BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL

EASTERN ZONE BENCH KOLKATA

O.A 82 /2026

IN THE MATTER

VETERANS FORUM FOR TRANSPARENCY IN PUBLIC LIFE

.....APPLICANT

VS

GOVT OF BIHAR & ORS

.....RESPONDENTS

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6/3/2026

Filed by
Veterans Forum for Transparency in Public Life
Through its General Secretary
Wing Commander (Retd) Dr Bishwanath Prasad Singh
B-124, Swarnngri, Greater Noida
Dist- G.B.Nagar (UP) -201315
Mob-9999383602, Email -2bnpsingh@gmail.com

Date-

(1)

Summary, Date and Events

April 2025- Environmental Survey of the catchment area of Tel river, Gamarhia, Bhatkesari and Mangolpur Wetlands was carried out by the applicant organisation,

31.12.2025- Letter regarding current status of Tel river, Gamarhia, Bhatkesari and Mangolpur Wetlands was submitted to Rural Development Department, Govt of Bihar, Bihar State Wetland Authority, District Magistrate Saran was submitted with the request to undertake corrective action.

As on date no action has been initiated by concerned authorities.

Hence the present application is being submitted before the Hon'ble Tribunal

(2)

BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL

EASTERN ZONE BENCH KOLKATA

(APPLICATION UNDER THE NGT ACT 2010 SECTION 14 &15)

OA /2026

IN THE MATTER

VETERANS FORUM FOR TRANSPARENCY IN PUBLIC LIFE

.....APPLICANT

VS

RURAL DEVELOPMENT DEPARTMENT, GOVT OF BIHAR & ORS.

.....RESPONDENTS

MEMO OF PARTIES

Veterans Forum for Transparency in Public Life
B 124, Swarnnagri, Greater Noida
Dist- G.B.Nagar (UP) 201315
Through its General Secretary
Wing Commander (Retd) Dr Bishwanath Prasad Singh
Email- 2bnpsingh@gmail.com Mob 9999383602

.....Applicant

Vs

1. Rural Development Department, Government of Bihar
   Old Secretariat, Patna
   PIN- 800015
   Through Secretary
   Email-cs-bihar@nic.in

2. Department of Water Resources
   Government of Bihar,
   Sichai Bhawan, Patna- 800015, Bihar
   Through Principal Secretary
   Email-wrd-bih@nic.in

3. Bihar State Wetland Authority
   Government of Bihar,
   Saheed Peer Ali Khan Road, Patna- 800014
   Through Member Secretary
   Email-ccwebihar@bihar.gov.in

4. District Magistrate, Saran
   Chapra, Bihar 841301
   Email-dm-saran.bih@nic.in

5. Bihar State Pollution Control Board
   PariveshBhawan, Patliputra Industrial Area
   Patna (Bihar)- 800013
   Through Member Secretary
   Email-msbspcb-bih@gov.in

6. District Forest Officer
   Saran, Chapra, Bihar- 841301
   Email- dfo-saran-bih@nic.in

.....Respondents

Applicant

Veterans Forum for Transparency in Public Life
Through its General Secretary
Wing Commander (Retd) Dr Bishwanath Prasad Singh
B-124, Swarnngri, Greater Noida
Dist- G.B.Nagar (UP) -201315
Mob-9999383602, Email -2bnpsingh@gmail.com

Place:

Date:

(4)

BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL

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.....Respondents

To

Hon'ble Judicial Member & Hon'ble Expert Member of the Hon'ble National Green Tribunal, Eastern Zone Bench, Kolkata.

The humble application on behalf of the Applicant

Most respectfully Sheweth

1. That the applicant is a permanent resident of Chapra, District Saran, Bihar and presently residing at Greater Noida, District- G.B.Nagar (U.P). The applicant is General Secretary of Veterans Forum for Transparency in Public Life, which is a formal and registered organisation of retired Defence Officers. That, the petitioner organisation has been espousing the cause of environmental sanitation and environmental up gradation. To achieve stated mission, petitioner organisation has filed several petitions before the Hon,ble National Green Tribunal (hereinafter Tribunal). Each of the petitions was brought before the Hon,ble Tribunal with due research and field visits.

2. That the present application has been filled with the prayer that Tel river which travels through Jalalpur, Revelgang and Chapra sadar block of Saran district may be made functional and obstruction/ encroachment free.

3. That the Tel river originates from the following Wetlands:

a) Name of Wetland- Bhatkesari
Panchayat- Bhatkesari
Block- Jalalpur
Area- 98.5 hectares

b) Name of Wetland- Gamarhia
Village-Kumna
Panchayat- Kumna
Block-Jalalpur
Area- 326 hectares

c) Name iof village- Mangolapur
Village- Nawada
Panchayat- Nawada
Block-Jalalpur
Area- 317 hectares

During its course of its flow, Tel river crosses villages of Jalalpur, Rvelganj and Chapra Block covering an area of 38350v sqkms and finally it drains into Ghagra (Saryu) river near Enai village. Due to encroachment and obstruction, the very existence of Tel river has been endangered and free flow of water has been obliterated. Due to obstruction of free flow of water in Tel river severe water logging over fertile land has occurred over 40% of fertile land of said Blocks.

4. That the Tel river is one of the tributary of Ghagra (Saryu) river. The two other tributary of Ghagra river are , Daha river which drains at Tajpur Fulwaria, and Sondhi river which joins Ghagra river at inai.

5. That the river Ghagra takes its origin in the foot hills of the Himalaya and running through the eastern district of Uttar Pradesh, flows along the south western boundary of Saran district and joins river Ganges near Revelganj. The usual flooding of south western portion of Saran district is caused by the river Ghagra spilling over its left bank and after crossing Siwan- Chapra railway line and road, passes to the north of Chapra town and again crossing Chapra- Masrakh road and railway line finally drains into Hardiya wetland. Further Hardiya wetland finally falls into river Ganges.

6. That all these tributaries of river Ghagra serves as the drainage channel for the south western region of Saran district, which do not get flooded during normal rain. Thus these tributaries flows from north to south discharging the surplus water into river Ghagra and saving the area from inundation and damages to crop. During the period when river Ghagra is itself in high flood, it cannot take any discharge from these tributaries; rather the flow in that case is reversed from south to north, causing a back flow in these tributaries, which in turn, causes inundation of area lying on the banks of these tributaries. Further these tributaries have been very badly silted up and having restyricted sections at many places due to the growth of weeds, water hyacinth and encroachment do not function well in carrying the river Ghagra over spill.

7. That Foreign, Commonwealth &Development Office (United Kingdom Govt Organisation) had carried out Tel river rejuvenation Detail Project Report (DPR) and pointed out choke points which impedes free flow of water. These choke points are located at village Rushi, Bhatkesari, Gamarhia, Nawada, Kumna, Deoria, Vishnupura, Ramnagar choukhra, Ashoknagar, Majhwalia, Majlishpur, Pirari, Naini, Fakuli, Tekniwas, Jakhua, Mukrera, Methwalia, Bramhpur and Inai. At the aforesaid villages, due to silting and encroachment the existence of Tel river has been has been endangered resulting into massive obstruction in free flow of water.

   Copy of the said DPR is placed at Annexure A I and Photograph of the affected portion of Tel river is placed at Annexure A II (colly).

8. That Wetland acts as "Natural Infrastructure" for water management by regulating the flow, quality and availability of water across landscapes. They are multifunctional ecosystems that perform critical roles in flood mitigation, groundwater recharge and waste water treatment. Key functions of Wetland in water management includes:-

   a) Flow regulation (the natural sponge) - Wetland absorbs excess water during periods of high rainfall or snowmelt and slowly releases it, which lowers flood peaks and reduces downstream erosion,
   b) Groundwater recharge- Wetland allows surface water to infiltrate the soil and replenish underground aquifers, ensuring water is available during dry seasons,
   c) Water purification- Known as the "Kidneys of the landscape", Wetlands filter pollutants through physical settling, chemical transformations and biological uptake by plants and microbes. They can remove up to 905 of sediments and significant amounts of nitrogen and phosphorus from runoff.

9. That Saran district is formed by a wide alluvial plain and is bounded by river Ganges, Gandak and Ghaghara and intersected by numerous water channels which flows in a south-easterly direction and carry off the drainage. They generally run along levels higher than the adjacent land which is therefore liable to inundation whenever they overtop their banks. Beneath these high banks lie the basins in which the surface drainage primarily collects, to be discharged into the rivers in their lower reaches. In the south and south- east of the district there are such depression areas which are locally known as "Chaurs"(Wetland). There is very gradual slope from north-western corner to south-east corner.

10. That as per publication of Indian Space Research Organisation (ISRO), there are 543 Wetland in the Saran district spread over 21170 hectares, which comprises about 8 percent of the geographical area of district. Bhatkesari, Gamarhia and Mangolpur Wetland are connected with each other with Pynes (channel) and during rainy season transfers excess water within themselves.

11. That over the period due to following causes, all the three Wetland has become non functional:-

    a. Unplanned construction in the Wetland area
    b. Pollution and waste disposal
    c. Encroachment and land reclamation
    d. Invasive species
    e. Climate change and hydrological changes

12. That as on date Tel river and described 3 Wetlands are non functional resulting into severe flood like situation and water stagnation severely affecting agriculture and Farm activities. Report of local news paper regarding severe stagnation of rain water in the above said areas are placed at Annexure A III and Annexure A IV.

13. That Respondent No 3 has prepared document of Wetland for notification under Wetland (Conservation and Management) Rules 2017, of which relevant portion pertaining to Gamarhia, Bhatkesari and Mangolpur Wetland is appended below:-

a. Gamarhia Wetland-
   Completely dried up
   Major land use within zone of influence- Agriculture 60%, Settlement 40%
   Natural flood water intake –restricted due to obstruction/diversion
   Natural flood water outlet- restricted due to obstruction/diversion

b. Bhatkesari Wetland-
   Dried up, devoid of water
   Major land use within zone of influence- Agriculture 60%, settlement 40%
   Natural flood water intake- choked due to obstruction/diversion
   Natural flood water outlet- choked due to obstruction/diversion

c. Mangolpur Wetland
   Devoid of water
   Major land use within zone of influence- Agriculture60%, settlement 40%
   Natural flood water intake- choked due to obstruction/diversion
   Natural flood water outlet- choked due to obstruction/diversion

Copy of aforesaid document of Bihar State Wetland Authority (Respondent 3) is placed at Annexure A V.

14. That the applicant submitted a letter to concerned authorities highlighting present condition of Tel river and Gamarhia, Bhatkesari and Mangolpur Wetlands. Copy of said letter is placed at Annexure A VI.
15. That instead of taking suitable remedial action, concerned authorities has created a physical barrier (Dam) in the main stream of Tel river. Photograph of newly created physical barrier is placed at Annexure A VII.

Grounds

1. Because due to large scale man made encroachment obliteration of Tel river which impedes free flow of water, violates Water (Prevention and Control of Pollution) Act 1974
2. Because arbitrary and paper based survey and demarcation of the extent of Bhatkesari, Mangolapur and Gamarhiya Wetland has been carried out by Respondent No 3, which is devoid of ground realties and map and data of Survey of India and Space application Centre Atlas 2021 has not been taken into the consideration.
3. Because Respondent No 3 has failed to indentify area of influence of said Wetlands.
4. Because there is large scale violation of Wetland (Conservation and Management) Rules 2017 over the area of Gamrahia, Mangolpur And Bhatkesari Wetlands.

(12)

Limitation

There is no limitation applicable to present application as the cause of action is still persisting and continuing.

Prayer

Interim Prayer

Hon'ble Tribunal may be pleased to pass the following order

1. Constitute a committee consisting of Respondent No 2,3 and Respondent No 4 to identify course of Tel river as per revenue records and identify obstruction/ encroachment thereupon..

Prayer

1. Hon'ble Tribunal may be pleased to direct/ order Respondent No 4 & Respondent No 6 to take appropriate steps towards rehabilitation/restoration of Tel river, remove encroachment thereupon and plantation of trees over the embankment of Tel river.
2. Tribunal may be pleased to pass any order/orders relevant and appropriate to present application.

And your applicant as in duty-bound shall ever pray.

Applicant

Veterans Forum for Transparency in Public Life
Through its General Secretary
Wing Commander (Retd) Dr Bishwanath Prasad Singh
B-124, Swarnngri, Greater Noida
Dist- G.B.Nagar (UP) -201315
Mob-9999383602, Email -2bnpsingh@gmail.com

Place: Gr. Noida

Date: 6/3/2026

(13)

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.....RESPONDENTS

Affidavit

I, Wing Commander (Retd) Dr Bishwanath Prasad Singh, age 76 years, S/O Late R. N. Singh, R/o B 124, Swarnnagri, Greater Noida, Dist –G.B. Nagar (UP) do hereby solemnly affirm and state as follow:-

a) That, I am the Applicant in the accompanying application and competent to sear the Affidavit.

b) That I further state that contents of the accompanying application has been drafted by me and same are true and correct to best of my knowledge and records relied upon are true and same may be traded as part and parcel of this Application.

Deponent

Verification

Verified at Chapra on this 18th day of February 2026, that the contents of the above Affidavit are true and correct to best of ny knowledge derived from records maintained by Applicant during its ordinary course and nothing has been concealed there from.

Deponent

Detail Project Report

On

Tel River Rejuvenation

Saran District Bihar

Infrastructure for Climate Resilient Growth in India (ICRG) EP

Foreign, Commonwealth & Development Office

Bihar Rural Department

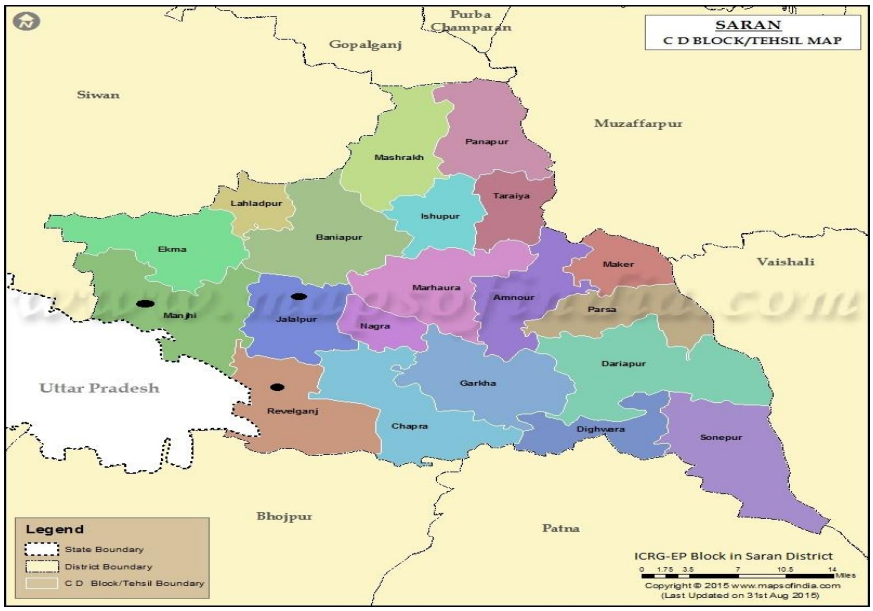
Patna Bihar

Contains

Chapter - 1

Background and Introduction

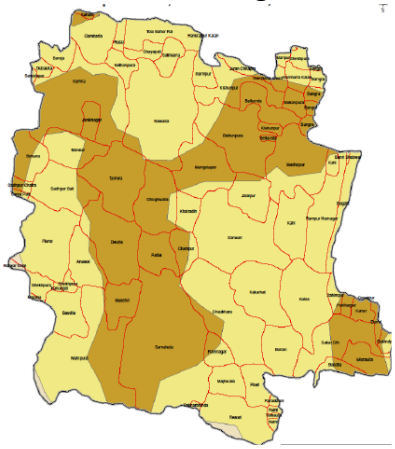
Saran district is located in Bihar which is about 70 km from Patna (Latitude 25º36' to 26º13', Longitude 84º24' to 85º 16'). The total geographical area of district is 2461 sq.kms. Saran district has 20 blocks and 323 Gram Panchayats and in all 1764 villages contains. The total population of district is 3951862 of which 2022821 are male and 1929041 are female.In the district total no of household is 580310 of which 73435 (12.65%) are Schedule Caste (SC), 5702(0.98%) are Sechedule Tribe (ST), and remaining 501173 HHs (86.37%) are from Other Backward Caste (OBC) and General. Total area of the district is 245000 Ha of which cultivable barren land is 144300 Ha and non-agriculture land is 98700 Ha. No forest is present in the district. For ICRG- EP project three blocks in Saran district name is Jalalpur, Manjhi and Revelganj are selected. In the district out of twenty blocks, six blocks (Sonepur, Dighwara, Revelganj, chapra, Manjhi andDariyapur) regularly under flood. Six others (Parsa, Marhoura, Amnaur, Jalalpur, and Ekma)are partially affected by floods. Soil type of the district is mostly alluvial. Due to lack of other economic activities, water plays an important role in livelihoods livestock and productivity.



Brief description of Block

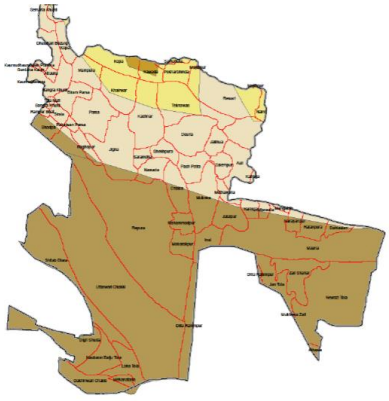
Jalalpur block of Saran District has 124 sq. km.total area. The Head quarter is Jalalpur Block is Jalalpur. Out of total area, net sown area is 9282 ha and area under wasteland is 91 Ha. There is no forest in the block.

Jalalpur Block consists of 65 Village in 15 GP. The Total population is 174156 living in 28118 houses of which 88656 are male and 85498 are female. Sex ratio of Jalalpur block is 964. The total literacy rate of Jalalpur block is 68.59%. In the block majorly young alluvial soil (sub type of Entisols) is found which is generally deficient of nitrogen and phosphoric acid but not of lime and potash. The general texture of the soil in the area is sandy to loamy sand. High soil moisture and regular flooding are causes water-logging condition in the area. These areas are most fertile soils and eminently suitable forextensive cultivation of Paddy and Sugarcane.



ManjhiBlock of Saran District has total geographical area is 14078 which is net sown area is 16495 ha, forest area is 0 & Area under wasteland is 152 Ha. Manjhi Head quarter is Manjhi Block. Maithili is the local language here. Block consists of 110 Village in 25 GP. The Total population is 268073 living in 42128 houses. For the total population of the block 136520 are males and 131553 are female.Sex ratio of Manjhi block is 964. The total literacy rate of Manjhi block is 70.54%. The male literacy rate is 81.98% and the female literacy rate is 58.76%. The block is situated along the rivers and is prone to floods.

Revelganj is a block in saran District of Bihar state. Revelganj is situated in 25º42'21.959'', 84º35'58.87'' to 25º51'25.012'', 84º45'19.357''. The total geographical area is 11104 which is net sown area is 8624 ha, forest area is 0 & Area under wasteland is 55 Ha. Revelganj Head quarter is Revelganj Block. Maithili is the local language here. Block consists of 41Village in 09 GP. The Total population is 119660 living in 18476 houses. The Population of male is 61889 and females are 57771. Sex ratio of Revelganj block is 933. The main crops of all these Block is Wheat, Rice, Oilseed, Vegetables and sugarcane.



Climate Condition

In summer the climate of the district is hot and but winter months are quite cool. Winter comes towards the middle of October after the monsoon season. The temperature begins falling and January is the coldest month of the year with mercury falling to about 7ºC. The blowing of westerly wind accompanied by dust storms about the middle of March marks the beginning of hot weather. The mercury starts shooting upward and May is the hottest month of the year when the maximum temperature goes up to 45ºC. The summer continues till the end of June when the onset of rains brings the much awaited relief and the temperature falls, though the humidity is still high the rise in humidity often makes the heat only more oppressive during the rainy season which lasts till the end of September. From November to February the district has a pleasant climate.

Table: Selected Block wise details of temperature in Saran District

Block	Summer Season		Winter Season		Rainy Season	
	Min	Max	Min	Max	Min	Max
Jalalpur	20.15	35.05	3.81	27.55	23.67	33.17
Manjhi	20.15	35.05	3.81	27.55	23.67	33.17
Revelganj	20.15	35.05	3.81	27.55	23.67	33.17

Source: District Statistical Office, Saran and Dynamic ground water resources of Bihar

The average annual rainfall in the district is 1075 mm. This is just sufficient for the type of agriculture practiced traditionally in this district. Due to changing climate situation, the district faces erratic monsoon behavior. More than 80% of the total precipitation occurs during Monsoon season (June-September). Block wise rainfall details are being presented in Table

Table: Selected Block wise rainfall in Saran District

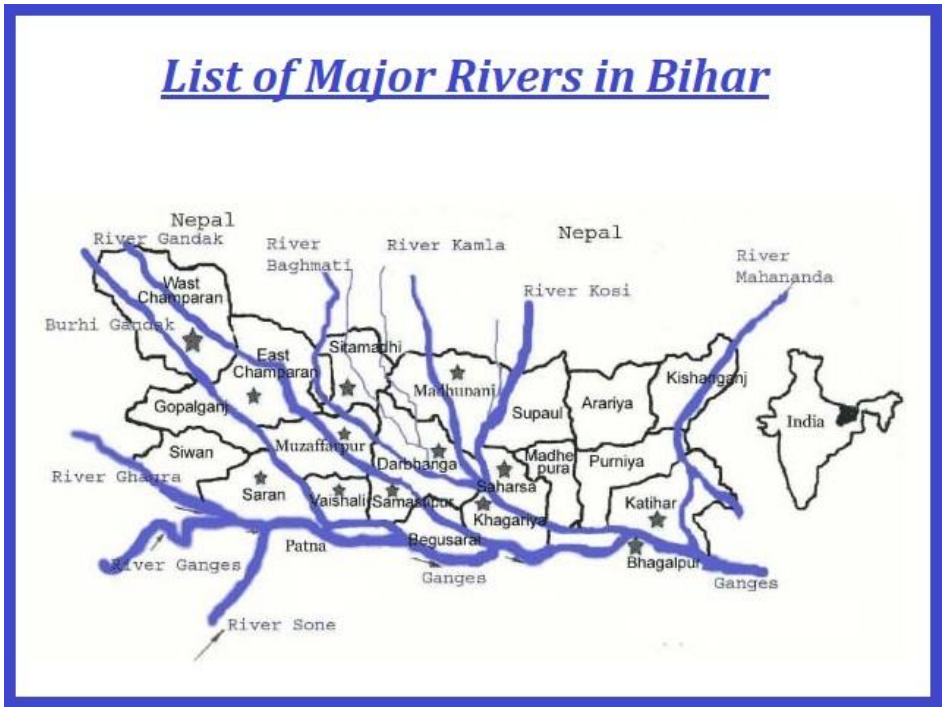
Block	**Normal Annual Rainfall (mm)**	**Average Monthly Rainfall (mm)**	**No. Of rainy days (No.)**	**Maximum Rainfall Intensity (mm)**		
				Up to 15 min	**Beyond 15 but up to 30 min**	**Beyond 30 but up to 60 min**
Jalalpur	1078.40	41.82	33.00	13.40	24.00	50.40
Manjhi	1078.4	41.82	37.00	13.00	24.00	4.00
Revelganj	1078.4	41.82	38.00	13.00	24.00	52.00

Source: District Statistical Office, Saran and Dynamic ground water resources of Bihar

Out of twenty blocks in the districts, six blocks vizSonepur, Dighwara, **Revelganj**, Chapra, **Manjhi** and Dariyapur are affected by floods regularly. There are six partially flood affected blocks Viz. Garkha, Parsa, Marhoura, Amnaur, **Jalalpur**, and Ekma. Tel River flow roughly inthese area in south-east direction.

Origin of the problems of the river

This district is a part of the Lower Ganga Basin and falls in Gandak sub-basin. Perennial rivers viz., the Ganga, the Ghagra and the Gandak, govern the drainage system in the area. The river Ganga starts from Kotwapatti Rampur in west and flow along South-east with in the district. The Gandak flows from along northwest to southeast boundary with in the district. The river Gandak meets the river Ganga at Sonepur in Saran Distict.



Flooding, surface water logging, soil salinity and Geogenic contamination of ground water of shallow aquifer with arsenic is major ground water related issues in the district. Flood in the monsoon period is a major problem with agriculture. Out of the 20 blocks six blocks viz., Sonepur, Dighwara, Revelganj, chapra, Manjhi and Dariyarpur are regularly affected by flood, and other six blocks viz., Garkha, Parsa, Marhaura, Amanpur, Jalalpur and Ekma are partially affected by the flood. The remaining 8 blocks are free from the flood and available for cultivation in monsoon period.

The surface water logging and soil salinity are the problems in parts of Mashrakh, Parsa and Ekma blocks of the district are other water related issues. Geogenic contamination of ground water of shallow aquifer with arsenic in a few villages of Sonepur, Dighwara, Chaprasadar and Revelganj came out as a major ground water related issues in the area.

Public Health Engineering Department (PHED), Government of Bihar has identified of Arsenic affected areas and issue warnings in hand pump with Red colour paint and safe hand pump with blue colour in the affected blocks in the district. The arsenic contaminated water in general, restricted with in the shallow aquifer (50 m).

The district is shaped like a triangle with its apex at the junction of the boundary of Gopalganj district and the Gandak River.
Major problems identified for the Tel River.

- Interception of the flow channel/ changed from straight to oblique
- Sedimentation (tonnes/ year)
- Reduction of the cross-sectional area
- Declining slope of the long profile
- Widening of the river and increasing length
- Increase in flood frequency and magnitude
- Crop production looses and
- Develop uncultivated Chaur land

Objectives and activities

In terms of bio-physical indicators, the areas of high vulnerability are high drought, forest cover, ground water availability and net irrigated area. In terms of socio-economic indicators, the block has a high illiteracy rate and large percentage of households with monthly incomes <Rs. 5000 and a high percentage of landless households deriving income from manual labour.
Given this combination of current vulnerabilities and exposure to long term climate change, the following MGNREGA works have the greatest potential to reduce vulnerabilities and enhance climate resilience of the communities:

- To address enhance crop area and net irrigated area: Construction of intermediate drains, drainage of water logged areas, contour bunds, diversion channel, farm ponds, deepening and repair of flood channels etc.
- To address low groundwater availability: recharge pits, contour bunds, artificial recharge of well through sand filter, staggered trench, box trench, diversion drain, chaur renovation etc.
- To address low forest cover: grassland development and silvipasture, eco restoration of forest, forest protection, road/canal side plantation, afforestation, plantation in government premises, plantation, bi drainage, diversion weir etc.

River Rejuvenation Components		Objectives
Core Structure	**River Rejuvenation**	1. To harvest rainfall precipitation through peak surface runoff for storage of water.
Complementary Structures (INRM approach)	**Embankment/Check dam/Culvert/Inlet/outlet construction and connect with pynes**	1. In order to arrest optimum surface runoff of peak rainy season (JJAS) and to utilize Tel river up to their optimum storage capacity 2. Waterway for safe discharge of surface runoff to irrigate the cropland for double cropping. 3. Smooth passes of surface runoff in time of flood situation.
strengthening Activities	**Fruit/Timber plantations**	1**.** Calculate the carbon sequestration by applying empirical formulae for climate resilient. 2. Increase alternate solution of Livelihood to farming communities. 3. Increase vegetative coverage by plantation on Ahar bunds (3 units of plantation) 4.Drought resistance seed varieties promoted on the farmers' fields through convergence of line department
Convergences Activities	**Sluice Gate/Linkage Channel/De siltation**	1. Some point need to WRD and Minor irrigation department work. 2. Part of de siltation and linkage channel need to irrigation department

Description of Tel River

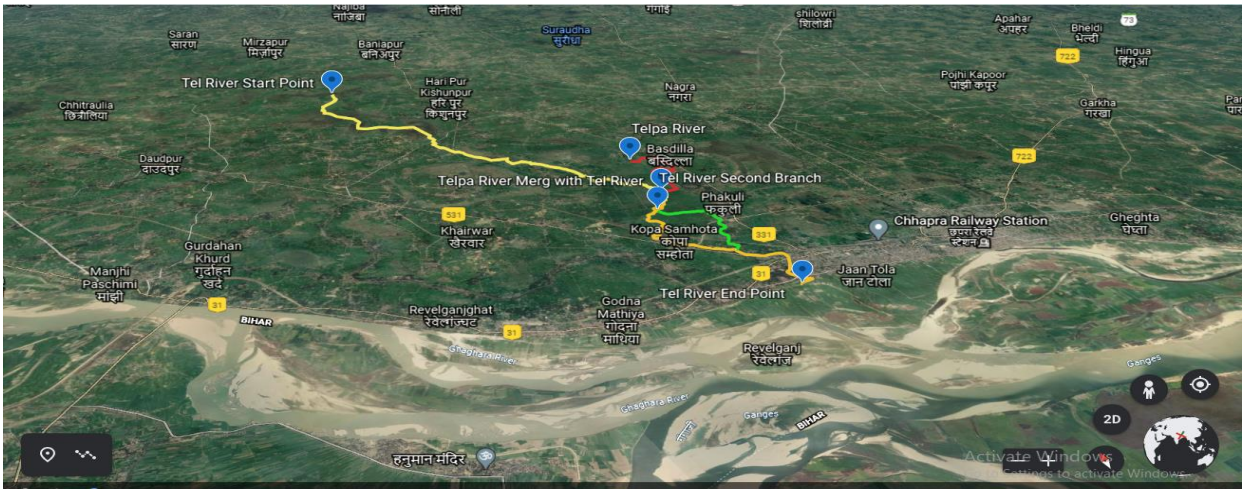
Chapter - 2

The starting GPS location of Tel River is 25.943507 N, 84.652855 E and End GPS location is 25.794648 N, 84.695445 E. Tel river crosses through 2 Blocks (Jalalpur and Revelganj) and covers about 12 Gram panchayat i.e. (Bhatkeshari, Kumana, Sakadi, Nawada, Deoriya, Ashok Nagar Choukhara, Rampoor, Noornagar, Rewari, Samhauta, Tekniwas and Mukrera). The Tel river cover the beneficiaries around 38350 hh, out of which SC are -8400hhs,ST are 1184hhs, OBC are 19129hhs, Gen are 8995hhs and women headed family around 332 house holds.

Preparation of Detailed Project Report (DPR) for these rivers for rejuvenation has started from the month of November 2020 with the aim to provide long-term and durable solutions for water scarcity for irrigation as well as other house hold purposes. Also this activity aims at rejuvenating the drainage of the area to prevent the community from flash flooding. Successful completion of the activity will benefit around 160282 beneficiaries residing in command area. As agriculture is the main source livelihood in the area, this work will help then securing and strengthen their livelihoods and majority of beneficiaries will be benefited.

In the community survey of the area, we found that The Tel River originate from the overflow water of Gandak River and Rainfall-runoff catchment area and join the Sarju River. The Rivercovered around average 30 Km in selected two blocksin the district. And the main problem of defunct River is water logging due to inadequate drainage of water after the rainy season, due to the Kharif crop does not occur and sometimes even rabi crop does not occur.

Tel River Synoptic view



Tel River crossed 2 Blocks (Jalalpur and Revelganj) and GP is Bhatkeshari, Kumana, Sakadi, Nawada, Deoriya, Ashoknagar choukhara, Rampoor noornagar, Rewari, Samhauta, Tekniwas, Mukrera and Bramhpursadarpanchayats. Tel River starts from village Bhatkeskri with two branches and joins them after about 800 m.

Some important reasons to take up the activity are:

- Tel River is through Lower Ganga Basin Flooding, surface water logging, soil salinity and Geogenic contamination of ground water of shallow aquifer with arsenic is major ground water related issues around the area of the river in the district
- Due to flooding soil erosion and nutrient loss happens in periodic basis and which results in poor productivity of land.
- This activity will lead to develop uncultivated Chaur land in area which will benefit to the farmers
- Silt Sedimentation (tonnes/ year) due to surface flow of area
- Due to some interaption in the natural flow of the rive it cause flash food flooding which results to huge loses to the farmers.
- High vulnerability is high Flood, forest cover, ground water availability and net irrigated area

Details Activities Plan

Total pkan of activity to rejuvinite Tel Rever can broad divide in three major head:

A. MGNREGA structure link with river repair and maintainence
B. De siltation of river and construction of embankment
C. Permanent structure in river and plantation

S.No	Distance of river in meter	Proposed Structure	Types of structure	Amount (Rs)
1	0	Chanel Deeping 600m	Water Harvesting Plantation	**1509880** **283817.04**
2	310	Pyne Desiltation	Adjoin Pyne 500 m De siltation Plantation	**96511.0003** **283817.04**
3	310 +290 = 500	De siltation of river Pond de siltation Plantation	250 m deeping 100x90x10 pond de siltation	**597229**
4	500 + 200 = 700	Plantation both side	200 RM plantation	-
5	700 + 100 = 800	Culvert	3 Hume pipe structure 11 x 1.5 m	**890125.19**
6	800 +500 = 1300	Connected pyne de siltation	500 m pyne de siltation	**276787.716** **561461.04**
7	1300 +230 = 1530	Connected pyne de siltation	Cleaning of channel (L=300, Tw=3, Bw=1, D=0.6), deep silted and kansa and plantation both bank side	**21921.5092** **561461.04**
8	1530 + 60 =1590	Culvert	New puliya nirman with 3 hume pipe (Dia=4 feet)	**890125.19**
9	1590 +500 = 2090	Embankment, Excavation & plantation (one unit)	River is deep silted (Tw=4.5, depth=1)	**93623** **283817.04**

S.No	Distance of river in meter	Proposed Structure	Types of structure	Cost (RS)
10.a	2090 +300 = 2390	Fully silted no shape only plain land called kumna 11awada chaur	Two injection well in chaur area or injection tubewell	**355642 250540**
10b		Injection Well recharge		**355642**
10c		Cutting of Trench In River 700m Plantation (one unit)		**1489149 283817.04**
11a	2390+1700 =4090	Culvert (Puliya Nirman)		**890125.19**
11b		Pyne/River trench cutting Near ganga kanauli ghat, jalalpur to kumna road bridge,Tw=30, Depth= 1.2		**75779.178**
12	4090 + 3500 =7590	Connected pyne de siltation	Cleaning of Pyne & plantation (Length 385, Tw=5, Depth=1m), New river way (Tw= 15m, Depth=1.2m, length=3000 m) Four puliya with 4 hume pipe (Dia=4 feet) and plantation both bank side and four injection well or injectionn tubewell in chaur area	-
13	7590 + 150 =7740	Deeping of canal Tw=20, depth= 2 and Plantation both side	Cleaning (length=350m, Tw=20m, depth=2 m) and a pyne (length 100m, Tw= 6m, Bw=3m, Depth=1m)	**645228 283817.04**
14	7740+100 =7840	Pyne connected (L=100, Tw=6, Bw=3, Depth=1		-
15	7840+250=8090	Near Puliya on basdiha to jalalpur road		-
16a			Dyke Construction over the River Bed	**22180**
16b	8090+10=9000	Pyne connected de siltation (600m) and plantation two unit	Cleaning & excavation (L=600, Tw=7, Depth=1.3) and inlet outlet structure	**655368.819 561461.04**
17	9000+700=9700	Deeping of river Tw=16, depth=1.2 and Two Unit Plantation	Embankment of river, Excavation (Length 500 m, Tw= 16m, depth=1.2m	**547202.789 561461.04**
18	9700+50=9750	Pyne connected de siltation	Pyne (L=430, Tw=6, Bw=2.5, D=1.2) Cleaning, excavation & Plantation	-
19	9750+100=9850	Community Pond de siltation	Pond cleaning (45*20*3), already connected with Pyne no 18	**215510**
20	9850+70=9920	De siltation of Ponds	2 Pond connected (25*25*3)(30*30*3)	-

S.No	Distance of river in meter	Proposed Structure	Types of structure	Remarks
21	9920+120=10040	Hume Pipe Culvert Construction	Embankment of river, Excavation (Length 1800 m, Tw= 17m, deptjh=1.4m and both bank side plantation four injection well in chaur area and pond cleaning and bank side plantation& Hume pipe culvert.	**890125.19**
22	10040+450=10490	Ex status of River Tw=17 to 25, Depth=1.4		
23	10490+600=11090	Ex status of River Tw=17to25, Depth=1.4 Deepening of River 600m		**817617.863 561461.04**
24	11090+1000=12090	Pond connected (65*80*4) side recharge unit proposed		**355642** **250540**
25	12090+750=12840	Pond connected (100*50*2.3)		-
26	12840+400=13240	Deeping Tw=18, D=1.2	Embankment of river, Excavation (Length 5500 m, Tw= 18m, deptjh=1.4m) and both bank side plantation four injection well in chaur areaand a Puliya with 3 hume pipe (Dia=4 feet) , 2 chek dam structure in both river Tel and telpa connected point (6 meter creast length), Ex river (Tw=12 m, Depth=1.5m)	-
27	13240+900=14140	Puliya on Piradi ramnagar road (Tw=20, Depth=1.5) and recharge unit proposed		**355642 250540**
28	14140+900=15040	Hume Culvert		**890125.19**
29	15040+620=15660	Only check Dam Proposed		**1253838**
30	15660+2500=18160	Connected point with Telpa riverCheck dam Proposed		**1165979**
31	18160+600=18760	Deeping Tw=12, Depth=1.2	Embankment of river, Excavation (Length 1000 m, Tw= 12m, deptjh=1.5m) and both embankment side plantation	-
32	18760+400=19160	Deeping Tw=11, Depth=1.5		-
33	19160+300=19460	Pyne connected (L=1000, Tw=5, Bw=2, depth=1)	Pyne cleaning (L=1000, Tw=5, Bw=3, Depth=1) and plantation both side embankment	**114539 283817.04**
34	19460+350=19810	Deeping Near pond (60*12*2.5)	Embankment and Plantation	
35	19810+180=19990	Chek dam (Creast length 12m)	Tw=50, Depth=2	**1354512**
36	19990+100=20090	connected Pond (50*50*2.3	Embankment and Plantation	-
37	20090+150=20240	Tel river branch (L=4000, Tw=6m, Bw=3, d=2.8) and three pond (50*40*1.5)(50*12*1.5)(50*25*1.5)	Second branch excavation (Length=4000m, Tw=6m to 20 m in start to end, Bw=3 m to 15 m, and depth 2.8m) and inlet outlet with 2 hume pipe (4 feet)	-

S.No	Distance of river in meter	Proposed Structure	Types of structure	Remarks
38	20240+180=20420	Plantation 2 unit both side embankment	Tw=50, Depth=4.5	-
39	20420+230=20650	Deepening of Pyne	Channel cleaning and plantation (L=1100, Tw= 8, Bw= 4, d=1)	**321857 283817.04**
40	20650+300=20950	Sulic gate on pyne	Channel cleaning and plantation (L=1100, Tw= 8, Bw= 4, d=2)	-
41	20950+360=21310	Sulic gate on pyne	channel cleaning (L=1100, Tw= 8, Bw= 4, d=2.3)	-
42	21310+750=22060	Channel cleaning	Near railway crossing (Tw=40, depth 2)	-
43	22060+250=22310	Connected pyne	channel cleaning (L= 560, Tw=12, Bw=8, depth=3m)	-
44	22060+300=22610	Culvert Repair	Near salimpur puliya, Tw= 30 to 40, depth=10	-
45	22610+280=22890	Tw=30, Depth=6.5	Cleaning way of river (length=4000m, tw=30 m, depth= 10 m	-
46	22890+600=23490	Near highway to tekniwas bridge (Tw= 40, depth=10)		-
47	23490+560=24050	Near arjun setu (Tw=30, depth=10) & near 3 pond		-
48	24050+730=24780	near Karinga brij , Tw= 30, depth=10		-
49	24780+1500=26280	Bramhpur brij, Tw= 25, depth=10		-
50	26280+1300=27580	Tw=20, Depth=7		-
51	27580+400= 27980	Tw=30, Depth=1		-
			Total Amount (Rs).	**2,26,93,551.304**

(Two Crore Twenty Six Lakh ninty three thousand five hundred fifty one only)

Chapter - 3

Proposed Estimate &Tech.Design of Structures:

The ICRG has three-pronged approach to rejuvenate the rivers:

1. **Sustainable Flow**: Maintain the river flow in sustainable manner by creating infrastructures and afforestation in the upper ridge and distributaries to solve the immediate needs of giving people access to safe water and also create systems that ensure reliable supplies in the future.
2. **Comprehensive**: Provide local solutions in scientific manners that impersonate the natural systems of restoring water.
3. **Community led and Community-driven**: Empower the local communities through capacity building frameworks for creating climate resilient Infrastructures and enhancing the production by climate smart agriculture practices.
   Generally the three type infrastructures may be recommended during the planning of river riparian processes.

1. Desalting river bed and water bodies aside of river bank.
2. Afforest ration on the river bank (line and block plantation)
3. Change in cropping pattern in the command area of rivers.

