

DETAILED PROJECT REPORT

INTEGRATED WATERSHED MANAGEMENT PROGRAMME

NAME OF PROJECT: Hanumangarh (IWMP) I /2009-10

AREA OF PROJECT : 5333 Hactare

COST OF PROJECT : 799.95 Lakhs

BLOCK :- Rawatsar

DISTRICT :- Hanumangarh

DEPARTMENT OF SOIL & WATER CONSERVATION, JAIPUR (RAJASTHAN)

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INTEGRATED WATERSHED MANAGEMENT PROGRAMME

NAME OF PROJECT (AS PER GOI)	:	Hanumangarh (IWMP) I /2009-10
LOCAL NAME OF PROJECT	:	Dhirdesar
No. of Macro W/S / No. of Gram Panchayat	:	3 / 1
Atlas Code of Macro W/S / Name of Gram Panchayat	:	Dhirdesar , Udasar Chhota , Sirasar
No. of Micro W/S / No. of Village	:	3
Atlas Code of Micro W/S / Name of Village	:	04452 , 04453 , 04455 , Dhirdesar , Udasar Chhota , Sirasar
AREA OF PROJECT	:	5333
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BLOCK	:	Rawatsar
DISTRICT	:	Hanumangarh

DEPARTMENT OF SOIL & WATER CONSERVATION, JAIPUR (RAJASTHAN)

CHAPTER - I

INTRODUCTION

The declining per capita land and fresh water availability coupled with soil erosion and depleting /degrading land and water resources are posing serious threat to food, environmental, social and economic security in the country. Rainfed areas that constitute about two-third of nations 142 million hectare cultivated land are inhibited by resource poor farmers who with low levels of productivity suffer the most from such degradation and vagaries of nature. It is estimated that rainfed areas contribute only 45% to total food grain production whereas area account for 37% of cultivated land but contribute 55% to total food grain production. With the projections made, about 20mha additional land is likely to be brought under irrigation. But nearly 69mha will still be left under rainfed condition. The Green revolution by passed the rainfed regions, remaining confined primarily to the irrigated plains. To usher in the era 'Ever Green Revolution' sustainable development of these rainfed areas to enhance their productivity with effective resource conservation and improved rainfed technology seems to be principle vehicle. This would also help in achieving the target of over 4% agricultural growth envisaged in the National Agriculture Policy. This requires concerted efforts for efficient utilization of resources in all rainfed-farming ecosystems in the central plains, hills, semi arid and coastal regions.

(i) About Hanumangarh District

Hanumangarh is a city in Northern rajasthan state in western india. Situated on the banks of river Ghaghar _ located about 400 km from Delhi . It is the administrative city of the hanumangarh District. The city once called Bhatner because it was a stronghold of Bhatti Rajput.It is surrounded by Ganganagar district in the west and Bikaner and Churu districts towards are south _west and south . Sirsa district of Haryana is the East and the Firojpur District in the North .

Blocks (Panchayat Samities):

Hanumangarh district is divided into 7 blocks (Panchayat Samities) which are Hanumangarh, Sangria, Rawatsar, Pilibanga, Nohar, Rawatsar, comprises with 251 gram panchayats.

Economy

The economy of the district and surrounding area is mainly based on agriculture and animal husbandry. The oilseeds especially mustard seed is the predominant crop . Jawar , Ground nut , Sugercane, wheat , Barle , Rice , Gram, mustered and cooton , Kharif pulses (pearl millet), Bajara and guar are other produces.

Farming is the main activity. That is carried out in the Hanumangarh district in Rajasthan crop likes pearl, Millet, wheat, cotton and Rise are grown here. Different kind of vegitable are also grown Over here. There are almost 40 registers small scale Industries in this palace.

Hanumangarh is the main mandi (market) for agricultural produce of the area. The district has a Krishi Upaj Mandi Samiti (Agricultural Produce Market Committee). The Food Corporation of India has its warehouses in Hanumangarh. The district is the main supply point for surrounding villages.

Geography

Hanumangarh is located in the north east of Rajasthan between $29^{\circ} 35'$ N to latitudes and $74^{\circ} 19'$ E longitudes and in the desert area of western Rajasthan. As per census 2001, it has an area of 9656.09 sq. kms and population is 1518005 lac. It has an average elevation of 177 m (581 ft).

HANUMANGARH is a district of enchanting topography in Thar Desert . The climate of the district is hot habbit. The mean maximum are 43.03° and 5.05° respectively . The mean minimum rainfall is 281 mm maximum preciation of (45)cm . The various from 350 to 225 mm with a discreasing thred from SE to NW . The northen part of the district is chiefly Ghagher flood plan with thick layer of alluminium and blown sand

duns and interdunal plains. The relative height of the plain sand dunes upto 50 mtrs . The ghaghar wick also known as Nalee is an ephemeral one and has NE to SW course near Hanumangarh . It some times got flooded during monsoon and causes extensive damages of crops the property soils of the region are deep to very deep with fine to coarse texture . Northern Irrigated Ghager plain is dominated by the field and moderately fine textured soils. In southern rain fed Zone the major soil groups are sandy to loamy sand at places underlined by lime concentration and gypsum substrata .

It is encircled that the north west – south area of the district have a large shifting sand dunes. It is characterized by high velocity wind, high shifting, and rolling sand dunes, high dunal variation of temperature, scanty rainfall and high rate of evaporation. The area is scanty in vegetation. Phoge (*Calligonum polygionoides*), khimp (*Leptadenia pyrotechnica*) and Kair bushes and Khejri, Royara and Babul trees are to be mainly found on the sand dunes. In the towns Neem and Peepal and Sirus trees can also be exist.

Geographical condition of the district comprises of severe district climate with a normal rainfall of about 281 mm per annum as per Vital Agriculture Statistics published by Agriculture Department (VAS). The temperature condition is extreme and does not possess perennial water resources. The rain water is harvested or collected in the man made structures locally called Diggies / water tanks (Tanka) in the houses or fields.

The region boasts record temperatures ranging from below freezing point in the winters to over 50 degrees in the summer after noons. During the months of December/ January, ice could be noticed in small waterpots or frozen water dews on the little vegetation where temperature dips below sub-zero but does not have snowfall. Yet one may find that summer nights are cooler and winter days are warmer. The variation in the minimum and maximum temperature is perhaps greatest in the district.

Demographics

As of 2001 India census, Hanumangarh had a population of 1518005. Males constitute 801486 i.e. 53% and females 716519 i.e. 47% of the population. Hanumangarh has an average literacy rate of 63.05%, higher than the national average of 59.5%. Male and female literacy rate are 75.18% 49.56% respectively. In Hanumangarh, 14% of the population is under 6 years of age. The Language use by all is either Bagri, or Punjabi or Hindi .The major occupation is Farming.

Total Live stock population is 13.51 lacs, of which 404324 are cattle's & 326423 buffaloes and 279895 goats & 285868 sheep's as per Live Stock Census 2007.

Details of Socio Economic indicators

1 Socio Economic conditions of district

1.1 Socio –Economic Indicators

A	Population			
a	Population of Hanumangarh district		1518005	By % age
	Male		801486	53 %
	Female		716519	47%
b	Childern		209443	14
c	Total Household		247152	
d	BPL Families		43461	17.50 %
	By Caste			
	General		20334	46.8 %
	S.C.		22469	51.7 %
	S.T.		658	1.5 %
	Density (per sq.kms)		4.5	
	Decadal growth rate (1991-2007)		24.39	
B	Human Development Index parameters			
	Litercy rate all %		63.05	%
	Male		75.18	%
	Female		49.56	%
	Litercy rate(rural) (M)		73.35	%

		Literacy rate(rural) (F)	46.27	%
		Sex ratio	894	
		Human Development index(2007)	0.671	
C	Distribution of households			
a	By Land Holding		202855	100
b	Marginal Farmers (0- 1ha)		6085	3 %
c	Samll Farmers (1- 2ha)		14200	7 %
d	Medium Farmers (2 to 4 ha)		5714	25 %
e	Big Farmers (more than 4 ha)		131855	65 %
f	Average holding size – ha		4.78	3.48 %
D	Major occupation			
a	Agriculture		5,18,970	
b	Landless labourers/ Agriculture labour		32564	3.16%
c	Household industrial labour		17211	2.35%
d	Others labour		162814	22.26%
e	Total working labour		731559	9.50%
E	Source of Income			
	1	Crop production & dairy enterprise	NA	
	2	Off-farm income / Other services	NA	
	3	Agriculture Labour	NA	
F	Income wise Category of /households/Families(No)		NA	

*NA Not Available

Details of human resources

Details of Human resources in Hanumangarh district

Human resources indicator are

Population	persons	1518005
Density of population	persons per sq. km	157
Male	Number	801486
Female	Number	716519
Literacy	per cent	63.05
Sex Ratio female per 1000 male		894
Working Population	per cent of population	51.39
Growth rate	per cent	11.26
Percentage distribution of work force		
Cultivators	per cent	73.17
Agricultural laborers	per cent	3.16
Household industry manufacturing	per cent	2.35
Processing, servicing and repairs	per cent	2.26
Other workers	per cent	21.41

Livelihood analysis

As mentioned that district have some part of canal system. The livelihood of the rural sector totally based either on Rainfed crops and animal husbandry or on the artesian trade industries especially leather crafts, dying, wood and wool and Bardi crafts established in all the blocks of the districts. The rearing of livestock is at large

scale i.e. each household has two to three milching animals. In general, each household has its own transport facilities i.e. rearing of camel. Livelihood of the rural sector is comparatively better. At district headquarter has big domestic markets and Agriculture Produce Market Committee.

Infrastructure

The district gets drinking water from (1) Bhakra Canal System (2) Indra Gandhi Nehar preyojana (3) Sidhmukh Canal Sytem (4) Bhakra canal System and (5) well and Tube well .The nective Ground Water is brick fish to saline except in small pocket the urbun and rural water supply schemes. Ground water available at the depth of 10 to 20 meters . The drinking water supply in the city is managed by PHED deptt. of the state. Southen part of all the village of the district rain water are harvested and collected in the pucca tanks called locally *diggies* a pucca structure constructed by the villagers either at their houses or in the agriculture fields. In southern part of the district main source of irrigation is rain water and well .

Main Industries

Aluminum utensils, Blanket Weaving, Cement, Churan and Chatni, Guar gum, Handicraft items on Sandal Wood, Handloom Cloth, Bardi weaving, lather tanning, Iron and Steel Fabrication, Oil Mills, Papad and Mangori, Polythene Films and Bags, Salt, Sand Lime bricks, Steel Furniture, Toilet and Washing Soap, Woolen yarn etc.

Natural Resources of the district

The District consists of 970315 ha area of which 90% is under cultivation. Agriculture is purely depending on the canal , underground water and monsoon rainfall and Irregated area comes in double crop and rainfed area comes in single cropped. According to VAS, the forest area is reported as only 0.40 % in the year 97-98 where as is slightly increased to 1.88 % in the year 2005-06. The net sown area is 82.10 % with cropping density of 121.80 % in the year 2005-06. Only 5.78 % irrigated area in the district is reported during 2005-06 in comparison to 3.30 % in the year 1998-99.

The District has approximately 0.10 lacs ha wasteland. 3937 ha pasture land which is degraded land/ grazing stable/ and deniable sand dunes of height 4 to 5 meters.

The area under the assured means of irrigation in the district is negligible. At some places of the blocks the irrigation is facilitated through wells. Details of land use pattern and waste lands of the district is given below :-

Details of land use pattern

Land use pattern of the Hanumangarh district

S.No	Land Use Details	Area (ha)	% to geographical area
1	Total Geographical area	970315	
2	Forest	18261	
3	Non agriculture use	56526	
4	Barren & unculturable land	94555	
5	Area unfit for cultivation (3+4)	151081	
6	Cultivable wasteland	4154	
7	Pasture and other grazing lands	3937	
8	Other uncultivated land excluding fallow lands (6+7)	48435	
9	Fallow (Other fallow +Current fellow lands)		
10	Net Area sown	1121264	
11	Total cropped Area		
12	Area sown more than once	328418	
13	Net area Irrigated	3010.48	

15	Rainfed cultivable land (6+9+10-13)	1122408	
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Details of waste lands

Categories wise waste land of the district

S. No.	Category	Total Waste land	% to total geographical area of the district	% of total waste land of the state
1	Land with scrub	24464	1.77	0.82
2	Land without scrub	28024	2.02	4.09
3	Land affected by salinity/alkalinity (Strong)	382	0.03	0.6
4	Land affected by salinity/alkalinity (Moderate)	573	0.04	0.87
5	Land affected by salinity/alkalinity (Slight)	753	0.05	0.3
6	Under utilized/ degraded notified forest land	3367	0.24	0.38
7	Under utilized/ degraded notified forest land (Agri.)	197	0.01	0.28
8	Degraded pastures/ grazing land	32882	2.37	3.75
9	Sands-(Semi stab-Stab>40m)	0	0	0
10	Sands-(Semi Stab-Stab Moder. High 15-40m)	39006	2.81	2.38
12	Sands-(Semi Stab to Stab low <15m)	41230	2.97	4.83
13	Mining wastelands	17	0.001	0.07

14	Barren rocky/ stony waste/ sheet rock area	461	0.03	0.09
	Total	171356	12.36	1.69

Soil

As mentioned district Hanumangarh is a part of great Thar Desert. It is covered with thick mantling sand i.e. 4 to 5 meters high longitudinal dunes trending north east to south west and general slope varies from south to north.

The general texture of the soil is deep to very deep with fine to coarse textures . Northen irrigated Ghagger plain is dominated by fine and moderately fine texture soil . In southern rain fed Zone the major soil group are sandy to lomey sand at places under line by line concretion and gypsifarois data.

As per VAS 2004-05 published by directorate of Agriculture, Rajasthan Jaipur, sodic or Alkali Soils is 250 ha.

The overall fertility (qualities of N, P, and K) are very less through out the area of the district. As per VAS, the status of fertility is as under-

Nitrogen Very Low

Phosphorous Medium

Potassium Medium

In order to improve the health of the soil , sound agronomic measures such as addition of organic measures, green manuring and crop rotation with stress on legumes and other measures which enhance the humus content of the soil are recommended.

Land resources

Although the soil depth in 80 % of the area is above 90 cms but topography of the land is Plain Alluvial Plain and Southern Part are under undulated and comprises of sand dunes. Being soil texture of the district is coarse sandy to very light, has very high permeability, low moisture holding capacity, overall low fertility (qualities of NPK), and the land capability class of the district falls under the category of III, IV and VII. The details of Land Capability classification as furnished by Remote sensing application centre Jodhpur given below :-

Land capability classification of Hanumangarh district

S. No.	LCC	Area in Ha.	Area in Sq. Kms.
1	II	509.79	5.1
2	III	570485.99	5704.86
3	IV	660049.33	6600.49
4	VI	68944.63	689.45
5	VII	339727.54	3397.28
6	VIII	451.71	4.52
	TOTAL	1640168.99	16401.69

Soil Erosion in District (Wind & Water)

Being major general soil texture light and coarse sandy, highly permeable and without any streams contributing runoff, no water erosion is reported but large amount of wind erosion takes place. The data with regards to wind erosion is not available.

Soil depth

As per classified by remote sensing centre, largely soils of the district falls under d5 to d3 i.e. 90 cms to 22.5 cms. However About 80 % of land has depth more than 90 cms.

The details as furnished by Remote Sensing application centre are given below :-

Soil depth

The details of the Area according to depth of soil		
Depth class	Area in Ha.	Area in Sq. Km.
d3	200033	2000.33
d4	136539	1365.39
d5	1303645	13036.45
TOTAL	1640217	16402.17

Slope distribution

The information provided by Remote Sensing Centre Jodhpur the slope of the district is varying from 0 to 50%. The slope of 55.47 % area of the district lies under categories under 0 to 1% and 37.32 and 5.53 % is under 1 to 3%.

The details as furnished by Remote Sensing Centre Jodhpur is given below :-

Slope distribution

General slope of area of the district

S. No.	Slope Category	Area in Ha.	Area in Sq. Km.
1	0-1%	906472.1	9064.72
2	1-3%	609851.49	6098.51
3	3-5%	90441.48	904.41

4	5-10%	26152.01	261.52
5	10-15%	816.69	8.17
6	15-35%	305.24	3.05
7	35-50%	28.18	0.28
	TOTAL	1634067.19	16340.67

Water Resources

Rainfall

The details of normal rainfall month wise of district Hanumangarh is as under-

Rainfall in mm

Month/Year	Actual rainfall	Normal rainfall	Actual Seasonal rainfall during	Normal number of rainy days	Actual number of rainy days
	2004-05		2004-05		2004-05
January	4	9.8	4.0	0.8	0.0
February	71	6.6	184.0	0.7	6.0
March	48	5.6		0.6	3.0
April	25	4.3		0.4	3.0
May	40	10.6		1.0	2.0
June	10	35.4	219.0	2.3	2.0
July	49	108.1		5.3	3.0
August	115	109.1		5.0	10.0
September	45	50.5		2.5	2.0
October	8	8.4	19.0	0.3	1.0
November	8	1.6		0.1	0.0
December	3	4.7		0.4	1.0
Annual		354.7	426.0	19.4	35
%deviation from normal			20.1		

Source - Vital Statistics of Agriculture Department 2004-2005

Irrigation status of district

The canal system does not exist in the district. The net cultivated area 11, 70,162 ha where as irrigated area to cultivated area is 4.02 % based on VAS 2004-05. The area under agriculture crops and thereby irrigation is increased during 2003-04 in comparison to 2002-03.

