives of food sufficiency and income and employment generation with environment security. In plan preparation due importance was given to topographic, land suitability, irrigation potentially, prevailing farming systems, micro farming situation, farming, farmers preferences and priorities along with economic and environment securities. Crop and tree selection and area distribution was done as per farmers priorities revealed through PRA exercise.

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

**Table no. 50: Present and proposed land use plan of the IWMP-I[st] watershed**

| S.No. | Land use | Present (ha) | Proposed area (ha) |
|---|---|---|---|
| 1 | Agriculture | 5545.00 | 6945.00 |
| a | Rainfed | 5062.00 | 5462.00 |
| | I Crops | 5042.00 | 5202.00 |
| | II Horticulture | 13.00 | 183.00 |
| | III Agro-forestry | 7.00 | 77.00 |
| b | Irrigated | 483.00 | 1483.00 |
| | I Assured | 183.00 | 883.00 |
| | II Partial | 300.00 | 600.00 |
| 2 | Waste land | 1644.00 | 244.00 |
| a | Aforestation | 69.00 | 120.00 |
| b | Pasture | Nil | 34.00 |
| c | Untreatable | 90.00 | 90.00 |
| 3 | Village land | 480.00 | 480.00 |
| | **Total** | **7669.00** | **7669.00** |

### 5.2.3 WATER RESOURCE DEVELOPMENT AND SOIL CONSERVATION MEASURES

**Status of Present Water Resources Utilization**

The micro watersheds are having four seasonal water bodies on private as well as on community land. Management and maintenance of these water bodies is still in the hand of minor irrigation department. During good rainfall year these water bodies having full of water during kharif season. Before sowing of rabi season crops water from these water bodies is either used for supplementary irrigation for kharif crops or irrigating fields for rabi sowing or allowed to go as waste. After releasing water from bodies, submergence area also put under cultivation for rabi crops.

**Proposed plan for Irrigation Development of existing water resources**

For efficient utilization of available water resources in the IWMP-II$^{nd}$ watersheds, present system of irrigation and wastage of water during October-November need to be made more efficient from water management point of view by minimizing conveyance losses in the existing water courses. The up gradation of the existing system of irrigation will result in:

a. Minimization of conveyance losses
b. Increase in frequency of irrigation
c. Adoption of high yielding varieties of crops, and
d. Assured cultivation of cash Crops
e. Drinking water problem will also solved
f. Local eco system will also improved

**New water harvesting structures (Ponds)**

Two new dug type water harvesting structures (pond) of capacity about 1400 cum (each) have been proposed to harvest excess runoff of the watershed. Harvested water will be used for supplementary irrigation and fish rearing. Details of these ponds have been given in the estimated budget in last.

**Crop production**

**Mulching and crop residue management**

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

**Green manuring**

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

**Vermi composting**

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

**Crop rotation and intercropping**

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

**Bio-fertilizers**

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

**Tillage operations**

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

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

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

**Balanced fertilizer use**

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

**Control of insect pest and diseases**

Aphid in the mustard and pod borer in gram are the major insects in the watershed areas leading to loss in crop productivity. Similarly white blister is also a common disease in the mustard crop. The management strategies of these insect pests and diseases will also be demonstrated in the watershed for benefit of the growers.

**Management of the crop**

The recommended technology (13.7) of crop management will be demonstrated to the farmers in half plot trial approach so as to enable the farmers to assess the benefits and impact of each technology or package of practice for their ultimate adoption in the watershed. The interventions scheduled on prioritization of problems in the crop production following PRA and surveys target specifically solution of the each and problem related to the crop production as per interventions at 13.7. The specific problems, if any shall be dealt with contingency budget.

**Dry land Horticulture**

About 121 ha of land is suitable for horticultural development. Species like Bael and Ber will be planted at suitable spacing in the watershed.

**Agri-Horticulture**

Anola and sahjan would be a suitable horticultural crop to the locality. Therefore, about 55 ha land in the farmers field shall be selected and brought under Agri-horti system. The cropping system followed will be Bajra and Wheat.

**Plantation :**

**Fuel wood plantation:** About 500 ha land will be taken the waste land falling in the class-IV category in the watershed. These lands will be planted with species like *Prosopis juliflora Acacia nilatica, Prosopis cineraria* and *Holoptelia integrifolia*.

**Table no. 51: Details of activities connected with vegetative cover in watershed works**

| S. No. | Names of villages | Name of structure/work | Type of treatment | | | Type of land | | | Executing agency | Total target | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | (i) Ridge area (R | (ii) Drainage line (D) | (iii) Land dev. (L) | (i) Private | (ii) Community | (iii) Others (pl. specify) | (i)UG (ii) SHG (iii) Others (pl. specify) | Area (ha) | No. of Plants | Estimated cost (Rs. In lakh) | Expected month & year of completion (mm/yyyy) |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| 1 | KHARIKAURA 2B1D5e1d | Afforestation | R | D | L | P | C | - | DoLR, DF | 40.00 | 6240 | 2.40 | 2012 |
| | | Agro-forestry | - | - | L | P | C | - | DoLR, UG, DF | 2.00 | 312 | 0.12 | 2012 |
| | | Fodder | - | - | L | P | - | - | DoLR,UG, DV | 2.00 | - | 0.12 | 2011 |
| | | Horticulture | R | - | L | P | C | - | DoLR, UG, DH | 15.00 | 2340 | 0.90 | 2012 |
| | | Pasture dev. | R | - | L | - | C | | DoLR,SHG, DV | 1.00 | - | 0.06 | 2011 |
| | | Nursery raising | - | - | L | - | C | - | DoLR, SHG, DH | 0.25 | - | 0.02 | 2010 |
| 2 | GANRAKHA 2B1D5e1d | Afforestation | R | D | L | P | C | - | DoLR, DF | 92.00 | 14352 | 5.52 | 2012 |
| | | Agro-forestry | - | - | L | P | C | - | DoLR, UG, DF | 3.00 | 468 | 0.18 | 2012 |
| | | Fodder | - | - | L | P | - | - | DoLR,UG, DV | 4.00 | - | 0.24 | 2011 |
| | | Horticulture | R | - | L | P | C | - | DoLR, UG, DH | 20.50 | 3198 | 1.23 | 2012 |
| | | Pasture dev. | R | - | L | - | C | | DoLR,SHG, DV | 1.00 | - | 0.06 | 2011 |
| | | Nursery raising | - | - | L | - | C | - | DoLR, SHG, DH | 1.00 | - | 0.06 | 2010 |
| 3 | BASAHIYA 2B1D5e2b | Afforestation | R | D | L | P | C | - | DoLR, DF | 100.00 | 15600 | 6.00 | 2012 |
| | | Agro-forestry | - | - | L | P | C | - | DoLR, UG, DF | 10.00 | 1560 | 0.60 | 2012 |
| | | Fodder | - | - | L | P | - | - | DoLR,UG, DV | 10.00 | - | 0.60 | 2011 |
| | | Horticulture | R | - | L | P | C | - | DoLR, UG, DH | 30.00 | 4680 | 1.80 | 2012 |
| | | Pasture dev. | R | - | L | - | C | | DoLR,SHG, DV | 2.00 | - | 0.12 | 2011 |
| | | Nursery raising | - | - | L | - | C | - | DoLR, SHG, DH | 1.50 | - | 0.15 | 2010 |
| 4 | PANARIYA 2B1D5e2c | Afforestation | R | D | L | P | C | - | DoLR, DF | 36.00 | 5616 | 2.16 | 2012 |
| | | Agro-forestry | - | - | L | P | C | - | DoLR, UG, DF | 3.00 | 468 | 0.18 | 2012 |
| | | Fodder | - | - | L | P | - | - | DoLR,UG, DV | 3.0 | - | 0.18 | 2011 |
| | | Horticulture | R | - | L | P | C | - | DoLR, UG, DH | 16.00 | 2496 | 0.48 | 2012 |
| | | Pasture dev. | R | - | L | - | C | | DoLR,SHG, DV | 1.00 | - | 0.06 | 2011 |
| | | Nursery raising | - | - | L | - | C | - | DoLR, SHG, DH | 0.50 | - | 0.03 | 2010 |

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | CHADAI 2B1D5e2d | Afforestation | R | D | L | P | C | - | DoLR, DF | 17.00 | 2652 | 1.02 | 2012 |
| | | Agro-forestry | - | - | L | P | C | - | DoLR, UG, DF | 1.50 | 234 | 0.09 | 2012 |
| | | Fodder | - | - | L | P | - | - | DoLR,UG, DV | 1.5 | - | 0.09 | 2011 |
| | | Horticulture | R | - | L | P | C | - | DoLR, UG, DH | 10.00 | 1560 | 0.60 | 2012 |
| | | Pasture dev. | R | - | L | - | C | | DoLR,SHG, DV | 0.50 | - | 0.03 | 2011 |
| | | Nursery raising | - | - | L | - | C | - | DoLR, SHG, DH | 0.25 | - | 0.02 | 2010 |
| 6 | MOHANKOLA 2B1D5e2e | Afforestation | R | D | L | P | C | - | DoLR, DF | 30.00 | 4680 | 1.80 | 2012 |
| | | Agro-forestry | - | - | L | P | C | - | DoLR, UG, DF | 3.00 | 465 | 0.18 | 2012 |
| | | Fodder | - | - | L | P | - | - | DoLR,UG, DV | 3.00 | - | 0.18 | 2011 |
| | | Horticulture | R | - | L | P | C | - | DoLR, UG, DH | 18.00 | 2808 | 1.08 | 2012 |
| | | Pasture dev. | R | - | L | - | C | | DoLR,SHG, DV | 1.00 | - | 0.06 | 2011 |
| | | Nursery raising | - | - | L | - | C | - | DoLR, SHG, DH | 0.50 | - | 0.03 | 2010 |
| 7 | DHANAURA M. 2B1D5e2f | Afforestation | R | D | L | P | C | - | DoLR, DF | 28.00 | 4368 | 1.68 | 2012 |
| | | Agro-forestry | - | - | L | P | C | - | DoLR, UG, DF | 2.50 | 360 | 0.15 | 2012 |
| | | Fodder | - | - | L | P | - | - | DoLR,UG, DV | 2.50 | - | 0.15 | 2011 |
| | | Horticulture | R | - | L | P | C | - | DoLR, UG, DH | 16.00 | 2496 | 0.96 | 2012 |
| | | Pasture dev. | R | - | L | - | C | | DoLR,SHG, DV | 1.00 | - | 0.06 | 2011 |
| | | Nursery raising | - | - | L | - | C | - | DoLR, SHG, DH | 0.50 | - | 0.03 | 2010 |
| 8 | SINHORAWA 2B1D5e2g | Afforestation | R | D | L | P | C | - | DoLR, DF | 100.00 | 1560 | 6.00 | 2012 |
| | | Agro-forestry | - | - | L | P | C | - | DoLR, UG, DF | 4.00 | 624 | 0.24 | 2012 |
| | | Fodder | - | - | L | P | - | - | DoLR,UG, DV | 4.00 | - | 0.24 | 2011 |
| | | Horticulture | R | - | L | P | C | - | DoLR, UG, DH | 25.00 | 3900 | 1.50 | 2012 |
| | | Pasture dev. | R | - | L | - | C | | DoLR,SHG, DV | 1.00 | - | 0.06 | 2011 |
| | | Nursery raising | - | - | L | - | C | - | DoLR, SHG, DH | 0.50 | - | 0.03 | 2010 |

**Table no. 52: Technical Details of Afforestation and Agro forestry Activities in 1ha**

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

**Table no. 53: Cost Estimation for afforestation and Agro forestry activity in 1ha**

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

**Table no. 54: Technical Details of Horticultural Activities in 1ha**

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

**Table no. 55 : Cost Estimation for Horticultural Activities in 1ha**

| S. No | Description | No. | Length (m.) | Width (m.) | Depth (m.) | Unit | Quantity | Rate | Amount |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Digging of pits for plants | 156 | 1 | 1 | 1 | Cum | 1,56.00 | 10 | 1560.00 |
| 2 | Plants samplings for plantation in Govt. pasture area, sampling not less than 30 cm. height | 156 | | | | Nos. | 1,56.00 | 10 | 1560.00 |
| 3 | Transportation of plants from nursery to camp site up to 15Km | 156 | | | | Nos. | 1,56.00 | 2 | 312.00 |
| 4 | Loading and unloading of plants | 156 | | | | Nos. | 1,56.00 | 2 | 312.00 |
| 5 | Rehandling of plants from camp site to actual planting site upto 200m. | 156 | | | | Nos. | 1,56.00 | 2 | 312.00 |
| 6 | Cost of fertiliser & insecticides incl. application | 156 | | | | Nos. | 1,56.00 | 10 | 1560.00 |
| 7 | Weeding and Hoeing two times (Twice in year) | 156 | | | | Nos. | 1,56.00 | 2.46 | 384.00 |
| **Total** | | | | | | | | | **6000.00** |

### 5.2.4 PRODUCTION SYSTEM AND MICRO ENTERPRIZES (Financial out lays 13% i.e., Rs. 75.0627 lacs)

## *PROPOSED EXTENSION STRATEGIES*

The following feasible extension strategies have been proposed based on the analysis of data collected through PRA & related issues/problems in IWMP 1st Siddharthnagar district.

### *Strategies:*

*A. Improvement of productivity and income of farmers in the existing enterprises and farming system.*
*B. Diversification and intensification of existing farming system.*
*C. Sustainability in productivity/income.*
*D. Integrated nutrient management.*
*E. Integrated pest management.*
*F. Seed multiplication and replacement.*
*G. Horticulture planting material*
*H. Success story.*
*I. Natural resources management.*
*J. Issue for Policy consideration*
*K. Farm mechanization.*
*L. Marketing & Media strategies.*
*M. Human Resource Development.*
*N. Farmers Organization.*
*O. Public Private Partnership.*

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

**Table no. 56: Agriculture Production**

| Crop | Critical Gap | Strategic issue | Strategies |
|---|---|---|---|
| **1** | **2** | **3** | **4** |
| 1. Wheat | Yield stagnation | Use of recommended seed rate, Weed management, PopularizingSeed production programme, Popularizing Organic farming | Demonstration, Exposure visits,Training |
| | Use of untreated seeds | Encouraging sowing with treated seeds | Demonstration, Exposure visits,Training |
| | Un judicious use of Irrigation water | Irrigation management | Demonstration, Exposure visits,Training |
| 2. Paddy | Imbalance use of Fertilizer | To promote INM | Demonstration, Soil testing, Exposure visits, - Training |
| | Un Availability of Quality Seed | In crease seed replacement ratio Promote seed production Programme | Demonstration, Exposure visits,Training |
| | 1. Improper nursery raising | -Raised seed beds | Demonstration, Exposure visits,Training |
| | 2. Inadequate Pest and disease management | Popularization of Integrated pest and disease management | - Demonstration<br>- Exposure visits<br>- Training |
| | 3. Weed management | Populazation of chemical Pesticide | Demonstration, Exposure visits,Training |

| 1 | 2 | 3 | 4 |
|---|---|---|---|
| 3..Maize | 1. Non adoption of seed treatment | Application of seed treatment | Demonstration, Exposure visits,Training |
| | 2. Excess application of fertilizes | Use of recommended dose of fertilizer | Demonstration, Exposure visits,Training |
| | 3. Use of Micro nutrients | -Use of recommended quantity of micro nutrients | Demonstration, Exposure visits,Training |
| | 4. Non adoption of hand pollination practices | Following hand pollination | Demonstration, Exposure visits,Training |
| 4. Mustard | 1. Higher plant population | Popularization of plant population technique per | Demonstration, Exposure visits,Training |
| | 2. Low production | -Suitable agronomical practices will be popularized | Demonstration, Exposure visits,Training |
| | 3. Imbalance use of fertilizer | -Use of balanced fertilizer promote, sulpher | Demonstration, Exposure visits,Training |
| | 4. Pest & disease management | -Adoption of proper pest and disease management practice | Demonstration, Exposure visits,Training |
| | 5. Post harvest technology | Popularization of improved storage method | Demonstration, Exposure visits,Training |
| 5. Lentil | 1. Yield stagnation | Timely sown, line sown, seed rate as per recommendation | Demonstration, Exposure visits,Training |
| | 2. Imbalance use of fertilizers | Popularization of phasphetik fertilizer | Demonstration, Exposure visits,Training |
| | 3. Low quantity of F.Y.M. | Use of recommended practice of F.Y.M. | Demonstration, Exposure visits,Training |
| | 4. Inadequate use of sowing techniques | Use of Recommended techniques | Demonstration, Exposure visits, Training |
| 6. Sugarcane | 1. Late sowing | -Timely sowing | Demonstration, Exposure visits, Training |
| | 2. Non application of fertilizers | Application of seed treatment | Demonstration, Exposure visits, Training |
| | 3. Excess application of fertilizers | Use of recommended dose of fertilizer, Popularization of recommended dose of F.Y.M./Green Manure | Demonstration, Exposure visits, Training |
| | 4. Use of Micro Nutrients | -Use of recommended quantity of micro nutrients | Demonstration, Exposure visits, Training |
| | 5. Inadequate pest and disease management | - Adoption of IPM/IDM | Demonstration, Exposure visits, Training |
| | 6. Injudicious use of water | -Irrigation management | Demonstration, Exposure visits, Training |

)

**Table no. 57: *Horticultural Production:-***

| | | | |
|---|---|---|---|
| (1) Potato | I. Un Identified verities | Popularization of Identified Recommended verities | Demonstration, Exposure visits, Training |
| | 2. No seed treatment | Adoption of recommended seed treatment | Demonstration, Exposure visits, Training |
| | 3. Non use of Micro nutrients | -Application of recommended Micro nutrients | Demonstration, Exposure visits, Training |
| | 4. Non Adoption of pest and disease management | -IDM | Demonstration, Exposure visits, Training |
| (2) Tomato | 1. No seed treatment | Adoption of recommended seed treatment | Demonstration, Exposure visits, Training |
| | 2. Imbalace use of fertilizers | Application of recommended dose of fertilizers | Demonstration, Exposure visits, Training |
| | 3. Low quantity use of F.Y.M. | Adoption of recommended doseOf F.Y.M. | Demonstration, Exposure visits, Training |
| | 4. Inadequate plant protection measure | Popularization of recommended plant protection techniques | Demonstration, Exposure visits, Training |
| (3) Banana | 1. Low quantity use of F.Y.M. | Use of Recommended dose of F.Y.M | Demonstration, Exposure visits, Training |
| | 2. No seed treatment | Popularization of bio agents, *Tricoderma* and P*seudomonas* For seed treatments | Demonstration, Exposure visits, Training |
| | 3. Inadequate plant protection technique | Popularization of plan protectiontechnique | Demonstration, Exposure visits, Training |

**Table no. 58: ANIMAL HUSBANDRY**

| Animal | Critical gap | Strategy | Activities |
|---|---|---|---|
| Cow & Bufallow | a) Artificial Insemination<br>partial adoption of AI | a) Improving knowledge about advantage and disadvantages of AI | a) Awareness campaign<br>b) Ensure the availability of technical staff.<br>c) Ensure the availability of semen<br>f) Conducting fertility improvement camps.<br>g) Conducting camps for castration of scrub bulls at village level<br>h) Providing wide month cry can & 1 Lit. Thermos for easy transportation of semen to remote villages |
| | b) Unavailable of quality fodder feed. | Improving the knowledge about animal production capacity and its fodder requirement | a) Organizing awareness camp about animal production capacity, its requirements and dairy economics.<br>b) ensure the supply of good quality fodder seeds.<br>c) Demonstration of conservation of fodder by silage making |
| | c) Minerals & vitamins.<br>Full gap in adoption of feeding | Motivating farmers about importance of minerals & vitamins. | a) Intensify the awareness programmers about importance of feeding minerals & vitamins by promoting stall feeding |
| | d) Inter-calving period is long period | Awarding about “a calf a year” | a) Awareness camp for reduction calving period |
| | e) Health care<br>gap in health care management | Providing knowledge about animal health and hygiene | a) organizing awareness programme about animal health & hygiene through trainings and field visits.<br>b) Awareness campaign about animal health camps |
| | f) General management<br>Partial gap in Adoption of general. Management | Technology dissemination about animal management and its importance | a organizing awareness programme about animal management through training and field visits. |
| | g) Average milk yield. Full gap in average milk yield. | Technology dissemination about complete dairy management | By providing awareness about complete dairy management |
| Goat, Goat & Pig, Poultry | a) Breed up gradation | Awareness about feed and fodder management | a) Providing awareness programme through training and field visits.<br>b) Refresher training course to technical |
| | b) Feed management<br>Partial adoption of feed management | Awareness about feed and fodder management | a) Providing awareness programme about the feed and fodder requirement of the animal.<br>b) Intesify the supply of fodder seeds |
| | d) Health care<br>-gap in health care management<br>-non adoption of deworming schedule | -Popularizing the importance of deworming.<br>- Providing knowledge about animal health and hygiene | a) awareness camp about importance of deworming<br>b) Conducting deworming comps<br>c) Organizing awareness programme about animal health and hygiene through training and field visit. |
| | d) General Management<br>- Partial gap in adoption of general management | - Technology dissemination about animal management and its importance | - Organizing awareness programme about animal management through training and field visit |

**Table no. 59: Fish Production**

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

## Table no. 60: Details of allied/ other activities (Total of the production system and micro enterprises intervention)

| S.no | Names of the villages | Name of activity | Type of land | | | Executing agency | Total target | |
|---|---|---|---|---|---|---|---|---|
| | | | (i) Private | (ii) Community | (iii) Others (pl. specify) | (i)UG (ii) SHG | Estimated cost (Rs. In lakh) | Expected month & year of completion |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| **A. PRODUCTION SYSTEM AND MICRENTERPRIZES INERVENTION (50 % BUDGET OF EACH INTERVENTION USE AS REVOLVING FUND AND 50 % USE AS TRAINING & TRAINING MATERIOALS)** | | | | | | | | |
| 1 | KHARIKAURA 2B1D5e1d (for 7 village) | Milk Collection Centre | - | Community | - | SHG | 1.00 | 2015 |
| | | Bee Keeping | - | Community | - | SHG | 1.00 | 2015 |
| | | Fruit preservation | - | Community | - | SHG | 1.00 | 2015 |
| | | Small ruminants (Goatry) | - | Community | - | SHG | 1.00 | 2015 |
| | | Fisheries | - | Community | - | SHG | 1.00 | 2015 |
| | | Portable hatchery | - | - | - | SHG | 1.00 | 2015 |
| | | Nursery raising | - | Community | - | SHG | 2.00 | 2015 |
| | | Rural craft | | Community | - | SHG | 2.00 | 2015 |
| | | Animal Nutient | Private | - | - | UG | 0.96 | 2015 |
| | Total | | | | | | 10.96 | 2015 |
| 2 | GANRAKHA 2B1D5#1d (for 2 village) | Bee Keeping | - | Community | - | SHG | 1.00 | 2015 |
| | | Fruit preservation | - | Community | - | SHG | 1.00 | 2015 |
| | | Fisheries | - | Community | - | SHG | 1.00 | 2015 |
| | | Nursery raising | - | Community | - | SHG | 1.00 | 2015 |
| | | Medicinal Plant | Private | - | - | SHG | 0.50 | 2015 |
| | | Rural craft | - | Community | - | SHG | 0.50 | 2015 |
| | | Animal Nutrient | Private | - | - | UG | 0.55 | 2015 |
| | Total | | | | | | 5.55 | 2015 |
| 3 | BASAHIYA 2B1D5e2b (for 5 village) | Milk Collection Centre | - | Community | - | SHG | 1.00 | 2015 |
| | | Bee Keeping | - | Community | - | SHG | 1.00 | 2015 |
| | | Fruit preservation | - | Community | - | SHG | 1.00 | 2015 |
| | | Small ruminants (Goatry) | - | Community | - | SHG | 1.00 | 2015 |
| | | Fisheries | - | Community | - | SHG | 0.50 | 2015 |
| | | Portable hatchery | - | - | - | SHG | 0.50 | 2015 |
| | | Nursery raising | - | Community | - | SHG | 1.00 | 2015 |
| | | Rural craft | | Community | - | SHG | 1.00 | 2015 |
| | | Animal Nutient | Private | - | - | UG | 0.61 | 2015 |
| | Total | | | | | | 7.61 | |

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|
| 4 | PANARIYA 2B1D5e2c (for 6 village) | Bee Keeping | - | Community | - | SHG | 2.00 | 2015 |
| | | Fruit preservation | - | Community | - | SHG | 2.00 | 2015 |
| | | Fisheries | - | Community | - | SHG | 2.00 | 2015 |
| | | Portable hatchery | - | - | - | SHG | 1.00 | 2015 |
| | | Nursery raising | - | Community | - | SHG | 1.00 | 2015 |
| | | Medicinal Plant | Private | - | - | SHG | 1.00 | 2015 |
| | | Rural craft | | Community | - | SHG | 1.00 | 2015 |
| | | Animal Nutrient | Private | - | - | UG | 0.54 | 2015 |
| | Total | | | | | | 10.54 | 2015 |
| 5 | CHANDAI 2B1D5e2d (for 6 village) | Milk Collection Centre | - | Community | - | SHG | 2.00 | 2015 |
| | | Bee Keeping | - | Community | - | SHG | 1.00 | 2015 |
| | | Fruit preservation | - | Community | - | SHG | 1.00 | 2015 |
| | | Small ruminants (Goatry) | - | Community | - | SHG | 1.00 | 2015 |
| | | Fisheries | - | Community | - | SHG | 1.00 | 2015 |
| | | Portable hatchery | - | - | - | SHG | 2.00 | 2015 |
| | | Nursery raising | - | Community | - | SHG | 1.00 | 2015 |
| | | Rural craft | | Community | - | SHG | 2.00 | 2015 |
| | | Animal Nutient | Private | - | - | UG | 0.48 | 2015 |
| | Total | | | | | | 11.48 | 2015 |
| 6 | MOHAN KOLA 2B1D5e2e (for 9 village) | Milk Collection Centre | - | Community | - | SHG | 2.00 | 2015 |
| | | Bee Keeping | - | Community | - | SHG | 2.00 | 2015 |
| | | Fruit preservation | - | Community | - | SHG | 2.00 | 2015 |
| | | Small ruminants (Goatry) | - | Community | - | SHG | 2.00 | 2015 |
| | | Fisheries | - | Community | - | SHG | 2.00 | 2015 |
| | | Portable hatchery | - | - | - | SHG | 2.00 | 2015 |
| | | Nursery raising | - | Community | - | SHG | 1.00 | 2015 |
| | | Rural craft | | Community | - | SHG | 1.00 | 2015 |
| | | Animal Nutient | Private | - | - | UG | 0.66 | 2015 |
| | Total | | | | | | 14.66 | 2015 |
| 7 | DHANAURA M. 2B1D5e2f (for 4 village) | Milk Collection Centre | - | Community | - | SHG | 2.00 | 2015 |
| | | Bee Keeping | - | Community | - | SHG | 0.50 | 2015 |
| | | Fruit preservation | - | Community | - | SHG | 0.50 | 2015 |
| | | Small ruminants (Goatry) | - | Community | - | SHG | 0.50 | 2015 |
| | | Fisheries | - | Community | - | SHG | 0.50 | 2015 |
| | | Portable hatchery | - | - | - | SHG | 0.50 | 2015 |
| | | Nursery raising | - | Community | - | SHG | 1.00 | 2015 |
| | | Rural craft | | Community | - | SHG | 0.50 | 2015 |
| | | Animal Nutient | Private | - | - | UG | 0.56 | 2015 |
| | Total | | | | | | 6.56 | |