Cost Estimation & Budget Plan of River Revival

Design &Cost estimation No-1

Location of Required Structure:	GPS Location in decimal	
	25.948293N, 84.653705E	
Design of deepening River Work-	Length of Trench M	600
Climate Resilient Work	Unit	Water Conveyance structure
Name of River		**Tel River**
Type of work	Deepening of existing nalla structure	
Shape of the Pyne	Trapezoidal	
Catchment (Ha)	Ha	NA
Fetch length (Max length of Travel)	M	1200
Slope of the Area		0-1%
Type of Soil		loam/black
Existing Depth (d) of Pyne		0.20
Existing Top Width (TW) of Pyne	M	15.00
Exiting Bottom Width (BW) of Pyne	M	7.00
Proposed Depth of Pyne (including 0.15 m free board)		2.00
Total depth of channel (existing + proposed)	M	2.20
Proposed TW of River	M	20.00
Proposed BW of River	M	10.00
Proposed cross-sectional Area of River (a= 1/2 (TW +BW)x Depth)	Sqm	33.00
Catchment Area of the River	Ha	500
Fetch length (Max length of Travel)	M	1200
Elevation difference from remote point to outlet of discharge		2
Command Area of the Pyne (ha)	Ha	230
Wetted Perimeter (p) ($p = Bw + 2(\sqrt{d^2 + (1.5\,d)^2}) = Bw + 3.604d$)		17.93
Hydraulic Radius R = a/p		1.84
S (Slope) = H/L		0.00
K = L/√S,		29393.88
Time of Concentration (Tc = 0.0195K0.77) where K = L/√S, and S(slope) = H/L, L = Maximum length of travel = 1400 m, and H = difference in elevation between most remote point and outlet point = 8m (minimum)		53.78
Per day maximum rainfall (as per Climate modelling report)		235
Rain fall intensity (I) , as per climate variability report (one day max rain fall 150 MM/day)	mm/hr	262.20
Coefficient of runoff © as per differnet catchment terrain May vary from 0.3 to 0.5		0.5
Manning's coefficient (n) may varies as per soil type of location		0.02

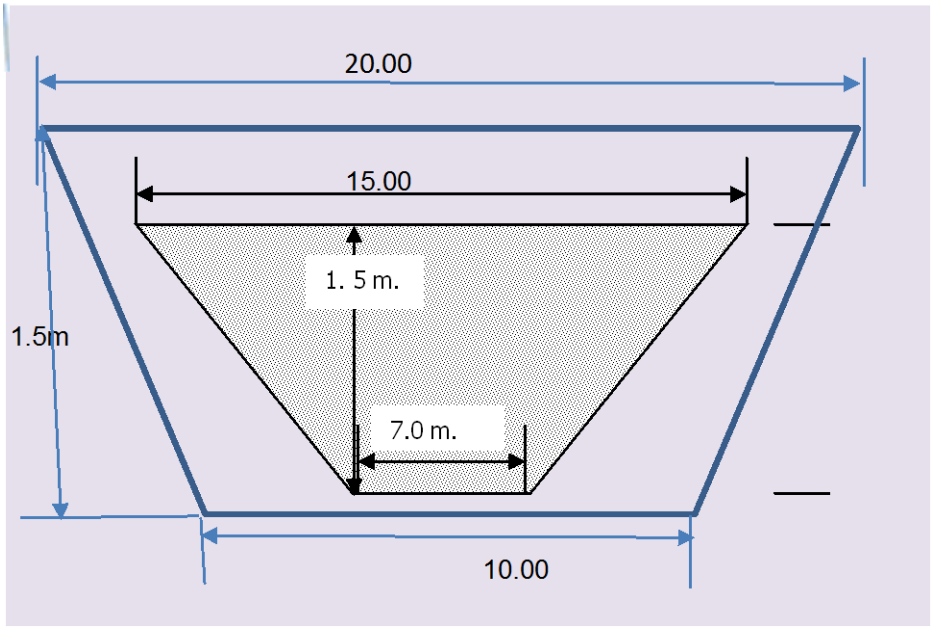
Discharge from drainage area (Q = CIA) Where C = Runoff coefficient = 0.4 for loamy soil arable land and slope rang 5-10%), I= Rainfall intensity (cm/hr), mean rainfall intensity for the design recurrence interval and for a duration equal to the time of concentration, A = Drainage Area (m^2)	cum/sec	182.08
S (Longitudinal gradient slope of channel) varies as per site slope and location(taking (1/6000)		0.00017
Velocity of water flow (V = R⅔S½/n)Where R= Hydraulic Radius, S = Longitudinal slope (may be assumed assume 1/6000 approx.), n = manning's coefficient = 0.02 for ordinary firm loam soil type		0.969
Maximum permissible velocities in non-vegetated canal for ordinary firm loam soil type (Reference table , After Fortier and Scobey, 1926)		Clean water =0.75m/sec Water with Colloidal silt =1.05M/sec Water with sand Gravel =0.68m/sec
As the designed velocity is within the permissible velocities limit, so we can say that the design of pyne is suitable.		

Estimation of structure: 01

Site Location : Trench /Pyne CRW-1									
Dimensions	length (ft)	Top Width M	Bottom Width M	depth M					
Proposed	600	20.00	10.00	2.00					
Existing dimensions	600	15.00	7.00	0.20					
Abstract of Cost Estimation : Description of the work- Pyne - Excavation									
Particulars	**Length**	**Top width**	**Bottom width**	**Depth**	**Qnty.**	**Unit**	**Rate**	**Unit**	**Amount**
Cleaning of Site, Survey, alignment & layout.					8	mday	177	Rs	1416
Earthwork cutting in Soft /Hard soil with initial lift including rough dressing and breaking of clods to maximum 5cm to 7cm and lying in layers as per direction of the Engineer-in-charge.									
Proposed Surface layer cutting									
Lx(TW+BW)/2XHT	600.0	20.00	10.00	2.00	18000.0	Cum			
Existing depth of the channel	**600.0**	15.00	7.00	0.20	1320.0	Cum			
Actual Earth work to be excavated					16680.0	cum			
M**ale -Mandays calculation** :EW & Lift of soil from 0 to 5 ft depth and height ,the required Man days @80cft/m days soil cutting will be taken for male mdays of 2/3 total work .									
590805.6	cft				4923.4				
Female -Mandays calculation :EW & Lift of soil from 0 to 5 ft depth and height ,the required Man days @68cft/m days soil cutting will be taken for female mdays of 1/3 total work .									
590805.6	cft				2896.1				
Total					7819.5	Mdays	177	Rs	**1385465**
Providing leveling, Ramming/ Rolling earth work in embankment side of Ahar manually with all complete job @1000cft/mdays and as per direction of Engineer in charge.									
Total EW/1000					590.8	Mdays	177	Rs	104572.59
Providing provision of supervisor (mate) for completing the while jobs and as per direction of engr. In charge are taken in the ratio of (1:40) of Total man-days									
Total Mdays/40					8410.29	Mdays			
Extra @ Rs 10 of 40 labour					50.73	Rs	10	Rs	507.25
Total Cost									**1491961**
labour cess 1% of the total Cost									14919.608
Providing cost of sign board ,photography and others LS									3000
Grand Total cost of Irrigation Channel Excavation									**1509880**

Drawing of Trench-01

All Diamention in Metre

Plantation on  **River Side**

Plantation Estimate : 01

Cost Estimation of Community Plantation on Pyne-In Tel River (One Unit Plantation)					
Subject/ Operation	**Year- 01- Establishment**				
	Unit	Qty.	Rate	Description	Amount
A. Maintenance cost					
Maintaining 100 lenior AF/Fruit plant up to 5 year and security of the same plant by 4 no gardeners	No	At least maintenance of 100 Fruit plants up to five year or 60 month on the basis of living plants	7	100*12*5*4*7	168000
Pit Digging of 100 plant	No	100 Big Fruit plants with Pit size 0.60x0.60x0.60= 43.2 cum or 1524.31 cft/108=14 m-days	177	177*14	2478
	NO	100 AF plants with Pit size 0.30x0.30x0.30x200=5.4 cum or 190.56cft/108=2 m-days	177	177*2	354
Purchasing of Fruit Plants for 100 plants	No	100 fruit plants	35	100*35	3500
	No	100 No Agro forestry plants	15	100*15	1500
Installation of hand Pump	No	Two number on the site of fruit and agro-forestry plantation @9500/hand pump	9500	2*9500	19000
Insecticide and pesticide treatment on 200 plants	Lump sump	year -1 after two month in 15 days gap LS@ 0.90 p/plant		200*20*0.90	3600
		Year - 2 in 30 days gap LS@ 0.90 p/plant		200*10*0.9	1800
		Year -3 in 30 days gap LS@ 0.90 p/plant		200*10*0.10	200
		Year - 4 in 30 days gap LS@ 0.90 p/plant		200*10*0.11	220
		Year - 5 in 30 days gap LS@ 0.90 p/plant		200*10*0.12	3600
Two bucket ,Mug, Jhara and clothes etc.		up to 5 year Lump sum Expenditure			4000
Permanent Net Fencing for 5 year and maintenance		400 plant fenced with permanent fencing @350/fencing		200x350	70000
		Total cost			**278252**
Miscellaneous expenditure		2 % of estimated cost			5565.04
		Grand Total			**283817.04**

Design &Cost Estimation No -02

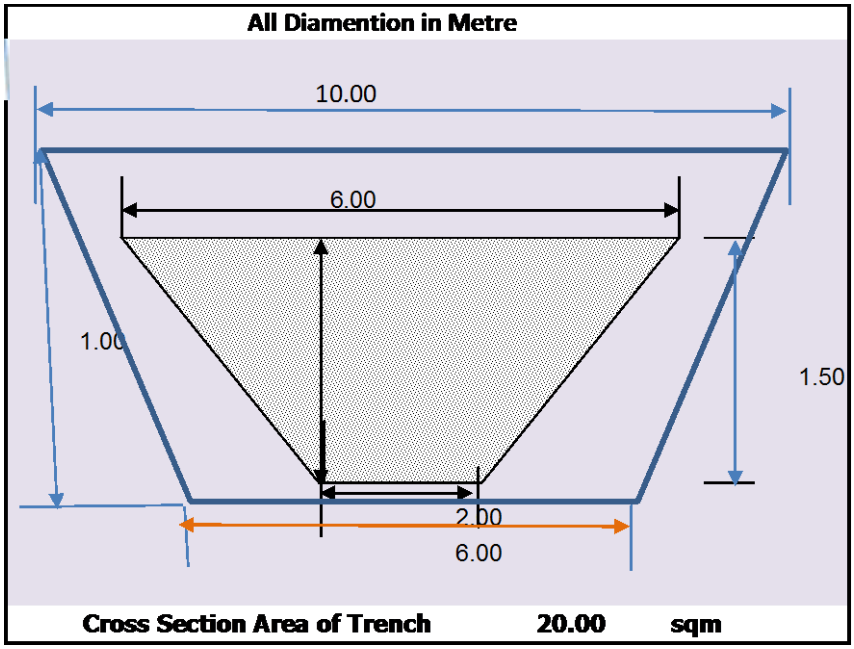
Cost Estimation No -2- River Trench Cutting & Cleaning		
Location of Required Structure:	.945597N, 84.653177E	
Design of Pyne CR Work	Length of Trench M	500
Climate Resilient Work	Unit	Irrigation/Drainage structure
Dimension during Field Survey		Pyne connected (L=500, Tw=6, Bw=2, D=1.5)
Type of Pyne		Renovation of existing Pyne structure
Shape of the Pyne		Trapezoidal
Catchment (Ha)	Ha	NA
Fetch length (Max length of Travel)	M	1400
Slope of the Area		0-1%
Type of Soil		loam/black
Existing Depth (d) of River /Pyne		1.50
Existing Top Width (TW) of River/Pyne	M	6.00
Exiting Bottom Width (BW) of River or Pyne	M	2.00
Proposed Depth of Pyne (including 0.15 m free board)		1.00
Total depth of channel (existing + proposed)	M	2.50
Proposed TW River Bed Trench	M	10.00
Proposed BW of River bed Trench	M	6.00
Proposed cross-sectional Area of River/Pyne (a= 1/2 (TW +BW)x Depth)	Sqm	20.00
Catchment Area of the River Trench	Ha	50
Fetch length (Max length of Travel)	M	1400
Elevation difference from remote point to outlet of discharge		1.5
Command Area of the River Bed Trech (ha)	Ha	230
Wetted Perimeter (p) (p = Bw + 2 (√(d² + (1.5 d) ²) = Bw +3.604d)		15.02
Hydraulic Radius R = a/p		1.33
S (Slope) = H/L		0.00
K = L/√S,		42770.71
Time of Concentration (Tc = 0.0195K0.77) where K = L/√S, and S(slope) = H/L, L = Maximum length of travel = 1400 m, and H = difference in elevation between most remote point and outlet point = 8m (minimum)		71.78
Per day maximum rainfall (as per Climate modelling report)		235
Rain fall intensity (I) , as per climate variability report (one day max rain fall 150 MM/day)	mm/hr	196.43
Coefficient of runoff © as per differnet catchment terrain May vary from 0.3 to 0.5		0.5
Manning's coefficient (n) may varies as per soil type of location		0.02
Discharge from drainage area (Q = CIA) Where C = Runoff coefficient = 0.4 for loamy soil arable land and slope rang 5-10%), I= Rainfall intensity (cm/hr), mean rainfall intensity for the design recurrence interval and for a duration equal to the time of concentration, A = Drainage Area (m²)	cum/sec	13.64

S (Longitudinal gradient slope of channel) varies as per site slope and location(taking (1/6000)		0.00017
Velocity of water flow (V = R⅔S½/n)Where R= Hydraulic Radius, S = Longitudinal slope (may be assumed assume 1/6000 approx.), n = manning's coefficient = 0.02 for ordinary firm loam soil type		0.781
Maximum permissible velocities in non-vegetated canal for ordinary firm loam soil type (Reference table , After Fortier and Scobey, 1926)		Clean water =0.75m/sec Water with Colloidal silt =1.05M/sec Water with sand Gravel =0.68m/sec
As the designed velocity is within the permissible velocities limit, so we can say that the design of pyne is suitable.		

Cost Estimate-No- 02

Abstract of Cost Estimation									
Description of the work- Trench – Excavation									
Particulars	**Length**	**Top width**	**Bottom width**	**Depth**	**Qnty.**	**Unit**	**Rate**	**Unit**	**Amount (Rs)**
Cleaning of Site, Survey, alignment & layout.					8	Mday	177	Rs	1416
Earthwork cutting in Soft /Hard soil with initial lift including rough dressing and breaking of clods to maximum 5cm to 7cm and laying in layers as per direction of the Engineer-in-charge.									
Proposed Surface layer cutting									
Lx(TW+BW)/2XHT	500.0	10.00	6.00	1.00	4000.0	Cum			
Existing depth of the channel	**500.0**	6.00	2.00	1.50	3000.0	Cum			
Actual Earth work to be excavated					1000.0	cum			
M**ale -Mandays calculation** :EW & Lift of soil from 0 to 5 ft depth and height ,the required Man days @80cft/m days soil cutting will be taken for male mdays of 2/3 total work .									
35420.0	cft				295.2				
Female -Mandays calculation :EW & Lift of soil from 0 to 5 ft depth and height ,the required Man days @68cft/m days soil cutting will be taken for female mdays of 1/3 total work .									
35420.0	cft				173.6				
Total					468.8	Mdays	177	Rs	**84392.55**
Providing leveling, Ramming/ Rolling earth work in embankment side of Pyne manually with all complete job @1000cft/mdays and as per direction of Engineer in charge.									
Total EW/1000					35.40	Mdays	177	Rs	6269.34
Providing provision of supervisor (mate) for completing the while jobs and as per direction of engr. In charge are taken in the ratio of (1:40) of Total man-days									
Total Mdays/40					504.21	Mdays			
Extra @ Rs 10 of 40 labour					50.725	Rs	10	Rs	507.25
Total Cost									**92585.14**
labour cess 1% of the total Cost									925.85
Providing cost of sign board ,photography and others LS									3000
Grand Total cost of Irrigation Channel Excavation									**96511.00**

Drawing:-2



Plantation Estimate - 02

Cost Estimation of Community Plantation on Pyne-In Tel River (One Unit Plantation)					
Subject/ Operation	**Year- 01- Establishment**				
	Unit	Qty.	Rate	Description	Amount
A. Maintenance cost					
Maintaining 100 lenior AF/Fruit plant up to 5 year and security of the same plant by 4 no gardeners	No	At least maintenance of 100 Fruit plants up to five year or 60 month on the basis of living plants	7	100*12*5*4*7	168000
Pit Digging of 100 plant	No	100 Big Fruit plants with Pit size 0.60x0.60x0.60= 43.2 cum or 1524.31 cft/108=14 m-days	177	177*14	2478
	NO	100 AF plants with Pit size 0.30x0.30x0.30x200=5.4 cum or 190.56cft/108=2 m-days	177	177*2	354
Purchasing of Fruit Plants for 100 plants	No	100 fruit plants	35	100*35	3500
	No	100 No Agro forestry plants	15	100*15	1500
Installation of hand Pump	No	Two number on the site of fruit and agro-forestry plantation @9500/hand pump	9500	2*9500	19000
Insecticide and pesticide treatment on 200 plants	Lump sump	year -1 after two month in 15 days gap LS@ 0.90 p/plant		200*20*0.90	3600
		Year - 2 in 30 days gap LS@ 0.90 p/plant		200*10*0.9	1800
		Year -3 in 30 days gap LS@ 0.90 p/plant		200*10*0.10	200
		Year - 4 in 30 days gap LS@ 0.90 p/plant		200*10*0.11	220
		Year - 5 in 30 days gap LS@ 0.90 p/plant		200*10*0.12	3600
Two bucket ,Mug, Jhara and clothes etc.		up to 5 year Lump sum Expenditure			4000
Permanent Net Fencing for 5 year and maintenance		400 plant fenced with permanent fencing @350/fencing		200x350	70000
		Total cost			**278252**
Miscellaneous expenditure		2 % of estimated cost			5565.04
		Grand Total			**283817.04**

Design &Cost Estimation No - 03

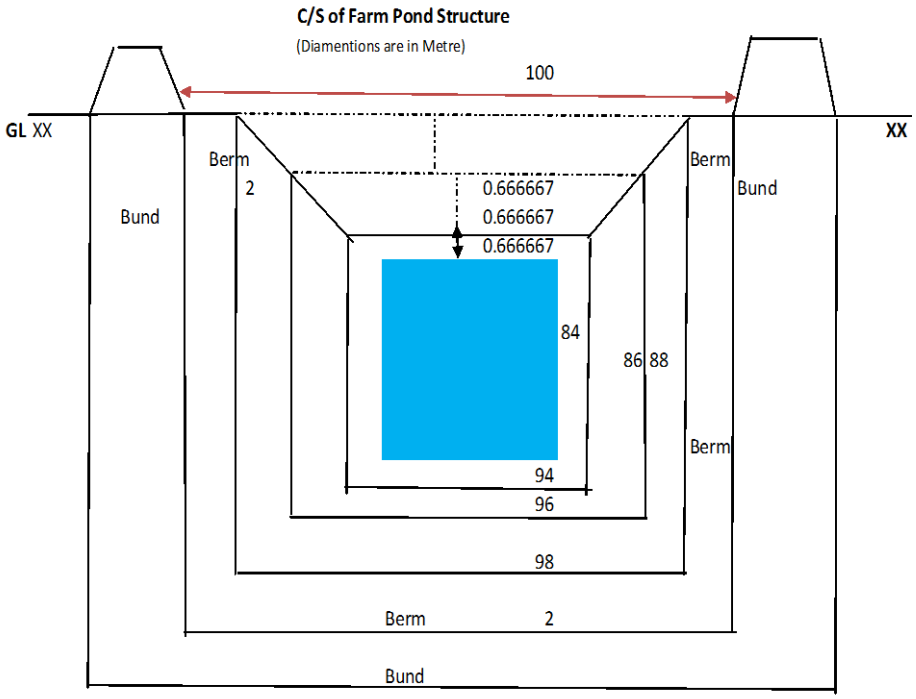
Location at 290 point	250m awayfrom river		
Design Procedure of Farm Pond		25°56'31.64"N, 84°38'59.57"E,	
Name of Village	**Rushi**	**GP**	**Rushi**
Activity	Re-Excavation of Climate Resilient Community Pond	**Type & shape of pond**	Dug out type , trapezoidal pond
Type of Soil	Sandy clay Soil	**Bed Rock**	Seems not appear inside of the community pond
Praposed Depth of the Pond (M)	2	**Proposed Lenth for Excavation (M) Exclud.Bund**	100
Existing depth (M)	1	**Proposed Width (M)**	90
Existing length (M)	120	**Existing width (M)**	80
Catchment area of the pond (ha) Flat of forest land	31	**Command area of the pond (ha)**	28
Fetch length (m)	500	**Total depth**	3
Using By Rational Formulae	**: Q=CIA/360**		
Where c= rational Runoff Coefficient for available sandy loam soil for 5-10% slope = 0.50		0.5	
I= Rain fall intensity for a duration equal to Time of concentration= mm/ annum		1750	
A= Catchments area from out side of the pond in Ha		43	
	Peak Runoff (Q)=CIA/360	**104.51**	**M³/sec**
(This is the sufficient runoff to fill the storage capacity of community pond)			
By Using Strainge's Table :			
Estimated Runoff (Q)	CIA=31x10000X1750x45.1x0.4/100	**471357.64**	cum/annum
(taking 43.1% runoff on 1750mm rainfall at good catchment)			
Free Board (0.5-1m)		0.7	
To design Pond capacity :	Total Irrigation requirment +livestock requirement + domestic requirement + 10 % of the sum of another losses.		
Wheat crop: - water requirement: if farmers will grow the wheat crop in 6 hectare of		9000	cum
Maize crop:- consequently the Maize crops in Gaya district are grown in a summer		4500	
Domestic Purposes: domestic cum livestock water requirement is taken as 10% of the		1350	
Other Loses: water loss for Transpiration, Evapotranspiration, and vaporization etc.		1485	
Dead Storage: Water store round the year = Area of Pond X water will store		2700	
Total Water demand = WC+MC+DP+OL+DS		**19035**	
Existing Pond Capacity =	Ht of Water X Area of Pond	**27000**	

Recommendation: Collecting all the information regarding Rushi- pond with physical investigation, it is calculated that the actual crop water requirement from several purposes is lessure than the pond capacity. Viewing the above fact of demand the site of pond seems to be feasible, economical and viable. And the vegetative coverage and plantation over embankment on site become climate resilient.
(ii) The crop water requirement + ET crop and some of other losses are lesser than the pond storage capacities which enhance the dead storage capacity.
(iii) The excess run off water drain through weir (outlet) during the rainy season.

Cost estimation No- 03

	Site Location :	**Rushi**						**GP**	**Rushi**		
	Excluding Bund Size L (M) :	100	Width	90	depth pro.	2		Berm	2		
	Abstract of Cost Estimation										
Sl.No	**Description of the work- Pond RE- Excavation**					**Quantity**	**Unit**	**Rate (Rs.)**	**Unit**	**Amount (Rs.)**	**SOR Code**
	Particular		**L(m)**	**W(m)**	**AV. D(m)**						
1	Survey, alignment & layout.										
						5	MD	177	/md	885	
2	Earthwork in Hard soil or, within 51M initial lead and 1.5M initial lift including rough dressing and										
A	Surface layer cutting		98	88	0.6666667	5749.333	cum	86.02	0	494558	
B	Middle layer cutting		96	86	0.6666667	5504	cum	86.02		473454	
C	Bottom layer cutting		94	84	0.6666667	5264	cum	86.02		452809	
	Total					**16517.33**	cum			**0**	
	Actual volume of EW = AV = A+(4 B)+C/6*AD					**5504.889**		86.02		**473531**	
4	Ramming/ Rolling earth work with light HRR in embankment in layers not exceeding 0.3m in										
						9844	cum	7.24	/cum	71270.6	
5	Fine dressing and vegetative measures on both the sides by broadcasting of lemon grass/ Napier										
	Inside & Outside	2	313	2.1		1314.6	sqm				
						1314.6	sqm	8.52	/sqm	11200.4	
6	Excavation for foundation for outlet of										
	head wall	1	1.8	0.6	0.6	0.65	cum				
	side wall	2	2	0.6	0.6	1.44	cum				
						2.09	cum	125.08	/cum	261.417	
7	Filling in foundation with sand ,gravel,cement (mixture) water etc. complete.										
	Foundation head wall	1	1.8	0.6	0.12	0.13	cum				
	Foundation Side wall	2	2	0.6	0.12	0.29	cum				
						0.42	cum	81.21	/cum	33.91	
8	Cement Concrete (1:3:6) with 4cm size hard granite metal per 1 cum										
	head wall	1	1.8	0.6	0.48	0.52	cum				
	side wall	2	2	0.6	0.48	1.15	cum				
						1.67	cum	2648.44	/cum	4423.95	
9	Brick masonry in cement mortar (1:6)										
	head wall	1	1.8	0.5	0.9	0.81	cum				
	side wall	2	2	0.5	1.2	2.4	cum				
						3.21	Cum	1798.57	/cum	5773.41	
10	12mm thick cement plaster (1:6) for brick work Per 1Sqm.										
	head wall	2	1.8		0.9	3.24	sqm				
		1	1.8		0.5	0.9	sqm				
	side wall	2	2		1.2	4.8	sqm				
		2	2		0.5	2	sqm				
						10.94	sqm	88.7	/sqm	970.38	
11	Transportation LS									2000	
12	Royalty on material									544	
6	CSP charges (For 50 labors 1 no. semiskilled labour)					97	MD	220	MD	21340	
7	Labour cess 1 percent of labour cost									0	
8	Construction of Transparency Board including plastering, painting & wall writing etc.								LS/SA	2000	
9	Rest shed								LS/SA	1000	
10	First Aid Kit,								LS/SA	1000	
11	Supply of Drinking Water								LS/SA	880	
12	Photography (Minimum 3 nos.)								LS/SA	500	
13	Xerox Charges (Estimates & other related documents)								LS/SA	500	
								Total		**597229**	

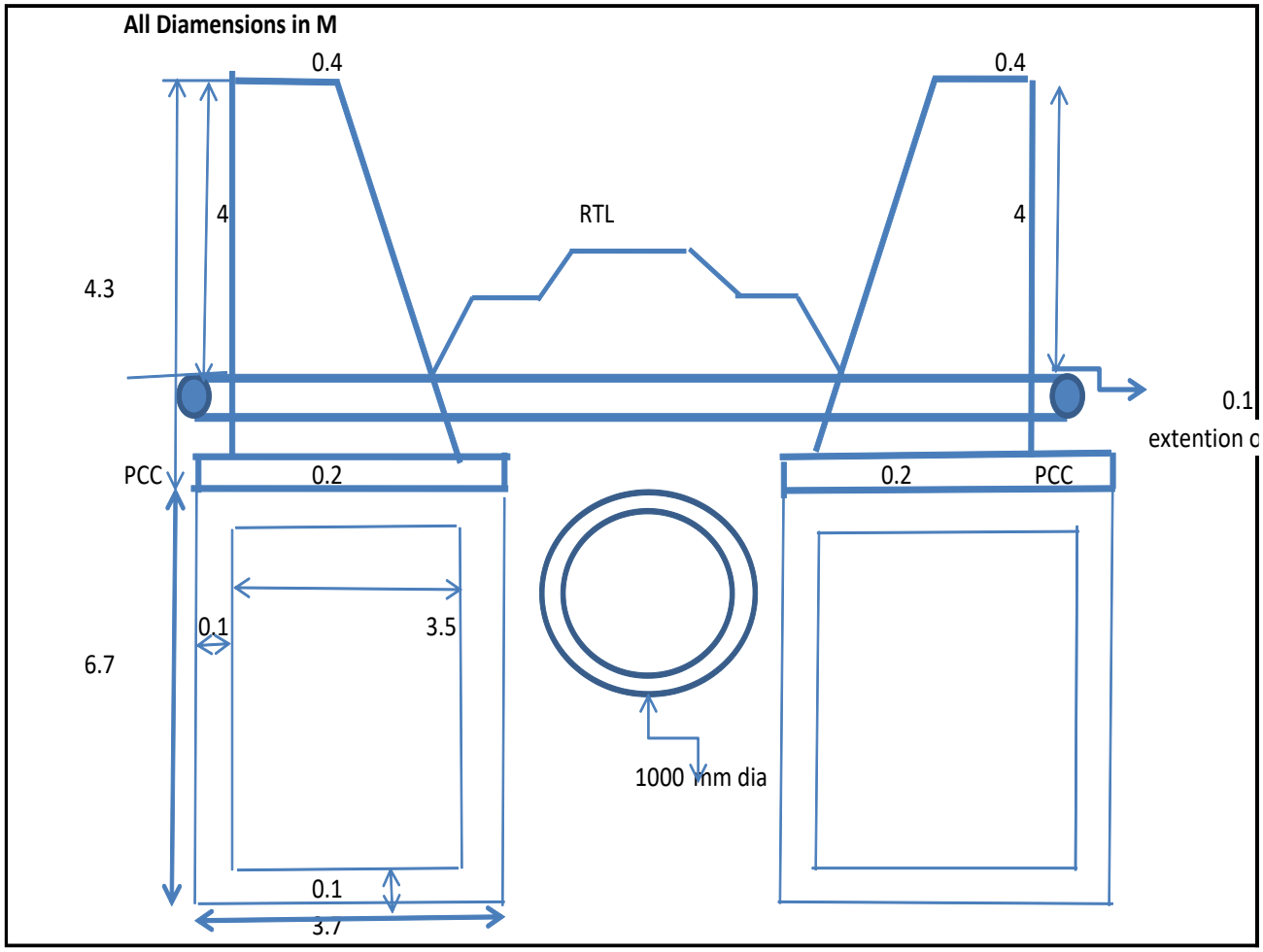
Drawing -03

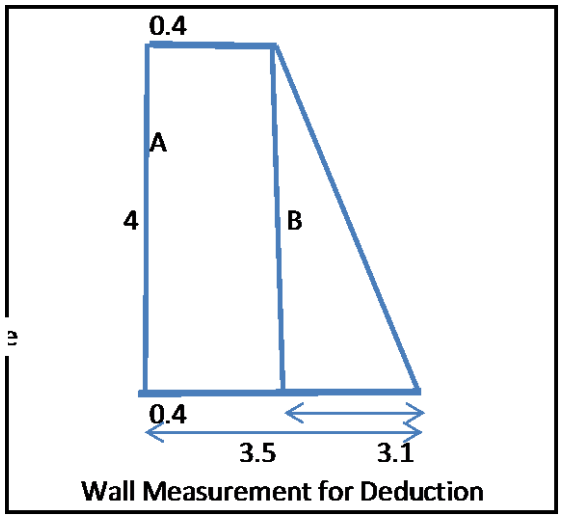


Design & Cost Estimation - 04

Location - Village Rushi & Bhatkesari (at 100 point)							Lat ,Long	25.940914N, 84.652183E			
Cost Estimation of Culvert or Pulia Nirman											
Sl No	Particulars	No	L	W	H/D	Volume	Quantity	Unit	Rate	Amount	
	Foundation -Earth work excavation										
1	Excavation of Foundation (one side)	1	6.7	3.7	4.3	106.60					
	Excavation of Foundation (2nd side	1	6.7	3.7	4.3	106.60		176.86/80cft			
	Sub Total					213.19	213.194	Cum	221	47115.87	221/cum
	Pre CementConcreate (PCC-1:4:8)	1	0.2	3.7	6.7	4.96				0	
2	**Pre CementConcreate (PCC-1:4:8)**									0	
	2nd Side Pre concreate(PCC-1:4:8)	1	0.2	3.7	6.7	4.96				0	
	Total PCC					9.92	9.916	Cum	3500	34706	
3	**B/W cement Mortar (1:4) or RCC(1:2:4)**									0	
	B/W cement Mortar (1:4) or	1	4	0.4	6.7	10.72				0	
	Cement Concreate wall (RCC-1:2:4)	1	3.5	4	6.7	46.90				0	
	2nd Side Reinforce concreate Cement (RCC-1:2:4)					57.62	57.62			0	
	Total RCC	2	0	0	0		115.24	Cum		0	
	Volume of Two Wall		3.023	0.3787	3.14	3.59	7.1898			0	
	Deduction (3.14Xr2xL)									0	
	Actual B/W (1:4) Cement Mortar Or						108.0502	Cum	6845	739603.32	
	RCC work(1:2:4)									0	
4	Cost of 1000 mm dia or 1m dia RCC hume Pipe	3					3		12500	37500	
5	Mason	12					12		600	7200	
6	Labour	34					34		500	17000	
7	Board	1					1		2000	2000	
7	Micellaneous lump sump								5000	5000	
	Total cost of Single Row Pipe Culvert									890125.19	

Drawing Culvert - 04



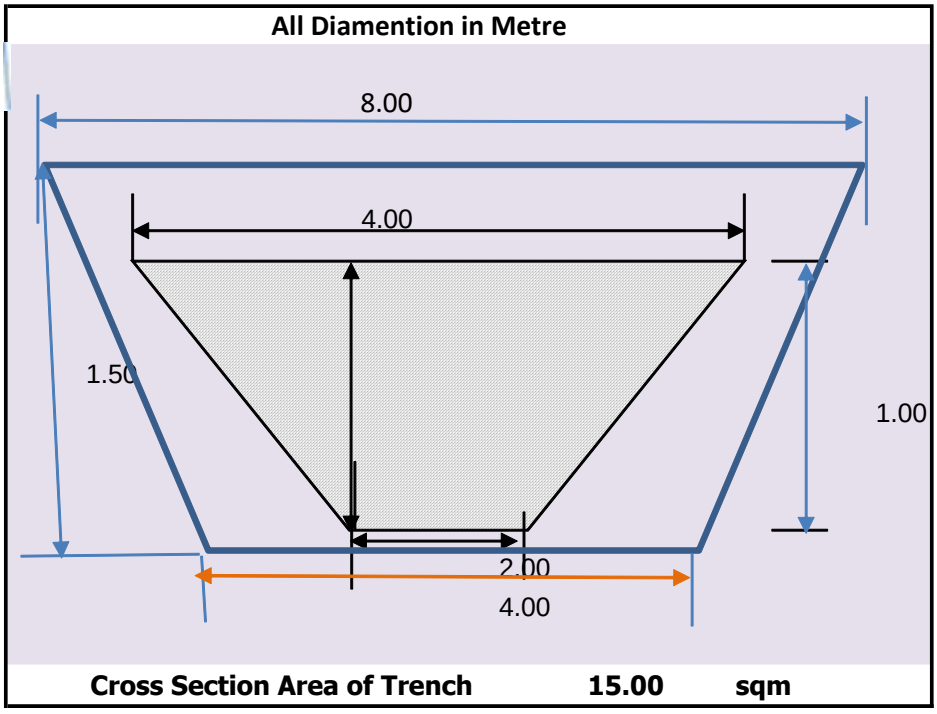


Design & Cost Estimation No - 05

Cost Estimation No -6- Proper chhanel Deepening	at point -500 (as Per Excel sheet)	
Location of Required Structure:	GPS Location in decimal	
	25.937272N, 84.64809E	
Design of pyne excavation At Gamariya	Length of Trench M	500
Diamention during Field Survey	Unit	Pond & meeting point both channel(Tw=15,d-2,L-20
Name of River		**Tel River**
Type of Pyne	Renovation of existing River structure	
Shape of the Pyne		Trapezoidal
Catchment (Ha)	Ha	NA
Fetch length (Max length of Travel)	M	1400
Slope of the Area		0-1%
Type of Soil		loam/black
Existing Depth (d) of River /Pyne		1.00
Existing Top Width (TW) of River/Pyne	M	4.00
Exiting Bottom Width (BW) of River or Pyne	M	2.00
Proposed Depth of Pyne (including 0.15 m free board)		1.50
Total depth of channel (existing + proposed)	M	2.50
Proposed TW River Bed Trench	M	8.00
Proposed BW of River bed Trench	M	4.00
Proposed cross-sectional Area of River/Pyne (a= 1/2 (TW +BW)x Depth)	Sqm	15.00
Catchment Area of the River Trench	Ha	50
Fetch length (Max length of Travel)	M	1400
Elevation difference from remote point to outlet of discharge		1.5
Command Area of the River Bed Trech (ha)	Ha	230
Wetted Perimeter (p) ($p = Bw + 2(\sqrt{(d^2 + (1.5\,d)^2)} = Bw + 3.604d$)		13.02
Hydraulic Radius R = a/p		1.15
S (Slope) = H/L		0.00
$K = L/\sqrt{S}$,		42770.71
Time of Concentration ($Tc = 0.0195K^{0.77}$) where $K = L/\sqrt{S}$, and S(slope) = H/L, L = Maximum length of travel = 1400 m, and H = difference in elevation between most remote point and outlet point = 8m (minimum)		71.78
Per day maximum rainfall (as per Climate modelling report)		235
Rain fall intensity (I) , as per climate variability report (one day	mm/hr	196.43
Coefficient of runoff © as per differnet catchment terrain May vary from 0.3 to 0.5 Manning's coefficient (n) may varies as per soil type of location		0.5 0.02
Discharge from drainage area (Q = CIA) Where C = Runoff coefficient = 0.4 for loamy soil arable land and slope rang 5-10%), I= Rainfall intensity (cm/hr), mean rainfall intensity for the design recurrence interval and for a duration equal to the time of concentration, A = Drainage Area (m^2)	cum/sec	13.64
S (Longitudinal gradient slope of channel) varies as per site slope and location(taking (1/6000)		0.00017
Velocity of water flow ($V = R^{2/3}S^{1/2}/n$)Where R= Hydraulic Radius, S = Longitudinal slope (may be assumed assume 1/6000 approx.), n = manning's coefficient = 0.02 for ordinary firm loam soil type		0.710
Maximum permissible velocities in non-vegetated canal for ordinary firm loam soil type (Reference table , After Fortier and Scobey, 1926)		Clean water =0.75m/sec Water with Colloidal silt Water with sand Gravel =0.68m/sec
As the designed velocity is within the permissible velocities limit, so we can say that the design of pyne is suitable.		

Site Location : Tench /Pyne					Lat,long	25.937272N, 84.64809E			
Diamentions	**length (m)**	Top Width M	Bottom Width M	depth M					
Proposed	500	8.00	4.00	1.50					
Existing	500	4.00	2.00	1.00					
Abstract of Cost Estimation									
Description of the work- Trench - Excavation									
Particulars	**Length**	**Top width**	**Bottom width**	**Depth**	**Qnty.**	**Unit**	**Rate**	unit	Amount (Rs)
Cleaning of Site, Survey, alignment & layout.									
					8	mday	177	Rs	1416
Earthwork cutting in Soft /Hard soil with initial lift including rough dressing and									
Proposed Surface layer cutting									
Lx(TW+BW)/2X	500.0	8.00	4.00	1.50	4500.0	Cum			
Existing depth of the channel	**500.0**	4.00	2.00	1.00	1500.0	Cum			
Actual Earth work to be excavated					3000.0	cum			
M**ale -Mandays calculation** :EW & Lift of soil from 0 to 5 ft depth and height ,the required Man days @80cft/m days soil cutting will be taken for male mdays of 2/3 total work .									
106260.0	cft				885.5				
Female -Mandays calculation :EW & Lift of soil from 0 to 5 ft depth and height ,the required Man days @68cft/m days soil cutting will be taken for female mdays of 1/3 total work .									
106260.0	cft				520.9				
Total					1406.4	mdays	177	Rs	**250345.676**
Providing leveling, Ramming/ Rolling earth work in embankment side of Ahar manually with all complete job @1000cft/mdays and as per direction of Engineer in charge.									
Total EW/1000					106.3	mdays	177	Rs	18808.02
Providing provision of supervisor (mate) for completing the while jobs and as per direction of engr. In charge are taken in the ratio of (1:40) of Total man-days									
Total Mdays/40					1512.6424	mdays			
Extra @ Rs 10 of 40 labour					50.725	Rs	10	Rs	507.25
Total Cost									**271076.946**
labour cess 1% of the total Cost									2710.769465
Providing cost of sign board ,photography and others LS									3000
Grand Total cost of Irrigation Channel Excavation									**276787.716**

Drawing: 05



Plantation: 05

Cost Estimation of Community Plantation In Tel River ,both side (two Unit Plantation)					
Subject/ Operation	**Year- 01- Establishment**				
A. Maintenance cost	Unit	Qty.	Rate	Description	Amount
Maintaining 100 lenior AF/Fruit plant up to 5 year and security of the same plant by 4 no gardeners	No	At least maintenance of 200 Fruit plants up to five year or 60 month on the basis of living plants	7	200*12*5*4*7	336000
Pit Digging of 100 plant	No	200 Big Fruit plants with Pit size 0.60x0.60x0.60= 43.2 cum or 1524.31 cft/108=30 mdays	177	177*30	5310
	No	100 AF plants with Pit size 0.30x0.30x0.30x200=5.4 cum or 190.56cft/108=6 mdays	177	177*6	1062
Purchasing of Fruit Plants for 100 plants	No	200 fruit plants	35	200*35	7000
	No	200 No Agro forestry plants	15	200*15	3000
Installation of hand Pump	No	Two number on the site of fruit and agroforestry plantation @9500/hand pump	9500	4*9500	38000

Insecticide and pesticide treatment on 200 plants	Lump sump	year -1 after two month in 15 days gap LS@ 0.90 p/plant		400*20*0.90	7200
		Year - 2 in 30 days gap LS@ 0.90 p/plant		400*10*0.9	3600
		Year -3 in 30 days gap LS@ 0.90 p/plant		400*10*0.10	400
		Year - 4 in 30 days gap LS@ 0.90 p/plant		400*10*0.11	440
		Year - 5 in 30 days gap LS@ 0.90 p/plant		400*10*0.12	440
Two bucket ,Mug, Jhara and clothes etc.		up to 5 year Lump sum Expenditure			8000
Permanent Net Fencing for 5 year and maintenance		400 plant fenced with permanent fencing @350/fencing		400x350	140000
		Total cost			**550452**
Miscellaneous expenditure		2 % of estimated cost			11009.04
		Grand Total			**561461.04**

Design & Cost Estimation No- 07

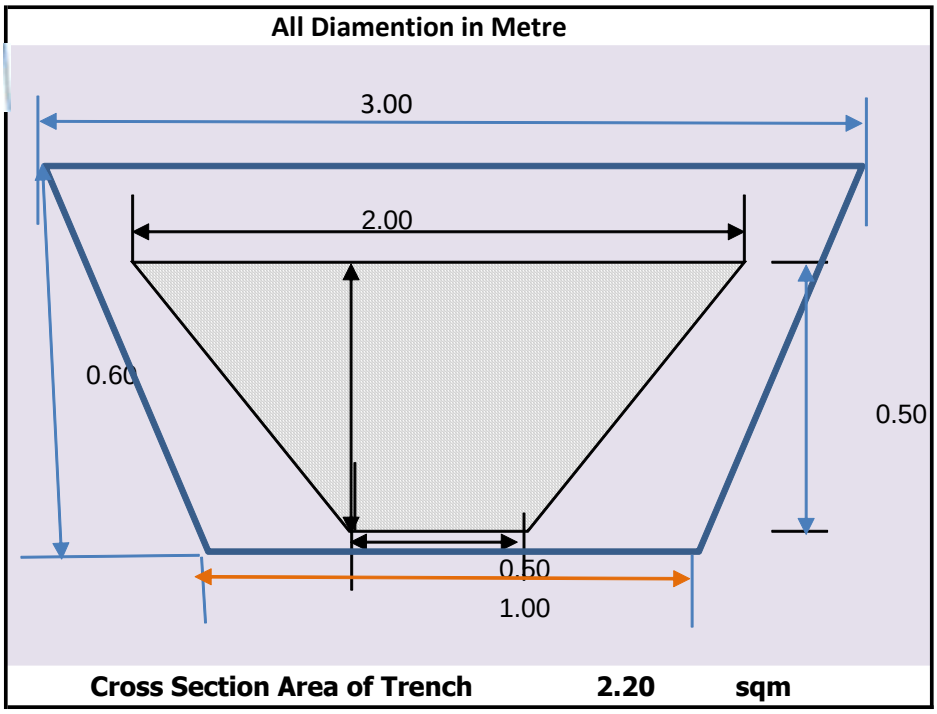
Cost Estimation No -7 Proper channel Deepening	at point -230 (as Per Excel sheet)	
Location of Required Structure:	GPS Location in decimal	
	25.935656N, 84.646831E	
At location Nathpura	Length of Trench M	300
Dimension during Field Survey	Unit	Pond & meeting point both channel(Tw=15,d-2,L-20
Name of River		**Tel River**
Type of Pyne	Renovation of existing River structure	
Shape of the Pyne		Trapezoidal
Catchment (Ha)	Ha	NA
Fetch length (Max length of Travel)	M	1400
Slope of the Area		0-1%
Type of Soil		loam/black
Existing Depth (d) of River /Pyne		0.50
Existing Top Width (TW) of River/Pyne	M	2.00
Exiting Bottom Width (BW) of River or Pyne	M	0.50
Proposed Depth of Pyne (including 0.15 m free board)		0.60
Total depth of channel (existing + proposed)	M	1.10

Proposed TW River Bed Trench	M	3.00
Proposed BW of River bed Trench	M	1.00
Proposed cross-sectional Area of River/Pyne (a= 1/2 (TW +BW)x Depth)	Sqm	2.20
Catchment Area of the River Trench	Ha	50
Fetch length (Max length of Travel)	M	1400
Elevation difference from remote point to outlet of discharge		1.5
Command Area of the River Bed Trech (ha)	Ha	230
Wetted Perimeter (p) (p = Bw + 2 (√(d² + (1.5 d) ²) = Bw +3.604d)		4.97
Hydraulic Radius R = a/p		0.44
S (Slope) = H/L		0.00
K = L/√S,		42770.71
Time of Concentration (Tc = 0.0195K0.77) where K = L/√S, and S(slope) = H/L, L = Maximum length of travel = 1400 m, and H = difference in elevation between most remote point and outlet point = 8m (minimum)		71.78
Per day maximum rainfall (as per Climate modelling report)		235
Rain fall intensity (I) , as per climate variability report (one day max rain fall 150 MM/day)	mm/hr	196.43
Coefficient of runoff © as per different catchment terrain May vary from 0.3 to 0.5		0.5
Manning's coefficient (n) may varies as per soil type of location		0.02
Discharge from drainage area (Q = CIA) Where C = Runoff coefficient = 0.4 for loamy soil arable land and slope rang 5-10%), I= Rainfall intensity (cm/hr), mean rainfall intensity for the design recurrence interval and for a duration equal to the time of concentration, A = Drainage Area (m²)	cum/sec	13.64
S (Longitudinal gradient slope of channel) varies as per site slope and location(taking (1/6000)		0.00017
Velocity of water flow (V = R⅔S½/n)Where R= Hydraulic Radius, S = Longitudinal slope (may be assumed assume 1/6000 approx.), n = manning's coefficient = 0.02 for ordinary firm loam soil type		0.375
Maximum permissible velocities in non-vegetated canal for ordinary firm loam soil type (Reference table , After Fortier and Scobey, 1926)		Clean water =0.75m/sec
		Water with Colloidal silt =1.05M/sec
		Water with sand Gravel =0.68m/sec
As the designed velocity is within the permissible velocities limit, so we can say that the design of pyne is suitable.		