The details are given below :-

Irrigation status of district

Details of Area under Cultivation and irrigated area	Year	
	2003-04	2002-2003
<u>Irrigated area in hectare</u>		
1. Net irrigated area	301048	
2. Gross irrigated area	538226	
<u>Cultivated area</u>		
1. Net cultivated area	895982	
2. Gross cultivated area	1685182	
% of irrigated area to cultivated area	3.5	

Source wise area under irrigation

Out of total irrigated cropped area 268180 ha, 27.77 % area by canal and 32868 3.40 %by Tube wells are irrigated during 2003-04.

The status of the wells in the district is as follows -

Well for irrigation in use

No. of old wells	20315
During 2003-04 (New)	0531

Total wells used for irrigation	17784
Wells used for drinking purposes	2531
Total No. of wells	20846
Total number of Tube wells	17784

Water is available at the depth of 5 to 30 meters .

Source wise irrigation is given below :-

Source wise area under irrigation

Source of irrigation	Area in hectare	% of total irrigated area
Canals	268180	nil
Tanks/ponds	Nil	nil
Wells	Nil	71.18
Tube wells	32868	28.82

Status of the wells in the district is as follows -

Well for irrigation in use		
No. of old wells		5232
During 2003-04 (New)		531
During 2003-04 repaired		0
Total wells used for irrigation		5763
Wells used for drinking purposes		2419
Total No. of wells		8182
Total number of Tube wells		1467

River basin wise area and run off in the district -

No river basin is existed. The soil is very light, sandy course and highly permeable, neither run off is generated and nor harvested. But people of the district construct pucca tankas / diggies/ talai for collecting the run off for the domestic purposes.

Ground water prospects

As reported out of 411592 ha area, the potential of ground water in the area 160641.5 ha is reported as critical. More emphasis on such activities which help in recharging the ground water is needed. Details of critical and safe area is given below :-

Ground water prospects

Category	Area in hectares	% to state
Critical	1,60,941.5	
Safe	2,50,650.5	
TOTAL	4,11,592	

Livestock Development

Livestock population & cattle migration

Rajasthan has 108.53 lacs cattle and 104.46 lacs buffalo's as per Live Stock Census 2003 census. Live stock population of the district is 14.45 lacs of which are 215234 cattle and 194524 buffaloes i.e. 28.36% which is 1.89% of the state population. 67.61% are sheep & Goats. The indigenous breeds in the state are the Goats of Marwari, Sirohi, and Jakharana, breeds and the Sheep of Chokla and Magra breeds.

The state is contributing about 13% of the states economy (GDP) and possesses 11% of the total animal population in India. The yield is almost 9.16% of the total milk production, 30% of the Goat meat production and 39% of the total wool production. The details are given below based on Livestock census 2003

**Milk production species wise, Av. Milk production per day and their ranks
in Rajasthan District HANUMANGARH**

(Cow + Buffaloes + Goats + CB) in the district for the year 2004-2005			
			(000 Tonns)
Milk Production (Cow)	Milk Production (Buffaloes)	Milk Production (Goats)	Total Milk Production
1	2	3	4
70	87	47	204

Milk production By Goat			
Estimated No. in Milk	Average Per Day (Kg.)	Annual (000 tonns)	Rank
1	2	3	4
169221	0.763	47	7

Milk production by Buffaloes			
Estimated No. in Milk	Average Per Day (Kg.)	Annual (000 tonns)	Rank
1	2	3	4
57283	4.151	87	21

Milk production by Cow			
Estimated No. in Milk	Average Milk Yield Per Day (Kg.)	Annual (000 tonnes)	Rank
2	3	4	5
64916	2.971	70	12

Total of the District and Rank in State and yield and production					
Milk production on (000 tonnes)		Egg (Million) No.		Wool (tonnes)	
Milk	Rank	Eggs	Rank	Wool	Rank
2	3	4	5	6	7
204	17	4.9	30	728.7	8

Source Live stock census of Animal Husbandry 2003

As per the census, live stock density per sq. kms is 86 and average livestock available with respect to human population is 0.75 only.

Fodder requirement of Rainfed area, is mainly met out from canal command area of near by the district. The district has only 2.74% as pasture land but these lands are fully scrubbed and opened. The vegetative cover is very little which cannot fetch the fodder requirements.

Important cattle breeds are Gir, Rathi, Tharparkar, Haryana, Kankrej, Malvi, and Nagauri and buffalo breeds are Murrah and Surti in the state. In Hanumangarh district, Murrah buffalo breeds are popular. The state produces approximately 8.05 million tones of milk per year of which Hanumangarh district contributes is 2.38 lacs liter /days and about 0.20 million tone milk per year as per report of Livestock census 2003.

Almost all households of rural sector of the district keep livestock of one species or other and earn income out of them. The animal husbandry is the most income generating activities in farm household next to crop production. The small ruminants like goat and sheep which are not dependent on crops residue and able to migrate during drought to those areas which are rich in edible crops residue are playing very important role for generating income and sustenance during drought years. However the migration to other areas is not yet reported and not visible in the district.

Backyard poultry is also an important source of supplemental income for small and marginal farmers. It is expected that farmers can fetch more than Rs.5000 additional income per year per family by maintaining ten hen flocks. Live stock rearing is the significance of draught animals in rain fed farming.

Livestock population & cattle migration

The migration of cattle & ruminants is not reported in the district

Livestock	Indigenous	Hybrid	Total
Cows & Bullocks	363179	41145	404294
Buffaloes	326423	0	326423
Camel	46607	0	46607
Goat	279895	0	279895
Sheep	285868	0	285868

The detail of livestock of the district is given below :-

The details of livestock in the district HANUMANGARH state based on livestock census 2003

Livestock	District Hanumangarh			Live Stock density per sq. Kms	Ratio with respect to Human population	State		
	Indi-genous	Crossed breed	Total			Indi-genous	Crossed breed	Total
1	2	3	4	5	6	7	8	9
Cattle	363179	41145	404294	86	0.75	463607	11655905	12119512
Buffaloes	326423	NA	326423			11091974	NA	11091974
Bullocks		NA				NA	NA	
Camel	46607	Na	46607		421836	NA	421836	
Goat	279895	NA	272895			21502996	NA	21502996
Sheep	285868	NA	285868			11189855	NA	11189855
Pigs	NA	NA	Na			208556	NA	208556
Camel	NA	NA	Na			421836	NA	421836
Total Livestock	NA	NA	Na			566663183	NA	566663183
Dogs	NA	NA	Na			1246036	NA	1246036
Rabbit	NA	NA	Na			9301	NA	9301

Poultry	NA	NA	na			4993620	NA	4993620
Total Livestock			3006748					107163845

Milk production

Parameters	District	State	National
Total production (liter /day)	0.15-0.20 million tones / year	8.05 million tones per year	805 million tones per year
Av. Production liters / household /day	2.3 liter / day per animal	-	-
Means of marketing	At milk collecting centers established by Dairy Federations and privately		

This indicates there is wide scope for increasing the productivity of the cattle and buffalo in the district through scientific breeding i.e. selective or upgrading breeding policy as per climatic condition.

Extent of availability of fodder, area of pasture land and status of pasture lands

As per VAS 2004-05, the pasture land in the district is 9656.09 ha where as waste land is 9996 km. Fellow land of permanent nature is 9673 ha. These lands are opened and scrubbed. The grass / fodder trees are very little and are not fetching the demand of fodder. The grass and fodder are procured during crop season or purchased from the market. With regards to the fodder availability, no significant information on the yield and production is available. These lands will be treated as silvi-pastoral approach. The trees, shrubs and grass seed will be sown including mechanical and biological measures in a scientific manner.

Agriculture

Agro climatic zone and its features

According to VAS 2004-05, Agro-climatic zones of Rajasthan characteristics of Hanumangarh district falls under the categories of **1B & 1C** where as Hanumangarh, Tibi, Pilibanga and Sangria blocks come in 1B agro climatic zone and Rawatsar, Nohar and Rawatsar blocks in 1C agro climatic zone.

Climate

The Hanumangarh city is situated at 29° 35'N 74° 19'E. The climate of the district is dry desert with large variation in temperature. The maximum and minimum temperature of the district generally varies from 0.50°C and 48.2°C. Relative humidity is below 30% during south east monsoon period and rises to 60% during the rainy season i.e. in the month of July to September of the year. This city often comes into extreme temperatures in winters and summers with lowest rain. The recorded minimum and maximum temperatures are - 6°C (21°F) and 49°C (120.2°F) respectively. Normal rainfall is only 332.6 mm / year which is not sufficient for growing the crops.

Agriculture

In southern part of district that agriculture is purely depending on the monsoon rainfall, sand dunes are typical features of rural countryside. Although farmers have excavated the wells, except in years of normal rainfall area under assured irrigation is negligible. The rain fed area is single cropped either in Kharif or in Rabi depending on the advent of monsoon. The vegetation is very scanty consisting of scrubs and thorny trees. Net sown area is 788200 ha (81.62%) in the district.

The details of cropping pattern of the district are given below :-

Cropping Pattern of Hanumangarh District

S.No.	Name of Crop	Kharif			Rabi			Total		
		Irr	Rain fed	Total	Irr	Rain fed	Total	Irr	Rain fed	Total
1	2	3	4	5	6	7	8	9	10	11
1	Bajra	-	97266	97266				-	97266	97266
2	Moth,	-	30441	30441				-	30441	30441
3	Moong	-	9398	9398				-	9398	9398
4	Guar	-	287382	287382				-	287382	287382
5	Groundnut	314	-	314				314	-	314
6	Cotton	144445	-	144445				144445	-	144445
7	Til	3261	-	3261				3261	-	3261
8	Chola	-	-	-				-	-	-
9	Gwarpatha	--	-	--				--	-	--
10	Aswghanda	-	-	-				-	-	-
11	Sonamukhi		-						-	
12	Vegetable	-	-	-	186381	-	186381	186381	-	186381
13	Wheat				-	-	-	-	-	-
14	Jon				-	-	-	-	-	-
15	Gram				149507	-	149507	149507	-	149507
16	Arandi				-	-	-	-	-	-
17	Mustard				-	9229	9229	-	9229	9229
18	Rae				-	-	-	-	-	-
19	Taramira				-	-	-	-	-	-
20	Dhaniya				-	-	-	-	-	-
21	Jeera				-	-	-	-	-	-
22	Methi				-	-	-	-	-	-
23	Lahsun				-	-	-	-	-	-
24	Isabghol				-	-	-	-	-	-
25	Patato				-	-	-	-	-	-
26	Chari				-	-	-	-	-	-
	Total	20896	1090153	1111049	67848	269590	337438	88744	1359743	14,34,240

Irr = irrigated area

Flora and fauna

Out of geographical area 970315, about 23946 ha of land i.e. 26.51 % is under forest having very little vegetation due to extreme temperatures during winter and summer, scanty rainfall and high rate of infiltration, existence of high sand dunes, and the area is free from biotic interferences and contain very poor and open forest. In the district Khejri, Babool, Jal, Kikar, Pipal, pilu, Phog, Kheemp, Aak, Senia Thor, Neem, Rohida, shisham, Lampla, Sawan are found.

Cropping pattern and Crop selection

Unpredictability of rains farmers does not have choice of crops. The major crops are Bajra (small millets), Guar, Moth, Mung (legume crops) and wheat, gram, rapeseed and mustard at few places are grown. The Agriculture production is quite low and out put is very little. The economy condition of the people is poor in spite of large holdings.

Due to unpredictability of rains the framers are not free to grow high yielding varieties of the crops. The major rain fed crops cultivated are Bajra, Moth, Moong, Rape & mustard and gram are given below. Few crops like wheat, barley, black gram etc are sown where one or two irrigation is applied depending on the availability of well water. During the good rains, farmers grow the onion, or vegetable crops like brinjal, potato in the pockets.

The important crops grown are Bajra, Moong, Moth, Ground Nut etc in Kharif and Gram, Wheat and Rape seeds & Mustard in the district. As per Vital Agriculture Statistics 2004-05, the cropping intensity and irrigation intensity are 106% and 119 % respectively during the year 2002-03. The crop wise area, its production & yield per ha and the production and areas sown during Kharif and Rabi are given below :-

DISTRICT-WISE AREA, PRODUCTION AND YIELD OF KHARIF CROPS

District: Hanumangarh

(Area in Ha., Production in tonnes & Yield in Kg./Hac.)

Region/District	2001-02			2002-03			2003-04			2004-05			2005-06			2006-07			2007-08		
	Area	Production	Yield	Area	Production	Yield	Area	Production	Yield	Area	Production	Yield	Area	Production	Yield	Area	Production	Yield	Area	Production	Yield
Rice	28345	86387	3048	22232	38653	1739	20869	67043	3213	17590	64671	3677	16969	65501	3860	15550	72134	4639	18169	76206	4194
Jowar	148	61	412	21	3	143	51	36	706	57	26	456	1	0	0	6	3	500	3	2	667
Bajra	96464	74769	775	59705	4516	76	116152	109912	946	69221	33474	484	78773	74225	942	97266	88146	906	86566	136157	1573
Maize	1	1	1000	8	7	875	14	26	1857	0	0	-	6	7	1167	10	11	1100	1	2	2000
S.Millets	0	0	-	0	0	-	0	0	-	0	0	-	0	0	-	0	0	-	0	0	-
Cereals Total	124958	161218	1290	81966	43179	527	137086	177017	1291	86868	98171	1130	95749	139733	1459	112832	160294	1421	104739	212367	2028
Arhar	38	35	921	22	3	136	28	24	857	24	6	250	3	2	667	60	24	400	4	4	1000
Moong	6877	2029	295	6337	1757	277	12668	8186	646	6497	1538	237	7724	3904	505	9358	3814	408	16236	6387	393
Urad	125	45	360	82	15	183	40	21	525	57	20	351	112	28	250	105	31	295	89	47	528
Moth	47599	19540	411	23273	3739	161	74418	40254	541	40680	5784	142	30907	4981	161	30441	8291	272	39052	16269	417
Kharif Pulses	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pulses Total	54639	21649	396	29714	5514	186	87154	48485	556	47258	7348	155	38746	8915	230	39964	12160	304	55381	22707	410
Sesamum (Til)	7248	4315	595	7870	776	99	2892	1581	547	6201	2811	453	6984	5231	749	9276	7492	808	3261	1864	572
Ground Nut	146	179	1226	2580	1772	687	1274	1994	1565	449	696	1550	509	787	1546	314	410	1306	729	1259	1727
Soyabean	0	0	-	0	0	-	0	0	-	0	0	-	0	0	-	0	0	-	5	7	1400
Castor	53	39	736	320	121	378	5529	7011	1268	10354	8160	788	20029	35736	1784	10974	15260	1391	2144	4304	2007
Oil-Seeds Total	7447	4533	609	10770	2669	248	9695	10586	1092	17004	11667	686	27522	41754	1517	20564	23162	1126	6139	7434	1211
Sugarcane	36	1717	47694	139	5870	42230	40	2136	53400	10	483	48300	5	305	61000	7	404	57714	-	-	-
Cotton	179476	62289	347	118202	46354	392	117060	265566	2269	158081	341269	2159	159425	367615	2306	144445	334773	2318	-	-	-
Guar	233810	82495	353	78845	3717	47	244003	278200	1140	166037	24302	146	203742	147927	726	287382	76256	265	319617	277972	870
Chillies	5	5	1000	6	2	333	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Deshi Cotton	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mesta	0	0	-	0	0	-	0	0	-	0	0	-	0	0	-	0	0	-	-	-	-
Sumheamp	4	2	500	3	0	0	4	6	1500	2	0	0	7	0	0	2	0	0	-	-	-
Melvin Cotton	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Paddy	28345	129581	4572	22232	57979	2608	20869	100564	4819	17590	97007	5515	16969	98251	5790	15550	108201	6958	-	-	-
Vegetables	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RajAmerican Cotton	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Punjab American Cotton	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Others Total	441676	276089	625	219427	113922	519	381976	646472	1692	341720	463061	1355	380148	614098	1615	447386	519634	1161	319617	277972	870
Gross Total	628720	463489	737	341877	165284	483	615911	882560	1433	492850	580247	1177	542165	804500	1484	620746	715250	1152	485876	520480	1071

Other Species	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other Vegetables	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Others Total	373	727	1949	321	180	561	283	1077	3806	194	1261	6500	193	331	1715	281	1710	6085	0
Gross Total	459163	812038	1769	558907	770775	1379	531059	637760	1201	576805	791741	1373	518823	744706	1435	495166	963107	1945	4

A detail of major crop wise area and its production wise is given below:

Name of crops	Area in hectare	Tonnes
Kidney bean (moth)	272646	25892
Gram	281882	107659
Bajra	404434	78283
Rapeseed & Mustard	23547	38046
Wheat	13071	37107
Guar seed	364155	18923
Groundnuts	9501	16870
Green gram (Moong)	34107	11056
Barley	2912	3622
Rapeseed	23547	38046
Fenugreek seed	1508	
Cumin seed	1360	589
Cowpea	537	272
Psyllium seeds	105	
Linseed	60	45

(ii) About Project

Location & General features of watershed/cluster/project

Hanumangarh II project falls in Hanumangarh District of Rajasthan. The geographical area of this project is 5333 ha and it comprises of Moter Gram pnnchayat covering 3 villages. The area lies between latitude of 28⁰ 4' to 28⁰ 11' N and longitude of 74⁰ 37' to 74⁰ 35' East.

