

DETAIL PROJECT REPORT OF INTEGRATED WATERSHED MANAGEMENT PROGRAMME



ALLAHABAD FOURTH
WATERSHED NAME- TONES RIVER

BLOCK- MEZA

DISTRICT- ALLAHABAD (U.P)

SUBMITTED TO
DEPARTMENT OF LAND DEVELOPMENT
WATER RESOURCES
LUCKNOW (U.P.)



REPRESENTED BY.
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Chapter -1 Project Background

Table 1. 1 PROJECT AT A GLANCE

1 - Name Of Project	I.W.M.P. IVth, Allahabad.
2- Name Of Block	Meza
3 -Name Of District	Allahabad
4 -Name Of State	U.P.
5-Name Of Watershed	Tons
6 -Name Village Selected	Sonbarsi,Madar,Kohrar,Harghar,Bhojpurwa,DauharUchahra,Bhaiya kharkadabar, Gedeora, Chandas,Sikikhurd, Dari, Mamauli, Madraha,Basundar Majhahali,Beli T Kauhara,Murpela,Shahpurkhurd,Hardia.
7 -Micro Watershed Code Selected	2A7D 2b1e, 2A7D2b1d, 2A7D2b1c, 2A7D2b1f, 2A7D2b2e, 2A7D 2b2d, 2A7D2b2d,
8 -Total Area Of The Project	4348.00 ha
9 -Proposed Area For Treatment	3160.00 ha
10-Cost Per Hectare	12000.00
11 -Project Period	2010-11 To 2014-15
12 -Total Cost Of Project	379.20 Lakhs
13 -Proposed Man Days	141000.00 Nos

Table 1.2. SALIENT FEATURES OF I.W.M.P.-IVth

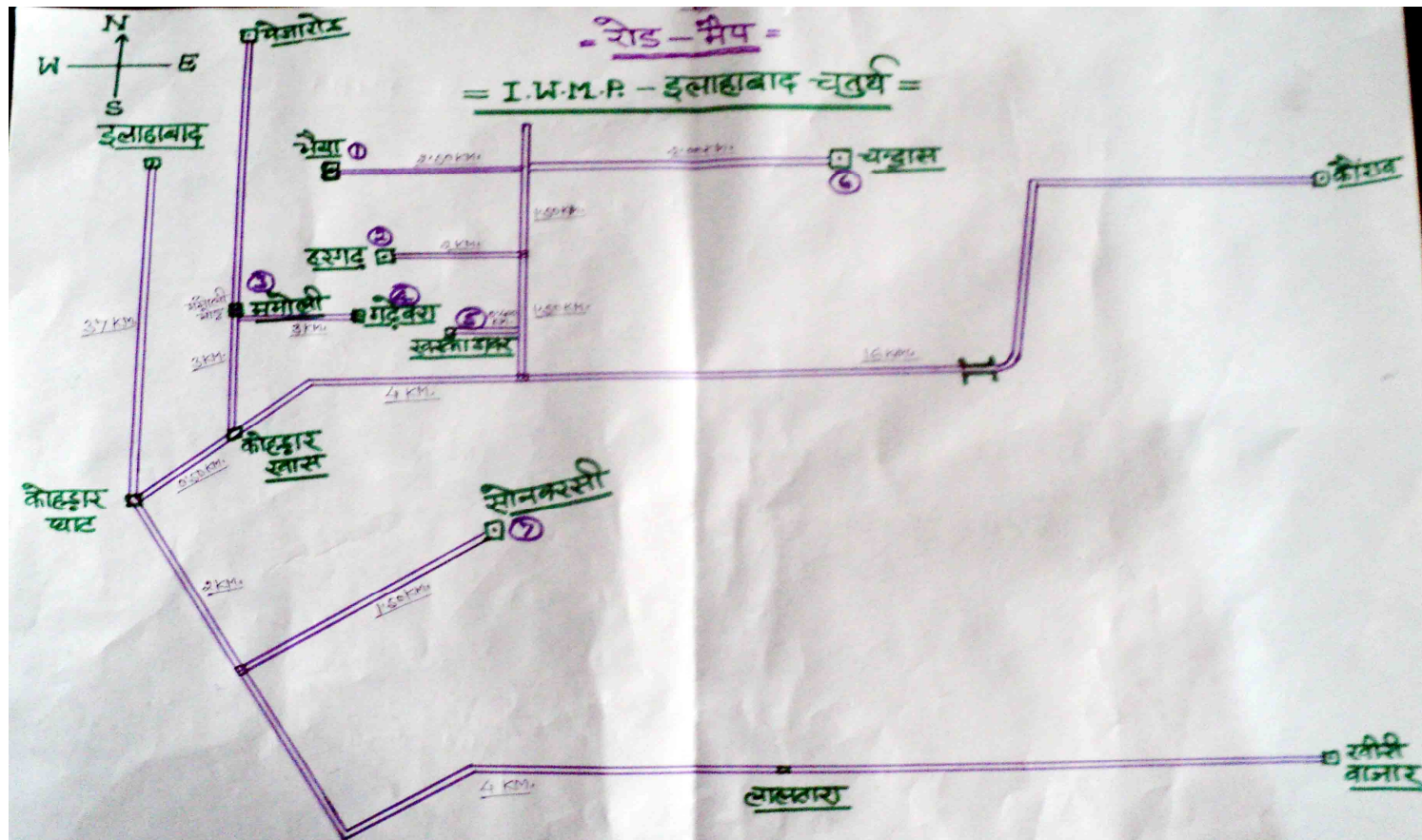
Financial & Physical Outlay.

(Amount in Lacs.)

Agency	Component	Particulars	Unit	Quantity	Unit Cost	TOTAL (100 %)
SLNA	Monitoring	-	-	√	-	0.7584
	Evaluation	-	-	√	-	3.792
	I & CB	-	-	√	-	1.1376
	Consolidation	-	-	√	-	0.3792
	TOTAL	-	-	√	-	6.0672
WCDC	Monitoring	-	-	√	-	1.896
	I & CB	-	-	√	-	3.4128
	Consolidation	-	-	√	-	0.3792
	TOTAL	-	-	√	-	5.688
PIA	Administration	-	-	√	-	18.96
	Monitoring	-	-	√	-	1.1376
	EPA	Roof top rain water harvesting for ground water recharge	Nos	7	0.11125	0.77875
		Soaking Pit	Nos	32	0.03900	1.2840
		Hand pump	Nos	8	0.62500	5.0000
		Krishak Vikas Manch	Nos	8	0.58922	4.12455
		Bathroom	Nos	9	0.44630	4.0167
		TOTAL	-	64		15.168
	I & CB	-	-	√		14.4096
	DPR	-	Nos	1		3.792
	Livelihood	Goat-keeping	Nos	23	0.43950	10.1085
		General Merchant / Mobile shop	Nos	25	0.2500	6.250

1.1 Project Background

IWMP-IV project is located in Meza block of Allahabad district of Gujarat state. The project is a cluster of seven micro-watersheds with 2A7D 2b1e, 2A7D2b1d, 2A7D2b1c, 2A7D2b1f, 2A7D2b2e, 2A7D 2b2d, 2A7D2b2d, being their respective codes. The total project area of the watershed is about 4348.00 ha, of which 3160.00 ha has been undertaken to be treated under Integrated Watershed Management Programme (IWMP) starting year 2010-11. watersheds are situated in the catchment of river Tons the watershed is situated in the South-East of Allahabad district. It lies between $25^{\circ}5'$ to $25^{\circ}10'$ latitude and $81^{\circ}55'$ to $82^{\circ}5'$ Longitude. (Location map – Pg.no.56 and watershed map 189.) Road Map of the watershed shown bellow:



Micro watershed wise villages and their area are shown in table 3.

Table 1.3. Detail of Watershed Project - IWMP – IV Allahabad				
Watershed Code	Name of the Watershed	Name of Village	Area in Hectare	Perimeter of the Area in Metre
2A7D2b1e	Hargarh	Bhojpurwa	107.57	4308.1
		Dhauhan	140.78	5473.01
		Hargarh	227.39	6240
		Khorka Dabara	34.03	2720.44
		Sampur Khurd	7.26	1659.16
		Unchehara	50.20	3340.74
	Total area in Hec.		567.23	
2A7D2b1d	Gedeora	Chandas	18.16	1908.01
		Dhauhan	167.91	6156.72
		Gedeora	150.71	5986.28
		Hargarh	89.40	3982.27
		Siki Khurd	3.36	779.82
		Unchehara	94.73	4125.77

	Total area in Hec.		524.27	
2A7D2b1c	Bhaiya	Bhaiya	576.86	10276.94
		Chandas	10.25	1889.28
		Dari	80.88	4764.99
		Unchehara	37.36	3071.51
	Total area in Hec.		705.35	
2A7D2b1f	Chandas	Chandas	310.95	8548.56
		Dari	62.94	3300.67
		Sinki Khurd	72.21	5074.82
		Unchehara	64.67	3222.72
Total area in Hec.			510.77	
2A7D2b1e	Mamauli	Beri Ti Kohan	29.51	2482.51
		Bhasundar Majhali	500.85	11407.21
		Madahara	51.54	3592.82
		Mamauli	280.40	7818.61
	Total area in Hec.		862.3	
2A7D2b2d	Kharkadabar	Haradiha	224.25	6662.8
		Hargargh	9.88	2141.84
		Kharkadabar	247.66	6962.54
		Mudpela	54.91	4713.51

	Total area in Hec.		536.70	
2A7D2b2d	Sonbarasi	Hardiha	256.32	7734.47
		Kaudar	102.13	4493.41
		Sonbarasi	281.94	7832.53
	Total area in Hec.		640.39	

Elevation of the area ranges from 100.00 m to 104.00 m above mean sea level. Twenty-seven villages comes under the project area namely Sonbarsi, Madar, Kohrar, Harghar, Bhojpurwa, DauharUchahra, Bhaiya, kharkadabar, Gedeora, Chandas, Sikikhurd, Dari, Mamauli, Madraha, BasundarMajhahali, BeliTKauhara, Murpela, Shahpurkhurd, Hardia

Maximum length and width of the watershed area is 12000 meter and 6000 meter respectively with a length: width ratio is 2.09:1.

The watershed is in the Vindhya region having moderate slopes and drains into river Tones And Lapri. About 50% of the watershed area has slopes up to 1%, 30% area has slopes up to 1% to 2%, 20% area has slopes from 2 to 3%. A number of streams join the main perennial stream of Tones. Total 19 numbers of streams of different order are found in watershed, with total length 35000 meters. Stream characteristics of the watershed are present in the table -1.

TABLE-1.4: STREAM CHARACTERISTICS OF SELECTED WATERSHED

Stream Order	Stream number	Mean Stream Length(M)
1 st order	34	31500
2 nd order	12	9500
3 rd order	9	7500
Total	55	48500

The climate of the selected project area is semi-arid with an average rainfall (preceding-five year) is 713 mm. out of which about 90% is received during the monsoon season from July to September. Temperature ranges from very high 48°C in the May-June to minimum 5°C during December –January.

The soil of project area is mainly clay, Domat. In the watershed area mainly four types of soil named. Mar, Kaber, Padawa & Rocker which are the main soil type of Vindhya region. Middle portion of the project has minor slope. Agriculture is the main occupation of the people in project area. The main crops are Gram, lentil, Arhar, Bajra. Most of the fields are kept fallow during Kharif season due to this season Green Manuring is the proposed to minimize the runoff and to maintain the soil fertility of the soil.

Natural vegetation of the watershed area is very poor. Babool, Mahua are the main tree of the area. Occasionally Mango, Neem, Sheesham, Ber tree are found in this area. There is no reserve pasture in the watershed area. Due to Ann da Pratha and lack of irrigation water the rate of mortality of planted trees is very high. P.R.A. exercises conducted in the villages of watershed area revealed that inadequate irrigation facilities, low production of field crops.

Fodder shortage, lack of inputs and market facility are some of the major constraints being experienced by the farmers. For this area Amla, Guava, Ber, Bel fruit plants are suitable. 18.00 ha Agro-Horticulture is proposed in the selected area to motivate the farmers to adopt the agro horticulture in practice because of inadequate irrigation water.

Table 1.5 Criteria and weightage for selection of watershed

S. N.	Criteria	Maximum score	Ranges & scores			
i	Poverty index (% of poor to population)	10	Above 80 % (10)	80 to 50 % (7.5)	50 to 20 % (5)	Below 20 % (2.5)
ii	% of SC/ ST population	10	More than 40 % (10)	20 to 40 % (5)	Less than 20 % (3)	Safe (0)
iii	Actual wages	5	Actual wages are significantly lower than minimum wages (5)	Actual wages are equal to or higher than minimum wages (0)	Less than 50 % (3)	Above 70 % (Reject)
iv	% of small and marginal farmers	10	More than 80 % (10)	50 to 80 % (5)	Sub critical (2)	Fully covered (0)
v	Ground water status	5	Over exploited (5)	Critical (3)	0 to -33.2 (0) Non DPAP/ DDP Block	
vi	Moisture index/ DPAP/ DDP Block	15	-66.7 & below (15) DDP Block	-33.3 to -66.6 (10) DPAP Block	70 to 80% (5)	
vii	Area under rain-fed agriculture	15	More than 90 % (15)	80 to 90 % (10)	Partially covered (5)	

vii i	Drinking water	10	No source (10)	Problematic village (7.5)	Low- less than 10 % of TGA (5)	
ix	Degraded land	15	High – above 20 % (15)	Medium – 10 to 20 % (10)	Lands with high production & where productivity can be marginally enhanced with reasonable efforts (5)	
x	Productivity potential of the land	15	Lands with low production & where productivity can be significantly enhanced with reasonable efforts (15)	Lands with moderate production & where productivity can be enhanced with reasonable efforts (10)	Neither contiguous to previously treated watershed nor contiguity within the microwatersheds in the project (0)	
xi	Contiguity to another watershed that has already been developed/ treated	10	Contiguous to previously treated watershed & contiguity within the microwatersheds in the project (10)	Contiguity within the microwatersheds in the project but non contiguous to previously treated watershed (5)	50 to 20 % (5)	

Chapter 2

Basic Information of the Project Area

2.1 Land use pattern:

The net geographical area of IWMP-IV watershed is about 4348.00 ha out of which 3762 hec. is used for Agricultural purposes. Forest area is approximately nil. The area is devoid of any sort of vegetation. Land utilized under different categories are given below:

TABLE 2.1 THE VARIED PRESENT LAND USE AND AREA UNDER DIFFERENT CATEGORIES IN WATERSHED IS AS BELOW:

(Area in Hectare)

S.No.	Name Of Project	No Of Micro Watershed	No Of Villages	Geographical Area Of The Villages	Forest Area	Land under Agriculture Use	Rainfed Area	Permanent Pastures	Wasteland		Treatable Area
									Cultivable	Uncultivable	
1	2	3	4	5	6	7	8	9	10	11	12
1	I.W.M.P IVth Allahabad	7	19	4348	0	3672	3504	0	41	154	3160

During PRA exercise, the villagers prepared land use and hydrology maps of their villages.

2.2 GEOMORPHOLOGY AND SOILS

2.2.1 Geomorphology: Geomorphologically the area is Alluvial plain, and partly plateau of Vindhyan Supergroup. The soil is mainly clay which is easily transportable after detaching causing soil erosion.

2.2.2 Soils: In the watershed area mainly four types of soil named. Mar, Kaber, Padawa & Roker which are the main soil type of Vindhya region. The soil is mainly clays and sandy loam. The soil is brown to very dark grayish brown in surface colour. The depth of soil is moderate to deep about 25 to 150 cm. The predominant texture of soil is loamy sand and silt and clay. The soil fertility is very poor with low nitrogen, phosphorus and potash. The topography of the area is moderate ranging from 0-5% slope. Main crops are pulses who need more phosphorous. Therefore deficiency of phosphorous is common in this area.

2.2.3 Drainage: Due to highly erodible nature of the soil, various gullies and nals have been formed in this area which drain the water of the whole area into the Tons and Lapri

2.2.4 VEGETATION

(a) Natural Vegetation:

Natural vegetation of the watershed is very poor. The forest vegetation is predominant with vilayati Babool (*Prosopis juliflora*) followed by babool (*Acacia nilotica*). There are occasional occurrence of Neem, Mango, Guava, Lemon, Amla, Mahua and Shisham. There is no reserve pasture land in the watershed. Grass patches are seen only on the bunds, road sides and other such places. The principal grasses are Doob & Munj.

(b) Horticulture: Though no organized orchards are present in the watershed, homestead planting of fruit trees of mango, papaya, amla, lemon, ber, bel etc. has been practiced by farmers.

(c) Agro-forestry: The agriculture fields of the village do not have any forest or horticultural plantation. At some places isolated trees of Mahua, Babool, Ber, can be seen, whose frequency is less than one tree per running length of 100 m.

2.2.5 Socio-Economic Profile

2.3. HUMAN AND LIVE STOCK POPULATION

(a) Human Population: The total population of Thirty Nine villages of the watershed is 32313 with average family size of 6 persons. Detail attached on Pg.no. 37-38

(b) Live Stock Population: Total live stock population of the watershed is 20842. Buffalo is preferred as milch animal compare to cow but milk yield is very low. Goats are kept mainly for the meat purpose. Homestead poultry rearing is common among marginal farmers. The breakup of live stock population is attached on Pg.no. 39-40

© **Land Holdings:** Majority of the watershed farmers are in category of marginal (< 1 ha) and small (1-2 ha). These small land holding are further scattered in different places which makes cultivation very difficult. Distribution of farm families according to the size of their land holdings is given as Pg.no. 35-36

(d) Infrastructure Social Features: The watershed has moderate communication facilities and all 19 villages are approachable through motorable road. Literacy rate in the watershed is very low because except some village all villages are having education facilities up to Primary, Junior High School. Only Two intermediate colleges and two Degree collage in village Pawari and Sirhir. All the villages are

electrified and have telephonic connection. Out of 19 villages television is available mostly villages. Nearest small market is Khiri, Kohrar and district headquarter Allahabad. Small land holdings (average less than 1.0 ha) with large family size (average 6 person) and more than 46% of the labour force of the total population living below poverty line indicate poor socio-economic status of the watershed community. However a strong community spirit among the village show a positive indication for the success of any programme implemented in a participatory mode. Traditionally, the entire village community participates in the individual's work needing labor such as sowing, harvesting, house construction works etc. social maps of the watershed villages drawn by villagers themselves, depicting villages features is attached from Pg.no. 44-45

(e) Means of Communication: The watershed can approached from two main roads

- 1- Allahabad Rewa Road through Nari Bari.
- 2- Allahabad Khiri through Karchhana-Kohdar.

The tee diagram to reach at all selected villages is attached on Pg.no. 159

(f) Natural Resource Base: Total rainfed area under watershed is 4338.00 ha at present land under agriculture use total 3160.00 ha. Main source of irrigation are private tube wells and seasonal water bodies for pre-sowing irrigation only. The natural resource maps of the watershed villages drawn by villagers themselves are attached from Pg.no. 162-187

(g) Importance of Development Institution: In the Venn diagram, farmer's perception was recorded for importance and role of different development institutions in relation to infrastructure development in the villages. Importance has been depicted with the size of the circle and role with distance from the village circle. The Venn diagram of selected villages is attached here with from Pg.no. 162-187

(h) Livelihood: Out of the total population 25406 in the watershed, farming is the major source of livelihood for more than 70% of population and 25% population are labours and Balance are service + business class.