Cost Estimate: 07

Site Location : Trench /Pyne CRW-2				**Lat,long**		**25.935656N, 84.646831E**			
Dimensions	**length (m)**	Top Width M	Bottom Width M	depth M					
Proposed	300	3.00	1.00	0.60					
Existing dimensions	300	2.00	0.50	0.50					
Abstract of Cost Estimation									
Description of the work- Trench - Excavation									
Particulars	**Length**	**Top width**	**Bottom width**	**Depth**	**Qty.**	**Unit**	**Rate**	unit	Amount (Rs)
Cleaning of Site, Survey, alignment & layout.									
					8	mday	177	Rs	1416
Earthwork cutting in Soft /Hard soil with initial lift including rough dressing and breaking of clods to maximum 5cm to 7cm and laying in layers as per direction of the Engineer-in-charge.									
Proposed Surface layer cutting									
Lx(TW+BW)/2XHT	300.0	3.00	1.00	0.60	360.0	Cum			
Existing depth of the channel	**300.0**	2.00	0.50	0.50	187.5	Cum			
Actual Earth work to be excavated					172.5	cum			
M**ale -Mandays calculation** :EW & Lift of soil from 0 to 5 ft depth and height ,the required Man days @80cft/m days soil cutting will be taken for male mdays of 2/3 total work .									
6110.0	cft				50.9				
Female -Mandays calculation :EW & Lift of soil from 0 to 5 ft depth and height ,the required Man days @68cft/m days soil cutting will be taken for female mdays of 1/3 total work .									
6110.0	cft				30.0				
Total					80.9	mdays	177	Rs	**15729.45**
Providing leveling, Ramming/ Rolling earth work in embankment side of Ahar manually with all complete job @1000cft/mdays and as per direction of Engineer in charge.									
Total EW/1000					6.1	mday	177	Rs	1081.46
Providing provision of supervisor (mate) for completing the while jobs and as per direction of engr. In charge are taken in the ratio of (1:40) of Total man-days									
Total Mdays/40					86.9769	mday			
Extra @ Rs 10 of 40 labour					50.725	Rs	10	Rs	507.25
Total Cost									**18734.16**
labour cess 1% of the total Cost									187.3416755
Providing cost of sign board ,photography and others LS									3000
Grand Total cost of Irrigation Channel Excavation									**21921.50**

Drawing: 07

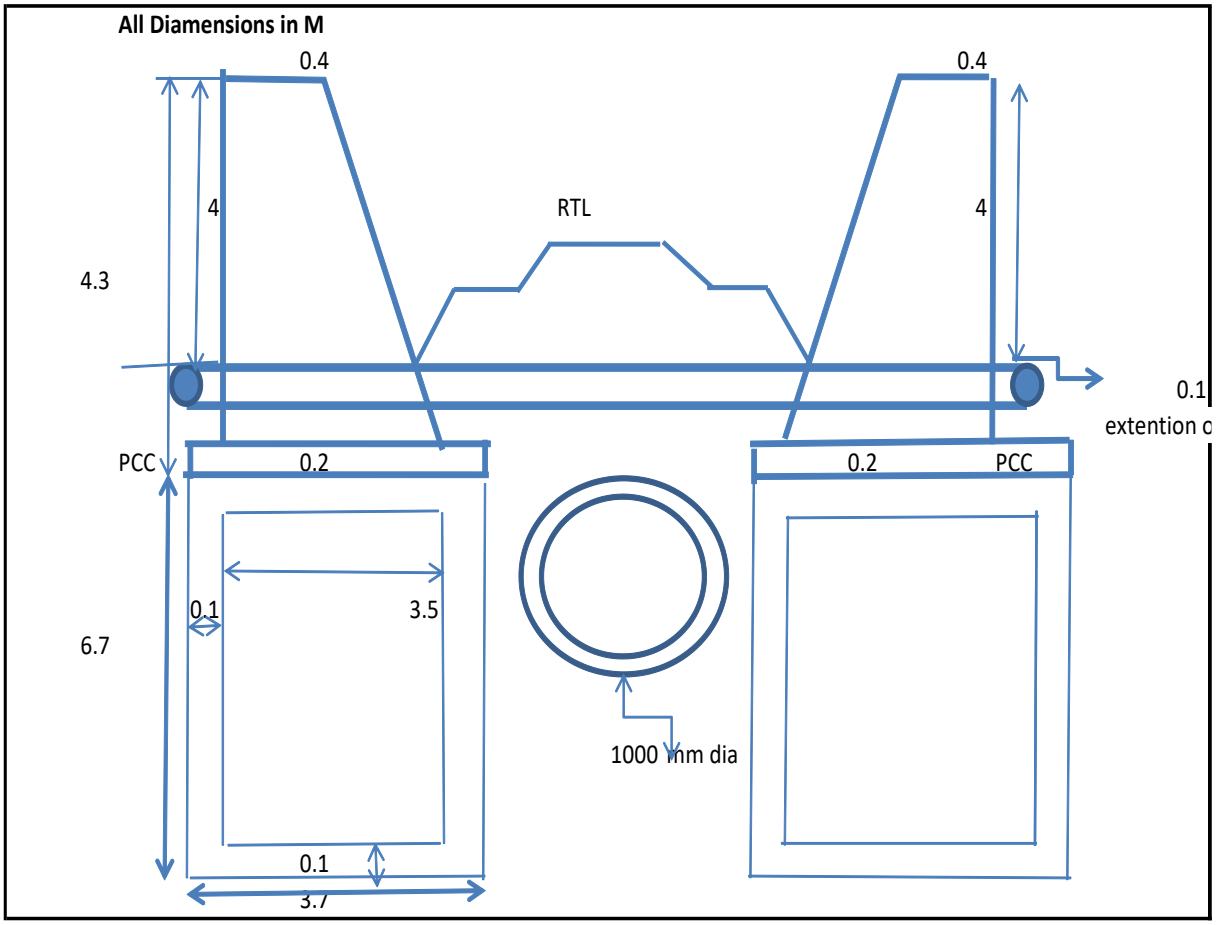


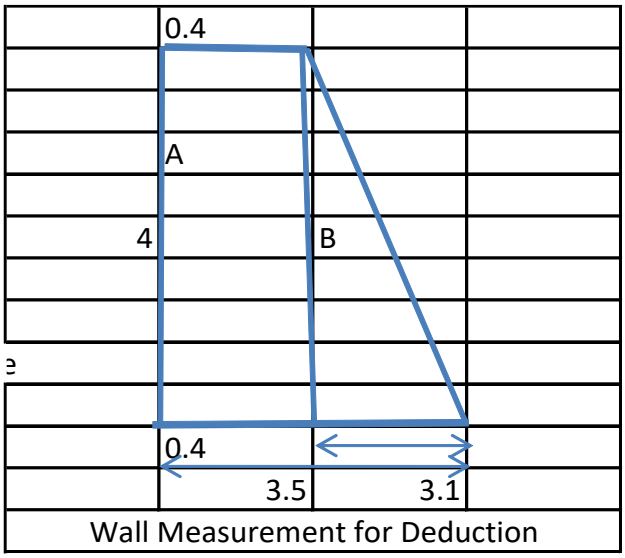
Plantation: 07

Cost Estimation of Community Plantation In Tel River ,both side (two Unit Plantation)					
Subject/ Operation	**Year- 01- Establishment**				
A. Maintenance cost	Unit	Qty.	Rate	Description	Amount
Maintaining 100 lenior AF/Fruit plant up to 5 year and security of the same plant by 4 no gardeners	No	At least maintenance of 200 Fruit plants up to five year or 60 month on the basis of living plants	7	200*12*5*4*7	336000
Pit Digging of 100 plant	No	200 Big Fruit plants with Pit size 0.60x0.60x0.60= 43.2 cum or 1524.31 cft/108=30 mdays	177	177*30	5310
	No	100 AF plants with Pit size 0.30x0.30x0.30x200=5.4 cum or 190.56cft/108=6 mdays	177	177*6	1062
Purchasing of Fruit Plants for 100 plants	No	200 fruit plants	35	200*35	7000
	No	200 No Agro forestry plants	15	200*15	3000
Installation of hand Pump	No	Two number on the site of fruit and agroforestry plantation @9500/hand pump	9500	4*9500	38000
Insecticide and pesticide treatment on 200 plants	Lump sump	year -1 after two month in 15 days gap LS@ 0.90 p/plant		400*20*0.90	7200
		Year - 2 in 30 days gap LS@ 0.90 p/plant		400*10*0.9	3600
		Year -3 in 30 days gap LS@ 0.90 p/plant		400*10*0.10	400
		Year - 4 in 30 days gap LS@ 0.90 p/plant		400*10*0.11	440
		Year - 5 in 30 days gap LS@ 0.90 p/plant		400*10*0.12	440
Two bucket ,Mug, Jhara and clothes etc.		up to 5 year Lump sum Expenditure			8000
Permanent Net Fencing for 5 year and maintenance		400 plant fenced with permanent fencing @350/fencing		400x350	140000
		Total cost			**550452**
Miscellaneous expenditure		2 % of estimated cost			11009.04
		Grand Total			**561461.04**

Design & Cost Estimation No - 08

Cost Estimation of Culvert or Pulia Nirman At Location -Nathanpura Nabada							**lat,long**	**25.935093N, 84.64673E**		
Sl No	Particulars	No	L	W	H/ D	Volume	Quantity	Unit	Rate	Amount
	Foundation -Earth work excavation									(Rs)
1	Excavation of Foundation (one side)	1	6.7	3.7	4.3	106.597				
	Excavation of Foundation (2nd side	1	6.7	3.7	4.3	106.597			176.86/80cft work	
	Sub Total					**213.194**	**213.194**	Cum	**221**	47115.87
	Pre CementConcrete (PCC-1:4:8)	1	0.2	3.7	6.7	4.958				0
2	**Pre CementConcrete (PCC-1:4:8)**									0
	2nd Side Pre concrete(PCC-1:4:8)	1	0.2	3.7	6.7	4.958				0
	Total PCC					9.916	**9.916**	Cum	**3500**	34706
3	**B/W cement Mortar (1:4) or RCC(1:2:4)**									0
	B/W cement Mortar (1:4) or	1	4	0.4	6.7	10.72				0
	Cement Concrete wall (RCC-1:2:4)	1	3.5	4	6.7	46.9				0
	2nd Side Reinforce concrete Cement (RCC-1:2:4)					57.62	57.62			0
	Total RCC	2	0	0	0		**115.24**	Cum		0
	Volume of Two Wall		3.02	0.378	3.1	3.59492	**7.1898**			0
	Actual B/W (1:4) Cement Mortar Or						**108.0502**	Cum	**6845**	739603.32
	RCC work(1:2:4)									
4	**Deduction (3.14Xr2xL)**	3							**12500**	37500
	Cost of 1000 mm dia or 1m dia RCC hume Pipe									
5	Mason	12							**600**	7200
6	Labour	34							500	17000
7	Board	1							2000	2000
7	Miscellaneous lump sump								5000	5000
	Total cost of Single Row Pipe Culvert									**890125.19**





Wall Measurement for Deduction

Design & Cost estimation No - 09

Input data for the earthen dam		lat long	25.931225N, 84.64588E
	Particulars	**A/U**	**Value**
	Village	Ganga kanauli ,Nabada	
	Stream / Nala	Tel river	
1	Catchment area	hac	50
	Total width of Nala at dam site	M	30
2	Type of Soil for construction		Clay+ sandy loam
3	Runoff coefficient for Deccan's formula		16
4	Depth of foundation/ Depth of transported material	M	1.20
5	Designed side slope U/S 1:	V:H	3
6	Designed side slope D/S 1:	V:H	2
7	Free board (as per site condition> 1Mtr)	M	1.20
8	Length of Surplus weir channel	M	20.00
9	Settlement allowance (10-15%)	%	10.00
10	**Measurements of Bund**		
	Chainage		**Height**
	0	M	0
	3.0	M	1
	6.0	M	1.85
	9.0	M	2.1
	12.0	M	2.4
	15.0	M	2.5
	18.0	M	2.9
	21.0	M	2.8
	24.0	M	2.2
	27.0	M	1.05
	30.0	M	0
	Depth of hard soil	M	0.5
	Depth of hard moorum	M	1
	Hard soil available for embanking (approx.)	%	70%
	Reading interval of nala X-Sec.	**M**	**3.0**

According to the area of catchment and amount of rainfall, C varies from 11.37 to 22.04 as given in Table 5.1.

Table 5.1.

Region	*Value of C*
North India	11.37
Central India	11.77—19.28
Western India	22.04

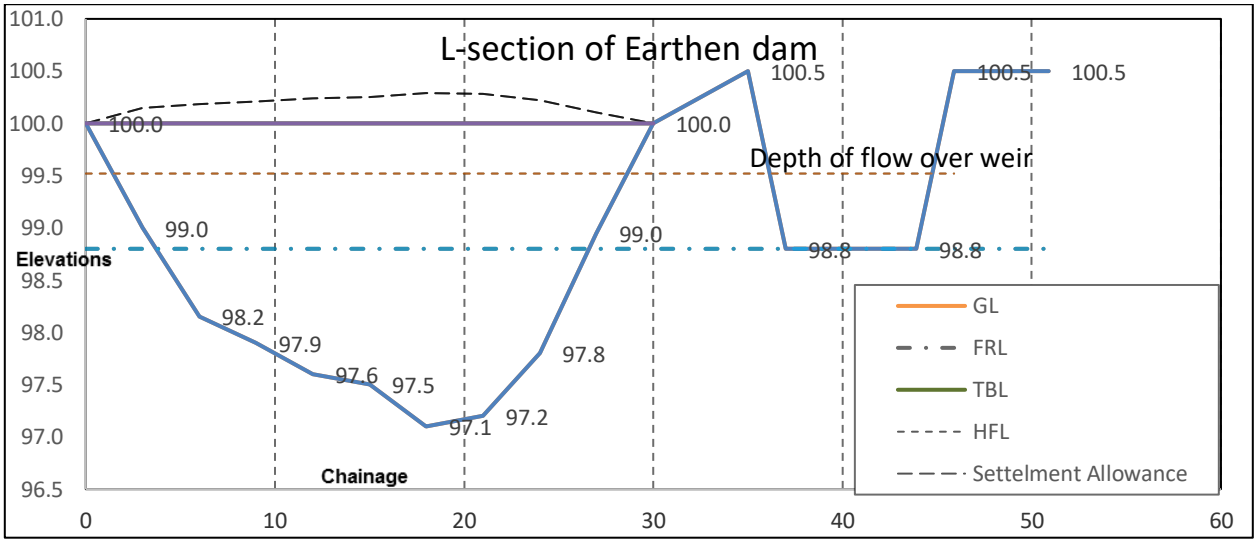
Detailed estiamte of Earthen dam									Tel river			Ganga kanauli Nabada									
Chainage	RL	Height	Area of X-Section	Av.area of x-Section	Length	Quantity of Embankment	Area of CoreWall	Av. Area of CoreWall	Qty. of Core Wall	Length of Pitching	Av. Length of Pitching	Area of Pitching	Area of Rock Toe	Av. Area of Rock Toe	Qty. of Rock Toe	Width of Stripping	Av. Width of Stripping	Area of Stripping	Width of Grass turfing	Av. Width of Grass turfing	Area of Grass turfing
0	100	0	0.00			0.00										2.16			0.00		0.00
3	99	1	4.66	2.33	3	6.99	0.3456	0.17	0.52	1.64	0.82	2.47	0.08	0.04	0.12	7.16	4.66	13.98	2.24	1.12	3.35
6	98.15	1.85	12.55	8.61	3	25.82	2.1816	1.2636	3.7908	4.33	2.99	8.97	0.27	0.17	0.52	11.41	6.79	20.36	4.14	2.07	6.21
9	97.9	2.1	15.56	14.06	3	42.17	2.7216	2.4516	7.3548	5.12	4.73	14.18	0.34	0.31	0.92	12.66	12.04	36.11	4.70	4.42	13.25
12	97.6	2.4	19.58	17.57	3	52.72	3.3696	3.0456	9.1368	6.07	5.60	16.79	0.45	0.40	1.19	14.16	13.41	40.23	5.37	5.03	15.09
15	97.5	2.5	21.03	20.30	3	60.91	3.5856	3.4776	10.4328	6.39	6.23	18.69	0.49	0.47	1.41	14.66	14.41	43.23	5.59	5.48	16.44
18	97.1	2.9	27.29	24.16	3	72.47	4.4496	4.0176	12.0528	7.65	7.02	21.06	0.66	0.57	1.72	16.66	15.66	46.98	6.48	6.04	18.11
21	97.2	2.8	25.65	26.47	3	79.41	4.2336	4.3416	13.0248	7.34	7.49	22.48	0.61	0.63	1.90	16.16	16.41	49.23	6.26	6.37	19.12
24	97.8	2.2	16.85	21.25	3	63.75	2.9376	3.5856	10.7568	5.44	6.39	19.16	0.38	0.50	1.49	13.16	14.66	43.98	4.92	5.59	16.77
27	98.95	1.05	5.02	10.94	3	32.81	0.4536	1.6956	5.0868	1.80	3.62	10.86	0.09	0.23	0.70	7.41	10.29	30.86	2.35	3.63	10.90
30	100	0	0.00	2.51	3	7.54		0.2268	0.6804		0.90	2.70	0.00	0.04	0.13	2.16	4.79	14.36	0.00	1.17	3.52
35	100.5	-0.5		0.00	5.00	0.00		0	0		0.00	0.00									
35.00	98.8	1.2		0.00	0	0.00		0	0		0.00	0.00									
43.90	98.8	1.2		0.00	8.90	0.00		0	0		0.00	0.00									
43.90	100.5	-0.5		0.00	0	0.00		0	0		0.00	0.00									
					43.90	**444.59**			**72.84**			**137.37**			**10.09**			**339.30**			**122.76**

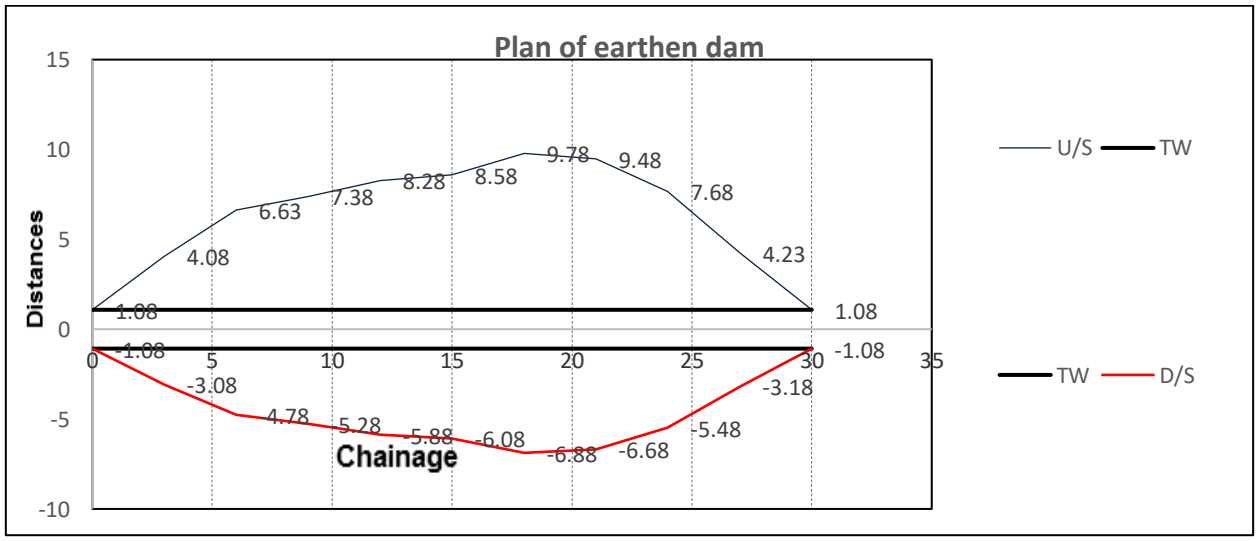
Design of Earthen Embankment

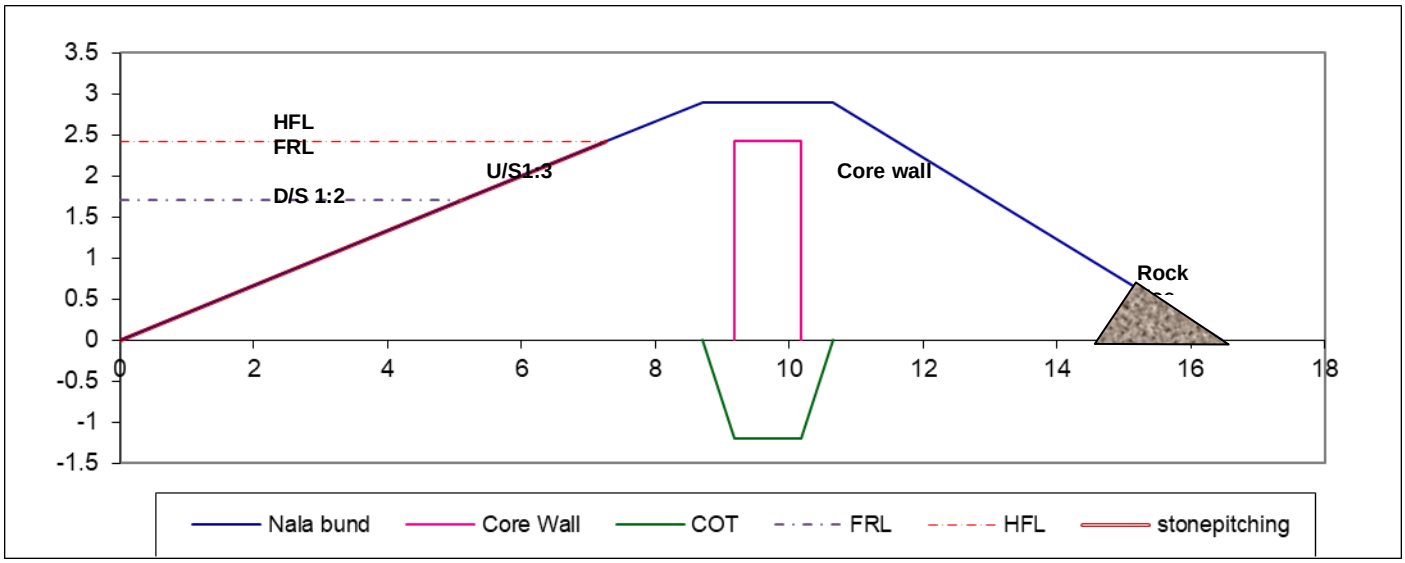
Earthen dam:Design data & Quantities		**Tel river**	**Ganga kanauli Nabada**
	Catchment area	ha	50
	Free Board	M	1.20
	Top Width	M	2.2
	Bottom width	M	16.7
	Core Wall Width	M	2.2
	Cut Off Trench Depth	M	1.2
	Surplus weir Width	M	8.90
	Total Length	M	43.9
	Max. height	M	2.90
	D/S Slope 1:		2
	U/S Slope 1:		3
	Earthen dam:Quantities		
	Particular	A/U	Qty.
1	Stripping 15 cm Thick For Work site	Cum	50.90
2	Excavation of puddle Trench		
	Top width	Mtr.	2.2
	Bottom width	Mtr.	1.2
	Total Depth	Mtr.	1.2
	Depth in Hard Soil	Mtr.	0.5
	Depth in Hard Moorum	Mtr.	0.7
	Area of X-Section in hard Soil	Sqm	0.98
	Area of X-Section in hard Moorum	Sqm	1.03
	Length of Puddle Trench	Mtr.	39.90
	Total Qty. of E/W	Cum	**80.20**
	Qty of E/W in Hard Soil	Cum	39.00
	Qty of E/W in Hard Moourum	Cum	41.20

3	Puddle filling of Trench	Cum	80.20
	Transport of Clay 0.5km Lead	Cum	80.20
	Transport of Water 1km Lead (Actual Rates)	Cum	80.20
4	Construction of Core wall	Cum	**72.84**
	Transport of Clay 0.5km Lead	Cum	72.84
	Transport of Water 1km Lead (Actual Rates)	Cum	72.84
5	Earthwork in Embankment i/c Corewall & Rocktoe	Cum	**444.59**
	E/W excluding Corewall and Rocktoe	Cum	361.66
	E/W in Embankment in Hard Soil in Cum @	70%	253.17
	E/W in Embankment in Hard Moorum in Cum @	30.0%	108.50
6	Stone pitching 22.5 cm thick on U/s face of Embankment	sqm	**137.37**
7	Grass turfing on downstream side slope	sqm	**122.76**
8	Construction of rock toe	Cum	**10.09**
9	Excavation of Surplus weir	Cum	266.95
	In Hard soil	Cum	266.95
10	Lining of Exit weir surface area with stone pitching	sqm	**272.46**

Drawing of Earthen Embankment:







Estimate of Earthen Embankment:

Detail cost Estimation of Earthen Embankment														
Name of the Work								30.00	M	Width		16.66		
Village: Ganga Kanauli -Nabada						GP – Nabada								
Block- Jalalpur						District- Saran								
dz	SOR	Description of Item	No		Length	Width	Height/Depth	Quantity	Unit	Rate	Total Amount	Labour rate	Labour amount	Material amount
1		2	3		4	5	6	7	8	9	10	11	12	13
	101	Cleaning of Site Grass Cutting Pile making and removing from site	1	1	52.80	16.66		879.59	Sqm	1.80	1583	1.8	1583	0
2	317	Knotting of Grasses												
	(d)	Marking of Single spade at least 0.75cm deep	1	4	52.80	-	-	211.19	m	0.30	63	0.3	63	0
3	2302	Cutting of Soil at least 15 cm deep with Slope of 1:12 and making embankment on ladder way ,at least 50 m lead and with complete dressing												
		Area of stripping	1	1	339.30		0.15	50.90	Cum	132.36	6736	132.4	6736	0
	301	Excavation of E/W(with deep at least 30cm, and width 1.50 m and area,more than 10 sqm and lead with 50m of excavated soil with dressing , levelling and proper cleaning to be done												
	¼d ½	Soft/hard soil /Murrum												
		Puddle trench						80.196						
		Waste weir						266.951						
		For Earthen embankment						444.587						

							791.733	Cum	110.30	87328	110.3	87328	0
5	2303	Earthen / embankment soil slope should proper dressing ,levelling and compacting to be done properly											
							791.73	Cum	110.30	87328	110.3	87328	0
6	2305 + 2307	The Cutting of Puddle trench excavation and black soil collection and re-filling with proper watering and compacting to be done											
		Puddle trench					80.196	Cum					
		For Earthen embankment					444.58	Cum					
		Core wall					72.835	Cum					
							597.61	Cum	285.80	170799	285.8	170799	0
	2308 & 2309												
							10.086	Cum	1317.17	13285	163.80	1652	11633
5	2310 & 2311	In The earthen Embankment Pitching of stone work ,proper setting ,pitching and soill filling to be done except foundation cutting											
		Boulder Besalt or Granite picking from minning or collection from stored place to site											
							409.83	Sqm	437.40	179259	268.60	110080	69179
6	1901+1902+1904	loading /unloading shifting upto site											
		22 cm thick boulder					102.30	Cum	217.98	22299			22299
		Puddle black soil					153.03	Cum	104.13	15935			15935
		Water					179.29	Cum	30.00	5379	30.0	5379	0
7		**Cost of wasteweir**								**93623**	**0**	**22264**	**71359**
							;ksx			**6836 19**		**493213**	**190406**
		wages difference from 1st june 15 enhancement of wage labour					3102		15	46530		46530	

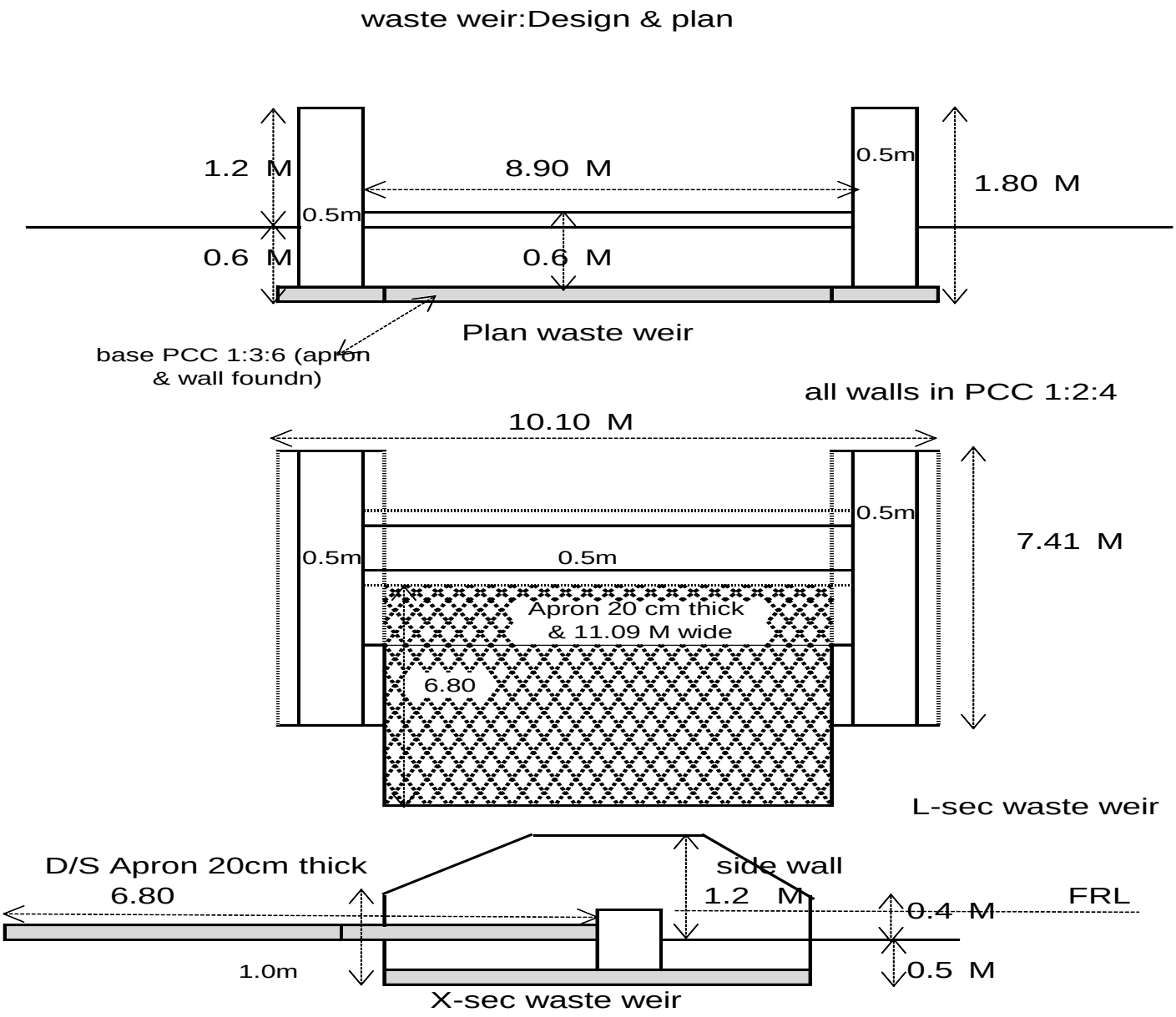
7		The cost of mate at work site						62	Mdays	197.00	12222			12222
8		Drinking water availability for labour water drinking						62	Mdays	174.00	10795		10795	0
9		Shade from heat,and first aid kit						Lumsum			1500			1500
10		Board and photo graph						Lumsum			5000			5000
12		Contengency charges 5%									36507			36507
								Total amount			**796173**		**550538**	245635
						Ratio	Amount		Percentage					
						Labour	550538		**69**	%				
						Material	245635		**31**	%				
						Total	796173		**100**	%				

cost estimate of waste weir

SN	SOR-item	Description of Work	No	Length	Width	height/depth	Quantity	Unit	Total rate	Total amount	Labour rate	Material	Total material	
1		2	3	4	5	6	7	8	9	10	11	12	13	
1	101	Cleaning of Site, Grass Cutting and removing from Site												
			1	9.89	6.00		59.34	sqm	1.80	107		107		
4	301	Earth work excavation (30cm deep,width 1.5m and area more than 10 sqm) and 50 m lead and 1.5 lift to be done												
		Soft/Hardor Murrum soil												
		For foundation of waste weir main wall	1	11.09	0.60	0.60	3.99	Cum						
		For Apron D/S	1	11.09	0.60	0.15	1.00	Cum						
		For wing wall L/S & R/S	2	6.00	0.60	0.60	4.32	Cum						
		Total Qty. of E/W				;ksx	9.31	Cum						
	301¼[k½	Of which, soft soil/hard soil…. (@70%)					6.52	Cum	110.30	719	1103.0	719	0	
	302 ¼d½	Of which, SR/ hard conglonmerate/ Disintgrated rocks…….. (@30%)					2.79	Cum	267.20	746	267.20	746	0	

										1466		1466	0	
5	304	E/Work to be done as per engr incharge for filling soil ,dressing, compacting and others as per instruction												
		Total excvn - Qty of Masonary in foundation	1				12.49	Cum	110.30	1377	110	1377	0	
6	413 ¼[k½	In Foundation 40 mm stone filling and watring, for PCC(1:3:6) compacting and dressing Work to be done												
		For foundation of waste weir main wall	1	10.10	0.60	0.10	0.61	Cum						
		For wing wall L/S & R/S	2	7.41	0.60	0.10	0.89	Cum						
		For Apron D/S	1	10.10	6.80	0.10	6.87	Cum						
		Total Qty. of PCC 1:3:6				;ksx	8.36	Cum	2527.00	21131	498.8	4171	16960	
8	425¼x½ 426	RCC Work with 1:2:4,lifting,bringing and Pouring into column and other area with Ratioo(1:2:4)												
		For waste weir main wall	1	10.10	0.50	0.60	3.03	Cum						
		For wing wall L/S & R/S	2	7.41	0.50	0.95	7.04	Cum						
		For Apron D/S	1	10.10	6.80	0.08	5.15	Cum						
							15.22	Cum	3731.20	56786	656.6	9993	46793	
12	1007	12 mmThick Plastering												
	¼[k½	Cement Mortar (1:4)												
		Over apron D/S	0	0	0		0.00	Sqm						
		For head wall both side & top	2	10.1	0.3		6.06	sqm						
		for wing wall faces	2	7.41	0.95		14.08	sqm						
		Over top surface of walls	2	6	0.5		6.00	sqm						
		Head wall top	1	10.1	0.5		5.05	sqm						
		12 mm thick Plastering in CM 1:4…					31.19	sqm	103.90	3240	44.50	1388	1853	
14	430- 431	Shuttering on RCC work, support, and opening of shutterin ,support and removing from site except transport												
		Farm work for all other structures…… for coping…												
		For waste weir main wall	2	10.1		0.6	12.12	Sqm						
		For wing wall L/S & R/S	4	6		0.95	22.80	Sqm						
		For Apron D/S	2	6.8		0.15	2.04	Sqm						
		for sides of wing wall	4	0.6		0.5	1.20	Sqm						
		Total Farm work					38.16	Sqm	211.00	8051	60.20	2297	5754	

Drawing of Earthen Embankment:



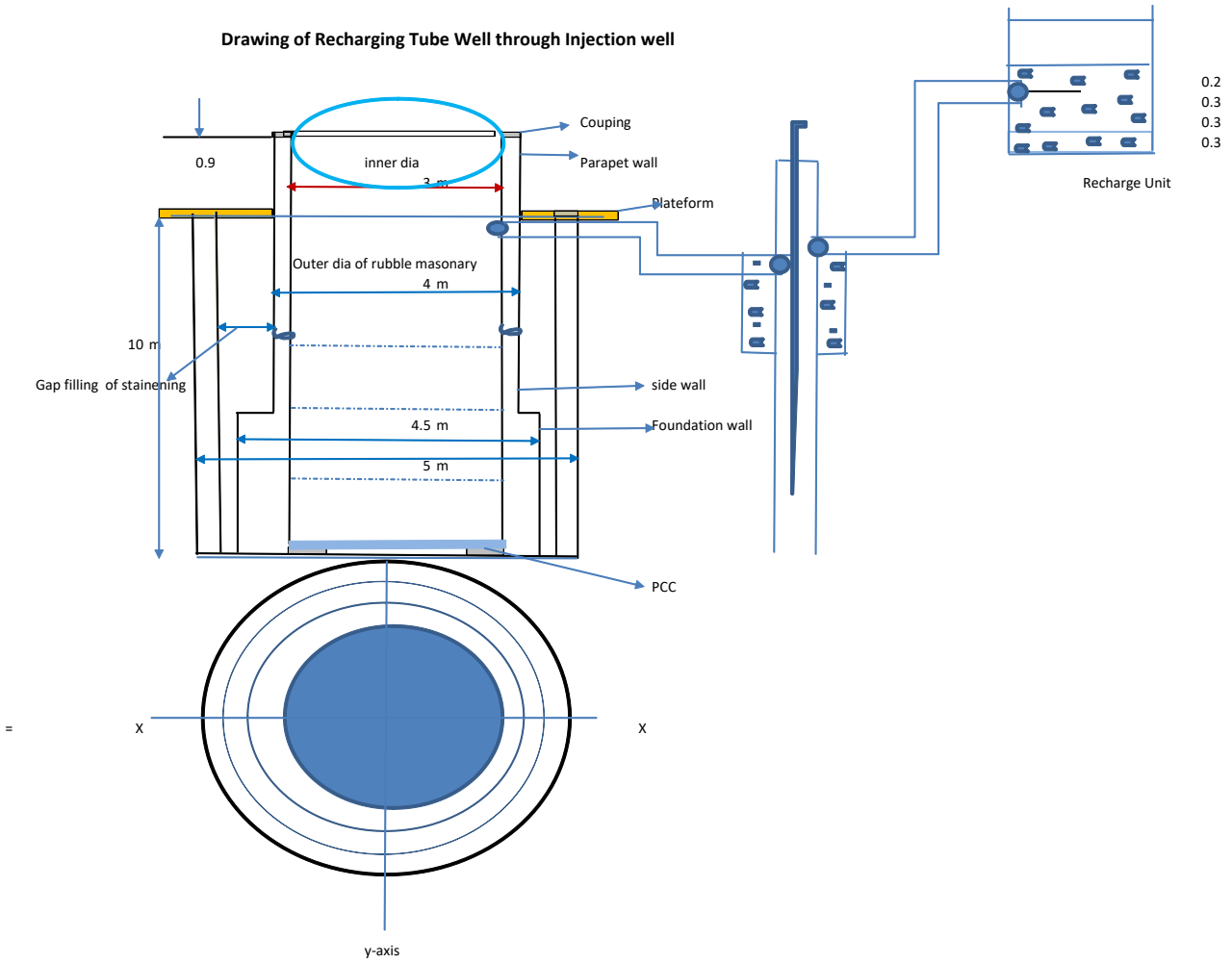
Bill of Quantity:

Detailed BOQ of waste weir Proposed on				Village: Ganga Kanauli –Nabada			
Sr No	**Particulars**	**A/U**	**Nos**	**L**	**W**	**D/H**	**Volume**
	Site Cleaning & Grass Cutting	**Sqm**	**1**	**8.90**	**25.0**		222.46
A	**Excavation for foundation**						
	For foundation of waste weir main wall	Cum	1	10.10	0.60	0.6	3.64
	For Apron D/S upto nala bed	Cum	1	10.10	6.80	0.15	10.30
	For wing wall L/S & R/S	Cum	2	7.41	0.50	0.6	4.45
	Total Qty. of E/W						18.38
3	Back filling in foundation….with excavated soil						
	Total excvn - Qty of Masonary in foundation	Cum		18.38	5.90		**12.49**
4	PCC in foundation in 1:3:6, C/C with 40mm metal						
	For foundation of waste weir main wall	Cum	1	10.10	0.60	0.1	0.61
	For wing wall L/S & R/S	Cum	2	7.41	0.60	0.1	0.89
	For Apron D/S	Cum	1	10.10	6.80	0.10	6.87
	Total Qty. of PCC 1:3:6						**8.36**
5	PCC in foundation in 1:2:4, C/C with 40mm metal						
	For waste weir main wall	Cum	1	10.10	0.50	0.6	3.03
	For wing wall L/S & R/S	Cum	2	7.41	0.50	0.95	7.04
	For Apron D/S	Cum	1	10.10	6.80	0.075	5.15
	PCC1:2:4	Cum		**Total Qty. of PCC**			**15.22**
7	12 mm thick Plastering in CM 1:4…						
	For head wall both side & top	Sqm	2	10.10	0.30		6.06
	for wing wall faces	Sqm	2	7.41	0.95		14.08
	Over top surface of walls	Sqm	2	6	0.50		6.00
	Head wall top	Sqm	1	10.10	0.50		5.05
	Total area						**31.19**
8	Farm work for all other structures…… for coping…						
	For waste weir main wall	Sqm	2	10.10		0.6	12.12
	For wing wall L/S & R/S	Sqm	4	6		0.95	22.80
	For Apron D/S	Sqm	2	6.80		0.15	2.04
	for sides of wing wall	Sqm	4	0.60		0.5	1.20
	Total Farm work	Sqm					**38.16**

Design & Cost Estimation No – 10A

Cost Estimation for Tube Well Recharging With Injection Well Methods									25.915835N, 84.65175E
S.No.	**Particulars of Work**	**Length (M)**	**Width (M)**	**Depth (m)**	**Quantity**	**Rate**	**Unit**	**Amount**	**Remark**
1	Site clearence, cutting of bushes, grasses, etc.	50	4	0	200	1.8	sq m	360	
2 (a)	Excavation of Earth work in bulk, excavation in trenches for foundation and for pipes, cables, etc. (not exceeding 1.5m width) in	30	1	1	30	38	cu m	1140	SOR WRD dated 01.09.2017 item no 2.01 of page 26
2 (b)	Excavation of Dense and hard soil	30	1	1	30	81	cu m	2430	SOR WRD dated 01.09.2017 item no 2.02 of page 26
2 (c.)	Excavation of Hard murram (Nala to recharging point)and water storage pit	30	1	1	30	81	cu m	2430	SOR WRD dated 01.09.2017 item no 2.02 of page 26
3	Excavation of Earth work in bulk, excavation exceeding 30 cm. in depth and 1.5m. Width, 1/2 disposal of excavated soil lead up to 30m. And lift 1.5m								
3 (a)	Water storage put in hard murram	61.5	6	6	54	252	cu m	13608	SOR WRD dated 01.09.2017 item no 2.03 of page 26
3 (b)	Excavation for filter. Hard murram	3	3	1	9	252	cu m	2268	SOR WRD dated 01.09.2017 item no 2.03 of page 26
3 (c.)	D.I.R	3	3	1	9	252	cu m	2268	SOR WRD dated 01.09.2017 item no 2.03 of page 26
4	Excavation of boring with boring tube well machine 1500mm bore	40			40	350	MT	14000	As per market rate
5	Cost of 150 mm PVC. Casing pipe and shifting in the bore	40			40	495	MT	19800	As per market rate
6	Provide filter material including filling of gravel ground pipe	3	3	2	18	483.1	cu m	8695.8	As per market rate
7	Provide PVC pipe of 110m. From Nala to water storage tank, and storage tank to filter	60			60	175	MT	10500	As per market rate
8	Labour charges of fitting PVC pipe	60			60	4.3	MT	258	As per market rate
9	Transporation of material	LS						5000	As per market rate
	Total							82757.8	
10	Contingencies and miscellaneous charges @ 3.5% on total cost							2896.52	
11	20% extra for escalating of material cost							19448.0	
12	Injection Recharge well cost 10.5 m d and 6m dia							**250540**	
13	**Tube well recharge cost**							**105102**	
14	**Grand Total Cost of Recharge Unit**							**355642**	

Drawing of Recharge Unit:



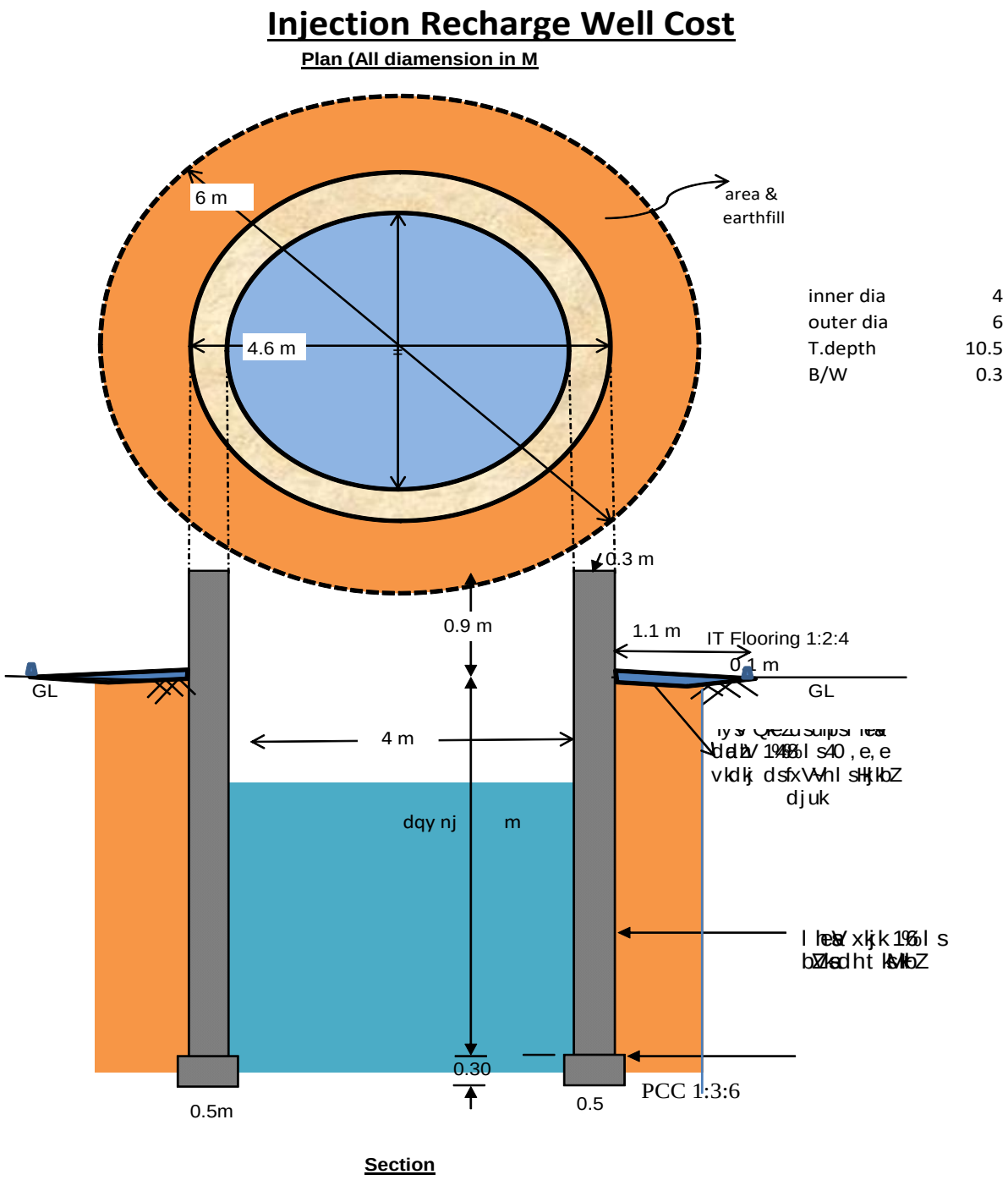
Estimation for excavation of well cost 10a:

Detailof Cost estimation for excavation of well										
Name ofthe Work - irrigation Well (4 m Dia and 9 m Depth)										
		Name of Village		Name of GP						
		Block-		District-						
		Earth work dia	6	Qnty	(3.14*dia*dia*depth)/4			Inner well Dia	4	
		depth	10.5							
dz	SOR Item No	Discription	Measurement	Qty	Unit	Total rate	Total amount	Labour Cost	Total labour	Total Material (7-9)
1	2	3	4	5	6	7	8	9	10	11
1	2401(B)	Earth Work excavation aand digging of 1.5 m depth and Lifting, lead upto 50 m with complete dressing								
		0.00 to 1.50 m	1.50	42.39	Cum	98.10	4158	98.10	4158	0

	2401 (B) +2403 (A)	1.50 to 2.00 m	0.5	14.13	Cum	105.90	1496	105.90	1496	0
			0.5	14.13	Cum	113.70	1607	113.70	1607	0
			0.5	14.13	Cum	121.50	1717	121.50	1717	0
			0.5	14.13	Cum	129.30	1827	129.30	1827	0
			0.5	14.13	Cum	137.10	1937	137.10	1937	0
			0.5	14.13	Cum	144.90	2047	144.90	2047	0
		4.50 to 6.00 m	0.5	14.13	Cum	152.70	2158	152.70	2158	0
	2402 (A) +2404 (B)		0.5	14.13	3.00 to 4.50 m	429.40	6067	429.40	6067	0
			0.5	14.13	Cum	443.50	6267	443.50	6267	0
		6.0 to 7-50 m	0.5	14.13	Cum	457.60	6466	457.60	6466	0
			0.5	14.13	Cum	471.70	6665	471.70	6665	0
			0.5	14.13	Cum	485.80	6864	485.80	6864	0
		7-50 to 9.00 m	0.5	14.13	Cum	499.90	7064	499.90	7064	0
			0.5	14.13	Cum	514.00	7263	514.00	7263	0
			0.5	14.13	Cum	528.10	7462	528.10	7462	0
	2401 A	Costruction of Plateform		2.03	Cum	98.10	200	98.10	200	0
2	2405	Digging of Soil in hard Soil under water with Lift and lead upto 1.5m								
		7.50 m to 9 m (20%vf/kd nj)	0.5	14.13	Cum	99.98	1413	99.98	1413	0
			0.5	14.13	Cum	102.80	1453	102.80	1453	0
			0.5	14.13	Cum	105.62	1492	105.62	1492	0
3	430	Shuttering for PCC work upto ripening days and open the same Work								
		Outer Part	4.8	4.52						
		Inner Part	3.8	3.58						0
			Total	8.10	Sqm	211.00	1709	60.20	488	1222
4	413 b 414	PCC work with Ratio (1:3:6) with 40 mm Metal work								
				2.03	Cum	2527.00	5118	498.8	1010	4108
5	605 j	Cement Mortar for Brick work (1:6)								
	Well Brick work From 9m to 6m		3	12.15	Cum					
	Well Brick work from 6mto 3m		3	12.15	Cum					
	Well Brick Work From 3m to 00.0 m		3	12.15	Cum					
	Parapet wall		0.9	3.65						
	Substraction of Gate Opening		0.6x0.3x0.6	0.11						
			Total	39.99	Cum	2825.30	112992	87	3479	109513
6	413 g 414	Under the Plateform filling of Pebble with ratio(1:4:8)								
		Plateform	0.1	1.97						
			Total	1.97	Cum	2227.20	4385	498.80	982	3403
7	605 j	Cement Concreate (1:6)								

		Plateform	0.50	1.05						
	Plateform and pani patti		0.10	0.35						
			Total	1.40	Cum	2825.30	3966	87	122	3843
8	1009 g - 1010	15 mm plastering with (1:6) Mortar and including Doga								
	Outer Part of Plateform		0.30	6.41						
		Outer Part	0.60	8.67						
		Upper part	0.30	4.05						
			Total	19.12						
		Substract	1x0.6x0.6	0.36						
			Total	18.76	sqm	90.10	1691	49.8	934	756
9	1022 &1025	In Brick Macacinary filling of gap with (1:3) and (including Teep)								
	Inner Part of the Well		1x3.14x4x6	75.36						
		Substarct	1x0.6x0.6	0.36						
			Total	75.00	Sqm	69.10	5183	58	4350	833
10	1220 & 1221	40 mm thick Flooring wwith 1;3:4 ration with 20 mm metal								
		Plateform	1.1	19.69						
			Total	19.69	sqm	204.20	4020	68.0	1339	2681
11	310 b	Soil Filling in the Outer part of well								
	Quantity of Digging		Quantity of Item no.1	254.34						
	Substration of Outer quantion of Well			91.00						
			Total	163.34	Cum	71.50	11679	71.50	11679	0
12	402	Filling of good murrum /Hard Soil								
		Plateform	2	3.94						
			Total	3.94	sqm	158.30	623	39.0	154	470
	Pully and rod for water lift						1000			1000
		Total amount for Construction of well					**227988**		**100160**	**127828**
	Difference in enhancing the Labour Rate from 1June 2`015 , the additional labour wages (174-159)		630		15.00		9449		9449	
	Monitoring of the work in Work Site Charges		13		197.00		2511			2511
	Charges of Water Drinking on the Work Site		13		174.00		2218		2218	
	Shadow and hanging Toys for Childrens						1000			1000
	Sign Board and Photograph						5000			5000
	Miscellanious Expenditure %		1	%			2374			2374
			Total Amount (RS)				**250540**		**111827**	**138713**
		Labour	111827	45	%					
		Material	138713	55	%					
		Total	250540	100	%					

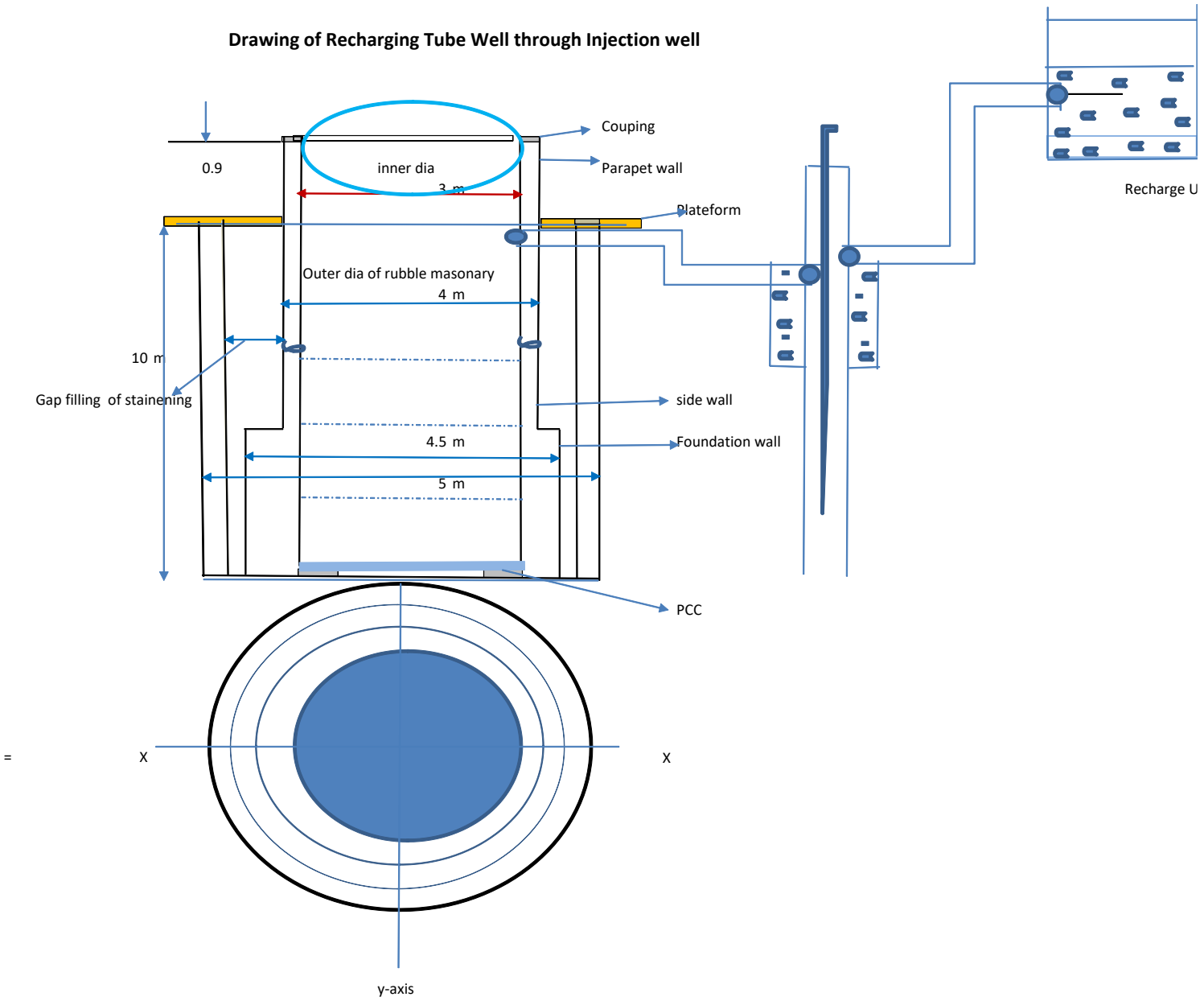
Drawing for Excavation of Well:



Design & Cost Estimation of Well & Tube Well Recharge Shaft Unit: No – 10B

Cost Estimation for Tube Well Recharging With Injection Well Methods									25.915835N, 84.65175E
S.No.	**Particulars of Work**	**Length (M)**	**Width (M)**	**Depth (m)**	**Quantity**	**Rate**	**Unit**	**Amount**	**Remark**
1	Site clearence, cutting of bushes, grasses, etc.	50	4	0	200	1.8	sqm	360	
2 (a)	Excavation of Earth work in bulk, excavation in trenches for foundation and for pipes, cables, etc.	30	1	1	30	38	cum	1140	SOR WRD dated 01.09.2017 item no 2.01
2 (b)	Excavation of Dense and hard soil	30	1	1	30	81	cum	2430	SOR WRD dated 01.09.2017 item no 2.02
2 (c.)	Excavation of Hard murram (Nala to recharging point)and water storage pit	30	1	1	30	81	cum	2430	SOR WRD dated 01.09.2017 item no 2.02
3	Excavation of Earth work in bulk, excavation exceeding 30 cm. in depth and 1.5m. Width, 1/2 disposal of excavated soil lead up to 30m. And lift 1.5m								
3 (a)	Water storage put in hard murram	61.5	6	6	54	252	cum	13608	SOR WRD dated 01.09.2017 item no 2.03
3 (b)	Excavation for filter. Hard murram	3	3	1	9	252	cum	2268	SOR WRD dated 01.09.2017 item no 2.03
3 (c.)	D.I.R	3	3	1	9	252	cum	2268	SOR WRD dated 01.09.2017 item no 2.03
4	Excavation of boring with boring tube well machine 1500mm bore	40			40	350	MT	14000	As per market rate
5	Cost of 150 mm PVC. Casing pipe and shifting in the bore	40			40	495	MT	19800	As per market rate
6	Provide filter material including filling of gravel ground pipe	3	3	2	18	483.1	cum	8695.8	As per market rate
7	Provide PVC pipe of 110m. From Nala to water storage tank, and storage tank to filter	60			60	175	MT	10500	As per market rate
8	Labour charges of fitting PVC pipe	60			60	4.3	MT	258	As per market rate
9	Transporation of material	lumpsu						5000	As per market rate
	Total							82757.8	
10	Contegencies and miscellenous charges @ 3.5% on total cost							2896.523	
11	20% extra for escalating of material cost							19448.08	
12	Injection Recharge well cost 10.5 m d and 6m dia							**250540**	
13	**Tube well recharge cost**							**105102.4**	
14	**Grand Total Cost of Recharge Unit**							**355642**	

Drawing of Recharge Unit 10 b:

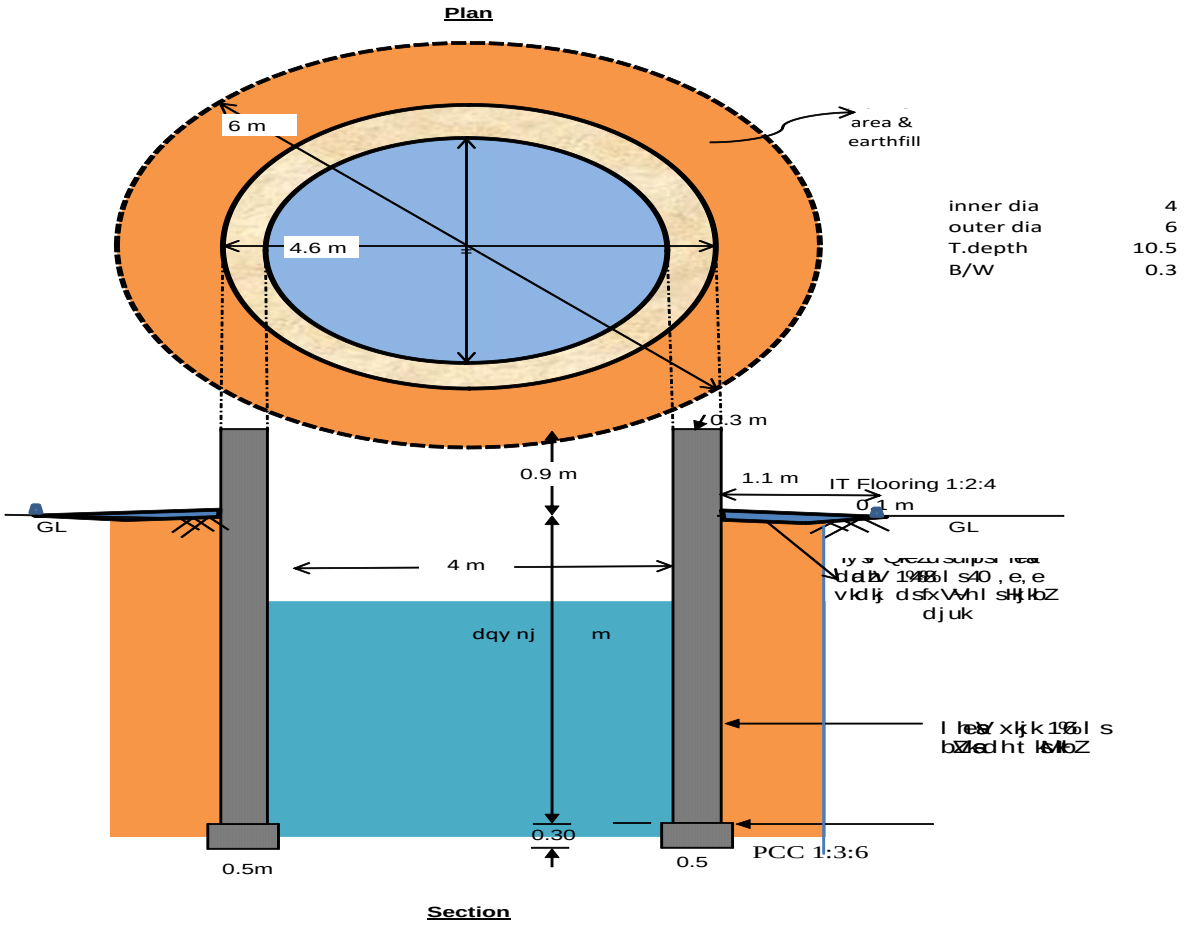


Estimate for excavation of Well 10b:

Detailof Cost estimation									
Name ofthe Work - irrigation Well (4 m Dia and 9 m Depth)									
		Name of Village		Name of GP					
		Block-		District-					
		Earth work dia	6	Qnty	(3.14*dia*dia*depth)/4			Inner well Dia	4
		depth	10.5						

dz	SOR Item No	Discription	Measurement	Qty	Unit	Total rate	Total amount	Labour Cost	Total labour		Total Material (7-9)
1	2	3	4	5	6	7	8	9	10		11
1	2401(B)	Earth Work excavation aand digging of 1.5 m depth and Lifting, lead upto 50 m with complete dressing									
		0.00 to 1.50 m		1.50	42.39	Cum	98.10	4158	98.10	4158	0
	2401 (B) +2403 (A)	1.50 to 2.00 m		0.5	14.13	Cum	105.90	1496	105.90	1496	0
				0.5	14.13	Cum	113.70	1607	113.70	1607	0
				0.5	14.13	Cum	121.50	1717	121.50	1717	0
				0.5	14.13	Cum	129.30	1827	129.30	1827	0
				0.5	14.13	Cum	137.10	1937	137.10	1937	0
				0.5	14.13	Cum	144.90	2047	144.90	2047	0
		4.50 to 6.00 m		0.5	14.13	Cum	152.70	2158	152.70	2158	0
	2402 (A) +2404 (B)			0.5	14.13	3.00 to 4.50 m	429.40	6067	429.40	6067	0
				0.5	14.13	Cum	443.50	6267	443.50	6267	0
		6.0 to 7-50 m		0.5	14.13	Cum	457.60	6466	457.60	6466	0
				0.5	14.13	Cum	471.70	6665	471.70	6665	0
				0.5	14.13	Cum	485.80	6864	485.80	6864	0
		7-50 to 9.00 m		0.5	14.13	Cum	499.90	7064	499.90	7064	0
				0.5	14.13	Cum	514.00	7263	514.00	7263	0
				0.5	14.13	Cum	528.10	7462	528.10	7462	0
	2401 A	Costruction of Plateform			2.03	Cum	98.10	200	98.10	200	0
2	2405	Digging of Soil in hard Soil under water with Lift and lead upto 1.5m									
		7.50 m to 9 m (20%vf/kd nj)		0.5	14.13	Cum	99.98	1413	99.98	1413	0
				0.5	14.13	Cum	102.80	1453	102.80	1453	0
				0.5	14.13	Cum	105.62	1492	105.62	1492	0
3	430	Shuttering for PCC work upto ripening days and open the same Work									
		Outer Part		4.8	4.52						
		Inner Part		3.8	3.58						0
				Total	8.10	Sqm	211.00	1709	60.20	488	1222
4	413 b 414	PCC work with Ratio (1:3:6) with 40 mm Metal work									
					2.03	Cum	2527.00	5118	498.8	1010	4108
5	605 j	Cement Mortar for Brick work (1:6)									
	Well Brick work From 9m to 6m			3	12.15	Cum					
	Well Brick work from 6mto 3m			3	12.15	Cum					
	Well Brick Work From 3m to 00.0 m			3	12.15	Cum					
	Parapet wall			0.9	3.65						
	Substraction of Gate Opening			0.6x0.3x 0.6	0.11						
				Total	39.99	Cum	2825.30	112992	87	3479	109513

6	413 g 414	Under the Plateform filling of Pebble with ratio(1:4:8)								
		Plateform	0.1	1.97						
			Total	1.97	Cum	2227.20	4385	498.80	982	3403
7	605 j	Cement Concreate (1:6)								
		Plateform	0.50	1.05						
		Plateform and pani patti	0.10	0.35						
			Total	1.40	Cum	2825.30	3966	87	122	3843
8	1009 g -1010	15 mm plastering with (1:6) Mortar and including Doga								
		Outer Part of Plateform	0.30	6.41						
		Outer Part	0.60	8.67						
		Upper part	0.30	4.05						
			Total	19.12						
		Substract	1x0.6x0.6	0.36						
			Total	18.76	sqm	90.10	1691	49.8	934	756
9	1022& 1025	In Brick Macacinary filling of gap with (1:3) and (including deep)								
		Inner Part of the Well	1x3.14x4x6	75.36						
		Substarct	1x0.6x0.6	0.36						
			Total	75.00	Sqm	69.10	5183	58	4350	833
10	1220 & 1221	40 mm thick Flooring wwith 1;3:4 ration with 20 mm metal								
		Plateform	1.1	19.69						
			Total	19.69	sqm	204.20	4020	68.0	1339	2681
11	310 b	Soil Filling in the Outer part of well								
	Quantity of Digging		Quantity of Item no.1	254.34						
	Substration of Outer quantion of Well			91.00						
			Total	163.34	Cum	71.50	11679	71.50	11679	0
12	402	Filling of good murrum /Hard Soil								
		Plateform	2	3.94						
			Total	3.94	sqm	158.30	623	39.0	154	470
	Pully and rod for water lift						1000			1000
		Total amount for Construction of well					227988		100160	127828
	Difference in enhancing the Labour Rate from 1 June 2`015 , the additional labour wages (174-159)		630		15.00		9449		9449	
	Monitoring of the work in Work Site Charges		13		197.00		2511			2511
	Charges of Water Drinking on the Work Site		13		174.00		2218		2218	
	Shadow and hanging Toys for Childrens						1000			1000
	Sign Board and Photograph						5000			5000
	Miscellanious Expenditure %		1	%			2374			2374
				Total Amount (RS)			**250540**		**111827**	**138713**
		Labour		111827	45	**%**				
		Material		138713	55	**%**				
		Total		250540	100	**%**				



Design &Cost Estimation No – 10C

Location of Required Structure:	GPS Location in decimal	
		25.929013N, 84.64655E
Design of deepening River Work- Kumna Nawada	Length of Trench M	700
Climate Resilient Work	Unit	Water Conveyance structure
Name of River		**Tel River**
Type of work	Deepening of existing nalla structure	
Shape of the Pyne		Trapezoidal
Catchment (Ha)	Ha	NA
Fetch length (Max length of Travel)	M	1200
Slope of the Area		0-1%
Type of Soil		loam/black
Existing Depth (d) of Pyne		0.20
Existing Top Width (TW) of Pyne	M	10.00
Exiting Bottom Width (BW) of Pyne	M	5.00
Proposed Depth of Pyne (including 0.15 m free board)		2.00
Total depth of channel (existing + proposed)	M	2.20
Proposed TW of River	M	15.00
Proposed BW of River	M	10.00

Proposed cross-sectional Area of River (a= 1/2 (TW +BW)x Depth)	Sqm	27.50
Catchment Area of the River	Ha	500
Fetch length (Max length of Travel)	M	1200
Elevation difference from remote point to outlet of discharge		2
Command Area of the Pyne (ha)	Ha	230
Wetted Perimeter (p) (p = Bw + 2 (√(d² + (1.5 d) ²) = Bw +3.604d)		17.93
Hydraulic Radius R = a/p		1.53
S (Slope) = H/L		0.00
K = L/√S,		29393.88
Time of Concentration (Tc = 0.0195K0.77) where K = L/√S, and S(slope) = H/L, L = Maximum length of travel = 1400 m, and H = difference in elevation between most remote point and outlet point = 8m (minimum)		53.78
Per day maximum rainfall (as per Climate modelling report)		235
Rain fall intensity (I) , as per climate variability report (one day max rain fall 150 MM/day)	mm/hr	262.20
Coefficient of runoff © as per differnet catchment terrain May vary from 0.3 to 0.5		0.5
Manning's coefficient (n) may varies as per soil type of location		0.02
Discharge from drainage area (Q = CIA) Where C = Runoff coefficient = 0.4 for loamy soil arable land and slope rang 5-10%), I= Rainfall intensity (cm/hr), mean rainfall intensity for the design recurrence interval and for a duration equal to the time of concentration, A = Drainage Area (m²)	cum/sec	182.08
S (Longitudinal gradient slope of channel) varies as per site slope and location(taking (1/6000)		0.00017
Velocity of water flow (V = R⅔S½/n)Where R= Hydraulic Radius, S = Longitudinal slope (may be assumed assume 1/6000 approx.), n = manning's coefficient = 0.02 for ordinary firm loam soil type		0.858
Maximum permissible velocities in non-vegetated canal for ordinary firm loam soil type (Reference table , After Fortier and Scobey, 1926)		Clean water =0.75m/sec
	Water with Colloidal silt =1.05M/sec	
	Water with sand Gravel =0.68m/sec	
As the designed velocity is within the permissible velocities limit, so we can say that the design of pyne is suitable.		

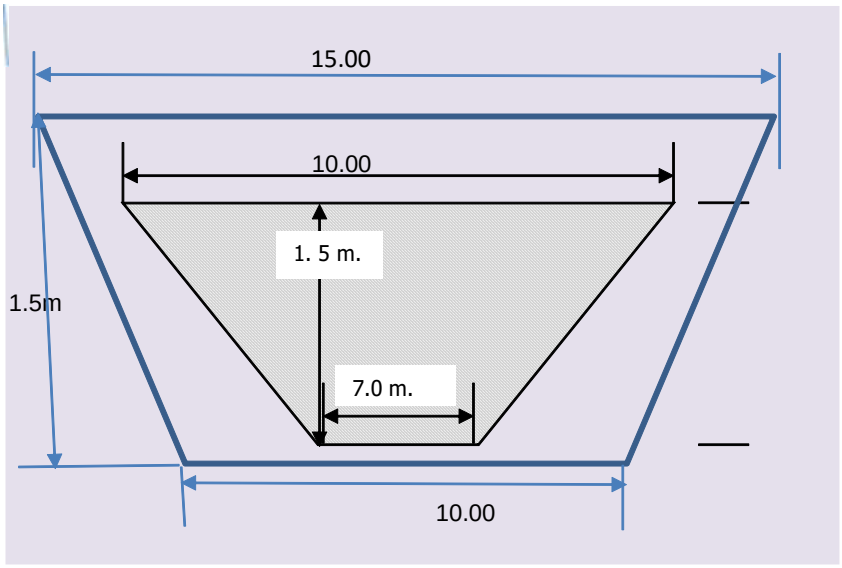
Cost Estimate 10c:

Site Location : Tench /Pyne									
Diamentions	length (ft)	Top WidthM	Bottom Width M	depth M					
Proposed	700	15.00	10.00	2.00					
Existing dimentions	700	10.00	5.00	0.20					

Abstract of Cost Estimation									
Description of the work- Ahar - Excavation									
Particulars	**Length**	**Top width**	**Bottom width**	**Depth**	**Qnty.**	**Unit**	**Rate**	**unit**	**Amount**
Cleaning of Site, Survey, alignment & layout.					8	mday	177	Rs	1416
Earthwork cutting in Soft /Hard soil with initial lift including rough dressing and breaking of clods to maximum 5cm to 7cm and laying in layers as per direction of the Engineer-in-charge.									
Proposed Surface layer cutting									
Lx(TW+BW)/2XHT	700.0	15.00	10.00	2.00	17500.0	Cum			
Existing depth of the channel	**700.0**	10.00	5.00	0.20	1050.0	Cum			
Actual Earth work to be excavated					16450.0	cum			
M**ale -Mandays calculation** :EW & Lift of soil from 0 to 5 ft depth and height ,the required Man days @80cft/m days soil cutting will be taken for male mdays of 2/3 total work .									
582659.0	cft				4855.5				
Female -Mandays calculation :EW & Lift of soil from 0 to 5 ft depth and height ,the required Man days @68cft/m days soil cutting will be taken for female mdays of 1/3 total work .									
582659.0	cft				2856.2				
Total					7711.7	mdays	177	Rs	**1366380**
Providing leveling, Ramming/ Rolling earth work in embankment side of Ahar manually with all complete job @1000cft/mdays and as per direction of Engineer in charge.									
Total EW/1000					582.7	mdays	177	Rs	103130.64
Providing provision of supervisor (mate) for completing the while jobs and as per direction of engr. In charge are taken in the ratio of (1:40) of Total man-days									
Total Mdays/40					8294.322	mdays			
Extra @ Rs 10 of 40 labour					50.725	Rs	10	Rs	507.25
Total Cost									**1471434**
labour cess 1% of the total Cost									14714.343
Providing cost of sign board ,photography and others LS									3000
Grand Total cost of Irrigation Channel Excavation									**1489149**

Drawing 10c:

All Diamention in Metre



Plantation 10c:

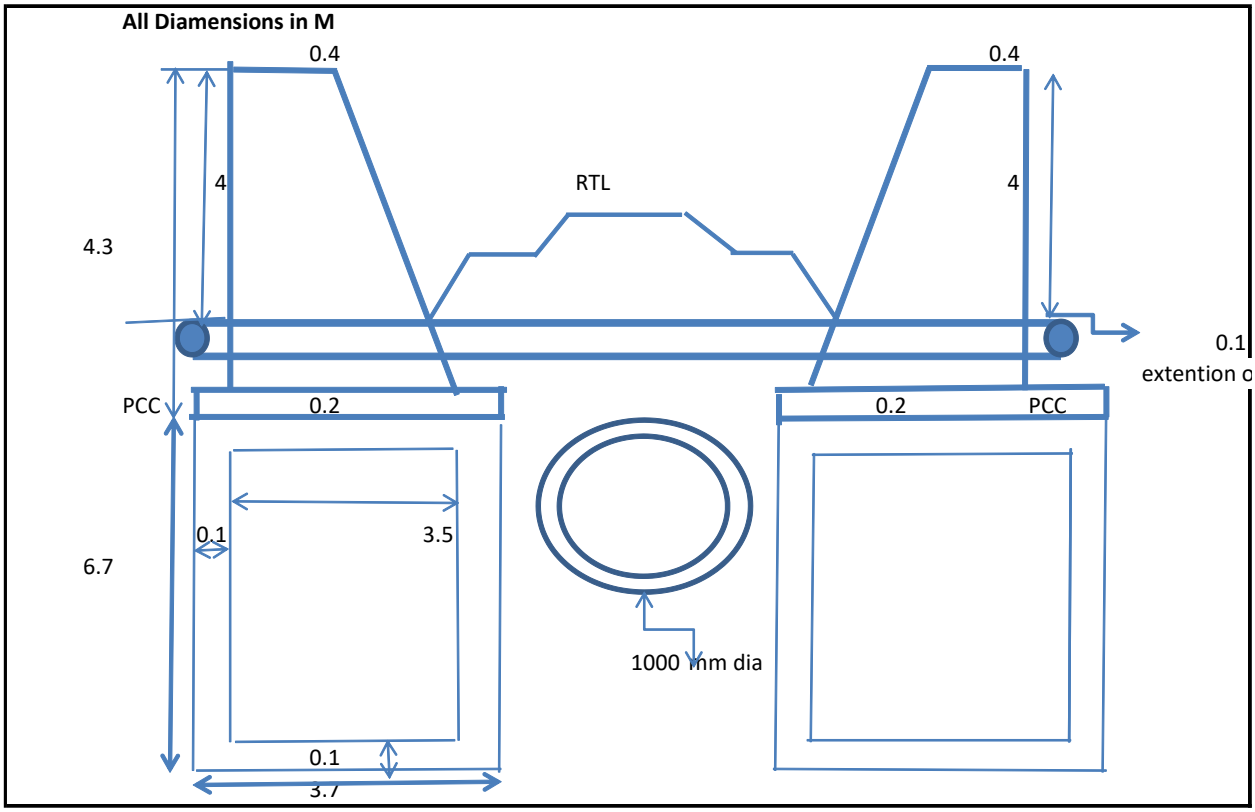
Cost Estimation of Community Plantation on Pyne-In Tel River (one Unit Plantation)					
Subject/ Operation	**Year- 01- Establishment**				
	Unit	Qty.	Rate	Description	Amount
A. Maintenance cost					
Maintaining 100 lenior AF/Fruit plant up to 5 year and security of the same plant by 4 no gardeners	No	At least maintenance of 100 Fruit plants up to five year or 60 month on the basis of living plants	7	100*12*5*4*7	168000
Pit Digging of 100 plant	No	100 Big Fruit plants with Pit size 0.60x0.60x0.60= 43.2 cum or 1524.31 cft/108=14 mdays	177	177*14	2478
	NO	100 AF plants with Pit size 0.30x0.30x0.30x200=5.4 cum or 190.56cft/108=2 mdays	177	177*2	354
Purchasing of Fruit Plants for 100 plants	No	100 fruit plants	35	100*35	3500
	No	100 No Agro forestry plants	15	100*15	1500
Installation of hand Pump	No	Two number on the site of fruit and agroforestry plantation @9500/hand pump	9500	2*9500	19000
Insecticide and pesticide treatment on 200 plants	Lump sump	year -1 after two month in 15 days gap LS@ 0.90 p/plant		200*20*0.90	3600
		year - 2 in 30 days gap LS@ 0.90 p/plant		200*10*0.9	1800
		year -3 in 30 days gap LS@ 0.90 p/plant		200*10*0.10	200
		year - 4 in 30 days gap LS@ 0.90 p/plant		200*10*0.11	220
		year - 5 in 30 days gap LS@ 0.90 p/plant		200*10*0.12	3600
Two bucket ,Mug, Jhara and clothes etc.		up to 5 year Lump sum Expenditure			4000
Permanent Net Fencing for 5 year and maintenance		400 plant fenced with permanent fencing @350/fencing		200x350	70000
		Total cost			**278252**
Miscellaneous expenditure		2 % of estimated cost			5565.04
		Grand Total			**283817.04**