Hanumangarh ii project is located in Rawatsar Block, Hanumangarh District of Rajasthan state. The project is a cluster of Moter covering Dhirdasr , **Udasar Chhota, Sirasar** villages with 04452,04453,04455,being their respective codes. The total Village area of the project (Cluster/watershed) is about 6833 Ha, out of which 5333 Ha has been undertaken to be treated under Integrated Watershed Management Programme (IWMP) starting year 2009-10.

The nearest town is Rawatsar which is about 70 Km from the project area and is well connected by *pucca* road. *Raika, Jaat* and *SC* communities are the primary inhabitants of the village. The livelihood of these people is primarily based on rainfed agriculture, animal husbandry, wage labour, goat and sheep rearing. It is a very poor and desolate village of India.

Average annual rainfall of the area is 300 mm and most of its parts get washed away in the form of wind erosion which also carries valuable top soil. Most of the residents of the project area are dependent on agriculture and animal produce. Area being rainfed and excess rains and early recession of rains causes the failure of crops. The economic condition of the people is poor.

Present status of land use of the project

Details of land use pattern of the project area is given below :-

Land use pattern of the project

S.No	Land Use Details	Area (ha)	% to geographical area
1	Total Geographical area	5333	100 %
2	Forest	0	0 %
3	Non agriculture use	72.25	1.35 %
4	Barren & unculturable land	0	0 %
5	Area unfit for cultivation (3+4)	72.25	1.35 %
6	Cultivable wasteland	0	0 %
7	Pasture and other grazing lands	102	1.91 %
8	Other uncultivated land excluding fallow lands (6+7)	102	1.91%
9	Fallow (Other fallow +Current fellow lands)	0	0 %
10	Net Area sown	5158.75	96.73 %
11	Total cropped Area	5158.75	96.73 %
12	Area sown more than once	100	1.18 %
13	Net area Irrigated	0	%
15	Rainfed cultivable land (6+9+10-13)	5333	100 %

Present status of rain water storage of the project

Details of Rain Water Storage of the project area is given below :-

Details of Rain Water Storage

S. No.	Source	No. of source	Capacity (in litre)	Qty (in litre)	Availability of water (in month)
1	Kachha Johar/Talaab	4	7,65,000	30,60,000	5
2	Pacca Johar/Talaab	3	7,65,000	22,95,000	8
3	Individual Farm Pond/Taanka	50	20000	10,00,000	8
4	Roof Top Rain Water Harvesting Structure	10	10,000	1,00,000	6
	Total	67		64,55,000	

Soil Erosion

Being general soil texture light and course sandy, highly permeable and without any streams contributing runoff, no water erosion is reported but large amount of wind erosion takes place in total project area ofHactare. The data regarding about wind erosion are not available.

Details of soil erosion in the project area

1	2	3	4	5
Cause	Type of erosion	Area affected (ha)	Run off (mm/ year)	Average soil loss (Tonnes/ ha/ year)
Water erosion				
a	Sheet		There is no runoff producing storm in the district	
B	Rill			
C	Gully			
Sub-Total				
Wind erosion		8128		Data regarding about wind erosion are not available
Total		8128		

Socio Economic Status

Hanumangarh I watershed project has a total of 532 households with a population of 3114 (*as per base-line survey*) out of which 1737 are male and 1377 female .The sex ratio is 793 female to 1000 male. There are 27 BPL families. The average family size is 6. The literacy rate is very low *i.e.* 49.8 per cent. Male literacy rate is 53.2 per cent (of total male population) and female literacy rate is as low as 44.6 per cent (of total female population). The major castes in the village are Jaat, Raika, Sharma and Schedule Caste . Majority of population is involved in agriculture and animal husbandry.

Details of Socio Economic indicators are below

1.1 Socio –Economic Indicators

A Population				
a	Population of the project		3114	By % age
	Male		1737	56
	Female		1377	44
b	Childern		433	14
c	Total Household		523	80
d	BPL Families		27	20
	By Caste			
	General			
	S.C.			
	S.T.			
	Density (per sq.kms)		17	
	Decadal growth rate (1991-2001)			
B Human Development Index parameters				
	Litercy rate all %		49.8	
	Male			
	Female			
	Litercy rate(rural) (M)		53.2	
	Litercy rate(rural) (F)		44.6	
	Sex ratio		793	

		Human Development index(2007)		
C	Distribution of households			
	a	By Land Holding		
	b	Marginal Farmers (0- 1ha)		
	c	Samll Farmers (1- 2ha)	45	
	d	Medium Farmers (2 to 4 ha)	152	
	e	Big Farmers (more than 4 ha)	317	
	f	Average holding size – ha	3.32	
D	Major occupation			
	a	Agriculture	1436	96
	b	Landless labourers/ Agriculture labour	54	4
	c	Household industrial labour	-	-
	d	Others labour	-	-
	e	Total working labour	1596	100
E	Source of Income			
	1	Crop production & dairy enterprise		50
	2	Off-farm income / Other services		10
	3	Agriculture Labour		40
F	Income wise Category of /households/Families(No)			

Human resources indicator are

Population	persons	3114
Density of population	persons per sq. km	58.39
Male	number	1737
Female	number	1377

Literacy	per cent	49.8
Sex Ratio female per 1000 male		793
Working Population	per cent of population	41.69
Growth rate	per cent	86.8
Percentage distribution of work force		
Cultivators	per cent	96
Agricultural laborers	per cent	4
Household industry manufacturing	per cent	-
Processing, servicing and repairs	per cent	-
Other workers	per cent	-

Problems and Scope of improvement goods/objectives

Problems

- Lack of conservation of rain water, indigenous plants and natural resources.
- Lack of irrigation facilities and lack of water harvesting structures.
- Low fertility and problem of nutrient losses due to wind erosion in summer season.
- Lack of Pasture land.
- Low Rainfall.
- Ground water at 45 to 48m depth & having 1800 to 3500 TDS.
- Migration
- Low availability of fodder.
- Low Vegetation.
- Low of agriculture production.
- Poor socio-economic condition of the farmers.
- Lower level of mechanisation in the watershed area.

Objectives

- Awareness building regarding conservation of rain water, indigenous plants, natural resources and to adopt bio compost etc.
- Regeneration of ecology by increasing vegetation i.e. conserving the medicinal plants, agro forestry and horticulture plants.
- Bridging ecological cycle by concentrating on eco-friendly land use methods, forestation, animal husbandry, land revitalization and efficient use of harvested water
- Increase the availability of biomass for consumption and market purpose (food, fodder, firewood, fiber and fertilizer)
- Ensure year round availability of employment opportunities and economic avenues particularly for women and landless
- Revitalization of traditional practices like organic manuring, soil fertility management through crop rotations by utilizing new crops and technologies i.e. vermi culture etc.
- To promote the villagers for conservation of plants & for Pasture land increase in vegetation cover.
- Establishment of ECO CLUBS in the village for sharing the knowledge regarding biodiversity.

Institutional Arrangements

State Level Nodal Agency (SLNA)

The State Level Nodal Agency (SLNA) is a nodal agency at level for Monitoring, evaluation, providing technical support to District Watershed Development Units (DWDU) and to oversee the smooth implementation of watershed projects in the state. The Additional Chief Secretary (Development) is the chairperson of the SLNA. The SLNA has dedicated and experienced staff, a technical expert and a multidisciplinary team. The objectives of the SLNA are supervising, planning, implementing, documenting and promoting watershed development projects and related developmental activities in the state as per guidelines.

State level Nodal Agencies (SLNAs)

Details of SLNA

1 S. No.	2 State	3 Type of SLNA	4 Date of Notification	5 Date of MoU with DoLR	6 Total no. of members of SLNA	7 Chairperson		8 CEO					
						Name	Designation	Name	Designation	Date of Appointment	Nature of appointment	Tenure (No. of years)	Contact Ph. No./ Fax/ E-mail

Details of functionaries in the SLNAs

List of Officers/Officials working in SLNA/
Directorate

S.No.	Names & Designation	Designation	Qualification	Experience	Work allocation	Monthly remuneration (Rs.)	Total budget of SLNA(lacs.)
							R
1	Sh.C.S.Mehta	Additional Director	B.E.Agri	38 years	Adll. Dir.(HQ)	53900	
2	Sh. D K Yadav	Jt.Director	B.E.Agri	37 years	MIES	51075	
3	Sh.Anil Mogra	Dy.Director	B.E.Agri	32 Years	Training	40297	
4	Sh.Rajesh Bhandari*	Dy.Director	B.E.Agri	32 years	IWMP	37190	
5	Sh.M.L.Barupal	Dy.Director	B.E.Agri	18 Years	NWDP	39169	
6	Sh.J D Meena	Dy.Director	B.E.Agri	38Years	Quality Control	44500	
7	Sh B L Verma	Dy.Director	B.E.Agri	18 Yrs	D.D.(Adm)	39169	
8	Sh Arun Surana	Dy.Director	B.E.Agri/MBA	24 Yrs	Livelihood Expert	42000	
9	Sh N S Rathore	Dy.Director	MSc Agri	20 Yrs	Agriculture Expert	40000	
10	Sh. A.S.Gehlot	Dy.Director	B.E.Agri	11 Years	Training	37230	
11	Smt.Susheela Yadav	Dy.Director	M.E.(IWM)	12 Years	Project Formulation &	33371	

					IWMP	
12	Sh.Vimal Gupta	CAO	M.A, M.Phill,	24 years	Accounts	45047
13	Mrs Sangeeta Rathore	AO	B.Com	10 years	Accounts	42839
14	Sh. R.S. Meena	AAO	B.Com	28 years	Accounts	34901
15	Sh.Gyarsi Lal	AAO	M.A	31 years	Accounts	31535
16	Sh. Prabhakar Saraswat*	JEN	B.E.Agri	13 Years	Data cell	17129
17	Sh. R.K.Vijay	JEN	B.E.Agri/MBA	13 Years	Training	20410
18	Sh. Nitin Srivastava	JEN	B.E.Agri/MBA	13 Years	IWMP	20410
19	Sh. Pawan	JEN	M CA /B.E.Agri	14 Years	RD	20410
20	Sh.Tarun Bhatnagar	JEN	M Tech /B.E.Agri	13Yrs	IWMP	20410
21	Sh.Vijay Agnihotri*	Investigator	M.Sc.Statistics, PGDCA	30 Years	Data supporting	34603
22	Sh. Ashok Kumar Tailor	Legal Asstt.	M.Com LLM	8 Years	Legal work	22064
23	Sh Rajesh Kumar	ACP	MA	18 Yrs	Data cell	35600
24	Sh Pukhraj Bumb	Programmer	MA	22 Yrs	Data cell	25400
25	Sh. Anil Jain	Asstt.Prog.	B.Com	15 Years	Computer supporting	22504
26	Sh. Gajadhar Sharma	Jr.Acctt.	B.Com	13 Years	Accounts	25500
27	Sh.C.M.Regar	Jr.Acctt.	M.Com	14 Years	Admn. Supporting	24422
Supporting staff (6 P.A.,6 Steno,10 UDC,20 LDC,1 Driver,23 Class IV)						

Persons to be hired on contract / deputation

28		Technical Expert(Animal Husbandry / Capacity Bldg.)	Veterinary Doctor			50000
29		GIS Expert				40000
30		Data Entry Operator(3 posts)				45000
36		Jr. Accountant (3 posts)				84000

Funding expected from DoLR (Rs)*

<i>Strengthening of State Data Cell</i>		R	NR
For the salaries, TA, O.E. and other expenses for the hired persons		90 lacs	
For strengthening of SLNA in terms of consultancy, workshops, R&D, strengthening, MEL, Softwares & Hardwares			40 lacs

* Also included in strengthening of SLAN mentioned in PPR 2

Details of State Level Data Cell (SLDC) functionalities

List of Officers/Officials working in Commissionrate

S.No.	Total no. of persons working in the SLNA for IWMP	Names & Designation	Designation	Qualification	Experience	Work allocation	Monthly remuneration (Rs.)
1	Given in PPR1	Sh.D K Yadav	Jt.Director	B.E.Agri	37 years	Data Cell, Monitoring and supervision	51075
2		Sh. Prabhakar Saraswat	JEN	B.E.Agri	13 Years	Data cell	17129
5		Sh.Vijay Agnihotri	Investigator	M.Sc.Statistics, PGDCA,	30 Years	Data supporting	34603
6		Sh.Raju Gorana	P.A	Hr.Secondary	16 Years	Dictation work	22843
10		Sh.Bheema Ram Meena	CLASS IV	Literate	36 Years	Peon	14187

Funding expected from DoLR (Rs)*

<i>Strengthening of State Data Cell</i>	R	NR
For the salaries, TA, O.E. and other expenses for the hired persons and AMC charges for equipments already precured.	Proposal to be sent seperately	
For strengthening of SLNA in terms of consultancy, workshops, R&D, strengthening, MEL, Softwares & Hardwares	Proposal to be sent seperately	

All expenses already considered in PPR-2

District Watershed Development Unit (DWDU)

The District Watershed Development Unit (DWDU) is a district level nodal agency to oversee the smooth implementation of watershed projects in the district. The Project Officer (Land Resource) is the chairman of the DWDU. The DWDU has dedicated and experienced staff comprising one Project Manager, a technical expert and a multidisciplinary team. The objectives of the DWDU are supervising, planning, implementing, documenting and promoting watershed development projects and related developmental activities in the district as per guidelines.

Project Implementing Agency (PIA)

Assistant Engineer, Panchayat Samiti, Rawatsar/ has been nominated to act as Project Implementing Agency (PIA) for Project Hanumangarh- I. The Project Implementing Agency (PIA) provides necessary technical guidance to the Watershed Committee for the preparation of development plans for the watershed through Participatory Rural Appraisal (PRA) exercise. The PIA 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 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 resources from other government programmes, such as NREGA, SGRY, Artificial Ground Water Recharging etc. implemented by DRDA, Agriculture, Horticulture, Animal Husbandry, Sericulture and Fisheries Departments during the District Watershed Committee meeting.

Staff at PIA level									
S. No.	Name	Age	Sex	Designation	Qualification	Experience	Govt. Servant/ on Contract	Mobile No.	E-mail
1	Shareef Mohammad	37	M	JEN	B. E. (Agri)	50 Yr	Govt. Servant	9414503429	

Watershed Development Team (WDT)

. 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 mobilisation 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 SLNA 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. DWDU will facilitate the training of the WDT members.

WDT

S. No.	Name of Project	Discipline	Name	Age	Sex	Qualification	Experience	Mobile No.	E-mail
1	Hanumangarh I	Engineer							
2		Agriculture Specialist	Ramgopal Bhambhi	26	m	M.Sc.	0	9887085659	
3		Animal Husbandry	Dinesh kumar	22	M	L. S. A.	0	9610657462	
4		Social worker	Kumod Kumari	30	F	M. A. (Sociology)	0	8094524850	

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 Gram Panchayat. This committee is registered under society Registration Act 1860. The Gram Sabha of the Gram Panchayat selects the chairman of the watershed committee with the secretary who will be a paid functionary. A watershed Committee was formed accordingly in Bhadi Gram Panchayat. Capacity building training to the watershed committee is given by WDT. The watershed committee has a pivotal role to play during and after the project implementation period.