2.3.1. Depending on forest for fuel wood and fodder

(a) Fuel wood: Some villagers of the selected village are using LPG to meet their cooking energy requirements. The main source of fuel is from cow dung cake, woody stem of Arhar crop and Mustard. About 70 to 75 percent of the domestic energy requirement is met from the Agro By-Product and cow dung cake. Rest is met out from the forest outside the village and watershed boundary. Fuel wood is obtained from the forest which is situated in the Block-koraon Outside the Watershed Boundary.

(b) Fodder: Villages do not have any significant dependency on forest based fodder as these sources are not available in the forests. There is shortage of green fodder in winter and summer due to inadequate irrigation facility. Due to lack of fodder availability here is Anna Pratha in this area which is the most important reason for more mortality rate of planted trees also.

© Labour Requirement: Labour requirement is found to be maximum during October-November, when the harvesting of Kharif and sowing of rabi crops are done simultaneously. The other crucial periods are March-April when harvesting and threshing of rabi

crop is done and July-August when sowing of Kharif crops takes place. Therefore other source off generating income should planned to reduce the migration of labours.

(d) Crop Calendar: The present crop calendar in the watershed comprises of fallow-gram, fallow-lentil, fallow-wheat, Arhar-Jawar mixed cropping, paddy-wheat, Til-wheat, fallow-Potato, Bajra-lentil etc. Fallow-wheat ,fallow-gram, fallow-lentil, Arhar + Jawar are the most prevailing crop rotation on the agricultural lands both in rainfed and irrigated condition in the watershed. Organized vegetable cultivation, fruit plantation and traditional agro-forestry system are lacking widely in the watershed. The limited vegetable cultivation in the watershed is confined either to kitchen gardens or to be irrigated conditions in a scattered manner on extremely small area with view to meet out the domestic demand for vegetables. There is lack of cultivation of crop other than gram lentil and muster in the watershed.

2.3.2 Farmers Preferences

(a) Fruit Trees: Farmers preferences for fruit trees are solicited in terms of attributes like production, market availability and timber wood value. Overall, Amla, Guava, Ber, Lemon, Papaya is found most preferred fruit tree.

(b) Fodder Trees: Farmers also do not have any preferred fodder tree in the watershed in spite of fact that watershed falls in semi arid tract.

The marketing facilities, lack of follow up of modern scientific package of practices of cropping potential in the watershed, socio-economical factors etc. is found to be most important factors deciding the preferences of farmers pertaining to selection and cultivation of agricultural crops, fruits, or fodder trees in the watershed.

© **Agriculture:** Arhar, Gram, Lentil, Jowar + Arhar, Bajra, are the most preferred agricultural crop in the watershed followed by wheat and paddy.

(d) Historical Time Line: The Historical Timeline is the chronological record of important events in the history of a village which is useful in understanding its background in the context of watershed development. Historical time line depicting important events in respect of different villages of the watershed has prepared through PRA “Historical timeline” of the selected village are attached from Pg.no. 32 – 33

(e) Agriculture: Various agriculture land uses in the watershed are extended to diversified land capabilities starting from marginal to good class IInd lands. The watershed distinctly has three types of land i.e. leveled, sloping and degraded and undulating. The agriculture is practiced on all these soil types though the productivity considerably varies. The total area in agriculture in the watershed is about 5914.00

ha. The water (both for irrigation and drinking) is most scarce natural resource in the watershed. The operation of tube wells for irrigation of agricultural crops frequently leads to the drinking water problem to the farmers for watershed.

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

Rehabilitation of waste lands with appropriate drought hardy species live introduction of suitable multipurpose tree, promoting agro foresting 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 uplift of farmers in the watershed.

One Year Crop Rotation:

Single Cropping: Fallow-Lentil, Fallow-gram, Fallow-wheat, arhar, Fallow-peanut.

Double Cropping: Bajra - Lentil, Arhar + Jowar, Mazie-Potato.

(f) Irrigated Agriculture:

One Year Crop Rotation: Urad/Moong-wheat, Urad/Moong-Potato, Urad/Moong-Vegetables, Paddy-Gram, Paddy-Lentil, Maize-Potato.

Crop Productivity: food crop production is a major land based activity in the watershed. Traditional cultivation practices, coupled with poor quality seeds and long duration crops varieties result in low crop yields. Crops are taken under rainfed as well as irrigated conditions. The yield levels of rainfed crops are particularly very poor. Large variation has been noticed in productivity of wheat (13 Kuintal.) and rice (21.31 Kuintal/ ha.) under rainfed and irrigation, condition respectively. At present level of rainfed farming. The total produce from Rabi and Kharif crops obtained by a medium size of holding owning family can meet food requirements for upto 6 to 7 months only.

The farmers also do not have suitable cropping systems to deal aberrant weather. Weeds impose considerable constraint in producing of both Kharif and rabi crops under irrigation as well as rain-fed production system. Use of weedicide is rare in the watershed.

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

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

(g) Indigenous Technological Knowledge: (I.T.K.) Agriculture is an old age occupation which farmers have practiced and improved in their own manner to earn livelihood under the condition of area. The villagers have their traditional village ponds, practice of field bunding, production of Arhar crop on the bunds in paddy area which typically constitute agriculture related ITKs in the watershed. The indigenous farming technology in the watershed is observed to cover a vast spectrum of activities involving tillage, implement crop selection, storage of produce and value condition in Vindhyachal region line showing is in the traditional practice due to the soil condition. Seed drill, seed comfort drill are used with tractor and Nai/chonga with indigenous plough. These ITKs are eco-friendly, cost effective and involve use of local materials with farmers own wisdom. These techniques equip farmers with skills and strength to adopt to the prevailing adverse conditions.

2.3.3 Forest And Other Vegetation

(a) Forests: The selected watershed has no resource forest area.

Horticulture / Agro-forestry:

(b) 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, built up soil fertility and productivity soil conservation, partly meeting out the fire wood demand of rural community and moreover, optimizing the watershed the other agro-forestry systems like bund and boundary plantations also have good potential to cater the firewood and fodder demands of the rural community it the watershed. The existing area under agro Forestry is almost negligible. *Prosopis juliflora* may be planted as block or sole plantation especially on marginal and degraded lands in the watershed. The agro-forestry interventions comprising of ber, bel, amla, guava, teak etc may be applied for

benefit of farmers under rainfed to irrigated production systems on leveled to slopy 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.

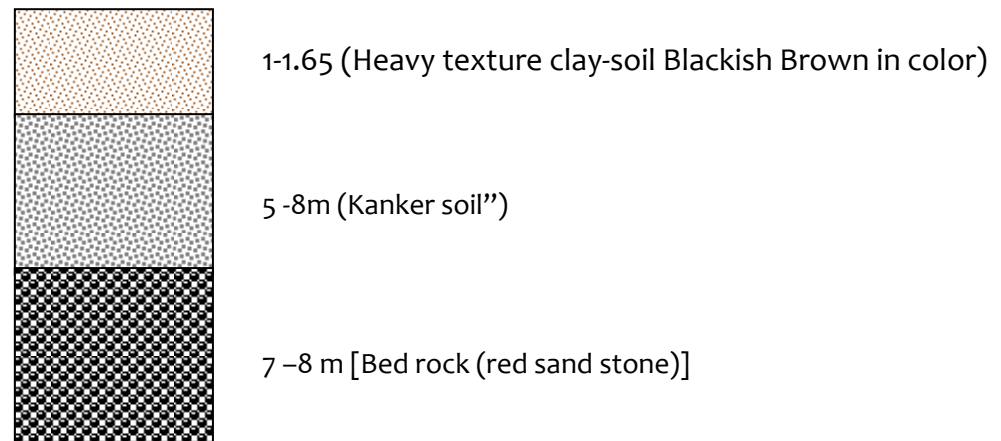
© **Horticulture:** The watershed does not have organized orchards; however, farmers have fruit plants (mango, ber, bel, guava, mahua, amla etc.) near the homesteads and kitchen gardens. The climate and soil of the area is favorable for fruit growing for sub tropical fruits in the lower reaches. Organized orchards, commercial vegetable cultivation, agro horticulture, and other system of agro forestry etc. are lacking but have good potential in the watershed. The watershed is located near the national marg and has scope to transport the produce to the nearest market Allahabad.

2.4 Soil and land Capability Classification:

(a) **Soil Morphology:** The selected area is situated in the south of District-Allahabad. The entire watershed is topographically divided into three major land forms. Accordingly, the soils of watershed have been grouped in the three major categories.

- 1- Plain land
- 2- Moderate slopy land
- 3- Ravinous land.

Soil Profile: A Representative Soil Profile



Morphology Of Typical Solid Profile Of Tones Watershed

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

(b) Soil Characteristics and Fertility Status:

Four types of soils are in the watershed area. The fertility status is about normal range due to production of major pulses crops. There is scarcity of phosphorus due to continuous growing of pulses. The two soil samples of each village have been send to laboratory. After receiving the analysis report effort will be made to motivate the farmers to use nutrients and micronutrients according to the any analysis report. For this demonstration of crop in Kharif and Rabi both seasons have been proposed under agriculture production activity. Receipts of sending samples are enclosed on Pg.no. 58

© Land Capability Classification (LCC):

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

Area Under Various LCC Classes Tones Watershed

LCC class	Area ha
I	160.0
II	1895.00
III	635.00
IV	470.00
Total	3160.00

The land capability classification of the Tones watershed provides reasonable good information with regard to capability of soil, that could be used for agriculture, agri-horticulture, 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 contour bunding for moisture conservation practices. In class III submergence bund, marginal and peripheral bund are planned and in class IV, gully plugging structures, earthen check dam and water harvesting bunds are proposed with permanent Pucca Drop Spill Way structures.

Table 2.2 DETAIL OF INFRASTRUCTURE VILLAGE WISE

S. No	NAME OF VILLAGE	INFRASTRUCTURE DETAILS													OTH ERE
		AN GA NW AD I	PRI MA- RY SCH OOL	SECO NDA- RY SCH OOL	DEGR EE COLL AGE	BAN K	POS T OFF I-CE	P. H. C.	VETERI NA-RI	MA RK- ET	COL L MILL OF CEN TR-E	CONNEC TIVI-TY FROM MAIN ROAD	ELECTR ICI-TY	AGRO INDUS TRY CENT RE	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	Sonbarsi	—	—	—	—	—	—	—	—	—	—	६।	६।	—	—
2	Madar	—	६।	६।	—	—	—	—	—	—	—	६।	६।	—	—
3	Kohrar	—	६।	६।	६।	६।	६।	६।	६।	६।	६।	६।	६।	—	—
4	Harghar	—	६।	—	—	—	—	—	—	—	—	६।	६।	—	—
5	Bhojpurwa	—	६।	—	—	—	—	—	—	—	—	६।	६।	—	—
6	Dauharuchehra	—	—	—	—	—	—	—	—	—	—	६।	६।	—	—
7	Bhaiya	—	६।	६।	.	—			—	—	—	—	६।	.	—
8	Kharkadabar	—	६।	६।	—	—	—	—	—	—	—	६।	६।	—	—
9	Gedeora	—	६।	६।	—	—	—	—	—	—	—	६।	६।	—	—

10	Chandas	—	ॐ ।	—	—	—	—	—	—	—	—	ॐ ।	ॐ ।	—	—
11	Sikikhurd	—	ॐ ।	—	—	—	—	—	—	—	—	ॐ ।	ॐ ।	—	—
12	Dari	—	—	—	—					—	—	—		—	
13	Mamauli	—	ॐ ।	ॐ ।	—	—	—	—	—	—	—	ॐ ।	ॐ ।	—	—
14	Mardraha	—	ॐ ।		—	—	—	—	—	—	—	ॐ ।	ॐ ।	—	—
15	Basundar Majhahali	—	—	—	—	ॐ ।	ॐ ।	ॐ ।	ॐ ।	ॐ ।	—	ॐ ।	ॐ ।	—	—
16	Beli T Kauhan	—	—									ॐ ।	ॐ ।	—	—
17	Murpela	—	—	ॐ ।								ॐ ।	ॐ ।	—	—
18	Shahpurkhurd	—	—									ॐ ।	ॐ ।	—	—
19	Hardia	—	ॐ ।	ॐ ।	—	—	—	—	—	—	—	ॐ ।	ॐ ।	—	—

Table 2.3 DETAIL OF AGRICULTURE IMPLIMENTS

SL.NO.	NAME OF VILLAGE	TYPE OF INFRASTRUCTURE			
		TRACTOR (NOS)	SPRAYERS MANNUAL/POWER (NOS.)	CULTVATOR/HARROW (NOS.)	SEED DRILL (NOS.)
1	2	3	4	5	6
1	Sonbarsi	4	—	2	—
2	Madar	2	—	2	—
3	Kohrar	12	—	9	—
4	Harghar	8	—	2	—
5	Bhojpurwa	6	—	6	—
6	Dauharuchehra	3	—	3	—
7	Bhaiya	10	—	6	—
8	Kharkadabar	8	—	4	—
9	Gedeora	8	—	4	3
10	Chandas	10	—	6	1
11	Sikikhurd	6	—	4	—
12	Dari	4	—	—	—
13	Mamauli	10	—	6	—

14	Mardraha	9	—	7	—
15	Basundar Majhahali	8	—	4	—
16	Beli T Kauhan	4	—	—	—
17	Murpela	8	—	5	—
18	Shahpurkhurd	7	1	4	—
19	Hardia	8	—	4	—

Table 2.4 DETAIL OF COMMUNITY PROPERTY RESOURCES

SL.NO.	NAME OF VILLAGE	VILLAGE PONDS /TANK	COMMUNITY BUILDING	DETAIL OF COMMUNITY PROPERTY RESOURCES						
				PERMANENT MARKET	TEMPLES/PLACES OF WORSHIP	FOREST Land	WOOD LOT	PASTURE	ORCHED	
1	2	3	4	5	6	7	8	9	10	11
1	Sonbarsi	1	1	—	—	—	—	—	—	—
2	Madar	1	1	—	1	—	—	—	—	—
3	Kohrar	1	—	—	1	—	—	—	—	—
4	Harghar	—	हाँ	—	1	—	—	—	—	—
5	Bhojpurwa	3	—	—	—	—	—	—	—	—
6	Dauharuchehra	—	1	—	1	—	—	—	—	—
7	Bhaiya	—	—	—	1	—	—	—	—	—
8	Kharkadabar	—	—	—	—	—	—	—	—	—
9	Gedeora	1	1	—	1	—	—	—	—	—
10	Chandas	—	1	—	—	—	—	—	—	—
11	Sikikhurd	1	—	—	2	—	—	—	—	—
12	Dari	—	—	—	—	—	—	—	—	—
13	Mamauli	1	—	—	1	—	—	—	—	—
14	Mardraha	1	1	—	1	—	—	—	—	—

15	Basundar Majhahali	2	1	हॉ	3	हॉ	—	—	—	—
16	Beli T Kauhan	—	1	—	1	—	—	—	—	—
17	Murpela	—	—	—	—	—	—	—	—	—
18	Shahpurkhurd	2	—	—	1	—	—	—	—	—
19	Hardia	2	—	—	1	—	—	—	—	—

Table 2.5 LAND HOLDING VILLAGE-WISE

S.No.	Name of village	Marginal	Small	Medium	Total
1	Sonbarsi	190	105	38	438
2	Madar	55	25	8	88
3	Kohrar	250	140	48	398
4	Harghar	55	30	20	105
5	Bhojpurwa	70	40	15	125
6	Dauharuchehra	30	15	14	59
7	Bhaiya	75	15	105	195

8	Kharkadabar	70	30	20	120
9	Gedeora	110	50	25	185
10	Chandas	45	20	55	120
11	Sikikhurd	88	51	14	153
12	Dari	23	74	175	272
13	Mamauli	270	145	53	478
14	Mardraha	55	40	14	109
15	Basundar Majhahali	85	68	40	183
16	Beli T Kauhan	28	16	40	74
17	Murpela	151	98	75	324
18	Shahpurkhurd	98	58	41	207
19	Hardia	131	80	28	209
	Total	1879	1100	828	3842

Table 2.6 VILLAGE WISE HUMAN POPULATION

S.No.	Name of village	Total population	Male	Female	Children
1	Sonbarsi	199	106	93	46
2	Madar	91	51	40	14
3	Kohrar	4439	2341	2090	910
4	Harghar	1332	711	721	324
5	Bhojpurwa	973	516	457	185
6	Dauharuchehra	92	47	45	28
7	Bhaiya	1406	744	662	273
8	Kharkadabar	693	371	322	161
9	Gedeora	1116	588	528	263
10	Chandas	672	344	328	170

11	Sikikhurd	645	355	290	174
12	Dari	1731	924	807	339
13	Mamauli	1768	939	829	379
14	Mardraha	1413	747	666	292
15	Basundar Majhahali	464	248	217	100
16	Beli T Kauhan	641	350	291	138
17	Murpela	1074	565	509	260
18	Shahpurkhurd	527	298	229	127
19	Hardia	2108	1106	1002	478
	Total	21385	11351	10034	4714

Table 2.8 VILLAGE WISE ANIMAL POPULATION

S.No.	Village	Cow	Buffalo	Goat	Ox	Seep	Hen
1	Sonbarsi	490	270	740	130	210	72
2	Madar	180	120	210	65	50	45
3	Kohrar	1450	850	710	110	560	95
4	Harghar	1500	350	300	100	1000	-
5	Bhojpurwa	50	35	40	20	-	-
6	Dauharuchehra	250	100	300	25	-	-
7	Bhaiya	1200	850	400	24	-	15
8	Kharkadabar	100	100	150	50	250	-
9	Gedeora	150	100	150	45	10	20
10	Chandas	250	100	300	50	400	80
11	Sikikhurd	250	150	400	20	100	-

12	Dari	100	50	150	-	-	-
13	Mamauli	366	385	950	98	450	45
14	Mardraha	250	180	315	60	140	40
15	Basundar Majhahali	480	210	460	130	155	65
16	Beli T Kauhan	260	210	200	86	70	-
17	Murpela	150	100	500	80	200	-
18	Shahpurkhurd	285	190	108	18	45	16
19	Hardia	1000	800	1000	200	1000	-

CHAPTER – 3

WATERSHED ACTIVITIES

3. Watershed Activities

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

3.1. Scientific Planning:

i) Cluster Approach

This envisages a broader vision of Geo-hydrological unit which involves treating a cluster of micro-watershed. The IWMP -IV Project consists of seven micro- watersheds namely 2A7D 2b1e, 2A7D2b1d, 2A7D2b1c, 2A7D2b1f, 2A7D2b2e, 2A7D 2b2d, 2A7D2b2d, as their respective codes.

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 *Gram Pradhan and Secretary* ncludes 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 village, average milk production of the cattle and various schemes running and their benefits Bio-physical survey was undertaken to identify various natural resources available in the village. It included the soil typology, 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)

Participatory approach provides a new path for planning, implementing, monitoring and post- withdrawal activities with a complete accountability of the stakeholders. Various PRA techniques like resource mapping, social mapping, and season calendars were used to understand the physical and social orientation of the 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

Remote Sensing and GIS tools have been used for eating the watershed boundary and the villages comes under this watershed area.

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 weightage 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 1:4000 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, Flow accumulation. This model overlaid over cadastral map to calculate the catchment area of each structures like the check dam etc. This has helped to remove the human error which generally occurs while calculating the catchment area of a check dam.

Table no. 3.1: Details of Scientific Planning and Inputs in IWMP projects S. No.