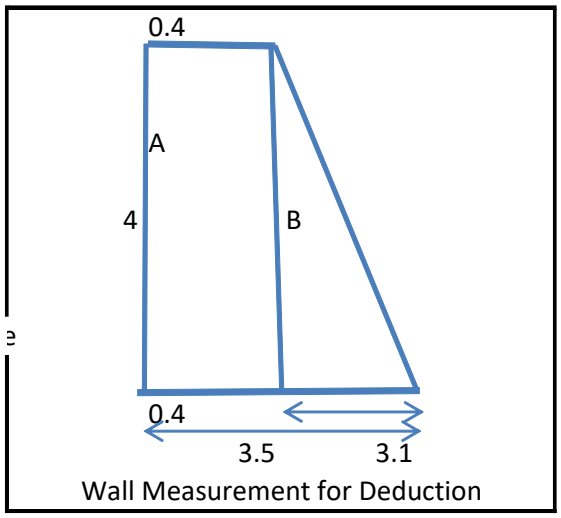
Design & Cost Estimation No – 11A

Location - Village Kumna & Bhatkesari (at 300 point)								Lat ,Long	25.940914N, 84.652183E	
Cost Estimation of Culvert or Pulia Nirman										
SNo	Particulars	No	L	W	H/D	Volume	Quantity	Unit	Rate	Amount
	Foundation -Earth work excavation									
1	Excavation of Foundation (one side)	1	6.7	3.7	4.3	106.60				
	Excavation of Foundation (2nd side	1	6.7	3.7	4.3	106.60		176.86/80cft work		
	Sub Total					**213.19**	**213.194**	Cum	**221**	47115.87
	Pre CementConcrete (PCC-1:4:8)	1	0.2	3.7	6.7	4.96				0
2	**Pre CementConcrete (PCC-1:4:8)**									0
	2nd Side Pre concrete(PCC-1:4:8)	1	0.2	3.7	6.7	4.96				0
	Total PCC					9.92	**9.916**	Cum	**3500**	34706
3	**B/W cement Mortar (1:4) or RCC(1:2:4)**									0
	B/W cement Mortar (1:4) or	1	4	0.4	6.7	10.72				0
	Cement Concrete wall (RCC-1:2:4)	1	3.5	4	6.7	46.90				0

	2nd Side Reinforce concrete Cement (RCC-1:2:4)					57.62	57.62			0
	Total RCC	2	0	0	0		**115.24**	Cum		0
	Volume of Two Wall		3.023	0.3787	3.14	3.59	**7.1898**			0
	Deduction (3.14Xr2xL)									0
	Actual B/W (1:4) Cement Mortar Or						**108.0502**	Cum	**6845**	739603.32
	RCC work(1:2:4)									0
4	Cost of 1000 mm dia or 1m dia RCC hume Pipe	3					3		**12500**	37500
5	Mason	12					12		**600**	7200
6	Labour	34					34		500	17000
7	Board	1					1		2000	2000
7	Micellaneous lump sump								5000	5000
	Total cost of Single Row Pipe Culvert									**890125.19**

Drawing 11a :





Design & Cost Estimation No – 11B

Cost Estimation No -2- River Trench Cutting & Cleaning	Goghuliya	
Location of Required Structure:	GPS Location in decimal	
	25.915835N, 84.65175E	
Design of Pyne CR Work	Length of Trench M	385
Diamention during Field Survey	Unit	Pyne connected (L=500, Tw=6, Bw=2, D=1.5)
Name of River		**Tel River**
Type of Pyne	Renovation of existing Pyne structure	
Shape of the Pyne		Trapezoidal
Catchment (Ha)	Ha	NA
Fetch length (Max length of Travel)	M	1400
Slope of the Area		0-1%
Type of Soil		loam/black
Existing Depth (d) of River /Pyne		1.50
Existing Top Width (TW) of River/Pyne	M	6.00
Exiting Bottom Width (BW) of River or Pyne	M	2.00
Proposed Depth of Pyne (including 0.15 m free board)		1.00
Total depth of channel (existing + proposed)	M	2.50
Proposed TW River Bed Trench	M	10.00
Proposed BW of River bed Trench	M	6.00
Proposed cross-sectional Area of River/Pyne (a= 1/2 (TW +BW)x Depth)	Sqm	20.00
Catchment Area of the River Trench	Ha	50
Fetch length (Max length of Travel)	M	1400
Elevation difference from remote point to outlet of discharge		1.5
Command Area of the River Bed Trech (ha)	Ha	230
Wetted Perimeter (p) (p = Bw + 2 (√(d^2 + (1.5 d) ^{2}) = Bw +3.604d)		15.02

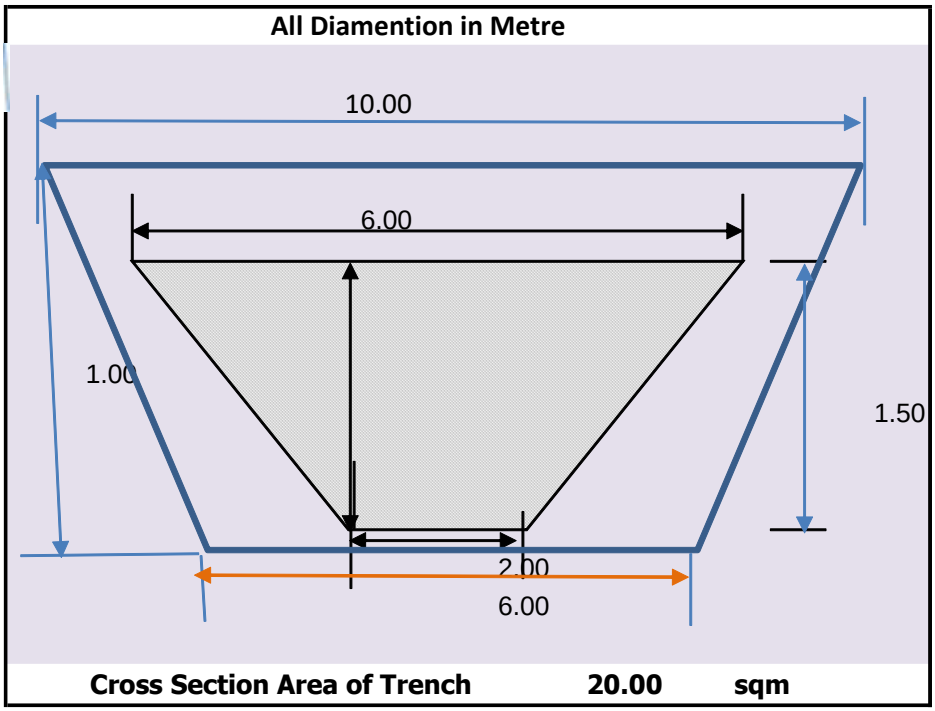
Hydraulic Radius R = a/p		1.33
S (Slope) = H/L		0.00
K = L/√S,		42770.71
Time of Concentration (Tc = 0.0195K0.77) where K = L/√S, and S(slope) = H/L, L = Maximum length of travel = 1400 m, and H = difference in elevation between most remote point and outlet point = 8m (minimum)		71.78
Per day maximum rainfall (as per Climate modelling report)		235
Rain fall intensity (I) , as per climate variability report (one day max rain fall 150 MM/day)	mm/hr	196.43
Coefficient of runoff © as per differnet catchment terrain May vary from 0.3 to 0.5		0.5
Manning's coefficient (n) may varies as per soil type of location		0.02
Discharge from drainage area (Q = CIA) Where C = Runoff coefficient = 0.4 for loamy soil arable land and slope rang 5-10%), I= Rainfall intensity (cm/hr), mean rainfall intensity for the design recurrence interval and for a duration equal to the time of concentration, A = Drainage Area (m^2)	cum/sec	13.64
S (Longitudinal gradient slope of channel) varies as per site slope and location(taking (1/6000)		0.00017
Velocity of water flow (V = R⅔S½/n)Where R= Hydraulic Radius, S = Longitudinal slope (may be assumed assume 1/6000 approx.), n = manning's coefficient = 0.02 for ordinary firm loam soil type		0.781
Maximum permissible velocities in non-vegetated canal for ordinary firm loam soil type (Reference table , After Fortier and Scobey, 1926)	Clean water =0.75m/sec Water with Colloidal silt =1.05M/sec Water with sand Gravel =0.68m/sec	
As the designed velocity is within the permissible velocities limit, so we can say that the design of pyne is suitable.		

Cost estimate: 11B

Site Location : Trench /Pyne CRW-2					**Lat,long**	**25°56'43.81"N, 84°39'10.55"E**			
Dimensions	**length (m)**	Top Width M	Bottom Width M	depth M					
Proposed	385	10.00	6.00	1.00					
Existing dimensions	385	6.00	2.00	1.50					
Abstract of Cost Estimation									
Description of the work- Trench - Excavation									
Particulars	**Length**	**Top width**	**Bottom width**	**Depth**	**Qnty.**	**Unit**	**Rate**	unit	Amount (Rs)
Cleaning of Site, Survey, alignment & layout.					8	mday	177	Rs	1416
Earthwork cutting in Soft /Hard soil with initial lift including rough dressing and breaking of clods to maximum 5cm to 7cm and laying in layers as per direction of the Engineer-in-charge.									
Proposed Surface layer cutting									
Lx(TW+BW)/2XHT	385.0	10.00	6.00	1.00	3080.0	Cum			
Existing depth of the channel	**385.0**	6.00	2.00	1.50	2310.0	Cum			
Actual Earth work to be excavated					770.0	cum			

Male -**Mandays calculation** :EW & Lift of soil from 0 to 5 ft depth and height ,the required Man days @80cft/m days soil cutting will be taken for male mdays of 2/3 total work .									
27273.4	cft				227.3				
Female -Mandays calculation :EW & Lift of soil from 0 to 5 ft depth and height ,the required Man days @68cft/m days soil cutting will be taken for female mdays of 1/3 total work .									
27273.4	cft				133.7				
Total					361.0	mdays	177	Rs	**65307.9503**
Providing leveling, Ramming/ Rolling earth work in embankment side of Ahar manually with all complete job @1000cft/mdays and as per direction of Engineer in charge.									
Total EW/1000					27.3	mdays	177	Rs	4827.3918
Providing provision of supervisor (mate) for completing the while jobs and as per direction of engr. In charge are taken in the ratio of (1:40) of Total man-days									
Total Mdays/40					388.24487	mdays			
Extra @ Rs 10 of 40 labour					50.725	Rs	10	Rs	507.25
Total Cost									**72058.5921**
labour cess 1% of the total Cost									720.5859209
Providing cost of sign board ,photography and others LS									3000
Grand Total cost of Irrigation Channel Excavation									**75779.178**

Drawing of Trench: 11 B



Design & Cost Estimation No - 13 & 14

Location of Required Structure:	GPS Location in decimal	
	25.89414N, 84.665097E	25.89356N, 84.664873E
Design of deepening & desilting River Work-	Length of Trench M	450
Climate Resilient Work	Unit	Water Conveyance structure
Name of River		**Tel River**
Type of work	Deepening of existing nalla structure	
Shape of the Pyne		Trapezoidal
Catchment (Ha)	Ha	NA
Fetch length (Max length of Travel)	M	1200
Slope of the Area		0-1%
Type of Soil		loam/black
Existing Depth (d) of Pyne		0.50
Existing Top Width (TW) of Pyne	M	6.00
Exiting Bottom Width (BW) of Pyne	M	3.00
Proposed Depth of Pyne (including 0.15 m free board)		2.00
Total depth of channel (existing + proposed)	M	2.50
Proposed TW of River	M	12.00
Proposed BW of River	M	6.00
Proposed cross-sectional Area of River (a= 1/2 (TW +BW)x Depth)	Sqm	22.50
Catchment Area of the River	Ha	500
Fetch length (Max length of Travel)	M	1200
Elevation difference from remote point to outlet of discharge		2
Command Area of the Pyne (ha)	Ha	230
Wetted Perimeter (p) (p = Bw + 2 (√(d² + (1.5 d) ²) = Bw +3.604d)		15.02
Hydraulic Radius R = a/p		1.50
S (Slope) = H/L		0.00
K = L/√S,		29393.88
Time of Concentration (Tc = 0.0195K0.77) where K = L/√S, and S(slope) = H/L, L = Maximum length of travel = 1400 m, and H = difference in elevation between most remote point and outlet point = 8m (minimum)		53.78
Per day maximum rainfall (as per Climate modelling report)		235
Rain fall intensity (I) , as per climate variability report (one day max rain fall 150 MM/day)	mm/hr	262.20
Coefficient of runoff © as per differnet catchment terrain May vary from 0.3 to 0.5		0.5
Manning's coefficient (n) may varies as per soil type of location		0.02

Discharge from drainage area (Q = CIA) Where C = Runoff coefficient = 0.4 for loamy soil arable land and slope rang 5-10%), I= Rainfall intensity (cm/hr), mean rainfall intensity for the design recurrence interval and for a duration equal to the time of concentration, A = Drainage Area (m^2)	cum/sec	182.08
S (Longitudinal gradient slope of channel) varies as per site slope and location(taking (1/6000)		0.00017
Velocity of water flow (V = R⅔S½/n)Where R= Hydraulic Radius, S = Longitudinal slope (may be assumed assume 1/6000 approx.), n = manning's coefficient = 0.02 for ordinary firm loam soil type		0.845
Maximum permissible velocities in non-vegetated canal for ordinary firm loam soil type (Reference table , After Fortier and Scobey, 1926)		Clean water =0.75m/sec Water with Colloidal silt =1.05M/sec Water with sand Gravel =0.68m/sec
As the designed velocity is within the permissible velocities limit, so we can say that the design of pyne is suitable.		

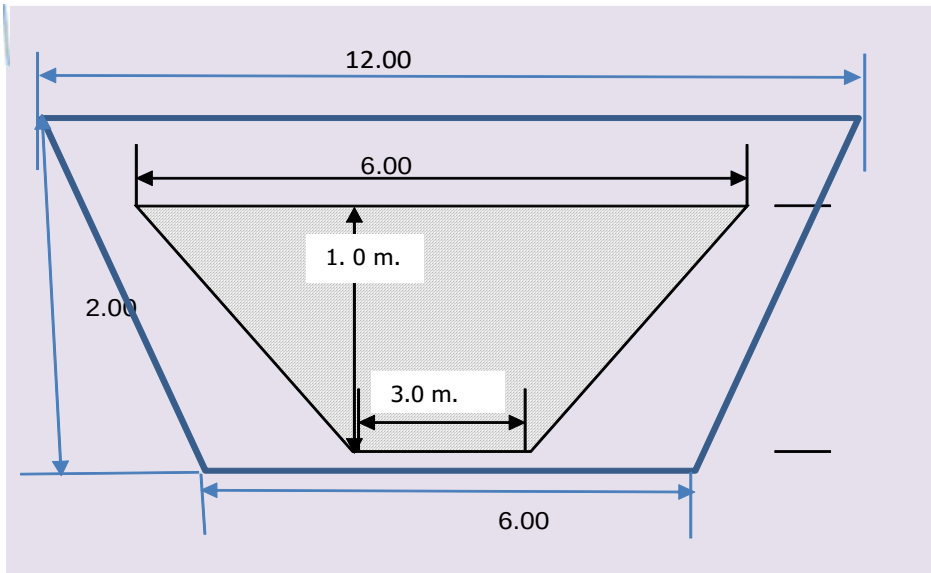
Estimate: 13 & 14

Site Location : Tench /Pyne									
Diamentions	length (ft)	Top Width M	Bottom Width M	depth M					
Proposed	450	12.00	6.00	2.00					
Existing dimentions	450	6.00	3.00	0.50					
Abstract of Cost Estimation									
Description of the work- Ahar - Excavation									
Particulars	**Length**	**Top width**	**Bottom width**	**Depth**	**Qnty.**	**Unit**	**Rate**	**unit**	**Amount**
Cleaning of Site, Survey, alignment & layout.					8	mday	177	Rs	1416
Earthwork cutting in Soft /Hard soil with initial lift including rough dressing and breaking of clods to maximum 5cm to 7cm and laying in layers as per direction of the Engineer-in-charge.									
Proposed Surface layer cutting									
Lx(TW+BW)/2XHT	450.0	12.00	6.00	2.00	8100.0	Cum			
Existing depth of the channel	**450.0**	6.00	3.00	0.50	1012.5	Cum			
Actual Earth work to be excavated					7087.5	cum			
M**ale -Mandays calculation** :EW & Lift of soil from 0 to 5 ft depth and height ,the required Man days @80cft/m days soil cutting will be taken for male mdays of 2/3 total work .									
251039.3	cft				2092.0				
Female -Mandays calculation :EW & Lift of soil from 0 to 5 ft depth and height ,the required Man days @68cft/m days soil cutting will be taken for female mdays of 1/3 total work .									
251039.3	cft				1230.6				
Total					3322.6	mday	177	Rs	**589512**

Providing leveling, Ramming/ Rolling earth work in embankment side of Ahar manually with all complete job @1000cft/mdays and as per direction of Engineer in charge.									
Total EW/1000					251.0	mday	177	Rs	44433.94
Providing provision of supervisor (mate) for completing the while jobs and as per direction of engr. In charge are taken in the ratio of (1:40) of Total man-days									
Total Mdays/40					3573.618	mdays			
Extra @ Rs 10 of 40 labour					50.725	Rs	10	Rs	507.25
Total Cost									**635870**
labour cess 1% of the total Cost									6358.6956
Providing cost of sign board ,photography and others LS									3000
Grand Total cost of Irrigation Channel Excavation									**645228**

Drawing:

All Diamention in Metre



Design and Estimate of Dyke No – 16 A

Name of the Work Under Ground Dyke				
Name of the Village-- Chainpur (savri)			Lat long and Location	
Name of District-Saran			25.890708N, 84.664950E	
Stream - Tel river				
Ditrict				
		GPS position Latitude	N $23^0$56' 30.3''	
		Longitude	E 74^0 49' 07.5''	
	S.no	**Particulars**	**Measerment**	**Unit**
	1	Width of Nala	6.0	Metres
	2	Length of Dyke	7.0	Metres
	3	Top width of Dyke	1.8	Metres
	4	Bottom Width of Dyke	1.05	Metres
	5	Depth of dyke	2.5	Metres

Estimate of Dyke:

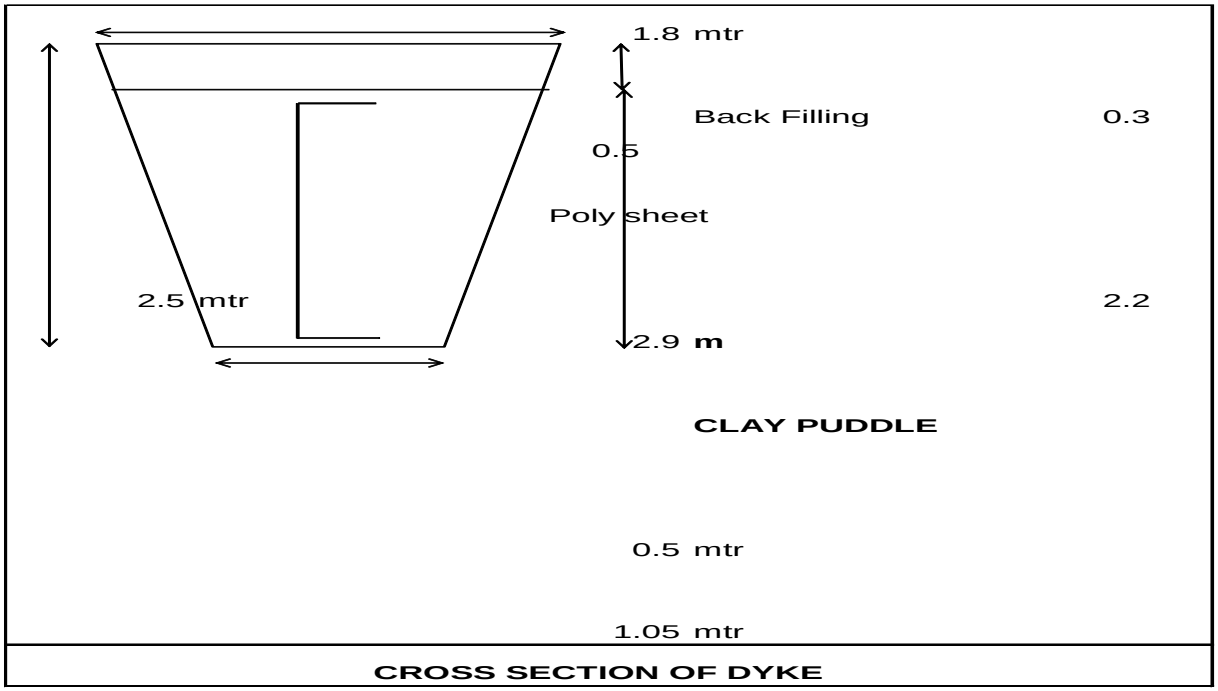
Detail Cost estimation														
Name of the Work	Dyke construction				Length		7.00		M		Depth		2.50	
S no	SOR Item No	Detail of work	No		Length	Width	Height/depth	Quantity	Unit	Rate	Total Amount	Labour rate	Labour amount	Material amount (7-9)
1		2	3		4	5	6	7	8	9	10	11	12	13
1	101	Cutting of Grass , collection of Gracess and Pile making with Removal from the Site												
			1	1	7.00	2.80		19.60	Sqm	1.80	35	1.8	35	0
2	317	Layout Marking												
	(d)	Single Spade line upto 0.75 m deep												
			1	2	9.80	-	-	19.60	RM	0.30	6	0.3	6	0
4	301	Earth work Excavation upto 30cm deep and 1.5m wide greater than 10 sqm with Lift of Soilup to 1.5m lift and lead with 50 away from site , dressing ,Levelling and Curing with Complete task												
	¼d½	Soft /Hard soil/Hard Murrum												
		Dyke						24.938	Cum	110.30	2751	110.3	2751	0
	322	Additinal rate for lifting 1.5 above soil												
	¼[k½	B) Soft and hard Soil						8.750	Cum	11.20	98	11.2	98	0
6	2305 + 2307	Trench Puddle Filling with Good/Black soil, Collecting of Soil from 50 m away, Ramming , Dhurmushing and watering with Complete task												
	1901+1902+1904	Puddle trench						21.945	Cum					
								21.945	Cum	285.80	6272	285.8	6272	0
5	310	Trench of Column upto 5 cum and making same hole then Riffing upto 20 cmlayer in Trench refilling												
		A) In Hard and soft soil												
								6.30	Cum	55.20	348	55.20	348	0
6		Collection of Material from Mine at least 3km away to site.enclosed the Transportation chart												
		Puddle soil						21.95	Cum	104.13	2285			2285
		Water						21.95	Cum	30.00	658	30.0	658	0
7	LMR	LDP Plastic sheet of 100 micron thickness for center layering						24.00	Sqm	50.00	1200			1200
								Total			**13653**		**10168**	**3485**
		Difference in enhancing the Labour Rate from 1 June 2015 , the additional labour wages (174-159)						64			831		831	
7		Provision wages for Monitoring / supervision of work for mate						1	sqm	197.00	252			252
8		Wages for Drinking water providing to labour during the site work						1	sqm	172.00	220		220	0
9		Shadow and hanging Toys for Workers Childrens						Lum Sump			1500			1500
10		Sign board and Photo graph Charges						LumSum			5000			5000
12		Miscellaneous amount 5%									724			724
								Total amount			**22180**		**11219**	10961

Ratio	Amount		Percentage	
Labour	11219		**51**	%
Material	10961		**49**	%
Total	22180		**100**	%

Bill of quantity of Dyke:

Name of the Work Under ground Dyke								
Name of the Village-- Chainpur (savri)					Lat long and Location			
Name of District-Saran					25.890708N, 84.664950E			
	S.no	**Particulars**	Measerment	**unit**				
	1	Width of Nala	6	metres				
	2	Length of Dyke	7	metres				
	3	Top width of Dyke	1.8	metres				
	4	Bottom Width of Dyke	1.05	metres				
	5	Depth of dyke	2.5	metres				
dz	SOR Item No	Detail of work	No	Length	Width	Height	Qty	Unit
1	2	3	4	5	6	7	8	9
1	101	Cleaning of Site Grass Cutting and Removal from Site	1	7.0	2.8		19.6	Sqm
2	317	Layout and marking by Single spade						
	(d)	Single spade marking at least 0.75cm deep for layout	2	9.8			19.6	Rm
3	301	Earth work Excavation upto 30cm deep and 1.5m wide greater than 10 sqm with Lift of Soilup to 1.5m lift and lead with 50 away from site , dressing ,Levelling and Curing with Complete task	1	7.0	1.425	2.5	24.9375	Cum
4	322	Additinal rate for lifting 1.5 above soil	1	7.0	1.25	1.0	8.75	Cum
	¼[k½	B) Soft and hard Soil					8.75	Cum
5	2305 + 2307	Trench Puddle Filling with Good/Black soil, Collecting of Soil from 50 m away, Ramming , Dhurmushing and watering with Complete task	1	7.0	1.425	2.2	21.945	Cum
6	1901+1902+ 1904	Collection of Material from Mine at least 3km away to site.enclosed the Transportation chart	1	7.0	1.425	2.2	21.945	Cum
		Puddle soil	1	7.0	1.425	1.9	18.9525	Cum
		Water					18.9525	Cum
		Total					59.85	Cum
7	LMR	LDP Plastic sheet of 100 micron thickness for center layering	1	8.0		3.0	24	Sqm
8	310	Trench of Column upto 5 cum and making same hole then Riffing upto 20 cmlayer in Trench refilling						Sqm
		A) In Hard and soft soil	1	7.0	1.8	0.5	6.3	Cum

Drawing:



Design and Cost Estimation No – 16B

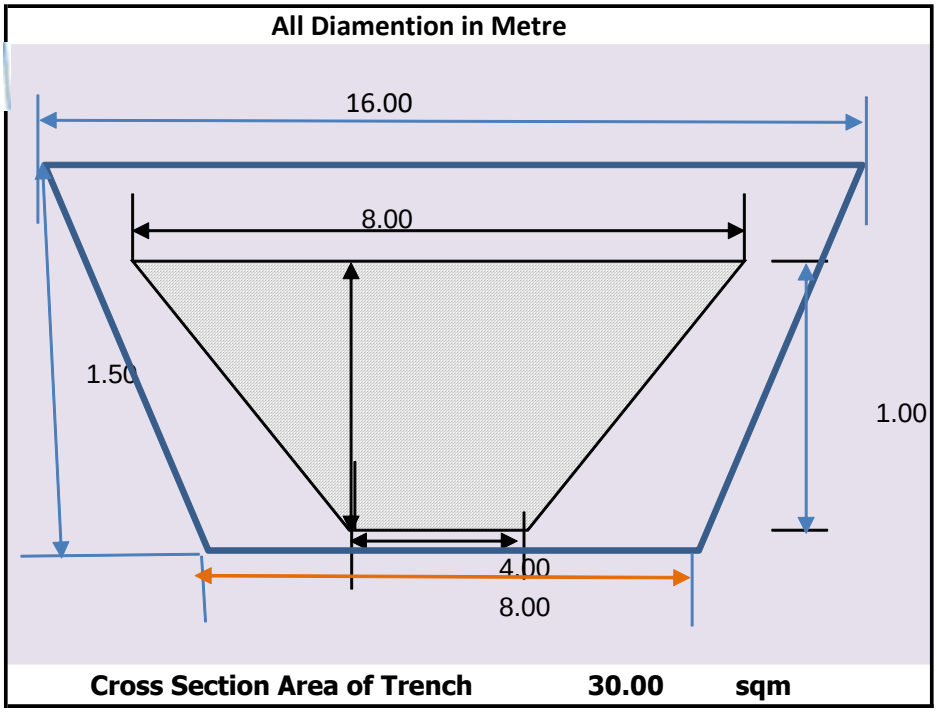
Cost Estimation No -16b- Proper chhanel Deepening	at point - Chainpur Savri	
Location of Required Structure:	GPS Location in decimal	
	25°53'26.55"N, 84°39'53.66"E	
Design of Culvert on Road bhatkesary to Rushi road	Length of Trench M	600
Diamention during Field Survey	Unit	Excavation (Length 500 m, Tw= 16m, deptjh=1.2m
Name of River		**Tel River**
Type of Pyne	Renovation of existing River structure	
Shape of the Pyne		Trapezoidal
Catchment (Ha)	Ha	NA
Fetch length (Max length of Travel)	M	1200
Slope of the Area		0-1%
Type of Soil		loam/black
Existing Depth (d) of River /Pyne		1.00
Existing Top Width (TW) of River/Pyne	M	8.00
Exiting Bottom Width (BW) of River or Pyne	M	4.00
Proposed Depth of Pyne (including 0.15 m free board)		1.50

Total depth of channel (existing + proposed)	M	2.50
Proposed TW River Bed Trench	M	16.00
Proposed BW of River bed Trench	M	8.00
Proposed cross-sectional Area of River/Pyne (a= 1/2 (TW +BW)x Depth)	Sqm	30.00
Catchment Area of the River Trench	Ha	50
Fetch length (Max length of Travel)	M	1200
Elevation difference from remote point to outlet of discharge		1.5
Command Area of the River Bed Trech (ha)	Ha	340
Wetted Perimeter (p) (p = Bw + 2 (√(d² + (1.5 d) ²) = Bw +3.604d)		17.02
Hydraulic Radius R = a/p		1.76
S (Slope) = H/L		0.00
K = L/√S,		33941.13
Time of Concentration (Tc = 0.0195K0.77) where K = L/√S, and S(slope) = H/L, L = Maximum length of travel = 1400 m, and H = difference in elevation between most remote point and outlet point = 8m (minimum)		60.08
Per day maximum rainfall (as per Climate modelling report)		235
Rain fall intensity (I) , as per climate variability report (one day max rain fall 150 MM/day)	mm/hr	234.71
Coefficient of runoff © as per differnet catchment terrain May vary from 0.3 to 0.5		0.5
Manning's coefficient (n) may varies as per soil type of location		0.02
Discharge from drainage area (Q = CIA) Where C = Runoff coefficient = 0.4 for loamy soil arable land and slope rang 5-10%), I= Rainfall intensity (cm/hr), mean rainfall intensity for the design recurrence interval and for a duration equal to the time of concentration, A = Drainage Area (m²)	cum/sec	16.30
S (Longitudinal gradient slope of channel) varies as per site slope and location(taking (1/6000)		0.00017
Velocity of water flow (V = R⅔S½/n)Where R= Hydraulic Radius, S = Longitudinal slope (may be assumed assume 1/6000 approx.), n = manning's coefficient = 0.02 for ordinary firm loam soil type		0.942
Maximum permissible velocities in non-vegetated canal for ordinary firm loam soil type (Reference table , After Fortier and Scobey, 1926)	Clean water =0.75m/sec	
	Water with Colloidal silt =1.05M/sec	
	Water with sand Gravel =0.68m/sec	
As the designed velocity is within the permissible velocities limit, so we can say that the design of pyne is suitable.		

Cost Estimate – 16 B

Site Location : Trench /Pyne					**Lat,long**	**25°56'43.81"N, 84°39'10.55"E**			
Dimensions	length (m)	Top Width M	Bottom Width M	depth M					
Proposed	600	16.00	8.00	1.50					
Existing dimensions	600	8.00	4.00	1.00					
Abstract of Cost Estimation									
Description of the work- Trench - Excavation									
Particulars	**Length**	**Top width**	**Bottom width**	**Depth**	**Qnty.**	**Unit**	**Rate**	unit	Amount (Rs)
Cleaning of Site, Survey, alignment & layout.									
					8	mday	177	Rs	1416
Earthwork cutting in Soft /Hard soil with initial lift including rough dressing and breaking of clods to maximum 5cm to 7cm and laying in layers as per direction of the Engineer-in-charge.									
Proposed Surface layer cutting									
Lx(TW+BW)/2XHT	600.0	16.00	8.00	1.50	10800.0	Cum			
Existing depth of the channel	**600.0**	8.00	4.00	1.00	3600.0	Cum			
Actual Earth work to be excavated					7200.0	cum			
M**ale -Mandays calculation** :EW & Lift of soil from 0 to 5 ft depth and height ,the required Man days @80cft/m days soil cutting will be taken for male mdays of 2/3 total work .									
255024.0	cft				2125.2				
Female -Mandays calculation :EW & Lift of soil from 0 to 5 ft depth and height ,the required Man days @68cft/m days soil cutting will be taken for female mdays of 1/3 total work .									
255024.0	cft				1250.1				
Total					3375.3	mday	177	Rs	**598847.2**
Providing leveling, Ramming/ Rolling earth work in embankment side of Ahar manually with all complete job @1000cft/mdays and as per direction of Engineer in charge.									
Total EW/1000					255.0	mday	177	Rs	45139.248
Providing provision of supervisor (mate) for completing the while jobs and as per direction of engr. In charge are taken in the ratio of (1:40) of Total man-days									
Total Mdays/40					3630.34	mday			
Extra @ Rs 10 of 40 labour					50.725	Rs	10	Rs	507.25
Total Cost									**645909.7**
labour cess 1% of the total Cost									6459.097215
Providing cost of sign board ,photography and others LS									3000
Grand Total cost of Irrigation Channel Excavation									**655368.8**

Drawing of River Deepening:



Plantation:

Cost Estimation of Community Plantation In Tel River ,both side (two Unit Plantation)					
Subject/ Operation	**Year- 01- Establishment**				
	Unit	Qty.	Rate	Description	Amount
A. Maintenance cost					
Maintaining 100 lenior AF/Fruit plant up to 5 year and security of the same plant by 4 no gardeners	No	At least maintenance of 200 Fruit plants up to five year or 60 month on the basis of living plants	7	200*12*5*4*7	336000
Pit Digging of 100 plant	No	200 Big Fruit plants with Pit size 0.60x0.60x0.60= 43.2 cum or 1524.31 cft/108=30 mdays	177	177*30	5310
	NO	100 AF plants with Pit size 0.30x0.30x0.30x200=5.4 cum or 190.56cft/108=6 mdays	177	177*6	1062
Purchasing of Fruit Plants for 100 plants	No	200 fruit plants	35	200*35	7000
	No	200 No Agro forestry plants	15	200*15	3000
Installation of hand Pump	No	Two number on the site of fruit and agroforestry plantation @9500/hand pump	9500	4*9500	38000
Insecticide and pesticide treatment on 200 plants	Lump sump	year -1 after two month in 15 days gap LS@ 0.90 p/plant		400*20*0.90	7200
		year - 2 in 30 days gap LS@ 0.90 p/plant		400*10*0.9	3600
		year -3 in 30 days gap LS@ 0.90 p/plant		400*10*0.10	400
		year - 4 in 30 days gap LS@ 0.90 p/plant		400*10*0.11	440
		year - 5 in 30 days gap LS@ 0.90 p/plant		400*10*0.12	440
Two bucket ,Mug, Jhara and clothes etc.		up to 5 year Lump sum Expenditure			8000
Permanent Net Fencing for 5 year and maintenance		400 plant fenced with permanent fencing @350/fencing		400x350	140000
		Total cost			**550452**
Miscellaneous expenditure		2 % of estimated cost			11009.04
		Grand Total			**561461.04**

Design and Cost Estimation No - 17

Cost Estimation No -17- Proper chhanel Deepening	at point - Patila Savri	
Location of Required Structure:	GPS Location in decimal	
	25.886763N, 84.664018E	
Design of Culvert on Road bhatkesary to Rushi road	Length of Trench M	500
Diamention during Field Survey	Unit	Excavation (Length 500 m, Tw= 16m, deptjh=1.2m
Name of River		**Tel River**
Type of Pyne	Renovation of existing River structure	
Shape of the Pyne		Trapezoidal
Catchment (Ha)	Ha	NA
Fetch length (Max length of Travel)	M	1200
Slope of the Area		0-1%
Type of Soil		loam/black
Existing Depth (d) of River /Pyne		1.00
Existing Top Width (TW) of River/Pyne	M	8.00
Exiting Bottom Width (BW) of River or Pyne	M	4.00
Proposed Depth of Pyne (including 0.15 m free board)		1.50
Total depth of channel (existing + proposed)	M	2.50
Proposed TW River Bed Trench	M	16.00
Proposed BW of River bed Trench	M	8.00
Proposed cross-sectional Area of River/Pyne (a= 1/2 (TW +BW)x Depth)	Sqm	30.00
Catchment Area of the River Trench	Ha	50
Fetch length (Max length of Travel)	M	1200
Elevation difference from remote point to outlet of discharge		1.5
Command Area of the River Bed Trech (ha)	Ha	340
Wetted Perimeter (p) ($p = Bw + 2(\sqrt{(d^2 + (1.5\,d)^2)} = Bw + 3.604d$)		17.02
Hydraulic Radius R = a/p		1.76
S (Slope) = H/L		0.00
$K = L/\sqrt{S}$,		33941.13
Time of Concentration (Tc = 0.0195K0.77) where $K = L/\sqrt{S}$, and S(slope) = H/L, L = Maximum length of travel = 1400 m, and H = difference in elevation between most remote point and outlet point = 8m (minimum)		60.08
Per day maximum rainfall (as per Climate modelling report)		235
Rain fall intensity (I) , as per climate variability report (one day max rain fall 150 MM/day)	mm/hr	234.71

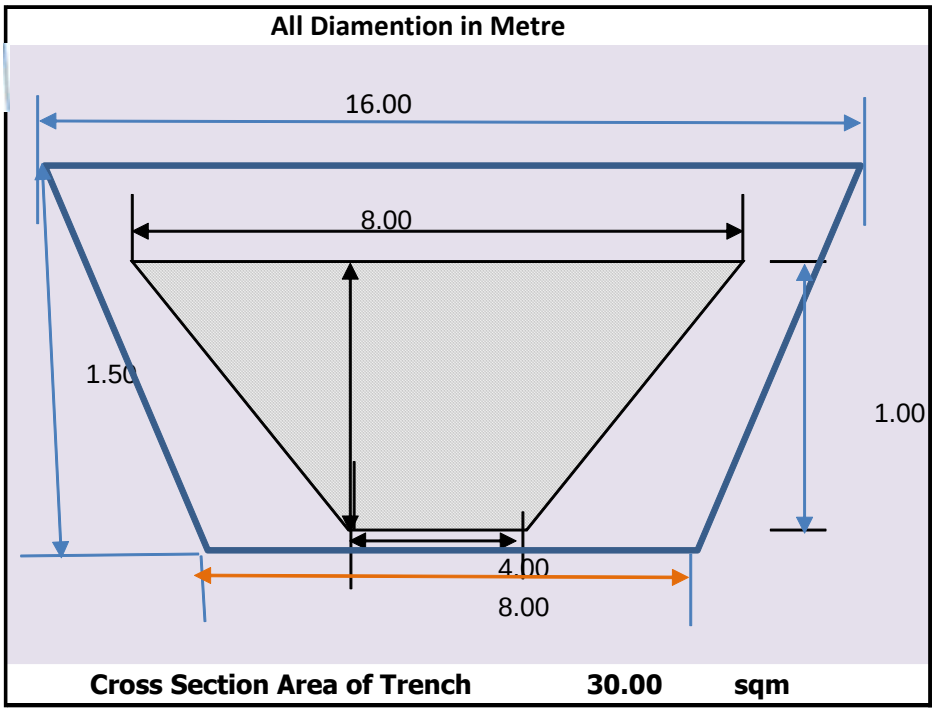
Coefficient of runoff © as per differnet catchment terrain May vary from 0.3 to 0.5		0.5
Manning's coefficient (n) may varies as per soil type of location		0.02
Discharge from drainage area (Q = CIA) Where C = Runoff coefficient = 0.4 for loamy soil arable land and slope rang 5-10%), I= Rainfall intensity (cm/hr), mean rainfall intensity for the design recurrence interval and for a duration equal to the time of concentration, A = Drainage Area (m²)	cum/sec	16.30
S (Longitudinal gradient slope of channel) varies as per site slope and location(taking (1/6000)		0.00017
Velocity of water flow (V = R⅔S½/n)Where R= Hydraulic Radius, S = Longitudinal slope (may be assumed assume 1/6000 approx.), n = manning's coefficient = 0.02 for ordinary firm loam soil type		0.942
Maximum permissible velocities in non-vegetated canal for ordinary firm loam soil type (Reference table , After Fortier and Scobey, 1926)	Clean water =0.75m/sec	
	Water with Colloidal silt =1.05M/sec	
	Water with sand Gravel =0.68m/sec	
As the designed velocity is within the permissible velocities limit, so we can say that the design of pyne is suitable.		