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|
| 8 | SINHORAWA 2B1D5e2g (for 9 village) | Milk Collection Centre | - | Community | - | SHG | 2.00 | 2015 |
| | | Bee Keeping | - | Community | - | SHG | 1.00 | 2015 |
| | | Fruit preservation | - | Community | - | SHG | 0.50 | 2015 |
| | | Small ruminants (Goatry) | - | Community | - | SHG | 0.50 | 2015 |
| | | Fisheries | - | Community | - | SHG | 0.50 | 2015 |
| | | Portable hatchery | - | - | - | SHG | 0.50 | 2015 |
| | | Nursery raising | - | Community | - | SHG | 0.50 | 2015 |
| | | Rural craft | | Community | - | SHG | 0.50 | 2015 |
| | | Animal Nutient | Private | - | - | UG | 0.64 | 2015 |
| | Total | | | | | | 6.64 | |
| | G. Total (for 48 village) | | | | | | 75.00 | |

**Table no. 61: Item wise total for the project**

| S.no | Names of the villages | Name of activity | Type of land | | | Executing agency | Total target | |
|---|---|---|---|---|---|---|---|---|
| | | | (i) Private | (ii) Community | (iii) Others (pl. specify) | (i)UG (ii) SHG (iii) Others (pl. specify) | Estimated cost (Rs. In lakh) | Expected month & year of completion (mm/yyyy) |
| 1 | 48 villages in IWMP 1st | Milk Collection Centre | - | Community | - | SHG | 10.00 | 2015 |
| | | Bee Keeping | - | Community | - | SHG | 9.50 | 2015 |
| | | Fruit preservation | - | Community | - | SHG | 9.00 | 2015 |
| | | Small ruminants (Goatry) | - | Community | - | SHG | 6.00 | 2015 |
| | | Fisheries | - | Community | - | SHG | 8.50 | 2015 |
| | | Portable hatchery | - | Community | - | SHG | 7.50 | 2015 |
| | | Nursery raising | - | Community | - | SHG | 8.50 | 2015 |
| | | Medicinal Plant | Private | - | - | SHG | 1.50 | 2015 |
| | | Rural craft | - | Community | - | SHG | 8.50 | 2015 |
| | | Animal Nutrient | Private | - | - | UG | 6.00 | 2015 |
| | Total | | | | | | 75.00 | |

**Table no 62: Activities related production system and micro enterprizes intervention by Self Help Groups (SHGs) in the Project areas**

| S.no | Names of the Villages | Major activities of the SHGs | | | | No. of SHGs require training | Total assistance planned for the SHG (Amount in Rs.) | | | | Total annual Income to be generated (Rs.) | Total annual Savings to be done (Rs.) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Name of activity | No. of SHGs involved | Average annual income from activity per SHG | Expected month & year of completion (mm/yyyy) | | Loan from revolving | Training | Material | Others (pl. specify) | | |
| 1 | 48 villages in IWMP 1st | Milk Collection Centre | 7 | 90000.00 | 2015 | 7 | 700000.00 | 210000.00 | 90000.00 | - | 630000.00 | 600000.00 |
| | | Bee Keeping | 9 | 70000.00 | 2015 | 9 | 450000.00 | 270000.00 | 230000.00 | - | 630000.00 | 500000.00 |
| | | Fruit preservation | 9 | 75000.00 | 2015 | 9 | 450000.00 | 270000.00 | 180000.00 | - | 675000.00 | 500000.00 |
| | | Small ruminants (Goatry) | 6 | 70000.00 | 2015 | 6 | 300000.00 | 180000.00 | 120000.00 | - | 420000.00 | 400000.00 |
| | | Fisheries | 8 | 100000.00 | 2015 | 8 | 400000.00 | 240000.00 | 160000.00 | - | 800000.00 | 600000.00 |
| | | Portable hatchery | 7 | 150000.00 | 2015 | 7 | 350000.00 | 210000.00 | 190000.00 | - | 1050000.00 | 800000.00 |
| | | Nursery raising | 8 | 40000.00 | 2015 | 8 | 400000.00 | 240000.00 | 210000.00 | - | 320000.00 | 400000.00 |
| | | Medicinal Plant | 1 | 50000.00 | 2015 | 1 | 50000.00 | 30000.00 | 70000.00 | - | 50000.00 | 100000.00 |
| | | Rural craft | 8 | 50000.00 | 2015 | 8 | 400000.00 | 240000.00 | 210000.00 | - | 400000.00 | 400000.00 |

### 5.2.5 LIVELIHOOD ACTIVITIES

Income generating activities through self help groups for landless farmers like goat farming, poultry farming bee keeping, livestock development activities, vocational training given with the involvement of KVK, Mau and NGOs. Financial out lays for this component is 10 % i.e., Rs 857.744 lacs, details are given below in table.

## Table no. 63: Details of allied/ other activities (Total of livelihood intervention)

| S.no | Names of the villages | Name of activity | Type of land | | | Executing agency | Total target | |
|---|---|---|---|---|---|---|---|---|
| | | | (i) Private | (ii) Community | (iii) Others (pl. specify) | (i)UG (ii) SHG | Estimated cost (Rs. In lakh) | Expected month & year of completion (mm/yyyy) |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| A. PRODUCTION SYSTEM AND MICRENTERPRIZES INERVENTION (50 % BUDGET OF EACH INTERVENTION (EXCEPT CROP DEMONSTRATION, MEDICINAL PLANT, HORTICULTURE) USE AS REVOLVING FUND AND 50 % USE AS TRAINING & TRAINING MATERIOALS) | | | | | | | | |
| 1 | KHARIKAURA 2B1D5e1d (for 7 village) | Crop demonstration | Private | - | - | UG | 2.00 | 2015 |
| | | Medicinal plant | Private | - | - | UG | 1.00 | 2015 |
| | | Horticulture | Private | | - | UG | 1.00 | 2015 |
| | | Nursery raising | Private | - | - | UG | 1.00 | 2015 |
| | | Fruit preservation | - | Community | - | SHG | 1.00 | 2015 |
| | | Rural craft | - | Community | - | SHG | 1.00 | 2015 |
| | | Goatery | | Community | | SHG | 1.00 | 2015 |
| | | Piggery | | Community | | SHG | 1.00 | 2015 |
| | | Animal Nutrient | Private | - | - | UG | 0.22 | 2015 |
| | Total | | | | | | 9.22 | 2015 |
| 2 | GANRAKHA 2B1D5#1d (for 2 village) | Crop demonstration | Private | - | - | UG | 1.00 | 2015 |
| | | Horticulture | Private | | - | UG | 1.00 | 2015 |
| | | Fruit preservation | - | Community | - | SHG | 0.50 | 2015 |
| | | Rural craft | - | Community | - | SHG | 0.50 | 2015 |
| | | Piggery | | Community | - | SHG | 1.00 | 2015 |
| | | Animal Nutrient | Private | - | - | UG | 0.27 | 2015 |
| | Total | | | | | | 4.27 | 2015 |
| 3 | BASAHIYA 2B1D5e2b (for 5 village) | Crop demonstration | Private | - | - | UG | 2.00 | 2015 |
| | | Medicinal plant | Private | - | - | UG | 0.50 | 2015 |
| | | Horticulture | Private | | - | UG | 0.50 | 2015 |
| | | Nursery raising | Private | - | - | UG | 0.50 | 2015 |
| | | Fruit preservation | - | Community | - | SHG | 0.50 | 2015 |
| | | Rural craft | - | Community | - | SHG | 0.50 | 2015 |
| | | Goatery | | Community | | SHG | 0.50 | 2015 |
| | | Piggery | | Community | | SHG | 0.50 | 2015 |
| | | Animal Nutrient | Private | - | - | UG | 0.36 | 2015 |
| | Total | | | | | | 5.86 | |

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|
| 4 | PANARIYA 2B1D5e2c (for 6 village) | Crop demonstration | Private | - | - | UG | 2.00 | 2015 |
| | | Horticulture | Private | | - | UG | 2.00 | 2015 |
| | | Fruit preservation | - | Community | - | SHG | 2.00 | 2015 |
| | | Rural craft | - | Community | - | SHG | 1.00 | 2015 |
| | | Piggery | | Community | - | SHG | 0.50 | 2015 |
| | | Animal Nutrient | Private | - | - | UG | 0.62 | 2015 |
| | Total | | | | | | 8.12 | 2015 |
| 5 | CHANDAI 2B1D5e2d (for 6 village) | Crop demonstration | Private | - | - | UG | 2.00 | 2015 |
| | | Medicinal plant | Private | - | - | UG | 1.00 | 2015 |
| | | Horticulture | Private | | - | UG | 1.00 | 2015 |
| | | Nursery raising | Private | - | - | UG | 0.50 | 2015 |
| | | Fruit preservation | - | Community | - | SHG | 0.50 | 2015 |
| | | Rural craft | - | Community | - | SHG | 1.00 | 2015 |
| | | Goatery | | Community | | SHG | 1.00 | 2015 |
| | | Piggery | | Community | | SHG | 1.00 | 2015 |
| | | Animal Nutrient | Private | - | - | UG | 0.83 | 2015 |
| | Total | | | | | | 8.83 | 2015 |
| 6 | MOHANKOLA 2B1D5e2e (for 9 village) | Crop demonstration | Private | - | - | UG | 2.00 | 2015 |
| | | Medicinal plant | Private | - | - | UG | 1.00 | 2015 |
| | | Horticulture | Private | | - | UG | 1.00 | 2015 |
| | | Nursery raising | Private | - | - | UG | 2.00 | 2015 |
| | | Fruit preservation | - | Community | - | SHG | 1.00 | 2015 |
| | | Rural craft | - | Community | - | SHG | 2.00 | 2015 |
| | | Goatery | | Community | | SHG | 1.00 | 2015 |
| | | Piggery | | Community | | SHG | 1.00 | 2015 |
| | | Animal Nutrient | Private | - | - | UG | 0.28 | 2015 |
| | Total | | | | | | 11.28 | |

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|
| 7 | DHANAURA M. 2B1D5e2f (for 4 village) | Crop demonstration | Private | - | - | UG | 0.50 | 2015 |
| | | Medicinal plant | Private | - | - | UG | 0.50 | 2015 |
| | | Horticulture | Private | | - | UG | 0.50 | 2015 |
| | | Nursery raising | Private | - | - | UG | 0.50 | 2015 |
| | | Fruit preservation | - | Community | - | SHG | 1.00 | 2015 |
| | | Rural craft | - | Community | - | SHG | 0.50 | 2015 |
| | | Goatery | | Community | | SHG | 0.50 | 2015 |
| | | Piggery | | Community | | SHG | 0.50 | 2015 |
| | | Animal Nutrient | Private | - | - | UG | 0.55 | 2015 |
| | Total | | | | | | 5.05 | 2015 |
| 8 | SINHORAWA 2B1D5e2g (for 9 village) | Crop demonstration | Private | - | - | UG | 1.00 | 2015 |
| | | Medicinal plant | Private | - | - | UG | 0.50 | 2015 |
| | | Horticulture | Private | | - | UG | 0.50 | 2015 |
| | | Fruit preservation | - | Community | - | SHG | 0.50 | 2015 |
| | | Rural craft | - | Community | - | SHG | 1.00 | 2015 |
| | | Goatery | | Community | | SHG | 0.50 | 2015 |
| | | Piggery | | Community | | SHG | 0.50 | 2015 |
| | | Animal Nutrient | Private | - | - | UG | 0.61 | 2015 |
| | Total | | | | | | 5.11 | |
| | G. Total (for 48 village) | | | | | | 57.74 | |

**Table no. 64: Item wise total for the project**

| S.no | Names of the villages | Name of activity | Type of land | | | Executing agency | Total target | |
|---|---|---|---|---|---|---|---|---|
| | | | (i) Private | (ii) Community | (iii) Others (pl. specify) | (i)UG (ii) SHG (iii) Others | Estimated cost (Rs. In lakh) | Expected month & year of completion (mm/yyyy) |
| 8 | 48 villages in IWMP II[nd] | Crop demonstration | Private | - | - | UG | 12.50 | 2015 |
| | | Medicinal plant | Private | - | - | UG | 4.50 | 2015 |
| | | Horticulture | Private | | - | UG | 7.50 | 2015 |
| | | Nursery raising | Private | - | - | UG | 4.50 | 2015 |
| | | Fruit preservation | - | Community | - | SHG | 7.00 | 2015 |
| | | Rural craft | - | Community | - | SHG | 7.50 | 2015 |
| | | Goatery | | Community | | SHG | 4.50 | 2015 |
| | | Piggery | | Community | | SHG | 6.00 | 2015 |
| | | Animal Nutrient | Private | - | - | UG | 3.74 | 2015 |
| | Total | | | | | | 57.74 | |

## Table no. 65: Activities related to livelihoods by Self Help Groups (SHGs) in the Project areas

| S.no | Names of the Villages | Major activities of the SHGs | | | | No. of SHGs require training | Total assistance planned for the SHG (Amount in Rs.) | | | | Total annual Income to be generated (Rs.) | Total annual Savings to be done (Rs.) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Name of activity | No. of SHGs involved | Average annual income from activity per SHG | Expected month & year of completion (mm/yyyy) | | Loan from revolving | Training | Material | Others (pl. specify) | | |
| 1 | 48 villages in IWMP II[nd] | Fruit preservation | 7 | 75000.00 | 2015 | 7 | 350000.00 | 210000.00 | 140000.00 | - | 525000.00 | 500000.00 |
| | | Rural craft | 7 | 50000.00 | 2015 | 7 | 350000.00 | 210000.00 | 190000.00 | - | 350000.00 | 400000.00 |
| | | Goatery | 4 | 70000.00 | 2015 | 4 | 200000.00 | 120000.00 | 130000.00 | - | 280000.00 | 300000.00 |
| | | Piggery | 6 | 100000.00 | 2015 | 6 | 300000.00 | 180000.00 | 120000.00 | - | 600000.00 | 700000.00 |

## Table no 66 : (A) Details of livelihoods created for landless people*- including micro enterprises

| S.no | Names of the villages | Name of activity | No. of beneficiaries | | | | | Pre-project income (Rs.) | Expected change in income from project intervention | Funds required for the activity (Rs.) | Sources of funding(Rs.) | | | | | Expected month & year of completion (mm/yyyy) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | SF | MF | LF | Land less | Total | | | | Project Fund | Beneficiary | Financial institution | NGO | Others | |
| 1 | 48 villages in IWMP II[nd] | Fruit preservation | 10 | 2 | | 108 | 120 | 12000.00 | 600000.00 | 800000 | 800000 | - | - | - | - | 2015 |
| | | Rural craft | 22 | 5 | - | 168 | 195 | 20000.00 | 650000.00 | 1300000 | 1300000 | - | - | - | - | 2015 |
| | | Goatery | 31 | 14 | - | 60 | 105 | 12000.00 | 490000.00 | 700000 | 700000 | - | - | - | - | 2015 |
| | | Piggery | - | - | - | 180 | 180 | 60000.00 | 1200000.00 | 1200000 | 1200000 | - | - | - | - | 2015 |

## Table no. 67: (B) Details of other livelihoods created for farmers

| S.no | Names of the villages | Name of activity | No. of beneficiaries | | | | | Pre-project income (Rs.) | Expected change in income from project intervention | Funds required for the activity (Rs.) | Sources of funding(Rs.) | | | | | Expected month & year of completion (mm/yyyy) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | SF | MF | LF | Other | Total | | | | Project Fund | Beneficiary | Financial institution | NGO | Others | |
| 1 | 48 villages in IWMP II[nd] | Crop demonstration | 250 | 525 | 125 | - | 900 | 900000.00 | 1200000.00 | 1800000 | 1800000 | - | - | - | - | 2015 |
| | | Medicinal plant | 15 | 30 | 15 | - | 60 | - | 3000000.00 | 600000 | 600000 | - | - | - | - | 2015 |
| | | Horticulture | 10 | 50 | 25 | - | 85 | 50000.00 | 8500000.00 | 850000 | 850000 | - | - | - | - | 2015 |
| | | Nursery raising | 4 | 2 | 3 | - | 9 | - | 900000.00 | 450000 | 450000 | - | - | - | - | 2015 |

### 5.2.6 Marketing linkage

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

**Table no. 68: Backward and Forward Linkage**

| S. No. | Project | Type of Marketing Facility | Pre-project (no.) | During the project (no.) | Post-project (no.) |
|---|---|---|---|---|---|
| 1 | ***IWMP II$^{nd}$*** | **Backward linkages** | | | |
| | | Seed certification | 1 | 1 | 1 |
| | | Seed supply system | 30 | 32 | 48 |
| | | Fertilizer supply system | 12 | 18 | 20 |
| | | Pesticide supply system | 6 | 6 | 10 |
| | | Credit institutions | Bank-5 | Bank-7 | Bank-10 |
| | | Water supply | - | - | - |
| | | Extension services | 3 | 3 | 12 |
| | | Nurseries | 1 | 1 | 12 |
| | | Tools/machinery suppliers | - | - | 2 |
| | | Price Support system | - | - | 4 |
| | | Labour | - | - | - |
| | | Any other (please specify) | - | - | - |
| | | **Forward linkages** | | | |
| | | Harvesting/threshing machinery | 4 | 8 | 12 |
| | | Storage (including cold storage) | 1 | 1 | 4 |
| | | Road network | | | |
| | | Transport facilities | - | - | - |
| | | Markets / Mandis | 8 | 9 | 12 |
| | | Agro and other Industries | 1 | 5 | 6 |
| | | Milk and other collection centres | - | 2 | 6 |
| | | Labour | - | - | - |
| | | Hatchery (Portable) | - | 5 | 8 |
| | | Vermi-compost unit | - | 2 | 5 |
| | | Animal Mineral Mixture | - | - | 50 gm/day/animal |

## 5.3 Convergence Planning for various activities

5.3.1 Earthen bund, contour bund, percolation tank, injection well will be made in watershed area convergence with MNREGS

5.3.2 Soil health card, crop demonstration, kisan gosthi, kisan mela, farmer's school also organized in watershed area under many scheme of department of Agriculture.

5.3.3 Composite fish farming or mixed fish farming popularized in this area with Department of fisheries.

5.3.4 Animal health camp, fodder development, vaccination work also made through Veterinary Department.

5.3.5 Aforestation in project area also done with Forest Department.

5.3.6 Dry land horticulture also convergence with department of horticulture.

**Table no. 69: Details of Convergence of other Schemes in the Project area with IWMP Project**

| S.No. | Name of the MW | Names of Departments with Schemes converging with IWMP* | Fund made available to IWMP project due to convergence (Rs. In lakh) | Was this fund included in Rs. 12,000/15,000 Per ha | | Name of activity/task/structure undertaken with converged funds | Reference no. of activity/task/structure in DPR | Level at which decision for convergence was taken $ |
|---|---|---|---|---|---|---|---|---|
| | | | | Yes | No | (a) Structures<br>(b) Livelihoods<br>(c) Production System | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 1 | **KHARIKAURA 2B1D5e1d** | MNREGS | 4.00 | | No | **a** | **5** | DRDA |
| | | DA | 0.40 | | No | **b, c** | **5** | PIA |
| | | DHO | 0.10 | | No | **b, c** | **5** | PIA |
| | | DF | 0.20 | | No | **b, c** | **5** | PIA |
| | | F | 0.30 | | No | **b, c** | **5** | PIA |
| | | **Total** | **5.00** | | No | | | |
| 2 | **GANRAKHA 2B1D5#1d** | MNREGS | 15.00 | | No | **a** | **5** | DRDA |
| | | DA | 1.50 | | No | **b, c** | **5** | PIA |
| | | DHO | 0.30 | | No | **b, c** | **5** | PIA |
| | | DF | 0.40 | | No | **b, c** | **5** | PIA |
| | | F | 0.30 | | No | **b, c** | **5** | PIA |
| | | **Total** | **17.50** | | No | | | |
| 3 | **BASAHIYA 2B1D5e2b** | MNREGS | 17.00 | | No | **a** | **5** | DRDA |
| | | DA | 1.70 | | No | **b, c** | **5** | PIA |
| | | DHO | 0.50 | | No | **b, c** | **5** | PIA |
| | | DF | 0.50 | | No | **b, c** | **5** | PIA |
| | | F | 0.30 | | No | **b, c** | **5** | PIA |
| | | **Total** | **19.00** | | No | | | |
| 4 | **PANARIYA 2B1D5e2c** | MNREGS | 14.00 | | No | **a** | **5** | DRDA |
| | | DA | 1.40 | | No | **b, c** | **5** | PIA |
| | | DHO | 0.30 | | No | **b, c** | **5** | PIA |
| | | DF | 0.40 | | No | **b, c** | **5** | PIA |
| | | F | 0.45 | | No | **b, c** | **5** | PIA |
| | | **Total** | **16.55** | | No | | | |
| 5 | **CHANDAI 2B1D5e2d** | MNREGS | 5.00 | | No | **a** | **5** | DRDA |
| | | DA | 0.50 | | No | **b, c** | **5** | PIA |
| | | DHO | 0.20 | | No | **b, c** | **5** | PIA |
| | | DF | 0.20 | | No | **b, c** | **5** | PIA |
| | | F | 0.20 | | No | **b, c** | **5** | PIA |
| | | **Total** | **6.10** | | No | | | |

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|
| 6 | **MOHANKOLA 2B1D5e2e** | MNREGS | 8.00 | | No | **a** | **5** | DRDA |
| | | DA | 0.60 | | No | **b, c** | **5** | PIA |
| | | DHO | 0.30 | | No | **b, c** | **5** | PIA |
| | | DF | 0.30 | | No | **b, c** | **5** | PIA |
| | | F | 0.25 | | No | **b, c** | **5** | PIA |
| | | **Total** | **9.45** | | No | | | |
| 7 | **DHANAURA M. 2B1D5e2f** | MNREGS | 11.00 | | No | **a** | **5** | DRDA |
| | | DA | 0.90 | | No | **b, c** | **5** | PIA |
| | | DHO | 0.40 | | No | **b, c** | **5** | PIA |
| | | DF | 0.45 | | No | **b, c** | **5** | PIA |
| | | F | 0.60 | | No | **b, c** | **5** | PIA |
| | | **Total** | **13.35** | | No | | | |
| 8 | **SINHORAWA 2B1D5e2g** | MNREGS | 20.50 | | No | **a** | **5** | DRDA |
| | | DA | 1.60 | | No | **b, c** | **5** | PIA |
| | | DHO | 0.50 | | No | **b, c** | **5** | PIA |
| | | DF | 0.50 | | No | **b, c** | **5** | PIA |
| | | F | 0.60 | | No | **b, c** | **5** | PIA |
| | | **Total** | **22.70** | | No | | | |
| | | **Grand Total** | **109.65** | | No | | | |

# only letter (a) or (b) or (c) needs to be filled. In case more than one activity has been undertaken all the concerned letters may be indicated e.g. (a) + (b)
$ WC/GP/WDT/PIA/DRDA cell/ZP/DPC/SLNA / DoLR- only initials as indicated here need to be entered.
* DA= Department of Agriculture, DHO= Department of Horticulture, VO= Department of Veterinary, DF= Department of Fisheries, F= Forest

# 6. CAPACITY BUILDING PLAN

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

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

**Scope of capacity building at IWMP II$^{nd}$**

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

Capacity building and training are the most important components of watershed management programme both for the field level project staff/ officers and functionaries of people institutions i.e. watershed community. Apart from enhancing technical skill of the project staff, this would also provide opportunities to community members to develop their capacity as the feature custodians of the programmes after project's withdrawal. IWMP II$^{nd}$ Siddharthnagar financial outlay for capacity buildings is 5% (Rs. 28.872) of the total project cost, out of which Rs 0.872 will be expanded for initition of village level institution.