Scientific criteria/ inputs used	Whether scientific criteria was used
(A) Planning	
Cluster approach	Yes
Whether technical back-stopping for the project has been arranged? If yes, mention the name of the Institute	Yes
Baseline survey	Yes
Hydro-geological survey	Yes
Contour mapping	Yes
Participatory Net Planning (PNP)	Yes
Remote sensing data-especially soil/ crop/ run-off cover	Yes
Ridge to Valley treatment	Yes
Online IT connectivity between	Yes
(1) Project and DRDA cell/ZP	Yes
(2) DRDA and SLNA	Yes
(3) SLNA and DoLR	Yes
Availability of GIS layers	Yes
1. Cadastral map	Yes
2. Village boundaries	Yes
3. Drainage	Yes
4. Soil (Soil nutrient status)	Yes
5. Land use	Yes

3.2. Institution building

i) Watershed Committee (WC)

It is a committee that is constituted by Gram Sabha to implement the watershed project with technical support of WDT in the village. The Gram Sabha of the village selects the chairman of the watershed committee with the secretary who will be a paid functionary.

The watershed committee has a pivotal role to play during and after the project implementation period.

3.3 Problems And Need Of Area:

Problem Identification and Prioritization: Food sufficiency, economic growth and environmental security has identified as the major issues to be addressed in the watershed area. The area has moderate to steep slope hence highly prone to soil erosion. Efficiency soil depth is unlimited and spatially useful for good crop growth.

Problems identified and prioritized the transect walk and PRA exercise in all 19 villages listed off problems representing the whole watershed was prepared. Problems have ranked as per their total Weightage in the 19 villages. Lack of irrigation water is the greatest problem experienced by the people followed by low function of field crops, lack of fodder availability and low animal productivity.

3.4 Problems Identification and Prioritization for Tones Watershed

S.No.	Problems	Rank
1	Low production of field crops	3
2	Lack of irrigation water	1
3	Lack of drinking water	4
4	Non availability of fuel wood	6
5	Lack of inputs like quality seeds, fertilizers, pesticides etc.	2
6	Medical and health care facilities for milching animals and low productivity	5
7	Lack of fodder availability and low annual productivity	7
8	Lack of medical educational and transportation facilities	8

3.5 STRENGTH, WEAKNESS, OPPORTUNITY AND THREAT (SWOT) ANALYSIS IS A USEFUL DECISION SUPPORT TOOL.

A SWOT analysis of Tones watershed is presented as below:

Strength (S)	Weakness(W)
1- Cooperative work culture is traditional activities 2- Close ethnic tier 3- Road at the top as well as outlet of the watershed 4- Hard working man power 5- Resource pool of crop genetic diversity 6- Awareness of farmers about watershed management program 7- Well established CPR maintaining and sharing system 8- Well maintained seasonal water bodies. 9- Social outlook of the community towards	1- Poor water management 2- Resource poor farmers 3- Out migration of youth 4- Low and erotic rain fall 5- Fragile geography 6- Fragmented land holding. 7- Heavy infestation of wild animals 8- Problem of fuel and fodder
Opportunities(O)	Threats (T)
1- Wide range of annual and personal crops 2- Scope of regular employment opportunity to check out migration 3- Strengthening of existing irrigation system 4- Conductive climate for rainfed crop diversification 5- Good scope for agro forestry and dry land horticulture. 6- Potential for collective active action and management of CPRs.	1- Prone to adverse climate like drought 2- High market risk 3- Social conflicts owing to PRI & WSM policies and local policies. 4- Weak coordination among line departments. 5- Lack of expertise of implementing agencies in different aspect of WSM.

3.6 PROPOSED LAND USE

Watershed management plan for Tones watershed is proposed with specific objectives of food efficiency and income and employment generation with environmental security. In plan preparation due importance is given to topology, land suitability, irrigation potentiality, prevailing farming systems, micro-farming situation, farmers preferences and priorities along with economic and environmental securities, crop and tree selection and area distribution is done as per farmers priorities revealed through PRA exercise. Technological options are blended with the indigenous knowledge based on the latest available research/experimental findings for this region. Due attention is given to resource of the farmers and adjustments has made in capital intensive/high resource demanding technological outputs while making them adoptable to the resource poor farmers. Emphasis is given on maximum use of Farmyard Manure (FYM) and green manuring. The proposed land use plan of watershed is given as below:

Present and Proposed land use plan of the selected watershed:

S.No.	Land use	Present (ha)	Proposed(ha)
1	Agriculture	3672	3672
a	Rainfed	3504	3414
	(i) Crop	3504	3231.50
	(ii) Agro-forestry	-	182.50
b	Irrigated	168	285.00
	(i) Assured	-	56.00
	(ii) Partial	168	202.00
2	Wasteland	195	170
	(a) Afforestation	-	25
	(b) Pasture	-	-
	(c) Untreatable	154	154
3	Village land	481	481
	Total	4348	4348

3.7 WATER RESOURCE DEVELOPMENT AND SOIL CONSERVATION MEASURES

3.7.1 Status Of Present Water Resources Utilization: There is no natural water body in the selected area which may used for irrigation. Present assured/Partial irrigation is done by private tub wells.

3.7.2 Proposed Plan For Irrigation Of Water Resources: Sprinkler sets for irrigation from private tube well are distributed by Agriculture Department to Tube well holders on the basis of & Irrigation group. Effort will made to help the tube well holders of selected area to form group and to get sprinkler sets. Therefore, more area will be irrigated by the available irrigation water.

3.7.3 New Water Harvesting Structures: In the 395.00 ha area new and renovation of existing watershed harvesting structure / Gully Plug / Earthen C.D. will be constructed for water harvesting.

3.7.4 Crop Production: In the light of the land capability classification of the watershed and need of the farmers, the reallocation of watershed area rainfed and irrigated lands has been done for improving productivity, income generation and maintaining ecological balance. The production crop management plan has the following salient features:

3.7.5 Organic Farming System: Organic Farming System will be achieved in the following manner:

- 1- Maximum use of crop residues in the Integrate plant Nutrients System(IPNS)
- 2- Prevision of legumes composed in the cropping system.
- 3- Green manuring with appropriate legumes.
- 4- Rapid compost using crop residue, domestic and farm waste animal dung.
- 5- **Milching and Crop Residue Management:** Sources of milch material includes weeds, pruning from agro-foresting trees and *in situ* grown legumes and green manure crops. The concept of live milching is based on the principle of mixed cropping whereby a fast growing legumes is established before or simultaneously along with a widely spaced seasonal grain crops such maize, and is incorporated into the soil at an appropriate stage to act on as a milch. Application of organic milch material 4-5 t / ha is recommended.
- 6- **Green Manuring:** To improve the organic matter and physical condition of the soils , green manuring crops like Dhaincha and sun hemp which supply 20-30 t / ha of green mutter and 85-125 kg/ha of Nitrogen shall be raised and incorporated in to the soil. In 438, ha area green manuring is planned.
- 7- **Seed Treatment With Rhyzobium Culture:** The seed of leguminous crop like black gram, soybean, pea, etc. should be treated with Rhyzobium culture before sowing.

- 8- **Tillage operation:** It is advisable to carry out tillage operation like ploughing followed by planking just after the harvest of Kharif crops. This will be helpful in conserving moisture for sowing and germination of Rabi crop in addition, coverage of soil surface with milch material is also recommended to ensure the soil moisture.
- 9- **Introduction Of Improved Seeds/Varieties:** Short duration and high yielding varieties suitable for this region have been proposed in long duration varieties. Demonstrations of High Yielding Varieties (HYVs) of different crops in 131.00 ha is planned in the watershed however for self sufficiency in seed requirement farmers of the watershed will be involved to produce required quantity of seed of the recommended crop varieties.
- 10- **Sowing Methods:** Agronomical practices like contour cultivation, strip or inter-cropping, optimum time of sowing , optimum plant population by keeping proper distance through line sowing and placement of fertilizer below the seed will help in enhancing the crop yields without involving monetary inputs.
- 11- **Control Of Insects Pest And Diseases:** Pod borer in gram is the major insect in the watershed area leading to loss in crop productivity. Similarly white blister is also a common disease in the mustard crop the management strategies of these insects, pests and diseases will also be demonstrated in the watershed for benefit of the growers.
- 12- **Dry Land Horticulture:** In the selected area 182.50 ha land is planned for horticulture and agro horticulture. Species like amla, guava, ber, bel, lemon will be planted at suitable spacing in the watershed.

Table 3.2 BENEFIT COST RATIO OF I.W.M.P.- IVth ALLAHABAD

Year	Construction cost (00,000 Rs.)	Operation and maintenance cost (00,000 Rs.)	Benefit (00,000 Rs.)
1	75.84	3.03	9.10
2	94.80	6.82	29.00
3	94.80	10.61	62.37
4	52.14	12.70	101.62
5	61.62	15.16	151.68
6	-	15.16	151.68
7	-	15.16	151.68
8	-	15.16	151.68
9	-	15.16	151.68
10	-	15.16	151.68

Table 3.3 BY BENEFIT, COST RATIO METHOD

S.No	Item	1	2	3	4	5	6	7	8	9	10	
1	Discount factor 10%	0.909	0.826	0.751	0.683	0.621	0.564	0.513	0.467	0.424	0.386	
2	Total cost(00,000 Rs.)	78.87	101.62	105.41	62.84	76.78	15.16	15.16	15.16	15.16	15.16	
3	Benefit(00,000 Rs.)	9.10	29.00	62.37	101.62	151.68	151.68	151.68	151.68	151.68	151.68	
4	Σ Cost	71.69	83.93	79.16	44.28	47.68	8.55	7.77	7.07	6.42	5.85	362.40
5	Σ Benefit	8.27	23.95	46.83	69.40	94.19	85.54	77.81	70.83	64.31	58.54	559.67

$$\begin{aligned}
 \text{Benefit cost ratio} &= \frac{\Sigma \text{Benefit}}{\Sigma \text{Cost}} \\
 &= \frac{559.67}{362.40} \\
 &= 1.65:1 \\
 &\text{Hence OK}
 \end{aligned}$$

Table 3.4 STATUS OF FOOD REQUIREMENT AND AVAILABILITY PER ANNUM IN PAISUNI & OHAN WATERSHED

S.No.	Item	Requirement Q / yr.	Before Project		Proposed	
			Availability Q / yr.	Deficit or Surplus Q / yr.	Availability Q / yr.	Deficit or Surplus Q / yr.
1.	Cereals	24587.00	19680.00	+ 4907.00	25250.00	+ 663.00
2.	Pulses	6635.00	8719.00	+2084.00	9645.00	+3010
3.	Oil Seeds	574.00	4385	-689.00	5581.00	+507.00
4.	Vegetables	16945.00	11575.00	-5370.00	17619.00	+675.00

3.7.6 Employment Generation

Labour migration in search of gainful employment is one of the major problems in the remote watershed in particular. Casual employment opportunities to the tune of more than 1.41 lakhs will be generated during the implementation of the project activities. However, changes in the land use pattern and adoption of other subsidiary enterprises will generate employment opportunities for persons of 8500.00 No. in the watershed.

Table 3.5 HISTORICAL TIMELINE VILLAGE-WISE OF I.W.M.P. IVth

Village Sonbarsi		Village Kharkadabar	
Year	Activity	Year	Activity
1733	Village was established. At a distance 40 Km. from Allahabad Koraon Road	1764	Village was established, At a distance 43 Km. from Allahabad Koraon Road.
2007	First Television was purchased in this village Shyam Ji	1988	First Television was purchased in this village by Sri Tej narayan Shukla
2001	First Motorbike was purchased in this village Vijay Shankar	1978	First Radio was purchased in this village by Sri Mangru Pal
1998	First Tractor was purchased in this village by Raghuvar Dayal	2001	First Motorbike was purchased in this village by Sri Tej Narayan
2009	Village was Electrified.	1988	First Tractor was purchased in this village by Sri Tej Narayan
		2005	Village was Electrified.
Village Bhaiya		Village Harghar	
Year	Activity	Year	Activity
1780	Village was established, At a distance 42 Km. from Allahabad Koraon Road.	1897	Village was established. At a distance 44 Km. from Allahabad Koraon Road.
1985	First Television was purchased in this village by Sri Rambahadur Pandey	1992	First Television was purchased by Sri Vijay pal Singh
	Lal Baharur Mishra	2000	First Motorbike was purchased by Sri Vijay pal Singh
1965	First Radio was purchased in this village by Bans Bahadur	1984	First Tractor was purchased by Sri Vijay pal Singh
		1994	Village was Electrified.
1970	First Motorbike was purchased in this village by Dasraha	1984	Thracer puchage by vijay pal Singh
1965	First Tractor was purchased in this village by Sidhmuni	1965	Diesel engine vijay pal singh
1990	Village was Electrified.		

Village Gedeora		Village Chandas	
Year	Activity	Year	Activity
1710	Village was established, At a distance 40 Km. from Allahabad Koraon Road.	1703	Village was established, At a distance 39 Km. from Allahabad Koraon Road.
2007	First Television was purchased in the village	1994	First Television was purchased by sheetla prasad
1982	First Tractor was purchased by Rajnarayan Yadav	1992	First Motorbike was purchased. By sheetla prasad
1984	First Motorbike was purchased in this village by Prayag ji Shukla	1985	First Tractor was purchased by Sheetala prasad
2002	Village was Electrified.	1984	Village was Electrified.
Village Mamauli Majhahli			
Year	Activity		
1612	Village was established. At a distance 50 Km. from Allahabad Koraon Road		.
1973	First Radio was purchased in the village by Gopi chandra		
1985	First Television was purchased in this village by Sri Gopi chandra		
1985	First Motorbike was purchased in this village by Gopi chandra		
1998	First Tractor was purchased in this village by Sri Gopi chandra		
1997	Village was Electrified.		

3.8. SEASONAL ANALYSIS

Seasonal analysis has done with the help of farmers about rainfall patterns, cultivated crops, employment, income, availability of fuel, fodder, migration, transport and health hazards, etc. with respect to seasonal variation in a year which is shown as below:

Month Item	January	February	March	April	May	June	July	August	September	October	November	December
Festivals			Holi	Baisakhi			Rakshabandhan			Dashara	Diwali	Guru Parv
Sowing crops/ harvesting			Mustard			Maize, Paddy, Arhar				Wheat		
				Wheat, Arhar					Maize, Paddy			
Disease	Cough & Cold					Gastro Intestinal/ Loose-motion.			Fever			
Purchase/ Expending												
Rains												
Fodder Scarcity												
Fuel/ wood scarcity												
Loaning period (required)												
Marriage Period												
Drinking Water Scarcity												
Irrigation Water Scarcity												

Table 3.6 Capacity Building Activities

S.No.	District	Project Stakeholders	Total No. of Persons	No. Of Persons Trained so far	No. of Persons be trained during Current financial Year	No. of Persons trained during current financial year	Sources of funding for training		Funds utilised	
							(a) DoLR	(b) any Other (Pl. Specify)	(a) DoLR	(b) any Other (Pl. Specify)
1	2	3	4	5	6	7	8	9	10	11
	Allahabad	PIAs	18	4	14	4	DoLR	—	—	—
2.		WDTs	11	4	7	4	DoLR	—	—	—
3.		UGs	398	—	398	—	DoLR	—	—	—
4.		SHGs	154	—	300	—	—	—	—	—
5		WCs	70	—	70	—	—	—	—	—
6.		Other	—	—	—	—	—	—	—	—

Table 3.7 Expected/Estimated out comes of IWMP IVth (2010-11) Allahabad.

S.No.	Item	Unit	Pre Project	Post Project Status
1	2	3	4	5
1	Status of the water table	Mtr.	16 to 17	15 to 16`
2.	Ground water Structure repaired/ rejuvenated	Nos.	-	121
3.	Quality of Drinking water	Quality	Normal	Good Quality
4.	Availability of drinking water	No of Days	280	365
5.	Increased in irrigated area	Ha.	168	258
6.	Changing in Cropping / Land use pattern	-	-	-
	A-Area under agriculture crop	Ha.	3672	3672
	i- Area under Single crop	Ha.	3150	3610
	ii- Area under double crop	Ha.	1280	2850
	iii- Area under Multiple crop	Ha.	-	258
	iv- Cropping intensity	%	120	183
7.	Increased in area under vegetation cover	Ha.	30	207
8.	Increased in area under horticulture	Ha.	-	182.50
9.	Area under fule & fodder	Ha.	30	25

10.	Increased in milk production	per capita per day per Ltr.	1.50 to 2.00	3.00 to 4.00
11.	No. of SHG	Nos	0	14
12.	Increased in livily hood	Rs./capita/- Anum	Approximate <9000	Approximate 17000
13.	Migration	Nos.	442	88
14.	SHG Federation Formed	Nos.	-	2
15.	Credit linkage with bank	Nos.	-	14

CHAPTER – 4

BUDGETING

PHASING OF WORK

Agency	Component	Particulars	Unit	Quantity	Unit Cost	Installment					TOTAL (100%)	
						20% Preparatory Phase	50% Work Phase		30% Consolidation Phase			
							1 st Year	2 nd Year	3 rd Year	4th year		5th year
SLNA	Monitoring	-	-	-	-	0.1896	0.1422	.1422	.1422	.1422	.7584	
	Evaluation	-	-	-	-	1.1376	.6636	.6636	.6636	.6636	3.792	
	I & CB	-	-	-	-	0.7584	.1896	.1896	-		1.1376	
	Consolidation	-	-	-	-	-	-	-	-	.3792	.3792	
	TOTAL	-	-	-	-	-	-	-	-	-	6.0672	
WCDC	Monitoring	-	-	-	-	.3792	.3792	.3792	-	.3792	1.896	
	I & CB	-	-	-	-	1.896	.474	.474	-		3.4128	
	Consolidation	-	-	-	-					.3792	.3792	
	TOTAL	-	-	-	-	2.2752	.8532	.8536	.948	.7584	5.688	
PIA	Administration	-	-	-	-	3.792	5.1192	5.1192	2.4648	2.4648	18.960	
	Monitoring	-	-	-	-	.1896	.237	.237	.237	.237	1.1376	
	EPA	Roof top rain water harvesting for ground water recharge	Nos	7	0.11125	.77875	-	-	-	-	-	.77875
		Soaking Pit	Nos	32	0.03900	1.24800	-	-	-	-	-	1.248
		Hand pump	Nos	8	0.62500	5.000	-	-	-	-	-	5.000
		Krishak Vikas Manch	Nos	8	0.58922	4.12455	-	-	-	-	-	4.12455
				-			-	-	-	-	-	
		Bathroom	Nos	-	0.44630	4.0167	-	-	-	-	-	4.0167
				-	-	-	-	-	-	-	-	
	TOTAL	-	-	-	-	15.168	-	-	-	-	15.168	
	I & CB	-	-	-	-	8.7216	2.1804	2.1804	1.3272		14.4096	
	DPR	-	Nos	-	-	3.792					3.792	
	Livelihood	Goat-keeping	Nos	23	0.43950	1.3185	3.51600	3.51600	.87900	.87900		10.1085
		General Merchant shop	Nos	25	0.25000	1.000	2.000	2.000	.5000	.7500		6.25
		Nadef Compost	Nos	60	0.11260	.6756	1.8016	1.80160	1.3512	1.12600		6.756
		Dairy Work	Nos	7	0.50000	.50000	1.5000	1.5000				3.5000
		TOTAL (1)	-	115		3.4941	8.8176	8.38176	2.7302	2.755		26.6145
	Production System & Micro-Enterprise	Livestock Development Activities	Detail Attached			.4479	2.0019	1.09665	.14455	.11975		3.81075
		Crop Production & Diversification of agriculture	Ha.	131	0.05975	1.01575	2.56925	3.40575	.41825	.41825		7.82725
		Demonstration of Green-Manuring	Ha.	438	0.00625	.35625	1.03125	1.10	.1250	.1250		2.7375
		Introduction of Agro-forestry agriculture	Ha.	7	2.2700	2.27	4.54	4.54	2.27	2.27		15.89
		TOTAL (2)	-	576	-	4.0899	10.1424	10.1424	2.9578	2.933		30.2655
		GRAND TOTAL (1& 2)	-	-	-	7.584	18.96	18.96	5.688	5.688		56.88
	Consolidation	-	-	-	-	-				.7584	.7584	
TOTAL	-	-	-	-						111.1056		
WC	Administration	-	-	-	-	3.792	5.1192	5.1192	2.4648	2.4648	18.96	
	Watershed Work	Construction of Bunds (Field, Contour, Submergence, Marginal & Peripheral)	Ha.	2559.50	0.03150	4.8215	17.6106	17.7141	17.58065	22.83065		80.5575
		Rainfed Horticulture with Fencing	Ha.	10.50	0.6080	1.216	1.824	1.824	.76	.76		6.384
		Rainfed Horticulture without Fencing	Ha.	172	0.15050	5.418	6.4715	6.4715	3.7625	3.7625		25.886