WC

S. No.	Name of WC	Registration No. & date	Name of Member	Designation	Gender	Age	Category	Qualification	Mobile No.	Bank A/C No.	Name of Bank
1	Watershed Committee Mundria Bada		Chetram Sihag	Chairman	M	55	OBC.	Primary	9649927256		
2			Kishan nath	Member	M	38	OBC	.			
3			Surat singh	Member	M	32	OBC				
4			Meera	Member	F		SC				
5			Pannaram	Member	M		SC				
6			Kamala	Member	F		SC				

7			Ramsawroop	Member	M		Gen.				
8			Devilal	Member	M		SC				
9			Modu Ram	Member	M		SC.				
10			Seema	Member	F		OBC				
11			Shanker	Member	M		OBC				
12			Girdawri	Member	F		OBC				
13			Bajranh	Member	M		Gen				
14			Rami	Member	f		SC				
15			Megharam	Member	M		Gen				
16			Sahiram	Member	M		SC				

Secretary

It is a person that is selected by Gram Sabha on the basis of merit and experience for the following tasks-

- Convening meetings of the Gram Sabha, Gram Panchyat, Watershed Committee for facilitating the decision making processes in the context of Watershed Development Project.
- Taking follow up action on all decisions.
- Maintaining all the records of project activities and proceedings of the meetings of Gram Panchayat, Watershed Committee (WC) and other institutions for Watershed Development Project.
- Ensuring payments and other financial transactions.
- Signing the cheques jointly with the WDT nominee on behalf of the Watershed Committee.

Secretary

S. No.	Name of Project	Name	Age	Sex	Qualification	Experience	Mobile No.	E-mail
1	Dhirdasar(Hanumangarhl)	Krishan Kumar	25	M	M.A	Nil		

CHAPTER – II

I. Basic Features : Socio Economic and Infrastructure

a) Land use and land classification map, land capability map & Present land use

The land capability class of the project area falls under the category of III, IV and VI The details of Land Capability classification as furnished by Remote sensing application centre Jodhpur given below :-

Land capability classification of the project area

S. No.	LCC	Area in Ha.	Area in Sq. Kms.
1	II	50	.5
2	III	2140	21.12
3	IV	2670	2670
4	VI	473	4.73
5	VII		
6	VIII		
	TOTAL	5333	-

The project consists of 5333 ha area of which 96.70 % is under cultivation. Agriculture is purely depending on the monsoon rainfall and single cropped. The net sown area is 96.70 % with cropping density of % in the year 2001 Only 0 % irrigated area in the project. The Project has approximately 0 ha wasteland 102 ha pasture land which is degraded land/ grazing stable/ and deniable sand dunes of height 6 to 30 meters. The area under the assured means of irrigation in the project is negligible. At some places of the project the irrigation is facilitated through wells. Details of present land use and waste lands of the project area is given below :-

Land use of Project Area								(area in Ha.)					
Gram Panchayat	Village	W/S	Geographical Area	Forest Area	Community Land	Pastures	Uncultivated Waste Land	Agriculture Land				Net sown area	Net Area sown more than once
								Temporary fallow	Parmanent fallow	Cultivared Rainfed	Cultivated irrigated		
Moter	Dhirdheasr	hanumangarhl	1806	0	29.25	0	29.25	0	0	1776.25	0	1776.25	
	Udasar chhota	hanumangarhl	1567	0	43	0	43	0	0	1524	0	1524	
	Siresar	hanumangarhl	1960	0	50	0	50	0	0	1910	0	1910	

Nett Effective area for Water Shed 5333 Hact.

b) Agriculture and Horticulture Status and fuel availability

Most of the area depends upon rain. Cropping intensity is less than ...50....% of the cropped area. In most of the area single crop is grown. The farmers left the f ields fallow for few years to regain the fertility of the soi l, and then they bring the field under cultivat ion. Main Crops raised in the Project area are:

1. Kharif : Bajra, Guar, Moth & Moong
2. Rabbi : Wheat , Mustard, and Grams.

Horticulture:

There are no orchards in the Project area. Only few jungli Bers are found in the project area.

Vegetation:

Important trees found in the project area are Khejra (*Prosopis spicigera*), Kikar (*Acacia nilotica*), Neem (*Azadirachte indica*), Hingota (*Balanites rox burghil*), Ker (*Capparis Aphylla*), Shisham (*Dalbergia Sisoo*), Jal-Pilu (*Salvadora oleoides*), Jal Khera (*Salvadora persica*) & Rohira (*Tecomela undulata*).

Important shurbs of the area which deserve mention are Bhui (*Arehna tomentosa*), Kut Kartalia (*Argemone mexicane*), Phog (*Calligonum polygonoides*), Aak (*Calotropis procera*), Senia (*Crotoleria burhia*), Thor (*Euphoriba royleana*), Kheep (*Laptadenia spartium*), Morali (*Lycium europoeum*) & Ber (*Zizyphus mauritiana*).

Several types of grasses are found in this project area viz. Bhurat (*Cenchrus catharticus*), Sewan (*Lasiurus catharticus*), Bura (*Cymbopogon Jwarincosa*), Lampra (*Aristida mutica*). Kucha (*Saccharum griffithii*) & Murat (*Panicum turgidum*).

Cropping Pattern of the Project Area

S.No.	Name of Crop	Kharif			Rabi			Total		
		Irr	Rain fed	Total	Irr	Rain fed	Total	Irr	Rain fed	Total
1	2	3	4	5	6	7	8	9	10	11
1	Bajra		172	172					172	172
2	Moth,		1057	1057					1057	1057
3	Moong									
4	Guar		4956	4956					4956	4956
5	Wheat					28			28	28
6	Mustard					13			13	13
7	Taramera					15			15	15
8	Chana					431			431	431

Total

Irr = irrigated area

Cropping Status

S. No.	Season	Crop Shown	Rain fed			Irrigated			Total	
			Area (ha)	Production (Ton)	Productivity (Kg/ha)	Area (ha)	Production (Ton)	Productivity (Kg/ha)	Area (ha)	Production (Ton)
1	Kharif	Bajra	172	103	600				172	103
		Moth,	1057	211	200				1057	211
		Moong								
		Guar	4956	2974	600				4956	2974
2	Rabi	Wheat	28	22.68	810				28	22.68

	Mustard	13	2.6	200				13	2.6
	Taramera	15	3.0	200				15	3.0
	ckana	431	177	410				431	177
	Barley	10		730				10	
	Total	6682	3493.28						

Note – Above figures are total area of village not for project area.s

Existing area under horticulture (ha)			Existing area under fuel-wood (ha)			Existing area under fodder (ha)		
Source/Name of report	Year of reference	Area already under Horticulture	Source/Name of report	Year of reference	Area already under fuel-wood	Source/Name of report	Year of reference	Area already under fodder
0	0	0	0	0	0	0	0	0

Abstract of cropped Area (ha)	
Area under Single crop	6665
Area under Double crop	1463
Area under Multiple crop	0

c) Livestock Status – Animals/milk production/average yield and fodder availability

Almost all households of the Project area keep livestock of one species or other and earn income out of them. The animal husbandry is the most income generating activities in farm household next to crop production. The animals useful in agriculture are camel & buffalo, which are used for ploughing and transportation work. Cows and buffaloes are main milk providing animals. Milk of goat is being used for domestic purpose. Sheep and Goat are fostering for wool and meat. Coak and hen are being fostering for meat and eggs.

Backyard poultry is also an important source of supplemental income for small and marginal farmers. It is expected that farmers can fetch more than Rs.5000 additional income per year per family by maintaining ten hen flocks.

As per basic survey of the project area live stock density per sq. km is 120 and average livestock available with respect to human population is 1.2 Only.

Fodder requirement of Rainfed area, is mainly met out from canal command area of near by the district. As per basic survey of the project area, the pasture land in the project area is 149 ha where as waste land is 20 ha. Fellow land of permanent nature is 0 ha. These lands are opened and scrubbed. The grass / fodder trees are very little and are not fetching the demand of fodder. The grass and fodder are procured during crop season or purchased from the market.

The data regarding to animals, milk production, average yield and fodder availability are given below –

The details of livestock in the project area based on base line survey

Livestock	Project			Annual Production				Yeild per day				Live Stock density per sq. Kms	Ratio with respect to Human population	Availability of fodder (quintals)	Deficiency of fodder (quintals)
	Indi- genous	Crossed breed	Total	Milk (tonns)	Meat (tonns)	Wool (tonns)	Egg (million no.)	Milk (litre)	Meat (Kg)	Wool (Kg)	Egg (No.)				
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Cows	1435	0	1435	4.26				3				135	2.31	800	280
Buffaloes	171		171	19.94				6							
Bullocks	10		10												
Camel	270		270												
Goat	1195		1195	2.0				0.5							
Sheep	4109		4109			2.3									
Poultry															
Pigs															
Total Livestock	7190	0	1422	26.2		2.3		9.5							

d) On-farm and Off-farm other income generating activities

e) Demography

As per basic survey, project area has a population of 3114 Males constitute 1737 i.e. 55.78% and females 1377 i.e. 44.22% of the population. The project area has an average literacy rate of 52.8%, lower than the national average of 59.5%. Male and female literacy rate are 56.2% & 49.4% respectively. In the project area, 21.47 % of the population is under 6 years of age. The growth rate against population is 105 %.

Total number of household in the project area are 632. Sex ratio of the project area is 927. Migration from project area is 8%. SC, ST, BPL & Landless population in the project area are respectively 20, 0, 20 & 6 %.

DEMOGRAPHY OF THE PROJECT AREA

Name of Village	No. of Household	Growth in Population during the last three census	Per capita availability of Land (Ha.)	Sex Ratio	Total Population			Population in the age group 0-6			Lit. Population	Literacy Level (%)	Migration	Total Worker	No. of SC, ST, BPL & Landless Population			
					Person	Male	Female	Person	Male	Female					SC	ST	BPL	Landless
Dhirdasar	198		33.86	744	954	547	407	200	112	88	553	58	30	594	21	0	1	18
Udasar Chhota	120		29.38	800	792	440	352	170	95	75	460	58	8	360	26	0	3	
Sirasar	214		36.77	824	1368	750	618	290	160	130	793	58	13	750	73	0	23	

F) Other infrastructure facilities available

Facilities available in the project area are given below :-

Details of infrastructure in the project areas

Parameters		Status			
(i)	No. of villages connected to the main road by an all-weather road	3			
(ii)	No. of villages provided with electricity	3			
(iii)	No. of households without access to drinking water	0			
(iv)	No. of educational institutions: Primary (P)/Secondary (S)/Higher Secondary (HS)/Vocational institution (VI)	(P) 1	(S) 0	(HS) 3	(VI) 0
(v)	No. of villages with access to Primary Health Centre	3			
(vi)	No. of villages with access to Veterinary Dispensary	0			
(vii)	No. of villages with access to Post Office	1			
(viii)	No. of villages with access to Bank	0			
(ix)	No. of villages with access to Market/Mandis	0			
(x)	No. of villages with access to Agro –industries	0			
(xi)	Total quantity of surplus milk				
(xii)	No. of milk collection centres (e.g. Union (U)/Society (S)/Private agency (PA)/Others (O)	(U) 0	(S) 0	(PA) 0	(O) 0
(xiii)	No. of villages with access to Aanganwadi Centre	0			
(xiv)	Any other facilities with no. of villages (please specify)				
(xv)	Nearest KVK	KVK Sangria 150 Km fro project area			
(xvi)	Co-operative Society				
(xvii)	NGOs				
(xviii)	Credit institutions				
	(i) Bank				
	(ii) Co-operative Society				
(xix)	Agro Service Centre's				

g) NREGA Status :-

Sr. no.	Name of Gram Panchayt	Total no.of job cards	Activity taken up in 2009-10														Employment Status of 2009-10	
			Category 1		Category 2		Category 3		Category 4		Category 5		Category 6		Category 7		Employment generated	Mandays generated
			Total	Project area	Total	Project area	Total	Project area	Total	Project area	Total	Project area	Total	Project area	Total	Project area		
1	Bhadi	915																
2	Mundria bada	1187																
3	Alayla	715																
4	Kunji	959																
Sr. no.	Name of Gram Panchayt	Total no.of job cards	Activity taken up in 2010-11														Employment Status of 2010-11	
			Category 1		Category 2		Category 3		Category 4		Category 5		Category 6		Category 7		Employment generated	Mandays generated
			Total	Project area	Total	Project area	Total	Project area	Total	Project area	Total	Project area	Total	Project area	Total	Project area		
1	Bhadi	915	8		9		3		35		3		11		27			14767
2	Mundria bada	1187	8		8		7		102		0		4		44			27854
3	Alayla	715	7		4		2		30		0		4		25			25423
4	Kunji	959	9		0		9		65		4		8		38			50378
Sr. no.	Name of Gram Panchayt	Total no.of job cards	Activity taken up in 2011-12														Employment Status of 2011-12	
			Category 1		Category 2		Category 3		Category 4		Category 5		Category 6		Category 7		Employment generated	Mandays generated
			Total	Project area	Total	Project area	Total	Project area	Total	Project area	Total	Project area	Total	Project area	Total	Project area		
1	Bhadi	915	17		7		8		60		3		31		36			2906
2	Mundria bada	1187	8		8		7		102		0		17		40			
3	Alayla	715	3		3		14		11		0		1		3			
4	Kunji	959	11		4		9		111		5		8		62			15246

h) Development Indicators

i) Land Holding details

Land holding of Large farmer, Small farmer & Marginal farmer in the project area is 65, 20 & 15 %respectively. Per capita of land holding of Large farmer, Small farmer & Marginal farmer in the project area is 65, 20 & 15 respectively. Land holding of General, SC, ST, OBC & BPL farmers in the project area is 32.9, 16.6, 0, & 46.4 %respectively. Per capita of land holding of General, SC, ST, OBC & BPL farmers in the project area is 5.2 respectively.

Land holding details of the project area is given below :-

	Irrigated (source)	Rainfed	Total	General	SC	ST	OBC	BPL
(i) Large Farmer	0	317	317	40	120	0	372	26
(ii) Small Farmer	0	152	152					
(iii) Marginal Farmer	0	45	45					
(iv) No. of Landless person	18							
(v) No. of BPL households	26							

j) Other Development Schemes in the project area

There are many other schemes running in the Project area. Other development scheme/programme running in the project area are given below :-

S. No.	Name of the Programme/Scheme	Sponsoring Agency	Objectives of the Programme/Scheme	Villages covered	Number of beneficiaries benefitted
1	Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS)	Rural Development Department	Employment	Dhirdesar , Udasar Chhota , Sirasar	
2	Indira Awas Yojna (IAY)	Rural Development Department	Housing	-Do-	
3	C M Rural BPL Housing Scheme	Rural Development Department	Housing	-Do-	
3	Swarnjayanti Gram Swarozgar Yojana (SGSY)	Rural Development Department	Loan	-Do-	
4	Total Sanitation campaign (TSC)	Rural Development Department	Sanitation	-Do-	
5	Member of Legislative Assembly Local Area Development (MLA LAD)	Rural Development Department	Development	-Do-	
6	Member of Parliament Local Area Development (MP LAD)	Rural Development Department	Development	-Do-	
7	Thirteenth Finance Commission (TFC)	Panchayati Raj Department	Development	-Do-	
8	State Finance Commission (SFC)	Panchayati Raj Department	Development	-Do-	
9	Swa Vivek	Rural Development Department	Development	-Do-	
10	Gramin Jan Sah-Bhagidari Yojna	Rural Development Department	Development	-Do-	
11	Nirband Yojna	Panchayati Raj Department	Development	-Do-	

II. Technical Features

a) Revenue maps

Revenue maps, constructed by SRSAC Jodhpur is based on 1 : 4000. Revenue records like khsra maps , khasra list has been collected, printed & enclosed in the DPR at the last. Base line map, Cartosat map, Land use map & Land cover map of the project area has been marked by SARSAC Jodhpur & enclosed in the DPR.

b) Topo maps/watershed maps with drainage line/ survey maps (as prescribed and utility)

Topo map traced on plastic sheets and scanned by SRSAC Jodhpur showing all topography of the project area is enclosed below :-
As mentioned above being general soil texture light and course sandy, highly permeable and without any streams contributing runoff, no water erosion is reported but large amount of wind erosion takes place in total project area of 8128 Hactare. The data regarding about wind erosion are not available. Therefore no drainage line map is available in the project area.

c) Hydro-Geological maps / Ground Water status and prospect maps

Ground water of the project area lies in between 45 to 48m depth & having 2300 to 2800 TDS.

S. No.	Well	No.	Depth	Dry	Area irrigated (Ha)	Water availability (days)
1	Dug well	6	45 m			
2	Shallow tube wells					
3	Pumping sets					
4	Deep tube wells					
	Total	6				

As reported out of 5333 ha area, the potential of ground water in the area 0 ha is reported as critical. More emphasis on such activities which help in recharging the ground water is needed. Details of critical and safe area is given below :-

Ground water prospects

Category	Area in hectares	% to district	% to state
Critical	0	0	
Safe	0	0	
TOTAL			

d) Slope details

The information provided by Remote Sensing Centre Jodhpur the slope of the area is varying from to%.