## Table no 70 : Capacity Building activities in the project

| S.No. | Project Stakeholders | Total no. of persons | No. of persons trained so far | No. of persons of be trained during current financial year | Sources of funding for training | | Name and Address of the Institute where Trained |
|---|---|---|---|---|---|---|---|
| | | | | | a) DoLR | b) any other (pl. specify) | |
| 1 | PIAs | 8 | 2 | 8 | **DoLR** | | KVK, GSP,GKSS |
| 2 | WDTs | 32 | 12 | 32 | **DoLR** | | KVK, GSP,GKSS |
| 3 | UGs | 155 | 52 | 155 | **DoLR** | | KVK, GSP,GKSS |
| 4 | SHGs | 180 | 42 | 180 | **DoLR** | | KVK, GSP,GKSS |
| 5 | WCs | 17 | 5 | 17 | **DoLR** | | KVK, GSP,GKSS |
| 6 | GPs | 22 | - | 22 | **DoLR** | | KVK, GSP,GKSS |
| 7 | Community | 1200 | - | 1200 | **DoLR** | | KVK, GSP,GKSS |
| 8 | Others (pl. specify) | | | | | | |

## Table no 70.1: Detail of activities undertaken

| Strategy | Proposed activity | No. of Units | Unit cost | Total Cost |
|---|---|---|---|---|
| Capacity building Activities | Stakeholders - Scientists Interaction, | 15 | 0.10 | 1.00 |
| | Training (2 days) | 100 | 0.05 | 5.00 |
| | Vocational/employment Generation Training (5-10 days) | 100 | 0.10 | 10.00 |
| | In-service Training. (3 days) | 20 | 0.10 | 2.00 |
| | Exposure visit within State | 5 | 0.20 | 1.00 |
| | Exposure visit out of State | 6 | 0.50 | 3.00 |
| | Field days | 10 | 0.20 | 2.00 |
| | Workshop | 2 | 1.00 | 2.00 |
| | **Total** | | | **26.00** |

## Table no 70.2 : Information, Education & Communication (IEC) activities in the project area

| S.no. | Activity | Executing agency | Estimated expenditure (Rs.) | Expected Outcome (may quantify wherever possible) |
|---|---|---|---|---|
| 1 | Street plays | Local Drama Groups | 50000.00 | Awareness about importance of watershed project |
| 2 | Video Shows | IWMP, Siddharthnagar | 50000.00 | |
| 3 | Pamphlets and Poster | IWMP, Siddharthnagar | 50000.00 | |
| 4 | Banners and Hoardings | IWMP, Siddharthnagar | 50000.00 | |
| | | **Total** | **200000.00** | |

# 7. PHASING OF PROGRAMMES AND BUDGETING

## 7.1 FUNDING OF THE PROJECT

**Table no. 72 : Funding for the IWMP Project ***

**(All financial figures in lakh Rs.)**

| S.No. | Names of Project | IWMP fund | | Funds from other sources in addition to IWMP funds | | | | | | | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Central share | State share | Convergence funds | | PPP | | Community | | Institutional finance | | Others (pl. specify) | | |
| | | | | Name of Scheme | Amount | Name of Private sector | Financial contribution | Name | Financial contribution | Name | Financial contribution | Name | Financial contribution | |
| 1 | IWMP II[nd] | 805.20 | - | * | 109.65 | - | - | - | - | - | - | - | - | 919.85 |

***For detail please see table no. 69 it is additional budget and not included in fund budget (Rs. 12000.00). this budget will be use in watershed area according requirement and need during work phase by PIA.**

## 7.2 YEAR WISE PHASING OF WORK (Physical and Financial)

Phasing of various works/ activities during different year of the project for treatable area 4812.00 ha out of proposed area 5062.00 ha presented in table

**Table no. 73: COMPONENT WISE AND YEAR WISE PHASING OF PHYSICAL AND FINANCIAL OUTLAY**

**(All financial figures in lakh Rs)**

| S.N. | Particulars | 1st Year (2010-11) | | 2nd Year (2011-12) | | 3rd Year (2012-13) | | 4th Year (2013-14) | | 5th Year (2014-15) | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Finncial lac | Phy. Hc | Finncial lac | Phy. Hc | Finncial lac | Phy. Hc | Finncial lac | Phy. Hc | Finncial lac | Phy. Hc | Finncial lac | Phy. Hc |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| 1 | Administration Cost 10% | 2.8872 | To meet out the administrative works/charges | 8.6616 | As per column 4 | 15.59 | As per column 4 | 15.59 | As per column 4 | 15.0134 | As per column 4 | 57.744 | As per column 4 |
| 2 | Monitoring 1% | - | monitoring of the project | 1.1548 | As per column 4 | 1.1548 | As per column 4 | 1.1548 | As per column 4 | 2.3097 | As per column 4 | 5.7744 | As per column 4 |
| 3 | Evaluation 1% | - | Evaluation of the project | 1.7323 | As per column 4 | 1.0105 | As per column 4 | 1.0105 | As per column 4 | 2.0210 | As per column 4 | 5.7744 | As per column 4 |

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **4** | **Entry point Activities 4%** | **23.0976** | **Renovation of Culvert, well soaking pit kishan vikas manch etc.** | **-** | **As per column 4** | **-** | **As per column 4** | **-** | **As per column 4** | **-** | **As per column 4** | **23.0976** | **As per column 4** |
| **5** | **Institution & Capacity Building 5%** | **2.8872** | **Training Of DPR** | **14.436** | **As per column 4** | **4.3308** | **As per column 4** | **4.3308** | **As per column 4** | **2.8872** | **As per column 4** | **28.872** | **As per column 4** |
| **6** | **DPR 1%** | **5.7744** | **Preparation of DPR** | **-** | **As per column 4** | **-** | **As per column 4** | **-** | **As per column 4** | **-** | **As per column 4** | **5.7744** | **As per column 4** |
| **7** | **Watershed Dev. Works 50%** | **-** | **Construction of Soil and water recharging structure Agro forestry horticulture etc.** | **43.308** | **721.8** | **89.5032** | **1491.72** | **83.7288** | **1395.48** | **72.18** | **1203** | **288.72** | **4812** |
| **8** | **Livelihood Activities 10%** | **-** | **Nadef compost unit, Dairy/Goat,Poultry General merchant etc.** | **5.7744** | **As per column 4** | **23.0976** | **As per column 4** | **17.3232** | **As per column 4** | **11.5488** | **As per column 4** | **57.744** | **As per column 4** |
| **9** | **Productiion System & micro Enterprises 13%** | **-** | **farming system approach animal husbandry activates, horticulture, vegetables growing, medicinal plants, Floriculture etc.** | **5.25** | **As per column 4** | **23.25** | **As per column 4** | **28.5** | **As per column 4** | **17.25** | **As per column 4** | **75.0672** | **As per column 4** |
| **10** | **Consolidation Phase** | **-** | **Consolidation activites** | **-** | **As per column 4** | **-** | **As per column 4** | **-** | **As per column 4** | **28.872** | **As per column 4** | **28.872** | **As per column 4** |
| | **Total** | **34.6464** | | **80.3171** | **721.8** | **157.9369** | **1491.72** | **151.6381** | **1395.48** | **152.0821** | **1203** | **577.44** | **4812** |

**Table no. 74: ABSTARACT OF COMPONENT WISE WORK AND FINANCIAL OUTLAY OF THE SELECTED 9 WATERSHED**

**(All financial figures in lakh Rs.)**

| S.No. | Component | Total |
|---|---|---|
| **1** | **MANAGEMENT COSTS** | |
| **A** | **Administrative cost-TA&DA, POL/Hiring of vehicles/office and payment of electricity and phone bill etc. computer, stationary and office consumable and Contingency** | 57.744 |
| **B** | **Monitoring** | 5.7744 |
| **C** | **Evaluation** | 5.7744 |
| | **Sub Total** | **69.2928** |
| **2** | **PREPARATORY PHSES** | - |
| **A** | **Entry Point Activities like improvement in drinking water system, school, temple etc** | 23.0976 |
| **B** | **Capacity Building** | 28.872 |
| **C** | **DPR** | 5.7744 |
| | **Sub Total** | **57.744** |
| **3** | **WATERSHED WORKS** | - |
| **A** | **Soil and Moisture Conservation** | 288.72 |
| | **Contour Bund** | 58.46 |
| | **Graded Bund** | 51.97 |
| | **Gully Plug** | 19.49 |
| **B** | **Water Resource Development** | |
| | **Water harvesting Bundhi, Farm ponds, check dam injection well, open well, bore well etc** | 164.80 |
| **C** | **Agro-forestry & Horticulture** | |
| | **Agro-forestry** | 4.20 |
| | **Horticulture** | 14.24 |
| | **Sub Total** | **288.72** |
| **4** | **LIVILIHOOD PROGRAMME (Community based)** | - |
| | **Income generating activities through SHG are for landless and marginal farmers. Establishment of Vermi compost units Mushroom cultivation Block plantation of Aonla Bael Ber for fire wood** | 57.744 |
| | **Sub Total** | **57.744** |
| **5** | **PRODUCTION SYATEM AND MICRO ENTERPRISES** | |
| | **<u>Demonstrations and Assessment</u>**<br>**Seed, Biofertilizer, Pest control, Advance agril. Equipment, Production of Compost** | 75.0672 |
| | **Sub Total** | **75.0672** |
| **6** | **CONSOLIDATION PHASE** | 28.872 |
| | **Sub Total** | **28.872** |
| | **TOTAL** | **450.4032** |
| | **GRAND TOTAL** | **577.44** |

# 8. CONSOLIDATION/EXIT STRATEGY

## 8.1 Quality and Sustainability Issues

### 8.1.1 Plans for Monitoring and Evaluation

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

### 8.1.2 Plans for Project management:

The Project management of any watershed programme is very important. It mainly depends upon the community organization and the village level institutes in IWMP II$^{nd}$ Siddharthnagar 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.

### 8.1.3 Watershed Development Fund:

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

### 8.1.4 User Charges:

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

## 8.2 Activities in the CPRs in the project area

**Table no. 75: Details of activities in the CPRs in the Project areas**

| S.no | Name (s) of the villages | CPR particulars | Activity Proposed | Target | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | Target area under the activity (ha) | Estimated expenditure (laks.) | Expected no. of beneficiaries | Estimated contribution to WDF (Rs.) | Expected month & year of completion (mm/yyyy) |
| 1 | **KHARIKAURA 2B1D5e1d** | Wasteland | Engineering work | 102.00 | 6.12 | 350 | 31000.00 | 2015 |
| | | Forest | Afforesttion | 22.00 | 1.32 | 88 | 7000.00 | 2012 |
| | | Pasture | Land development | 3.00 | 0.18 | 70 | 1000.00 | 2012 |
| | | Orchard | Horticulture | 10.00 | 0.60 | 180 | 3000.00 | 2012 |
| | | Village Pond | Moisture Conservation | 2 no | 2.00 | 140 | 10000.00 | 2011 |
| | | **Total** | | **137.00** | **10.22** | **828** | **52000.00** | |
| 2 | **GANRAKHA 2B1D5e1d** | Wasteland | Engineering work | 107.00 | 6.42 | 410 | 32100.00 | 2015 |
| | | Forest | Afforesttion | 45.00 | 2.70 | 188 | 13500.00 | 2012 |
| | | Pasture | Land development | 4.00 | 0.24 | 82 | 1200.00 | 2012 |
| | | Orchard | Horticulture | 10.00 | 0.60 | 192 | 3000.00 | 2012 |
| | | Village Pond | Moisture Conservation | 2 no | 2.00 | 140 | 10000.00 | 2011 |
| | | **Total** | | **166.00** | **11.96** | **1012** | **59800.00** | |
| 3 | **BASHIYA 2B1D5e2b** | Wasteland | Engineering work | 223.00 | 13.38 | 1092 | 66900.00 | 2015 |
| | | Forest | Afforesttion | 90.00 | 5.40 | 375 | 27000.00 | 2012 |
| | | Pasture | Land development | 5.00 | 0.30 | 75 | 1500.00 | 2012 |
| | | Orchard | Horticulture | 20.00 | 1.20 | 315 | 6000.00 | 2012 |
| | | Village Pond | Moisture Conservation | 2 no | 2.00 | 140 | 10000.00 | 2011 |
| | | Temple | EPA | 2 no | 2.00 | - | 10000.00 | 2015 |
| 4 | **PANARIYA 2B1D5e2c** | **Total** | | **338.00** | **24.28** | **1997** | **121400.00** | |
| | | Wasteland | Engineering work | 82.50 | 4.95 | 290 | 24750.00 | 2015 |
| | | Forest | Afforesttion | 22.00 | 1.32 | 82 | 7000.00 | 2012 |
| | | Pasture | Land development | 3.00 | 0.18 | 92 | 1000.00 | 2012 |
| | | Orchard | Horticulture | 10.00 | 0.60 | 170 | 3000.00 | 2012 |
| | | Village Pond | Moisture Conservation | 3 no | 3.00 | 152 | 10000.00 | 2011 |
| | | **Total** | | **120.50** | **10.23** | **786** | **51150.00** | |
| 5 | **CHANDAI 2B1D5e2d** | Wasteland | Engineering work | 42.70 | 2.56 | 295 | 12800.00 | 2015 |
| | | Forest | Afforesttion | 5.00 | 0.30 | 78 | 1500.00 | 2012 |
| | | Orchard | Horticulture | 3.00 | 0.18 | 70 | 1000.00 | 2012 |
| | | Village Pond | Moisture Conservation | 3 no | 3.00 | 152 | 10000.00 | 2012 |
| | | **Total** | | **50.70** | **6.04** | **595** | **30200.00** | |

| S.no | Name (s) of the villages | CPR particulars | Activity Proposed | Target | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | Target area under the activity (ha) | Estimated expenditure (laks.) | Expected no. of beneficiaries | Estimated contribution to WDF (Rs.) | Expected month & year of completion (mm/yyyy) |
| 6 | **MOHANKOLA 2B1D5e2e** | Wasteland | Engineering work | 102.00 | 6.12 | 350 | 24750.00 | 2015 |
| | | Forest | Afforesttion | 22.00 | 1.32 | 88 | 7000.00 | 2012 |
| | | Pasture | Land development | 3.00 | 0.18 | 70 | 1000.00 | 2012 |
| | | Orchard | Horticulture | 10.00 | 0.60 | 180 | 3000.00 | 2012 |
| | | Village Pond | Moisture Conservation | 3 no | 3.00 | 140 | 15000.00 | 2011 |
| | | **Total** | | **137.00** | **11.22** | **828** | **56150.00** | |
| 7 | **DHANAURA M. 2B1D5e2f** | Wasteland | Engineering work | 107.00 | 6.42 | 410 | 32100.00 | 2015 |
| | | Forest | Afforesttion | 45.00 | 2.70 | 188 | 13500.00 | 2012 |
| | | Pasture | Land development | 4.00 | 0.24 | 82 | 1200.00 | 2012 |
| | | Orchard | Horticulture | 10.00 | 0.60 | 192 | 3000.00 | 2012 |
| | | Village Pond | Moisture Conservation | 2 no | 2.00 | 140 | 10000.00 | 2011 |
| | | **Total** | | **166.00** | **11.96** | **1012** | **59800.00** | |
| 8 | **SINHORAWA 2B1D5e2g** | Wasteland | Engineering work | 223.00 | 13.38 | 1092 | 66900.00 | 2015 |
| | | Forest | Afforesttion | 90.00 | 5.40 | 375 | 27000.00 | 2012 |
| | | Pasture | Land development | 5.00 | 0.30 | 75 | 1500.00 | 2012 |
| | | Orchard | Horticulture | 20.00 | 1.20 | 315 | 6000.00 | 2012 |
| | | Village Pond | Moisture Conservation | 5 no | 5.00 | 280 | 25000.00 | 2011 |
| | | Temple | EPA | 2 no | 2.00 | - | 10000.00 | 2015 |
| | | **Total** | | **338.00** | **24.28** | **2137** | **136400.00** | |

## 8.3 Sustainability and environment security

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

## 8.4 Economic Analysis

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

### 8.4.1 Agriculture

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

**Table no. 76: Economics of agriculture sector**

| S.No. | Sector | Area (ha) | NPV (Rs.) | BC ratio |
|---|---|---|---|---|
| 1 | Irrigated agriculture | 1483.00 | 94755630 | 1.6:1 |
| 2 | Rainfed agriculture | 5462.00 | 16642810 | 1.2:1 |
| 3 | Total | 6945.00 | 111398440 | 1.4:1 |

### 8.4.2 Horticulture

Economic analysis of horticulture plantation in agri-horti system at IWMP-I$^{st}$ watershed Project life is considered to be 25 years and discount rate for NPV estimation is 10%

**Table no. 77: Economics of Horticulture sector**

| S.No. | Common Name | Scientific name | Area (ha) | NPV of net venefit (Rs.) | BC ratio |
|---|---|---|---|---|---|
| 1 | Aonla | *Embelica officinalis* | 70.00 | 1057725 | 3.97:1 |
| 2 | Ber | *Zyziphus mauritiana* | 50.00 | 251962 | 2.81:1 |
| 3 | Bael | *Aegle marmelos* | 50.00 | 169887 | 2.84:1 |
| | Total | | 170.00 | 1,47,9574 | 3.512 |

### 8.4.3 Forest/ Fuel wood plantation

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

**Table no. 78: Economics of aforestation sector**

| S.No. | Common Name | Scientific name | Area (ha) | NPV of net benefit (Rs.) | BC ratio |
|---|---|---|---|---|---|
| 1 | Vilayati Babul | Prosopis juliflora | 70.00 | 384482 | 2.11:1 |

### 8.4.4 Food sufficiency

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

**Table no 79: Status of food requirement and availability per annum in IWMP-II[nd] watershed**

| S.No. | Items | Requirement (q/yr) | Before project | | Proposed | |
|---|---|---|---|---|---|---|
| | | | Availability (q/yr) | Deficit or surplus (q/yr) | Availability (q/yr) | Deficit or surplus (q/yr) |
| 1 | Cereals | 55000 | 49850 | -6150 | 79460 | +24460 |
| 2 | Pulses | 16000 | 12340 | -3660 | 28936 | +12936 |
| 3 | Oil seeds | 22000 | 17750 | -4250 | 29972 | +7972 |
| 4 | Vegetable | 33000 | 25330 | -8670 | 38540 | +5540 |

# 9. EXPECTED OUTCOMES

## 9.1 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. 80: Employment in Project area**

| S.no. | No. of the villages | Wage employment | | | | | | | | | | Self employment | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | No. of man days | | | | | No. of beneficiaries | | | | | No. of beneficiaries | | | | |
| | | SC | ST | Others | Women | Total | SC | ST | Others | Women | Total | SC | ST | Others | Women | Total |
| 1 | 48 (IWMP II$^{nd}$) | 1.050 | - | 1.288 | 0.140 | 2.338 | 1280 | - | 244 | 192 | 3720 | 160 | - | 24 | 50 | 45 |

## 9.2. Migration

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

**Table no. 81: Details of seasonal migration from Project area**

| S.no. | Names of villages | No. of persons migration | No. of days per year of migration | Major reason(s) for migration | For reduced migration identify major activities of IWMP responsible | | Expected reduction in No. of persons migration |
|---|---|---|---|---|---|---|---|
| | | | | | (a) Structures | (b) Livelihoods | |
| 1 | IWMP II$^{nd}$ (48 village) | 9400 | 180 | Due to employment | Structure | Livelihood | 6000 |

## 9.3 Drinking water

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

**Table no. 82: Status of Drinking water**

| S. No. | Names of Villages | Availability of drinking water (no. of months in a year) | | Quality of drinking water | | Comments |
|---|---|---|---|---|---|---|
| | | Pre-project | Expected Post project | Pre-project | Expected Post-project | |
| 1 | IWMP II$^{nd}$ (48 village) | 10 month | 12 month | General water | Good water | - |

## 9.4 Vegetative cover

There is negligible area under tree cover. The village has a negligible forest area which consists of only *Prosopis Juliflora* (babool). Trees like Neem and *Alianthus* are seen just here and there, not concentrated in any area. It is planned that 120.00 ha land to be covered under new plantation.

**Table no. 83: Forest/vegetative cover**

| S. No. | Name of Village | Existing area under tree cover (ha) | Area under tree cover proposed |
|---|---|---|---|
| 1 | IWMP II$^{nd}$ (48 village) | - | 120 |

## 9.5 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. 84: Details of livestock in the project areas (for fluids please mention in litres, for solids please mention in kgs. and income in Rs.)**

| S. no. | Name of MW | Type of animal | Pre Projected | | | Expected Post Projected | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | No | Yield | Income | No | Yield | Income | |
| 1 | IWMP II[nd] (48 village) | Buffalow | 9665 | 2.33lit/animal | 20.00/day | 11786 | 4.00lit/animal | 30.00/day | |
| | | Cow | 6837 | 1.84lit/animal | 16.00/day | 7668 | 3.004lit/animal | 25.00/day | |
| | | Sheep | 347 | 10kg/animal | 2000.00/animal | 7681 | 20kg/animal | 4000.00/animal | |
| | | Goats | 6732 | 8 kg/animal | 1600.00/animal | 405 | 16 kg/animal | 3200.00/animal | |
| | | Pigs | 10 | 20.0 kg/ha | 2000.00/animal | 710 | 50.0 kg/ha | 10000.00/animal | |
| | | Poultry | - | 0.75kg/bird | 150.00/bird | - | 0.75kg/bird | 300.00/bird | |
| | | Fish | - | 10.73 q/ha | 15000.00/ha | - | 50.00 q/ha | 75000.00/ha | |

## 9.6 Vegetation/ crop related outcomes:

**Table no. 85: Details of karif drop area and yield in the project areas**

| S. No. | Names of villages | Name of crops | Pre-project | | | | | | Expected Post-project | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Area (ha) | | Average Yield (Qtl) per ha. | | Total Production (Qtl) | | Area (ha) | | Average Yield (Qtl) per ha. | | Total Production (Qtl) | |
| | | | Irri | Rf. | Irri | Rf. | Irri | Rf. | Irri | Rf. | Irri | Rf. | Irri | Rf. |
| 1 | **KHARIKAURA 2B1D5d2f** | Paddy | 60 | 10 | 18.00 | 10.00 | 1080 | 100 | 268 | 78 | 30.00 | 20.00 | 8040 | 1560 |
| | | Others* | - | 200 | - | 8.00 | - | 1600 | - | 300 | - | 15.00 | - | 4500 |
| 2 | **GANRAKHA 2B1D5d2d** | Paddy | 100 | 50 | 18.00 | 10.00 | 1800 | 900 | 290 | 110 | 30.00 | 20.00 | 8700 | 2200 |
| | | Others* | - | 250 | - | 8.00 | - | 2000 | - | 400 | - | 15.00 | - | 6000 |
| 3 | **BASAHIYA 2B1D5d2e** | Paddy | 200 | 100 | 18.00 | 10.00 | 3600 | 1000 | 524 | 217 | 30.00 | 20.00 | 15720 | 4340 |
| | | Others* | - | 400 | - | 8.00 | - | 3200 | - | 700 | - | 15.00 | - | 10500 |
| 4 | **PANARIYA 2B1D5d3a** | Paddy | 50 | 80 | 18.00 | 10.00 | 900 | 800 | 251 | 102 | 30.00 | 20.00 | 7530 | 2040 |
| | | Others* | - | 150 | - | 8.00 | - | 1120 | - | 300 | - | 15.00 | - | 4500 |
| 5 | **CHNDAI 2B1D5d3e** | Paddy | 30 | 20 | 18.00 | 10.00 | 540 | 200 | 238 | 50 | 30.00 | 20.00 | 7140 | 1000 |
| | | Others* | - | 90 | - | 8.00 | - | 720 | - | 200 | - | 15.00 | - | 3000 |
| 6 | **MOHANKOLA 2B1D5d2c** | Paddy | 50 | 40 | 18.00 | 10.00 | 900 | 400 | 283 | 90 | 30.00 | 20.00 | 8490 | 1800 |
| | | Others* | - | 170 | - | 8.00 | - | 1360 | - | 300 | - | 15.00 | - | 4500 |
| 7 | **DHANAURA M. 2B1D5d3b** | Paddy | 40 | 30 | 18.00 | 10.00 | 720 | 400 | 257 | 80 | 30.00 | 20.00 | 7710 | 1600 |
| | | Others* | - | 180 | - | 8.00 | - | 1440 | - | 300 | - | 15.00 | - | 4500 |
| 8 | **SINHORAWA 2B1D5d3c** | Paddy | 200 | 100 | 18.00 | 10.00 | 3600 | 1000 | 471 | 150 | 30.00 | 20.00 | 14130 | 3000 |
| | | Others* | - | 400 | - | 8.00 | - | 3200 | - | 500 | - | 15.00 | - | 7500 |
| | **Total** | | **730** | **2270** | **144** | **144** | **13140** | **19440** | **2582** | **3877** | **240** | **280** | **77460** | **62540** |

Irri.- Irrigated Rf.- Rainfed

Others: Pigeon pea, moong urd, jwar, etc

**Table no. 86: Details of Rabi drop area and yield in the project areas ***

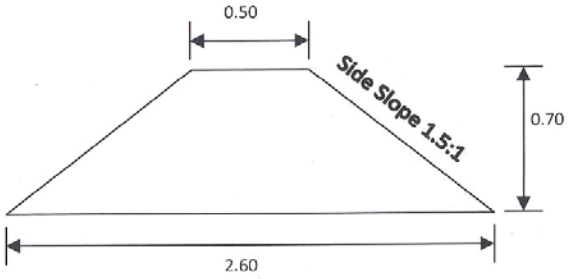
| S.No. | Names of villages | Name of crops | Pre-project | | | | | | Expected Post-project | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Area (ha) | | Average Yield (Qtl) per ha. | | Total Production (Qtl) | | Area (ha) | | Average Yield (Qtl) per ha. | | Total Production (Qtl) | |
| | | | Irri | Rf. | Irri | Rf. | Irri | Rf. | Irri | Rf. | Irri | Rf. | Irri | Rf. |
| 1 | **KHARIKAURA 2B1D5d2f** | Wheat | 60 | 160 | 25.00 | 20.00 | 1500 | 1600 | 268 | 200 | 30.00 | 25.00 | 8040 | 5000 |
| | | Others* | - | 90 | - | 10.00 | - | 900 | - | 78 | - | 15.00 | - | 1170 |
| 2 | **GANRAKHA 2B1D5d2d** | Wheat | 100 | 250 | 25.00 | 20.00 | 2500 | 5000 | 290 | 300 | 30.00 | 25.00 | 8700 | 7500 |
| | | Others* | - | 100 | - | 10.00 | - | 1000 | - | 110 | - | 15.00 | - | 1650 |
| 3 | **BASAHIYA 2B1D5d2e** | Wheat | 200 | 400 | 25.00 | 20.00 | 5000 | 8000 | 524 | 600 | 30.00 | 25.00 | 15720 | 15000 |
| | | Others* | - | 150 | - | 10.00 | - | 1500 | - | 212 | - | 15.00 | - | 3180 |
| 4 | **PANARIYA 2B1D5d3a** | Wheat | 50 | 180 | 25.00 | 20.00 | 900 | 800 | 251 | 200 | 30.00 | 25.00 | 7530 | 5000 |
| | | Others* | - | 80 | - | 10.00 | - | 1120 | - | 102 | - | 15.00 | - | 1530 |
| 5 | **CHNDAI 2B1D5d3e** | Wheat | 30 | 90 | 25.00 | 20.00 | 540 | 200 | 238 | 200 | 30.00 | 25.00 | 7140 | 5000 |
| | | Others* | - | 20 | - | 10.00 | - | 720 | - | 50 | - | 15.00 | - | 750 |
| 6 | **MOHANKOLA 2B1D5d2c** | Wheat | 50 | 200 | 25.00 | 20.00 | 900 | 400 | 283 | 200 | 30.00 | 25.00 | 8490 | 5000 |
| | | Others* | - | 50 | - | 10.00 | - | 1360 | - | 90 | - | 15.00 | - | 1350 |
| 7 | **DHANAURA M. 2B1D5d3b** | Wheat | 40 | 200 | 25.00 | 20.00 | 720 | 400 | 257 | 200 | 30.00 | 25.00 | 7710 | 5000 |
| | | Others* | - | 40 | - | 10.00 | - | 1440 | - | 80 | - | 15.00 | - | 1200 |
| 8 | **SINHORAWA 2B1D5d3c** | Wheat | 200 | 400 | 25.00 | 20.00 | 3600 | 1000 | 471 | 400 | 30.00 | 25.00 | 14130 | 10000 |
| | | Others* | - | 110 | - | 10.00 | - | 3200 | - | 150 | - | 15.00 | - | 2250 |
| **Total** | | | **730** | **2520** | **200** | **240** | **15660** | **28640** | **2582** | **3172** | **240** | **320** | **77460** | **70580** |

Irri.- Irrigated Rf.- Rainfed

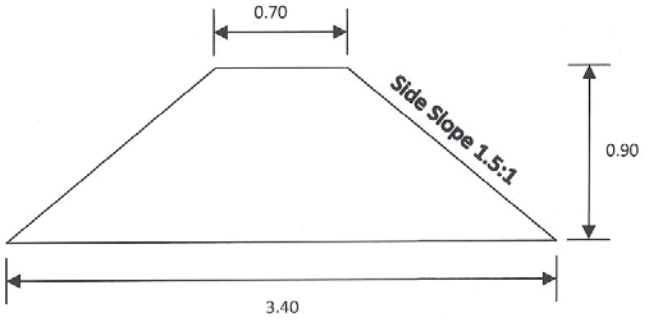
* Others crop: chick pea, pea, mustard, potato etc

# 10- DETAILS ESTIMATE OF WATERSHED DEVELOPMENT WORK PHASES (ANNEXURE-1)

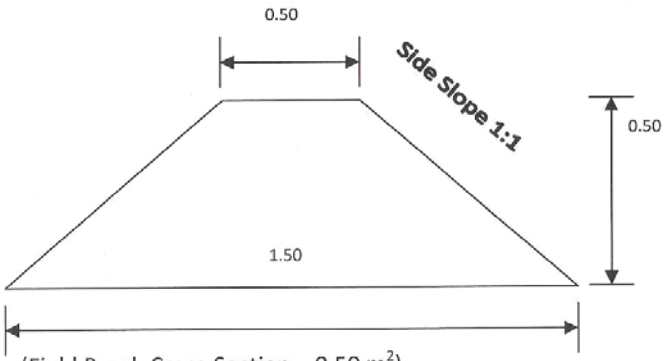
**DRAWING OF C.B., S.B., P.B., AND M.B.** (All dimensions in Metre) *(Not to Scale)*



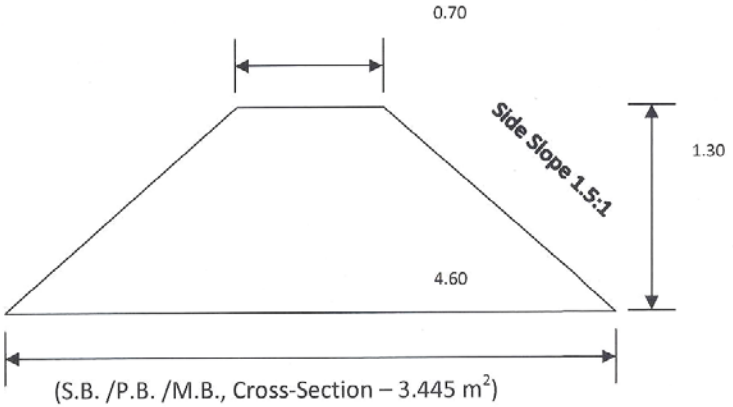

(C.B., Cross-Section – 1.085 $m^2$)