		Total of Rainfed Horticulture	Ha.	182.50							
		New & renovation of existing Water Harvesting structures/ Gully Plugs/ Chek Dams	Ha.	395	0.12500	9.875	12.25	12.25	7.375	7.375	49.125
		Afforestation & development of Silivi-Pastoral System	Ha.	25	0.10350	0.51750	.72450	.62100	.36225	.36225	2.5875
		Farm Pond for 2 ha. Area	Nos	7	3.1650		9.495	9.495	3.165		22.155
		Drop Spillway for 50.00 hect	Nos	7	2.0850	4.17	4.17	4.17	2.085	-	14.595
		Drop Spillway for 30.00 hect	Nos	4	1.8000	-	3.60	3.60	-	-	7.20
		Pipe Outlets	Nos	110	0.17300	2.422	5.19	5.19	3.114	3.114	19.03
		TOTAL		-	-	28.44	61.3356	61.3356	38.2044	38.2044	227.52
	Consolidation	-	-	-	-					9.8592	9.8592
Total	GRAND TOTAL	-	-	-	-	32.232	66.4548	66.4548	40.6692	50.5284	256.3392
	Administration	-	-	-	-	7.584	10.2384	10.2384	4.9296	4.9296	37.92
	Monitoring	-	-	-	-	.75841	.7584	.7584	.7584	.7584	3.792
	Evaluation	-	-	-	-	1.1376	.6636	.6636	.6636	.6636	3.792
	EPA	-	-	-	-	15.168					15.168
	I & CB	-	-	-	-	11.376	2.844	2.844	2.0382		18.96
	DPR	-	-	-	-	3.792					3.792
	Watershed Work	-	-	-	-	28.44	61.3356	61.3356	38.2046	38.2044	227.52
	Livelihood	-	-	-	-	3.4941	8.8176	8.8176	2.7302	2.755	26.6145
	Production system & micro-enterprise	-	-	-	-	4.0899	10.1424	10.1424	2.9578	2.933	30.2655
	GRAND TOTAL	-	-	-	-						
	Consolidation	-	-	-	-					11.376	11.376
	GRAND TOTAL	-	-	-	-	75.84	94.80	94.80	52.14	61.62	379.20

4.1 Budgeting

The first step in budgeting is dividing the cost of the project into various components as detailed in the common guidelines. It helps us in further identifying activities under different components and allocate appropriate funds.

Table 4.1 PHASING OF WORK (FINANCIAL & PHYSICAL) IWMP IVth

Financial Outlay.

(Amount in Lacs.)

Table 4.2 Physical Outlay.

(Area in Ha.)

Agency	Component	Particulars	Unit	Quantity	Unit Cost	Installment					TOTAL (100%)	
						20% Preparatory Phase	50% Work Phase		30% Consolidation Phase			
							1 st Year	2 nd Year	3 rd Year	4th year		5th year
SLNA	Monitoring					-	-	-	-	√	√	
	Evaluation					-	√	√	√	√	√	
	I & CB					√	√	√	√	-	√	
	Consolidation					-	-	-	-	√	√	
WCDC	Monitoring					√	√	√	√	√	√	
	I & CB					√	√	√	√	-	√	
	Consolidation					-	-	-	-	√	√	
PIA	Administration					√	√	√	√	√	√	
	Monitoring					√	√	√	√	√	√	
	EPA	Roof top rain water harvesting for ground water recharge	Nos	7	0.11125	7	-	-	-	-	-	7
		Soaking Pit	Nos	32	0.03900	32	-	-	-	-	-	32
		Hand pump	Nos	8	0.62500	8	-	-	-	-	-	8
		Krishak Vikas Manch	Nos	8	0.58922	8	-	-	-	-	-	8
		Bathroom	Nos	9	0.43630	9	-	-	-	-	-	9
		TOTAL	-	64		64	-	-	-	-	-	64
	I & CB	-	-			√	√	√	√	-	√	
	DPR	-	Nos	1	3.792	1	-	-	-	-	1	
	Livelihood	Goat-keeping	Nos	23	0.43950	3	8	8	2	2	23	
		Mobile Repairing/ G.M.	Nos	25	0.25000	4	8	8	2	3	25	
		Nadef Compost	Nos	60	0.11260	6	16	16	12	10	60	
		Dairy Work	Nos	7	0.5000	1	3	3	-	-	7	
		TOTAL	-	115	-	14	35	35	16	15	115	
	Production System & Micro-Enterprise	Livestock Development Activities	Detail Attached			√	√	√	√	√	√	
		Crop Production & Diversification of agriculture	Ha.	131	0.05975	17	43	57	7	7	131	
		Demonstration of Green-Manuring	Ha.	438	0.00625	57	165	176	20	20	438	

		Introduction of Agro-forestry agriculture	Ha.	7	2.27	1	2	2	1	1	7
		TOTAL	-	576	-	75	210	235	28	28	576
	Consolidation	-	-	-	-	-	-	-	-	√	√
WC	Administration	-	-	-		√	√	√	√	√	√
	Watershed Work	Construction of Bunds (Field, Contour, Submergence, Marginal & Peripheral)	Ha.	2559.50	0.03150	153	559	563	559	725.50	2559.50
		Rainfed Horticulture with Fencing	Ha.	10.50	0.60800	2	3	3	1.25	1.25	10.50
		Rainfed Horticulture without Fencing	Ha.	172	0.15050	36	43	43	25	25	172
		Total		182.50		38	46	46	26.25	26.25	182.50
		New & renovation of existing Water Harvesting structures/ Gully Plugs/ Chek Dams	Ha.	393	0.12500	79	98	98	59	59	393
		Afforestation & development of Silivi-Pastoral System	Ha.	25	0.10350	5	7	6	3.5	3.5	25
		Farm Pond for 2 ha. Area	Nos	500	3.165	-	3	3	1	-	7
		Drop Spillway for 30.00 hect	Nos	4	0.1800	-	2	2	-	-	4
		Drop Spillway for 50.00 hect	Nos	7	2.08500	2	2	2	1	-	7
		Pipe Outlets	Nos	110	0.17300	14	30	30	18	18	110
	Consolidation	-	-	-	-	-	-	-	-	√	√
Total	Administration	-	-	-	-	√	√	√	√	√	√
	Monitoring	-	-	-	-	√	√	√	√	√	√
	Evaluation	-	-	-	-	√	√	√	√	√	√
	EPA	-	-	-	-	100	-	-	-	-	100
	I & CB	-	-	-	-	√	√	√	√	-	√
	DPR	-	-	-	-	1	-	-	-	-	1
	Watershed Work	-	Nos	128	-	19	37	35	19	18	128
			Ha.	3160	-	275	710	713	647.75	814.25	3160
	Livelihood	-				√	√	√	√	√	√
	Production system & micro-enterprise					76.80	192	192	57.60	57.60	570
	Consolidation	-	-	-	-	-	-	-	-	√	√
	GRAND TOTAL	-	Nos	-	-	19	37	35	19	18	128
			Ha.	-	-	275	710	713	647.75	814.25	3160

Chapter 5

DRAWING AND DETAIL ESTIMATE IN PREPARATORY PHASE

DRAWING OF BATHROOM (Cloth Changing Room)

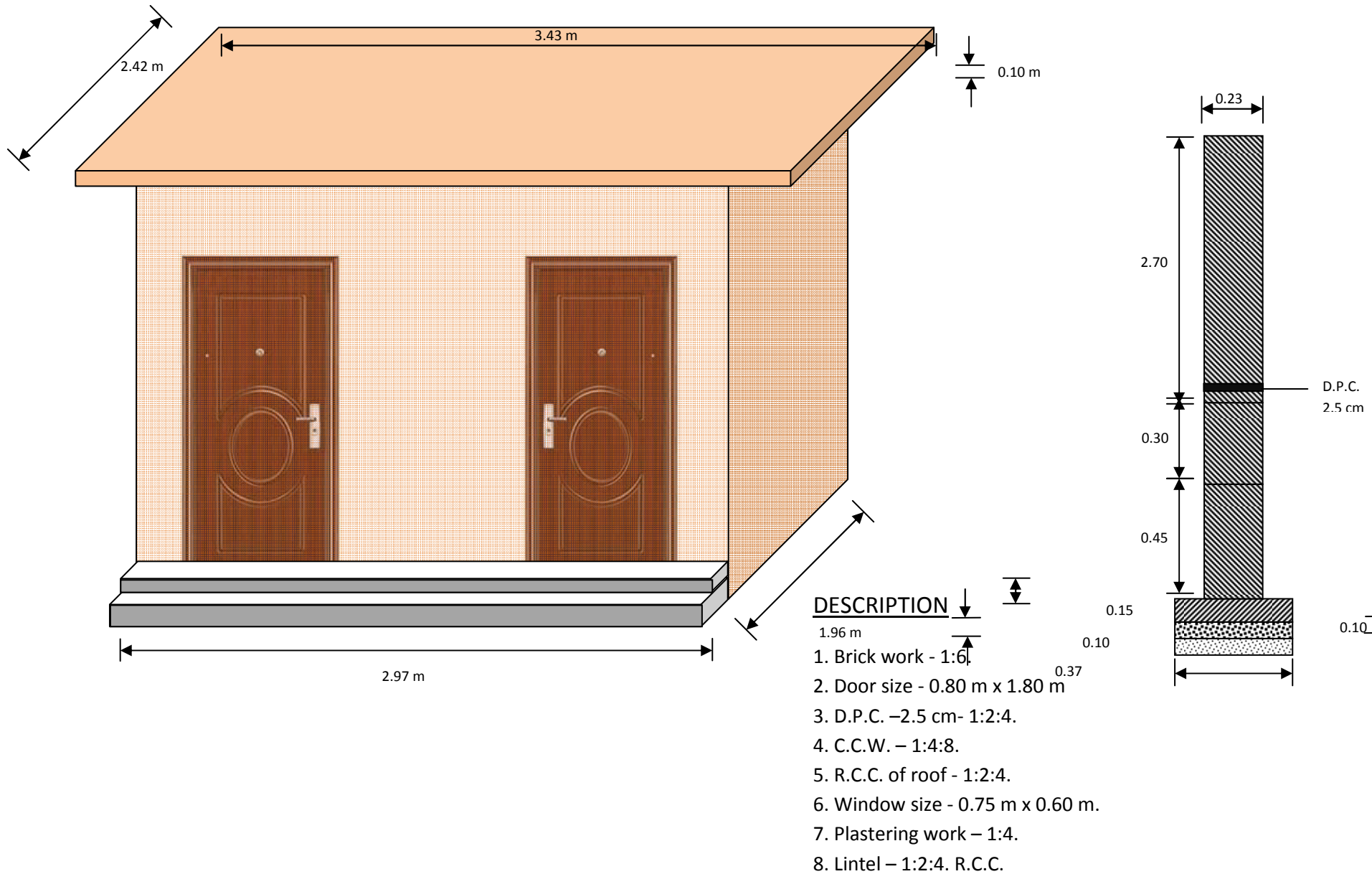


Table 5.1 Detail Estimate of praposed Public Toilet Room (Bathroom)

S.N.	Description of work	No.	Length (M)	Width (M)	Height/Depth (M)	Quantity
1	Earth work in digging	2	3.30	0.60	0.80	3.168
		2	1.33	0.60	0.80	1.276
		1	1.33	0.30	0.80	0.319
		Total				4.763 cum
2	Laying of sand in foundation	2	3.11	0.37	0.10	0.230
		2	1.36	0.37	0.10	0.100
		1	1.36	0.15	0.10	0.020
		Total				0.350 cum
3	C.C.W. 1:4:8 in foundation	2	3.11	0.37	0.10	0.230
		2	1.36	0.37	0.10	0.100
		1	1.36	0.15	0.10	0.020
		Total				0.350 cum
4	Brick work 1:6 in foundation up to plingth	2	3.11	0.37	0.15	0.345
		2	1.36	0.37	0.15	0.150
		1	1.36	0.11	0.15	0.022
		2	2.97	0.23	0.75	1.024
		2	1.50	0.23	0.75	0.517
		1	1.50	0.11	0.75	0.123
	Super Structure	2	2.97	0.23	2.70	3.688

		2	1.50	0.23	2.70	1.863
		1	1.50	0.11	2.70	0.445
	Total					8.177 cum
5	D.P.C. 1:2:4	2	2.97	0.23	0.025	0.034
		2	1.50	0.23	0.025	0.017
		1	1.50	0.11	0.025	0.004
	Total					0.055 cum
6	Lintel 1:2:4 for door	2	1.00	0.23	0.10	0.046
	R.C.C. for window	2	0.75	0.23	0.10	0.034
	Total					0.080 cum
7	Deduction from Brick work					
	door	2	0.80	0.23	1.80	0.662
	window	2	0.80	0.23	0.60	0.220
	Total					0.882 cum
	Net brick masonry work	8.177 - 0.882				7.295 cum
8	Plastering 1:4	2	3.11	-	3.00	18.66
		2	1.96	-	3.00	11.76
		4	1.20	-	2.70	12.96
		4	1.50	-	2.70	16.20
		2	1.20	1.50	-	3.60
	Total					63.18
	Deduction for doors	2	0.80	-	1.80	2.88 sq.m
	Net plastering work	63.18 – 2.88				60.30 sq.m

9	Flooring C.C.W. 1:4:8	2	1.50	1.20	0.075	0.270 cum
	C.C.W. 1:2:4	2	1.50	1.20	0.025	0.090 cum
10	white washing	2	3.11	-	3.00	18.66
		2	1.96	-	3.00	11.76
		4	1.20	-	2.70	12.96
		4	1.50	-	2.70	16.20
		2	1.20	1.50	-	3.60
	Total					63.18 sq.m
	Deduction for doors	2	0.80	-	1.80	2.88 sq.m
	Net white washing	63.18 - 2.88				60.30 sq.m
11	Roof R.C.C. 1:2:4	1	3.57	1.96	0.10	0.699 cum

Table 5.2 CONSUMPTION OF MATERIALS

S. N.	Particulars	Quantity	Cement (Bags)	Coarse sand (cum)	Brick (Nos)	G.S.B (m ³)	M.S. Bar 8 mm	10-20 m.m. Grit	Door No.	Lime (kg.)
1	sand laying	0.350 cum	-	0.350	-	-	-	-	-	-
2	C.C.W. 1:4:8	0.620 cum	2.10	0.279	-	0.576	-	-	-	-
3	C.C.W. 1:2:4	0.095 cum	0.57	0.039	-	-	-	0.080	-	-
4	R.C.C. 1:2:4	0.779 cum	4.75	0.327	-	-	0.0079/61.15 kg	0.662	-	-
5	Brick work 1:4	7.295 cum	13.13	1.969	3356	-	-	-	-	-
6	Plastering 1:4	60.300 m ²	6.63	0.904	-	-	-	-	-	-
7	White washing	60.300 m ²	-	-	-	-	-	-	-	6.00
8	Doors	2 Nos	-	-	-	-	-	0.742	2	-
Total			27.18	3.868	3356	0.576	0.0079/61.15 kg	0.742	2 Nos.	6.00
Say			27	3.870	3360	0.576	0.0079/61.15 kg	0.742	2 Nos.	6.00

Table 5.3 LABOUR CHARGES

1.	Earth Work	4.76 cum	33.33/cum	158.65
2.	Sand laying	0.350 cum	33.33/cum	11.66
3.	C.C.W. 1:4:8	0.620 cum	492.00/cum	305.04
4.	C.C.W. 1:2:4	0.095 cum	492.00/cum	46.74
5.	R.C.C.1:2:4	0.779 cum	560.00/cum	436.24
6.	Brick work	7.295 cum	370.00/cum	2699.15
7.	Plastering	60.300 m ²	40.00/m ²	2412.00
8.	White washing	60.300 m ²	2.70/m ²	162.81
9.	Curing	7.295 cum	25.00/cum	182.37
10.	Chowkidar	6 Man days	100.00/Man day	600.00
Total				Rs. 7,014.66

Cost Of Meterial

S.No.	Particulars	Quantity	Rate	Amount
1.	Cement	27 bags	285.00/bag	7695.00
2.	Coarse sand	3.87 cum	910.00/cum	3521.70
3.	Bricks	3360 Nos.	4500.00/thousand	15120.00
4.	M.S. Bar 8 mm ø	61.15 Kg.	345.00/ctl	2109.67
5.	G.S.B 25-40 m	0.576 cum	855/cum	492.48
6.	G.S. Grit 10-20 mm	0.742 cum	1250/cum	927.50
7.	Doors with frame	2 Nos.	3850.00 each	7700.00
8.	White lime	6 Kg.	8.00/kg	48.00
Total				Rs. 37,614.35

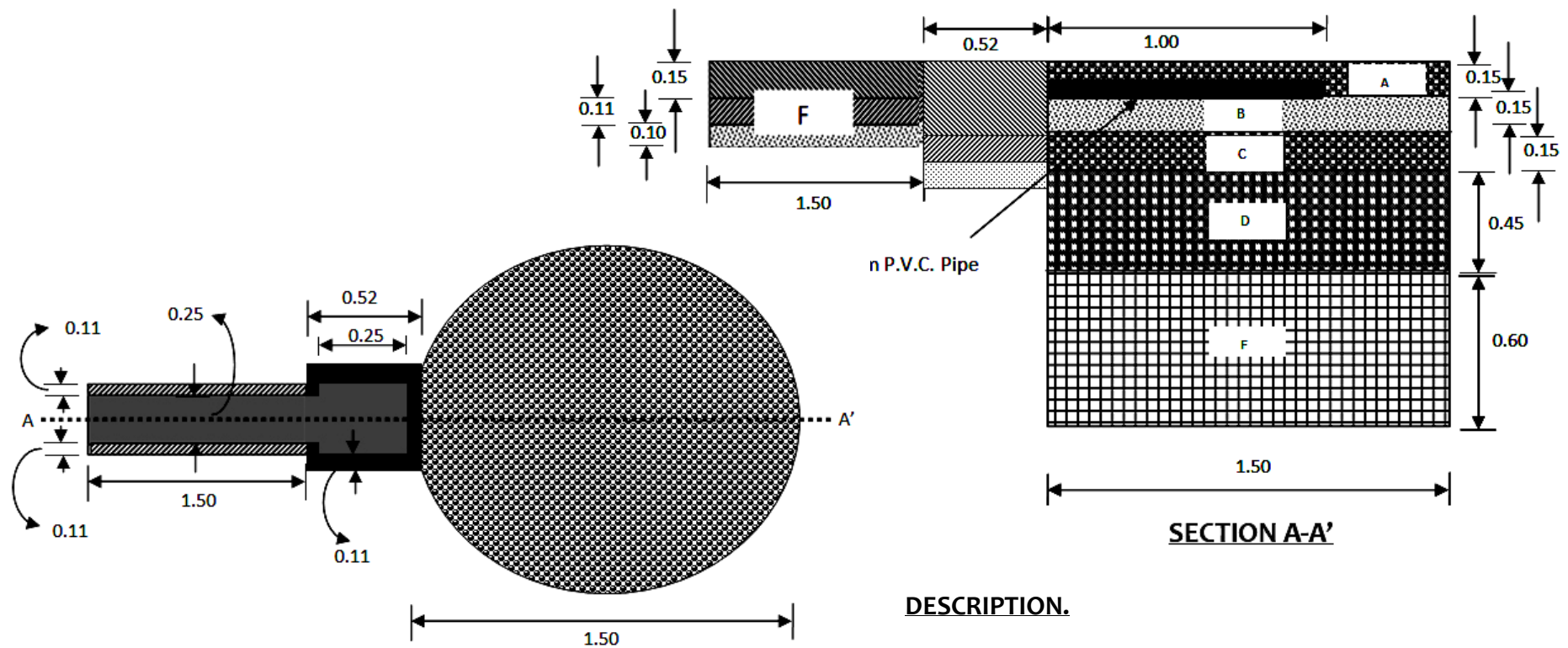
LABOUR CHARGES

Total Cost	
1. Cost of materials	37,614.35
2. Labour charges	7,014.66
Total	Rs. 44,629.01
Say Rs. 44,630.00 only.	