The details as furnished by Remote Sensing Centre Jodhpur is given below :-

Slope distribution

General slope of area of the Project

S. No.	Slope Category	Area in Ha.	Area in Sq. Km.
1	0-1%	2600	26
2	1-3%	1600	16
3	3-5%	1133	11.33
4	5-10%		
5	10-15%		
6	15-35%		

7	35-50%		
	TOTAL	5333	53.33

e) (i) Available surface runoff based on average rainfall

The soil of the project area is very light, sandy course and highly permeable, neither run off is generated and nor harvested. But only runoff take place from 20% of the average rainfall in johar area, 100% from Daamar Road, 70% from Daamar Road Berms, 100% from roof top of the building/house, 100% from C. C. Road, 80 % from Brick Road (Khurra/Kharanja), 100% from the pacca catchment area of the water harvesting structure already exist. Total surface runoff available in the project area are given below :-

S. No.	Particulars	Area (sqm)	Average Rainfall (m)	Available Runoff (litre)
1	Johar	30000	.30	9000000
2	Daamar Road	70000	.30	21000000
3	Daamar Road Berms			
4	Roof top of the building/house	36000	.30	36000000
5	C. C. Road			
6	Brick Road (Khurra/Kharanja)			
7	Pucca catchment of Water Harvesting Structure			
8	Other if any			
9	Total	46000		471000000

(ii) Surface runoff tapped in existing structures

Surface runoff tapped in existing structure lies in the project area area given below :-

Details of Rain Water Storage

S. No.	Source	No. of source	Capacity (in litre)	Qty (in litre)	Availability of water (in month)
1	Kachha Johar/Talaab	6	3,00,000	24,00,000	5
2	Pacca Johar/Talaab	1	4,00,000	4,00,000	8
3	Individual Farm Pond/Taanka	10	20,000	24,00,000	8
4	Individual Farm Pond/Taanka	20	30,000	75,0,000	8
5	Roof Top Rain Water Harvesting Structure	12	10,000	12,00,000	7
	Total	49		7150000	36

(iii) Balance Available Runoff

Total available runoff of the project area is 182,81,855 litre & runoff tapped in the existing structure is 68,75,000 litre. So balance available runoff to be tapped is 114,06,855 Litre.

(iv) Total Demand of water for human & animals in the project area

S. No.	Particulars	No.	Demand of Water (litre)	
			Per person per day	Per year
1	Persons (for drinking purpose)	3114	5.5	6251355
2	Persons (for bathing, washing etc. purpose)	3114	60	56830500
3	Cows	1435	20	10475500
4	Buffaloes	171	35	2184525
5	Bullocks			
6	Camel	270	30	2956500
7	Goat	1195	10	4361750
8	Sheep	4109	10	14997850

9	Poultry			
10	Pigs			
11	Agro-forestry Plantation			
12	Horticulture Plantation			
13	any other			
	TOTAL DEMAND			98057980

(v) Net Demand of Water in the Project Area

1. Total Demand of Water in the Project Area :- 98057980 litre
2. Total Water Available in the Existing Structure in the Project Area :- 7150000 litre
3. Total Supply of water by Deptt., NGO & any other agency in the Project Area :- 72726300 litre
4. Net Demand of Water in the Project Area :- 18180 litre
5. Is Net Demand of Water in the Project Area is Greater than the Balance Available Runoff No

f) Soil Map and Soil details

As mentioned Project area is a part of great Thar Desert. It is covered with thick mantling sand i.e. 3 to 7 meters high longitudinal dunes trending north east to south west and general slope varies from south to north.

The general texture of the soil is course sandy to sandy loam, red soils in depressions, calcareous that has rapid infiltration rate of water, low human content due to rapid oxidation high salinity. The organic carbon values are almost negligible.

As per **Remote Sensing application centre**, Sodic or Alkali Soils is ha.

The overall fertility (qualities of N, P, and K) are very less through out the area of the Project. As per **Remote Sensing application centre**, the status of fertility is as under-

Nitrogen Very Low/Medium

Phosphorous Very Low/Medium

Potassium Very Low/Medium

In order to improve the health of the soil , sound agronomic measures such as addition of organic measures, green manuring and crop rotation with stress on legumes and other measures which enhance the humus content of the soil are recommended.

As per classified by remote sensing centre, largely soils of the Project falls under d3 to d5 i.e. cms to cms. However About 80 % of land has depth more than 90 cms.

The details as furnished by Remote Sensing application centre are given below :-

Soil depth

The details of the Area according to depth of soil		
Depth class	Area in Ha.	Area in Sq. Km.
d3		
d4		
d5		
TOTAL		

Soil depth

The details of the Area according to depth of soil		
Depth (Cms)	Area in Ha.	Area in Sq. Km.
0.00 to 7.50		

7.50 to 45.00		
> 45.00	\	
TOTAL	5333	53.33

Soil Profile

Major Soil Classes	Area in Hectares
II	82
III	1470
IV	3300
VI	481
Total	5333

Soil Fertility Status

Soil Fertility Status	Kg/ha
N	
P	
K	
Micro nutrients	PPM

g) Climatic and Hydrological details

The Area of Project is situated at latitude of 28° 4' to 28° 11' N and longitude of 74° 37' to 74° 35' E. The climate of the Project area is dry desert with large variation in temperature. The maximum and minimum temperature of the Project area generally varies from 5°C to 43°C. Relatively humidity is below 40% during south east monsoon period and rises to 65% during the rainy session i.e. in the month of July to September of the year. This Project area comes into extreme temperatures in winters and summers with lowest rain. The recorded minimum and maximum temperatures are 0°C (.....°F) and 50°C (.....°F)

respectively. Normal rainfall is only 290 mm / year which is sufficient for growing the crops.

The Climatic & Hydrological details of the project area are given below :-

Climatic and Hydrological information

Name of Agroclimatic zone :- **1C**

Average Annual Rainfall (mm)

S. No.	Year	Average Annual Rainfall (mm)
1	2002	84
2	2003	266
3	2004	131.30
4	2005	152.6
5	2006	136.30
6	2007	164
7	2008	199.80
8	2009	101
9	2010	310
10	2011	

332.6

Avg. Monthly Rainfall (Last Ten Years)

S. No.	Month	Rainfall (mm)
1	June	31.12
2	July	38.39
3	August	28.92
4	September	17.91

Maximum Rainfall Intensity (mm)

S. No.	Duration	Rainfall intensity (mm)
1	15 minute duration	
2	30 minute duration	
3	60 minute duration	

Temperture (Degree C)

S. No.	Season	Max.	Min.
1	Summer Season	49	24
2	Winter Season	20	-1
3	Rainy Season	26	21

Potential Evaporation Transpiration (PET) (mm/day)

S. No.	Season	PET
1	Summer	4 to 20 mm/day (Max.)
2	Winter	2 to 8 mm/day (Min)
3	Rainy	

i) Erosion details

Being general soil texture light and coarse sandy, highly permeable and without any streams contributing runoff, no water erosion is reported but large amount of wind erosion takes place in total project area of8128....Hactare. The data regarding about wind erosion are not available.

Details of soil erosion in the project area

1	2	3	4	5
Cause	Type of erosion	Area affected (ha)	Run off (mm/ year)	Average soil loss (Tonnes/ ha/ year)
Water erosion				
a	Sheet		There is no runoff producing storm in the district	
b	Rill			
c	Gully			
Sub-Total				
Wind erosion		5333		Data regarding about wind erosion are not available
Total		5333		

III. Problems, Demand and Scope for comprehensive area development

a) NRM

Problems

- Being general soil texture light and coarse sandy, highly permeable and without any streams contributing runoff, no water erosion take place in the project area. All rainfall water percolate in soil & increases the water table.
- Severe Wind erosion take place in the summer season which washed away a upper productive soil of the project area.
- Low community land as comparative to total area & deforestation of community land.
- Less vegetative cover
- Ground water depth ranges from 10 to 20 m which is Slightly deep
- Ground water having a TDS ranging 2300 to 2800 which is not suitable for drinking purpose.
- Average annual rainfall is 332.6 mm which is insufficient for fullfill the need of the area.
- Potential Evaporation Transpiration (PET) is 8.5 mm/day which transpire most of the water in the air.
- Max. & Min. temperature of the project area is 49 & 0 which is a adverse condition of the project area.
- Land slope having 3 to 7 m which effect on production.
- Land Capability Classification lies in between ...II..... toVI.....

Demand

- 1,75,94,812 litre runoff wants to store for requirement of the project area.
- There should be a barrier to stop wind erosion & protection of productive soil in the project area.
- There should be afforestation in the community land.
- There should be a rich vegetative cover in the project area.
- Ground water depth should be decrease.
- TDS of water should be suitable for drinking purpose.

- There should be a sufficient structure for capturing & storing rain.
- There should be a minimum Potential Evaporation Transpiration (PET) rate.
- There should be a heavy & rich plantation in the project area for favourable climatic condition.
- There should be a work for stabilisation of sand dunes.
- There should be a work for improvement of land.

Scope for development

- No. of artificial catchment & tank can be take up in the project area for capturing runoff & storage of rain.
- No. of vegetative barrier & shelter belt plantation can be take up in the project area against wind erosion & to protect the productive soil of the area.
- All the community land can be take up for afforestation.
- Maximum area can be take up for requirement of vegetation.
- Recharge well can be take up for decreasing ground water depth.
- Maximum rain fall water capturing structure can be take up for improving TDS.
- No. of structure can be take up for capturing & storing rain water.
- Adding zipsum in the soil can be take up for decreasing PET rate.
- Maximum plantatiion can be take up for improving climatic condition.
- Sand Dune Stabilization work can be take up for stabilization of sand dunes.
- Latest scientific methods can be take up for improvement of land.

b) Agriculture and Horticulture Productivity gap analysis

Problems

- Low productive soil of the project area.
- Soil fertility is low
- Agriculture is purely depending on the monsoon rainfall and single cropped.
- Assured irrigation is negligible.
- Low use of fertilizer per unit cropped area.
- Traditional farming methods.
- Lack of adequate farm machinery.
- Lack of finances for farmers.
- Lack of good quality seeds and fertilizers.
- Lack of other facilities such as storage and marketing.

Demand

- There should be some mechanism for improvement of productive soil.
- There should be some mechanism for increase the soil fertility.
- There should be rainfall capturing structure to ensure for double cropping system.
- There should be heavy water storage structure for life saving irrigation.
- There should be some training for farmers for use of fertilizer.
- There should be some training on modern farming methods.
- There should be some demonstration on modern farm machinery.
- There should be some loan facility for fulfill the demand of finances.
- There should be some demonstration on good quality seeds & fertilizer.
- There should be some training on storage of seeds & marketing.

Scope for development

- Vegetation barrier Can be take up for improving soil condition.
- Vegetation Barrier Can be take up for improving soil fertility.
- Suitable number of water harvesting structure can be take up for ensuring double cropping .
- Suitable number of water storage structure can be take up for life saving irrigation.
- Suitable number of training can be take up about benefits of fertilizer.
- Suitable number of training can be take up to aware about mordern farming methods.
- Suitable number of demostration can be take up about benefits of mordern farm machinary.
- Deemand of finance can be fulfill by loan of bank or society.
- Suitable number of crop demostration can be take up about good seed & fertiliser.
- Suitable number of trainings can be take up on storage of seed & fertilizer.

c) Live-stock gap of fodder availability

Problems

- Cows and buffaloes are of local breeds.
- Lack of fodder and pasture availability.
- Migration of goats and sheeps.
- Milk production is low.
- No local treatment is available.
- No pure water is available for drinking for live-stock.
- Lack of green fodder.
- Lack of time period of repeat breeding.
- Lack of balanced & nutrient feed in the project area.

- Lack of suitable habitation of live stock.
- Lack of milk marketing in the project area.
- Lack of poultry farming.
- Unawareness of animal health.
- Traditional methods of treatment.
- Cost of feed is greater than production.
- Street animals.
- Unauthorised veterinary practitioner by unknown person in the project area.
- Lack of awareness.
- Lack of vaccination.
- Unawareness of animal insurance.

Demand

- There should be a cows and buffaloes of hybrid nature.
- There should be a sufficient fodder & rich vegetative cover in Pasture land.
- There should some way to stop live-stock migration.
- There should some way of increasing milk production.
- There should be a availability of local treatment.
- There should be a pure water for live-stock.
- There should some way of increasing availability of green fodder.
- There should some way of increasing availability of balanced & nutrient feed.
- There should be a training programme on suitable habitation of live-stock.
- There should some way for developing milk marketing.

- There should some training on poultry farming.
- There should some training to aware about animal health.
- There should be a modern method of treatment.
- There should be a sufficient fodder that cost of feed should be less than the production.
- Street animals should be in definate area.
- There should be authorised vetenaty practicener in the project area.
- There should be some training on awareness.
- There should be some camp of vaccination.
- There should be some training on awareness of animal insurance.

Scope for development

- Distribution of improved bull and bull calves for natural services can be take up in the project area.
- A good vegetation programme can be take up in the pasture land.
- A good fodder vegetation programme on field boundry of famers & on common land can be take up to stop live-stock migration in the project area.
- Breed improvement programme can be take up for increase in milk production.
- Vetenary specialist as a WDT can be take up for local treatment.
- No. of rain harvesting structure can be take up for pure water for live-stock.
- Sufficient no. of plantation of fodder plant can be take up for availability of green fodder.
- No. of training can be take up on balanced & nutrient feed, suitable habitation of live-stock, milk marketing, poultry farming, aware about animal health, modern method of treatment, vaccination & animal insurance.
- Castration programme can be take up for street animal.

d) Livelihood & Micro-enterprises

Problems

- The villagers earn their livelihood from animal husbandry and agriculture and during lean seasons they migrate for daily wage in other parts of the state.
- Lack of small enterprises in the project area.
- Lack of Agro based industry in the project area.
- Lack of strengthening of Self Help Group.

Scope for development

- Development of small entrepreneurship such as stitching, embroidery, shops, fragrance sticks, candle preparation, handicrafts.
- Developing Agro based industry such as wool, Papad and Bardi weaving units with equipment and machines for livelihood enhancement.
- Poultry and piggery
- Vermi composting and animal waste as manure
- Fodder bank creation
- Establishment of processing center.
- Self Help Group Formation and there strengthening.

CHAPTER – III

Proposed Development Plan

1- Mobilization , Education, trainings and envisioning for

- Watershed Development Team
- Stakeholders at field level i.e. committee member
- Watershed secretary, SHG and User groups and progressive farmers.
- Vocational trainings for SHG and User Groups
- Capacity building for farmers and other progressive farmers on new interventions in the fields of soil water conservation measures to optimize natural water resources, rain fed agriculture, use of animal waste as manure, invention of water collection ways and use of micro irrigation technique
- Exposure tours
- Trainings on agriculture, horticulture and agro-based micro enterprises and silvi-pastoral approach
- Trainings on the development of livestock especially on improved market access for produce
- Training of the equity distribution of usufruct rights
- Livelihood activities for asset less people

2- Entry Point Activity (EPA)

To establish credibility of the Watershed Development Team and create rapport with the watershed community. Following works have been identified for the Entry Point Activity component, with the consent of the Gram Sabha.

S. No.	Name of Gram Panchayat	Name of Village	Amount Alloted for EPA (Rs. In Lakhs)	No of works	Estimated Cost (Rs. In Lakhs)
1	Moter	Dhirdesar	32	5	10.56
2		Udasar chhota		3	9.50
3		Sirasar		4	11.94

3- Watershed Development Works on Arable lands

- New Farm pond (Tanka) of at least 1 lakh litter capacity and plantation
- Repair of private well and farm ponds
- Field bunding for vegetative barrier against wind.
- Road top water harvesting structure.

4- Watershed Development Works on Non arable lands

- Community farm ponds locally Johar a harvesting structure of more than 20 to 30 liters lakh literscapacity based its catchment
- Jal Grahan Koop (recharge well)
- Repair of existing community farm ponds and pucca Johar locally called Tall- A harvesting structures
- Continuous trenching works with sowing of local perennial grass and shrubs and trees
- Shunken ponds/Khet Talai

5- Production System

- Crop Demonstration (high yielding varieties of cereals pulses, oilseed, and vegetable, medicinal, spices, production of good agriculture seed and fodder etc.)

- Horticulture plantation especially at the periphery of farm ponds
- Agro-forestry
- Plantation of in non arable area
- Bio fuel plantation
- Over seeding of grass and legumes

6- Live stock development activities

Live stock development activities will be undertaken in the project area with the help of Animal Husbandry department and selected NGO i.e. BAIF etc and Krishi Vigyan Centers established in the various districts

- a - Breed improvement i.e. rearing and distribution of improved bull and bull calves for natural services
- b- Genetic improvement of defined ingenuous livestock breeds through selective breeding, upgrading and replacement of nondescript stock through cross breeding.
- c- Expansion and strengthening of infrastructures to propagate the elite germ-plasm by using modern reproductive technologies through convergence of the programme implemented by line department.
- d- Distribution of improved bucks and rams for improvement of the small ruminants in the district
- e- Animal health camps, animal health care activities viz vaccination, deworming
- f- Promotion of the farmers for producing the good quality fodder seeds and fodder
- g- Castration of scrub bulls and their subsequent replacement by elite bulls in a phased manner.
- h- Conservation of important indigenous breeds and promotion of breeders association / cooperative groups.