(S.B., Cross-Section – 1.845$m^2$)



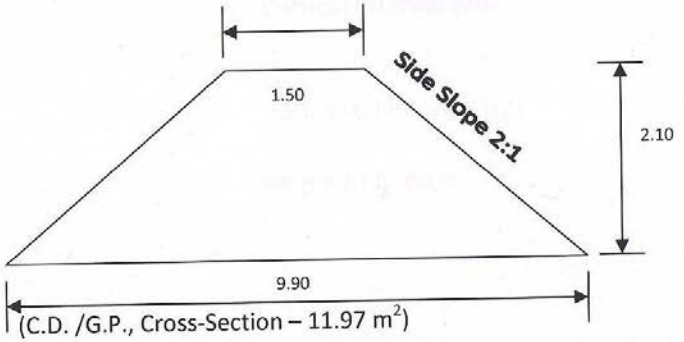

(Field Bund, Cross-Section – 0.50 $m^2$)



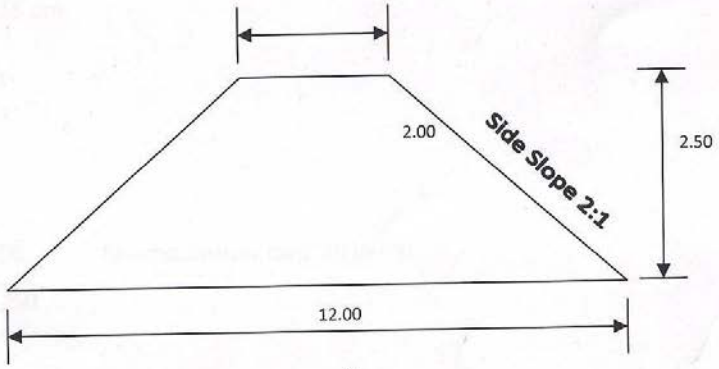

(S.B. /P.B. /M.B., Cross-Section – 3.445 $m^2$)

## DRAWING OF EARTHEN CHEKDAM / GULLY PLUG

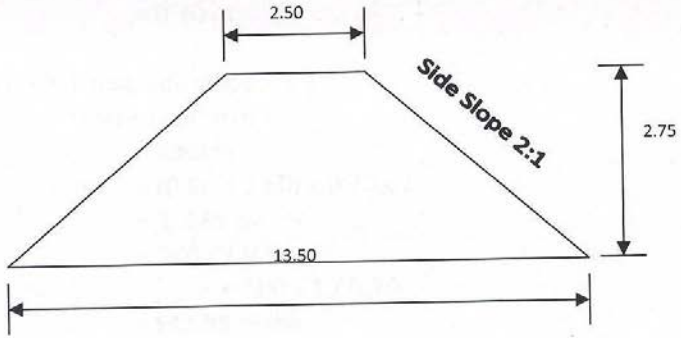
*(Not to Scale)*




(C.D. /G.P., Cross-Section – 11.97 $m^2$)




(C.D. /G.P., Cross-Section – 17.50 $m^2$)




(W.H.B., Cross-Section – 22.00 $m^2$)

**(All dimensions in Metre)**

# DESIGN OF CONTOUR BJUND

| | |
|---|---|
| Type of Soil | - Clay |
| Rain fall | - 24 hr in cm -25 cm |
| Fied Stop -1% | |
| Virtical interval (Vi) | = [s/3+2] |
| | = [1/3+2] |
| Horizontal interval (HI) | = 0.70 m |
| | = 100xV.I/s |
| Heidht of Bond h | = (Rex vi)/50 |
| | = (25x0.7) /50 |
| | 0.35 |
| | 0.59 |
| | Say 0.6 m |
| Ferr bord | = 15% of high mimimum -10 cm |
| Hight | = 0.60+0.10 |
| | = 0.70m |
| Taking top widh of bond 0.50 m and side slope 1.5:l | |
| Then base of bond | =0.50+(1.10d)x 2 |
| | = 2.60 m |
| Coress-Seclion of bond | =(2.50+ 2.60) x0.70/2 |
| | =1.085$m^2$ |
| Length of bond | = 100s/V.I. |
| | =100x1/0.70 |
| | **= 142.85 m/ha** |
| | **Say 120 m/ha** |
| Earth work /ha | = 250x1.085 |
| | = 162.75 cum |
| | = 162 .75 cum |
| Cort Rs./ ha | =162.7 x39.16=6373.29 |
| | **Say 6375.00** |

## DESION OF SUMBERGENCE BOND

| | |
|---|---|
| Types siol – Caly | Rainfall intensiy for 24 hrs – 25 cm |
| Fild slope 3% | V.I. =[s/3+2] x0.30 |
| | = 0.909 m |
| Horizontal Interval =(100xV.I.)/s | = (100x0).3 |
| | = 30m |
| Height of bond h = (Re x V.I.)/50 | =( 25 x 0.90)/0 =0.45 =0.67m. Say 0.70m |
| Feree bord 20% of hight minimum 20 cm | = |
| Total Hight | = 0.90 m |
| Takingh top wigth of bond 0.70 m and side slope 1.5:1 | |
| Bottom of bund | = 0.70+2x 1.5d |
| | = 0.70+2.70 |
| | = 3.40 |
| Cross section of Submergence Bond | = (0.70+3.40)x09.90/2 |
| | = 1.845 $m^2$ |
| Lengh of bond | = 100s/V.I. |
| | = (100x3) /0.90 |
| | = 333 m |
| Feasible length | = 100+25+25 |
| | = 150m |
| Earth work/ha | = 150x1.845 |
| | = 276.75 |
| | = 276.75x39.16 |
| Cost per has | = 10,837.53 |
| | **Say 10,850=00** |

## TYPICAL SECAION OF FILED BUND

| | |
|---|---|
| Top widht | = 0.50m |
| Side slope | =1:1 |
| Height of bound | = 0.50m |
| Bottom Widht | = 1.50m |
| Cross section | = (0.580+1.50)x0.50/2=100cum |
| Length per hectare | = 200 m |
| Earhwork | = 200x0.50=100cum |
| Cost 39.16/cum | = Rs.3916.00 |
| Cost per hectare | =Rs. 3916.00 |

## TYPICAL SECTION OF P.B., M.B., S.B0.

| | |
|---|---|
| Top width | = 0.70m |
| Side slope | = 1.5: 1 |
| Height | = 1.30 m |
| Bottom | =4.60 m |
| Cross section | = (0.70+4.60)x1.30/2=3.445$m^2$ |
| Cost/meter | = Rs. 142.00 |

**TYPICAL SECTION OF EARTHEN CHECK DAM / GULLY PLUG**

| | |
|---|---|
| Top width | =1.50 m |
| Side slope | = 2:1 |
| Height | = 2.10m |
| Bottom Width | =9.90 m |
| Cross section | = (1.50 + 9.90 ) x2.10 / 2 |
| | =11.97 $m^2$ |
| Cost per meter | = Rs. 551.45 |

**TYPICAL SECION OF CHEK DAM / GULLY PLUG**

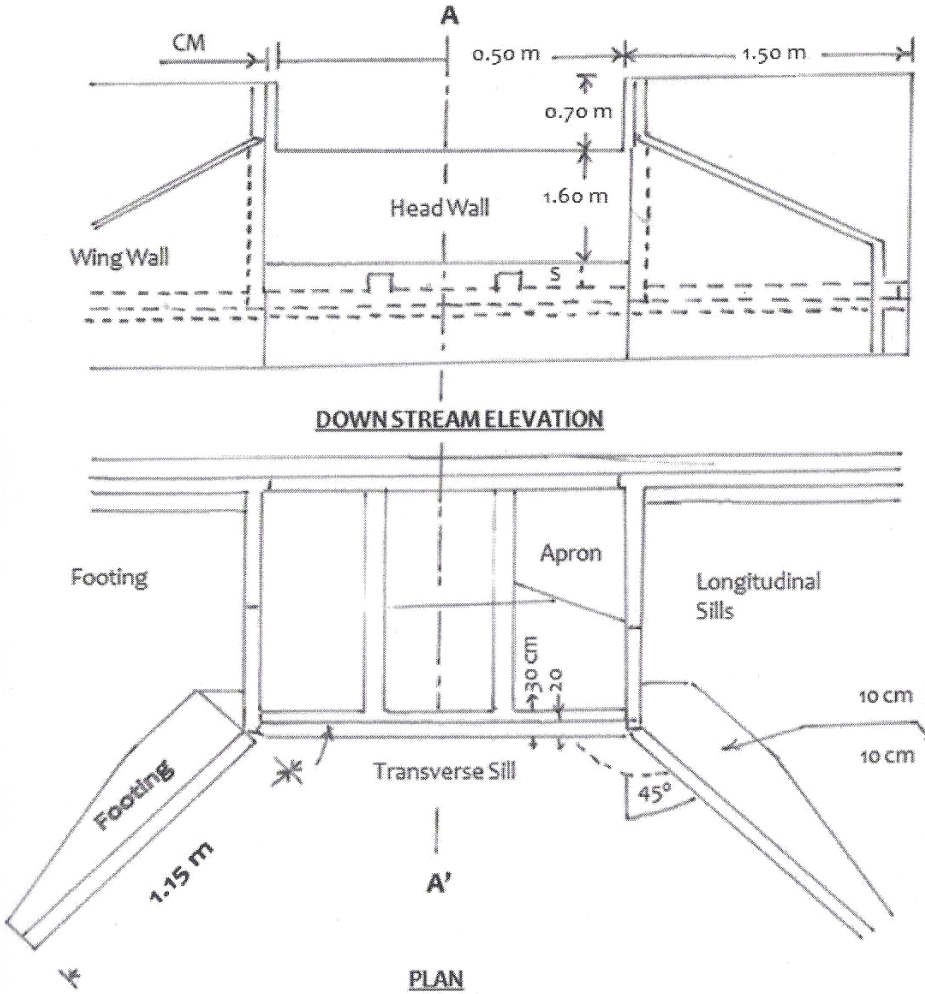
| | |
|---|---|
| Top Width | = 2.00m |
| Side slope | =2:1 |
| Height | = 2.50 m |
| Bottom Width | = 12.00 m |
| Cross Section | = (2.00 + 12.00 ) x 2.50 / 2 |
| | = 17.50 $m^2$ |
| Cost/meter | = Rs. 839.12 |

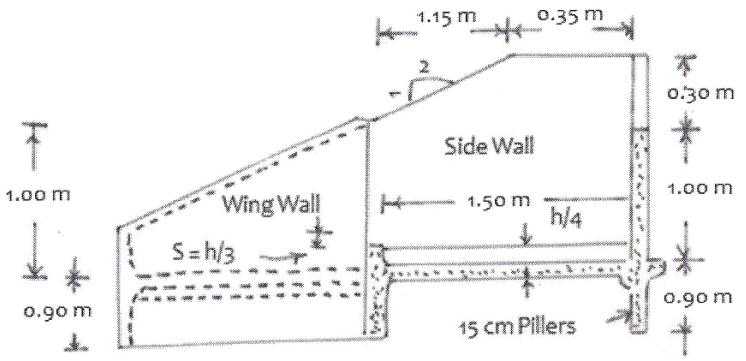
## TYPICAL SECTIO0N OF W.H.B

| | |
|---|---|
| Top width | = 2.50 m |
| Side slope | = 2:1 |
| Height | = 2.75 m |
| Bottom Width | = 13.50 m |
| Cross section | = ( 2.50 + 13.50 ) x 2.75/2 |
| | = 22.00 $m^2$ |
| Per meter cost | = Rs. 1085.92 |

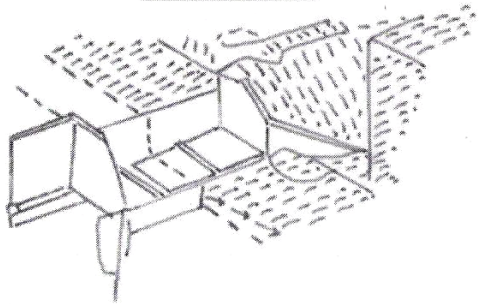
## DRAWING OF SPILLWAY OF CREST LENGTH 0.5 m

Not to Scale




SECTION ON A-A'



PERSPECTIVE VIEW

Design of Drop Spillway to be constructed at a place in a gully having width of 1.0 m and catchment area 1.00 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 120 mm/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 form 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

$$Q = \frac{1.711LH^{3/2}}{} = (1.1+0.01f) = \text{o find suitable value of L\&H}$$

Let us assume L=0.50 m(since width of gully is 1.00m)

$$0.10 = \frac{1.711LH^{3/2}}{(1.1.+0..01x\ 0.5)} = \frac{1.711L\ H^{3/2}}{(1.105)}$$

$$L\ H^{3/2} = \frac{1.105x\ .10}{1.711} = \frac{0.1105}{1.711} = 0.064$$

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

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

Test L / h = 0.50 = 2.$\geq$ 2. 0 hence O.K.; 0.25 h / f = $\frac{0.25}{0.50}$ = 0.50 $\leq$ 0.5 hence O.K.

## 3. Structural design -

1. Minimum headwall extension , E =(3h +0.6 ) or 1.5 f whichever is greater E= 3x0.5+0.6 or 1.5x0.50
   E = 2.10m or 0.75+m = Adopted 2.10m
2. Length of apron basin $L_B$ = (2.28 h/f + 0.54 ) =0.50 (2.20 x $\frac{0.5}{}$ + 0.54)-0.5
   =0.50x2.74 =1.37 m says 1.40m
3. Height of end sill, S =h=0.50= 0.16m says 0.20m

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

$J = 2h$ or $[f + h + S – (L_B + 0.10)/2 ]$ whichever is greater = 2 x 0.20 or [0.50 + 0.50+0.16 – (1.37+0.10/2)]

= 1.0 or [1.16 -0.735 ] = 1.0 or 0.425 (adopt J = 1.00 m )

5. $M = 2(f + 1.33\ h – J)$ = 2 (0.050 + 1.16 – 0.733x 0.25 – 1.00) = 2x (-0.167) = -0.335

6. $K = ( L_B + 0.1 ) – M$ = (1.037 + 0.1 ) – 0.335 =1.47 – 0.335 =1.135 m

Toe and cut off walls

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

Maximum Scour depth (M S D ) = 1.5 x N S D = 1.5 x 0.219 = 0.328m 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 0.20m since structure is constructed in masonry ,the Apron thickness will be 0.20x1.50=0.30m

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

| **Description** | **Thickness of wall** | |
|---|---|---|
| | **T op width** | **Bottom width** |
| Head wall | 0.40 | 1.00 |
| Side wall | 0.30 | 0.80 |
| Wing all 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 | Tow 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 | 2 | 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 | 4.70 | 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 Brick 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 | Tow 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 | 16.360cum |

**5. C.C.W. 1:2:4 in 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 | 0.18 | 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 | 0.130cum |

**6. Tuck Pointing 1:3**

| S.No. | Description of work | No. | L | B | D/H | Quantity |
|---|---|---|---|---|---|---|
| 1 | Head wall | 1<br>1 | 0.50<br>0.50 | - | 0.60<br>0.84 | 0.30<br>0.42 |
| 2 | Side wall | 2<br>2 | 1.50<br>(0.30+1.50)/2 | - | 1.00<br>0.30 | 3.00<br>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 | $9.62m^2$ |

**CONSUMPTAION OF MATERIALS**

| S.No. | Particulars | Quantity | Cement (Bags) | Coarse Sand (cum) | Brick (No.) | G.S.B. 25-40 mm (cum) | G.S. Grit 10-20 mm (cum) |
|---|---|---|---|---|---|---|---|
| 1 | Sand laying | 0.995cum | - | 0.995 | - | - | - |
| 2 | C.C.W. 1:3:6 | 1.492 cum | 6.61 | 0.671 | - | 1.342 | - |
| 3 | Brick Masonry | 16.360 cum | 29.26 | 5.562 | 1880 | - | - |
| 4 | C.C.W. 1:2:4 | 0.130 cum | 0.79 | 0.045 | - | - | 0.110 |
| 5 | Tuck Pointing 1:3 | $9.62\ m^2$ | 0.44 | 0.045 | - | - | |
| | Total | | 46.90 | 7.327 | 8180 | 1.342 | 0.110 |
| | Say | 47 Bags | | | | | |

## Cost of Materials

| S.No. | Name of Materials | Quantity | Rate | Amount |
|---|---|---|---|---|
| 1 | Cement | 47 Bags | 255.00/bag | 11985.00 |
| 2 | Coarse sand | 7.327 cum | 910.00/cum | 6667.57 |
| 3 | Brick | 8180 | 4500.00/th | 36810.00 |
| 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 |
| | **Total** | | | **Rs.56747.48** |

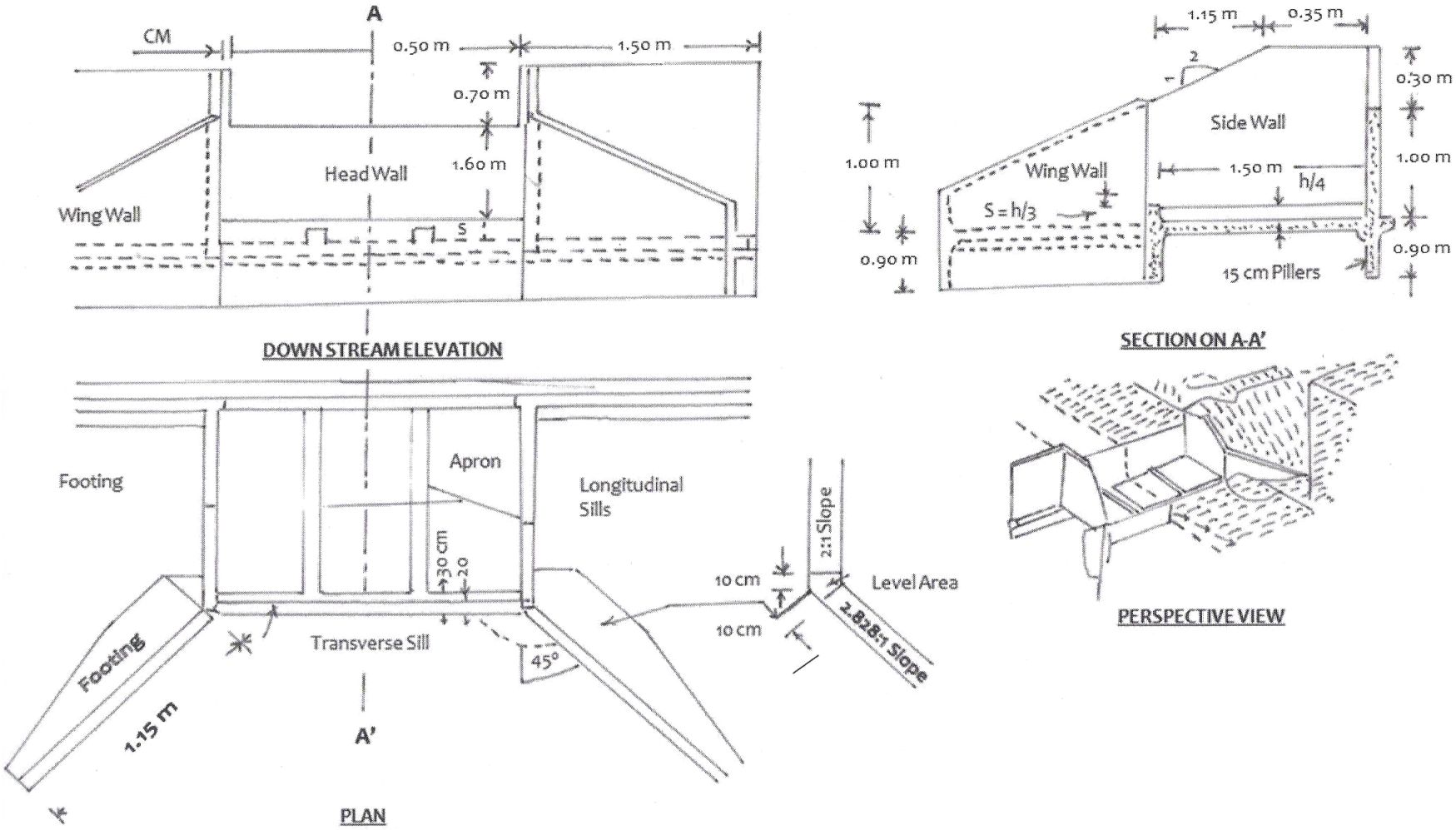
## LABOUR CHARGE

| S.No. | Name of Materials | Quantity | Rate | Amount |
|---|---|---|---|---|
| 1 | Earth Work | 13.23cum | 36.66/cum | 485.01 |
| 2 | Sand Laying | 0.995cum | 33.33/cum | 33.16 |
| 3 | C.C.W. 1:3:6 | 1.495cum | 494/cum | 337.04 |
| 4 | Brick masonry | 16.36cum | 400/cum | 6544.00 |
| 5 | C.C.W. 1:2:4 | 0.130cum | 494/cum | 64.22 |
| 6 | Tuck Pointing | 9.62$m^2$ | 51.61/$m^2$ | 496.48 |
| 7 | Curing | 16.36cum | 25.00/cum | 409.00 |
| 8 | Chowkidar | 6 Man days | 100.00/Man day | 600.00 |
| 9 | Head Load & local taion cost 10% cost of material | - | - | 3670.64 |
| Total | | | | **Rs. 13039.55** |

| **Total Expenditure** | |
|---|---|
| 1. Cost of Materials | 56747.48 |
| 2 Labour Charges | 13039.55 |
| **Total** | **Rs. 69787.03** |
| | **Says Rs. 69800.00 only** |

## DRAWING OF SPILLWAY OF CREST LENGTH 0.5 m

Not to Scale



Design of Drop Spillway to be constructed at a place in a gully having width of 1.0 m and Catchments area 1.00 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 120 mm/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 form Rational formula is given as :

$$Q = \frac{C.I.A.}{360} = \frac{0.3 \times 120 \times 5.0}{360} = 0.50\ m^3/s$$

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

$$Q = \frac{1.711LH^{3/2}}{(1.1+0.01f)} =$$

To find suitable value of L&H

Let us assume L=1.0 m(since width of gully is 2.00m)

$$0.50 = \frac{1.711LH^{3/2}}{(1.1.+0..01x\ 0.5)} = \frac{1.711L\ H^{3/2}}{(1.2)}$$

$$L\ H^{3/2} = \frac{1.120 \times 0.5}{1.711} = 0.350$$

$$H^{3/2} = \frac{0.375}{1.711x4} = 0.35$$

$$H = (0.350)^{3/2} = 0.49\ m \text{ says } 0.50m$$

Test $L / h = \frac{1.00}{0.25} = 2.00 \geq 2.0$ hence O.K.;

$h / f = \frac{0.50}{1.00} = \leq 0.5 \leq$ hence O.K.

Heace he designed hydraulic dimensions of the Spilay are :

Crest Length (L) = 1.00 m

Weir depth (h) = 0.50m

## 3. Structural design -

1. Minimum headwall extension , E =(3h +0.6 ) or 1.5 f whichever is greater ; 3x0.50+0.6 or 1.5x1

E =(1.5+060) or 21.50m

= 2.10 or 1.50 Adopted = 2.10 m

2. Length of apron basin $L_B$ = (2.28 h/f + 0.54 ) =1(2.28 x $\underline{0.50}$ + 0.54 = 1.68m

3. Height of end sill, S =$\underline{h}$=$\underline{0.50}$= 0.16m

3 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 x 0.50 or [1.0+ 0.50+0.16 – (1.68+0.10/2)]

= 1.0 or [1.66 -0.89 ] = 1.00 or 0.77(adopt J = 1.00 m )

5. M = 2(f + 1.33 h –J) = 2 (1.0+ 1.33 x 0.50 – 1.00) = 2 (-0.1665-1.00) = 1.33m

6. K = ( $L_B$ + 0.1 ) – M = (1.68 + 0.1 ) – 1.33 =0.45 m

Toe and cut off walls

Normal scour depth (N S D ) =0.473 x (Q / f )$^{1/3}$ = 0.473 x (0.5/1.0) $^{1/3}$ taking f =1

= 0.473 x(0.5)$^{1/3}$ = 0.473 x0.793 =0.375 m

Maximum Scour depth (M S D ) = 1.5 x N S D = 1.5 x 0.375 = 0.56m Says

Depth of cutoff / Toe wall 0.56 m say 0.60m

**Apron thickness :** For an over fall of 1.0 m .The apron thickness in concrete construction is 0.30m since structure is constructed in masonry ,the Apron thickness will be 0.30x1.50=0.45m

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

| **Description** | **Thickness of wall** | |
|---|---|---|
| | **T op width** | **Bottom width** |
| Head wall | 0.45 | 1.00 |
| Side wall | 0.30 | 0.80 |
| Wing all and head wall extension | 0.30 | 0.60 |

## DETAIL ESTIMATE OF DROP SPILLWAY CREST LENGTH

1. Earth work n cutting

| S.No. | Description of work | No. | L | B | D/H | Quantity |
|---|---|---|---|---|---|---|
| 1 | Side wall | 2 | 1.70 | 1.00 | 1.15 | 3.91 |
| 2 | Head all | 1 | 0.80 | 1.20 | 1.15 | 1.10 |
| 3 | Head wall extension | 2 | 2.20 | 0.80 | 1.15 | 4.04 |
| 4 | Toe wall | 1 | 0.80 | 0.70 | 0.80 | 0.45 |
| 5 | Cut off | 1 | 5.20 | 0.80 | 0.70 | 2.91 |
| 6 | Apron | 1 | 1.70 | 0.80 | 0.60 | 0.81 |
| 7 | Wing wall | 2 | 1.30 | 0.80 | 1.15 | 2.39 |
| | | Total | | | | 15.60 cum |

**2. Laying of sand in the bed & foundation**

| S. No. | Description of work | No. | L | B | D/H | Quantity |
|---|---|---|---|---|---|---|
| 1 | Side wall | 2 | 1.70 | 1.00 | 0.10 | 0.340 |
| 2 | Head all | 1 | 1.00 | 0.40 | 0.10 | 0.040 |
| 3 | Head wall extension | 2 | 2.10 | 0.80 | 0.10 | 0.336 |
| 4 | Toe wall | 1 | 1.00 | 0.80 | 0.10 | 0.080 |
| 5 | Cut off | 1 | 5.20 | 0.80 | 0.10 | 0.416 |
| 6 | Apron | 1 | 1.60 | 1.00 | 0.10 | 0.160 |
| 7 | Wing wall | 2 | 1.30 | 0.80 | 0.10 | 0.208 |
| | Total | | | | | 1.580 cum |

**3.C.C.W 1:3:6 in founjdation**

| S. No. | Description of work | No. | L | B | D/H | Quantity |
|---|---|---|---|---|---|---|
| 1 | Side wall | 2 | 1.70 | 1.00 | 0.15 | 0.510 |
| 2 | Head all | 1 | 1.00 | 0.40 | 0.15 | 0.060 |
| 3 | Head wall extension | 2 | 2.10 | 0.80 | 0.15 | 0.378 |
| 4 | Toe wall | 1 | 1.00 | 0.80 | 0.15 | 0.120 |
| 5 | Cut off | 1 | 5.20 | 0.80 | 0.15 | 0.624 |
| 6 | Apron | 1 | 1.60 | 1.00 | 0.10 | 0.160 |
| 7 | Wing wall | 2 | 1.30 | 0.80 | 0.15 | 0.312 |
| | Total | | | | | 2.164cum |