DRAWING OF SOAKING PITS WITH SILTING TANK

All Dimensions

Are in Metre



PLAN OF SOAKING PITS WITH SILTING TANKS

DESCRIPTION.

A – 0.10 x 0.20 Grit.

B – Coarse Sand.

C – 0.10 x 0.20 Grit.

025 x 0.50 Grit.

Cut Stone / Random Rubble.

F – Brick wall 0.11 m x 0.25 m Width channel

D –
E –

Table 5.3 DETAIL ESTIMATE OF SOAKING PIT & CHANNEL OF LENGTH 1.50 M

S.No.	Description of Work	No.	L.	B.	D./H.	Quantity
1.	Earth work in cutting	1	3.14 x 0.75 x 0.75	-	1.50	2.64 cum
2.	Laying of Khanda	1	3.14 x 0.75 x 0.75	-	0.60	1.059 cum
3.	Laying G.S.B. 25-50 mm	1	3.14 x 0.75 x 0.75	-	0.45	0.794 cum
4.	Laying of G.S.Grit 10-20 mm	1	3.14 x 0.75 x 0.75	-	0.15	0.264 cum
5.	Laying of Coarse sand	1	3.14 x 0.75 x 0.75	-	0.15	0.264 cum
6.	Laying of G.S.B. 25-50 mm	1	3.14 x 0.75 x 0.75	-	0.15	0.264 cum
7.	Earth work	1	1.50	0.50	0.40	0.30 cum
8.	Laying of sand	1	1.50	0.47	0.10	0.070 cum
9.	Brick work 1:4	1	1.50	0.47	0.11	0.077 cum
10.	Brick work 1:4	1 x 2	1.50	0.11	0.15	0.049 cum
	Total of (9.) + (10.) Brick work 1:4.					0.126 cum
11.	Plastering 1:4	1 x 2	1.50	0.56	-	1.680 m ²

Table 5.4 ABSTRACT OF MEASUREMENT

1.	Earth work	2.64 + 0.30	2.94 cum
2.	Laying of Khanda		1.059 cum
3.	Laying of G.S.B. 25-50 mm	0.794 + 0.264	1.058 cum
4.	Laying of G.S.Grit 10-20 mm		0.264 cum
5.	Laying of coarse sand	0.264 + 0.070	0.334 cum
6.	Brick work 1:4		0.126 cum
7.	Plastering 1:4		1.680 m ²

Table 5.5 CONSUMPTION OF MATERIAL

S.No.	Description of work	Quantity	Cement (bag)	Brick (nos)	Khanda (cum)	G.S.B. 25-50 mm (cum)	G.S.Grit 10-20 mm (cum)	Coarse Sand
1.	Laying of khanda	1.059 cum	-	-	1.059	-	-	-
2.	Laying of G.S.B.	1.058 cum	-	-	-	1.058	-	-
3.	Laying of G.S.Grit	0.264 cum	-	-	-	-	0.264	-
4.	Laying of coarse sand	0.334 cum	-	-	-	-	-	0.334
5.	Brick work 1:4	0.126 cum	0.17	60	-	-	-	0.030
6.	Plastering 1:4	1.680 m ²	0.18	-	-	-	-	0.025
Total			0.35	60	1.059	1.058	0.264	0.389

Table 5.6 COST OF MATERIALS

S.No.	Particulars	Quantity	Rate	Amount
1.	Khanda	1.059 cum	1025.00/cum	1085.47
2.	Cement	0.35 Bags	285.00/Bag	99.75
3.	Brick	60 nos	4500.00/Thousand	270.00
4.	Coarse Sand	0.389 cum	910.00/cum	353.99
5.	G.S.B. 25-50 mm	1.058 cum	855.00/cum	904.59
6.	G.S.Grit	0.264 cum	1250.00/cum	330.00
Total				Rs. 3043.80

Table 5.6 LABOUR CHARGES

S.No.	Particulars	Quantity	Rate	Amount
1.	Earth work	2.94 cum	36.66/cum	107.78
2.	Khanda laying	1.059 cum	33.33/cum	35.29
3.	G.S.B. laying	1.058 cum	33.33/cum	35.26
4.	G.S.Grit laying	0.264 cum	33.33/cum	8.79
5.	Laying of sand	0.334 cum	33.33/cum	11.13
6.	Brick work 1:4	0.126 cum	370.00/cum	46.62
7.	Plastering 1:4	1.680 m ²	40.00/m ²	67.20
8.	Curing	0.126 cum	25.00/cum	3.15
	Total			Rs. 315.22

Total Expenditure	
1. Cost of materials	3043.80
2. Labour Charges	315.22
Total	Rs. 3,359.02
Say	Rs. 3,360.00 only

Table 5.7 DETAIL ESTIMATE OF SILTING TANK

S.No.	Description of Work	No.	L.	B.	D./H.	Quantity
1.	Earth Work	1	0.70	0.70	0.50	0.24 cum
2.	Sand Laying	1	0.52	0.52	0.10	0.027 cum
3.	Brick Work	1	0.52	0.52	0.11	0.029
		2	0.52	0.11	0.30	0.034
		2	0.30	0.11	0.30	0.019
	Total					0.082 cum
4.	Plastering	4	0.30	-	0.30	0.360
		2	0.52	-	0.11	0.114
		2	0.30	-	0.11	0.066
		1	0.30	0.30	-	0.090
	Total					0.630 m²
5.	Steel Filter 4" Ø	1				1 nos.
6.	P.V.C. Pipe 110 mm Ø	1	1.00	-	-	1.00 m

Table 5.8 CONSUMPTION OF MATERIALS

S.No.	Description of Work	Quantity	Cement (bags)	Coarse Sand (cum)	Brick (nos.)	P.V.C. Pipe 110 mm Ø	Steel Filter
1.	Sand Laying	0.027 cum	-	0.027	-	-	-
2.	Brick Work 1:4	0.082 cum	0.11	0.019	39	-	-
3.	Steel Filter 4"	1 nos.	-	-	-	-	1 nos.
4.	P.V.C. Pipe 110 mm Ø	1.0 m	-	-	-	1.00 m	-
5.	Plastering	0.63 m ²	0.06	0.009	-	-	-
Total			0.17	0.055	39	1.00 m	1 nos.

COST OF MATERIALS

S.No.	Particulars	Quantity	Rate	Amount
1.	Coarse Sand	0.055 cum	910.00/cum	50.05
2.	Cement	0.17 bags	285.00/Bag	48.45
3.	Brick	39 nos.	4500.00/Thousand	175.50
4.	Steel Filter 4" Ø	1 nos.	25.00 each	25.00
5.	P.V.C. Pipe 110 mm Ø	1.00 m	150.00/m	150.00
Total				Rs. 449.00

LABOUR CHARGE

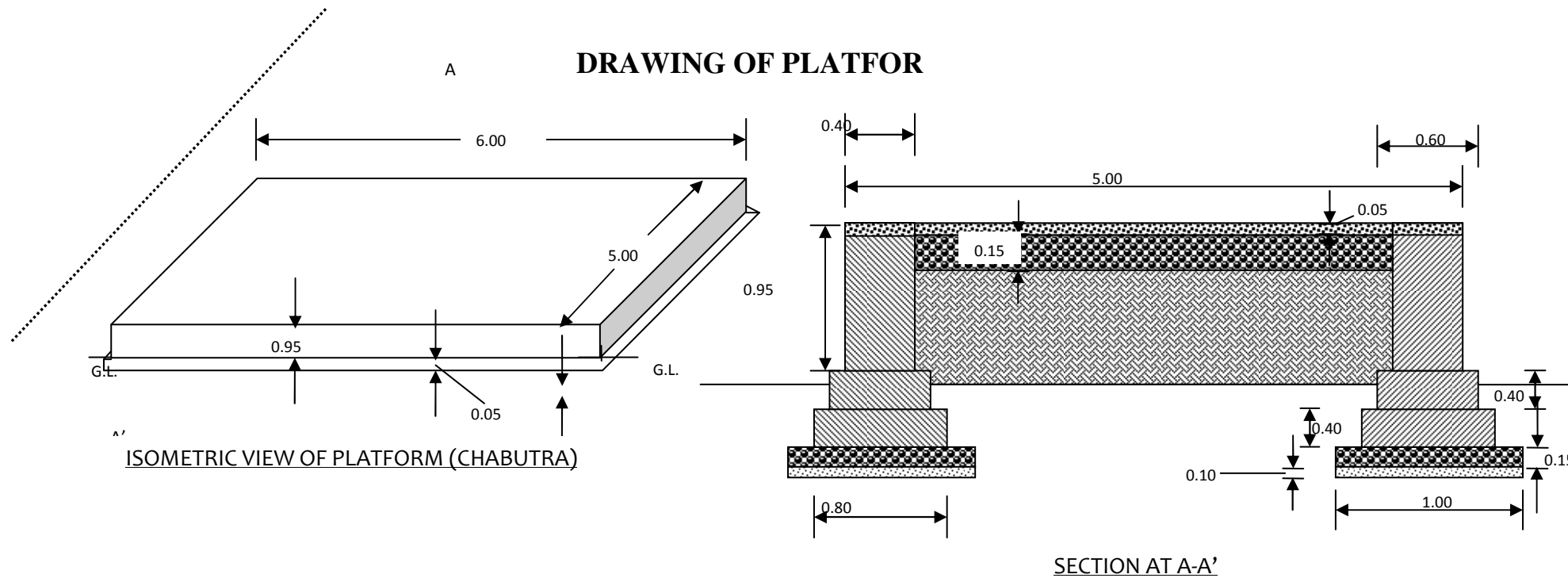
S.No.	Particulars	Quantity	Rate	Amount
1.	Earth Work	0.24 cum	36.66/cum	8.79
2.	Sand Laying	0.027 cum	33.33/cum	0.89
3.	Brick Work	0.082 cum	370.00/cum	30.34
4.	Plastering	0.63 m ²	40.00/m ²	25.20
5.	Fixing of pipe & filter	-	-	25.00
Total				Rs. 90.22

Total Expenditure	
1. Cost of materials	449.00
2. Labour Charge	90.22
Total	Rs. 539.22
Say Rs. 540.00 only	
<u>TOTAL EXPENDITURE OF SOAKING PIT & SILTING TANK</u>	
1. Soaking Pits	3360.00
2. Silting Tank	540.00
	Rs. 3900.00

Table 5.9 DETAIL ESTIMATE OF INDIA MARK-II HAND PUMP**DISTRICT - ALLAHABAD U.P.**

S.No.	Description of work	Unit	Quantity	Rate	Amount
1	Transportation of rig machine, hand Pump material, P.V.C. Pipe, strainer and cement from store to work site.	work	1	3000.00	3000.00
2	Supply of material to install Hand Pump	No.	1	5380.00	5380.00
	i- Lowering and installation of India mark-II Hand Pump with G.I. Pipe & connecting rods.				
	ii- 140 mm P.V.C. Pipe 8kg/cm ² .	metre	20	240.00	4800.00
	iii- medium G.I.Pipe of the 32 mm Ø.	metre	30	202.90	6087.00
3	Boring work by D.T.H. Rig machine and lowering of P.V.C. assembling	meter	50	396.00	19800.00
4	Development of Hand Pump after installation	work	1	100.00	100.00
5	work after development with material	work	1	50.00	50.00
6	construction of Platform of 1.86 m Ø with all material and cement	work	1	2525.00	2525.00
7	construction of channel with all material and labour	meter	3	125.00	375.00
8	Embossing work	work	1	50.00	50.00
9	Water testing work	work	1	400.00	400.00
				Total	Rs. 42,567.00
				Says	Rs. 42,600.00

DRAWING OF KRISHAK VIKAS MANCH



DESCRIPTION

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

Table 5.10 DETAIL ESTIMATE OF PANCHAYATI CHABUTARA

S.No.	Description of Work	No.	L.	B.	D/H	Quantity
1.	Earth work in foundation					
	Long Wall	2	6.40	0.60	0.85	6.52
	Short Wall	2	4.30	0.60	0.85	4.38
Total						10.90 cum
2.	Laying of Sand					
	Long Wall	2	6.20	0.60	0.10	0.744
	Short Wall	2	4.30	0.60	0.10	0.516
Total						1.26 cum
3.	C.C.W. 1:4:8					
	Long Wall	2	6.20	0.60	0.15	1.116
	Short Wall	2	4.30	0.60	0.15	0.774
Total						1.89 cum
4.	Brick work 1:4 in foundation & super structure					
	Foundation.					
	Long Wall	2	6.20	0.48	0.60	3.571
	Short Wall	2	4.52	0.48	0.60	2.2
	Super Structure					
	Long Wall	2	6.00	0.35	1.00	4.200
	Short Wall	2	4.30	0.35	1.00	1.505
Total						11. 878cum

5.	Earth work in filling	1	5.30	4.30	0.75	17.09 cum
6.	C.C.W. 1:4:8	1	5.30	4.30	0.15	3.418 cum
7.	C.C.W. 1:2:4	1	5.30	4.30	0.05	1.139 cum
8.	Raised plastering 1:4					
	Long Wall	2	6.00	-	1.00	12.00
	Short Wall	2	5.00	-	1.00	10.00
	Top	1	5.30	4.30	-	22.79
Total						44.79 m²

ABSTRACT OF WORK

1.	Earth Work	27.99 cum
2.	Sand Laying	1.260 cum
3.	C.C.W. 1:4:8	1.890 cum
4.	Brick work 1:4	11.878 cum
5.	C.C.W. 1:2:4	1.139 cum
6.	Plastering 1:4	44.79 m ²

CONSUMPTION OF MATERIALS

S.No.	Particulars	Quantity	Cement (cum)	Coarse Sand (cum)	Brick (No)	G.S.B. 25- 40 mm (cum)	Stone Grit 10-20 mm (cum)
1.	Sand Laying	1.260 cum	-	1.260	-	-	-
2.	C.C.W 1:4:8	1.890 cum	6.42	0.85	-	1.757	-
3.	Brick work	11.878 cum	21.38	3.207	5464	-	-
4.	C.C.W. 1:2:4	1.139 cum	6.94	0.478	-	-	0.968
5.	Plastering	44.79 m ²	4.92	0.671	-	-	-
Total			39.66	6.466	5464	1.757	0.968
Say			40 Bags	6.50	6470	1.75	0.968

COST OF MATERIALS

S.No.	Particulars	Quantity	Rate	Amount
1.	Cement	40 Bags	285/Bag	11400.00
2.	Coarse Sand	6.50 cum	910.00/cum	6915.00
3.	Brick	5470 cum	4500.00/Hundred	24615.00
4.	G.S.B. 25-40 mm	1.75 cum	855.00/cum	1496.00
5.	G.S. Grit 10-20 mm	0.968 cum	1250.00/cum	1210.00
Total				Rs. 44636.00

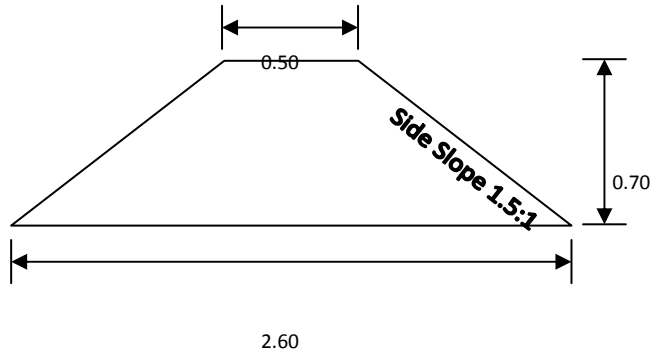
LABOUR CHARGES

S.No.	Particulars	Quantity	Rate	Amount
1.	Earth Work	27.99 cum	36.66/cum	1026.11
2.	Sand Laying	1.26 cum	33.33/cum	41.99
3.	C.C.W. 1:4:8	1.89 cum	494.00/cum	933.66
4.	C.C.W. 1:2:4	1.139 cum	494.00/cum	2210.72
5.	Brick work	11.878 cum	370.00/cum	4394.86
6.	Plastering 1:4	44.79 m ²	40Sq/mt	1791.60
7.	Curing Charges	11.878 cum	40.00/cum	471.48
8.	Chowkidar	6 Man Days	100.00/Man Day	600.00
9.	10% Transpotation charge Material cost			4463.60
Total				Rs. 14285.96

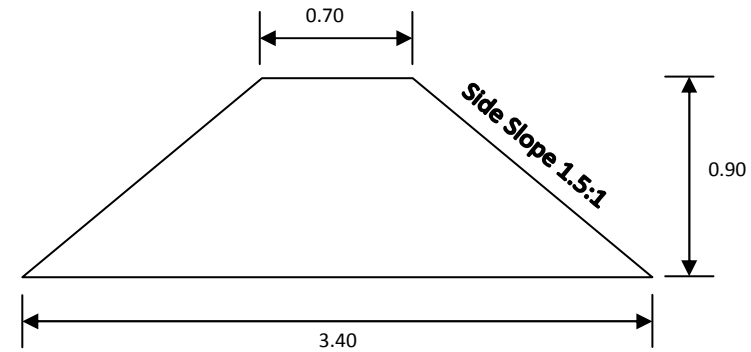
Total Expenditure	
1. Cost of Materials	44636.00
2. Labour Charges	14,494.92
Total	Rs. 58921.96
Say	Rs. 58922.00 only