7- Livelihood Support

- Development of small entrepreneurship such as stitching, embroidery, shops, fragrance sticks, candle preparation, handicrafts.
- Developing Agro based industry such as wool, Papad and Bardi weaving units with equipment and machines for livelihood enhancement.

- Poultry and piggery
- Vermi composting and animal waste as manure
- Fodder bank creation
- Establishment of processing center.
- Rearing of goats etc.
- Self Help Group Formation and there strengthening.

Consolidation / Exit Strategy

Consolidation and completion of various works, Building the capacity of the community based organizations to carry out the new agenda items during post project period, Sustainable management of (developed) natural resources, up-scaling of successful experience regarding farm production systems/off-farm livelihoods, etc.

Introduction

Consolidation and withdrawal phase is the most important and crucial phase in the participatory development projects. This phase facilitate the users to maintain the project activities in a sustainable manner during the post project period and initiate the new activities by users themselves. In this phase the resources augmented and economic plans developed in Phase II as per common guidelines are made the foundation to create new nature-based, sustainable livelihoods and raise productivity levels. The classification of activities in

the three phases must not be understood in a rigid manner. Many of the Phase III activities may even start in many watersheds during Phase I and/or II itself. Phasing of activities needs to have an internal logic and integrity that must flow through the entire action plan. This will depend on a host of factors such as the prevailing initial conditions, needs and possibilities in each village, response of the community etc. Such flexibility must be built into the action plan and is to be seen as a distinguishing feature of common guidelines

2008.

Activities to be undertaken during withdrawal phase

- Consolidation and completion of various works.

- Building the capacity of the community based organizations to carry out the new agenda items during post project period.
- Sustainable management of (developed) natural resources and Up-scaling of successful experiences regarding farm production systems /off-farm livelihoods

Completion various works

All the works initiated should be completed during first half of this phase.

Documentation of successful experiences /project interventions

- Successful stories of the farmers has to be documented either in the form of brochure or video clipping in local language.

Building the capacity of the community based organizations

- To carry out the new agenda items during post project period.
- To manage the developed natural resources.
- Improving the sustainability of various interventions under the project.
- Formal allocation of users right over Common Property Resources (CPRs).
- Collection of user charges for CPRs.
- Repair, maintenance and protection of CPRs.
- Sustainable utilization of developed natural resource.
- Intensification of farm production systems/off-farm livelihoods.
- Promotion of agro-processing and marketing enterprises.
- Maintenance of association including financial and records management.
- Farmers may also be encouraged to develop non pesticidal management, low cost organic inputs, seed farms and links with wider markets to fetch competitive price.
- Project management related aspects.
- Creating awareness about the various government schemes and facilitate them to approach appropriate organization.

Institutional linking with user groups / watershed associations

The PIA should make arrangements to link the watershed association and other user groups with appropriate external institutions for their self sustainability.

- Research, Developmental and Training organizations.
- Marketing agencies for procuring their on farm and off farm products.
- Financial institutions for providing loan in future.
- Any other organizations whom the farmers needed support based on the activities implemented during the project period.

Up scaling of successful interventions

Up scaling of successful experiences / interventions has to be attempted by availing revolving fund under the project as well as credit and technical support from external institutions.

Community enterprises

Community enterprises like a small agri or agro-processing units could be established by availing credit facilities from the financial institutions by watershed associations and the benefit can be used for post project management in addition to watershed development fund.

Formation of Federation

Federations could be formed at the level of a cluster of villages in order to support economic activities at scale. These would further strengthen and activate the linkages established with external resource agencies for knowledge, credit, input procurement, sale of local produce, carrying on processing activities to the point of exports.

Terminal evaluation

Terminal evaluation of project should be attempted by involving user groups for selected interventions on their impact based on pre and post project status. For example, the impact on water resources development could be gauged from additional area brought up under irrigation due to project interventions. Impact of production systems could be gauged from increase in yield. Impact of livestock and fisheries development could be gauged from additional income due to project interventions.

Consolidated project report preparation

Detailed completion report of the project which includes all intervention and activities implemented in the project has to be prepared in detail. The outline of the report will be as follows:

- Introduction and history of the watershed including special problems if any.
- Location, geographical and soils details etc. of the watershed.

- Details and maps of watershed.
- Budget allocation and utilization head wise.
- Details of the interventions, activities etc. implemented in watershed.
- Status of each intervention.
- Impact of interventions.
- Constraints.
- Any other matters PIA would like to highlight.
- Recommendations drawn based on lessons learnt for future use.

CHAPTER – IV

Technical Designs and Estimates

4. Technical Design of Kund/Farm Pond of 20,000 lit

Volume of Kund should be 20.00 Cumec for 20,000 litre capacity

Volume = $\pi/4 * (\text{Dia.})^2 * \text{depth}$

Assuming Diameter of Kund = 3.04 m

Than Depth should be = $20 / \pi/4(3.04)^2$

Therefore Depth = 2.75 m \approx 3.00 m

Catchment area of Kund should be for 20,000 litre

Volume of Water = Catchment area * Average Rainfall

Average rainfall of the project area is 300 mm

Therefore Catchment area = $20/0.30$

Catchment area = 66.66 Sqm

(Dia of Catchment area) 2 = $66.667 / \pi/4$

(Dia of Catchment area) 2 = 84.91

Dia of Catchment area = 9.21 m \approx 9.5m

मॉडल तकमीना

Name of Work:-Construction of Faram pond in Arable land for Individusal Beneficeries

कार्य का नाम : कुण्ड निर्माण

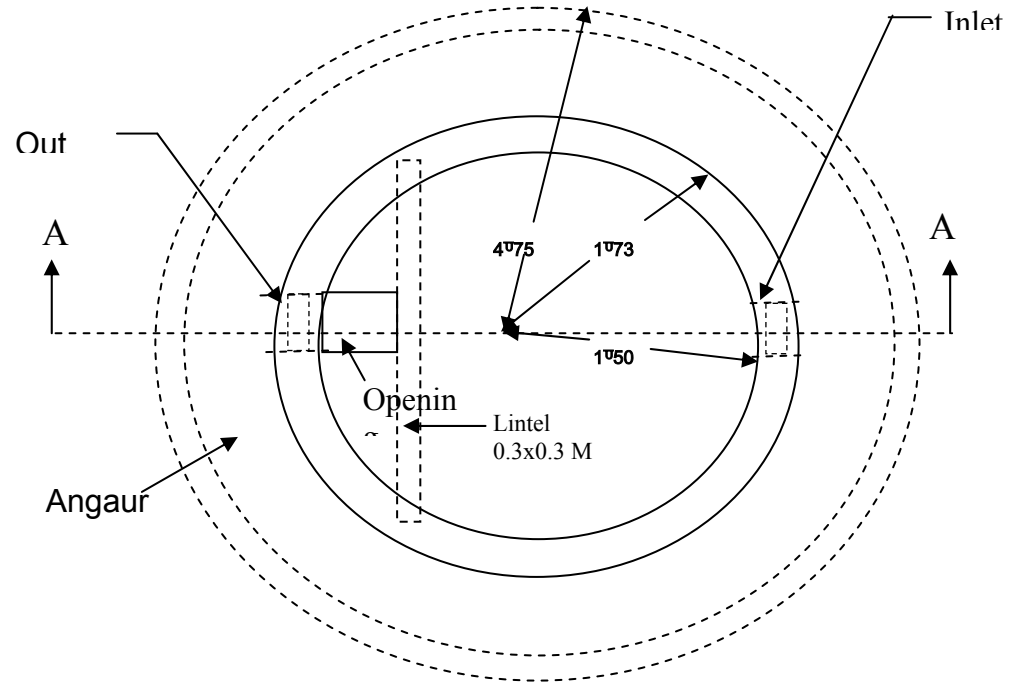
क्षमता 20000लीटर

क. सं.	विवरण	मात्रा	छर	राशि	श्रम
1	कुण्ड की खुदाई का कार्य खुदाई 0 मी. से 1.5 मी. तक $\pi/4$ (3.8) 2 * 1.5	17.012 Cum	75 /Cum	Rs. 1276	1276
इ	खुदाई 1.5 मी. से 3.0 मी. तक $\pi/4$; 3.8) 2 * 1.5	17.012 Cum	86 /Cum	Rs. 1463	1463
ब	खुदाई 3.0 मी. से 4.5 मी. तक $\pi/4$; 3.8) 2 * 0.25	2.835 Cum	97 /Cum	Rs. 275	275
	सिमेन्ट कंकरीट का कार्य 1,5,10				

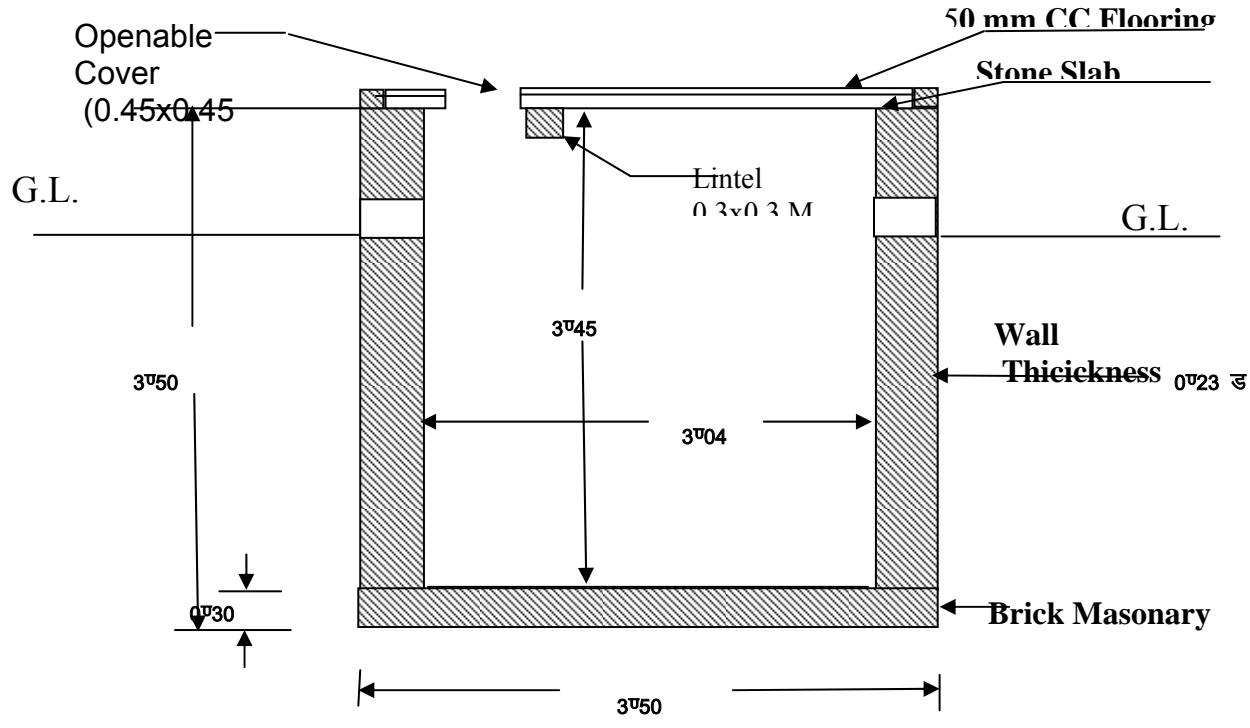
	$\pi/4$; 3.8) ² * 0.15	1.701	1617 /Cum	Rs. 2751	543
2.	ईट की चिनाई का कार्य				
	$\pi/4$; 3.5 ² 3.04 ²) * 3.45	8.152 Cum			
	$\pi/4$; 9.96 ² 9.5 ²) * 0.45	3.164 Cum			
		11.315 Cum	2194 /Cum	Rs. 24826	3915
3.	पेंदे में सिमेन्ट कंकरीट का कार्य 1:3:6 अनुपात में				
	$\pi/4$ (3.04) ² 1	7.258 Sqm	236 /Sqm	Rs. 1713	573
4.	लिटल लगाने का कार्य				
	2 * 3.3 * 0.3	1.980 Sqm	550 /Sqm	Rs. 1089	0
5.	कुण्ड पर पट्टी लगाने का पूर्ण कार्य				
	$\pi/4$ (3.5) ² .45*.45	9.419 Sqm	931 /Sqm	Rs. 8769	2129
5.	सिमेन्ट कंकरीट का कार्य 1:5:10				
	$\pi/4$ (3.5) ² .45*.45 0.075	0.709	1617	1147	226
6.	पायतन पर ईट बिछाने का कार्य				
	$\pi/4$ (9.5 ² 3.5 ²)	61.261 Sqm	205 /Cum	Rs. 12559	3982
7.	प्लास्टर का कार्य 1:6 अनुपात में । 20mm				
	$\pi/4$ (3.04) ²	7.258 Sqm			
	π * 3.04 * 3.45	32.932 Sqm			
	π * 3.5 * 0.45	4.946 Sqm			
		45.136 Sqm	74 /Sqm	Rs. 3340	1851
8.	पोइंटिंग का कार्य 1:4 अनुपात में ।				
	$\pi/4$ (9.5 ² 3.5 ²)	61.261 Sqm			
	π * 9.5 * 0.1	2.983 Sqm			
	π * 9.73 * 0	0.000 Sqm			
	π * 9.96 * 0.45	14.073 Sqm			
		78.318 Sqm	50 /Sqm	Rs. 3916	3054
9.	किवाड़ व जाली लगाने का कार्य		≈	2000	
	योग			Rs. 65123	19287
	लागत श्रम मद में	19287			
	लागत सामग्री मद में	45836			
	कुल योग	65123			

कार्य का नाम – कुण्ड निर्माण

ड्राईंग कुण्ड निर्माण



PLAN



SECTION ON 'A-A'

4. Technical Design of Kund/Farm Pond of 75,000 lit

Volume of Kund should be 75.00 Cumec for 75,000 litre capacity

$$\text{Volume} = \pi/4 * (\text{Dia.})^2 * \text{depth}$$

Assuming Diameter of Kund = 4.5 m

$$\text{Than Depth should be} = 75 / \pi/4(4.5)^2$$

Therefore Depth = 4.71 m \approx 4.75 m

Catchment area of Kund should be for 75,000 litre

$$\text{Volume of Water} = \text{Catchment area} * \text{Average Rainfall}$$

Average rainfall of the project area is 300 mm

$$\text{Therefore Catchment area} = 75/0.30$$

Catchment area = 250 Sqm

$$(\text{Dia of Catchment area})^2 = 250 / \pi/4$$

$$(\text{Dia of Catchment area})^2 = 318.47$$

Dia of Catchment area = 17.84 m \approx 18m

Detail Estimate

Name of work:-

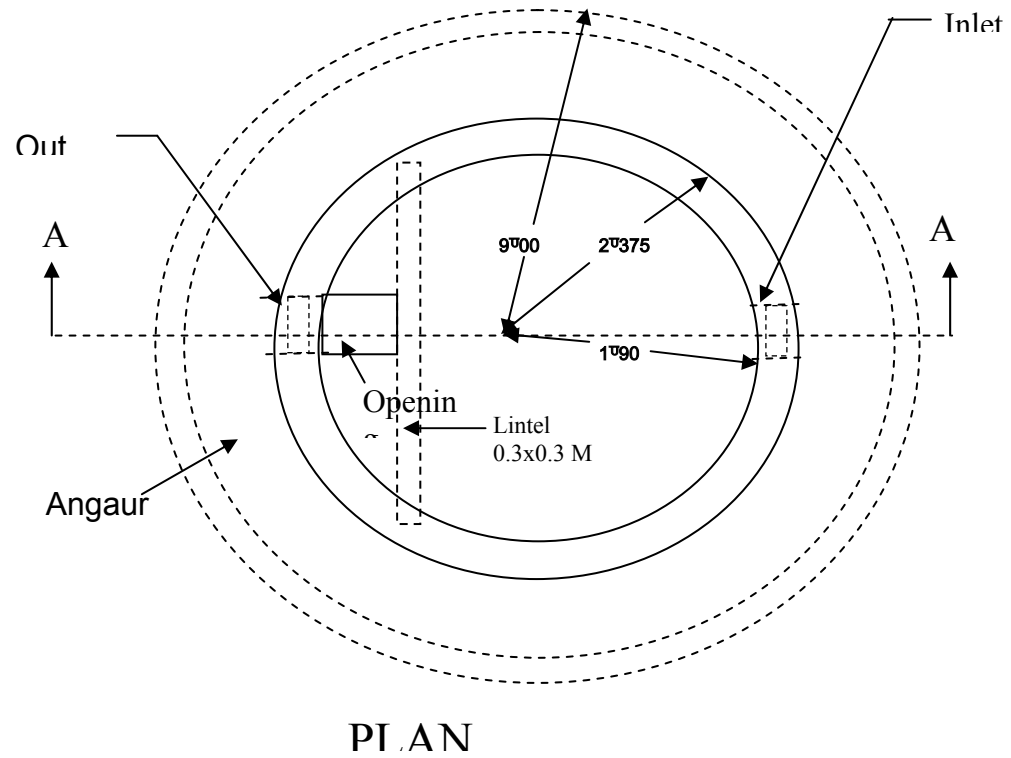
क्र. सं.	विवरण	मात्रा	राशि	श्रम
1	कुण्ड की खुदाई का कार्य			
	खुदाई 0 मी. से 1.5 मी. तक			
	$\pi/4$ (5.50) ² * 1.5	35.637	75 /Cum	Rs. 2673
इ	खुदाई 1.5 मी. से 3.0 मी. तक			
	$\pi/4$ (5.50) ² * 1.5	35.637	86 /Cum	Rs. 3065
ब	खुदाई 3.0 मी. से 4.5 मी. तक			
	$\pi/4$ (5.50) ² * 1.50	35.637	97 /Cum	Rs. 3457
क	खुदाई 4.5 मी. से 6.00 मी. तक	0.000		
	$\pi/4$ (5.50) ² * 0.5	11.879	108 /Cum	Rs. 1283