**4. Brick masonry**

| S. No. | Description of work | No. | L | B | D/H | Quantity |
|---|---|---|---|---|---|---|
| 1 | Cut of wall | 1 | 5.20 | 0.60 | 0..60 | 1.8725 |
| 2 | Head wall | 1 | 1.00 | 1.00 | 0.90 | 0.900 |
| | | 1 | 1.00 | (0.40+1.00)/2 | 1.00 | 0.700 |
| 3 | Side wall | 2 | 1.70 | 1.00 | 0.45 | 1.530 |
| | | 2 | 1.70 | 0.80 | 0.45 | 0.918 |
| | | 2 | 1.70 | 0.80 | 0.60 | 1.020 |
| | | 2 | 1.70 | 0.60 | 0.40 | 0.544 |
| | | 2 | (1.70+0.45)/2 | 0.40 | 0.50 | 0.430 |
| 4 | Head wall extension | 2 | 2.10 | 0.80 | 0.65 | 2.184 |
| | | 2 | 2.10 | 0.60 | 0.45 | 1.134 |
| | | 2 | 2.10 | 0.40 | 1.30 | 2.184 |
| 5 | Wing wall | 2 | 1.30 | 0.80 | 0.45 | 0.936 |
| | | 2 | 1.30 | 0.60 | 0.45 | 0.702 |
| | | 2 | 1.30 | 0.40 | (1.00+0)/2 | 0.520 |
| 6 | Toe wall | 1 | 1.00 | 0.80 | 0.45 | 0.360 |
| | | 1 | 1.00 | 0.60 | 0.45 | 0.270 |
| 7 | Apron | 1 | 1.70 | 1.00 | 0.45 | 0.765 |
| 8 | Longitudinal sill | 2 | 1.70 | 0.20 | 0.20 | 0.136 |
| 9 | Transverse sill | 2 | 1.00 | 0.20 | 0.20 | 0.0440 |
| Total | | | | | | 17.145 cum |

**5. C.C.W. 1;2;4 on the wall and Apron**

| S. No. | Description of work | No. | L | B | D/H | Quantity |
|---|---|---|---|---|---|---|
| 1 | Hide wall | 1 | 1.00 | 0.40 | 0.025 | 0.010 |
| 2 | Side wall | 2 | 0.45 | 0.40 | 0.025 | 0.009 |
| | | 2 | 1.35 | 0.40 | 0.025 | 0.027 |
| 3 | Head wall extension | 2 | 2.10 | 0.40 | 0.025 | 0.042 |
| 4 | Wing wall | 2 | 1.60 | 0.40 | 0.025 | 0.032 |
| 5 | Longitudinal | 2 | 1.70 | 0.20 | 0.025 | 0.017 |
| 6 | Transverse sill | 1 | 1.00 | 0.20 | 0.025 | 0.005 |
| 7 | Apron | 3 | 1.60 | 02. | 0.025 | 0.024 |
| **Total** | | | | | | **0.166 cum** |

**6. Tuck Pointing 1:3**

| S. No. | Description of work | No. | L | B | D/H | Quantity |
|---|---|---|---|---|---|---|
| 1 | Side wall | 1 | 1.00 | - | 1.00 | 1.00 |
| | | 1 | 1.00 | - | 1.165 | 1.16 |
| 2 | Side wall | 2 | 0.45 | - | 1.50 | 1.35 |
| | | 2 | 1.25 | - | (1.50+1.00)/2 | 3.12 |
| 3. | Wing wall | 2 | 2.30 | - | (1.00+0)/2 | 1.30 |
| 4 | Head wall | 2 | 2.10 | - | 1.00 | 4.20 |
| **Total** | | | | | | **12.13m$^2$** |

## CONSUMPTION OF MATERIALS

| S. No. | Particulars | Quantity | Cement(Bags) | Sand(cum) | Brick (N0) | G.S.Git 25-40mm(cum) | Grit 10-20 mm(cum) |
|---|---|---|---|---|---|---|---|
| 1 | Sand laying | 1.580cum | - | 1.580 | - | - | - |
| 2 | C.C.W. 1:3:6 | 2.164 cum | 9.95 | 0.973 | - | 1.947 | - |
| 3 | Brick masonry | 17.145cum | 41.14 | 5.829 | 8755 | - | - |
| 4 | C.C.W 1:2:4 | 0.166 cum | 1.01 | 0.069 | - | - | 0.141 |
| 5 | Tuck Pointing | 12.13m$^2$ | 0.55 | 0.057 | - | - | - |
| | **Total** | | **25.65** | **8.508** | **8755** | **1.947** | **0.141** |
| | **Say** | | **53 Bags** | **8.51 cum** | **8755** | **1.95cum** | **0.14 cum** |

## COST OF MATERILS

| S.No. | Name of materials | Quantity | Rate | Amount |
|---|---|---|---|---|
| 1 | Cement | 53 ?Bags | 255.00 | 13515.00 |
| 2 | Course sand | 8.51cum | 910.00 | 7744.10 |
| 3 | Brick | 8755 | 4500/th | 39397.50 |
| 4 | G.S.B. 25-40 mm | 1.95 cum | 855.00 | 1667.25 |
| 5 | G.S.Grit 10-20 | 0.14 cum | 1250.00 | 175.00 |
| | | **Total** | | **Rs.62498.85** |

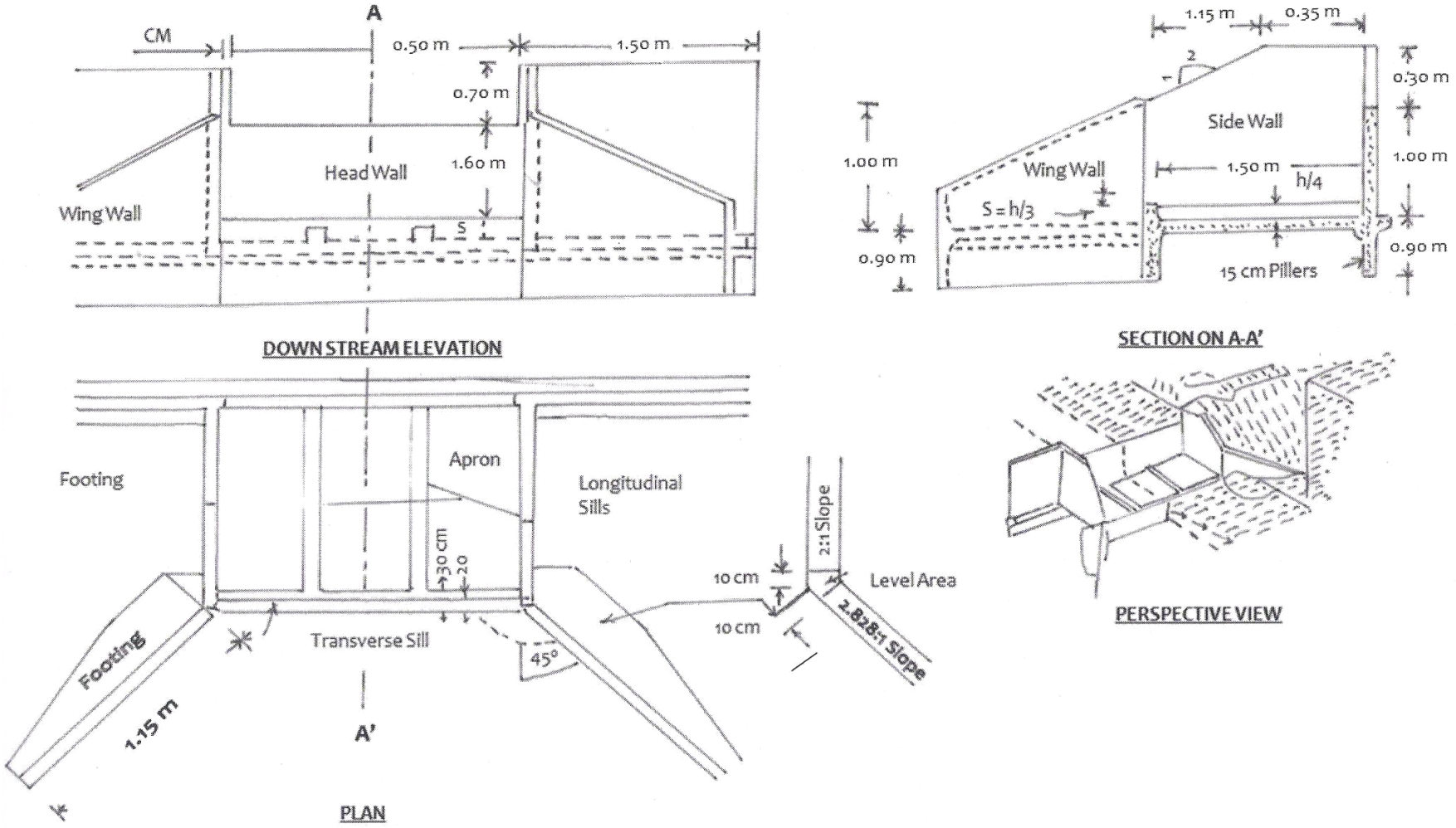
## LABOUR CHARHGE

| S.No. | Particulars | Quantity | Rate | Amount |
|---|---|---|---|---|
| 1 | Earth work | 15.60 cum | 36.66/cum | 57189 |
| 2 | Sand Laying | 1.580 cum | 33.33/cum | 52.66 |
| 3 | C.C.W 1:3:6: | 2.164 cum | 494/cum | 1.69.0. |
| 4 | C.C.W. 1:2:4: | 0.166 cum | 494/cum | 82.00 |
| 5 | Brick Masonry | 17.145 cum | 400/cum | 6858.00 |
| 6 | Truck Pointing | 12.13$m^2$ | 51.61/$m^2$ | 626.02 |
| 7 | Curing | 170145cum | 25.00/cum | 428.62 |
| 8 | Chowkidar | 65Man Days | 100.00/Man Day | 600.00 |
| 9 | Head Load & local transporation 10% cost of materials | | | 4068.00 |
| | | | **Total** | **Rs.14356.20** |

| **Total Expenditure** | |
|---|---|
| 1. Cost of Materials | 62498.85 |
| 2. Labour Charges | 14356.20 |
| **Total** | **Rs. 76855.05** |
| | **Say Rs.76900.00** |

## DRAWING OF SPILLWAY OF CREST LENGTH 0.5 m

Not to Scale



Design of Drop Spillway to be constructed at a place in a gully having width of 1.0 m and Catchments area 1.00 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 120 mm/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 form Rational formula is given as :

$$Q = \frac{C.I.A.}{360} = \frac{0.3 \times 120 \times 20.0}{360} = 2.00\ m^3/s$$

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

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

To find suitable value of L&H

Let us assume L =2.0 m (since width of gully is 3.00m)

$$2.00 = \frac{1.711LH^{3/2}}{(1.1.+0..01x\ 0.5)} = \frac{1.711L\ H^{3/2}}{(1.10+1.15)}$$

$$L\ H^{3/2} = \frac{2.0 \times 1.115}{1.711} = 0.350$$

$$H^{3/2} = \frac{2.23}{1.711x4} = 0.65$$

$$H = (0.65)^{3/2} = 0.75\ m$$

Test $L / h = \frac{2.00}{0.25} = 2.66 \geq 2.0$ hence O.K.;

$h / f = \frac{0.75}{1.50} = \leq 0.5$ hence O.K.

Heace he designed hydraulic dimensions of the Spilay are :

Crest Length (L) = 2.00 m

Weir depth (h) = 0.81m

## 3. Structural design -

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

E = 3x0.81+0.6 or 1.5x1.50

E =3.03 m or 2.25 m

Adopted = 3.03m

2. Length of apron basin $L_B$ = (2.28 h/f + 0.54 ) =1.5(2.28 x 0.08 + 0.54)
= 1.50 (1.20 + 0.54) =2.61 m

3. Height of end sill, S =h=0.50= 0.16m

4. Height of wing wall and side wall at Junction:
J = 2h or [f + h + S – ($L_B$ + 0.10)/2 ] whichever is greater
= 2 x 0.80 or [1.50+ 0.81+0.27 – (2.61+0.10/2]
= 1.0 or [1.66 -0.89 ] = 1.00 or 0.77(adopt J = 1.00 m )
adopt J = 1.62 m

5. M = 2(f + 1.33 h –J) = 2(1.50 + 1.33 x 0.81 – 1.62 ) = 1.90 m
6. K = ( $L_B$ + 0.1 ) – M = (2.61 + 0.1 ) – 190 =0.81 m

Toe and cut off walls

Normal scour depth (N S D ) =0.473 x (Q / f )$^{1/3}$ = 0.473 x (2/1) $^{1/3}$ = 0.473 x 1.259 = 0.595 m
Maximum Scour depth (M S D ) = 1.5 x N S D = 1.5 x 0.595= 0.89m
Depth of cutoff / Toe wall 0.89 m say 0.60m

**Apron thickness :** For an over fall of 1.0 m .The apron thickness in concrete construction is 0.30m since structure is constructed in masonry ,the Apron thickness will be 0.30x1.50=0.45m

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

| **Description** | **Thickness of wall** | |
|---|---|---|
| | **T op width** | **Bottom width** |
| Head wall | 0.45 | 1.33 |
| Side wall | 0.30 | 1.10 |
| Wing all and head wall extension | 0.30 | 0.80 |

## DETAIL ESTIMATE OF DROP SPILLWAY OF CREST LENGTH 2.00 METRE

**1. Earth work in cutting in foundation**

| S.No. | Description of work | No. | L | B | D/H | Quantity |
|---|---|---|---|---|---|---|
| 1 | Side wall | 2 | 2.65 | 1.30 | 1.15 | 7.92 |
| 2 | Head wall | 1 | 2.00 | 1.60 | 1.15 | 3.68 |
| 3 | Head wall extension | 2 | 3.05 | 1.00 | 1.15 | 7.01 |
| 4 | Wing wall | 2 | 1.95 | 1.00 | 1.15 | 4.48 |
| 5 | Tow wall | 1 | 2.00 | 1.00 | 1.15 | 2.30 |
| 6 | Cut off wall | 1 | 8.40 | 1.00 | 1.15 | 9.66 |
| 7 | Apron | 1 | 2.60 | 2.00 | 0.75 | 3.90 |
| Total | | | | | | **38.95 cum** |

**2 Laying of sand in the bed of foundation**

| S.No. | Description of work | No. | L | B | D/H | Quantity |
|---|---|---|---|---|---|---|
| 1 | Cut of wall | 2 | 8.10 | 0.90 | 0.10 | 0.729 |
| 2 | Side wall | 1 | 2.65 | 1.20 | 0.10 | 0.636 |
| 3 | Head wall l | 2 | 2.00 | 0.70 | 0.10 | 0.140 |
| 4 | Head wall extension | 2 | 3.05 | 0.10 | 0.10 | 0.061 |
| 5 | Wing wall | 1 | 1.95 | 0.90 | 0.10 | 0.351 |
| 6 | Toe wall | 1 | 2.00 | 0.90 | 0.10 | 0.180 |
| 7 | Apron | 1 | 2.00 | 2.65 | 0.10 | 0.530 |
| Total | | | | | | **2.627 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 | 8.10 | 0.90 | 0.15 | 1.093 |
| 2 | Side wall | 2 | 2.65 | 1.20 | 0.15 | 0.954 |
| 3 | Head wall | 1 | 2.00 | 0.70 | 0.15 | 0.210 |
| 4 | Head wall extension | 2 | 3.05 | 0.10 | 0.15 | 0.091 |
| 5 | Wing wall | 2 | 1.95 | 0.90 | 0.15 | 0.526 |
| 6 | Tow wall | 1 | 2.00 | 0.90 | 0.15 | 0.270 |
| 7 | Apron | 1 | 2.00 | 2.65 | 0.15 | 0.795 |
| Total | | | | | | 3.939 cum |

**4 Brick masonry 1:4**

| S.No. | Description of work | No. | L | B | D/H | Quantity |
|---|---|---|---|---|---|---|
| 1 | Cut off wall | 1 | 8.10 | 0.90 | 0.90 | 6.561 |
| 2 | Head wall | 1 | 2.00 | 1.60 | 0.45 | 1.440 |
| | | 1 | 2.00 | 1.50 | 0.45 | 1.350 |
| | | 1 | 2.00 | (0.45+1.40)/2 | 0.85 | 0.527 |
| 3 | Head wall extension | 2 | 3.30 | 0.90 | 0.45 | 2.673 |
| | | 2 | 3.30 | 0.80 | 0.45 | 2.376 |
| | | 2 | 3.30 | 0.60 | 0.60 | 2.376 |
| | | 2 | 3.30 | 0.50 | 0.60 | 1.980 |
| | | 2 | 3.30 | 0.40 | 1.15 | 3.036 |
| 4 | Side wall | 2 | 2.65 | 1.10 | 0.90 | 5.247 |
| | | 2 | 2.65 | 1.10 | 0.45 | 2.623 |
| | | 2 | 2.65 | 1.10 | 0.65 | 3.789 |
| | | 2 | 2.65 | 0.80 | 0.60 | 2.544 |
| | | 2 | 2.65 | 0.60 | 0.45 | 1.431 |
| | | 2 | (0.80+2.65)/2 | 0.50 | 0.70 | 1.260 |
| 5 | Wing wall | 2 | 1.90 | 0.90 | 0.45 | 1.539 |
| | | 2 | 1.90 | 0.80 | 0.45 | 1.368 |
| | | 2 | 1.90 | 0.60 | (1.65+0)/2 | 1.881 |
| 6 | Tow wall | 1 | 2.00 | 0.90 | 0.45 | 0.810 |
| | | 1 | 2.00 | 0.80 | 0.45 | 0.720 |
| | | 1 | 2.00 | 0.40 | 0.30 | 0.240 |
| 7 | Longitudinal sill | 2 | 2.65 | 0.20 | 0.30 | 0.318 |
| 8 | Apron | 2 | 2.65 | 2.00 | 0.45 | 4.770 |
| | | | | | Total | 51.806 cum |

**5. C.C.W. 1:2:4 in the wall**

| S.No. | Description of work | No. | L | B | D/H | Quantity |
|---|---|---|---|---|---|---|
| 1 | Head wall | 1 | 2.00 | 0.45 | 0.025 | 0.0225 |
| 2 | Side wall | 2<br>2 | 0.80<br>1.32 | 0.50<br>0.50 | 0.025<br>0.025 | 0.0200<br>0.330 |
| 3 | Head wall extension | 2 | 3.02 | 0.40 | 0.025 | 0.610 |
| 4 | Wing wall | 2 | 2.52 | 0.60 | 0.025 | 0.765 |
| 5 | Longitudinal sill | 2 | 2.65 | 0.20 | 0.025 | 0.265 |
| 6 | Apron | 1 | 2.65 | 1.60/3 | 0.025 | 0.353 |
| 6 | Toe Wall | 1 | 2.00 | 0.40 | 0.025 | 0.200 |
| | | | | | Total | 0.2939cum |

**6. Tuck Pointing 1:3**

| **S.No.** | **Description of work** | **No.** | **L** | **B** | **D/H** | **Quantity** |
|---|---|---|---|---|---|---|
| 1 | Head wall | 1<br>1 | 2.00<br>2.00 | -<br>- | 0.85<br>1.27 | 1.70<br>2.45 |
| 2 | Side wall | 1<br>1 | 2.65<br>(0.80+2.65)/2 | - | 1.65<br>0.70 | 4.37 |
| 3 | Head wall extension | 2 | 3.30 | - | 1.50 | 1.20 |
| 4 | Wing wall | 2 | 1.90 | - | (1.665+0)/2 | 9.90 |
| | | | | | Total | 3.13$m^2$ |

**CONSUMPTAION OF MATERIALS**

| S.No. | Particulars | Quantity | Cement (Bags) | Coarse Sand (cum) | Brick (No.) | G.S.B. 25-40 mm (cum) | G.S. Grit 10-20 mm (cum) |
|---|---|---|---|---|---|---|---|
| 1 | Sand laying | 2.627 cum | - | 2.227 | - | - | - |
| 2 | C.C.W. 1:3:6 | 3.939 cum | 16.93 | 1.772 | - | 3.545 | - |
| 3 | Brick Masonry | 51.806 cum | 124.33 | 17.614 | 25903 | - | - |
| 4 | C.C.W. 1:2:4 | 0.294 cum | 1.79 | 0.123 | - | - | 0.249 |
| 5 | Tuck Pointing 1:3 | 22.84 $m^2$ | 1.50 | 0.107 | - | - | - |
| | **Total** | | **144.10** | **22.243** | **25903** | **3.545** | **0.249** |
| | **Say** | | **144 Bags** | **22.243 cum** | **25903** | **3.55 cum** | **0.250 cum** |

# Cost of Materials

| S.No. | Name of Materials | Quantity | Rate | Amount |
|---|---|---|---|---|
| 1 | Cement | 144 Bags | 255.00/bag | 36720.00 |
| 2 | Coarse sand | 22.243 cum | 910.00/cum | 20241.13 |
| 3 | Brick | 25903 | 4500.00/th | 115663.50 |
| 4 | G.S.B. 25-40 mm | 3.55 cum | 855.00/cum | 3035.25 |
| 5 | G.S. Grit 10-20 mm | 0.250 cum | 1250.00/cum | 312.50 |
| | Total | | | Rs.176872.38 |

**LABOUR CHARGE**

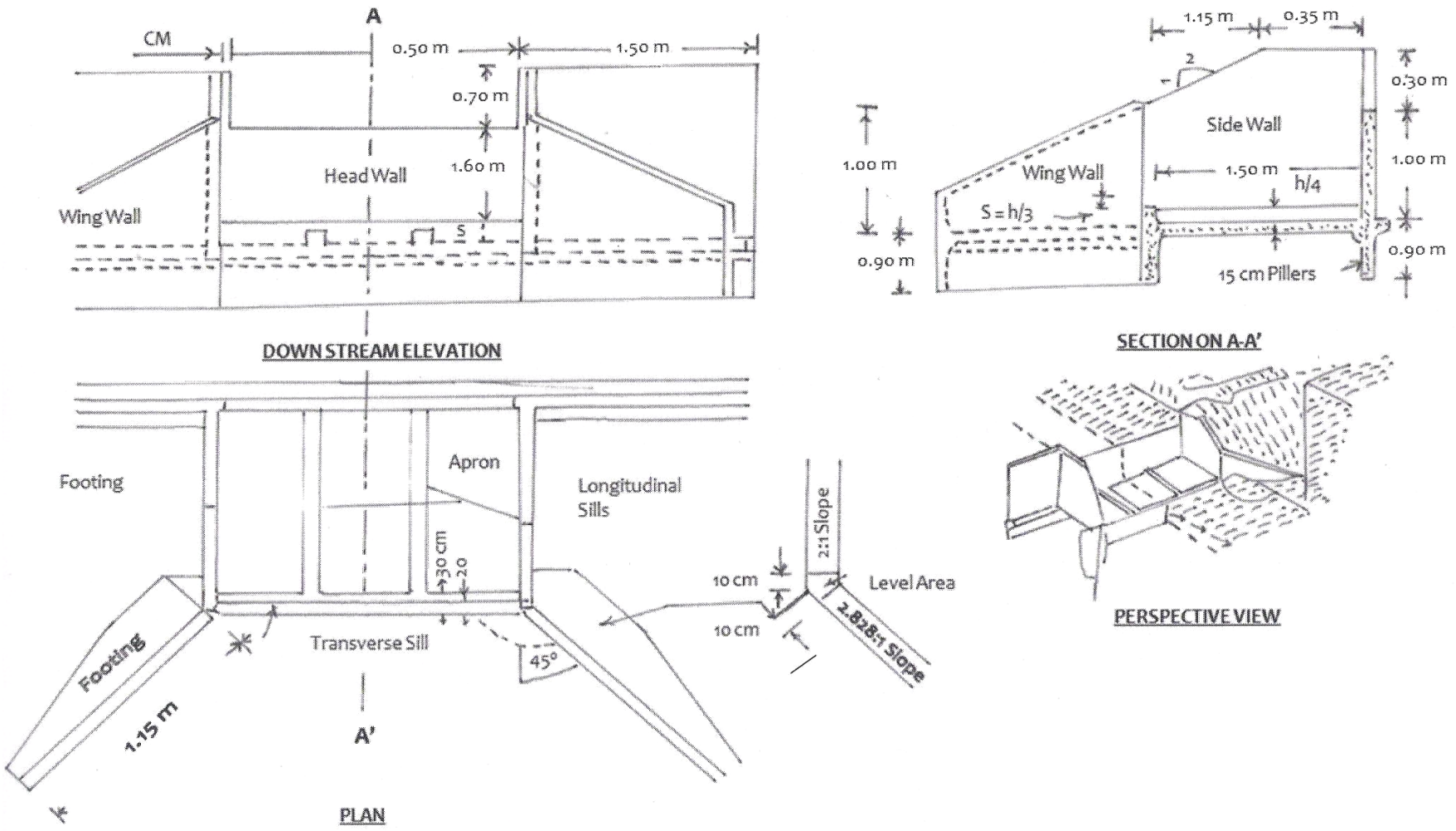
| S.No. | Particulars | Quantity | Rate | Amount |
|---|---|---|---|---|
| 1 | Earth Work | 38.95cum | 36.66/cum | 1427.90 |
| 2 | Sand Laying | 2.627 cum | 33.33/cum | 87.55 |
| 3 | C.C.W. 1:3:6 | 3.939 cum | 494/cum | 1945.86 |
| 4 | C.C.W. 1:2:4 | 0.2939 cum | 400/cum | 145.18 |
| 5 | Brick masonry | 51.806 cum | 494/cum | 20722.40 |
| 6 | Tuck Pointing | 22.84 $m^2$ | 51.61/$m^2$ | 1178.77 |
| 7 | Curing | 51.806 cum | 25.00/cum | 1295.15 |
| 8 | Chowkidar | 13 Man days | 100.00/Man day | 1300.00 |
| 9 | Head Load & local taion cost 10% cost of material | - | - | 11340.03 |
| Total | | | | **Rs. 39442.84** |

**Total Expenditure**

| | |
|---|---|
| 1. Cost of Materials | 176872.38 |
| 2 Labour Charges | 39442.84 |
| **Total** | **Rs. 216315.22** |
| | **Says Rs. 216315.00 only** |

## DRAWING OF SPILLWAY OF CREST LENGTH 0.5 m

Not to Scale



Design of Drop Spillway to be constructed at a place in a gully having width of 1.0 m and Catchments area 1.00 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 120 mm/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 form Rational formula is given as :

$$Q = \frac{C.I.A.}{360} = \frac{0.3 \times 120 \times 20.0}{360} = 2.00\ m^3/s$$

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

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

To find suitable value of L&H

Let us assume L =2.0 m (since width of gully is 3.00m)

$$2.00 = \frac{1.711LH^{3/2}}{(1.1.+0..01x\ 0.5)} = \frac{1.711L\ H^{3/2}}{(1.10+1.15)}$$

$$L\ H^{3/2} = \frac{2.0 \times 1.115}{1.711} = 0.350$$

$$H^{3/2} = \frac{2.23}{1.711x4} = 0.65$$

$$H = (0.65)^{3/2} = 0.75\ m$$

Test $L / h = \frac{2.00}{0.25} = 2.66 \geq 2.0$ hence O.K.;

$h / f = \frac{0.75}{1.50} = \leq 0.5$ hence O.K.