DRAWING OF C.B., S.B., P.B., AND M.B. *Scale)*

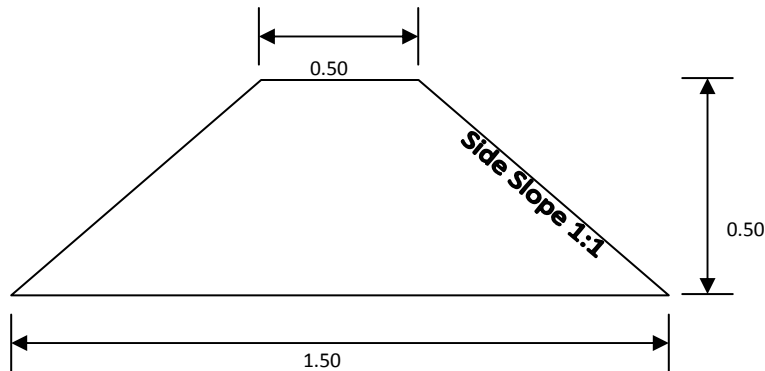
(Not to



(C.B., Cross-Section – 1.085 m²)
1.845m²)

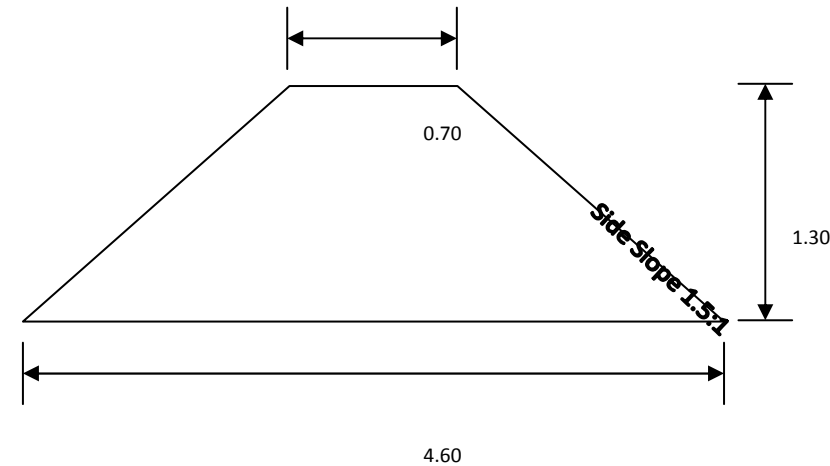


(S.B., Cross-Section –



(Field Bund, Cross-Section – 0.50 m²)

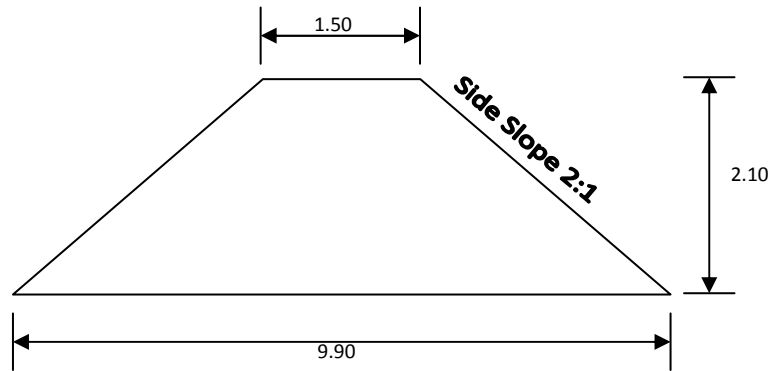
Cross-
3.445 m²)



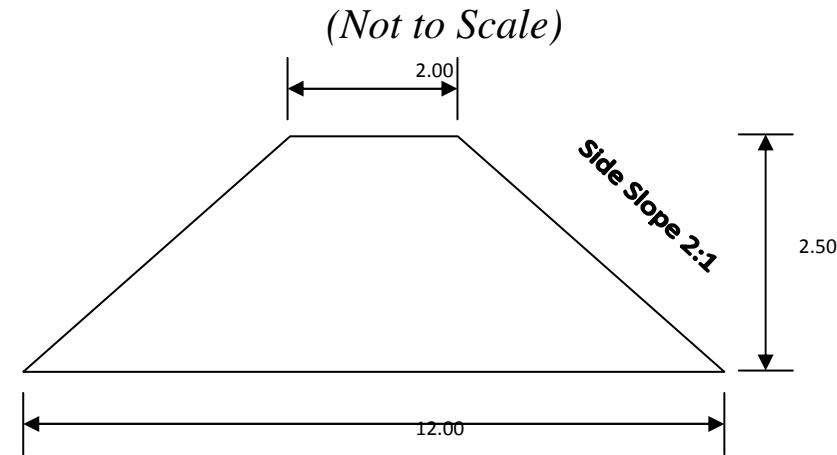
(S.B. /P.B. /M.B.,
Section –

(All dimensions in Metre)

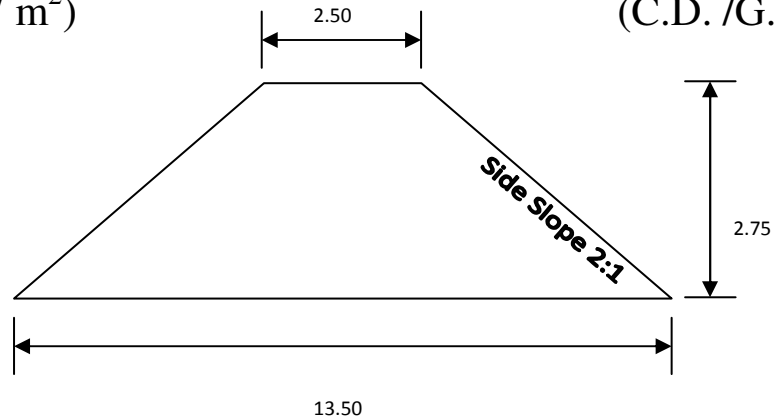
DRAWING OF EARTHEN CHEKDAM / GULLY PLUG



(C.D. /G.P., Cross-Section – 11.97 m²)
Section – 17.50 m²)



(C.D. /G.P., Cross-



(W.H.B., Cross-Section – 22.00 m²)

(All dimensions in Metre)

DESIGN OF CONTOUR BUND

Type of Soil	-Clay	
Rain fall	-24 hr in cm -25 cm	
Field Slope -1%		
Vertical Interval (VI)	$= [s/3+2] \times 0.3$ $= [1/3+2] \times 0.3$ $= 0.70 \text{ m}$	
Horizontal Interval (HI)	$= 100 \times \text{V.I./s}$ $= 100 \times 0.7/1$	
Height of bund h	$= \sqrt{(\text{Re} \times \text{VI})/50}$ $= \sqrt{(25 \times 0.7)/50}$ $= \sqrt{0.35}$ $= 0.59$	Re=maximum rainfall in cm
	Say 0.60 m	
Free board	=15% of height minimum -10 cm	
Height	$= 0.60 + 0.10$ $= 0.70 \text{ m}$	
Taking top width of bund 0.50 m and side slope 1.5:1		
Then base of Bund	$= 0.50 + (1.50 \text{ d}) \times 2$ $= 2.60 \text{ m}$	
Cross-Section of bund	$= (0.50 + 2.60) \times 0.70 / 2$ $= 1.085 \text{ m}^2$	
Length of bund	$= 100 \text{ s} / \text{V.I.}$ $= 100 \times 1 / 0.70$ $= 142.85 \text{ m/ha}$	
	Say 150 m/ha	
Earth work/ha	$= 150 \times 1.085$ $= 162.75 \text{ cum}$	
Cost Rs. / ha	$= 162.75 \times 39.16 = 6373.29$ $\text{Say } 6375.00$	

DESIGN OF SUBMERGENCE BUND

Types of soil –Clay	Rainfall intensity for 24 hrs – 25cm
Field slope 3%	$V.I. = [s/3+2] \times 0.30$
	$= 0.90 \text{ m}$
Horizontal Interval = $(100 \times V.I.) / s$	$= (100 \times 0.90) / 3$
	$= 30 \text{ m}$
Height of bund $h = \sqrt{(R \times V.I.) / 50}$	$= \sqrt{(25 \times 0.90) / 50} = \sqrt{0.45} = 0.67 \text{ m. Say } 0.70 \text{ m}$
Free board 20% of height minimum 20cm	
Total Height	$= 0.90 \text{ m}$
Taking top width of bund 0.70m and side slope 1.5:1	
Bottom of bund	$= 0.70 + 2 \times 1.5d$
	$= 0.70 + 2.70$
	$= 3.40$
Cross Section of Submergence Bund	$= (0.70 + 3.40) \times 0.90 / 2$
	$= 1.845 \text{ m}^2$
Length of bund	$= 100 s / V.I.$
	$= (100 \times 3) / 0.90$
	$= 333 \text{ m}$
Feasible length	$100 + 25 + 25$
	$= 150 \text{ m}$
Earth work/ha	$= 150 \times 1.845$
	$= 276.75$
Cost per ha	$= 276.75 \times 39.16$
	$= 10,837.53$
	Say 10,850=00

TYPICAL SECTION OF FIELD BUND

Top width	= 0.50 m
Side slope	= 1:1
Height of bound	= 0.50 m
Bottom Width	= 1.50 m
Cross section	= $(0.50+1.50) \times 0.50 / 2 = 0.50 \text{ m}^2$
Length per hectare	= 200 m
Earthwork	= $200 \times 0.50 = 100 \text{ cum}$
Cost 39.16/cum	= Rs. 3916.00
Cost per hectare	= Rs. 3916.00

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

Top width	= 0.70 m
Side slope	= 1.5:1
Height	= 1.30 m
Bottom	= 4.60 m
Cross section	= $(0.70+4.60) \times 1.30 / 2$ = 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	= $(1.50 + 9.90) \times 2.10 / 2$ = 11.97 m ²
Cost per meter	= Rs. 551.45

TYPICAL SECTION OF CHECK DAM / GULLY PLUG

Top width	= 2.00m
Side slope	= 2:1
Height	= 2.50 m
Bottom Width	= 12.00 m
Cross Section	= $(2.00 + 12.00) \times 2.50 / 2$ = 17.50 m ²
Cost /meter	= Rs. 839.12

TYPICAL SECTION OF W.H.B

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

5.2 HORTICULTURE DEVELOPMENT FOR WATERSHED MANAGEMENT

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

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

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

(A) Basic constraints

- 1- Lack of suitable agro-techniques for degraded lands
- 2- Lack of trained resource persons
- 3- Inadequate dissemination of the technologies
- 4- Lack of community approach
- 5- High biotic interference
- 6- Lack of infrastructure including marketing.

(B) Soil constraints

- 1- Poor nutrient status of the soil
- 2- Physical impediment
- 3- Moisture stress / water logging / inadequate drainage.

(C) Plant related constraints

- 1- Problem of plant establishment
- 2- Physiological disorders
- 3- Fruit drop and poor productivity
- 4- Incidence of insects-pests.

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

5.2.1 CONCEPTS AND ADVANTAGES OF CONSERVATION HORTICULTURE

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

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

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

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

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

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.

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

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

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 dryfarming conditions to increase the productivity by minimizing evapotranspiration losses.

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 (With Fencing)

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

5.2.4 DESIGN OF DROP SPILLWAY FOR 50.00 HA CATCHMENT AREA

Design of Drop Spillway to be constructed at a place in a gully having width of 5.0 m and catchment area 50.00 ha and net drop 2.0m Taking rainfall intensity for duration equal to time of concentration of watershed and design return period of 25 years, as 120mm/hr. The coefficient of runoff for the watershed is 0.3.

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

given as:

$$Q = \frac{\text{C.I.A.}}{360} = \frac{0.3 \times 120 \times 50}{360} = 5.00 \text{ m}^3/\text{second}$$

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

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

To find suitable value of land L and H

Let us assume $L = 4.0 \text{ m}$ (since width of gulley is 5.0 m)

$$5 = \frac{1.711 \times 4.0 \times h^{3/2}}{(1.1 + 0.01 F)}$$

$$(1.10+0.01x2)$$

$$h^{3/2} = \frac{5.0 \times 1.12}{6.844} = \frac{5.60}{6.844} = 0.818$$

$$h = (0.818)^{2/3} \\ = 0.874 \text{ m says } 0.90 \text{ m.}$$

Test: $L / h = 4/0.9 = 4.44 \geq 2.0$ hence, O.K.

$h / f = 0.9/2.0 = 0.45 \leq 0.5$ hence, O.K

Hence the designed hydraulic dimensions of the Spillway are:

Crest Length (L) = 4.0 m

Weir depth (h) = 0.90 m

3. Structural design –

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

$$E = 3 \times 0.9 + 0.6 = 3.3 \text{ or } 1.5 \times 2 = 3.00 \text{ m}$$

$$E = 3.30 \text{ m}$$

2- Length of apron basin $L_B = f (2.28 h/f + 0.54) = 2(2.20 \times 0.9/2.0 + 0.54)$

$$= 2 (0.99 + 0.54) = 2 \times 1.53 = 3.06 \text{ m Says } 3.10$$

3- Height of end sill, $S = \frac{h}{3} = 0.9/3 = 0.3 \text{ m}$

3

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

$$J = 2h \text{ or } [f + h + s - (L_B + 0.10)/2] \text{ whichever is greater}$$

$$= 2 \times 0.9 \text{ or } [2 + 0.9 + 0.30 - (3.06 + 0.10) / 2]$$

$$= 1.8 \text{ or } [3.20 - 1.58]$$

$$= 1.8 \text{ or } 1.62 \text{ hence adopt } J = 1.8 \text{ m}$$

$$5- \quad M = 2(f + 1.33 h - J) = 2(2 + 1.33 \times 0.9 - 1.8)$$

$$= 2 \times 1.397 = 2.794 \text{ Says } 2.80 \text{ m}$$

$$6- \quad K = (L_B + 0.1) - M = (3.06 + 0.1) - 2.80$$

$$= 0.36 \text{ m}$$

Toe and cut off walls

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

$$= 0.473 \times (5/1)^{1/3}$$

$$= 0.473 \times 1.7099$$

$$= 0.808$$

$$\text{Maximum Scour depth (M S D)} = 1.5 \times \text{N S D}$$

$$= 1.5 \times 808$$

$$= 1.212 \text{ says } 1.21 \text{ m}$$

$$\text{Depth of cutoff /Toe wall} = 1.21 \text{ m}$$

Apron Thickness : For an over fall of 2.0 m in concrete construction is 0.3 m, since the structure is constructed in masonry , the Apron thickness will be $1.5 \times 0.30 = 0.45 \text{ m}$

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

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

DETAIL ESTIMATE OF DROP SPILLWAY OF CREST LENGTH 4.00 METRE

1. Earth work in cutting in foundation

S.No.	Description of work	No.	L	B	D/H	Quantity
1	Side wall	2	3.20	1.20	1.15	8.32
2	Head wall	1	4.00	1.60	1.15	7.36
3	Head wall extension	2	3.30	1.00	1.15	7.59
4	Wing wall	2	2.20	1.00	1.15	5.06
5	Toe wall	1	4.00	1.00	1.15	4.60
6	Cut off wall	1	10.60	1.00	1.15	12.19
7	Apron	1	4.00	3.20	0.70	8.96
Total						54.08 cum

2. Laying of sand in the bed of foundation

S.No.	Description of work	No.	L	B	D/H	Quantity
1.	Side wall	2	3.20	1.20	0.10	0.768
2.	Cut off wall	1	10.60	0.90	0.10	0.954
3.	Head wall	1	4.00	0.60	0.10	0.240

4.	Head Wall Extension	2	3.30	0.40	0.10	0.264
5.	Wing wall	2	2.20	0.90	0.10	0.396
6.	Toe wall	1	4.00	0.90	0.10	0.360
7.	Apron	1	4.00	3.20	0.10	1.280
Total						4.262 cum

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

S.No.	Description of work	No.	L	B	D/H	Quantity
1.	Side Wall	2	3.20	1.20	0.15	1.152
2.	Cut-off Wall	1	10.60	0.90	0.15	1.431
3.	Head Wall	1	4.00	0.60	0.15	0.360
4.	Head Wall Extension	2	3.30	0.40	0.15	0.396
5.	Wing Wall	2	2.20	0.90	0.15	0.594
6.	Toe Wall	1	4.00	0.90	0.15	0.540
7.	Apron	1	4.00	3.20	0.15	1.920
Total						6.393 cum

4. R/R Stone masonry 1:4

S.No.	Description of work	No.	L	B	D/H	Quantity
1.	Cut off wall	1	10.60	0.90	0.90	8.586

2.	Head wall	1	4.00	1.40	0.90	5.040
		1	4.00	$(0.50 + 1.40) / 2$	1.00	3.800
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	1.20	3.168
4.	Side wall	2	3.20	1.20	0.45	3.456
		2	3.20	1.00	0.45	2.790
		2	3.20	0.80	0.60	3.072
		2	3.20	0.60	0.60	2.304
		2	3.20	0.50	0.60	1.920
		2	$(0.40 + 3.20) / 2$	0.40	0.60	0.768
5.	Wing wall	2	2.20	0.80	0.45	1.584
		2	2.20	0.60	0.45	1.188
		2	2.20	0.50	$(1.80 + 0) / 2$	1.980
6.	Toe wall	1	4.00	0.80	0.60	1.920
		1	4.00	0.60	0.60	1.440

		1	4.00	0.40	0.30	0.480
7.	Longitudinal sill	2	3.20	0.20	0.30	0.384
8.	Apron	1	4.00	3.20	0.45	5.760
	Total					59.045 cum

5. C.C.W. 1:2:4 on the wall

S.No.	Description of work	No.	L	B	D/H	Quantity
1.	Head wall	1	4.00	0.50	0.025	0.050
2.	Side wall	2	0.40	0.40	0.025	0.008
		2	2.86	0.40	0.025	0.057
3.	Head wall extension	2	3.30	0.40	0.025	0.066
4.	Wing wall	2	2.84	0.50	0.025	0.071
5.	Longitudinal sill	2	3.20	0.20	0.025	0.032
6.	Apron	3	3.20	1.20	0.025	0.192
7.	Toe Wall	1	4.00	0.40	0.025	0.040
	Total					0.445 cum

6. Raised Pointing 1:3

S.No.	Description of work	No.	L	B	D/H	Quantity
1.	Head wall	1	4.00	-	1.00	4.00
		1	4.00	-	1.72	6.88
2.	Side wall	2	3.20	-	1.80	11.52
		2	(0.40 + 3.20) /2	-	0.60	2.16
3.	Head wall extension	2	3.30	-	1.00	6.60
4.	Wing wall	2	2.20	-	(1.80 + 0) /2	3.96
Total						35.12 m ²

CONSUMPTION OF MATERIALS

S.No.	Particulars	Quantity	Cement (Bags)	Coarse Sand (cum)	Khanda (cum)	G.S.B 25-40 mm (cum)	G.S. Grit 10-20 mm (cum)
1.	Sand laying	4.262 cum	-	4.262	-	-	-
2.	C.C.W. 1:3:6	6.393 cum	27.48	2.876	-	5.75	-
3.	C.C.W. 1:2:4	0.445 cum	2.71	0.186	-	-	0.378
4.	R/R Stone Masonry 1:4	59.045 cum	141.70	20.075	59.045	-	-

5.	Raised Pointing 1:3	35.120 m ²	1.61	0.165	-	-	-
Total			193.50	27.5640	59.045	5.75	0.378
Say			194 Bags	27.5640 cum	59.04 cum	5.75 cum	0.38 cum