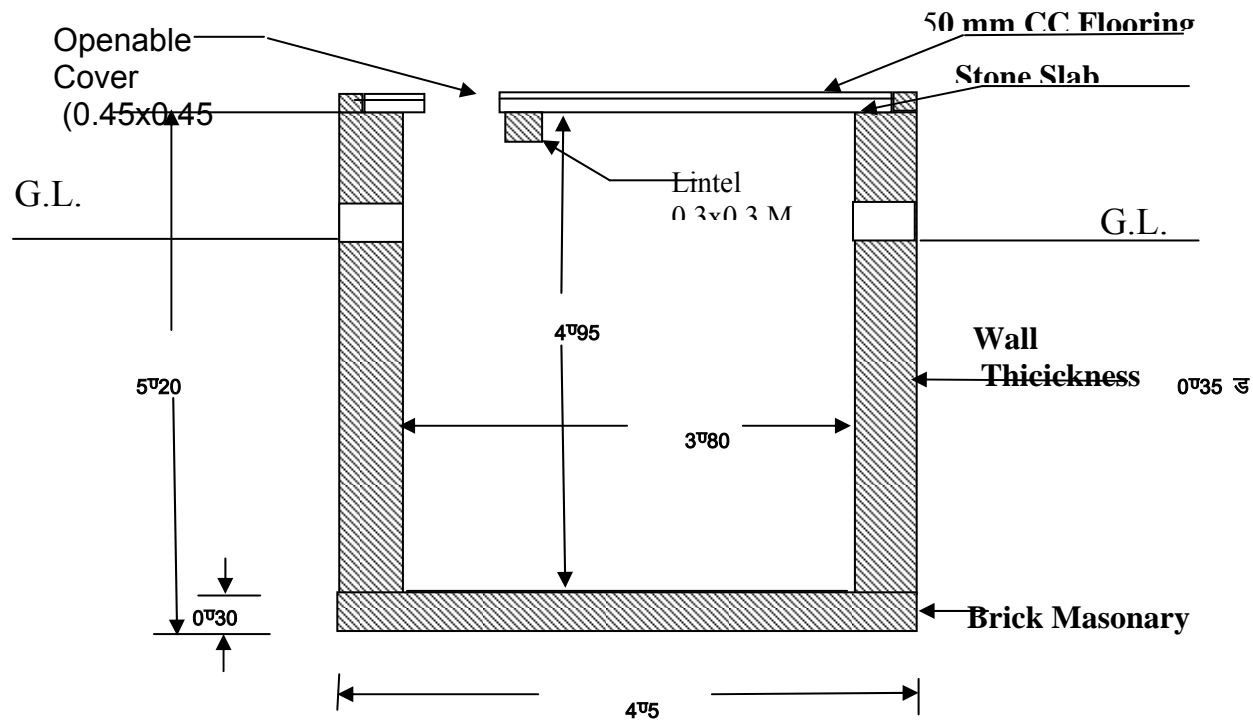
2	पेंदे में सिमेन्ट कंकरीट का कार्य 1:5:10 अनुपात में												
	π/4 (5.50) ² * 0.2	4.752	1617	/Cum	Rs.	7683							
3	ईट की चिनाई का कार्य												
	π/4 (5.20) ² * 4.5) * 5.20	27.731											
	π 18.46 0.35 0.075	1.522											
	π 18.23 0.23 0.45	5.925											
		35.177	2194.0	/Cum	Rs.	77178							12171
4	पेंदे में सिमेन्ट कंकरीट का कार्य 1:3:6 अनुपात में												
	π/4 (4.50) ² * 1	15.904											
		15.904	236	/Sqm	Rs.	3753							
5	चधस बरुब पद तबब बनतपदह बवउचंबजपवद												
	2 * 5.00 * 0.3 * 0.35	1.05	3739	Cum	Rs.	3926							
6	चधसतमपदवितबमउमदज												
	2 1.05 * 100	105.00	47.7	Kg	Rs	5009							
7	चधसतमपदवितबमउमदज बमदजतपदह दकीनजजमतपदह												
	*d2- 2 d1 3.55 0.83	5.89	84	/Sqm		495							
8	कुण्ड पर पट्टी लगाने का पूर्ण कार्य												
	π/4 (5.2) ² * 0.45 * 0.45	21.03	931	/Sqm	Rs.	19583							4754
	पेंदे में सिमेन्ट कंकरीट का कार्य 1:5:10 अनुपात में												
	π/4 (5.2) ² * 0.45 * 0.45	1.59	1617	Cum	Rs.	2574							
9	पट.इन्टो का फर्श मसाला												
	π/4 (18.00) ² * 5.20) * 1	233.11	205	/Sqm	Rs.	47788							15152
10	प्लास्टर का कार्य 1:6 अनुपात में । 20उउ												
	π/4 (4.5) ²	15.90											
	π * 4.5 * 5.20	73.48											
	π * 5.2 * 0.45	7.35											
	π/4 * 5.20 * 5.20	21.23											
		117.95	74	/Sqm	Rs.	8729							
11	P/L Flush /Rulled Pointing	233.11	50	/Sqm	Rs.	11656							9091
	Total					198852							60881
12	Contingency					5966							

योग	Rs.	204818	60881
लागत श्रम मद में	60881	yk[k	
लागत सामग्री मद में	143936	yk[k	
कुल योग	204818	yk[k	
	205000/-		

कार्य का नाम – कुण्ड निर्माण

ड्राईंग कुण्ड निर्माण





SECTION ON 'A-A'

Detail Estimate

Name of Work :- Construction of Pucca Johar 30m Dia.....

Gramme :-.....Gramme

Panchayat.....P. S. Rawatsar

ब्यंबपजल 15९२ स्वे स्पजमत

क.सं.	विशेष विवरण					मात्रा	इकाई	दर		राशि	
		सं.	ल.	चौ.	ऊं/ग.			श्रम	कुल	श्रम	कुल
1	नींव,खाई तथा नाला आदि के लिए 1.5 मीटर गहराई तक मिट्टी की खुदाई करना, तल को कूटना, पानी डालना, बगल को संवारना, खुदी मिट्टी को बाहर निकालना, नींव भरने के बाद खाली स्थानों को पुनः मिट्टी से भरना तथा बची हुई मिट्टी को 50 मीटर की दूरी तक निस्त										
	Ist	π/4	30.94	30.94	1.5	1127.20					
	Ghat	0.5	3.7	15	1.5	41.63					
	"	2	15	0.6	0.15	2.70					
	Stair	0.5	3.7	2.1	1.5	5.83					
	"	2	2.1	0.6	0.15	0.38					
				योग		1177.73	घ.मी.	91.00	91.00	107173.61	107173.61
2do..... 1.5m to 3.00m										
	Ist	π/4	30.94	30.94	0.3	225.44					
	Ist	π/4	20.7	20.7	0.75	252.27					
	IIIst	π/4	10.7	10.7	0.5	44.94					
				योग		522.65	घ.मी.	102.00	102.00	53310.41	53310.41
3do..... 3.0m to 4.50m										
	IIIst	π/4	10.7	10.7	0.25	22.47					
				योग		22.47	घ.मी.	113.00	113.00	2538.96	2538.96
4	सीमेन्ट कांक्रीट नींव या फर्श में 40 मि. मी. नामीय माप की पत्थर गिट्टी, सीमेन्ट – रेत मसाला में 1 सीमेन्ट : 6 रेत : 12 गिट्टी अनुपात में मिलाकर डालना तथा कुटाई करना, तराई समेत।										
	Bottom	π/4	30.94	30.94	0.30	225.44					

	Ghat	2	15.00	0.60	0.30	5.40						
	"	1	15.00	3.10	0.30	13.95						
	Stair	2	2.10	0.60	0.30	0.76						
	Khura	π	31.94	1.00	0.150	15.05						
					योग	245.55	घ.मी.	319.00	2189.00	78329.27	537500.82	
5	छप्प में प्रथम श्रेणी ईटो की सीमेंट बजरी 1:6 के अनुपात मसाले में चिनाई मय बगल की झिरी बन्द करने तथा तराई समेत पूर्ण कार्य ।											
	Ist	π	30.47	0.47	1.50	67.49						
	IInd	π	20.35	0.35	0.75	16.78						
	IIIrd	π	10.35	0.35	0.75	8.54						
	Ghat	1	15.00	0.47	1.50	10.58						
	Stair	1	2.10	0.47	1.50	1.48						
	"	8	2.30	0.36	0.19	1.26						
	Pt.	π	30.35	0.35	0.60	20.02						
					योग	126.14						
	dVksfr;ka											
	Stair	1	3.70	0.47	1.50	2.61						
					;ksx	2.61						
					'ks"k	123.53	घ.मी.	346.00	2194.00	42741.98	271028.61	
6	सीमेंट प्लास्टर दिवार पर 1:6 अनुपात में सीमेंट बजरी मिलाकर जोड़ो को कुरेदना तथा तराई करना । 20 मि.मी. मोटा											
	Bottom	π/4	30.00	30.00		706.50						
	Ist	π	30.00	1.50		141.37						
	IInd	π	20.00	0.75		47.12						
	IIIrd	π	10.00	0.75		23.56						
	Pt.	π	30.35	1.55		147.79						
	Ghat	1	15.00	2.80		42.00						
	"	1	15.00	1.85		27.75						
	Stair	1	2.10	2.75		5.78						
	"	2	2.10	1.85		7.77						
					योग	1149.64	व.मी.	41.00	74.00	47135.31	85073.49	
					कुल योग					331229.53	1056625.9	
7	Add contingency											
												31698.78
8												

योग	331229.5	1088324.7
लागत श्रम मद में		3.31
.....		
लागत सामग्री मद में ...		7.57
.....		
कुल योग		10.88

कनिष्ठ अभियन्ता
पंचायत समिति,भादरा

कार्य का नाम :- ब्वदेजण वटिमहमजंजपअम ठंततपमत वद थ्यमसक ठवनदकतल वित कमबतमेंपदहँपदक म्त्वेपवद ;वित 1 ीमबजंतमद्ध

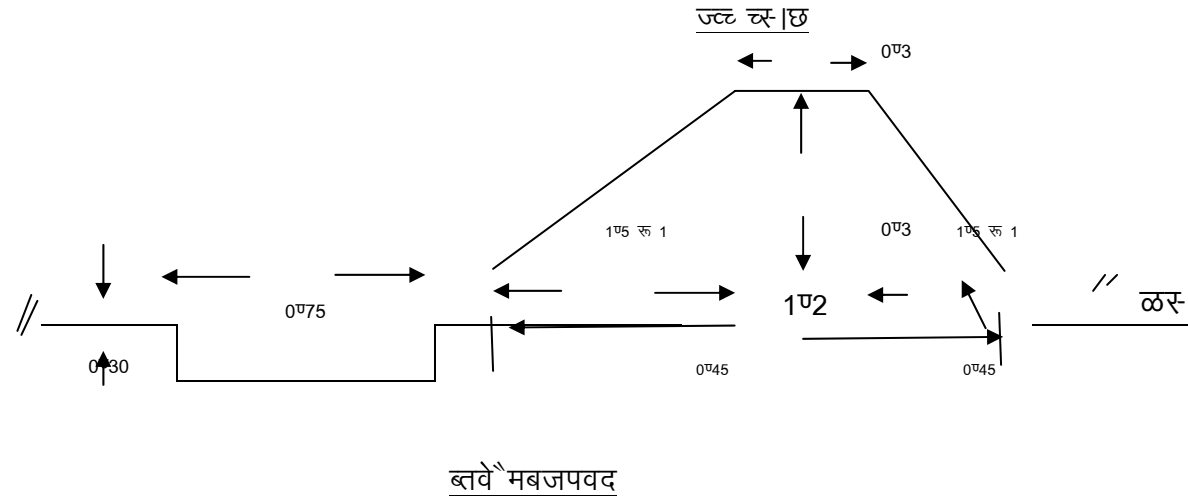
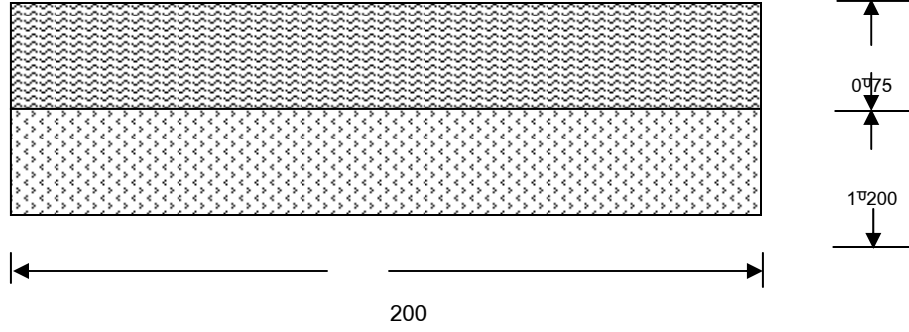
क्र. सं.	विशेष विवरण				मात्रा	इकाई	दर		राशि	
	सं.	ल.	चौ.	ऊं/ग.			श्रम	कुल	श्रम	कुल
1	मिट्टी का कार्य कटाई में, 1.5 मी उठान कर 50 मी. निस्पादन तथा डाग बेल लगाना, होदा में केम्बर, ग्रेड लगाना तथा निस्पादित मिट्टी को समतल तथा दरेसी करना। साधारण मिट्टी में।				45.00	घ.मी.	34.00	34.00	1530.00	1530.00
	1	200	0.75	0.3	45.00					
2	बीज बुवाई बनाये गये रिज पर।;पद 6 तवूद्ध				1200.00	मी.	0.59	0.59	708.00	708.00
	6	200			1200.00					
3	बीज की लागत (बीज 3 ग्राम प्रति मीटर) ;ब्वेज वटिममकँ चमत उंतामज त्जमद्ध				3.60	किलो	0.00	70.00	0.00	252.00
	0.003	1200			3.60					
योग									2238.00	2490.00
Add 3% Contingencies charges										74.70
Grand Total										2564.70
लागत श्रम मद में									0.022	लाख
लागत सामग्री मद में									0.003	लाख
कुल योग									0.026	लाख

कार्य का नाम – मिट्टी के बन्द का निर्माण कार्य

Excavation Cross Section 0.225

Bund Cross Section 0.225

ज्वच पूकजी 0प3

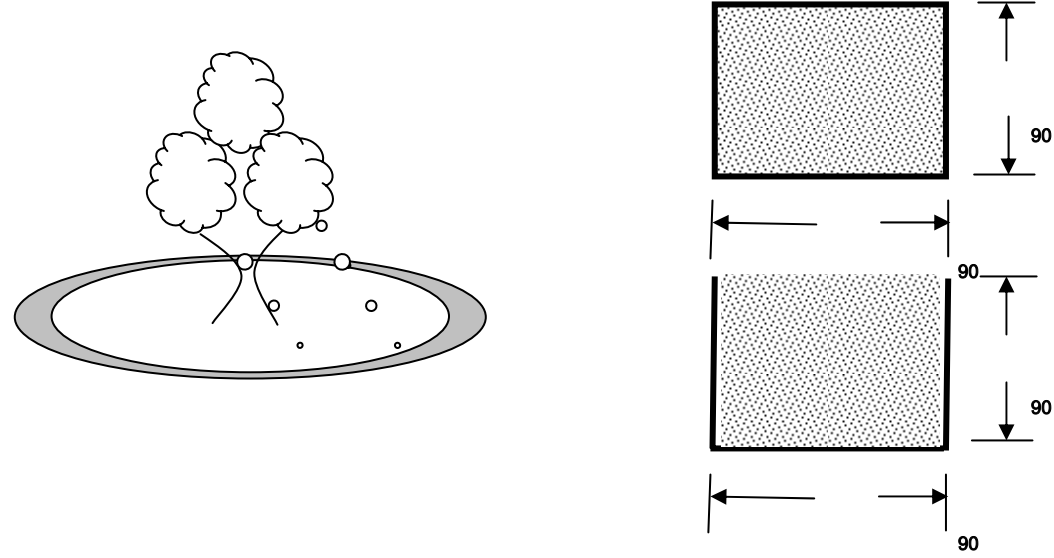


कार्य का नाम :- भवतजपबनसजनतम चसंदजंजपवद व 100 चसंदजण
 कम्प्युटर मेज्ड ज

क्र.	विशेष विवरण	मात्रा	इकाई	दर	राशि
------	-------------	--------	------	----	------