Heace he designed hydraulic dimensions of the Spilay are :

Crest Length (L) = 2.00 m

Weir depth (h) = 0.81m

## 3. Structural design -

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

E = 3x0.81+0.6 or 1.5x1.50

E =3.03 m or 2.25 m

Adopted = 3.03m

2. Length of apron basin $L_B$ = (2.28 h/f + 0.54 ) =1.5(2.28 x 0.08 + 0.54)
= 1.50 (1.20 + 0.54) =2.61 m

3. Height of end sill, S =h=0.50= 0.16m

4. Height of wing wall and side wall at Junction:
J = 2h or [f + h + S – ($L_B$ + 0.10)/2 ] whichever is greater
= 2 x 0.80 or [1.50+ 0.81+0.27 – (2.61+0.10/2]
= 1.0 or [1.66 -0.89 ] = 1.00 or 0.77(adopt J = 1.00 m )
adopt J = 1.62 m

5. M = 2(f + 1.33 h –J) = 2(1.50 + 1.33 x 0.81 – 1.62 ) = 1.90 m
6. K = ( $L_B$ + 0.1 ) – M = (2.61 + 0.1 ) – 190 =0.81 m

Toe and cut off walls

Normal scour depth (N S D ) =0.473 x (Q / f )$^{1/3}$ = 0.473 x (2/1) $^{1/3}$ = 0.473 x 1.259 = 0.595 m
Maximum Scour depth (M S D ) = 1.5 x N S D = 1.5 x 0.595= 0.89m
Depth of cutoff / Toe wall 0.89 m say 0.60m

**Apron thickness :** For an over fall of 1.0 m .The apron thickness in concrete construction is 0.30m since structure is constructed in masonry ,the Apron thickness will be 0.30x1.50=0.45m

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

| **Description** | **Thickness of wall** | |
|---|---|---|
| | **T op width** | **Bottom width** |
| Head wall | 0.45 | 1.33 |
| Side wall | 0.30 | 1.10 |
| Wing all and head wall extension | 0.30 | 0.80 |

**DETAIL ESTIMATE OF DROP SPILLWAY OF CREST LENGTH 2.00 METRE**

**2. Earth work in cutting in foundation**

| S.No. | Description of work | No. | L | B | D/H | Quantity |
|---|---|---|---|---|---|---|
| 1 | Side wall | 2 | 3.40 | 1.30 | 1.15 | 9.38 |
| 2 | Head wall | 1 | 3.00 | 1.60 | 1.15 | 5.52 |
| 3 | Head wall extension | 2 | 3.00 | 1.00 | 1.15 | 6.90 |
| 4 | Wing wall | 2 | 1.80 | 1.00 | 1.15 | 4.96 |
| 5 | Tow wall | 1 | 3.00 | 1.00 | 1.15 | 3.45 |
| 6 | Cut off wall | 1 | 9.00 | 1.00 | 1.15 | 10.35 |
| 7 | Apron | 1 | 3.00 | 2.00 | 0.75 | 5.56 |
| Total | | | | | | **46.12 cum** |

**2 Laying of sand in the bed of foundation**

| S.No. | Description of work | No. | L | B | D/H | Quantity |
|---|---|---|---|---|---|---|
| 1 | Cut of wall | 2 | 3.40 | 0.90 | 0.10 | 0.680 |
| 2 | Head wall l | 2 | 3.00 | 0.70 | 0.10 | 0.180 |
| 3 | Head wall extension | 2 | 1.80 | 0.10 | 0.10 | 3.60 |
| 4 | Wing wall | 1 | 3.00 | 0.90 | 0.10 | 2.40 |
| 5 | Toe wall | 1 | 9.00 | 0.90 | 0.10 | 0.900 |
| 6 | Apron | 1 | 3.00 | 2.65 | 0.10 | 0.795 |
| Total | | | | | | **3.155 cum** |

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

| S.No. | Description of work | No. | L | B | D/H | Quantity |
|---|---|---|---|---|---|---|
| 1 | Cut off wall | 1 | 9.00 | 0.90 | 0.15 | 1.35 |
| 2 | Head wall | 1 | 3.00 | 0.70 | 0.15 | 0.27 |
| 3 | Head wall extension | 2 | 3.40 | 0.10 | 0.15 | 1.02 |
| 4 | Wing wall | 2 | 1.80 | 0.90 | 0.15 | 0.54 |
| 5 | Tow wall | 1 | 3.00 | 0.90 | 0.15 | 0.36 |
| 6 | Apron | 1 | 3.00 | 2.65 | 0.15 | 1.192 |
| Total | | | | | | **4732 cum** |

**4. Brick masonry**

| S.No. | Description of work | No. | L | B | D/H | Quantity |
|---|---|---|---|---|---|---|
| 1 | Cut off wall | 1 | 9.00 | 1.00 | 0.90 | 8.100 |
| 2 | Head wall | 1 | 3.00 | 1.50 | 0.90 | 4.050 |
| | | 1 | 3.00 | (1.50+0.50)/2 | 1.50 | 4.500 |
| 3 | Head wall extension | 2 | 3.00 | 0.80 | 0.45 | 2.160 |
| | | 2 | 3.00 | 0.60 | 0.45 | 1.620 |
| | | 2 | 3.00 | 0.60 | 0.60 | 2.160 |
| | | 2 | 3.00 | 0.50 | 0.60 | 1.800 |
| | | 2 | 3.00 | 0.40 | 1.30 | 2.120 |
| 4 | Side wall | 2 | 3.40 | 1.00 | 0.45 | 3.060 |
| | | 2 | 3.60 | 0.80 | 0.45 | 2.592 |
| | | 2 | 3.80 | 0.60 | 0.60 | 2.736 |
| | | 2 | 3.90 | 0.50 | 1.00 | 3.900 |
| | | 2 | (4.00+1.40)/2 | 0.40 | 1.50 | 3.240 |
| 5 | Wing wall | 2 | 1.80 | 1.00 | 0.45 | 1.620 |
| | | 2 | 1.80 | 0.80 | 0.45 | 1.296 |
| | | 2 | 1.80 | 0.50 | (1.60+0)/2 | 1.440 |
| 6 | Toe wall | 1 | 3.00 | 0.80 | 0.45 | 1.080 |
| | | 1 | 3.00 | 0.60 | 0.45 | 0.810 |
| | | 1 | 3.00 | 0.40 | 0.30 | 0.360 |
| 7 | Apron | 1 | 3.00 | 2.65 | 0.45 | 0.577 |
| 8 | Longitudinal sill | 2 | 2.60 | 2.20 | 0.45 | 0.486 |
| **Total** | | | | | | **53.689 cum** |

**5. C.C.W. 1:2:4 in the wall**

| S.No. | Description of work | No. | L | B | D/H | Quantity |
|---|---|---|---|---|---|---|
| 1 | Head wall | 1 | 3.00 | 0.50 | 0.025 | 0.037 |
| 2 | Side wall | 2 | 1.40 | 0.40 | 0.025 | 0.028 |
| | | 2 | 3.00 | 0.40 | 0.025 | 0.060 |
| 3 | Head wall extension | 2 | 3.00 | 0.40 | 0.025 | 0.060 |
| 4 | Wing wall | 2 | 2.40 | 0.50 | 0.025 | 0.060 |
| 5 | Longitudinal sill | 2 | 2.65 | 0.20 | 0.025 | 0.026 |
| 6 | Apron | 3 | 2.65 | 0.86 | 0.025 | 0.170 |
| | | | | | Total | 0.441cum |

**6. Tuck Pointing 1:3**

| S.No. | Description of work | No. | L | B | D/H | Quantity |
|---|---|---|---|---|---|---|
| 1 | Head wall | 1 | 3.00 | - | 1.00 | 4.56 |
| | | 1 | 3.00 | - | 1.18 | 5.40 |
| 2 | Side wall | 2 | 3.40 | - | 1.60 | 10.88 |
| | | 2 | (1.40+3.40)/2 | - | 1.50 | 7.20 |
| 3 | Head wall extension | 2 | 3.00 | - | 1.50 | 9.00 |
| 4 | Wing wall | 2 | 1.80 | - | (1.60+0)/2 | 2.88 |
| | | | | | Total | 39.86$m^2$ |

# CONSUMPTAION OF MATERIALS

| S.No. | Particulars | Quantity | Cement (Bags) | Coarse Sand (cum) | Brick (No.) | G.S.B. 25-40 mm (cum) | G.S. Grit 10-20 mm (cum) |
|---|---|---|---|---|---|---|---|
| 1 | Sand laying | 3.155 cum | - | 3.155 | - | - | - |
| 2 | C.C.W. 1:3:6 | 4.732 cum | 2.34 | 2.129 | - | 4.258 | - |
| 3 | C.C.W. 1:2:4 | 0.441 cum | 2.69 | 0.185 | 26845 | - | - |
| 4 | B/W 1:4 | 53.689 cum | 128.85 | 18.254 | - | - | 0.374 |
| 5 | Raised Pointing | 39.86 $m^2$ | 1.83 | 0.187 | - | - | - |
| | **Total** | | **153.71** | **23.910** | **26845** | **4.258** | **0.374** |
| | **Say** | | **154** | **23.910** | **26845** | **4.26** | **0.374** |

**Cost of Materials**

| S.No. | Name of Materials | Quantity | Rate | Amount |
|---|---|---|---|---|
| 1 | Cement | 154 Bags | 255.00/bag | 39270.00 |
| 2 | Coarse sand | 23.91 cum | 910.00/cum | 21758.10 |
| 3 | Brick | 26845 | 4500.00/th | 129802.00 |
| 4 | G.S.B. 25-40 mm | 4.26 cum | 855.00/cum | 3633.75 |
| 5 | G.S. Grit 10-20 mm | 0.374 cum | 1250.00/cum | 467.50 |
| | **Total** | | | **Rs.192931.35** |

**LABOUR CHARGE**

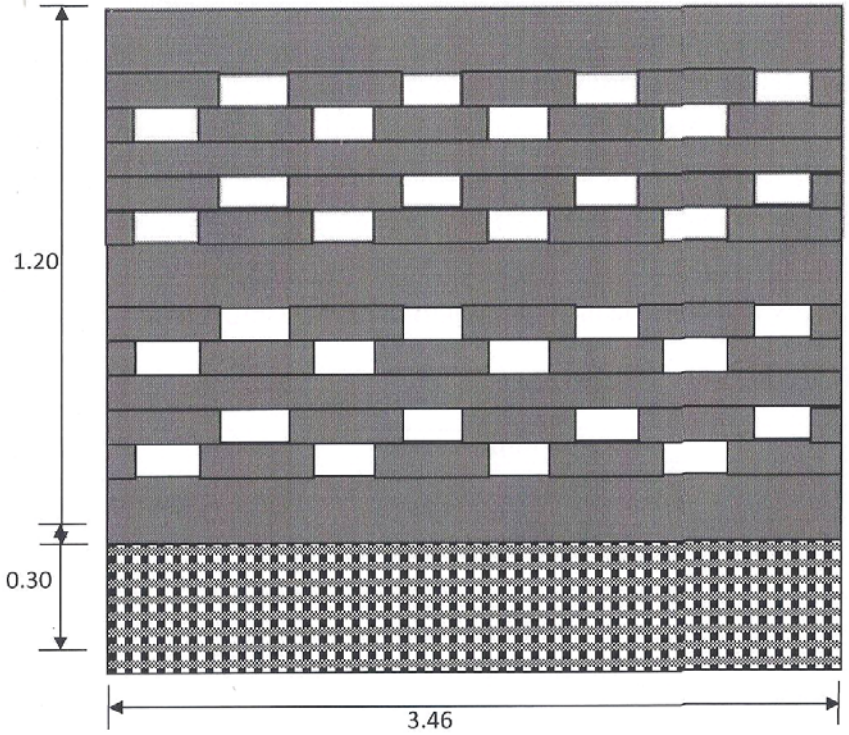
| S.No. | Particulars | Quantity | Rate | Amount |
|---|---|---|---|---|
| 1 | Earth Work | 46.12 cum | 36.66/cum | 1690.75 |
| 2 | Sand Laying | 3.155 cum | 33.33/cum | 105.15 |
| 3 | C.C.W. 1:3:6 | 4.732 cum | 494/cum | 2337.60 |
| 4 | C.C.W. 1:2:4 | 1.441 cum | 494/cum | 217.85 |
| 5 | B/W 1:4 | 53.689 cum | 400/cum | 21475.60 |
| 6 | Tuck Pointing | 39.86 $m^2$ | 51.61/$m^2$ | 2057.17 |
| 7 | Curing | 53.689 cum | 25.00/cum | 1342.22 |
| 8 | Chowkidar | 13 Man days | 100.00/Man day | 1300.00 |
| 9 | Head Load & local taion cost 10% cost of material | - | - | 12015.12 |
| **Total** | | | | **Rs. 425441.34** |

| **Total Expenditure** | |
|---|---|
| 1-Cost of Materials | 192931.35 |
| 2 Labour Charges | 42541.34 |
| **Total** | **Rs. 235472.69** |
| | **Says Rs. 235500.00 only** |

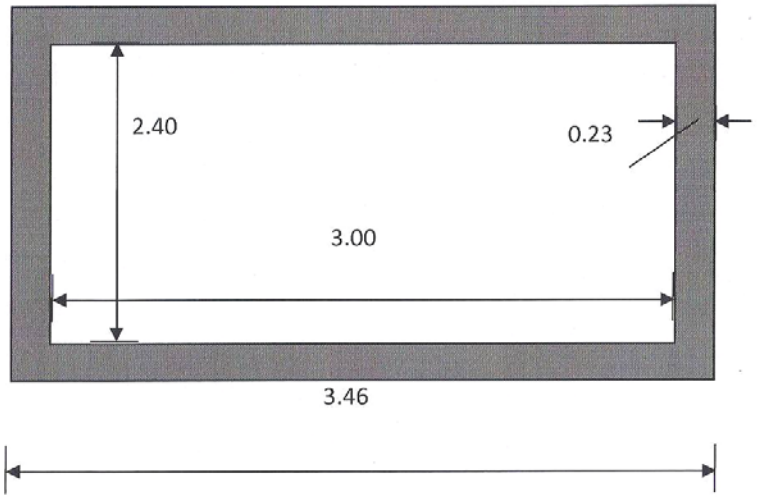
# 11- DRAWING AND DETAILS ESTIMATE OF THE LIVELIHOOD PROGRAMME

**(ANNEXURE-2)**

**DRAWING OF NADEF COMPOST STRUCTURE**




**ELEVATION**




**DESCRIPTION.** **PLAN**

1. Brick work = 1:4.
2. Plastering = 1:4.
3. Thickness of wall = 0.23 m.
4. Total height of Structure = 1.20 + 0.30 = 1.50 m.

**(Not to Scale)**

3.46

**ELEVATION**

3. Thickness of wall = 0.23 m.
4. Total height of Structure = 1.20 + 0.30 = 1.50 m.

**(Not to Scale)**

## PERPARATION OF COMPOST BY NANDEF METHD

NADEP is the name of the method. in this method glazed pit of brick masonry above Ground level is made as shown in the drying. in this method by using a little quantity of cow during, and crop residue, leaf of trees, straw and other organic materials. The method of filling up the pit is – first of all best soil of pond or field is spread in the bottom of pit as least 3" thickness and then one layer of 6" thickness and other agriculture waste is made then best soil is spread on in and on this layer the liquid made of cow dung is spread to wet the crop residue, straw etc. this method is repeated unit the pit is net completely filled up. On the top layer of this material a bulk is made and then pit is closed by earthen gara. water is spread on the top of bulk and from glazed side weekly. This process is repeated to moist the filling material always. The decomposition in filling material started and within six month filled material become compost khad.

| S.No. | Description of work | No. | L. | B. | D./H. | Quantity |
|---|---|---|---|---|---|---|
| **1.** | Earth work | | | | | |
| | Long Wall | 2 | 3.60 | 0.30 | 0.30 | 0.648 |
| | Short Wall | 2 | 2.33 | 0.30 | 0.30 | 0.419 |
| | Total | | | | | 1.067 cum |
| **2.** | Brick work 1:4 | | | | | |
| | Long wall solid | 2 | 3.46 | 0.23 | 0.90 | 1.432 |
| | Short Wall Solid | 2 | 2.40 | 0.23 | 0.90 | 0.993 |
| | Total | | | | | 2.425 cum |
| **3.** | Plastering Work | | | | | |
| | Long Wall | 2 | 3.46 | - | 0.60 | 4.152 |
| | Short Wall | 2 | 2.40 | - | 0.60 | 2.880 |
| | Top of Long Wall | 2 | 3.46 | 0.23 | - | 1.591 |
| | Top of Short Wall | 2 | 2.40 | 0.23 | - | 1.104 |
| | Total | | | | | 9.727 $m^2$ |

## ABSTRACT OF WORK

| S.N. | Particulars | Quantity |
|---|---|---|
| 1. | Earth Work | 1.06 com |
| 2. | Brick Work 1:4  2.425 + 1.616/2 | 3.233 cum |
| 3. | Plastering 1:4 | 9.727 $m^2$ |

## CONSUMPTION OF MATERIALS

| S.NO. | Particulars | Quantity | Cement (Bags) | Coarse Sand (cum) | Brick (nos.) |
|---|---|---|---|---|---|
| 1. | Brick work 1:4 | 3.233 cum | 5.82 | 0.873 | 1487 |
| 2. | Plastering 1:4 | 9.727 $m^2$ | 1.07 | 0.146 | - |
| | Total | | 6.89 | 1.019 | 1487 |
| | Say | | 7 Bags | 1.02 cum | 1500 nos. |

## COST OF MATERIALS

| S.NO. | Particulars | Quantity | Rate | Amount |
|---|---|---|---|---|
| 1. | Cement | 7 Bags | 255.00/Bag | 1785.00 |
| 2. | Coarse Sand | 1.02 cum | 910.00/cum | 928.20 |
| 3. | $1^{st}$ Class Brick work 1:4 | 1500 nos. | 4050.00/ Thousand | 6075.00 |
| | **Total** | | | **Rs. 8,788.20** |

## LABOUR CHARGES

| S.NO. | Particulars | Quantity | Rate | Amount |
|---|---|---|---|---|
| 1. | Earth Work | 1.06 cum | 36.66/cum | 30.85 |
| 2. | Brick | 3.233 cum | 370.00/cum | 1196.21 |
| 3. | Plastering | 9.727 $m^2$ | 40.00/$m^2$ | 389.08 |
| | **Total** | | | **Rs. 1616.14** |

| **Total Expenditure** | |
|---|---|
| **1.** Cost of Materials | **8788.20** |
| **2.** Labour Charges | **1616.14** |
| **Total** | **Rs.10,404.34** |
| | **Say Rs. 10,400.00 only** |

## DAIRY WORK

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

## Establishment of Goat Unit for S.H.G.'s formed in I.W.M.P. II$^{nd}$ Sidharthnagar

## Project

District Sidharthanagar II$^{nd}$ is situated in eastern part of state, where the number of goat/sheep is very less and they are small in nature, Goat Population is appreciable and is fact, it is the major source of livelihood for poor people of the district. in the state , on an average, 16 kg of meat is obtained from a goat, if they are dewormmed twice, shall be increment of 4 kg in meat on an average, benefiting the farmers of the state.

Deworming and vitamins, mineral- supplement to the goats shall enhance their productivity and also improve anti-body response and protection level through vaccination, i.e., importance in efficiency of vaccination. More Productivity and assured health and low mortality shall

result into adoption of more framers to goat farming with the formation of more S.H.G. ‘s and in turn availability of goats for processing unit. Goat excreta shall be of immense help in enrichment of soil fertility.

## Establishment of Goat Units for S.H.G.’s

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

16 Goat Unit are Proposed in I.W.M.P. II$^{nd}$ Project for S.H.G. one unit constituting 10 goats and 1 buck will be distributed to one S.H.G.
A register Of S.H.G. will be maintained by Secretary Of S.H.G. in the supervision of W.D.T. member . The details of benficiaries Of S.H.G. including the breed of goat reared, breeding and feeding status, deworming status, deaths, post mortem conducted claim settlement and working status of unit will be maintained in the register.

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

## Financial Component

| S.No. | Component | Amount |
|---|---|---|
| **1.** | Cost Of 10 goat of improved breed (Not less than 6 months of age) @Rs. 3000.00 each | **30000.00** |
| **2** | Cost of 1 back of improved breed @ Rs.5000.00 | **5000.00** |
| **3** | Cost of insurance @ 11.63/unit | **4070.00** |
| **4** | Feed cost for 3 months @ 250gm/day for goats @Rs.11.84/250gm | **2930.00** |
| **5** | Provision of deworming, mineral and vitamin supplement, treatment, vaccination @ Rs/160/animal | **1760.00** |
| **6** | The expense including monitoring expenses, register and record @Rs.170.00/unit | **170.00** |
| | **Total** | **Rs. 43,930.40** |
| | | **Say Rs. 43.950.00** |

**Estimate of Livestock Development Activities**

Total number of female animals: Buffa1o - 4725

Cow - 5597

Total - 10,322

**1. Artificial Insemination (A.I.):** 33% of total animals per year, i 3406 (say 3400 nos.)

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

**Total Amount - Rs. 3,40,00.00**

**2. Vaccination:** Total number of animals in I.W.M.P II$^{nd}$ - 12657 nos.

1. H.S. + B.Q. @ 5.50 69,613.50

2. F.M.D. @10.50 2 (Twice in a year)

**Total Amount - Rs. 3,35,410.00**

**3. Deworming**: Adult animals -. 11472

Child animals - 1185

Albendazole for 11472 animals @ 40.56 4,65,304.00

1185 child animals@20.28 24,032.00

**Total Amount - Rs. 4,89,336.00**

**4. Mineral Mixture: Agnmine Forte Chelated for 8205 animals @ 115.00 Rs. 9,43,575.00**

**GRAND TOTAL - Rs. 21,08,321.00**

# 12- DRWAING AND DETAILS ESTIMATE OF PRODUCTION SYSTEM AND MICRO-ENTERPRISES

**(ANNEXURE-3)**

## DEMOSTRATION OF WHEAT

1. Variety recommended for District

   Irrigated - W.H.- 542

   Unirrigated – K 8027 , K – 5351 (Mandakini)

   Kathia – Raj 1555

2- Seed rate – 100 -125 Kg/ hectare

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

**ESTIMATE OF DEMONSTRATION OF WHEAT IN EATERSHED (PER HA)**

| S.No. | Particulars | Quantity | Rate | Amount | Remarks |
|---|---|---|---|---|---|
| 1 | Tillage operation or preparation of field for sowing | 100.00 kg | 1000.0/ha | 1000.00 | Since the project is to be operated in a participatory Mode, contribution in form of the tillage ,sowing, irrigation and harvesting done by farmer is not included in the estimates |
| 2 | Cost of seed | 1.00ha | 18.00/kg | 1800.00 | |
| 3 | Sowing by seed drill | 160 Kg | 1000.00/ha | 1000.00 | |
| 4 | D.A.P. 18:46 | 210 Kg | 573.00/50 kg | 1833.60 | |
| 5 | Urea | 150 Kg | 270.00/50 kg | 1134.00 | |
| 6 | Potash (M.O.P.) | 1.0 0ha | 300.00/50 kg | 900.00 | |
| 7 | Irrigation (three irrigation) | 1.00ha | 650.00/ha | 650.00 | |
| 8 | Harvesting | | 2000.00/ha | 2000.00 | |
| | | | **Total** | **5657.60** | |
| | | | **Say** | **5700.00** | |

**Hence demonstration cost of wheat /ha is Rss 5700.00**

# DEMOSTRATION OF GRAM IN WATERSHED AREA (per ha)

1 Variety Irrigated - vdai , KWR – 108 ,

Rainfed - J.G. – 315 , Avrdhi

2- Seed rate /ha – 50 -55 Kg

3- Fertilizers requirement / ha N- 25.0 Kg , P- 80Kg, K- 30 Kg

**ESTIMATE OF DEMONSTRATION OF GRAM (PER HA)**

| S.No. | Particulars | Quantity | Rate | Amount | Remarks |
|---|---|---|---|---|---|
| 1 | Tillage operation or preparation of field for sowing | 1.0 ha (twice) | 1000.0/ha | 2000.00 | Since the project is to be operated in a participatory Mode, contribution by the former in the form of tillage ,sowing, operation , sowing and and harvesting is not included in the estimates |
| 2 | Cost of seed | 55 kg | 90/kg | 4950.00 | |
| 3 | D.A.P. | 175 Kg | 573.00/50 kg | 2005.50 | |
| 4 | M.O.P | 65 Kg | 300.00/50 kg | 390.00 | |
| 5 | Medicine | 1.00 ha | Lump sum | 1250.00 | |
| 6 | Harvesting | 1.00 ha | 700.00/ ha | 700.00 | |
| | | | **Total** | **8595.50** | |
| | | | **Say** | **8600.00** | |

**Hence per hectare of demonstration Rs 8600.00**

# DEMOSTRATION OF ARAHAR IN WATERSHED AREA (per ha)

1 Variety - Malviya -13 narendra -1 Amar I
2- Seed rate /ha – 30 Kg
3- Fertilizers requirement / ha N- 20.0 Kg , P- 50Kg, K- 40 Kg

**ESTIMATE OF DEMONSTRATION OF ARAHAR (PER ha)**

| S.No. | Particulars | Quantity | Rate | Amount | Remarks |
|---|---|---|---|---|---|
| 1 | Tillage operation in preparation of field for sowing | 1.0 ha | 1000.0/ha | 2000.00 | Since the project is to be operated in a participatory Mode, contribution by the former in the form of tillage operation, sowing and and harvesting provided by participating farmers ,hence this cost is not included in the estimates |
| 2 | Cost of seed | 30.0 kg | 120.00/kg | 3600.00 | |
| 3 | Nitrogen N.P.K. 12:21:16 | 190.0 Kg | 470.00/50 kg | 1786.50 | |
| 4 | Urea | - | - | - | |
| 5 | M.O.P | - | - | - | |
| 6 | Harvesting | 1.00 ha | 650.00 | 650.00 | |
| 7 | Medicine | 1.00 ha | Lump sum | 1000.00 | |
| | | | **Total** | **6386.00** | |
| | | | **Say** | **6400.00** | |

**Hence per hectare of demonstration Rs 6400.00**

# DEMOSTRATION OF HYBRID IN WATERSHED AREA (per ha)

**1** Requirement of Seed /ha - 10 kg I

2- Requirement of fertilizers / ha N- 60.0 Kg , P- 40.00Kg, K- 40.00 Kg

**ESTIMATE OF DEMONSTRATION OF BAJRA (PER ha) RAINFED**

| S.No. | Particulars | Quantity | Rate | Amount | Remarks |
|---|---|---|---|---|---|
| 1 | Tillage operation in preparation of field for sowing | 1.0 ha | 1000.0/ha | 2000.00 | Since the project is to be operated in a participatory Mode, contribution by the former in the form of tillage operation, sowing and and harvesting provided by participating farmers ,hence this cost is not included in the estimates |
| 2 | Cost of seed | 10.0 kg | 130.00/kg | 1300.00 | |
| 3 | Nitrogen N.P.K. 12:21:16 | 125.0 Kg | 470.00/50 kg | 1175.00 | |
| 4 | Urea | 90 kg | 270.00/50 kg | 486.00 | |
| 5 | M.O.P | 40kg | 300.00/50 kg | 240.00 | |
| 6 | Harvesting | 1.00 ha | 650.00 /ha | 600.00 | |
| | | | **Total** | **3201.00** | |
| | | | **Say** | **3200.00** | |

**Hence per hectare of demonstration of Bajra Rs 3200.00**

**DEMONSTRATION OF AGRO-HORTICULTURE USING PLASTIC DRUM OF 200 LITRES CAPACITY**

Sidharthanagar is situated in Eastern U.P. region where there is scarcity of water and in summer temperature rises up to 45c causing upper layer of fields dry and therefore mortality rate of plants is very high. Farmers usually like to grow grain crops only. They are not interested in horticulture because of less holding. The production of crops decreases below the tree. Therefore to promote horticulture with crops a demonstration model using plastic drums for horticulture is made. Mainly crops roots go in to the soil up to “4-5” in cereal crops and “6-9” in pulses. Using plastic drums the plants will be planted 50-60 cm below the ground level which is below the root zone of crops. Therefore trees will not able to take nutrients from upper layer of fields and there will no effect of plants on crops

In summer season up to 1 to 1.50m depth of soil becomes dry causes more mortality rate of plants, using drums plants are planted below 50-60 from Ground level and in rainy and winter season up to February roots of plants goes below 2.lOm below where moisture will be available and plants will be safe in summer also. Using barbed wire fencing the plants will be protected. Therefore, it is hoped that farmers will adapt this procedure for Agro-forestry and will become prosperous.