COST OF MATERIALS

S.NO	Name of materials	Quantity	Rate	Amount
1.	Cement	194 Bags	285.00/bag	55290.00
2.	Coarse sand	27.564 cum	910.00/cum	25083.24
3.	Khanda	59.04 cum	1300.00/cum	76752.00
4.	G.S.B. 25-40 mm	5.75 cum	855.00/cum	4916.25
5.	G.S.Grit 10-20 mm	0.38 cum	1250.00/cum	475.00
Total				Rs. 1,62,516.49

LABOUR CHARGE

S.No.	Particulars	Quantity	Rate	Amount
1.	Earth Work	54.08 cum	36.66/cum	1982.57
2.	Sand Laying	4.262 cum	33.33/cum	142.05
3.	C.C.W. 1:3:6	6.393 cum	494/cum	3158.14
4.	C.C.W. 1:2:4	0.445 cum	494/cum	219.83
5.	Stone masonry	59.045 cum	370/cum	21846.65
6.	Raised Pointing	35.12 m ²	51.61/m ²	1812.54
7.	Curing	59.045 cum	25.00/cum	1476.12
8.	Chowkidar	13 Man Days	100.00/Man Day	1300.00
9.	Head load & local transportation cost 10% cost of material	-	-	14046.60
	Total			Rs. 45,984.50

Total Expenditure	
1. Cost of materials	162516.49
2. Labour Charges	45984.50
Total	Rs. 208500.99
Say Rs. 208500.00 only	

Not to Scale



5.4 DESIGN OF DROP SPILLWAY FOR 30.00 HA CATCHMENT AREA

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

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

given as:

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

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

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

To find suitable value of L & H

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

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

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

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

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

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

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

Hence the designed hydraulic dimensions of the Spillway are:

Crest Length (L) = 3.00 m

Weir depth (h) = 0.80 m

3. Structural design –

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

$$E = 3 \times 0.80 + 0.6 \quad \text{or} \quad 1.5 \times 1.50$$

$$E = 3.0 \text{ m} \quad \text{or} \quad 2.25 \text{ m}$$

$$\text{Head wall extension} = 3.0 \text{ m}$$

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

$$1.5$$

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

$$= 2.634 \text{ m says } 2.63 \text{ m}$$

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

$$3 \quad 3$$

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

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

$$= 2 \times 0.80 \text{ or } [1.50 + 0.80 + 0.26 - (2.63 + 0.10)/2]$$

$$= 1.6 \text{ or } [2.56 - 1.365]$$

$$= 1.6 \text{ or } 1.195$$

$$\text{adopt } J = 1.60 \text{ m}$$

$$5\text{- } M = 2 (f + 1.33 h - J) = 2 (1.50 + 1.33 \times 0.80 - 1.60) = 2 (2.564 - 1.60)$$

$$= 1.928 \text{ m}$$

$$6- \quad K = (L_B + 0.1) - M = (2.63 + 0.1) - 1.93$$

$$= 0.80 \text{ m}$$

Toe and cut off walls

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

$$= 0.473 \times (3/1)^{1/3}$$

$$= 0.473 \times 1.442$$

$$= 0.68 \text{ m}$$

$$\text{Maximum Scour depth (M S D)} = 1.5 \times \text{N S D}$$

$$= 1.5 \times 0.68$$

$$= 1.02 \text{ m}$$

$$\text{Depth of cutoff /Toe wall} = 1.02 \text{ m}$$

Apron thickness: For an over fall of 1.50 m. The Apron thickness in concrete construction is 0.30 m since the structure is constructed in masonry, the Apron thickness will be $0.30 \times 1.50 = 0.45 \text{ m}$

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

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

**Table 5.11DETAIL ESTIMATE OF DROP SPILLWAY OF CREST LENGTH 3.00
METRE**

1. Earth work in cutting in foundation

S.No.	Description of work	No.	L	B	D/H	Quantity
1	Side wall	2	3.40	1.20	1.15	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	1.20	1.15	4.96
5	Toe 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	2.65	0.70	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	Side wall	2	3.40	1.00	0.10	0.680
2	Head wall	1	3.00	0.60	0.10	0.180
3	Wing wall	2	1.80	1.00	0.10	0.360
4	Toe wall	1	3.00	0.80	0.10	0.240
5	Cut off wall	1	9.00	1.00	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	1.00	0.15	1.35
2	Head wall	1	3.00	0.60	0.15	0.27
3	Side wall	2	3.40	1.00	0.15	1.02
4	Wing wall	2	1.80	1.00	0.15	0.54
5	Toe wall	1	3.00	0.80	0.15	0.36
6	Apron	1	3.00	2.65	0.15	1.192
Total						4.732 cum

4. R/R Stone masonry 1:4

S.No.	Description of work	No.	L	B	D/H	Quantity
1	Cut off wall	1	9.00	1.00	0.90	8.100
2	Head wall	1	3.00	1.50	0.90	4.050
		1	3.00	$(1.50+0.50)/2$	1.50	4.500
3	Head wall extension	2	3.00	0.80	0.45	2.160
		2	3.00	0.60	0.45	1.620
		2	3.00	0.60	0.60	2.160
		2	3.00	0.50	0.60	1.800
		2	3.00	0.40	1.30	3.120
4	Side wall	2	3.40	1.00	0.45	3.060
		2	3.60	0.80	0.45	2.592
		2	3.80	0.60	0.60	2.736
		2	3.90	0.50	1.00	3.900
		2	$(4.00+1.40)/2$	0.40	1.50	3.240

5	Wing wall	2	1.80	1.00	0.45	1.620
		2	1.80	0.80	0.45	1.296
		2	1.80	0.50	(1.60+0) /2	1.440
6	Toe wall	1	3.00	0.80	0.45	1.080
		1	3.00	0.60	0.45	0.810
		1	3.00	0.40	0.30	0.360
7	Apron	1	3.00	2.65	0.45	3.577
8	Longitudinal sill	2	2.60	0.20	0.45	0.468
				Total		53.689 cum

5. C.C.W. 1:2:4 on the wall

S.No.	Description of work	No.	L	B	D/H	Quantity
1	Head wall	1	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						0.441 cum

6. Raised 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

CONSUMPTION OF MATERIALS

S.No.	Particulars	Quantity	Cement (Bags)	Sand (cum)	Khanda (cum)	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	20.34	2.129	-	4.258	-
3	C.C.W. 1:2:4	0.441 cum	2.69	0.185	-	-	0.374

4	S/M 1:4	53.689 cum	128.85	18.254	53.689	-	-
5	Raised Pointing 1:3	39.86 m ²	1.83	0.187	-	-	-
Total			153.71	23.910	53.689	4.258	0.374
Say			154	23.910	53.68	4.26	0.374

COST OF MATERIALS

S.NO	Name of materials	Quantity	Rate	Amount
1	Cement	154 Bags	285.00	43890.00
2	Coarse sand	23.91	910.00	21758.10
3	Khanda	53.68	1300.00	69784.00
4	G.S.B. 25-40 mm	4.26	855.00	3633.75
5	Grit 10-20 mm	0.374	1250.00	467.50
Total				139533.35

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.	S/M 1:4	53.689 cum	370/cum	19864.93
6.	Raised 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 transportation cost 10% cost of material	-	-	12074.53
	Total			Rs. 40504.22

Total Expenditure	
1. Cost of materials	139533.35
2. Labour Charges	40504.22
Total	Rs. 180037.57
Say Rs. 180000.00 only	

Estimate of Pipe Outlet

S.No.	Item	Unit	Length	W	H	Qty (Cmt)
1	E.W. in foundation	1				
(i)	Upper side wall	1	2.00	1.00	1.10	2.20
(ii)	Collor support	1	1.00	1.00	1.05	1.05
(iii)	Down side wall	1	2.00	1.00	1.10	2.20
(iv)	Apron	1	1.00	1.00	0.25	0.25
(v)	Under Hume Pipe	1	5.00	0.80	0.80	3.20
(vi)	E.W. in filling	1	4.50	0.80	0.50	1.80
	Total					10.70 m ³
2	C.C. work in foundation					
(i)	Upper side wall	1	2.00	0.70	0.15	0.21
(ii)	Collor support	1	1.00	0.70	0.15	0.105
(iii)	Down side wall	1	2.00	0.70	0.15	0.210
(iv)	Apron	1	1.00	1.00	0.15	0.150
	Total					0.675 m ³
3	Khanda Work					
(i)	Upper side wall	1	2.00	0.68	0.90	1.224
		1	2.00	0.45	0.68	0.612
(ii)	Collor support	1	1.00	0.68	0.45	0.306
		1	1.00	0.45	0.45	0.202
(iii)	Down side wall	1	2.00	0.68	0.90	1.224
S.No.	Item	Unit	Length	W	H	Qty (Cmt)
		1	2.00	0.45	0.68	0.612
(iv)	Apron	1	1.00	1.00	0.22	0.220
	Total					4.400

	Deduction opening pipe	1x	2x3.14 x	$(.175)^2 \times 45$		= 086
			Net Khanda Work			4.314 m ³
4	Pointing Side Wall					
	Side	2x2	&	0.45	0.68	1.22
		2x2	&	0.68	0.45	1.22
	Front	2x2	2.00	&	1.13	9.04
	Back	2x2	2.00	&	1.13	9.04
	Deduction opening pipe	2x2	$x3.14(.175)^2 \times .38$			20.52
			Net Pointing			20.14 m ²
5	Plastering					
	Top	2	2.00	0.45	&	1.80 m ²

Consumption of Material

S.No.	Item	Unit	Qty	Cement	Morum	Khanda	Stone Ballast	Pipe + collar
1	C.C. Work 1:4:8	m3	0.675	2.29	0.310	&	0.63	&
2	Khanda Work	m3	4.314	10.35	1.51	4.314	&	&
3	Pointing	m2	20.14	0.70	0.07	&	&	&
4	Plastering	m2	1.80	0.19	0.027	&	&	&
				13.53	1.917	4.314	0.63	2 Pipe + 1 collar
			Say	13.5	1.92	4.32	0.63	

Cost Of Material

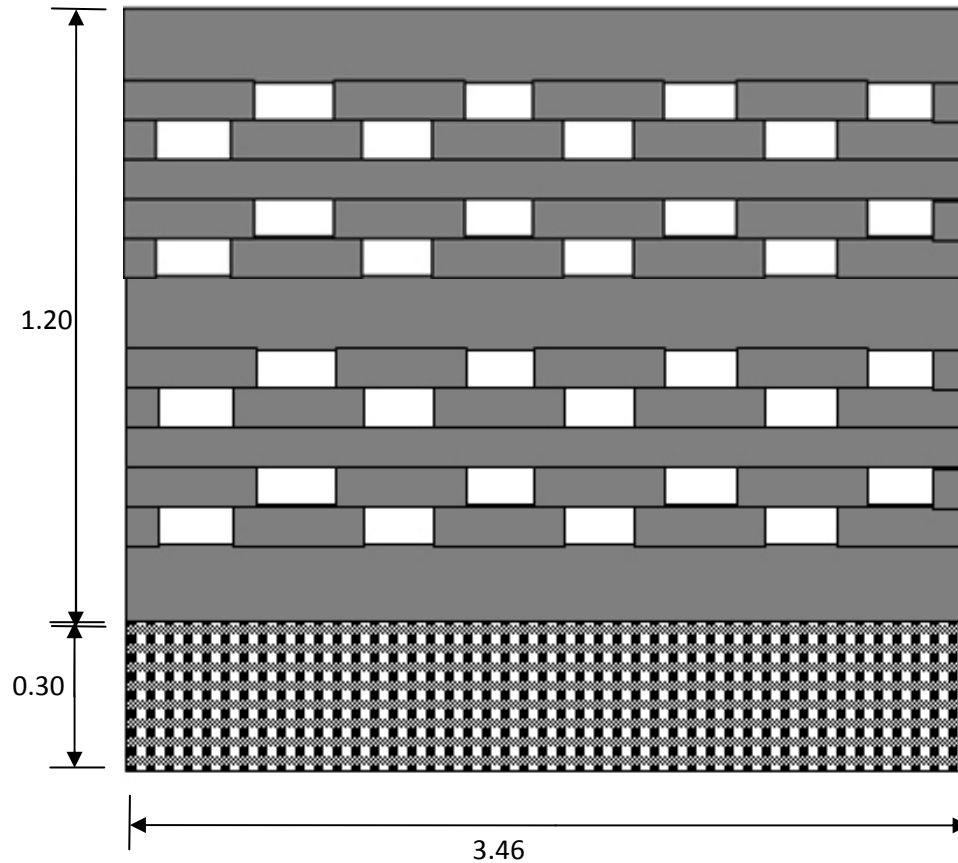
S.N.	Item	Unit	Qty	Rate	Amount	Remark
1	Stone Khanda	Cmt	4.32	850/	3672.00	
2	Morum	Cmt	1.92	800/	1536.00	
3	Cement	No.	13.5	285/	3847.50	
4	Pipe + Coloor	M/no	5m/1	357/RM 79/RM	1864.00	
5	Stone Ballast	Cmt	0.63	1250/	787.50	
	Total				11707.00	

Labour Charges

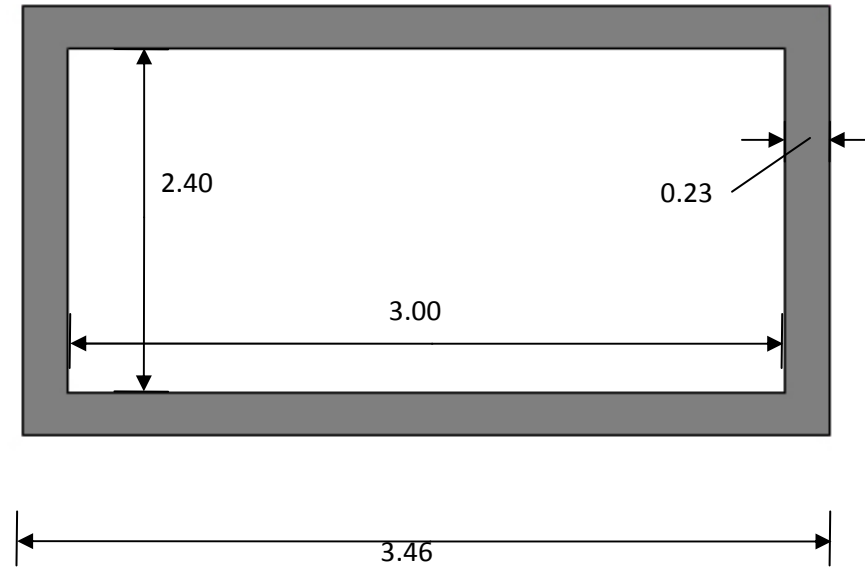
S.n.	Item	Unit	Qty	Rate	Amount	Remark
1	E/W in exvation	Cmt	10.70	44.05/ Cmt	471.33	
2	C.C.Work 1%4%8	Cmt	0.675	494/ Cmt	333.45	
3	B/WZ 1%4	Cmt	4.314	370/ Cmt	1596.18	
4	Layu Pipe lane	M	5	175/pipe	350.00	
5	Pointing work 1%4	M	20.14 mtr	50/m ²	1007.00	
6	Plastring	M	1.80	40/m ²	72.00	
7	Chaukidari	&	4 days	100/	400.00	
8	Quring	Cmt	4.314	25/	107.85	
9	Water Cost	Cmt	4.314	9/	38.82	
10	Head Load	&	&	&	1170.70	
	Total				5547.33	

DRAWING AND DETAIL ESTIMATE OF LIVELIHOOD PROGRAMME IN WATERSHED WORK PHASE

DRAWING OF NADEF COMPOST STRUCTURE



ELEVATION



PLAN

DESCRIPTION.

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)

PREPARATION OF COMPOST BY NADEF METHOD

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

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

ESTIMATE OF COMPOST BY NADEF METHOD

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
	Long Wall Glazed	2	3.46	0.23	0.60	0.954
	Short Wall Glazed	2	2.40	0.23	0.60	0.662
	Total					1.616 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 m²

ABSTRACT OF WORK

S.No.	Particulars	Quantity
1.	Earth Work	1.06 cum
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)	Bricks (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	285.00/ Bag	1995.00
2.	Coarse Sand	1.02 cum	910.00/ cum	928.20
3.	1 st class Brick Work 1:4	1500 nos.	4500.00/ Thousand	6750.00
	Total			Rs. 9,643.20

LABOUR CHARGES

S.No.	Particulars	Quantity	Rate	Amount
1.	Earth Work	1.06 cum	36.66/ cum	30.85
2.	Brick Work	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	9643.20
2. Labour Charges	1616.14
Total	Rs. 11,259.34
Say Rs. 11,260.00 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.

1.) Cow Unit.

S.No.	Particulars	Rate	Amount
1.	3 Cows	12500.00/Cow	37,500.00
2.	Insurance.	11.63%	4,360.00
3.	Food cost for three months @ 3kg per day per cow	23.00/kg	6,210.00
4.	Provision for deworming, mineral and vitamin supplement, treatment, vaccination.	500.00/Animal	1,500.00
5.	Miscellaneous		430.00
Total			Rs. 50,000.00

2.) Buffalo Unit.

S.No.	Particulars	Rate	Amount
1.	2 Buffaloes.	18000.00/Buffalo	36,000.00
2.	Insurance.	11.63%	4,185.00
3.	Food cost for three months @ 4kg per day per Buffalo.	23.00/kg	8,280.00
4.	Provision for deworming, mineral and vitamin supplement, treatment, vaccination.	500.00/Animal	1000.00
5.	Miscellaneous		535.00
Total			Rs. 50,000.00

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

Project

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

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

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

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

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

Vindhya 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. Keeping in view the above facts, goat units shall be formed in the area in intensive way.