योग		27546.00	30546.00
	Add 3% Contingencies charges		916.38
	Grand Total		31462.38
लागत श्रम मद में		0.275	लाख
लागत सामग्री मद में		0.039	लाख
कुल योग		0.315	लाख
Cost per plant = Rs. 315/-			

कार्य का नाम – फलदार पौधा रोपण कार्य



चक्र

फलदार पौधों के हिसाब से पौध रोपण की दूरी एवं गड्डों का आकार

क्र. सं.	फलदार पौधे का नाम	पौध रोपण की दूरी	गड्डे का आकार	प्रति हेक्टर गड्डों का संख्या
1	पपीता, फालसा	2x2 M	2x2x2 Ft.	2500
2	अंगूर, करौंदा	3x3 M	3x3x3 Ft.	1111
3	अनार, सीताफल	5x5 M	3x3x3 Ft.	400
4	नींबू, संतरा, किन्नो, लसोड़ा	6x6 M	3x3x3 Ft.	227
5	आंवला, बेलपत्र, अमरूद, बेर, शहतूत, अंजीर	6x6 M	3x3x3 Ft.	227
6	खजूर	8x8 M	3x3x3 Ft.	165

DETAILED ESTIMATE

कार्य का नाम :- **Agro-forestry Plantation of 100 plant**

क्र. सं.	विशेष विवरण				मात्रा	इकाई	दर		राशि	
	सं.	ल.	चौ.	ऊं/ग.			श्रम	कुल	श्रम	कुल
1	गड्डे की खुदाई करना मय अलायमेंट व निसानदेही। 45X45X45 Cm Size				9.11	घ.मी.	75.00	75.00	683.44	683.44
	100	0.45	0.45	0.45						
2	थावला बनाना, कम से कम 50 से. मी. अर्द्धव्यास का				100.00	नग	1.50	1.50	150.00	150.00
	100									
3	वानिकी पौधे की कीमत कार्य स्थल तक परिवहन सहित				100.00	नग	0.00	8.00	0.00	800.00
	100									
4	पौधे रोपण करना।				100.00	नग	2.52	2.52	252.00	252.00
	100									
5	पौधों को उपलब्ध पानी पिलाना, 15 ली. प्रति पौधा ; अमृतं 2 जपउम चमत उवदजी वित 9 उवदजीधलमंत वित 3 लमंते त्र 54 जपउमेद्ध				5400.00	नग	1.92	1.92	10368.00	10368.00
	100	54								
6	पौधों निडाई गुडाई करना, 15 से.मी. गहराई तक तथा 45 से. मी. अर्द्धव्यास तक ; 3 जपउम चमत लमंत वित 3 लमंत पजोवनसक इम 9 जपउमेद्ध									

	100	9	योग	900.00					
				900.00	नग	1.05	1.05	940.50	940.50
7	Add for manure, medicin etc.					0.00	10.00	0.00	1000.00
	योग							12393.94	14193.94
				Add 3% Contingencies charges					425.82
				Grand Total					14619.76
	लागत श्रम मद में							0.124	लाख
	लागत सामग्री मद में							0.022	लाख
	कुल योग							0.146	लाख
Cost per plant = Rs. 146									

Table - A Primary Model for A Fodder Bank

A.	Total Dairy farmers	70	
	No. of Cattle to be catered by one fodder bank.	No. of adult animals	No. of calves
		100	50
	Total	150	
	Fodder requirement per day (10kg dry fodder for adult and 4kg for calf)	1000 kg(per Day)+500 kg(per Day)= 1500 Kg	
	Fodder requirement for 180 days.	2700 quintal	
	Fodder come from community land	15 hec *150=2250 quintal	
	Cost of cultivation for fodder production (See table no. B)	72,500 Rs	
	Remaining requirement for 120 days	2700-2250=450 quintal	
	Total Cost		
Avg. procurement rate in harvesting season, Rs.600 per Qt. including transportation	600*450= Rs.2,70,000/-		
Net Cost of Fodder Production (cost of cultivation + Cost of procurement)	3,42,500		
B.	Area development for fodder bank Land required Approx. 3000 m ² (preferably land will be allotted by Gram Panchayat @ Rs.600 per month)	Rs 7200	
C.	Total Cost for Fodder bank (1year) (A+B)	Rs. 3,49,700/-	

Table - B Cost of cultivation for fodder production

Cost Detail	Unit cost
1. Cost for tillage	4.5 hour*15 hec*400 Rs=27000 Rs
2. Cost for seed	12 kg seed *15 hec *100=18000 Rs
3. Cost for fertilizer	10,000 Rs
4. Cost for irrigation	10,000 Rs
5. Depreciation cost of C1. (5%)	7500 Rs
Total cost for 15 hec	Rs. 72,500

Table No. - C Initial investment for fodder bank

A	Total Cost for Fodder bank (1year) (A+B+D)	Rs. 3,49,700/-
B	C1.Fencing + Weighing machine + Small shed + Other tools.	Rs.1,50,000
C	Required labour for fodder bank management (2 person @2000 per month for each)	Rs.48,000
D	Total initial cost	Rs.5,47,700

Table No. - D Revenue and return Details.

S. No	Return Details	Cost (in Rs.)
1	Cost of fodder Per Kg	= 3,49,700/270000 1.30 Rs./Kg
2	Selling Price of Fodder	Rs 2 /Kg
3	Net selling Price	Rs. 5,40,000
4	Net Profit	Rs 1,90,300

Estimate for a vermicompost unit:

- . Requirement of nitrogen for 1 hectare sorghum fodder production=90 kg.
- . 1.6% N available in vermin compost .
- . 90 kg N fulfill by the use of $90/1.6*100= 5625$ kg vermicompost (5.5 ton).
- . Need of vermicompost to fulfill the requirement of nitrogen for 15 hectare $5.5*15 =82.5$ (80 ton).
- . 45 kg phosphorus required for 1 hectare sorghum fodder production.
- . Requirement of phosphorus for 15 hectare fodder production $15*45=675$ kg.
- . Supply of phosphorus through vermin compost $0.7/100*80000=560$ kg.
- . Remaining requirement of phosphorus $675-560=115$ kg.
- . Remaining dose of phosphorus will be supplied by rock phosphate.

One compost cycle need 45 days so we need 8 cycle for 80 ton vermin compost production.

Model for A Vermi-compost Unit

S. No	Particulars	Quantity	Rate (Rs.)	Amount (Rs.)
1	Wooden ballies (3 m long)	20	50	1000
2	Wooden (4 m long)	25	60	1500
3	Shade mats for covering the roof	125	25	3125
4	Binding wire for tying wooden ballies & mats	20 Kg	50	1000
5	5 Labour charges for erection of sheds	20	100	2000
6	Shovels, spades, crowbars, iron baskets,			2500
7	Weighing scale (100 kg capacity)	1	2000	2000
8	Cow dung	10 ton	800	8000
9	Worms @ 3 kg per ton	30 Kg	80	2400
10	Formation of vermin bed with agro-waste, cow dung and worms	20 bed	250	5000
11	Miscellaneous			
	Total cost			28,525
	Cost for 8 cycles			2,28,200

Returns from vermicomposting

Benefits	
1. Sale of vermin compost of 80 tones @ Rs.3500/- per ton	80*3500=2,80,000 Rs
2. Sale of worms @ 5 kg per ton of compost and Rs. 50 per kg	400*50=20,000 Rs
Total	3,00,000 Rs/-
Net benefit	3,00,000-2,28,200=71,800 Rs/-

CHAPTER – V

Activity Wise Total Abstract of Cost

S. No.	Activities	Unit	Total		
			Unit Cost	Phy.	Fin.
1	Admn.	–	–	–	80
2	Monitoring	–	–	–	8
3	Evaluation	–	–	–	8
	(A) Preparatory phase				
1	EPA	No.	–	8	32
2	I & CB	–	–	–	40
3	DPR	–	–	–	8
	Total (A)	–	–	–	80
	(B) Natural resource management				
	Conservation measures for arable land				
1	Vegetative Barrier	Ha.	0.021	2500	52.50
2	Tanka/Farm Pond (20000 litre Capacity)	No.	0.650	220	143
3	Road Top Water Harvesting Structure (2.01 Lakhs litre Capacity)	No.			
4	Road Top Water Harvesting Structure (3.13 Lakhs litre Capacity)	No.			
5	Road Top Water Harvesting Structure (4.53 Lakhs litre Capacity)	No.			
	Conservation measures for non arable land				
1	Tanka (50000 litre Capacity)	No.	1.50	15	22.50
2	Tanka (75000 litre Capacity)	No.	2.05	15	30
3	Tanka (100000 litre Capacity)	No.			
4	Recharge Well (40 m depth)	No.			
5	Recharge Well (50 m depth)	No.			
6	Recharge Well (60 m depth)	No.			
	Production measures for arable land				
1	Horticulture plantation	No.	.003	3115	101.16
2	Agro-Forestry plantation	No.	.001	55000	80.30

3	Crop Demonstration	No.	.001	525	.58
4	Medicinal Plantation	Ha.	.001	50	.06
5	Vegetable Plantation	Ha.	.001	250	.28
	Production measures for non arable land				
1	Afforestation & Pasture Development	Ha.	1.716	20	34.32
	Live Stock development Activities				
1	Distribution of improved Bull & Bull calves for natural service	No.	.50	3	1.50
2	Distribution of improved Bucks & Rams	No.	.100	10	1.0
3	Animal Health Camps	No.	.25	30	7.50
4	Animal Health Care Activities (Vaccination & Deworming)	No.	0	10000	4.50
5	Castration	No.	0	10000	.03
	Total (B)				
	(C) Livelihood activities, Production System and Micro Enterprise				
	Activities				
1	Backyard Poultry	No.	–	–	
2	Composting	No.	–	–	
3	Nursery Raising	No.	–	–	
4	Fodder Bank	No.	–	–	
5	Vermi composting	No.	–	–	
6	Handicraft-wool	No.	–	–	
7	Milk Collection Centre	No.	–	–	
8	Micro Enterprises	No.	–	–	
	Total (C)				
	(D) Consolidation Phase				
	Total (D)				
	Grand Total				

	Total (C)				0.00			0.00			39.96			40.00			40.03			0.00			119.99			
	(D) Consolidatio n Phase		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16.00	-	-	8.00	-	-	24.00
	Total (D)																			16.00			8.00			24.00
	Grand Total				58.80			34.00			151.43			205.28			165.94			27.20			12.40			799.95

47.997

CHAPTER – VI
Annual Action Plan

CHAPTER – VII

Project Outcomes

The watershed development works are implemented based on Agro-climatologically characteristics. However it will differ watershed to watershed but the following criteria and performance standards are spell out to evaluate the success of participatory watershed management.

- The level of understanding among farmers will increase towards the environmental degradation.
- The moisture retention will increase in the fields resulted in enhancement of agriculture production by 15 %
- Watershed farmers will get drinking water through out the year through rain water storage tanks
- Due to harvest of rain water in the storage pucca tankas the cultivation of horticulture plants and the plants which has medicinal value will be protected thereby survival of plants be increased by 40%
- The ground water column will increase to the extent of 1.2-1.5 m.
- Straightening and empowering of local community so as to manage the assets created after completion of the project
- Due to moisture retention in the fields the cultivable area will increase by 10 % and irrigated area by 15 %
- On the completion of project, about 2 % number of wells will increase.
- Farmers of the watershed will come forward for the replacement of seed rate by 15 % in every year
- The fodder production will increase by 10 to 15 %

- The employment opportunities at the village will increase resulted in reduction of migration significantly by 30 % and will generate 22000 to 25000 man days based on last years experiences in the clusters executed so far in every cluster in each year.
- Number of sustainable SHG and UG will be 2 to 4 per cluster
- The project will improve the breed of the livestock and animal health. With the result, more production of the milk, meet and access its marketing with ease. Rearing of animals i.e. rearing of goat and sheep will also improve their livelihood and ultimately human development.
- The village community themselves will be able to prepare farmers led program and to implement the various developmental activities in their villages per their need including the fund management and in assessing the problem more accurately in a participatory and sustainable manner.
- The project will provide the guideline for policy makers and implementing agencies especially in the fields of animal husbandry activities in the district areas and other similar conditions.
- The livestock owner will be able to increase the average yield of milk per day from 2.3 liter/day to 3 to 4 liters per day. The lactation period will be optimized in order to increase the milk production.
- By introduction of crossed breeding the production of meat and wool will increase by 40 to 50% i.e. meat from 2.36 to 3.5 tones and wool by 728 tones to 1300 tones.
- Per capita income of the watershed farmer will increase from Rs. 11113 to Rs. 15000 on completion of the project i.e. 30 to 40 %

CHAPTER – VIII

Year Wise Break Up

Chapter III Proposed Development Plan

S. No.	Activities	Unit	I Year			II Year			III Year			IV Year			V Year			VI Year			VII Year			Total		
			Unit Cost	Phy.	Fin.	Unit Cost	Phy.	Fin.	Unit Cost	Phy.	Fin.	Unit Cost	Phy.	Fin.	Unit Cost	Phy.	Fin.	Unit Cost	Phy.	Fin.	Unit Cost	Phy.	Fin.	Unit Cost	Phy.	Fin.
1	Admn.	–	–	–	12.19	–	–	24.38	–	–	24.38	–	–	24.38	–	–	24.38	–	–	6.10	–	–	6.10	–	–	121.92
2	Monitoring	–	–	–	1.22	–	–	2.44	–	–	2.44	–	–	2.44	–	–	2.44	–	–	0.61	–	–	0.61	–	–	12.19
3	Evaluation	–	–	–	0.00	–	–	3.66	–	–	0.00	–	–	4.27	–	–	0.00	–	–	4.27	–	–	0.00	–	–	12.19
	(A) Preparatory phase																									
1	EPA	No.	–	8	48.77	–	–	0.00	–	–	0.00	–	–	0.00	–	–	0.00	–	–	0.00	–	–	0.00	–	8	48.77
2	I & CB	–	–	–	18.29	–	–	18.29	–	–	6.10	–	–	6.10	–	–	6.10	–	–	6.10	–	–	0.00	–	–	60.96
3	DPR	–	–	–	9.14	–	–	3.05	–	–	0.00	–	–	0.00	–	–	0.00	–	–	0.00	–	–	0.00	–	–	12.19
	Total (A)	–	–	–	76.20	–	–	21.34	–	–	6.10	–	–	6.10	–	–	6.10	–	–	6.10	–	–	0.00	–	–	121.92
	(B) Natural resource management																									
	Conservation measures for arable land																									
1	Vegetative Barrier	Ha.	–	–	–	–	–	–	0.021	1400	29.40	0.021	1400	29.40	0.021	1450	30.45	–	–	–	–	–	–	0.021	4250	89.25
2	Tanka/Farm Pond (20000 litre Capacity)	No.	–	–	–	–	–	–	0.650	166	107.90	0.650	166	107.90	0.650	166	107.90	–	–	–	–	–	–	0.650	498	323.70

5	Vermi composting	No.	-	-	-	-	-	-	-	-	4.06	-	-	4.06	-	-	4.07	-	-	-	-	-	-	-	12.19
6	Handicraft-wool	No.	-	-	-	-	-	-	-	-	4.06	-	-	4.06	-	-	4.07	-	-	-	-	-	-	-	12.19
7	Milk Collection Centre	No.	-	-	-	-	-	-	-	-	8.12	-	-	8.13	-	-	8.13	-	-	-	-	-	-	-	24.38
8	Micro Enterprises	No.	-	-	-	-	-	-	-	-	20.32	-	-	20.32	-	-	20.32	-	-	-	-	-	-	-	60.96
	Total (C)				0.00						60.94			60.95			60.99						0.00		182.88
	(D) Consolidation Phase		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24.38	-	-	12.19	-	36.58
	Total (D)																			24.38			12.19		36.58
	Grand Total				89.61						344.06			348.90			323.68						18.90		1219.20