## DETAIL ESTIMATE OF DEMONSTRATION OF HORTICULTURE AND MIXED CROPPING

| S.No. | Description of Works | No. | L. | B. | D./H. | Quantity |
|---|---|---|---|---|---|---|
| 1 | Earth work in cutting | 156 | 3.14 x 1.20 | - | 1.35 | 793.54 |
| | Trench | 156 | 1.50 | 0.75 | 0.75 | 131.62 |
| | Fencing Poll | 133 | 0.20 | 0.20 | 0.20 | 1.064 |
| | **Total** | | | | | **926.22 cum** |
| | Farm yard manure | 156x 10 | | - | | 1560 kg |
| | Filling of earth work with farm yard manure | 156 | 3.14 x 1.00 | - | 1.20 | 587.80 cum |
| | C.C.W. 1:2:4 for fencing poll | 133 | 0.20 | 0.20 | 0.20 | 1.064 cum |
| | Angle iron of poll | 133 | 1.80 | - | - | 239.40 m |
| | Barbed wire | 3 | 400 | - | - | 1200.00 m |
| | Plants | 156 | - | - | - | 156 nos |
| | Plastic drum (200 litre) | 156 | - | - | - | 156 nos |

## CONSUMPTION OF MATERIAL

| S.N. | Description of Work | Quantity | Farmyard Manure (Kg> | Cement Bags (nos) | Coarse Sand ( cum) | G.S. Grit 10-20 mm | Angle Iron (m) | Barbed Wire (Kg) | Planting Drum (nos) |
|---|---|---|---|---|---|---|---|---|---|
| **1** | **C.C.W. 1:2:4** | **1.064 cum** | **-** | **6.49** | **-** | **-** | **-** | **-** | **-** |
| **2** | **Angle Iron** | **239.4 m** | **-** | **-** | **-** | **-** | **-** | **-** | **-** |
| **3** | **Barbed wire** | **1200.0m** | **-** | **-** | **-** | **-** | **-** | **-** | **-** |
| **4** | **Farmyard manure** | **1560.0 kg** | **1560 kg** | **-** | **-** | **-** | **-** | **-** | **-** |
| **5** | **Plastic drum** | **156 nos** | - | **-** | **-** | **-** | **-** | **-** | **-** |
| **Total** | | | **1560.0 kg** | **6.49** | **0.446** | **0.883** | **239.40** | **1200.00** | **156** |
| **Say** | | | **1560.0 kg** | **6.50 bags** | **0.450 bags** | **0.900 cum** | **239.40** | **1200.0 m** | **156** |

# COST OF MATERIALS

| S.No. | Particulars | Quantity | Rate | Amount |
|---|---|---|---|---|
| 1. | Fram yard manure | 1560.0kg | 10,00 kg | 15600.00 |
| 2. | Barbed wire | 1200.0m/120.0kg | 60.50/kg | 7260.00 |
| 3. | Angle Iron | 239.40m/785kg | 40.50/kg | 31792.50 |
| 4. | plastick drum | 156 nos | 690.50each | 107640.00 |
| 5. | Cement | 6.50bags | 255.00/bag | 1657.50 |
| 6. | Coarse Sand | 0.450 cum | 910.00/cum | 409.50 |
| 7. | G.S.Grit 10-20mm | 0.900 cum | 1250.00/cum | 1125.00 |
| 8. | Plants | 156 nos | 18.00each | 2808.00 |
| | | Total | | Rs.1,68,292,50 |

# LABOUR CHARGES

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

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

5- Lack of infrastructure including marketing.

**(B) Soil constraints**

1- Poor nutrient status of the soil

2- Physical impediment

3- Moisture stress / water logging / inadequate drainage.

**(C) Plant related constraints**

1- Problem of plant establishment

2- Physiological disorders

3- Fruit drop and poor productivity

4- Incidence of insects-pests.

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

## CONCEPTS AND ADVANTAGES OF CONSERVATION HORTICULTURE

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

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

## CONSERVATION HORTICULTURE PRACTICES

Some of the important practices are given below

**1- Selection of Suitable** Fruits Types: For the success of conservation horticulture, selection of hardy varieties resistant to diseases and pests and use of local or other hardy root stocks for raising fruit-trees is of great importance. The major part of the reproductive cycle i.e. Period from flowering to fruiting must also fall during maximum water availability period and the root ripening must be completed before the onset of dry summer (April-May).

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

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

**3- Use of Root Stokes:_** Budding and grafting on the wild root stock gives benefit of the establishment root and in turn provides better quality fruits with high field potential. For example, Ziziphun mauritiana, a wild ber can be successful budded with scion of improved cultivars, This practice is only successful where sizable patch of wild root stock is available. The budded/grafted stock needs intensive management as it is required to be protected from the wild animals, birds,

insects, pests etc. The wild root stock develops efficient top root to provide moisture and nutrients to the scion. Amla. Bel is other examples of raising the improved cultivation the wild root stock.

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

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

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

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

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

| S.No. | Particulars | Quantity | Rate | Amount | Remarks |
|---|---|---|---|---|---|
| A, Horticulture | | | | | |
| 1. | Soil Working 1m x 1m size pits (270nos.) including cost of refilling | 270.00 cum | 36.66/cum | 9898.20 | Since,the project is to be operated in a participatory mode,countribution in the form of labour input for pit digging, FYM and its applications, weeding and hoeing are to be provieded by the participating farmers, hens the cots are no included in the eastmates, |
| 2. | Aplicetion of Farmyard manure inclding cast | | L.S. | 450.00 | |
| 3. | Cost of NPK mixture. neemicide @ 250 gm/plants | | L.S. | 400.00 | |
| 4. | Cost of plants (including 15% etc. for mortality) including transportation and planting | 310 nos. | 15.00/Plant | 4650.00 | |
| 5. | Casualty replacement @ 10% of item no. 4&5 | | | 465.00 | |
| 6. | Cost of 2 weeding and hoeing | | 1.00/Plant | 540 | |
| 7. | Contingency and unforeseen (3%) | | | 492.00 | |
| | Total | | | Rs.6,007.00 | |
| | Say | | | Rs. 6,000.00 | |
| | Maintenance cost 2nd Year onwards – 15% of 1st year cost | | | 900.00 | |
| | For next 5 years i.e.,Rs. 900x5 | | | 4500.00 | |
| | Total Cost | | | Rs. 10,500.00 | |
| | Say | | | Rs.10,500.00 | |
| B. Agro-Horticulture (Cost per ha) | | | | | |
| 1 | Cost of raising 270 plants UP to 5 year @ Rs. 10,000.00 | | | 10500.00 | The remarks mentioned under Horticulture are also applicable for agro Horticulture. |
| 2 | Cost of rasising agricultural Crops @ Rs. 5,000 per hectare per year | | | 5000.00 | |
| | **Total** | | | **Rs.15,500.00** | |

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

| S.No. | Particulars | Quantity | Rate | Amount | Remarks |
|---|---|---|---|---|---|
| A, Horticulture | | | | | |
| 1. | Soil Working 1m x 1m size pits (270nos.) including cost of refilling | 270.00 cum | 36.66/cum | 9898.20 | Since,the project is to be operated in a participatory mode,countribution in the form of labour input for pit digging, FYM and its applications, weeding and hoeing are to be provieded by the participating farmers, hens the cots are no included in the eastmates, |
| 2. | Aplicetion of Farmyard manure inclding cast | | L.S. | 450.00 | |
| 3. | Cost of NPK mixture. neemicide @ 250 gm/plants | | L.S. | 400.00 | |
| 4. | Cost of plants (including 15% etc. for mortality) including transportation and planting | 310 nos. | 15.00/Plan t | 4650.00 | |
| 5. | Casualty replacement @ 10% of item no. 4&5 | | | 465.00 | |
| 6. | Cost of 2 weeding and hoeing | | 1.00/Plant | 540 | |
| 7. | Contingency and unforeseen (3%) | | | 492.00 | |
| | Total | | | Rs.6,007.00 | |
| | Say | | | Rs. 6,000.00 | |
| | Maintenance cost 2nd Year onwards – 15% of 1st year cost | | | 900.00 | |
| | For next 5 years i.e.,Rs. 900x5 | | | 4500.00 | |
| | Total Cost | | | Rs. 10,500.00 | |
| | Say | | | Rs.10,500.00 | |
| B. Agro-Horticulture (Cost per ha) | | | | | |
| 1 | Cost of raising 270 plants UP to 5 year @ Rs. 10,000.00 | | | 10500.00 | The remarks mentioned under Horticulture are also applicable for agro Horticulture. |
| 2 | Cost of rasising agricultural Crops @ Rs. 5,000 per hectare per year | | | 5000.00 | |
| 3. | **Fencing** | | | **45300.00** | |
| | **Total** | | | **Rs.60,800.00** | |

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

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

## ESTMATE FOR SILVI-PASTROAL SYSTEM (RS.ha$^{-1}$) PLANTATIONS (800 PLANTS ha$^{1}$ )

| S. N | Particulars of work | Rate (Rs.) | Cost (Rs.) | Remarks |
|---|---|---|---|---|
| 1- | Clear felling or bush clearance of area Infected with Lantana etc,including cost of burning | LS | 550.00 | The area is to be procted through biofencing |
| 2- | Soil working – earth work ,digging of Pits / holes 60 cm deep, 30cm dia -800 Nos.Including cost of refilling and trenching.(400trenches/ha) | LS | 6085.00 | |
| 3- | Cost of seedlings for 900 nos and grass /legumes seeds and planing.sowing | - | 2050.00 | Rs.2.00 per seeding |
| 4- | Weeding and hoeing(2 Nos.) | LS | 300.00 | |
| Total | | | 8985 | |
| Mainteance<br>**2nd Years 15% of the 1st year Xpenditure including being up 1st year failure** | | | | |
| **Grand total<br>say** | | | **10.335.00<br>10.335.00** | |

## DEMONSTRATION OF GREEN MANURING

Green Manuring is very useful but due to sowing of Kharif season crop, lack of suitable type of seeds, and limitation of moisture, it is not widely practiced. Green Manuring brings immediate advantage because of its quick decomposition where as FYM and compost improves the soil physical condition in the long-run. Benefits of Green Manuring accrue from substitution of chemical fertilizers, enhance soil biological activities and erosion control due to vegetative cover. Sesbania Species (Dhaincha) and Crotolaria Juneea (Sunhemper Sanai) are most common green manure crops. They accumulate about 100 kg N/ha in their biomass and 64-88% of this is derived from atmosphere. Apart from direct benefit of green Manuring as a source of nutrients and organic matter, it has the capacity to mobilize soil phosphorus and other nutrients. It also helps in reclamation of problem of soil, e.g., Sesbania helps in removing exchangeable sodium and reclamation of salt affected soils.

In District Kushi Nagar more fields are kept fallow and only single crop in Rabi is grown. Therefore, this area is suitable for Green Manuring. Therefore, in I.W.M.P.II$^{nd}$ Sidharthanagar Project, efforts will be made to oblise the farmers for Green Manuring.

4 typical estimate is made for Green Manuring is given below:

**ESTIMATE FOR GREEN MANURING IN THE WATERSHED (PER ha)**

| S.No. | Parcticulurs | Rate | Cost | Remark |
|---|---|---|---|---|
| 1 | Seed of Sesbania (Dhanicha) 25 Kg /ha | 25.00 /kg | 625 | Since the prokect to be operated in a participatory mode contribution in the form of tillage will be done by farmers in not included in the estimate |
| 2 | Tillage operation before sowing and to plough the plants of dhaincha after 40 – 45 days of sowing for Green Manuring | 1000/ ha Before and after saring | 2000.00 | |
| | **Total** | | **Rs . 625.00** | |

**Therefore cost per hectare of Green Manuring is Rs. 625.00/ha**

## PASTURE MANAGEMENT

**Introduction:** The sound animal industry in any country centers around good quality feed and fodders. The livestock population in India is nearly 15%of the total livestock population of the world, tough we have only 2% of the world's geographical area. The project on for green and dry fodder requirement in India has been estimated at 1061 and 590 million tons by 2010 A-D, while the present feed and fodder resources in the country can meet only 4% of the requirement. The grazing intensity is very high i.e., 26 adult cattle unit (ACU)/ha as against 0.8 ACU in the developing countries. The importance of grasses for protection and production, the two aspects of soil and water conservation is well known. Grass is unique in that it is the only resource utilized in situ by grazing. A "grassland" or more appropriately, a "range" is defined as "the areas which are predominantly covered with grasses or grass like plants and are primarily utilized as for age for grazing animals or used as hay." The grasslands are the major sources of food to the animals.

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

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

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

**Conservation on of Forages:** In order to sustain animal production, it is essential that the optimum feeding should be maintained round the year. In India, we have two seasons, rainy season and winter season, when surplus quantities of green fodder is available-country to this there are 2 to 3 months of lean periods(October-November and April to July) when the fodder availability to animals is at its low. In the summer months, it is difficult even to meet the maintenance

**requirements of the animals.** Stage of maturity to feed the animals adequately during the lean period. The conservation of forages could be done in the form of silage from cultivated fodders (legumes and cereals) and also pasture grasses.

Forages could also be conserved in the form of hay when dried to its nutrients. This feed stuff is quantitatively important from both maintenance and nutritional point of view.

**Agro-forestry system for fodder production:_**A number of fodder trees play an important role in human food security through their function as animal food sources, especially as drought services. Agro-forestry systems consisting of such tress and animals and/or pasture are called Silvo-Pastoral system. Silvi-Pasture (or Silvo-Pastoral system) is the most promising alternate land use system which integrates multipurpose trees, shrubs, legumes and grasses mostly on non arable, degraded and marginal lands for optimizing land productivity. It helps in conservation of vegetation, soil and nutrients and provides forage, timber and fuel wood on a sustainable basis. Potentials of Semi-arid region for different **forage production systems.**

Region Forge Production Systems

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

## ROLE OF GRASSLAND IN SOIL CONSERVATION

The grass plant itself protects the soil from the forces of water erosion including the impact of rain drops and surface flow. Grass acts a spring cushion intercepting and broking up the falling rain drops in their way down. Conducting the water down the blades and stems of the plants and finally allowing it to reach the ground as fine sprays without disturbing the surface. Clamps of grass plants, in a mechanical way, obstruct-flowing water and reduce its rate of flow. In fact to control soil erosion whatever technique is adopted, there are four approaches to deal with the problem:

1- To condition the soil to make it resistant to determent and transportation and create more absorptive surface layer.

2- To cover the soil so that it is protected from the impact of wind and rain drops.

3- To decrease the velocity of wind or runoff water.

4- To provide safe disposal outlet for surplus run off.

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

1- Strip cropping, rotational cropping or lay farming.

2- Stabilization of bunds and terraces.

3- Stabilization of gullies, diversion or drainage channels.

4- Stabilization of sand dunes.

5- Meadows and pasture on steep slopes.

6- Fertility builder for eroded soil.

## Expected/Estimated Outcomes *(IWMP-II$^{nd}$)-SIDDHARTHNAGAR*

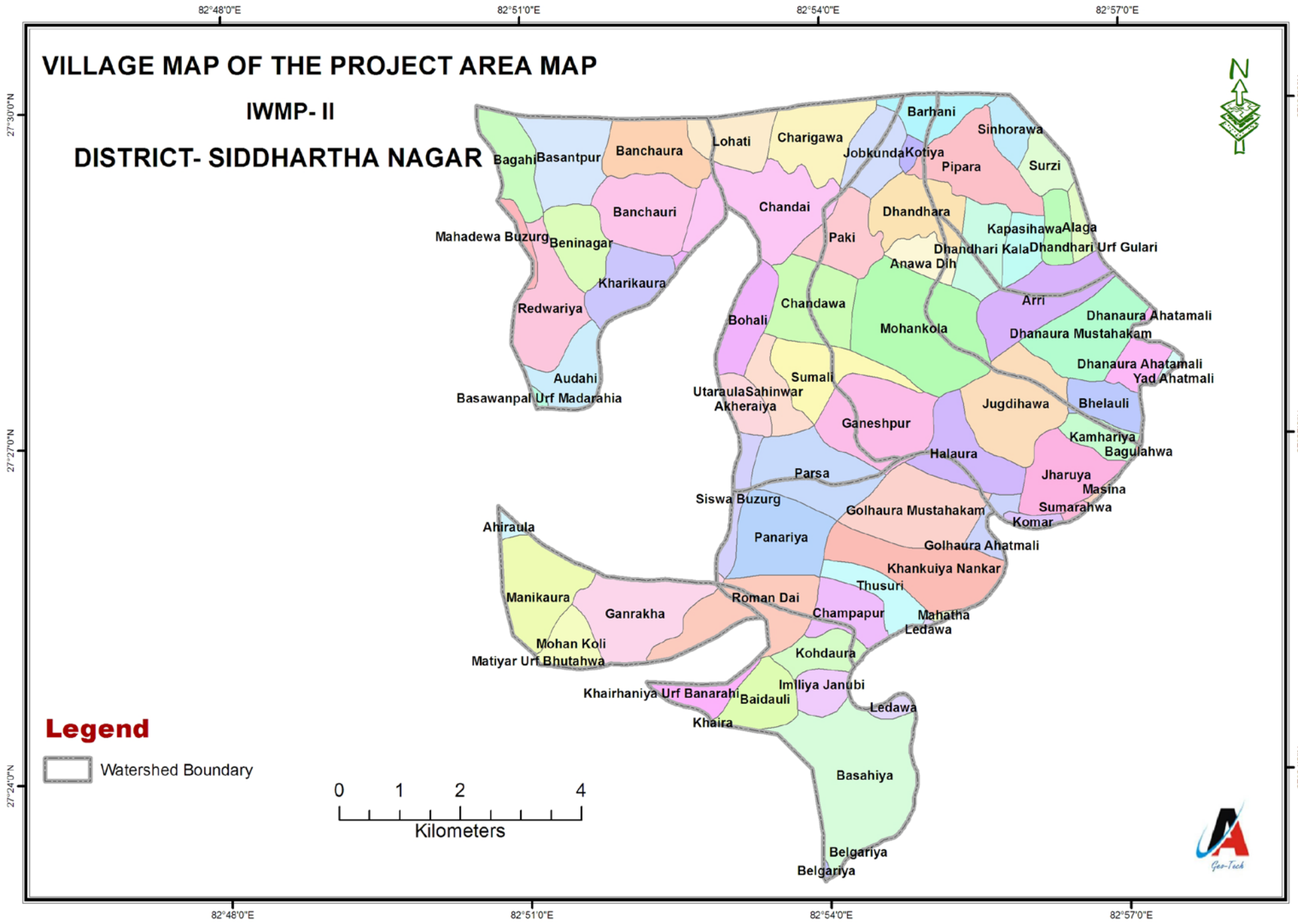
| S. No. | Name of the District | Item | Unit of measurement | Pre-project Status | Expected Post-project Status | Remarks |
|---|---|---|---|---|---|---|
| 1 | Siddharthnagar | Status of water table | Meters | 6-8 | 5-6 | |
| 2 | | Ground water structures repaired/ rejuvenated | No. | - | 120 | |
| 3 | | Quality of drinking water | Quality | Poor | Good | |
| 4 | | Availability of drinking water | Days | 300 | 365 | |
| 5 | | Increase in irrigation potential | % | 3 | 6 | |
| 6 | | Change in cropping/ land use pattern | Cropping pattern | Single/ double | Double/ multiple | |
| 7 | | Area under agricultural crop | Ha | 5545.00 | 5945.00 | |
| 8 | | i Area under single crop | Ha | 5042.00 | 5202.00 | |
| 9 | | ii Area under double crop | Ha | 300.00 | 600.00 | |
| 10 | | iii Area under multiple crop | Ha | 483.00 | 1483.00 | |
| 11 | | Net increase in crop production area | Ha | - | 1050.00 | |
| 12 | | Increase in area under vegetation | Ha | 200.00 | 259.00 | |
| 13 | | Increase in area under horticulture | Ha | 210.00 | 354.00 | |
| 14 | | Increase in area under fuel & fodder | Ha | 190.00 | 267.00 | |
| 15 | | Increase in milk production | Av.lit/day/ cattle | 1.75 | 3.10 | |
| 16 | | No. of SHGs | No. | 12 | 62 | |
| 17 | | Increase in no. of livelihoods | No. | - | 5% | |
| 18 | | Increase in income | Rs. | 19194.00 | 25240.00 | |
| 19 | | Migration | % | 9.00 | 5.00 | |
| 20 | | SHG Federations formed | No. | - | 1 | |
| 21 | | Credit linkage with banks | No. | 8 | 62 | |
| 22 | | Resource use agreements | % | Agreed | 100% as per required | |
| 23 | | WDF collection & management | % | 5-10 | 100% collection during project period | |
| | | Summary of lessons learnt | | | | |

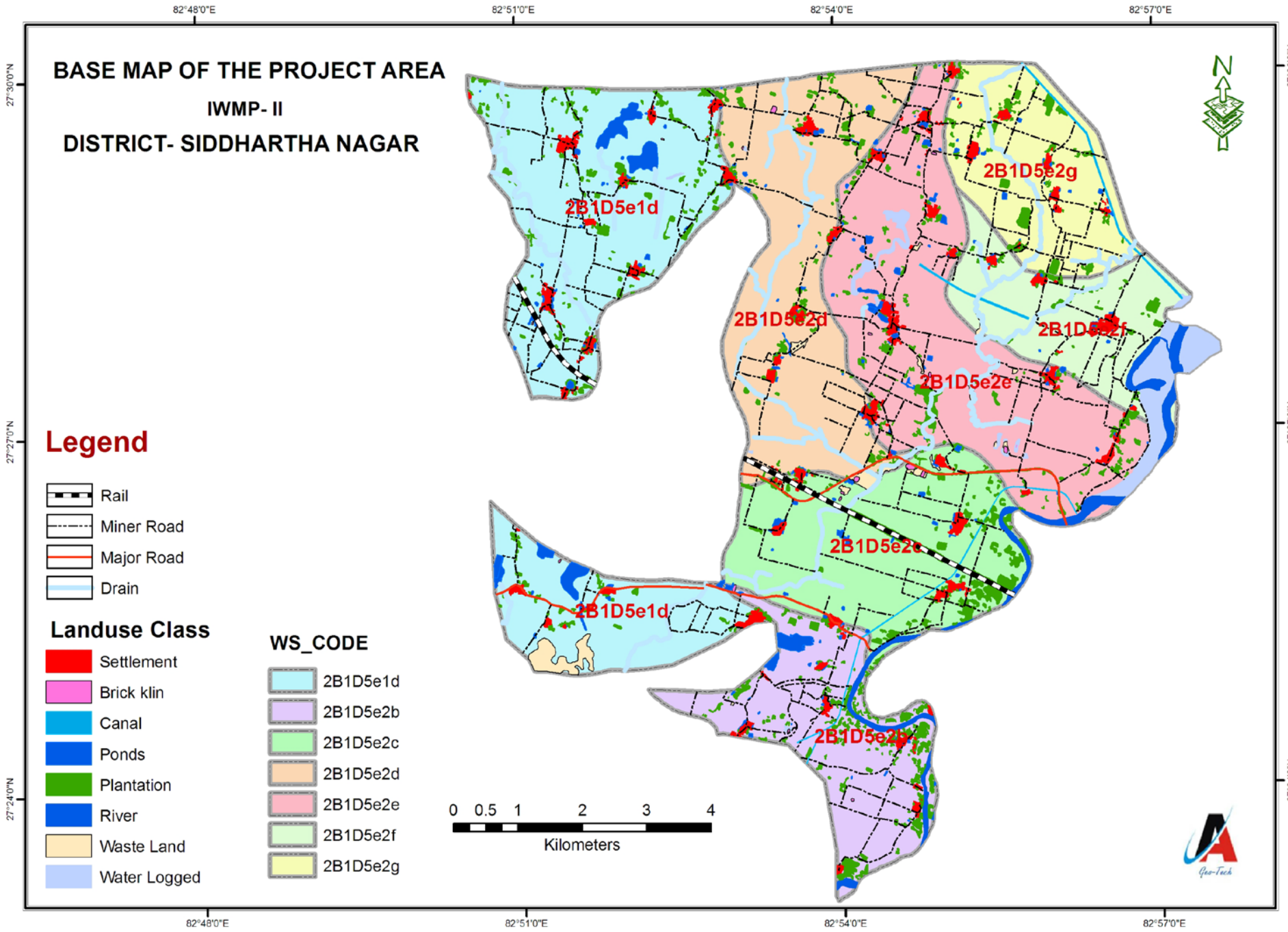
**Date;**

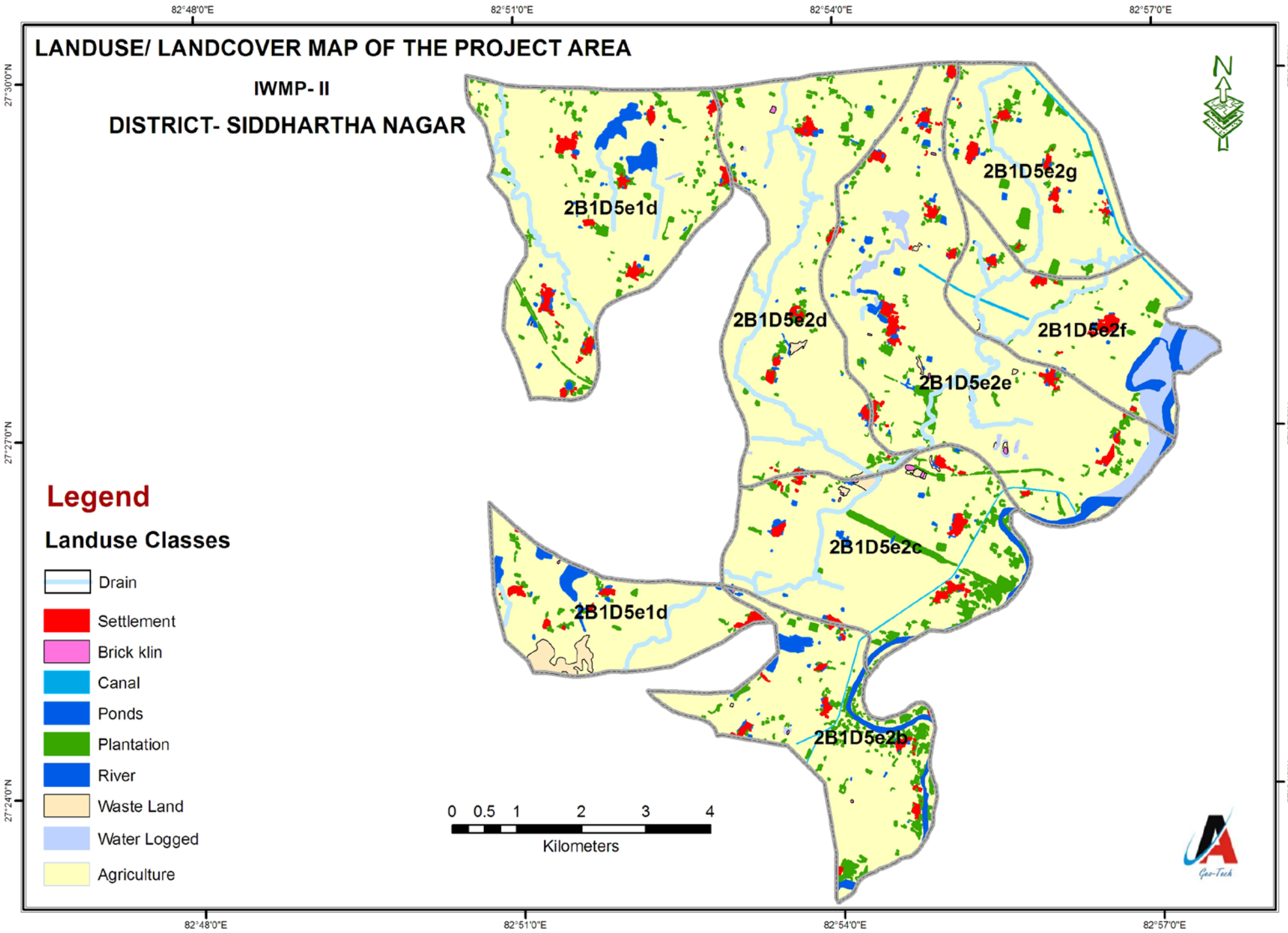
**Signature of officers authorized**
**by State Govt. with name and Designation**