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

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

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

Financial Component

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

Estimate of Livestock Development Activities

Total number of female animals:	Buffalo	-	898
	Cow	-	989
	Total	-	1887

1. Artificial Insemination (A.I.): 33% of total animals per year, i.e., 624

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

Total Amount - Rs.62400.00

2. Vaccination: Total number of animals in I.W.M.P.VIth^t - 2232 nos.

1. H.S. + B.Q. @ 5.50 12276.00

2. F.M.D. @ 10.50 23436.00

(Twice in a year)

Total Amount - Rs. 98012.00

3. Deworming: Adult animals - 2009

Child animals - 223

Albendazole for 2009 animals @ 40.56 81485.04

223 child animals @ 20.28 45022.44

Total Amount - Rs 86007.48

4. Mineral Mixture: Agrimine Forte Chelated for 1713 animals @ 115.00 Rs .196995.00

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

DEMONSTRATION OF WHEAT

- 1- Allahabad 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 WATERSHED (PER ha)

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

Hence demonstration cost of wheat /ha is Rs. 5700.00

DEMONSTRATION OF GRAM IN WATERSHED AREA (per ha)

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

ESTIMATE FOR DEMONSTRATION OF GRAM(PER ha)

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

Hence per hectare of demonstration –Rs. 8600.00

DEMONSTRATION OF ARHAR IN WATERSHED AREA(PER ha)

Variety - Malviya-13, narendra-1, Amar

1-

Seed rate/ha -30 kg

2- Requirement of fertilizers/ha N-20.0 kg, P-50 kg, K-40 kg

ESTIMATE FOR DEMONSTRATION OF ARHAR (PER ha)

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

Hence per hectare of demonstration –Rs. 6400.00

DEMONSTRATION OF HYBRID BAJRA IN WATERSHES (per ha)

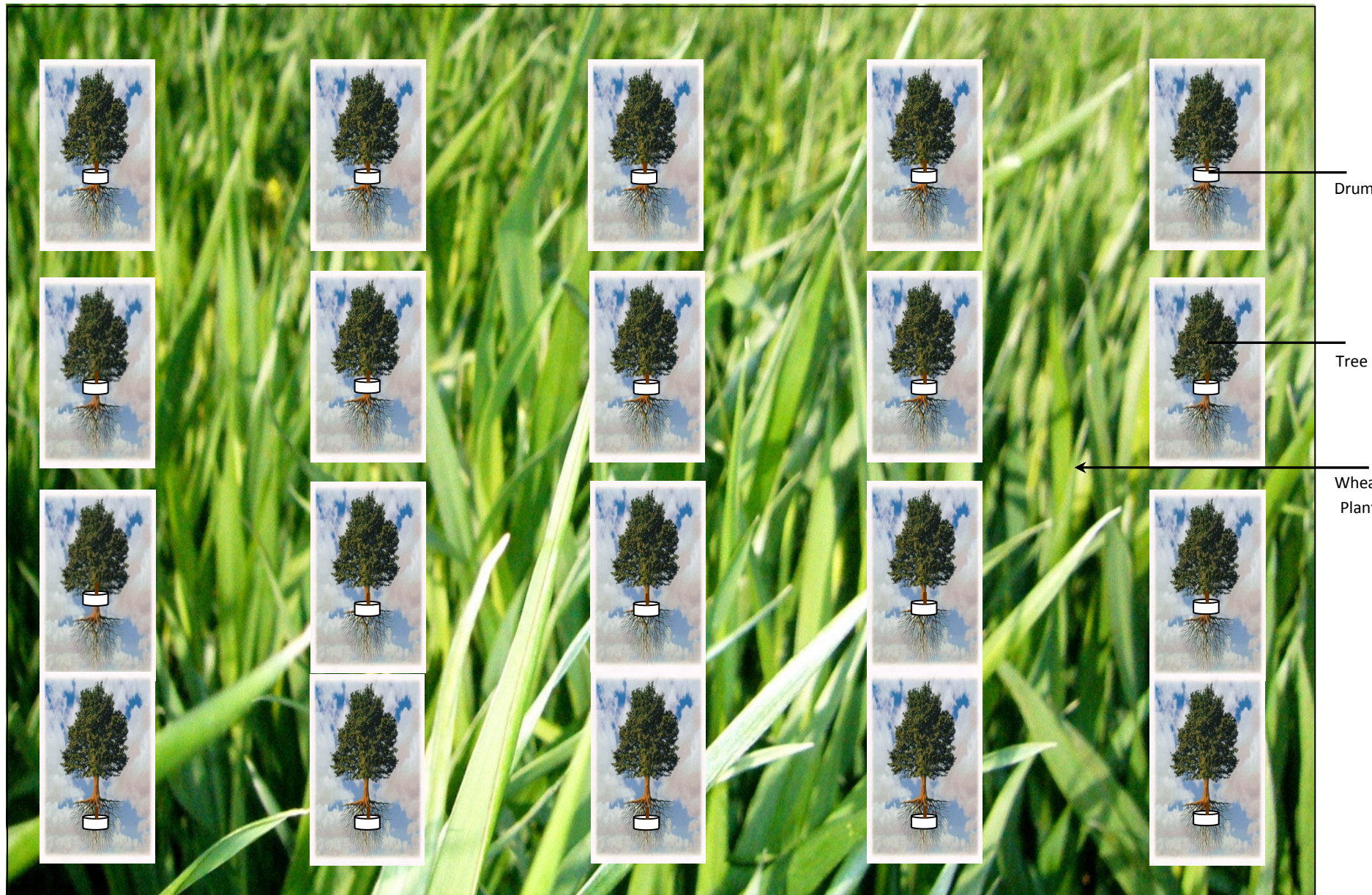
- 1- Requirement of Seed / ha -10kg
- 2- Requirement of fertilizers/ ha N- 60.00 kg, P- 40.00 kg, K-40.00 kg

ESTIMATE FOR DEMONSTRATION OF BAJRA (per ha) RAINFED

S.No.	Particulars	Quantity	Rate	Amount	Remark
1	Tillage operation in preparation of field and for sowing	1.0ha	1000.00/ha	2000.00	Since the project is to be operated in participatory Mode, contribution of tillage operation, and harvesting cost
2	Cost of seed	10.0kg	130.00/kg	1300.00	
3	Nitrogen N.P.K 16:32:16	125.0kg	470.00/50kg	1175.00	
4	Urea	90kg	270.00/50 kg	486.00	
5	M.O.P.	40kg	300.00/50kg	240.00	
6	Harvesting	1.00Ha	650.00/ha	600.00	
Total				3201.00	
Say				Rs. 3200.00	

Hence per hectare of demonstration of Bajra is Rs. 3200.00/ha

DEMONSTRATION OF AGRO-FORESTRY / HORTICULTURE



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

District Allahabad is situated in Vindhya region where there is scarcity of water and in summer temperature rises up to 48°C causing upper layer of fields dry and therefore mortality rate of plants is very high. Farmers usually like to grow grain crops only. They are not interested in horticulture because of Anna Pratha and 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 be able to take nutrients from upper layer of fields and there will be 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 go below 2.10m below where moisture will be available and plants will be safe in summer also. Using barbed wire fencing the plants will be protected by Anna Pratha.

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

DETAIL ESTIMATE OF DEMONSTRATION OF HORTICULTURE AND MIXED CROPPING

For 1.00 Hectare

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

CONSUMPTION OF MATERIALS

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

COST OF MATERIALS

S.No.	Particulars	Quantity	Rate	Amount
1.	Farm yard manure	1560.0 kg	10.00/kg	15600.00
2.	Barbed wire	1200.0 m/120.0 kg	60.50/kg	7260.00
3.	Angle iron	239.40 m/785 kg	40.50/kg	31792.50
4.	Plastic drum	156 nos	690.00 each	107640.00
5.	Cement	6.50 bags	285.00/bag	1852.50
6.	Coarse sand	0.450 cum	910.00/cum	409.50
7.	G.S.Grit 10-20 mm	0.900 cum	1250.00/cum	1125.00
8.	Plants	156 nos	18.00 each	2808.00
Total				Rs. 1,68,487.50

LABOUR CHARGES

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

Total Expenditure	
1. Cost of materials	1,68,487.50
2. Labour Charges	58,527.85
Total	Rs. 2,27,015.35
Say	Rs. 2,27,000.00 only

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 *Crotalaria Juncea* (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 Allahabad 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. IIIrd Project, efforts will be made to oblige the farmers for Green Manuring.

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

ESTIMATE FOR GREEN MANURING IN THE WATERSHED (PER ha)

S.No.	Particulars	Rate	Cost	Remark
1	Seed of Sesbania (Dhaincha)25Kg/ha	25.00/Kg	625	Since the project is to be operated in a participatory mode, contribution in the form of tillage will be done by farmers is 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, though we have only 2% of the world's geographical area. The project on 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 forage 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 more 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 hay 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 an industry. Under the aegis of ICAR's all India coordinated Research Project on Forage Crops, several highly productive fodder cropping systems 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+Cowpea-Jowar-Berseem+Japanrape	197.2	
3- Jawar+Cowpea-Berseem+Japanrape-Jawar+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.

CONSTITUTION OF PIA, WDT, USER GROUPS, SHG's AND WC

U.P. Government, Land Development And Water Resources Department section -1 Lucknow has nominates as PIA to Bhoomi Sanrakshan Unit, Land development and water resources Department Allahabad- for IWMP-IIIrd vide letter no-

Detail Staffing Pattern of PIA:

S.No.	Name	Designation	Qualification	Experience (Year)
1	Sri Rajendra Singh	BSA	Intermediate Diploma in Ag. Engg.	31
2	Sri Manoj Kumar Singh	Jr. Engg.	High School, Diploma Ag. Engg	29
3	Sri Vinay Kumar Maurya	Jr. Engg.	Intermediate, Diploma Ag. Engg	27
4	Sri Kuldeep Narain Srivastava	Jr. Engg.	Intermediate, Diploma Ag. Engg	25
5	Sri Dinesh Kumar Vajpai	Accountant	M.Com., B.Ed	24
6	Sri Narendra Kumar Yadav	Accountant	M.Com., C.S., C.A.(inter)	26
7	Sri Haridas	Sr. clerk	B.A.	29
8	Sri Suryabhan Singh Tomar	Draftt Man	Intermediate, Diploma in Draft man	30
9	Sri C.B. Singh	Draftt Man	B.Com	30
10	Sri Rameshwar Singh	Tracer	B.A.	32
11	Sri R. B. Yadav	Jr.Clerk	Intermediate	20
12	Smt. Pushaplata Singh	Jr.Clerk	Intermediate	24
13	Smt. Anita	Munsi	B.A.	20
14	Sri Shitala Prasad Pandey	Munsi	Intermediate	32
15	Sri Radheshyam Verma	A.S.C.I.	Intermediate	32
16	Sri Santosh Kumar	A.S.C.I.	M.Sc.(Ag) Agronomy	07

17	Sri Shushil Kumar	A.S.C.I.	M.Sc. Ag Soil Conservation	07
18	Sri Ashok Kumar Singh	Work Incharge	B.com	21
19	Sri Dilip Kumar Sharma	Work Incharge	Intermediate	20
20	Sri Ram Kumar Dixit	Work Incharge	Intermediate	24
21	Sri Harishankar Singh	Work Incharge	Intermediate	24
22	Sri Yogendra Kumar Tiwari	Work Incharge	Intermediate	25
23	Sri Shivbaran Yadav	Jiledar	Intermediate	29
24	Sri AnilKumar Singh	Seench Pal	Intermediate	21
25	Sri Bhupendra Tripathi	Seench Pal	Intermediate	25
26	Sri Mukul Srivastava	Seench Pal	B.Com.	20
27	Sri Dayashankar Mishra	Seench Pal	Intermediate	25
28	Mohd. Ahamad	Seench Pal	Intermediate	21
29	Sri Ramakant Yadav	IV Class	High School	26
30	Sri Baratilal Upadhyay	IV Class	Jr.High School	29
31	Sri Purshottam	IV Class	Educated	29
32	Sri Bharat Prasad Gupta	IV Class	Educated	31
33	Smt. Leelawati	IV Class	Intermediate	30
34	Smt. Kalawati	IV Class	Educated	30

Institutional Arrangement at Project level:

Project management Agency (PIA)

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

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

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

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

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

Roles and Responsibilities of the PIA:

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

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

CONSTITUTION OF W.D.T. BY P.I.A.

W.D.T. have constituted. The Detail of W.D.T. is as below:

W.D.T

S.No.	Name of the member	Subject	Qualification /Experience	Gov./Contact
1.	Sri Rajendra Singh	Water Management	Diploma in Ag. Engg	Gov.
2.	Sri Vinay Kumar Maurya	Water Management	Diploma in Ag. Engg	Gov.
3.	Sri M.K. Singh	Soil and Water Management	Diploma in Ag. Engg	Gov.
4.	Smt Nitu Shukla	Social Ogranization	M.A.. (Sociology)	Contact
5.	Sri K.N. Srivastava	Soil and Water Management	Diploma in Ag. Engg	Gov.
6.	Sri Sushil Kumar Gautam	Soil Science	M.Sc. (Soil Science)	Gov.
7.	Sri Ram Briksh Seth	Soil conservation	Retired Technical Assisstant Soil Conversation	Contact
8.	Sri M.S. Singh	Social Organisation	M.Sc. (Village Sociology and Agriculture Economics)	Gov.
9.	Sri Ashok Kumar Singh	Instituatioanal Building	B.Com	Gov.
10.	Sri Santosh Kumar	Agriculture	M.Sc. (Agronomy Science)	Gov.
11.	Sri Yogesh Chandra Srivastava	Agriculture	D. Phil. (Agriculture Extension)	Gov.

WATERSHED DEVELOPMENT TEAM:

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

Roles and Responsibilities of WDT:

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

- a. Assist Gram Panchayat /Gram Sabha in constitution of the watershed committee and their functioning.
- b. Organizing and nurturing User Groups and Self-Help Groups.
- c. Mobilizing women to ensure that the perspectives and interests of women are adequately related in the watershed action plan.
- d. Conducting the participatory base –line surveys, training and capacity building.

- e. Preparing detailed resource development plans including water and soil conservation or redamation etc. to promote sustainable livelihood at household level.
- f. Common property resource management and equitable sharing.
- g. Preparing Detailed Project Report (DPR) for the consideration of Gram Sabha.
- h. Undertake engineering surveys, prepare engineering drawing and cost estimates for any structure to be built.
- i. Monitoring, checking, accessing, and undertaking physical verification and measurement of work done.
- j. Facilitating the development of livelihood opportunities for the landless.
- k. Maintaining project accounts.
- l. Arranging physical, financial and social audit of the work undertaken.
- m. Setting up suitable arrangements for post-project operation, maintenance and future development of the assets created during the project period.

DETAIL OF WATERSHED COMMITTEE & SUB WATERSHED COMMITTEE

S. No	Name Of Gram Panchyat/ Village	Committee/S ubcommittee	Date Of Constituti on	Name Of President	Name Of Secretary	Member Of User Group	Member Of Shg	Female Member	Sc Member	Land Less Member	Work In Charge	Wdt Member
1	Harghar	Committee	01.02.2011	Roshan lal	Vijay pal singh	Suresh	Ramesh	Durgawati	Ramdeen	Mukesh	Sushil kumar	
2	Gareora	Committee	02.02.2011	Smt Rajul Jain	Anjani kumar	Shivshankar	Teeja devi	Mamta devi	Ram Dhani	Sidhnath	Ashok Singh	
3	Bhaiya	Committee	03.02.2011	Kausilesh kumar	Urmila Devi	Durga prashad	Mishri lal	Jokhana	Devideen	Sivjangi	Santosh	
4	Chandas	Committee	04.02.2011	Kausilesh kumar Singh	Kausiliesh kumar	Santosh kumar	Dudhu ram	Photodevi	Anand	Ramesh kumar	Harishan kar Singh	
5	Mamauli	Committee	05.02.2011	Purvanti devi	Ramesh Chandra	Ajuk narayan	Virendra kumar	Banswati	Ramjiyan	Amarnath	Radhe shyam Verma	
6	Kharaka dabar	Committee	06.02.2011	Sher bahadur singh	Narendra Singh	Harishankar Singh	Lal Ji	Ushawati	Hinch lal	Sobhnath	Dilip kumar Sharma	
7	Sonbarsi	Committee	07.02.2011	Aushotosh Shukla	Indresh	Raghuver Dayal	Rajeshwari prashad	Kamlawati	Munni lal	Ramesh Chandra	Yogendra Tiwari	

FORMATION OF SELF HELP GROUP

S.No	Name Of Village	Name of SHG	President	Secretary	Work
1	Harghar	Sharda SHG	Ramesh	Mukesh	Dairy Work
		Jai ma Durga	Vandana	Rekha	Goat Keepingc
2	Gareora	Bhole SHG	Anjani Kumar	Devishankar	Goat Keeping
		Parvati SHG	Teeja Devi	Sunita Devi	Dairy Work
3	Bhaiya	Manwar Kashiram SHG	Vinod kumar	Shivangi	Goat Keeping
		Ma Mahamaya SHG	Sury kali	Kalui	Goat Keeping
4	Chandas	Paramhans SHG	Budhram	Ramesh	General Merchant
		Laxmi SHG	Sukuariya	Sonkali	General Merchant
5	Mamauli	Sri Krishna SHG	Akhilesh kumar	Ravi Shankar	Goat Keeping
		Sri Radha SHG	Sariya	Mamta	Goat Keeping
6	Kharakadabar	Bajrang SHG	Ranveer	Narendra	Dairy work
		Ganga SHG	Mithilesh	Shandhya	Goat Keeping
7	Sonbarsi	Ganga SHG	Rajeswari prashad	Ramesh Chandra	Goat Keeping
		Ma Sharda SHG	Kallan Devi	Kamala devi	Goat Keeping

DETAILS OF USER GROUPS

User Groups (U.G) have constituted of homogeneous groups of persons which are more affected by each work/ related activity and has include those having land holdings within the watershed area.

S.No.	Name Of Micro Watershed	Area Of Micro Watershed Ha	Selected Area For Treatment	No. Of User Group Constituted
1	2A7D2b1e	567.765	412	7
2	2A7D2b1d	524.084	381	6
3	2A7D2b1c	705.084	512	7
4	2A7D2d1f	510.592	371	6
5	2A7D2b2e	862.555	627	9
6	2A7D2b2d	537.767	390	5
7	2A7D2b2d	640.245	467	6
8	TOTAL	4348.06	3160	46

**PHOTOGRAPHS
OF
RESOURCES MAP, SOCIAL MAP,
TRANSECT WALK, VENN DIAGRAM,
L.C.C. MAP, LAND USE MAP OF
VILLAGES IN I.W.M.P. -IVth
AND
SELF HELP GROUPS (SHGs)
IN
PARTICIPATORY RURAL APPRAISAL**

DESCRIPTION OF SYMBOL USED LLC MAP

(Textural Class)

Textural Class	Symbol	LC Category
Sand	S	IV
Loamy Sand	Is	III
Sandy Loam	sI	I
Loam	I	I
Clay loam	cI	I
Sandy Clay loam	scI	I
Silt	si	I
Silty loam	sil	I
Silty clay	sic	II
Silty clay loam	sicl	I
Silty clay	sc	II
Clay	c	II,III

(Depth Classes)

Depth Class	Symbol	Particulars	I.C
90Cm	d5	Highly Depth	I
45-90 Cm	d4	Depth	II
22.5-40 Cm	d3	Light Depth	III
7.5-22.4 Cm	d2	Shallow	IV
7.5 Cm	d1	Highly Shallow	VI,VII

Slope percentage according to Different Categories LC

A	0-1	I
B	1-3	II
C	3-5	III
D	5-10	IV
E	10-15	IV
F	15-25	VI
G	25-33	VI
H	33-50	VII
I	50 HIGH	VIII

Erosion

Erosion Category & Symbol	Particulars	Proposal LC
e ₁ Slight Erosion	Sheet are Rill erosion where 25% Loss of "A" Horizon	I,II
e ₂ Moderate erosion	Gully erosion 50%-75% Loss of "A" Horizon	III
e ₃ Severe erosion	Total Loss of "A" Horizon and in initial Stage of "B" Horizon	IV
e ₄ Very Severe erosion	25%-75% Loss of "B" Horizon Development of very deep gullies	VI,VII

CHAPTER – 6

EXPECTED OUTCOMES

6.1 Expected Outcomes

6.1.1 Employment

Employment has always been a problem in the villages. The principal occupations of the people are 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.

6.1.2. 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.

6.1.3 Ground water table

Rainfall has been scanty but demand for ground water has been increasing all the time. The ground water table thus has depleted over the years. Presently it stands at 18 m. Proper water harvesting structures and percolation tanks would go a long way in increasing water table depth from 28 m in the pre-project level to 25 m in the post project period.

6.1.4 Drinking water

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

6.1.5 Crops

Agriculture primarily depends upon water; but this is what is lacking in this watershed area. The surface water is very limited which could not fulfil the need of crop production. All this can change with the integrated land and water management during the watershed project. The planned earthen bunds would help in percolate water underground, and preserve some moisture in the soil. This will help in additional area coming under cultivation and increasing productivity too. The farmers can take more than one season of crops. Different varieties of crops can be taken.