Estimate of River Deepening

Site Location : Trench /Pyne no 17					**Lat,long**	**25°56'43.81"N, 84°39'10.55"E**			
Dimensions	**length (m)**	**Top Width M**	**Bottom Width M**	**depth M**					
Proposed	500	16.00	8.00	1.50					
Existing dimensions	500	8.00	4.00	1.00					
Abstract of Cost Estimation									
Description of the work- Trench - Excavation									
Particulars	**Length**	**Top width**	**Bottom width**	**Depth**	**Qnty.**	**Unit**	**Rate**	unit	Amount (Rs)
Cleaning of Site, Survey, alignment & layout.									
					8	mday	177	Rs	1416
Earthwork cutting in Soft /Hard soil with initial lift including rough dressing and breaking of clods to maximum 5cm to 7cm and laying in layers as per direction of the Engineer-in-charge.									
Proposed Surface layer cutting									
Lx(TW+BW)/2XHT	500.	16.0	8.0	1.5	9000.0	Cum			
Existing depth of the channel	**500.**	8.0	4.0	1.00	3000.0	Cum			
Actual Earth work to be excavated					6000.0	cum			

Male -Mandays calculation :EW & Lift of soil from 0 to 5 ft depth and height ,the required Man days @80cft/m days soil cutting will be taken for male mdays of 2/3 total work .									
212520.0	cft				1771.0				
Female -Mandays calculation :EW & Lift of soil from 0 to 5 ft depth and height ,the required Man days @68cft/m days soil cutting will be taken for female mdays of 1/3 total work .									
212520.0	cft				1041.8				
Total					2812.8	mdays	177	Rs	**499275.353**
Providing levelling, Ramming/ Rolling earth work in embankment side of Ahar manually with all complete job @1000cft/mdays and as per direction of Engineer in charge.									
Total EW/1000					212.5	mdays	177	Rs	37616.04
Providing provision of supervisor (mate) for completing the while jobs and as per direction of engr. In charge are taken in the ratio of (1:40) of Total man-days									
Total Mdays/40					3025.2847	mdays			
Extra @ Rs 10 of 40 labour					50.725	Rs	10	Rs	507.25
Total Cost									**538814.643**
labour cess 1% of the total Cost									5388.146429
Providing cost of sign board ,photography and others LS									3000
Grand Total cost of Irrigation Channel Excavation									**547202.789**

Drawing:



Plantation 17:

Cost Estimation of Community Plantation In Tel River ,both side (two Unit Plantation)					
Subject/ Operation	**Year- 01- Establishment**				
	Unit	Qty.	Rate	Description	Amount
A. Maintenance cost					
Maintaining 100 lenior AF/Fruit plant up to 5 year and security of the same plant by 4 no gardeners	No	At least maintenance of 200 Fruit plants up to five year or 60 month on the basis of living plants	7	200*12*5*4*7	336000
Pit Digging of 100 plant	No	200 Big Fruit plants with Pit size 0.60x0.60x0.60= 43.2 cum or 1524.31 cft/108=30 mdays	177	177*30	5310
	NO	100 AF plants with Pit size 0.30x0.30x0.30x200=5.4 cum or 190.56cft/108=6 mdays	177	177*6	1062
Purchasing of Fruit Plants for 100 plants	No	200 fruit plants	35	200*35	7000
	No	200 No Agro forestry plants	15	200*15	3000
Installation of hand Pump	No	Two number on the site of fruit and agroforestry plantation @9500/hand pump	9500	4*9500	38000
Insecticide and pesticide treatment on 200 plants	Lump sump	year -1 after two month in 15 days gap LS@ 0.90 p/plant		400*20*0.90	7200
		year - 2 in 30 days gap LS@ 0.90 p/plant		400*10*0.9	3600
		year -3 in 30 days gap LS@ 0.90 p/plant		400*10*0.10	400
		year - 4 in 30 days gap LS@ 0.90 p/plant		400*10*0.11	440
		year - 5 in 30 days gap LS@ 0.90 p/plant		400*10*0.12	440
Two bucket ,Mug, Jhara and clothes etc.		up to 5 year Lump sum Expenditure			8000
Permanent Net Fencing for 5 year and maintenance		400 plant fenced with permanent fencing @350/fencing		400x350	140000
		Total cost			**550452**
Miscellaneous expenditure		2 % of estimated cost			11009.04
		Grand Total			**561461.04**

Design and Cost Estimation No-19

Location at -point	25.88548N, 84.664303E		
Design Procedure of Farm Pond			
Name of Village	**Patila (savari)**	**GP**	**Patila**
Activity	Re-Excavation of Climate Resilient Community Pond	**Type & shape of pond**	Dug out type , trapezoidal pond
Type of Soil	Sandy clay Soil	**Bed Rock**	Seems not appear inside of the community pond
Praposed Depth of the Pond (M)	3	**Proposed Lenth for Excavation (M) Exclud.Bund**	45
Existing depth (M)	2	**Proposed Width (M)**	30
Existing length (M)	25	**Existing width (M)**	25
Catchment area of the pond (ha) Flat of forest land	25	**Command area of the pond (ha)**	25
Fetch length (m)	500	**Total depth**	5
Using By Rational Formulae	**: Q=CIA/360**		
Where c= rational Runoff Coefficient for available sandy loam soil for 5-10% slope = 0.50		0.5	
I= Rain fall intensity for a duration equal to Time of concentration= mm/ annum		1750	
A= Catchments area from out side of the pond in Ha		43	
	Peak Runoff (Q)=CIA/360	**104.51**	**M^3/sec**
(This is the sufficient runoff to fill the storage capacity of community pond)			
By Using Strainge's Table :			
Estimated Runoff (Q)	CIA=31x10000X1750x45.1x0.4/100	**471357.64**	cum/annum
(taking 43.1% runoff on 1750mm rainfall at good catchment)			
Free Board (0.5-1m)		0.7	
To design Pond capacity :	Total Irrigation requirment +livestock requirement + domestic requirement + 10 % of the sum of another losses.		
Wheat crop: - water requirement: if farmers will grow the wheat crop in 6 hectare of total land		9000	cum
Maize crop:- consequently the Maize crops in Gaya district are grown in a summer season and		4500	
Domestic Purposes: domestic cum livestock water requirement is taken as 10% of the total		1350	
Other Loses: water loss for Transpiration, Evapotranspiration, and vaporization etc. (Taking		1485	
Dead Storage: Water store round the year = Area of Pond X water will store		405	
Total Water demand = WC+MC+DP+OL+DS		**16740**	
Existing Pond Capacity =	Ht of Water X Area of Pond	**6750**	

Recommendation: Collecting all the information regarding Rushi- pond with physical investigation, it is calculated that the actual crop water requirement from several purposes is lessure than the pond capacity. Viewing the above fact of demand the site of pond seems to be feasible, economical and viable. And the vegetative coverage and plantation over embankment on site become climate resilient.

(ii) The crop water requirement + ET crop and some of other losses are lesser than the pond storage capacities which enhance the dead storage capacity.

(iii) The excess run off water drain through weir (outlet) during the rainy season.

Strange's table for runoff estimation

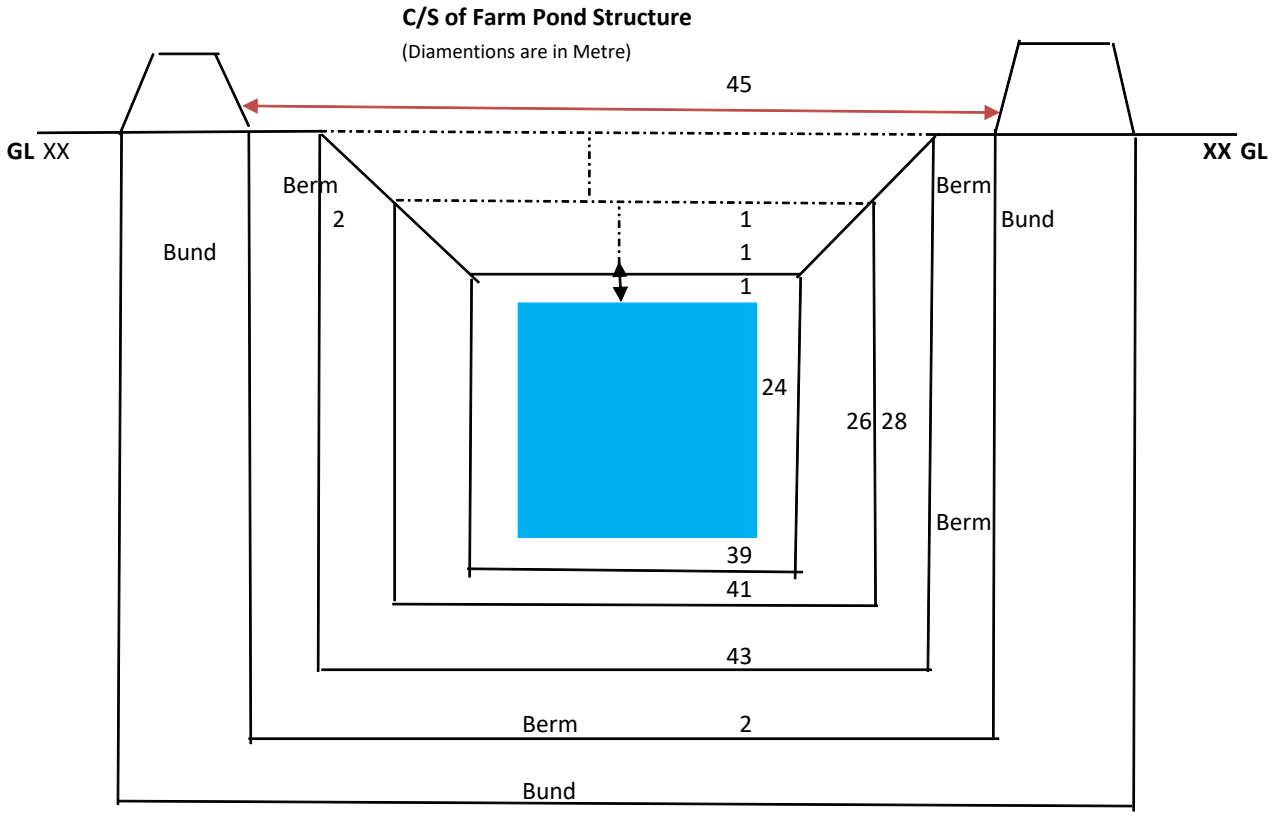
Total Monsoon rainfall inches)	Total Monsoon rainfall (mm)	Percentage of Runoff to rainfall			Total Monsoon rainfall (inches)	Total Monsoon rainfall (mm)	Percentage of Runoff to rainfall		
		Good catchment	Average catchment	Bad catchment			Good catchment	Average catchment	Bad catchment
1.0	25.4	0.1	0.1	0.1	31.0	787.4	27.4	20.5	13.7
2.0	50.8	0.2	0.2	0.1	32.0	812.8	28.5	21.3	14.2
3.0	76.2	0.4	0.3	0.2	33.0	838.2	29.6	22.2	14.8
4.0	101.6	0.7	0.5	0.3	34.0	863.6	30.8	23.1	15.4
5.0	127.0	1.0	0.7	0.5	35.0	889.0	31.9	23.9	15.9
6.0	152.4	1.5	1.1	0.7	36.0	914.4	33.0	24.7	16.5
7.0	177.8	2.1	1.5	1.0	37.0	939.8	34.1	25.5	17.0
8.0	203.2	2.8	2.1	1.4	38.0	965.2	35.3	26.4	17.6
9.0	228.6	3.5	2.6	1.7	39.0	990.6	36.4	27.3	18.2
10.0	254.0	4.3	3.2	2.1	40.0	1016.0	37.5	28.1	18.7
11.0	279.4	5.2	3.9	2.6	41.0	1 041.4	38.6	28.9	19.3
12.0	304.8	6.2	4.6	3.1	42.0	1066.8	39.8	29.8	19.9
13.0	330.2	7.2	5.4	3.6	43.0	1092.2	40.9	30.6	20.4
14.0	355.6	8.3	6.2	4.1	44.0	1117.6	42.0	31.5	21.0
15.0	381.0	9.4	7.0	4.7	45.0	1143.0	43.1	32.3	21.5
16.0	406.4	10.5	7.8	5.2	46.0	1168.4	44.3	33.2	22.1
17.0	431.8	11.6	8.7	5.8	47.0	1193.8	45.4	34.0	22.7
18.0	457.2	12.8	9.6	6.4	48.0	1219.2	46.5	34.8	23.2
19.0	482.6	13.9	10.4	6.9	49.0	1244.6	47.6	35.7	23.8
20.0	508.0	15.0	11.3	7.5	50.0	1270.0	48.8	36.6	24.4
21.0	533.4	16.1	12.0	8.0	51.0	1295.4	49.9	37.4	24.9
22.0	558.8	17.3	12.9	8.6	52.0	1320.8	51.0	38.2	25.5
23.0	584.2	18.4	13.8	9.2	53.0	1346.2	52.1	39.0	26.0
24.0	609.6	19.5	14.6	9.7	54.0	1371.6	53.3	39.9	26.6
25.0	635.0	20.6	15.4	10.3	55.0	1397.0	54.4	40.8	27.2
26.0	660.4	21.8	16.3	10.9	56.0	1422.4	55.5	41.6	27.7
27.0	685.8	22.9	17.1	11.4	57.0	1447.8	56.6	42.4	28.3
28.0	711.2	24.0	18.0	12.0	58.0	1473.2	57.8	43.3	28.9
29.0	736.6	25.1	18.8	12.5	59.0	1498.6	58.9	44.4	29.41
30.0	762.0	26.3	19.7	13.1	60.0	1524.0	60.0	45.0	30.0

Estimate 19:

	Site Location :	Patila (savari)						GP	Patila	
	Excluding Bund Size L (M)	45	Width	30	Depth pro.	3		Berm	2	
	Abstract of Cost Estimation									
S.No	**Description of the work- Pond RE- Excavation**					**Quantity**	**Unit**	**Rate**	**Unit**	**Amount**
	Particular		**L(m)**	**W(m)**	**AV. D(m)**			**(Rs.)**		**(Rs.)**
1	Survey, alignment & layout.					5	MD	177	/md	885
2	Earthwork in Hard soil or, within 51M initial lead and 1.5M initial lift including rough dressing and breaking of clods to maximum 5cm to 7cm and laying in layers not exceeding 0.30m in depth & as per direction of the Engineer-in-charge per 100 cum.									
A	Surface layer cutting		43	28	1	1204	cum	86.02	0	103568
B	Middle layer cutting		41	26	1	1066	cum	86.02		91697.3
C	Bottom layer cutting		39	24	1	936	cum	86.02		80514.7
	Total					**3206**	cum			**0**

	Actual volume of EW = AV = A+(4 B)+C/6*AD					**1067.333**		86.02		**91812**
4	Ramming/ Rolling earth work with light HRR in embankment in layers not exceeding 0.3m in depth									
						9844	cum	7.24	/cum	71270.6
5	Fine dressing and vegetative measures on both the sides by broadcasting of lemon grass/ Napier grass on both sides of embankment.(taking perimetre of EM 128+100)									
	Inside & Outside	2	313	2.1		1314.6	sqm			
						1314.6	sqm	8.52	/sqm	11200.4
6	Excavation for foundation for outlet of pond									
	head wall	1	1.8	0.6	0.6	0.65	cum			
	side wall	2	2	0.6	0.6	1.44	cum			
						2.09	cum	125.08	/cum	261.417
7	Filling in foundation with sand ,gravel,cement (mixture) water etc. complete.									
	Foundation head wall	1	1.8	0.6	0.12	0.13	cum			
	Foundation Side wall	2	2	0.6	0.12	0.29	cum			
						0.42	cum	81.21	/cum	33.91
8	Cement Concrete (1:3:6) with 4cm size hard granite metal per 1 cum									
	head wall	1	1.8	0.6	0.48	0.52	cum			
	side wall	2	2	0.6	0.48	1.15	cum			
						1.67	cum	2648.44	/cum	4423.95
9	Brick masonry in cement mortar (1:6)									
	head wall	1	1.8	0.5	0.9	0.81	cum			
	side wall	2	2	0.5	1.2	2.4	cum			
						3.21	Cum	1798.57	/cum	5773.41
10	12mm thick cement plaster (1:6) for brick work Per 1Sqm.									
	head wall	2	1.8		0.9	3.24	sqm			
		1	1.8		0.5	0.9	sqm			
	side wall	2	2		1.2	4.8	sqm			
		2	2		0.5	2	sqm			
						10.94	sqm	88.7	/sqm	970.38
11	Transportation LS									2000
12	Royalty on material									544
6	CSP charges (For 50 labors 1 no. semiskilled labour)					97	MD	220	MD	21340
7	Labour cess 1 percent of labour cost									0
8	Construction of Transparency Board including plastering, painting & wall writing etc. Complete.(Navy Blue Back ground with white letter writing, size (1x6'x4')								LS/SA	2000
9	Rest shed								LS/SA	1000
10	First Aid Kit,								LS/SA	1000
11	Supply of Drinking Water								LS/SA	880
12	Photography (Minimum 3 nos.)								LS/SA	500
13	Xerox Charges (Estimates & other related documents)								LS/SA	500
								Total		**215510**

Drawing 19:

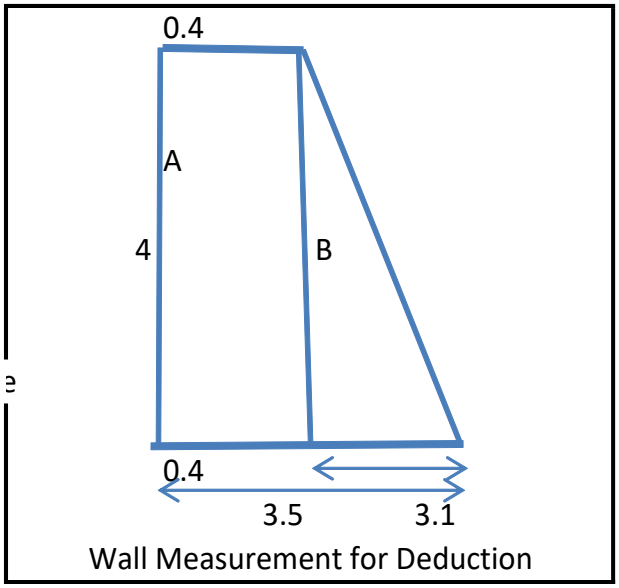


Design and Estimate of Culvert No –21

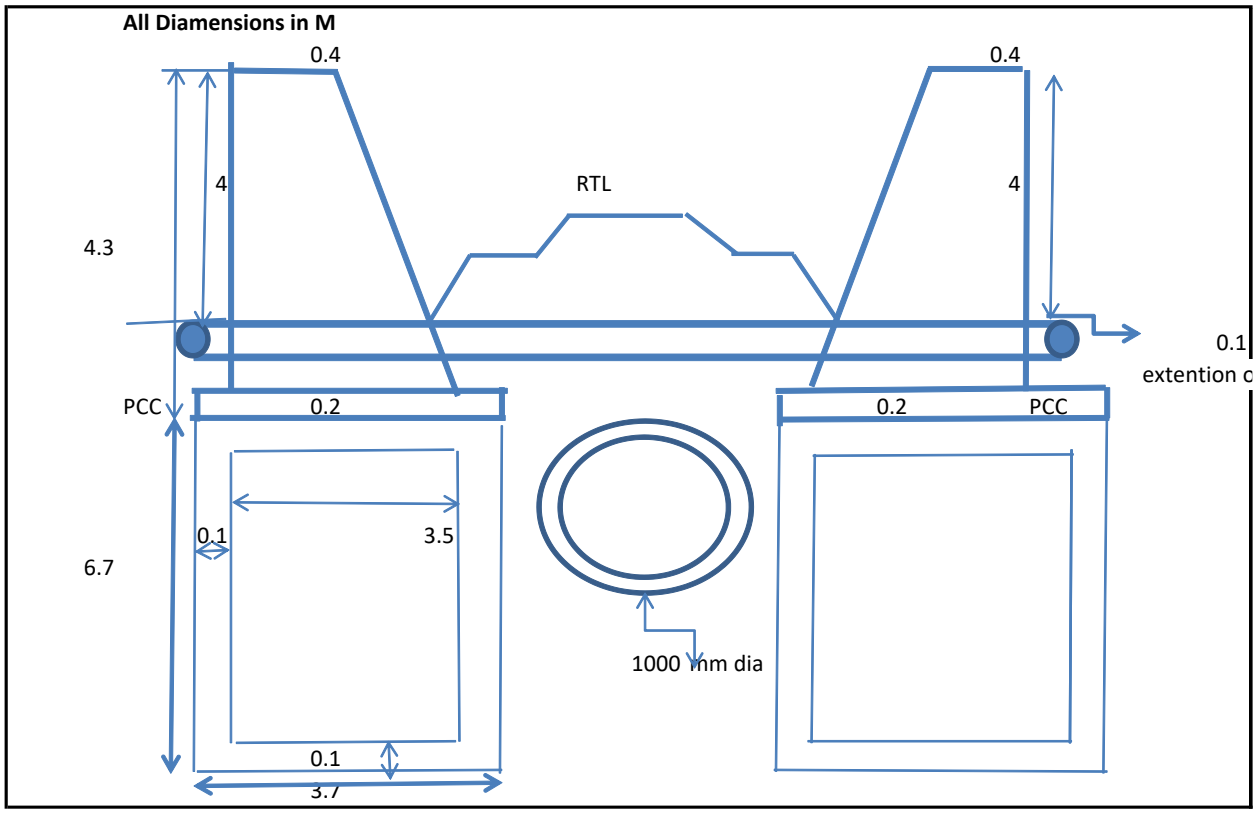
21-Cost Estimation of Culvert or Pulia Nirman At Location -		120	Patila savri				lat,long	25.884132N, 84.665378E		
Sl No	Particulars	No	L	W	H/D	Volume	Quantity	Unit	Rate	Amount
	Foundation -Earth work excavation									(Rs)
1	Excavation of Foundation (one side)	1	6.7	3.7	4.3	106.597				
	Excavation of Foundation (2nd side	1	6.7	3.7	4.3	106.597			176.86/80cft work	
	Sub Total					**213.1**	**213.19**	Cum	**221**	47115.8
	Pre Cement Concrete (PCC-1:4:8)	1	0.2	3.7	6.7	4.958				0
2	**Pre CementConcrete (PCC-1:4:8)**									0
	2nd Side Pre concrete(PCC-1:4:8)	1	0.2	3.7	6.7	4.958				0
	Total PCC					9.916	**9.916**	Cum	**3500**	34706

3	**B/W cement Mortar (1:4) or RCC(1:2:4)**									0
	B/W cement Mortar (1:4) or	1	4	0.4	6.7	10.72				0
	Cement Concrete wall (RCC-1:2:4)	1	3.5	4	6.7	46.9				0
	2nd Side Reinforce concrete Cement (RCC-1:2:4)					57.62	57.62			0
	Total RCC	2	0	0	0		**115.24**	Cum		0
	Volume of Two Wall		3.02	0.37	3.1	3.594	**7.1898**			0
	Deduction (3.14Xr2xL)									0
	Actual B/W (1:4) Cement Mortar Or						**108.0502**	Cum	**6845**	739603.32
	RCC work(1:2:4)									0
4	Cost of 1000 mm dia or 1m dia RCC hume Pipe	3							**12500**	37500
5	Mason	12							**600**	7200
6	Labour	34							500	17000
7	Board	1							2000	2000
7	Miscellaneous lump sump								5000	5000
	Total cost of Single Row Pipe Culvert									**890125.19**

Drawing:



Wall Measurement for Deduction



Design and Cost Estimation No-23

Cost Estimation No 23-Proper chhanel Deepening	at point -200 (Chatra samauta)	
Location of Required Structure:	GPS Location in decimal	
	25.875967N, 84.668842E	
Deepening Of River	Length of Trench M	600
Diamention during Field Survey	Unit	Pond & meeting point both channel(Tw=15,d-2,L-20
Name of River		**Tel River**
Type of River	Deepening of existing River structure	
Shape of the Pyne		Trapezoidal
Catchment (Ha)	Ha	NA
Fetch length (Max length of Travel)	M	1400
Slope of the Area		0-1%
Type of Soil		loam/black
Existing Depth (d) of River /Pyne		2.00
Existing Top Width (TW) of River/Pyne	M	15.00
Exiting Bottom Width (BW) of River or Pyne	M	12.00
Proposed Depth of Pyne (including 0.15 m free board)		3.00
Total depth of channel (existing + proposed)	M	5.00

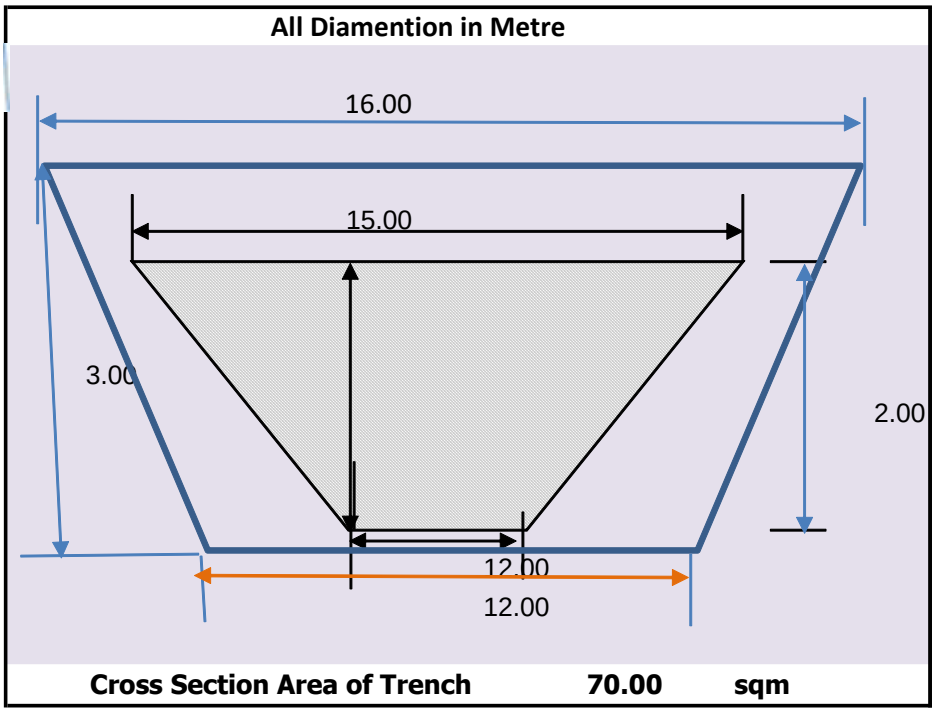
Proposed TW River Bed Trench	M	16.00
Proposed BW of River bed Trench	M	12.00
Proposed cross-sectional Area of River/Pyne (a= 1/2 (TW +BW)x Depth)	Sqm	70.00
Catchment Area of the River Trench	Ha	50
Fetch length (Max length of Travel)	M	1400
Elevation difference from remote point to outlet of discharge		1.5
Command Area of the River Bed Trech (ha)	Ha	230
Wetted Perimeter (p) (p = Bw + 2 (√(d² + (1.5 d) ²) = Bw +3.604d)		30.03
Hydraulic Radius R = a/p		2.33
S (Slope) = H/L		0.00
K = L/√S,		42770.71
Time of Concentration (Tc = 0.0195K0.77) where K = L/√S, and S(slope) = H/L, L = Maximum length of travel = 1400 m, and H = difference in elevation between most remote point and outlet point = 8m (minimum)		71.78
Per day maximum rainfall (as per Climate modelling report)		235
Rain fall intensity (I) , as per climate variability report (one day max rain fall 150 MM/day)	mm/hr	196.43
Coefficient of runoff © as per differnet catchment terrain May vary from 0.3 to 0.5		0.5
Manning's coefficient (n) may varies as per soil type of location		0.02
Discharge from drainage area (Q = CIA) Where C = Runoff coefficient = 0.4 for loamy soil arable land and slope rang 5-10%), I= Rainfall intensity (cm/hr), mean rainfall intensity for the design recurrence interval and for a duration equal to the time of concentration, A = Drainage Area (m²)	cum/sec	13.64
S (Longitudinal gradient slope of channel) varies as per site slope and location(taking (1/6000)		0.00017
Velocity of water flow (V = R⅔S½/n)Where R= Hydraulic Radius, S = Longitudinal slope (may be assumed assume 1/6000 approx.), n = manning's coefficient = 0.02 for ordinary firm loam soil type		1.135
Maximum permissible velocities in non-vegetated canal for ordinary firm loam soil type (Reference table , After Fortier and Scobey, 1926)	Clean water =0.75m/sec	
	Water with Colloidal silt =1.05M/sec	
	Water with sand Gravel =0.68m/sec	
As the designed velocity is within the permissible velocities limit, so we can say that the design of pyne is suitable.		

Cost Estimate-23:

Site Location : Tench digging					**Lat,long**	**25.875967N, 84.668842E**			
Diamentions	**length (m)**	Top Width M	Bottom Width M	depth M					
Proposed	600	16.00	12.00	3.00					
Existing dimentions	600	15.00	12.00	2.00					

Abstract of Cost Estimation									
Description of the work- Trench - Excavation									
Particulars	**Length**	**Top width**	**Bottom width**	**Depth**	**Qnty.**	**Unit**	**Rate**	unit	Amount (Rs)
Cleaning of Site, Survey, alignment & layout.									
					8	mday	177	Rs	1416
Earthwork cutting in Soft /Hard soil with initial lift including rough dressing and breaking of clods to maximum 5cm to 7cm and laying in layers as per direction of the Engineer-in-charge.									
Proposed Surface layer cutting									
Lx(TW+BW)/2XHT	600.0	16.0	12.00	3.00	25200.0	Cum			
Existing depth of the channel	**600.0**	15.00	12.00	2.00	16200.0	Cum			
Actual Earth work to be excavated					9000.0	cum			
M**ale -Mandays calculation** :EW & Lift of soil from 0 to 5 ft depth and height ,the required Man days @80cft/m days soil cutting will be taken for male mdays of 2/3 total work .									
318780.0	cft				2656.5				
Female -Mandays calculation :EW & Lift of soil from 0 to 5 ft depth and height ,the required Man days @68cft/m days soil cutting will be taken for female mdays of 1/3 total work .									
318780.0	cft				1562.6				
Total					4219.1	mdays	177	Rs	**748205.0**
Providing leveling, Ramming/ Rolling earth work in embankment side of Ahar manually with all complete job @1000cft/mdays and as per direction of Engineer in charge.									
Total EW/1000					318.8	mday	177	Rs	56424.06
Providing provision of supervisor (mate) for completing the while jobs and as per direction of engr. In charge are taken in the ratio of (1:40) of Total man-days									
Total Mdays/40					4537.9	mday			
Extra @ Rs 10 of 40 labour					50.725	Rs	10	Rs	507.25
Total Cost									**806552.3**
labour cess 1% of the total Cost									8065.523394
Providing cost of sign board ,photography and others LS									3000
Grand Total cost of Irrigation Channel Excavation									**817617.8**

Drawing 23:



Plantation: 23

Cost Estimation of Community Plantation In Tel River ,both side (two Unit Plantation)					
Subject/ Operation	**Year- 01- Establishment**				
	Unit	Qty.	Rate	Description	Amount
A. Maintenance cost					
Maintaining 100 lenior AF/Fruit plant up to 5 year and security of the same plant by 4 no gardeners	No	At least maintenance of 200 Fruit plants up to five year or 60 month on the basis of living plants	7	200*12*5*4*7	336000
Pit Digging of 100 plant	No	200 Big Fruit plants with Pit size 0.60x0.60x0.60= 43.2 cum or 1524.31 cft/108=30 mdays	177	177*30	5310
	NO	100 AF plants with Pit size 0.30x0.30x0.30x200=5.4 cum or 190.56cft/108=6 mdays	177	177*6	1062
Purchasing of Fruit Plants for 100 plants	No	200 fruit plants	35	200*35	7000
	No	200 No Agro forestry plants	15	200*15	3000
Installation of hand Pump	No	Two number on the site of fruit and agroforestry plantation @9500/hand pump	9500	4*9500	38000
Insecticide and pesticide treatment on 200 plants	Lump sump	year -1 after two month in 15 days gap LS@ 0.90 p/plant		400*20*0.90	7200
		Year - 2 in 30 days gap LS@ 0.90 p/plant		400*10*0.9	3600
		Year -3 in 30 days gap LS@ 0.90 p/plant		400*10*0.10	400
		Year - 4 in 30 days gap LS@ 0.90 p/plant		400*10*0.11	440
		Year - 5 in 30 days gap LS@ 0.90 p/plant		400*10*0.12	440

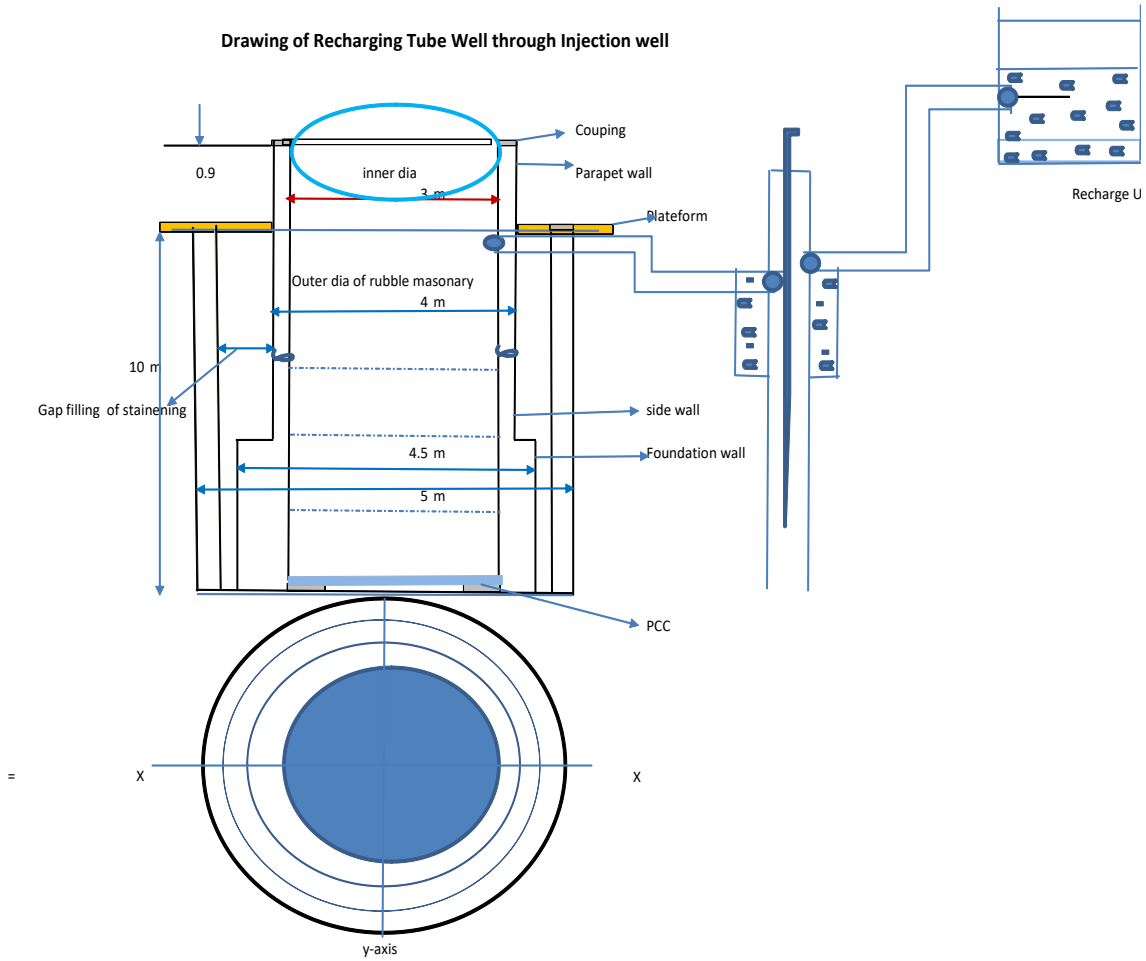
Two bucket ,Mug, Jhara and clothes etc.		up to 5 year Lump sum Expenditure			8000
Permanent Net Fencing for 5 year and maintenance		400 plant fenced with permanent fencing @350/fencing		400x350	140000
		Total cost			**550452**
Miscellaneous expenditure		2 % of estimated cost			11009.04
		Grand Total			**561461.04**

Design and Cost estimation No-24

Cost Estimation for Tube Well Recharging With Injection Well Methods									**25.915835N, 84.65175E**
S.No.	**Particulars of Work**	**Length (M)**	**Width (M)**	**Depth (m)**	**Quantity**	**Rate**	**Unit**	**Amount**	**Remark**
1	Site clearance, cutting of bushes, grasses, etc.	50	4	0	200	1.8	sqm	360	
2 (a)	Excavation of Earth work in bulk, excavation in trenches for foundation and for pipes, cables, etc. (not exceeding 1.5m width) in	30	1	1	30	38	cum	1140	SOR WRD dated 01.09.2017 item no 2.01 of page 26
2 (b)	Excavation of Dense and hard soil	30	1	1	30	81	cum	2430	SOR WRD dated 01.09.2017 item no 2.02 of page 26
2 (c.)	Excavation of Hard murram (Nala to recharging point)and water storage pit	30	1	1	30	81	cum	2430	SOR WRD dated 01.09.2017 item no 2.02 of page 26
3	Excavation of Earth work in bulk, excavation exceeding 30 cm. in depth and 1.5m. Width, 1/2 disposal of excavated soil lead up to 30m. And lift 1.5m								
3 (a)	Water storage put in hard murram	61.5	6	6	54	252	cum	13608	SOR WRD dated 01.09.2017 item no 2.03 of page 26
3 (b)	Excavation for filter. Hard murram	3	3	1	9	252	cum	2268	SOR WRD dated 01.09.2017 item no 2.03 of page 26
3 (c.)	D.I.R	3	3	1	9	252	cum	2268	SOR WRD dated 01.09.2017 item no 2.03 of page 26
4	Excavation of boring with boring tube well machine 1500mm bore	40			40	350	MT	14000	As per market rate
5	Cost of 150 mm PVC. Casing pipe and shifting in the bore	40			40	495	MT	19800	As per market rate
6	Provide filter material including filling of gravel ground pipe	3	3	2	18	483.1	cum	8695.8	As per market rate

7	Provide PVC pipe of 110m. From Nala to water storage tank, and storage tank to filter	60			60	175	MT	10500	As per market rate
8	Labour charges of fitting PVC pipe	60			60	4.3	MT	258	As per market rate
9	Transportation of material	lumpsum						5000	As per market rate
	Total							82757.8	
10	Contingencies and miscellaneous charges @ 3.5% on total cost							2896.523	
11	20% extra for escalating of material cost							19448.08	
12	Injection Recharge well cost 10.5 m d and 6m dia							**250540**	
13	**Tube well recharge cost**							**105102.4**	
14	**Grand Total Cost of Recharge Unit**							**355642**	

Drawing:



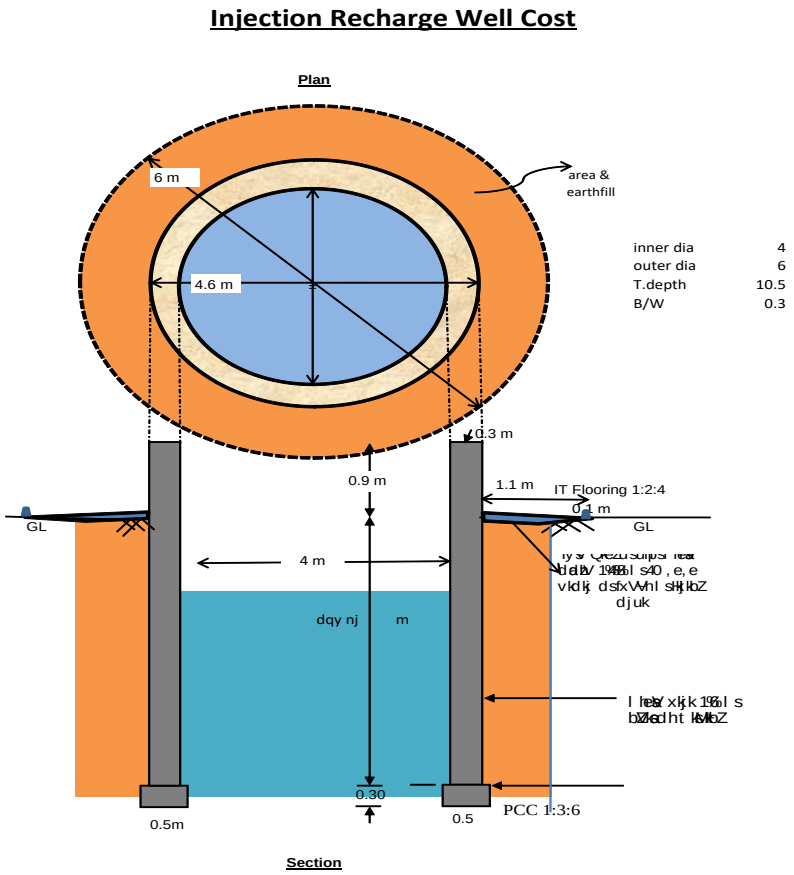
Cost Estimation for excavation of Recharge well:

Detailof Cost estimation for excavation of Well										
Name ofthe Work - irrigation Well (4 m Dia and 9 m Depth)										
		Name of Village		Name of GP						
		Block-		District-						
		Earth work dia	6	Qnty	(3.14*dia*dia*depth)/4			Inner well Dia	4	
		depth	10.5							
dz	SOR Item No	Discription	Measurement	Qty	Unit	Total rate	Total amount	Labour Cost	Total labour	Total Material (7-9)
1	2	3	4	5	6	7	8	9	10	11
1	2401(B)	Earth Work excavation aand digging of 1.5 m depth and Lifting, lead upto 50 m with complete dressing								
		0.00 to 1.50 m	1.50	42.39	Cum	98.10	4158	98.10	4158	0
	2401 (B) +2403 (A)	1.50 to 2.00 m	0.5	14.13	Cum	105.90	1496	105.90	1496	0
			0.5	14.13	Cum	113.70	1607	113.70	1607	0
			0.5	14.13	Cum	121.50	1717	121.50	1717	0
			0.5	14.13	Cum	129.30	1827	129.30	1827	0
			0.5	14.13	Cum	137.10	1937	137.10	1937	0
			0.5	14.13	Cum	144.90	2047	144.90	2047	0
		4.50 to 6.00 m	0.5	14.13	Cum	152.70	2158	152.70	2158	0
	2402 (A) +2404 (B)		0.5	14.13	3.00 to 4.50 m	429.40	6067	429.40	6067	0
			0.5	14.13	Cum	443.50	6267	443.50	6267	0
		6.0 to 7-50 m	0.5	14.13	Cum	457.60	6466	457.60	6466	0
			0.5	14.13	Cum	471.70	6665	471.70	6665	0
			0.5	14.13	Cum	485.80	6864	485.80	6864	0
		7-50 to 9.00 m	0.5	14.13	Cum	499.90	7064	499.90	7064	0
			0.5	14.13	Cum	514.00	7263	514.00	7263	0
			0.5	14.13	Cum	528.10	7462	528.10	7462	0
	2401 A	Costruction of Plateform		2.03	Cum	98.10	200	98.10	200	0
2	2405	Digging of Soil in hard Soil under water with Lift and lead upto 1.5m								
		7.50 m to 9 m (20%vf/kd nj)	0.5	14.13	Cum	99.98	1413	99.98	1413	0
			0.5	14.13	Cum	102.80	1453	102.80	1453	0
			0.5	14.13	Cum	105.62	1492	105.62	1492	0
3	430	Shuttering for PCC work upto ripening days and open the same Work								
		Outer Part		4.8	4.52					
		Inner Part		3.8	3.58					0
				Total	8.10	Sqm	211.00	1709	60.20	488	1222
4	413 b 414	PCC work with Ratio (1:3:6) with 40 mm Metal work								
					2.03	Cum	2527.00	5118	498.8	1010	4108

5	605 j	Cement Mortar for Brick work (1:6)								
	Well Brick work From 9m to 6m		3	12.15	Cum					
	Well Brick work from 6mto 3m		3	12.15	Cum					
	Well Brick Work From 3m to 00.0 m		3	12.15	Cum					
	Parapet wall		0.9	3.65						
	Substraction of Gate Opening		0.6x0.3 x0.6	0.11						
			Total	39.99	Cum	2825.30	112992	87	3479	109513
6	413 g 414	Under the Plateform filling of Pebble with ratio(1:4:8)								
		Plateform	0.1	1.97						
			Total	1.97	Cum	2227.20	4385	498.80	982	3403
7	605 j	Cement Concreate (1:6)								
		Plateform	0.50	1.05						
	Plateform and pani patti		0.10	0.35						
			Total	1.40	Cum	2825.30	3966	87	122	3843
8	1009 g - 1010	15 mm plastering with (1:6) Mortar and including Doga								
	Outer Part of Plateform		0.30	6.41						
		Outer Part	0.60	8.67						
		Upper part	0.30	4.05						
			Total	19.12						
		Substract	1x0.6x0 .6	0.36						
			Total	18.76	sqm	90.10	1691	49.8	934	756
9	1022 &1025	In Brick Macacinary filling of gap with (1:3) and (including Teep)								
	Inner Part of the Well		1x3.14x 4x6	75.36						
		Substarct	1x0.6x0 .6	0.36						
			Total	75.00	Sqm	69.10	5183	58	4350	833
10	1220 & 1221	40 mm thick Flooring wwith 1;3:4 ration with 20 mm metal								
		Plateform	1.1	19.69						
			Total	19.69	sqm	204.20	4020	68.0	1339	2681
11	310 b	Soil Filling in the Outer part of well								
	Quantity of Digging		uantity of Item no.1	254.34						
	Substration of Outer quantion of Well			91.00						
			Total	163.34	Cum	71.50	11679	71.50	11679	0

2	402	Filling of good murrum /Hard Soil								
		Plateform	2	3.94						
			Total	3.94	sqm	158.30	623	39.0	154	470
		Pully and rod for water lift					1000			1000
		Total amount for Construction of well					**227988**		**100160**	**127828**
	Difference in enhancing the Labour Rate from 1June 2`015 , the additional labour wages (174-159)		630			15.00	9449		9449	
	Monitoring of the work in Work Site Charges		13			197.00	2511			2511
	Charges of Water Drinking on the Work Site		13			174.00	2218		2218	
	Shadow and hanging Toys for Childrens						1000			1000
	Sign Board and Photograph						5000			5000
	Miscellanious Expenditure %		1	%			2374			2374
			Total Amount (RS)				**250540**		**111827**	**138713**
		Labour	111827	45	**%**					
		Material	138713	55	**%**					
		Total	250540	100	**%**					

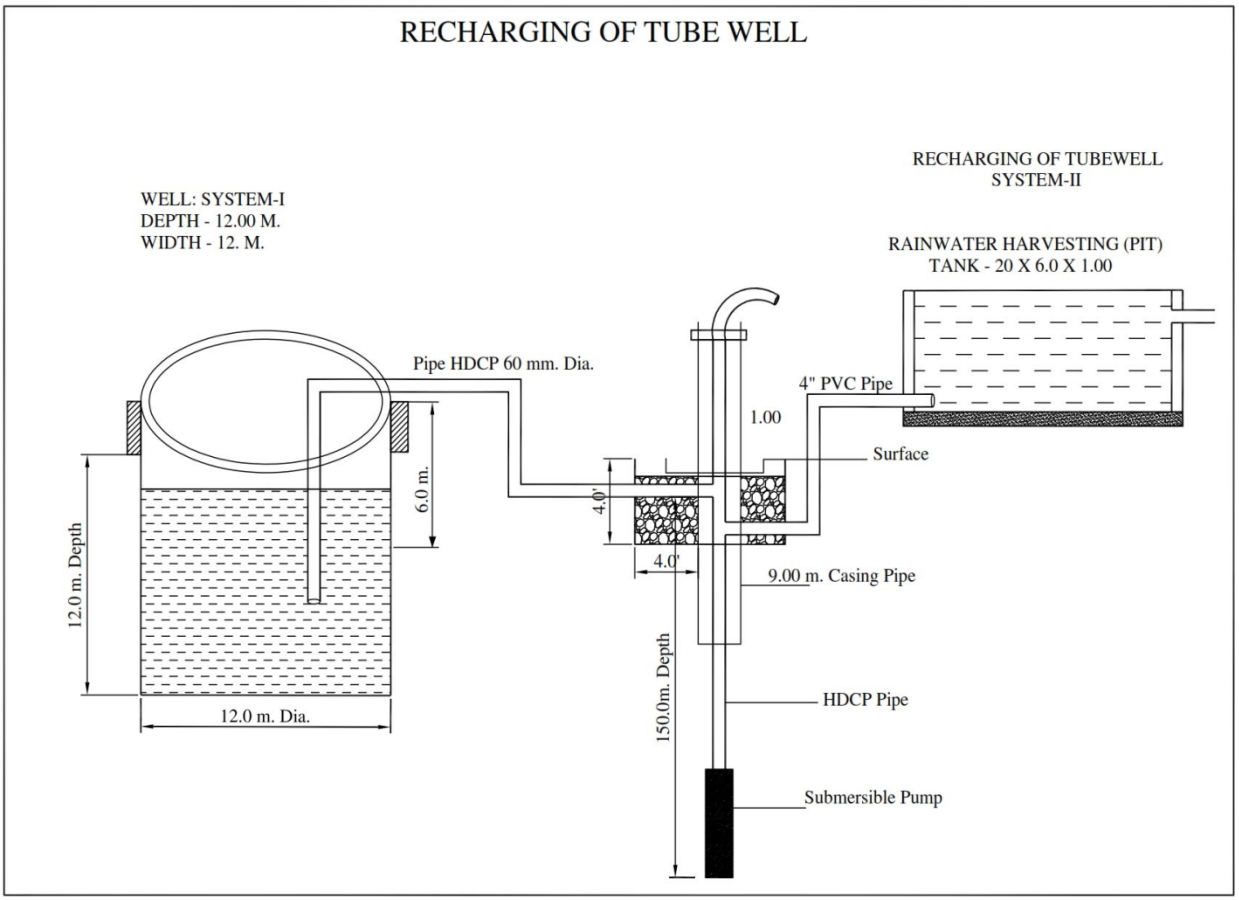
Drawing for excavation of well:



Design and cost estimation No-27

Cost Estimation for Tube Well Recharging With Injection Well Methods									25.857128N, 84.685922E
S.No.	**Particulars of Work**	**Length (M)**	**Width (M)**	**Depth (m)**	**Quantity**	**Rate**	**Unit**	**Amount**	**Remark**
1	Site clearence, cutting of bushes, grasses, etc.	50	4	0	200	1.8	sqm	360	
2 (a)	Excavation of Earth work in bulk, excavation in trenches for foundation and for pipes, cables, etc. (not exceeding 1.5m width) in	30	1	1	30	38	cum	1140	SOR WRD dated 01.09.2017 item no 2.01 of page 26
2 (b)	Excavation of Dense and hard soil	30	1	1	30	81	cum	2430	SOR WRD dated 01.09.2017 item no 2.02 of page 26
2 (c.)	Excavation of Hard murram (Nala to recharging point)and water storage pit	30	1	1	30	81	cum	2430	SOR WRD dated 01.09.2017 item no 2.02 of page 26
3	Excavation of Earth work in bulk, excavation exceeding 30 cm. in depth and 1.5m. Width, 1/2 disposal of excavated soil lead up to 30m. And lift 1.5m								
3 (a)	Water storage put in hard murram	61.5	6	6	54	252	cum	13608	SOR WRD dated 01.09.2017 item no 2.03 of page 26
3 (b)	Excavation for filter. Hard murram	3	3	1	9	252	cum	2268	SOR WRD dated 01.09.2017 item no 2.03 of page 26
3 (c.)	D.I.R	3	3	1	9	252	cum	2268	SOR WRD dated 01.09.2017 item no 2.03 of page 26
4	Excavation of boring with boring tube well machine 1500mm bore	40			40	350	MT	14000	As per market rate
5	Cost of 150 mm PVC. Casing pipe and shifting in the bore	40			40	495	MT	19800	As per market rate
6	Provide filter material including filling of gravel ground pipe	3	3	2	18	483.1	cum	8695.8	As per market rate
7	Provide PVC pipe of 110m. From Nala to water storage tank, and storage tank to filter	60			60	175	MT	10500	As per market rate
8	Labour charges of fitting PVC pipe	60			60	4.3	MT	258	As per market rate
9	Transporation of material	lumpsum						5000	As per market rate
	Total							82757.8	
10	Contegencies and miscellenous charges @ 3.5% on total cost							2896.523	
11	20% extra for escalating of material cost							19448.08	
12	Injection Recharge well cost 10.5 m d and 6m dia							**250540**	
13	**Tube well recharge cost**							**105102.4**	
14	**Grand Total Cost of Recharge Unit**							**355642**	

Drawing of Recharge unit



Cost Estimate for excavation of Recharge well:

Detailof Cost estimation for well excavation										
Name ofthe Work - irrigation Well (4 m Dia and 9 m Depth)										
		Name of Village		Name of GP						
		Block-		District-						
		Earth work dia	6	Qnty	(3.14*dia*dia*depth)/4			Inner well Dia	4	
		depth	10.5							
dz	SOR Item No	Discription	Measurement	Qty	Unit	Total rate	Total amount	Labour Cost	Total labour	Total Material (7-9)
1	2	3	4	5	6	7	8	9	10	11
1	2401(B)	Earth Work excavation aand digging of 1.5 m depth and Lifting, lead upto 50 m with complete dressing								
		0.00 to 1.50 m	1.50	42.39	Cum	98.10	4158	98.10	4158	0

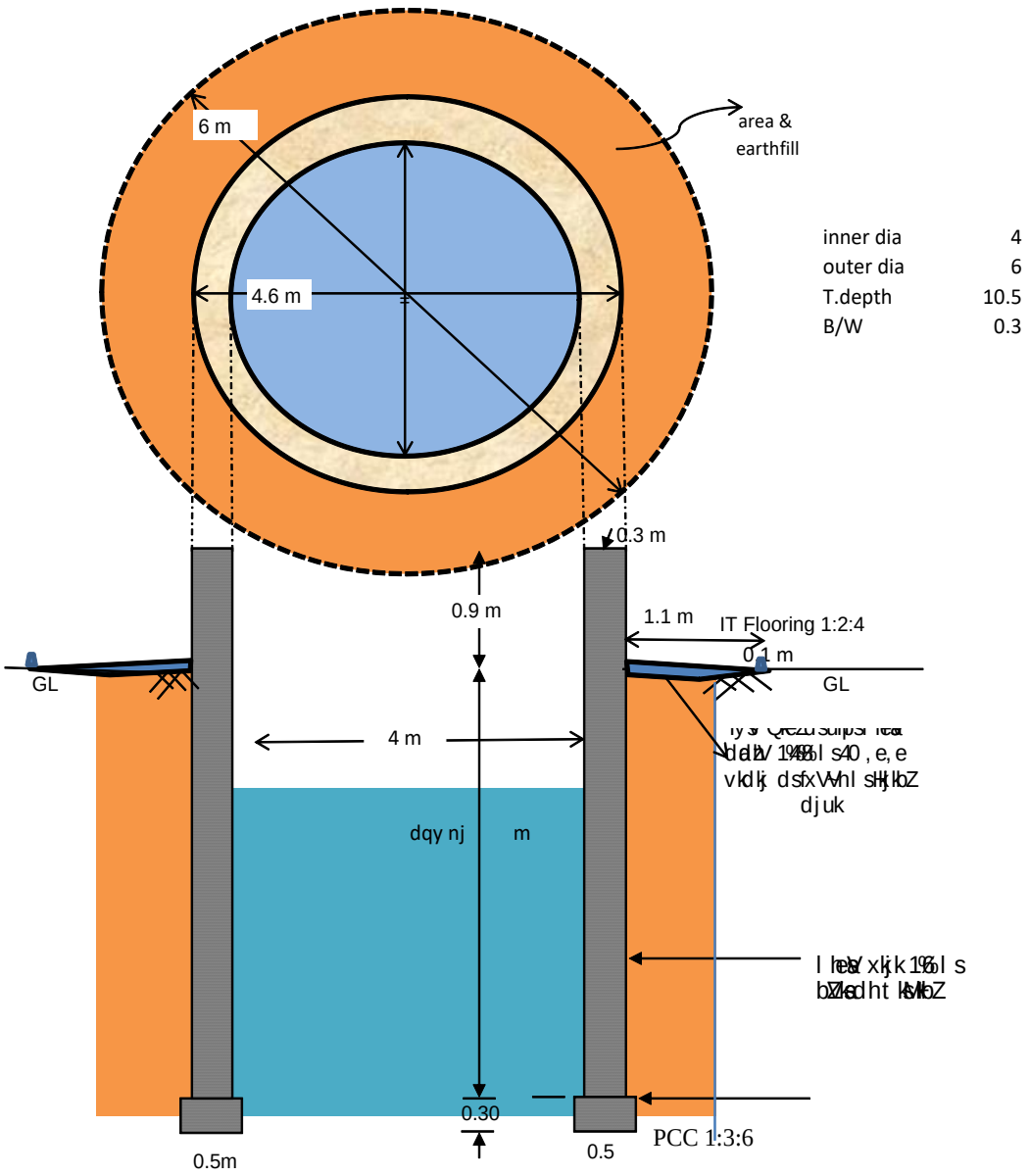
	2401 (B) +2403 (A)	1.50 to 2.00 m	0.5	14.13	Cum	105.90	1496	105.90	1496	0
			0.5	14.13	Cum	113.70	1607	113.70	1607	0
			0.5	14.13	Cum	121.50	1717	121.50	1717	0
			0.5	14.13	Cum	129.30	1827	129.30	1827	0
			0.5	14.13	Cum	137.10	1937	137.10	1937	0
			0.5	14.13	Cum	144.90	2047	144.90	2047	0
		4.50 to 6.00 m	0.5	14.13	Cum	152.70	2158	152.70	2158	0
	2402 (A) +2404 (B)		0.5	14.13	3.00 to 4.50 m	429.40	6067	429.40	6067	0
			0.5	14.13	Cum	443.50	6267	443.50	6267	0
		6.0 to 7-50 m	0.5	14.13	Cum	457.60	6466	457.60	6466	0
			0.5	14.13	Cum	471.70	6665	471.70	6665	0
			0.5	14.13	Cum	485.80	6864	485.80	6864	0
		7-50 to 9.00 m	0.5	14.13	Cum	499.90	7064	499.90	7064	0
			0.5	14.13	Cum	514.00	7263	514.00	7263	0
			0.5	14.13	Cum	528.10	7462	528.10	7462	0
	2401 A	Costruction of Plateform		2.03	Cum	98.10	200	98.10	200	0
2	2405	Digging of Soil in hard Soil under water with Lift and lead upto 1.5m								
		7.50 m to 9 m (20%vf/kd nj)	0.5	14.13	Cum	99.98	1413	99.98	1413	0
			0.5	14.13	Cum	102.80	1453	102.80	1453	0
			0.5	14.13	Cum	105.62	1492	105.62	1492	0
3	430	Shuttering for PCC work upto ripening days and open the same Work								
		Outer Part	4.8	4.52						
		Inner Part	3.8	3.58						0
			Total	8.10	Sqm	211.00	1709	60.20	488	1222
4	413 b 414	PCC work with Ratio (1:3:6) with 40 mm Metal work								
				2.03	Cum	2527.00	5118	498.8	1010	4108
5	605 j	Cement Mortar for Brick work (1:6)								
	Well Brick work From 9m to 6m		3	12.15	Cum					
	Well Brick work from 6mto 3m		3	12.15	Cum					
	Well Brick Work From 3m to 00.0 m		3	12.15	Cum					
	Parapet wall		0.9	3.65						
	Substraction of Gate Opening		0.6x0.3x0.6	0.11						
			Total	39.99	Cum	2825.30	112992	87	3479	109513
6	413 g 414	Under the Plateform filling of Pebble with ratio(1:4:8)								
		Plateform	0.1	1.97						
			Total	1.97	Cum	2227.20	4385	498.80	982	3403

7	605 j	Cement Concreate (1:6)								
		Plateform	0.50	1.05						
		Plateform and pani patti	0.10	0.35						
			Total	1.40	Cum	2825.30	3966	87	122	3843
8	1009 g - 1010	15 mm plastering with (1:6) Mortar and including Doga								
		Outer Part of Plateform	0.30	6.41						
		Outer Part	0.60	8.67						
		Upper part	0.30	4.05						
			Total	19.12						
		Substract	1x0.6x0.6	0.36						
			Total	18.76	sqm	90.10	1691	49.8	934	756
9	1022 &1025	In Brick Macacinary filling of gap with (1:3) and (including Teep)								
		Inner Part of the Well	1x3.14x4x6	75.36						
		Substarct	1x0.6x0.6	0.36						
			Total	75.00	Sqm	69.10	5183	58	4350	833
10	1220 & 1221	40 mm thick Flooring wwith 1;3:4 ration with 20 mm metal								
		Plateform	1.1	19.69						
			Total	19.69	sqm	204.20	4020	68.0	1339	2681
11	310 b	Soil Filling in the Outer part of well								
	Quantity of Digging		Quantity of Item no.1	254.34						
	Substration of Outer quantion of Well			91.00						
			Total	163.34	Cum	71.50	11679	71.50	11679	0
12	402	Filling of good murrum /Hard Soil								
		Plateform	2	3.94						
			Total	3.94	sqm	158.30	623	39.0	154	470
	Pully and rod for water lift						1000			1000
		Total amount for Construction of well					**227988**		**100160**	**127828**
	Difference in enhancing the Labour Rate from 1June 2`015 , the additional labour wages (174-159)				630		15.00	9449		9449	
	Monitoring of the work in Work Site Charges				13		197.00	2511			2511
	Charges of Water Drinking on the Work Site				13		174.00	2218		2218	
	Shadow and hanging Toys for Childrens							1000			1000
	Sign Board and Photograph							5000			5000
	Miscellanious Expenditure %				1	%		2374			2374
			Total Amount (RS)					**250540**		**111827**	**138713**
		Labour	111827	45	**%**						
		Material	138713	55	**%**						
		Total	250540	100	**%**						

Drawing for excavation of Well:

Injection Recharge Well Cost

Plan

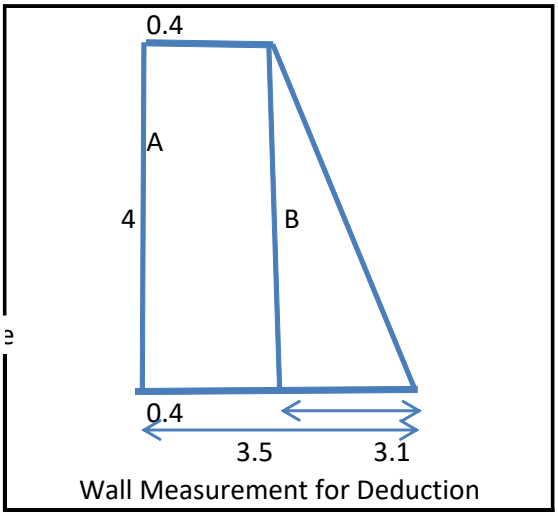


Section

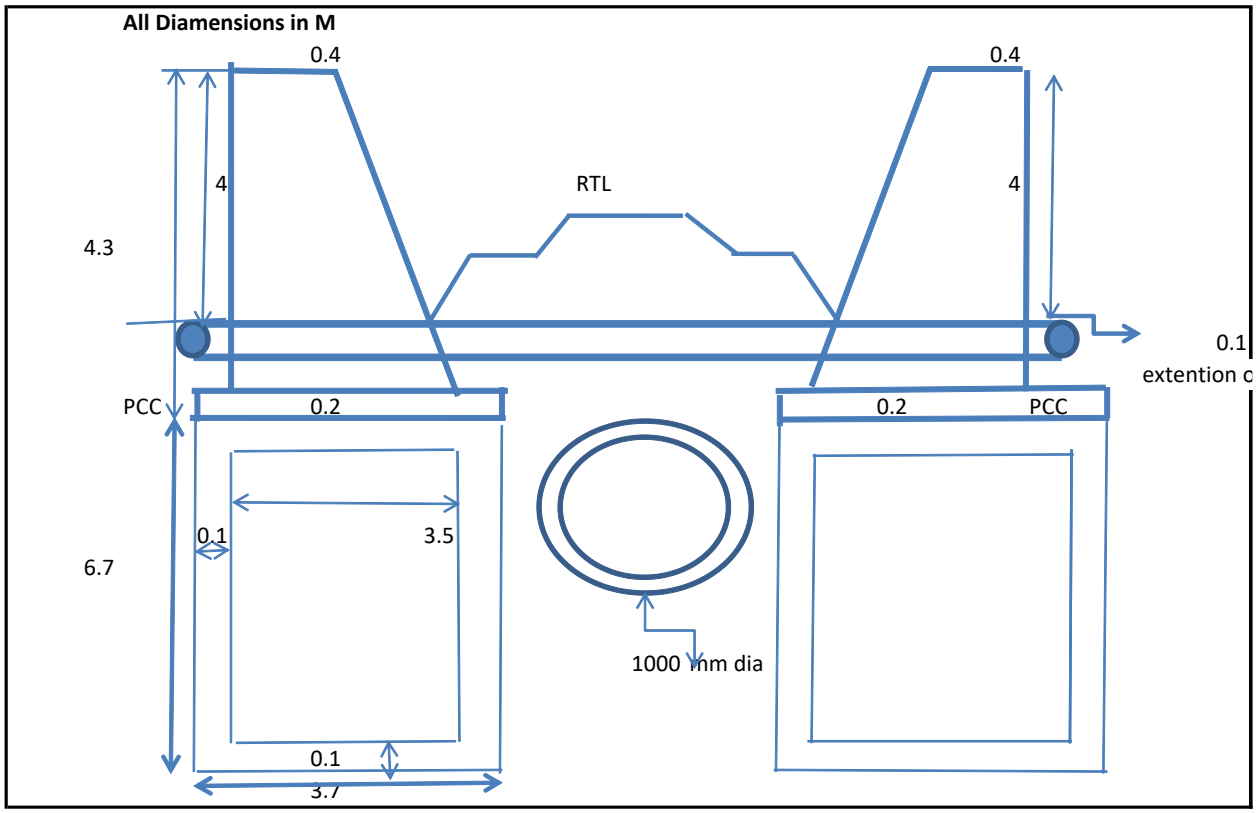
Design and Cost Estimation No-28

Location - Village Rewari							Lat ,Long	25.849848N, 84.687895E		
Cost Estimation of Culvert or Pulia Nirman										
Sl No	Particulars	No	L	W	H/D	Volume	Quantity	Unit	Rate	Amount
	Foundation -Earth work excavation									
1	Excavation of Foundation (one side)	1	6.7	3.7	4.3	106.60				
	Excavation of Foundation (2nd side	1	6.7	3.7	4.3	106.60		176.86/80cft		
	Sub Total					**213.19**	**213.194**	Cum	**221**	47115.87
	Pre CementConcreate (PCC-1:4:8)	1	0.2	3.7	6.7	4.96				0
2	**Pre CementConcreate (PCC-1:4:8)**									0
	2nd Side Pre concreate(PCC-1:4:8)	1	0.2	3.7	6.7	4.96				0
	Total PCC					9.92	**9.916**	Cum	**3500**	34706
3	**B/W cement Mortar (1:4) or RCC(1:2:4)**									0
	B/W cement Mortar (1:4) or	1	4	0.4	6.7	10.72				0
	Cement Concreate wall (RCC-1:2:4)	1	3.5	4	6.7	46.90				0
	2nd Side Reinforce concreate Cement (RCC-1:2:4)					57.62	57.62			0
	Total RCC	2	0	0	0		**115.24**	Cum		0
	Volume of Two Wall		3.023	0.3787	3.14	3.59	**7.1898**			0
	Deduction (3.14Xr2xL)									0
	Actual B/W (1:4) Cement Mortar Or						**108.0502**	Cum	**6845**	739603.32
	RCC work(1:2:4)									0
4	Cost of 1000 mm dia or 1m dia RCC hume Pipe	3					3		**12500**	37500
5	Mason	12					12		**600**	7200
6	Labour	34					34		500	17000
7	Board	1					1		2000	2000
7	Micellaneous lump sump								5000	5000
	Total cost of Single Row Pipe Culvert									**890125.19**

Drawing of Culvert or Pulia:



Wall Measurement for Deduction



Design and Cost Estimation No-29:

INPUT DATA			
	GPS Location of Check dam	**25.857128N, 84.685922E**	
	Name of stream/ site	**Telpa**	
	village	**Pirari Majlishpur**	
	Gram panchayat	**Majlishpur**	
	Block	**Majlishpur**	
	District/ state	**Saran**	
Sr. no.	**Particulars**	**Unit**	**QTY.**
1	Catchment Area	Ha	300.00
2	Length of Crest wall	m	14.00
3	Fetch length Dm	m	1000.00
4	Height of Dam Wall (H)	m	**1.50**
5	Specific Gravity "G" of construction Material (For PCC G =2.54)	constant	2.24
6	Constant for hydraulic gradient of River Bed Material "K" for sandy+boulder	constant	9
7	C(Deckan's formula) for Eastern Region	constant	16.00
8	Foundation depth	M	1.50
9	Soft soil depth	M	0.50

10	Extension of bunds with earthen bunding (if required to connect with nearby higher bank)	M	5.00
Cost summary			
1	**Total cost of Structure**	**1547373**	**100**
2	**Labour cost**	**487576**	**32%**
3	**Material cost**	**1059797**	**68%**

Deccan's constant for peak runoff estimation

C= coefficient of runoff, the value of C is as below

Zone	C
Central India	14 to 19.5
North India	11.5
Western Ghat	22 to 26

Specific gravity of different construction material:

Sr. No.	Construction material	Specific gravity (G)
1	Plain cement concrete (PCC)	2.24
2	Reinforced cement concrete (RCC)	2.40
3	Stone masonry in cement mortar	2.54
4	Dry stone masonry	2.08
5	Random rubble masonry	2.32
6	Brick masonry	1.92
7	Reinforced brick masonry	2.00
8	Plum cement concrete	2.24

Hydraulic gradient (K) for different situation of drain bed:

Sr. No.	Situation of drain bed	Safe hydraulic gradient (K)
1	Coarse sand	12
2	Fine sand + mud	8
3	Sand + Boulder	5 to 9
4	Fine sand	15
5	Boulder	5
6	Big Boulder	3.5 to 4.5

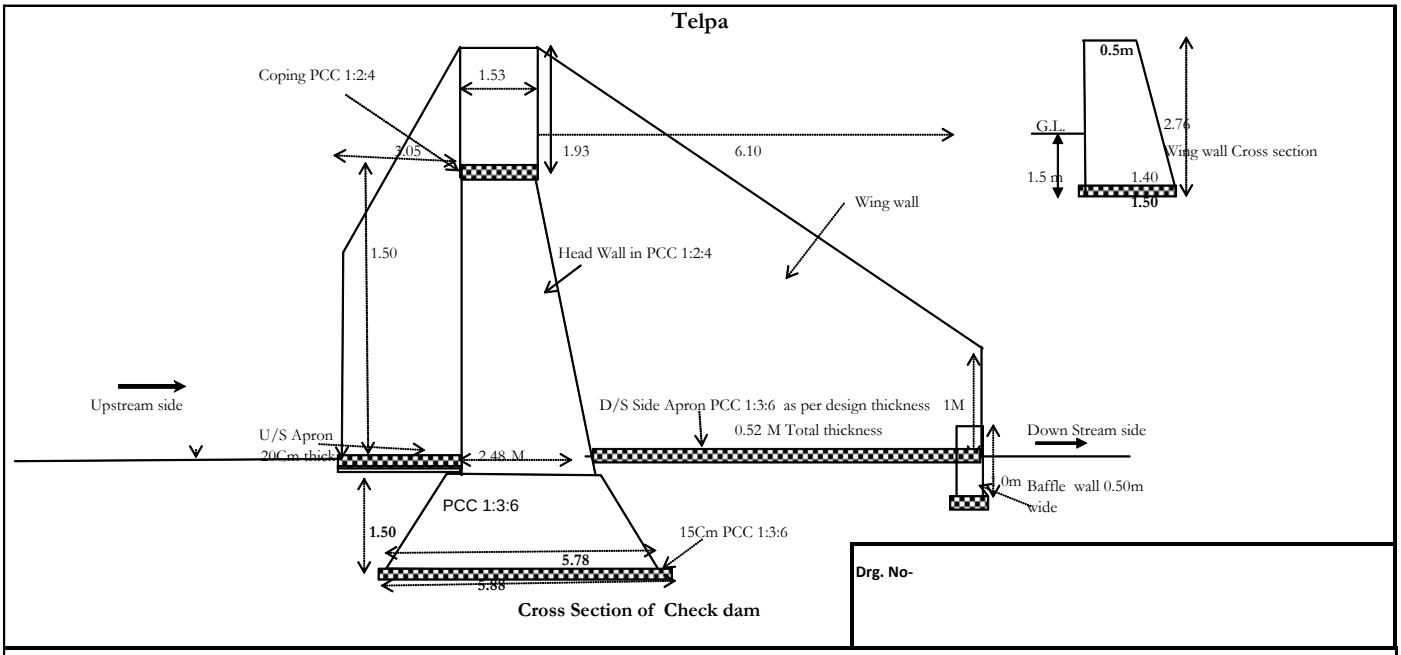
Design of Check dam -29:

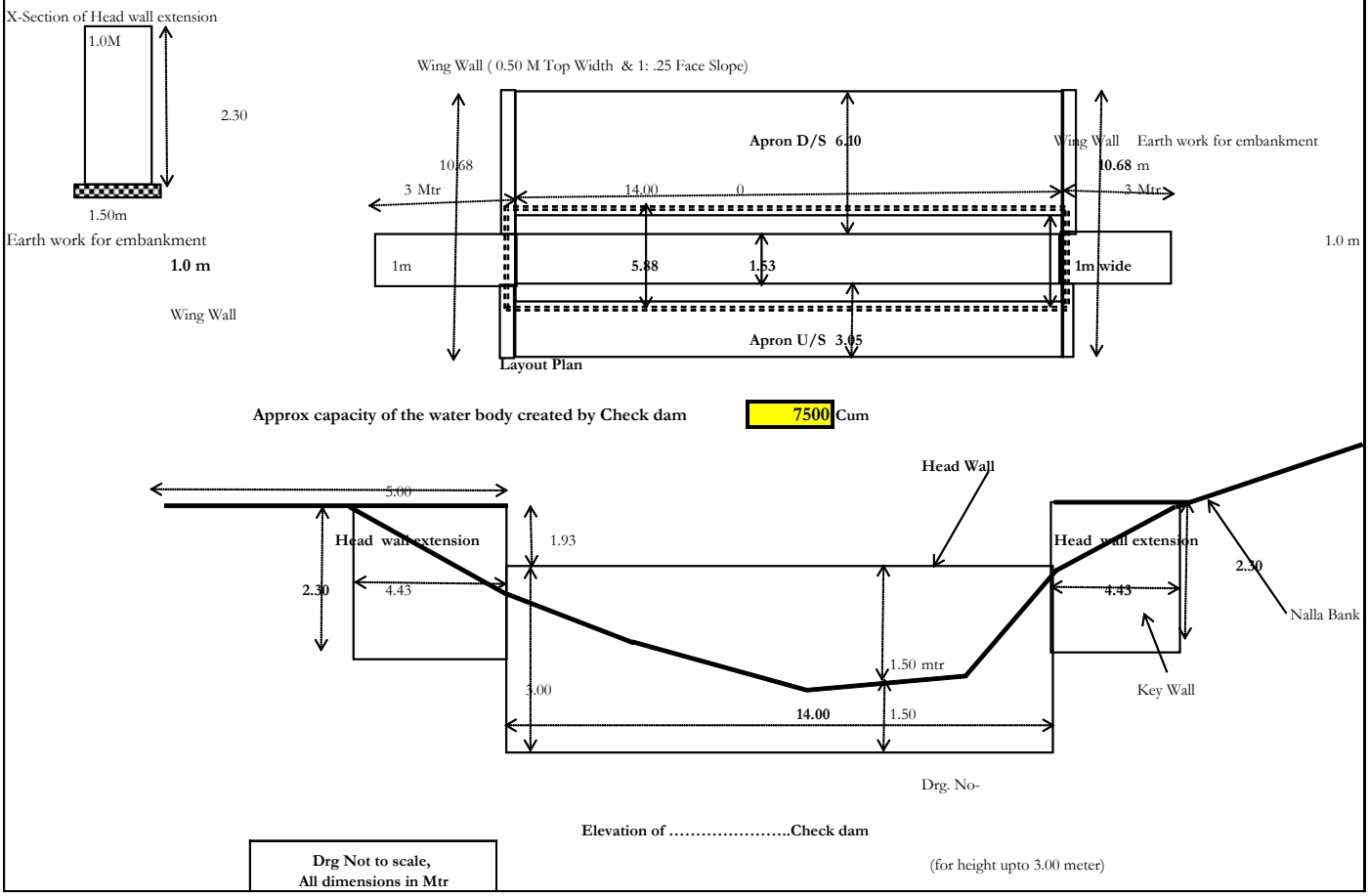
Design of Check Dam			
	Name of stream/ site	**Telpa**	
	GPS Location of Check dam	**25.857128N, 84.685922E**	
	village	**Pirari Majlishpur**	
	Gram panchayat	**Majlishpur**	
	Block	**majlishpur**	
	District/ state	**Saran**	
Sr No.	**Particulars**	**Unit**	**QTY.**
1	Catchment Area	Ha	300.00
2	Length of Creast wall	m	14.00
3	Fetch length Dm	m	1000.00
4	(hw=wave height,m)= $0.014(Dm)^{1/2}$	m	0.44
5	Net Free board $F=1.5h_w$	m	0.66
6	Total free board (Depth of flow +Net free board)=hf= h+F	m	1.93
7	Maximum Flood Discharge ($Q = CA^{3/4}$), A in sq Km	Cumecs	36.47
8	C(Deckan's formula) for Eastern Region		16.00
9	Maximum Flood Discharge per meter q=Q/L	Cumecs	2.61
10	Hydraulic Depth over Weir (h)=$(q/1.84)^{2/3}$	m	1.26
11	Height of Dam Wall (H)	m	**1.50**
12	Total Hydraulic Depth (H_L)	m	2.76
13	Specific Gravity "G" of construction Material (For PCC G =2.54)		2.24
14	Top Width of Dam Wall a= (H_L/Sqrt(G+1))	m	1.53
15	Bottom Width of Dam Wall b= (H_L/Sqrt(G-1))	m	2.48
16	Constant for hydraulic gradient of River Bed Material "K" for sandy+boulder		9
17	Length of D/S Apron, L_A=1.45K(sqrt(H_L/13)	m	6.02
18	Thickness of D/S Apron, L_{th}=1.33(h/G+1)	m	0.52
19	Baffle wall Height h_b (Height Ranges Between0.3 Mtr to 0.5 Mtr. for smaller structures upto 3 mtr ht))	m	0.50
20	Baffle wall width (width Ranges Between0.3 Mtr to 0.5 Mtr. for smaller structures upto 3 mtr ht))	m	0.50
21	Head wall extention length HWe=H+hf+1	m	4.43
22	Height of head wall extension	m	2.30
23	D/S Side wall length SW=1.75H+.075hf+0.45	m	4.52
24	Length of Wing Wall D/S	m	6.10
25	Length of Wing Wall U/S	m	3.05
26	Upstream Apron Length Lau =L_A/2	m	3.01
27	Upstream Apron Thickness L_{thu}=L_{th} /2	m	0.26
28	Foundation depth	M	1.50
29	Soft soil depth	M	0.50

Item No.	Particulars	A/U	Nos
	Site clearance, cutting grass, raking into heaps and removing off the premises	Sqm	1
	Excavation for foundation		
	For foundation of check dam main wall	Cum	1
	For foundation of Head wall extension L/S	Cum	1
	For foundation of Head wall extension R/S	Cum	1
	For Apron D/S	Cum	1
	For Apron U/S	Cum	1
	For Baffle Wall D/S	Cum	1
	For wing wall D/S	Cum	2
	For wing wall U/S	Cum	2
	E/w for extension of embank ments both side	Cum	2
	Total Qty. of E/W		
	Back filling in foundation….with excavtaed soil		
	Total excvn - Qty of Masonary in foundation	Cum	
	PCC in foundation in 1:3:6, C/C with 40mm metal		
	For foundation of check dam main wall	Cum	1
	For foundation of Head wall extension L/S	Cum	1
	For foundation of Head wall extension R/S	Cum	1
	For Apron D/S	Cum	1
	For Apron U/S	Cum	1
	For Baffle Wall D/S	Cum	1
	For wing wall D/S	Cum	2
	For wing wall U/S	Cum	2
	Total Qty. of PCC 1:3:6		
	PCC in foundation in 1:2:4, C/C with 40mm metal		
	For foundation of check dam main wall Width	Cum	1
	For Super structure of check dam main wall Width	Cum	1
	For Head wall extension L/S	Cum	1
	For Head wall extension R/S	Cum	1
	For Apron D/S	Cum	1
	For Apron U/S	Cum	1

	For Baffle Wall D/S	Cum	1
	For wing wall D/S (0.60 + 1.5)/2	Cum	2
	For wing wall U/S	Cum	2
	PCC1:2:4	Cum	
	12 mm thick Plastering in CM 1:4…		
	Over apron D/S	Sqm	1
	For head wall both side & top	Sqm	1
	for wing wall faces	Sqm	2
	Over apron U/S	Sqm	1
	Sides of baffle wall 1.0m D/S and .30 M U/S of baffle wall	Sqm	1
	Total area		
	Farm work for all other structures……		
	For check dam main wall	Sqm	2
	For Head wall extension L/S	Sqm	2
	For Head wall extension R/S	Sqm	2
	For Apron D/S	Sqm	1
	For Apron U/S	Sqm	1
	For Baffle Wall D/S	Sqm	2
	For wing wall D/S	Sqm	4
	For wing wall U/S	Sqm	4
	Total Farm work	Sqm	
	45 cm thick Stone pitching on U/s face of earthen structure		
	Upto HFL of the bunds	Sqm	2
	Total Materials Required		
	40 mm Metal	**cum**	**45.72**
	20 mm Metal	**cum**	**238.78**
	Sand	**cum**	**248.94**
	Cement	**Bags**	**1815**
	Stones	**cum**	**7**

Drawing of Check Dam -29:





Cost Estimate of Check dam 29:

Name of the work-Check dam Construction Tel & Terpa River River									6.00	Metre			
Village -Fakuli						Gram panchayat-Fakuli							
Bock -Jalalpur						District Saran							
dz	SOR Item no	Detailof work	No	Length	Width	Height /depth	Qty	Unit	Total Rate	Total amount	Labour rate	Labour amount	Material amount (7-9)
1		2	3	4	5	6	7	8	9	10	11	12	13
1	101	Cleaning and Grass Cutting of the Site with collection and disposal from the work Site											
			1	16.00	15.83		253.25	Sqm	1.80	456	1.80	456	
2	301	Soil work (depth 30 cm, width 1.50m) and greater than 10 sqm area digging and the excavated Soil lead upto 50 m and lift 1.50 m with removal of soil from Work site											
		Soft or Hard soil /Hard Murrum											
		For foundation of check dam main wall	1	6.00	6.75	1.50	60.72	cum					
		For foundation of Head wall extension L/S	1	5.39	2.00	1.50	16.17	cum					
		For foundation of Head wall extension R/S	1	5.39	2.00	1.50	16.17	cum					
		For Apron D/S	1	6.00	3.61	0.91	19.82	cum					
		For Apron U/S	1	6.00	2.99	0.46	8.21	cum					
		For Baffle Wall D/S	1	6.00	0.60	1.50	5.40	cum					
		For wing wall D/S	2	7.00	1.50	1.50	31.50	cum					
		For wing wall U/S	2	3.50	1.50	1.50	15.75	cum					
		E/w for extension of embank ments both side	2	5.00	4.50	0.50	22.50	cum					
		Total Qty. of E/W				Total	196.25	cum					
3	301b	Of which, soft soil/hard soil…. (@40%)					78.50	cum	110.30	8659	110.30	8659	0
4	302 a	Of which, SR/ hard conglonmerate/ Disintgrated rocks…….. (@60%)					117.75	cum	267.20	31463	267.20	31463	0
										40122		40122	0
5	304	E/W Excavation and riffling of Soil in the Trench or making bund,Levelling, Dressing with complete task as per direction of engr Incharge.											
		Total excvn - Qty of Masonary in foundation	1				51.64	cum	110.30	5696	110.30	5696	0
6	413 b	PCC Work with Ratio of PCC(1:3:6) mixing , arrangement with 40 mm metal ,lifting ,pouring on the foundation with watering etc.											
		For foundation of check dam main wall	1	6	6.747	0.3	12.14	cum					