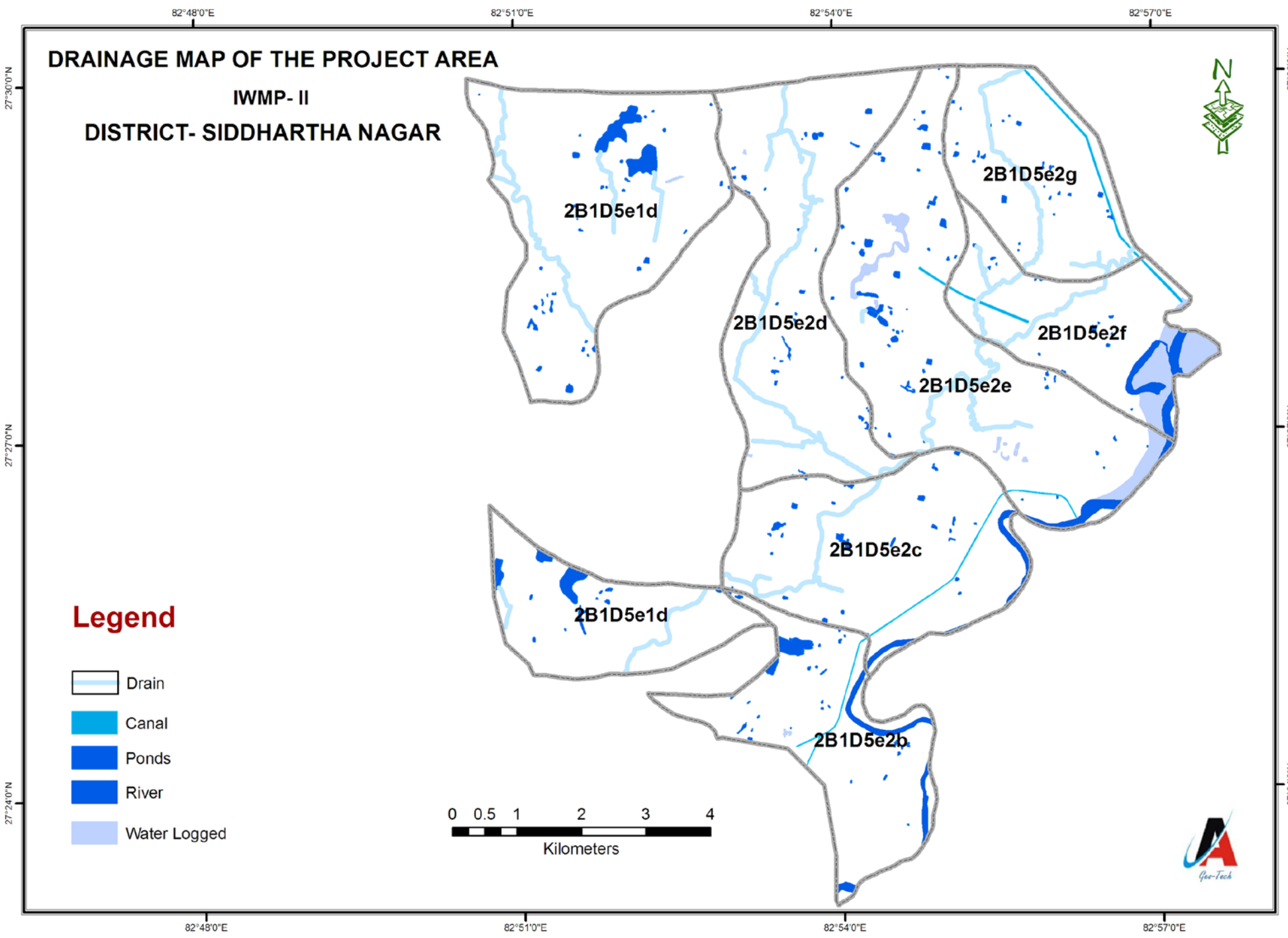
**CHAPTER- 13**

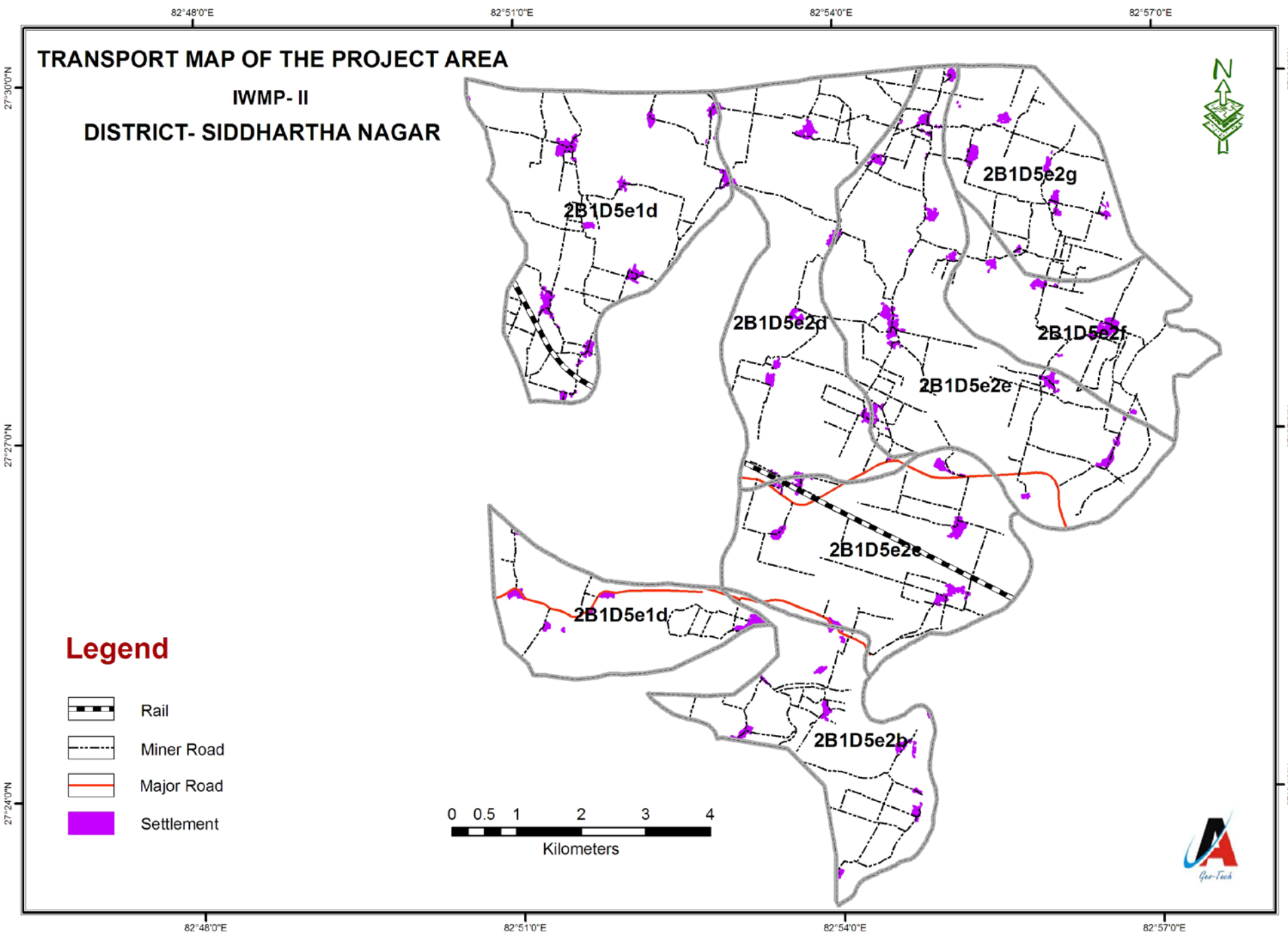
# MAPPING

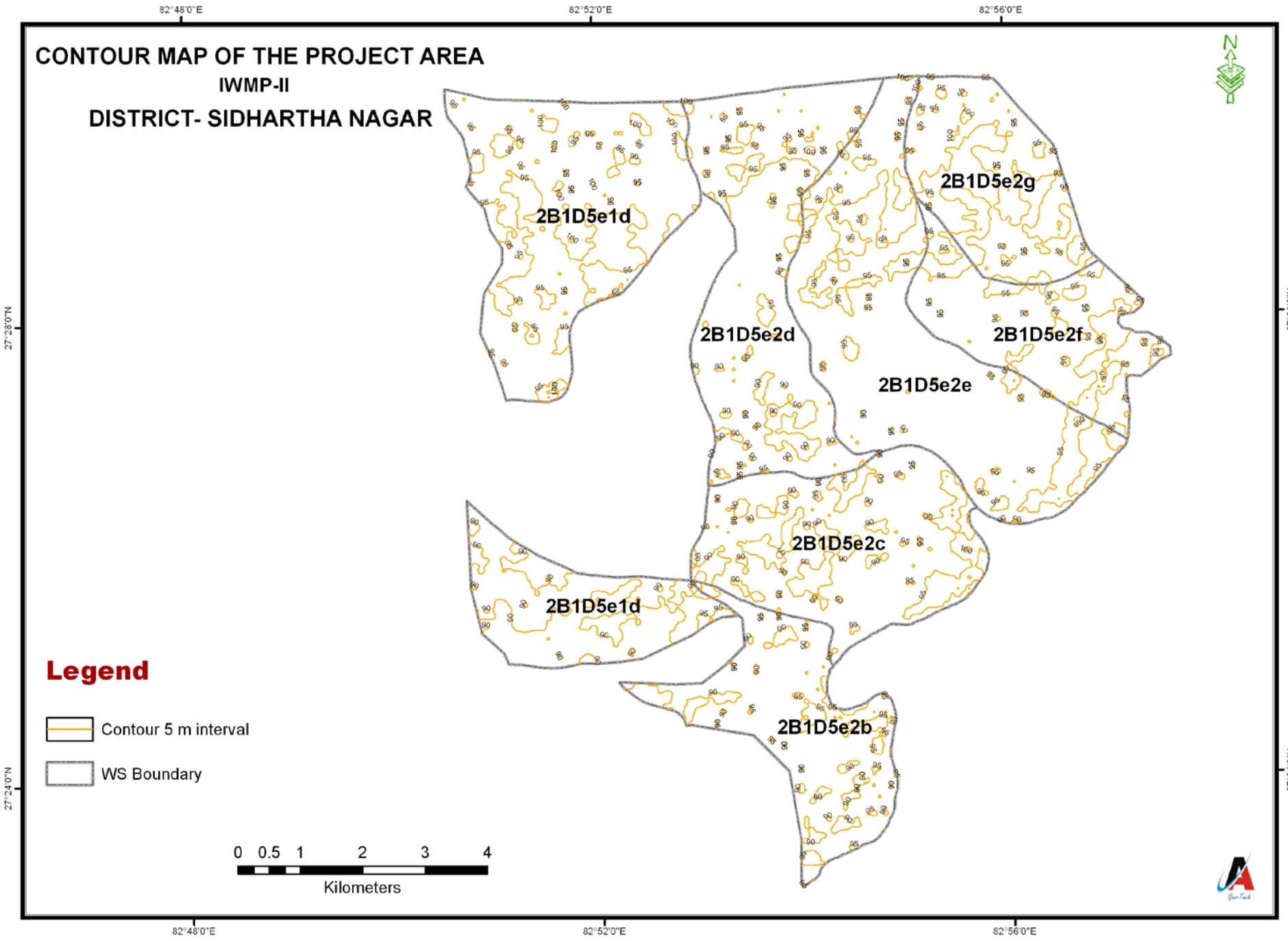

VILLAGE MAP OF THE PROJECT AREA MAP
IWMP- II
DISTRICT- SIDDHARTHA NAGAR
82°48'0"E
82°51'0"E
82°54'0"E
82°57'0"E
27°30'0"N
27°27'0"N
27°24'0"N
N
Barhani
Sinhorawa
Lohati
Charigawa
Jobkunda
Kotiya
Pipara
Surzi
Bagahi
Basantpur
Banchaura
Chandai
Dhandhara
Banchauri
Kapasihawa
Alaga
Mahadewa Buzurg
Beninagar
Paki
Dhandhari Kala
Dhandhari Urf Gulari
Anawa Dih
Kharikaura
Arri
Chandawa
Redwariya
Bohali
Mohankola
Dhanaura Ahatamali
Dhanaura Mustahakam
Audahi
Sumali
Dhanaura Ahatamali
Yad Ahatmali
Basawanpal Urf Madarahia
Utaraula
Sahinwar
Akheraiya
Jugdihawa
Bhelauli
Ganeshpur
Kamhariya
Halaura
Bagulahwa
Parsa
Jharuya
Masina
Siswa Buzurg
Golhaura Mustahakam
Sumarahwa
Komar
Ahiraula
Panariya
Golhaura Ahatmali
Khankuiya Nankar
Thusuri
Manikaura
Roman Dai
Ganrakha
Champapur
Mahatha
Ledawa
Mohan Koli
Matiyar Urf Bhutahwa
Kohdaura
Imlliya Janubi
Khairhaniya Urf Banarahi
Baidauli
Ledawa
Khaira
Basahiya
Belgariya
Belgariya
Legend
Watershed Boundary
0
1
2
4
Kilometers
Geo-Tech

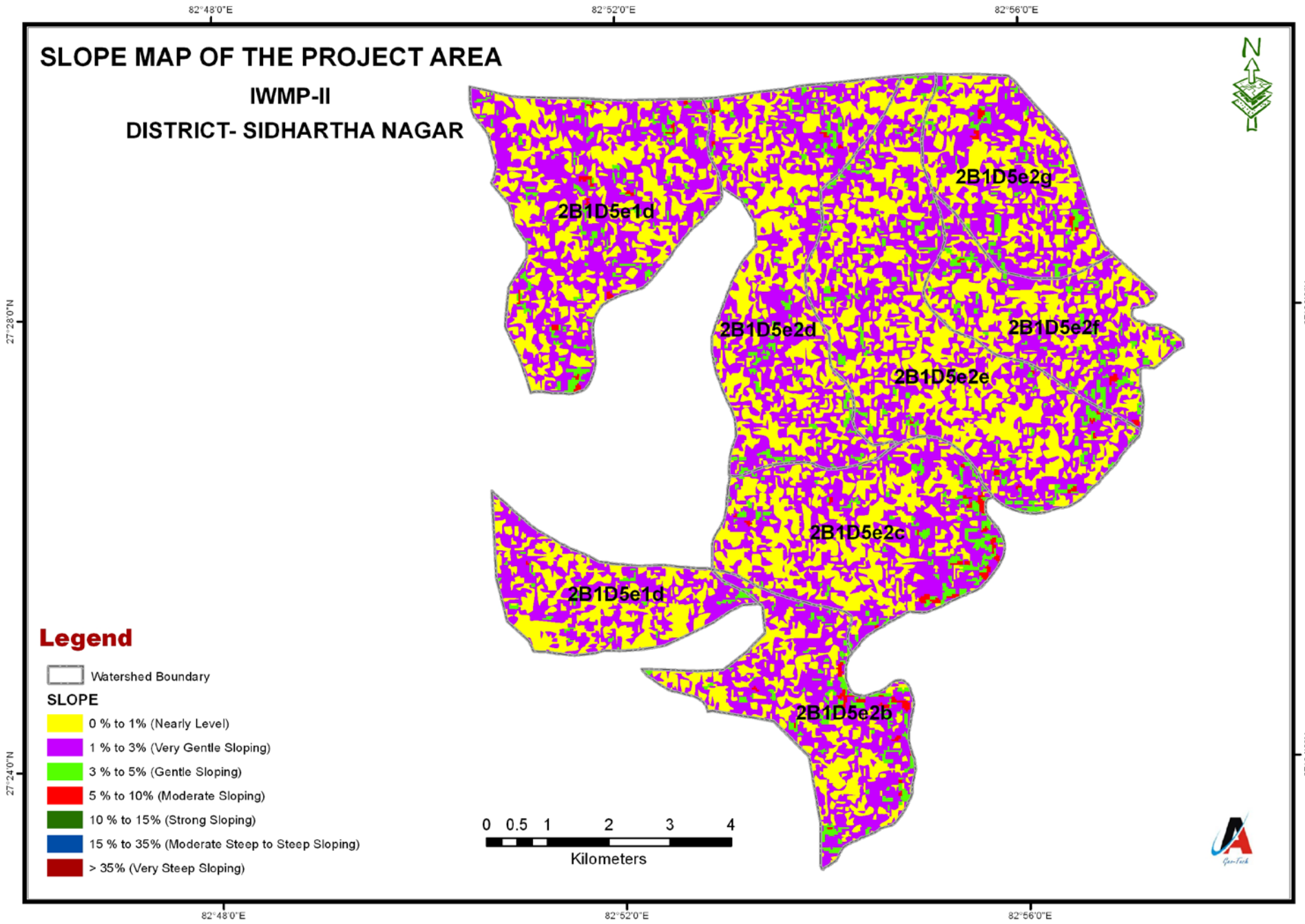

BASE MAP OF THE PROJECT AREA
IWMP- II
DISTRICT- SIDDHARTHA NAGAR
82°48'0"E
82°51'0"E
82°54'0"E
82°57'0"E
27°30'0"N
27°27'0"N
27°24'0"N
N
2B1D5e1d
2B1D5e2g
2B1D5e2d
2B1D5e2f
2B1D5e2e
2B1D5e2c
2B1D5e1d
2B1D5e2b
Legend
Rail
Miner Road
Major Road
Drain
Landuse Class
Settlement
Brick klin
Canal
Ponds
Plantation
River
Waste Land
Water Logged
WS_CODE
2B1D5e1d
2B1D5e2b
2B1D5e2c
2B1D5e2d
2B1D5e2e
2B1D5e2f
2B1D5e2g
0 0.5 1 2 3 4
Kilometers
Geo-Tech


LANDUSE/ LANDCOVER MAP OF THE PROJECT AREA
IWMP- II
DISTRICT- SIDDHARTHA NAGAR
82°48'0"E
82°51'0"E
82°54'0"E
82°57'0"E
27°30'0"N
27°27'0"N
27°24'0"N
N
2B1D5e1d
2B1D5e2g
2B1D5e2d
2B1D5e2f
2B1D5e2e
2B1D5e2c
2B1D5e1d
2B1D5e2b
Legend
Landuse Classes
Drain
Settlement
Brick klin
Canal
Ponds
Plantation
River
Waste Land
Water Logged
Agriculture
0 0.5 1 2 3 4
Kilometers
Geo-Tech


DRAINAGE MAP OF THE PROJECT AREA
IWMP- II
DISTRICT- SIDDHARTHA NAGAR
82°48'0"E
82°51'0"E
82°54'0"E
82°57'0"E
27°30'0"N
27°27'0"N
27°24'0"N
N
2B1D5e1d
2B1D5e2g
2B1D5e2d
2B1D5e2f
2B1D5e2e
2B1D5e2c
2B1D5e1d
2B1D5e2b
Legend
Drain
Canal
Ponds
River
Water Logged
0 0.5 1 2 3 4
Kilometers


TRANSPORT MAP OF THE PROJECT AREA
IWMP- II
DISTRICT- SIDDHARTHA NAGAR
82°48'0"E
82°51'0"E
82°54'0"E
82°57'0"E
27°30'0"N
27°27'0"N
27°24'0"N
N
2B1D5e1d
2B1D5e2g
2B1D5e2d
2B1D5e2f
2B1D5e2e
2B1D5e2c
2B1D5e1d
2B1D5e2b
Legend
Rail
Miner Road
Major Road
Settlement
0 0.5 1 2 3 4
Kilometers
Geo-Tech


CONTOUR MAP OF THE PROJECT AREA
IWMP-II
DISTRICT- SIDHARTHA NAGAR
82°48'0"E
82°52'0"E
82°56'0"E
27°28'0"N
27°24'0"N
N
2B1D5e1d
2B1D5e2g
2B1D5e2d
2B1D5e2f
2B1D5e2e
2B1D5e2c
2B1D5e1d
2B1D5e2b
Legend
Contour 5 m interval
WS Boundary
0 0.5 1 2 3 4
Kilometers


SLOPE MAP OF THE PROJECT AREA
IWMP-II
DISTRICT- SIDHARTHA NAGAR
82°48'0"E
82°52'0"E
82°56'0"E
27°28'0"N
27°24'0"N
N
2B1D5e2g
2B1D5e1d
2B1D5e2d
2B1D5e2f
2B1D5e2e
2B1D5e2c
2B1D5e1d
2B1D5e2b
Legend
Watershed Boundary
SLOPE
0 % to 1% (Nearly Level)
1 % to 3% (Very Gentle Sloping)
3 % to 5% (Gentle Sloping)
5 % to 10% (Moderate Sloping)
10 % to 15% (Strong Sloping)
15 % to 35% (Moderate Steep to Steep Sloping)
> 35% (Very Steep Sloping)
0 0.5 1 2 3 4
Kilometers

# PERPARTION OF DPR

Detail Project Report Of Integrated Watershed Management Programme IWMP II[nd] had been prepared through base line/bench Mark survey for Physiographic climate, soil land use, vegetation, hydrology and socio economic date analysis PRA have been exercised to collect primary date secondary date have been collected from Revenue Statistics department Statistical Magazine oft the district, Sant Kabir Nagar. Toposheet (1:50000) survey of india Dehradoon and technical & specifie input and health with prepartion and drafting of detail project report.

**Table no 33: Staff at PIA level**

| S.N. | Name | Designation |
|---|---|---|
| I | II | III |
| 1. | Dr. N. K. Singh | Scientist, KVK, Mau |
| 2. | Dr. Ranjana Singh | Geologist |
| 3. | Dr. Rakesh Singh | Scientist, Advanced Geo-Tech Solutions, 7,Vrindavan Vihar Bahadurpur, Lucknow-226021 |
| 4. | Dr. Vijendra Kumar Pandey | Scientist, Advanced Geo-Tech Solutions, 7,Vrindavan Vihar Bahadurpur, Lucknow-226021 |
| 5. | Mr. C.L. Paul | Scientist, Advanced Geo-Tech Solutions, 7,Vrindavan Vihar Bahadurpur, Lucknow-226021 |
| 6. | Mr. S. M. Misra | Scientist, Advanced Geo-Tech Solutions, 7,Vrindavan Vihar Bahadurpur, Lucknow-226021 |
| 7. | Mr. Yudhishther Singh | Scientist, Advanced Geo-Tech Solutions, 7,Vrindavan Vihar Bahadurpur, Lucknow-226021 |
| 8. | Mr. Sushil Kumar | GIS Engineer, Advanced Geo-Tech Solutions, 7,Vrindavan Vihar Bahadurpur, Lucknow-226021 |
| 9. | Mr. Arun Kumar | GIS Engineer, Advanced Geo-Tech Solutions, 7,Vrindavan Vihar Bahadurpur, Lucknow-226021 |
| 10. | Mr. Rohinish Karan | Architect, Advanced Geo-Tech Solutions, 7,Vrindavan Vihar Bahadurpur, Lucknow-226021 |
| 11. | Sri Narayan Prasad | BSA, IWDP,Siddharthnagar |
| 12. | Sri Indrajit Singh | JE IWDP, Siddharthnagar |
| 13. | Sri Sanjay awasthi | JE IWDP, Siddharthnagar |
| 14. | Sri Anil Kumar Gupta | Accountant IWDP, Siddharthnagar |
| 15. | Sri Dilip Kumar Srivastava | Accountant IWDP, Siddharthnagar |
| 16. | Sri Rangnath Tiwari | Jiledar, IWDP, Siddharthnagar |
| 17. | Sri Sarvesh Kumar | Jr. Clerk IWDP, Siddharthnagar |
| 18. | Sri Nem Singh | Tracer, IWDP, Siddharthnagar |
| 19. | Sri Sambhu Yadava | ASCI, IWDP, Siddharthnagar |
| 20. | Sri Jhhingur Ram | ASCI, IWDP, Siddharthnagar |

| | | |
|---|---|---|
| **21.** | Sri Hriday Nath Kushwaha | SP, IWDP, Siddharthnagar |
| **22.** | Sri Ramesh | SP, IWDP, Siddharthnagar |
| **23.** | Sri Anil Kumar | SP, IWDP, Siddharthnagar |
| **24.** | Sri Ram Nayan maurya | Munshi, IWDP, Siddharthnagar |
| **25.** | Sri Rajendra Prashad Chaudhri | SP, IWDP, Siddharthnagar |
| **26.** | Sri Kalpnath shukla | SP, IWDP, Siddharthnagar |
| **27.** | Sri swami Nath Upadhyay | SP, IWDP, Siddharthnagar |
| **28.** | Sri Dharmraj Singh | SP, IWDP, Siddharthnagar |
| **29.** | Sri Ram Poojan Singh | SP, IWDP, Siddharthnagar |
| **30.** | Sri kashi Ram Yadava | IVth Class IWDP, Siddharthnagar |
| **31.** | Sri S. P. Mishra | IVth Class IWDP, Siddharthnagar |
| **32.** | Sri Bal Ram Pal | IVth Class IWDP, Siddharthnagar |
| **33.** | Sri Parash Nath Yadava | IVth Class IWDP, Siddharthnagar |

# DPR PLAN ABSTRACT

The collection of all the relevant data of watershed area and the possible option and solution are described with the help of feedback of focused discussion and detailed perspective plan for the watershed area with year wise and activity wise semmarized for the DPR plan sbstract for 5 year (2010-11 to 2014-14) .

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

## Prepared By:

Bhoomi Sanrakshan Adhikari
Dept. Of Land Development & Water Resources
District- **Sidharthanagar**

## Technically Approved By:

Deputy Director
Dept. Of Land Development & Water Resources
Region- **Sidharthnagar**

## Physically & Financially Approved:

**Project Director**
**District Rural Development Authority**
**District- Sidharthnagar**

**Chief Development Officer**
**District- Sidharthnagar**