		For foundation of Head wall extension L/S	1	5.391	2.0706	0.15	1.67	cum					
		For foundation of Head wall extension R/S	1	5.391	2.0706	0.15	1.67	cum					
		For Apron D/S	1	6	6.9875	0.15	6.29	cum					
		For Apron U/S	1	6	3.4937	0.15	3.14	cum					
		For Baffle Wall D/S	1	6	0.6	0.15	0.54	cum					
		For wing wall D/S	2	7	1.5	0.1	2.10	cum					
		For wing wall U/S	2	3.5	1.5	0.1	1.05	cum					
		Total Qty. of PCC 1:3:6				Total	28.62	cum	2527.00	72314	498.8	14274	58040
7	25 g 426	RCC Work with Ratio (1:2:4) Mixing of Metal 20mm ,lifting and pouring on column, wall, lentils, and roof with proper spreading cleaning and curing with complete task etc.											
		For foundation of check dam main wall	1	6.00	5.05	1.20	36.34	cum					
		For Super structure of check dam main wall Width	1	6.00	2.71	1.50	24.38	cum					
		For Head wall extension L/S	1	5.39	1.00	1.50	8.09	cum					
		For Head wall extension R/S	1	5.39	1.00	1.50	8.09	cum					
		For Apron D/S	1	6.00	6.99	0.76	32.04	cum					
		For Apron U/S	1	6.00	3.49	0.31	6.44	cum					
		For Baffle Wall D/S	1	6.00	0.50	1.00	3.00	cum					
		For wing wall D/S (0.50 + 1.2)/2	2	7.00	1.05	5.43	79.78	cum					
		For wing wall U/S	2	3.50	1.05	5.43	39.89	cum					
							238.03	cum	3731.20	888143	656.6	156292	731852
8	1007	12 MM Plaster on rub wall											
	k	Cement Mortar 1:4 (1 cement and 4 Sand)											
		Over apron D/S	1	6	6.9875		41.92	sqm					
		For head wall both side & top	1	6	5.0706		30.42	sqm					
		for wing wall faces	2	10.50	3.727		78.27	sqm					
		Over apron U/S	1	6	3.4937		20.96	sqm					
		Sides of baffle wall 1.0m D/S and .30 M U/S of baffle wall	1	6	1		6.00	sqm					

		12 mm thick Plastering in CM 1:4…					177.58	sqm	103.90	18450	44.50	7902	10548
9	430-431	Removal of Shuttering from column, Roof, pillars and other part with collection one place .Complete task.											
		Farm work for all other structures……											
		For check dam main wall	2	6	0	3	36.00	sqm					
		For Head wall extension L/S	2	5.391	0	1.5	16.17	sqm					
		For Head wall extension R/S	2	5.391	0	1.5	16.17	sqm					
		For Apron D/S	1	6	0	0.91418	5.49	sqm					
		For Apron U/S	1	6	0	0.45709	2.74	sqm					
		For Baffle Wall D/S	2	6	0	1	12.00	sqm					
		For wing wall D/S	4	6.987	0	5.42702	151.68	sqm					
		For wing wall U/S	4	3.494	0	5.42702	75.84	sqm					
		Total Farm work					316.10	sqm	211.00	66697	60.20	19029	47668
10	2310 ¼[k ½-2311	Pitching for Embankment of CD in U/s and D/S side , Pitching ,levelling of stone sand filling and cleaning of embankment etc.											
		45cm thick in 2 layer by hand stone pitching with 45x30x30 cm boulder size with gap of1.5 m extended header stone laying.	2	5.00	1.50	0.45	6.75	cum	437.40	2952	268.60	1813	1139
		Total amount								1134953		285706	849247
1		Difference in enhancing the Labour Rate from 1 June 2015 , the additional labour wages (174-159)							15	0		0	
2		Provision for mate wage for supervision of the Work					142.76	Mdays	197.00	28123.99			28124
3		Provision for providing drinking water to the working Labours					142.76	Mdays	172.00	24554.95		24555	
4		First aid box, Jhula, Shade etc at the work site for workers Childrens					Lumpsump			1500			1500
5		Sign board and Photograh					Lumpsump			5000			5000
6		Miscellaneous					5%			59707			59707
							Total amount			**1253838**		**310260**	**943578**
				Ratio		Amount		Percentage					
				Labour		310260		25	%				
				Material		943578		75	%				
				Total		1253838		100	%				

Cost Estimation of Check Dam -30: Rewari GP & Naini Sadar:

INPUT DATA			
	GPS Location of Check dam	25.831495N, 84.699898E	
	Name of stream/ site	Tel	
	village	Rewari sadar	
	Gram panchayat	Rewari sadar	
	Block	Jalanpur	
	District/ state	Saran	
Sr. no.	Particulars	Unit	QTY.
1	Catchment Area	Ha	240.00
2	Length of Crest wall	m	6.00
3	Fetch length Dm	m	1000.00
4	Height of Dam Wall (H)	m	**1.50**
5	Specific Gravity "G" of construction Material (For PCC G =2.54)	constant	2.24
6	Constant for hydraulic gradient of River Bed Material "K" for sandy+boulder	constant	9
7	C(Deckan's formula) for Eastern Region	constant	16.00
8	Foundation depth	M	1.50
9	Soft soil depth	M	0.50
10	Extension of bunds with earthen bunding (if required to connect with nearby higher bank)	M	5.00

Cost summary			
1	**Total cost of Structure**	**1165979**	**100**
2	**Labour cost**	**290957**	**25%**
3	**Material cost**	**875022**	**75%**

Deccan's constant for peak runoff estimation

C= coefficient of runoff, the value of C is as below

Zone	C
Central India	14 to 19.5
North India	11.5
Western Ghat	22 to 26

Specific gravity of different construction material:

Sr. No.	Construction material	Specific gravity (G)
1	Plain cement concrete (PCC)	2.24
2	Reinforced cement concrete (RCC)	2.40
3	Stone masonry in cement mortar	2.54
4	Dry stone masonry	2.08
5	Random rubble masonry	2.32
6	Brick masonry	1.92
7	Reinforced brick masonry	2.00
8	Plum cement concrete	2.24

Hydraulic gradient (K) for different situation of drain bed:

Sr. No.	Situation of drain bed	Safe hydraulic gradient (K)
1	Coarse sand	12
2	Fine sand + mud	8
3	Sand + Boulder	5 to 9
4	Fine sand	15
5	Boulder	5
6	Big Boulder	3.5 to 4.5

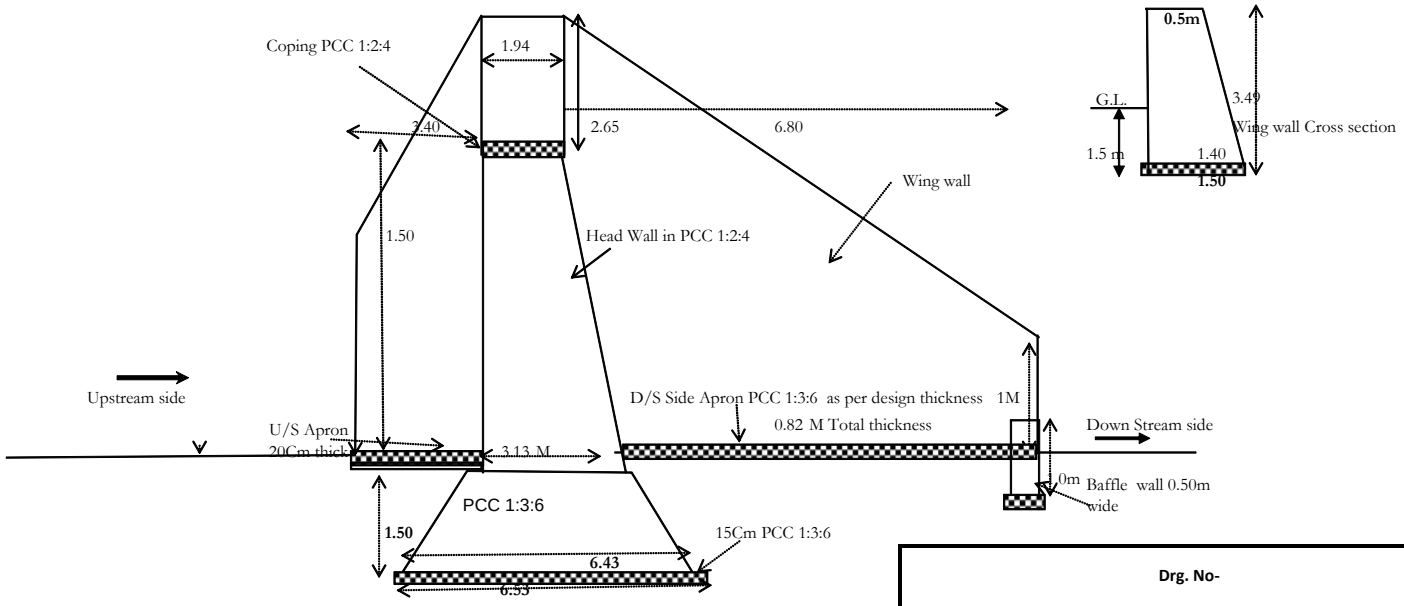
Design of Check Dam No 30			
	Name of stream/ site	**Tel River**	
	GPS Location of Check dam	**25.831495N, 84.699898E**	
	village	**Rewari sadar**	
	Gram panchayat	**Rewari sadar**	
	Block	**Jalanpur**	
	District/ state	**Saran**	
SrNo.	**Particulars**	**Unit**	**QTY.**
1	Catchment Area	Ha	240.00
2	Length of Creast wall	m	6.00
3	Fetch length Dm	m	1000.00
4	(hw=wave height,m)= $0.014(Dm)^{1/2}$	m	0.44
5	Net Free board $F=1.5h_w$	m	0.66
6	Total free board (Depth of flow +Net free board)=hf= h+F	m	2.65
7	Maximum Flood Discharge ($Q = CA^{3/4}$), A in sq Km	Cumecs	30.85
8	C(Deckan's formula) for Eastern Region		16.00
9	Maximum Flood Discharge per meter q=Q/L	Cumecs	5.14
10	Hydraulic Depth over Weir (h)=$(q/1.84)^{2/3}$	m	1.99
11	Height of Dam Wall (H)	m	**1.50**
12	Total Hydraulic Depth (H_L)	m	3.49
13	Specific Gravity "G" of construction Material (For PCC G =2.54)		2.24
14	Top Width of Dam Wall a= (H_L/Sqrt(G+1))	m	1.94
15	Bottom Width of Dam Wall b= (H_L/Sqrt(G-1))	m	3.13
16	Constant for hydraulic gradient of River Bed Material "K" for sandy+boulder		9
17	Length of D/S Apron, L_A=1.45K(sqrt(H_L/13)	m	6.76
18	Thickness of D/S Apron, L_{th}=1.33(h/G+1)	m	0.82
19	Baffle wall Height h_b (Height Ranges Between0.3 Mtr to 0.5 Mtr. for smaller structures upto 3 mtr ht))	m	0.50
20	Baffle wall width (width Ranges Between0.3 Mtr to 0.5 Mtr. for smaller structures upto 3 mtr ht))	m	0.50
21	Head wall extention length HWe=H+hf+1	m	5.15
22	Height of head wall extension	m	3.03
23	D/S Side wall length SW=1.75H+.075hf+0.45	m	5.07
24	Length of Wing Wall D/S	m	6.80
25	Length of Wing Wall U/S	m	3.40
26	Upstream Apron Length Lau =L_A/2	m	3.38
27	Upstream Apron Thickness L_{thu}=L_{th} /2	m	0.41
28	Foundation depth	M	1.50
29	Soft soil depth	M	0.50

Sr No.	Item No.	Particulars	A/U	Nos
1		Site clearance, cutting grass, raking into heaps and removing off the premises	Sqm	1
A		**Excavation for foundation**		
		For foundation of check dam main wall	Cum	1
		For foundation of Head wall extension L/S	Cum	1
		For foundation of Head wall extension R/S	Cum	1
		For Apron D/S	Cum	1
		For Apron U/S	Cum	1
		For Baffle Wall D/S	Cum	1
		For wing wall D/S	Cum	2
		For wing wall U/S	Cum	2
		E/w for extension of embank ments both side	Cum	2
		Total Qty. of E/W		
2		Back filling in foundation….with excavtaed soil		
		Total excvn - Qty of Masonary in foundation	Cum	
3		PCC in foundation in 1:3:6, C/C with 40mm metal		
		For foundation of check dam main wall	Cum	1
		For foundation of Head wall extension L/S	Cum	1
		For foundation of Head wall extension R/S	Cum	1
		For Apron D/S	Cum	1
		For Apron U/S	Cum	1
		For Baffle Wall D/S	Cum	1
		For wing wall D/S	Cum	2
		For wing wall U/S	Cum	2
		Total Qty. of PCC 1:3:6		
4		PCC in foundation in 1:2:4, C/C with 40mm metal		
		For foundation of check dam main wall Width	Cum	1
		For Super structure of check dam main wall Width	Cum	1
		For Head wall extension L/S	Cum	1
		For Head wall extension R/S	Cum	1
		For Apron D/S	Cum	1
		For Apron U/S	Cum	1
		For Baffle Wall D/S	Cum	1
		For wing wall D/S (0.60 + 1.5)/2	Cum	2
		For wing wall U/S	Cum	2

		PCC1:2:4	Cum	

5		12 mm thick Plastering in CM 1:4…		
		Over apron D/S	Sqm	1
		For head wall both side & top	Sqm	1
		for wing wall faces	Sqm	2
		Over apron U/S	Sqm	1
		Sides of baffle wall 1.0m D/S and .30 M U/S of baffle wall	Sqm	1
		Total area		
6		Farm work for all other structures……		
		For check dam main wall	Sqm	2
		For Head wall extension L/S	Sqm	2
		For Head wall extension R/S	Sqm	2
		For Apron D/S	Sqm	1
		For Apron U/S	Sqm	1
		For Baffle Wall D/S	Sqm	2
		For wing wall D/S	Sqm	4
		For wing wall U/S	Sqm	4
		Total Farm work	Sqm	
7		45 cm thick Stone pitching on U/s face of earthen structure		
		Upto HFL of the bunds	Sqm	2
		Total Materials Required		
		40 mm Metal	cum	25.29
		20 mm Metal	cum	206.44
		Sand	cum	208.10
		Cement	Bags	1497
		Stones	cum	7

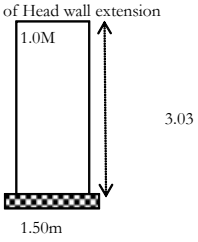
Tel



Drg. No-

Cross Section of Check dam

X-Section of Head wall extension

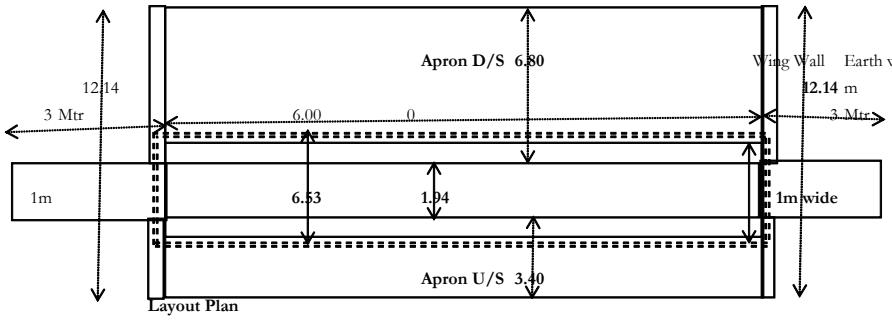


Earth work for embankment

1.0 m

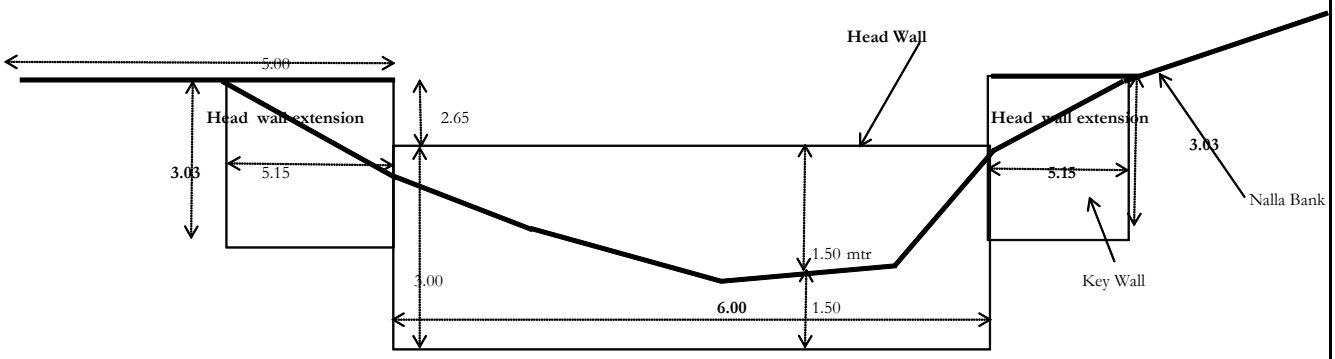
Wing Wall

Wing Wall (0.50 M Top Width & 1: .25 Face Slope)



Layout Plan

Approx capacity of the water body created by Check dam **7500** **Cum**



Drg. No-

Elevation of ……..Check dam

(for height upto 3.00 meter)

Drg Not to scale,
All dimensions in Mtr

Cost estimation of Check Dam: 30

Name of the work-Check dam Construction no 30 Tel & Terpa					River River			6.00	Metre			
Village -Fakuli					Gram panchayat-Fakuli							
Bock -Jalalpur					District Saran							
dz	SOR Item no	Detailof work	No	Length	Width	Height /depth	Qty	Unit	Total Rate	Total amount	Labour rate	Labour amount	Material amount (7-9)
1		2	3	4	5	6	7	8	9	10	11	12	13
1	101	Cleaning and Grass Cutting of the Site with collection and disposal from the work Site											
			1	16.00	15.28		244.46	Sqm	1.80	440	1.80	440	
2	301	Soil work (depth 30 cm, width 1.50m) and greater than 10 sqm area digging and the excavated Soil lead upto 50 m and lift 1.50 m with removal of soil from Work site											
		Soft or Hard soil /Hard Murrum											
		For foundation of check dam main wall	1	6.00	6.53	1.50	58.81	cum					
		For foundation of Head wall extension L/S	1	5.15	2.00	1.50	15.46	cum					
		For foundation of Head wall extension R/S	1	5.15	2.00	1.50	15.46	cum					
		For Apron D/S	1	6.00	3.49	0.82	17.14	cum					
		For Apron U/S	1	6.00	2.88	0.41	7.06	cum					
		For Baffle Wall D/S	1	6.00	0.60	1.50	5.40	cum					
		For wing wall D/S	2	6.80	1.50	1.50	30.60	cum					
		For wing wall U/S	2	3.40	1.50	1.50	15.30	cum					
		E/w for extension of embank ments both side	2	5.00	4.50	0.50	22.50	cum					
		Total Qty. of E/W				Total	187.74	cum					
3	301b	Of which, soft soil/hard soil…. (@40%)					75.10	cum	110.30	8283	110.30	8283	0
4	302 a	Of which, SR/ hard conglonmerate/ Disintgrated rocks…….. (@60%)					112.65	cum	267.20	30099	267.20	30099	0
										38382		38382	0
5	304	E/W Excavation and riffling of Soil in the Trench or making bund,Levelling, Dressing with complete task as per direction of engr Incharge.											
		Total excvn - Qty of Masonary in foundation	1				53.19	cum	110.30	5867	110.30	5867	0

6	413 b	PCC Work with Ratio of PCC(1:3:6) mixing , arrangement with 40 mm metal ,lifting ,pouring on the foundation with watering etc.											
		For foundation of check dam main wall	1	6	6.534	0.3	11.76	cum					
		For foundation of Head wall extension L/S	1	5.155	1.933	0.15	1.50	cum					
		For foundation of Head wall extension R/S	1	5.155	1.939	0.15	1.50	cum					
		For Apron D/S	1	6	6.762	0.15	6.09	cum					
		For Apron U/S	1	6	3.381	0.15	3.04	cum					
		For Baffle Wall D/S	1	6	0.6	0.15	0.54	cum					
		For wing wall D/S	2	6.8	1.5	0.1	2.04	cum					
		For wing wall U/S	2	3.4	1.5	0.1	1.02	cum					
		Total Qty. of PCC 1:3:6				Total	27.49	cum	2527.00	69470	498.8	13713	55757
7	425 g 426	RCC Work with Ratio (1:2:4) Mixing of Metal 20mm ,lifting and pouring on column, wall, lentils, and roof with proper spreading cleaning and curing with complete task etc.											
		For foundation of check dam main wall	1	6.00	4.83	1.20	34.81	cum					
		For Super structure of check dam main wall Width	1	6.00	2.54	1.50	22.83	cum					
		For Head wall extension L/S	1	5.15	1.00	1.50	7.73	cum					
		For Head wall extension R/S	1	5.15	1.00	1.50	7.73	cum					
		For Apron D/S	1	6.00	6.76	0.67	27.07	cum					
		For Apron U/S	1	6.00	3.38	0.26	5.25	cum					
		For Baffle Wall D/S	1	6.00	0.50	1.0	3.00	cum					
		For wing wall D/S (0.50 + 1.2)/2	2	6.80	1.05	5.19	74.12	cum					
		For wing wall U/S	2	3.40	1.05	5.19	37.06	cum					
							219.61	cum	3731.20	819424	656.6	144199	675225
8	1007 k	12 MM Plaster on rub wall											
		Cement Mortar 1:4 (1 cement and 4 Sand)											
		Over apron D/S	1	6	6.7624		40.57	sq m					
		For head wall both side & top	1	6	4.9393		29.64	sq m					
		for wing wall faces	2	10.20	3.4908		71.21	sq m					
		Over apron U/S	1	6	3.3812		20.29	sq m					
		Sides of baffle wall 1.0m D/S and .30 M U/S of baffle wall	1	6	1		6.00	sq m					
		12 mm thick Plastering in CM 1:4…					167.71	sq m	103.90	17425	44.50	7463	9962

9	430-431	Removal of Shuttering from column, Roof, pillars and other part with collection one place .Complete task.											
		Farm work for all other structures……											
		For check dam main wall	2	6	0	3	36.00	sqm					
		For Head wall extension L/S	2	5.155	0	1.5	15.46	sqm					
		For Head wall extension R/S	2	5.155	0	1.5	15.46	sqm					
		For Apron D/S	1	6	0	0.81721	4.90	sqm					
		For Apron U/S	1	6	0	0.40861	2.45	sqm					
		For Baffle Wall D/S	2	6	0	1	12.00	sqm					
		For wing wall D/S	4	6.762	0	5.1908	140.41	sqm					
		For wing wall U/S	4	3.38	0	5.1908	70.20	sqm					
		Total Farm work					296.90	sqm	211.00	62645	60.20	17873	44772
10	2310 ¼[k ½-2311	Pitching for Embankment of CD in U/s and D/S side , Pitching ,levelling of stone sand filling and cleaning of embankment etc.											
		45cm thick in 2 layer by hand stone pitching with 45x30x30 cm boulder size with gap of1.5 m extended header stone laying.	2	5.00	1.50	0.45	6.75	cum	437.40	2952	268.60	1813	1139
		Total amount								1054989		268132	786856
1		Difference in enhancing the Labour Rate from 1 June 2015 , the additional labour wages (174-159)							15	0		0	
2		Provision for mate wage for supervision of the Work					132.70	Mdays	197.00	26142.48			26142
3		Provision for providing drinking water to the working Labours					132.70	Mdays	172.00	22824.91		22825	
4		First aid box, Jhula, Shade etc at the work site for workers Childrens					Lumpsump			1500			1500
5		Sign board and Photograh					Lumpsump			5000			5000
6		Miscellaneous					5%			55523			55523
							Total amount			**1165979**		**290957**	**875022**
				Ratio		Amount		Percentage					
				Labour		290957		25	%				
				Material		875022		75	%				
				Total		1165979		100	%				

Cost Estimation No -33

	location lat,long	25.825017N, 84.696095E
Design of Pyne CR Work- Pyne excavation	**Length of pyne M**	**1000**
Climate Resilient Work	**Unit**	**Water Conveyance structure**
Name of Village	**Fakuli**	
Type of Pyne	**Renovation of existing Pyne structure**	
Shape of the Pyne		Trapezoidal
Catchment (Ha)	**Ha**	NA
Fetch length (Max length of Travel)	**M**	1400
Slope of the Area		0-3%
Type of Soil		loam
Existing Depth (d) of Pyne		1.00
Existing Top Width (TW) of Pyne	**M**	5.00
Exiting Bottom Width (BW) of Pyne	**M**	2.00
Proposed Depth of Pyne (including 0.15 m free board)		1.15
Total depth of channel (existing + proposed)	**M**	2.15
Proposed TW of Pyne	**M**	5.00
Proposed BW of Pyne	**M**	3.00
Proposed cross-sectional Area of Pyne (a= 1/2 (TW +BW)x Depth)	**Sqm**	8.60
Catchment Area of the pyne	**Ha**	60
Fetch length (Max length of Travel)	**M**	1400
Elevation difference from remote point to outlet of discharge		8
Command Area of the Pyne (ha)	**Ha**	235
Wetted Perimeter (p) (p = Bw + 2 (√(d² + (1.5 d) ²) = Bw +3.604d)		10.75
Hydraulic Radius R = a/p		0.80
S (Slope) = H/L		0.01
K = L/√S,		18520.26
Time of Concentration (Tc = 0.0195K0.77) where K = L/√S, and S(slope) = H/L, L = Maximum length of travel = 1400 m, and H = difference in elevation between most remote point and outlet point = 8m (minimum)		37.68
Per day maximum rainfall (as per Climate modelling report)		235
Rain fall intensity (I) , as per climate variability report (one day max rain fall 150 MM/day)	**mm/hr**	374.19
coefficient of runoff © as per differnet catchment terrain May vary from 0.3 to 0.5		0.5

Manning's coefficient (n) may varies as per soil type of location		0.02
Discharge from drainage area (Q = CIA) Where C = Runoff coefficient = 0.4 for loamy soil arable land and slope rang 5-10%), I= Rainfall intensity (cm/hr), mean rainfall intensity for the design recurrence interval and for a duration equal to the time of concentration, A = Drainage Area (m²)	**cum/sec**	31.18
S (Longitudinal gradient slope of channel) varies as per site slope and location(taking (1/6000)		0.00017
Velocity of water flow (V = R⅔S½/n)Where R= Hydraulic Radius, S = Longitudinal slope (may be assumed assume 1/6000 approx.), n = manning's coefficient = 0.02 for ordinary firm loam soil type		0.556
Maximum permissible velocities in non-vegetated canal for ordinary firm loam soil type (Reference table , After Fortier and Scobey, 1926)		Clean water =0.75m/sec
		Water with Colloidal silt =1.05M/sec
		Water with sand Gravel =0.68m/sec
As the designed velocity is within the permissible velocities limit, so we can say that the design of pyne is suitable.		

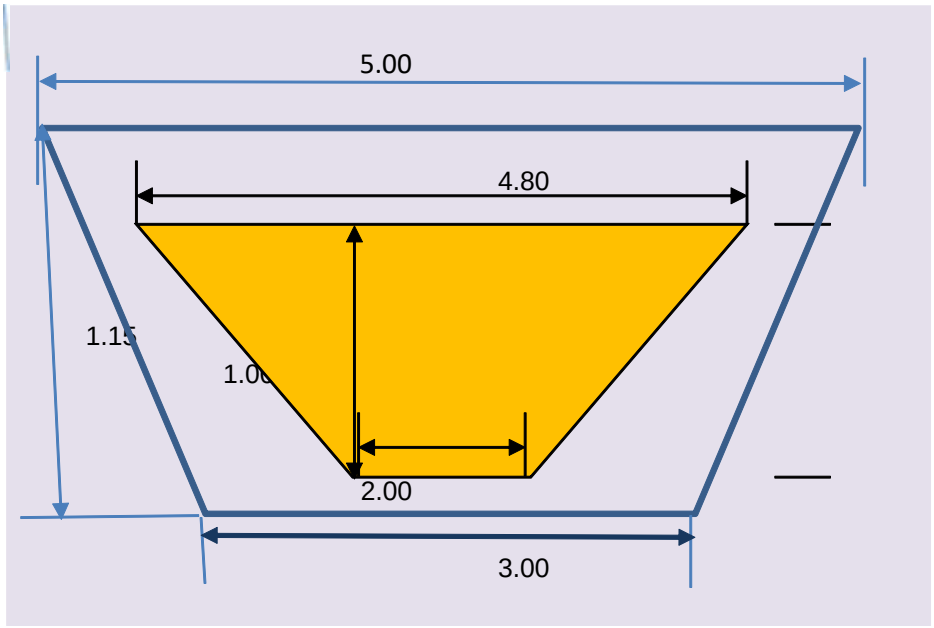
Cost Estimate 33:

Site Location : Pyne no 33								**25.825017N, 84.696095E**	
Diamentions	length (ft)	Top Width M	Bottom Width M	depth M					
Proposed	1000	5.00	3.00	1.15					
Existing dimentions	1000	5.00	2.00	1.00					
Abstract of Cost Estimation									
Description of the work- Ahar - Excavation									
Particulars	**Length**	**Top width**	**Bottom width**	**Depth**	**Qnty.**	**Unit**	**Rate**	unit	Amount
Cleaning of Site, Survey, alignment & layout.					8	mday	177	Rs	1416
Earthwork cutting in Soft /Hard soil with initial lift including rough dressing and breaking of clods to maximum 5cm to 7cm and laying in layers as per direction of the Engineer-in-charge.									
Proposed Surface layer cutting									
Lx(TW+BW)/2XHT	1000.0	5.00	3.00	1.15	4600.0	Cum			
Existing depth of the channel	**1000.0**	4.80	2.00	1.00	3400.0	Cum			
Actual Earth work to be excavated					1200.0	cum			
M**ale -Mandays calculation** :EW & Lift of soil from 0 to 5 ft depth and height ,the required Man days @80cft/m days soil cutting will be taken for male mdays of 2/3 total work .									
42504.0	cft				354.2				

Female -Mandays calculation :EW & Lift of soil from 0 to 5 ft depth and height ,the required Man days @68cft/m days soil cutting will be taken for female mdays of 1/3 total work .									
42504.0	cft				208.4				
Total					562.6	mdays	177	Rs	**100988**
Providing leveling, Ramming/ Rolling earth work in embankment side of Ahar manually with all complete job @1000cft/mdays and as per direction of Engineer in charge.									
Total EW/1000					42.5	mdays	177	Rs	7523.208
Providing provision of supervisor (mate) for completing the while jobs and as per direction of engr. In charge are taken in the ratio of (1:40) of Total man-days									
Total Mdays/40					605.0569	mdays			
Extra @ Rs 10 of 40 labour					50.725	Rs	10	Rs	507.25
Total Cost									**110434**
labour cess 1% of the total Cost									1104.3433
Providing cost of sign board ,photography and others LS									3000
Grand Total cost of Irrigation Channel Excavation									**114539**

Drawing-33:

All diamention in metre



Cross section Area of pyne **8.60**

Cost estimate of plantation over Fakuli pyne:

Cost Estimation of Community Plantation on Fakuli Pyne. (one Unit Plantation)					
Subject/ Operation	**Year- 01- Establishment**				
	Unit	Qty.	Rate	Description	Amount
A. Maintenance cost					
Maintaining 100 lenior AF/Fruit plant up to 5 year and security of the same plant by 4 no gardeners	No	At least maintenance of 100 Fruit plants up to five year or 60 month on the basis of living plants	7	100*12*5*4*7	168000
Pit Digging of 100 plant	No	100 Big Fruit plants with Pit size 0.60x0.60x0.60= 43.2 cum or 1524.31 cft/108=14 mdays	177	177*14	2478
	NO	100 AF plants with Pit size 0.30x0.30x0.30x200=5.4 cum or 190.56cft/108=2 mdays	177	177*2	354
Purchasing of Fruit Plants for 100 plants	No	100 fruit plants	35	100*35	3500
	No	100 No Agro forestry plants	15	100*15	1500
Installation of hand Pump	No	Two number on the site of fruit and agroforestry plantation @9500/hand pump	9500	2*9500	19000
Insecticide and pesticide treatment on 200 plants	Lump sump	year -1 after two month in 15 days gap LS@ 0.90 p/plant		200*20*0.90	3600
		year - 2 in 30 days gap LS@ 0.90 p/plant		200*10*0.9	1800
		year -3 in 30 days gap LS@ 0.90 p/plant		200*10*0.10	200
		year - 4 in 30 days gap LS@ 0.90 p/plant		200*10*0.11	220
		year - 5 in 30 days gap LS@ 0.90 p/plant		200*10*0.12	3600
Two bucket ,Mug, Jhara and clothes etc.		up to 5 year Lump sum Expenditure			4000
Permanent Net Fencing for 5 year and maintenance		400 plant fenced with permanent fencing @350/fencing		200x350	70000
		Total cost			**278252**
Miscellaneous expenditure		2 % of estimated cost			5565.04
		Grand Total			**283817.04**

Cost Estimation No -35 Check dam Construction:

INPUT DATA			
	GPS Location of Check dam	**25.857128N, 84.685922E**	
	Name of stream/ site	**Telpa**	
	village	**Pirari Majlishpur**	
	Gram panchayat	**Majlishpur**	
	Block	**majlishpur**	
	District/ state	**Saran**	
Sr. no.	**Particulars**	**Unit**	**QTY.**
1	Catchment Area	Ha	300.00
2	Length of Crest wall	m	14.00
3	Fetch length Dm	m	1000.00
4	Height of Dam Wall (H)	m	**1.50**

5	Specific Gravity "G" of construction Material (For PCC G =2.54)	constant	2.24
6	Constant for hydraulic gradient of River Bed Material "K" for sandy+boulder	constant	9
7	C(Deckan's formula) for Eastern Region	constant	16.00
8	Foundation depth	M	1.50
9	Soft soil depth	M	0.50
10	Extension of bunds with earthen bunding (if required to connect with nearby higher bank)	M	5.00
Cost summary			
1	**Total cost of Structure**	**1547373**	**100**
2	**Labour cost**	**487576**	**32%**
3	**Material cost**	**1059797**	**68%**

Deccan's constant for peak runoff estimation

C= coefficient of runoff, the value of C is as below

Zone	C
Central India	14 to 19.5
North India	11.5
Western Ghat	22 to 26

Specific gravity of different construction material:

Sr. No.	Construction material	Specific gravity (G)
1	Plain cement concrete (PCC)	2.24
2	Reinforced cement concrete (RCC)	2.40
3	Stone masonry in cement mortar	2.54
4	Dry stone masonry	2.08
5	Random rubble masonry	2.32
6	Brick masonry	1.92
7	Reinforced brick masonry	2.00
8	Plum cement concrete	2.24

Hydraulic gradient (K) for different situation of drain bed:

Sr. No.	Situation of drain bed	Safe hydraulic gradient (K)
1	Coarse sand	12
2	Fine sand + mud	8
3	Sand + Boulder	5 to 9
4	Fine sand	15
5	Boulder	5
6	Big Boulder	3.5 to 4.5

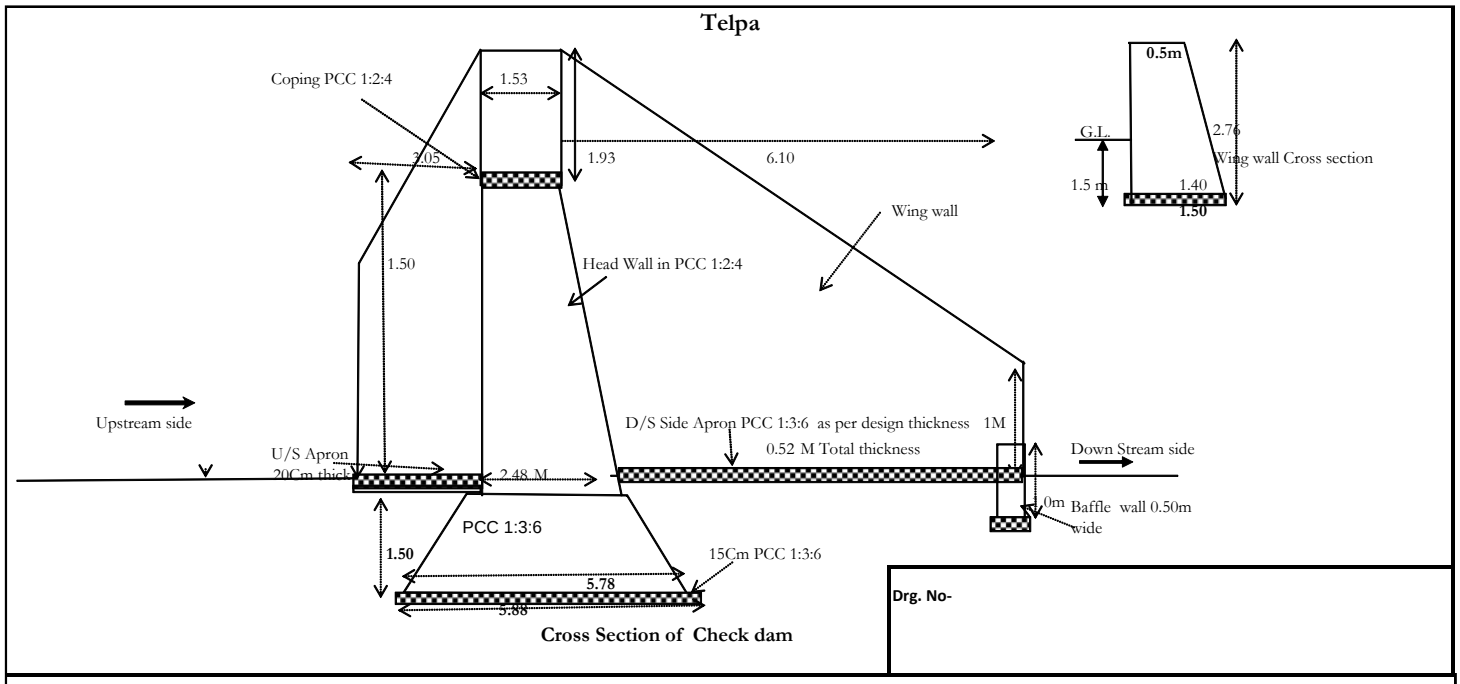
Design of Check Dam Construction -35:

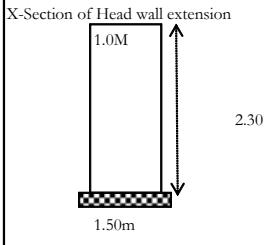
Design of Check Dam			
	Name of stream/ site	**Telpa**	
	GPS Location of Check dam	**25.857128N, 84.685922E**	
	village	**Pirari Majlishpur**	
	Gram panchayat	**Majlishpur**	
	Block	**majlishpur**	
	District/ state	**Saran**	
SNo.	**Particulars**	**Unit**	**QTY.**
1	Catchment Area	Ha	300.00
2	Length of Creast wall	m	14.00
3	Fetch length Dm	m	1000.00
4	(hw=wave height,m)= $0.014(Dm)^{1/2}$	m	0.44
5	Net Free board $F=1.5h_w$	m	0.66
6	Total free board (Depth of flow +Net free board)=hf= h+F	m	1.93
7	Maximum Flood Discharge ($Q = CA^{3/4}$), A in sq Km	Cumecs	36.47
8	C(Deckan's formula) for Eastern Region		16.00
9	Maximum Flood Discharge per meter q=Q/L	Cumecs	2.61
10	Hydraulic Depth over Weir (h)=$(q/1.84)^{2/3}$	m	1.26
11	Height of Dam Wall (H)	m	**1.50**
12	Total Hydraulic Depth (H_L)	m	2.76
13	Specific Gravity "G" of construction Material (For PCC G =2.54)		2.24
14	Top Width of Dam Wall a= (H_L/Sqrt(G+1))	m	1.53
15	Bottom Width of Dam Wall b= (H_L/Sqrt(G-1))	m	2.48
16	Constant for hydraulic gradient of River Bed Material "K" for sandy+boulder		9
17	Length of D/S Apron, L_A=1.45K(sqrt(H_L/13)	m	6.02
18	Thickness of D/S Apron, L_{th}=1.33(h/G+1)	m	0.52
19	Baffle wall Height h_b (Height Ranges Between0.3 Mtr to 0.5 Mtr. for smaller structures upto 3 mtr ht))	m	0.50
20	Baffle wall width (width Ranges Between0.3 Mtr to 0.5 Mtr. for smaller structures upto 3 mtr ht))	m	0.50
21	Head wall extention length HWe=H+hf+1	m	4.43
22	Height of head wall extension	m	2.30
23	D/S Side wall length SW=1.75H+.075hf+0.45	m	4.52
24	Length of Wing Wall D/S	m	6.10
25	Length of Wing Wall U/S	m	3.05
26	Upstream Apron Length Lau =L_A/2	m	3.01
27	Upstream Apron Thickness L_{thu}=L_{th} /2	m	0.26
28	Foundation depth	M	1.50
29	Soft soil depth	M	0.50

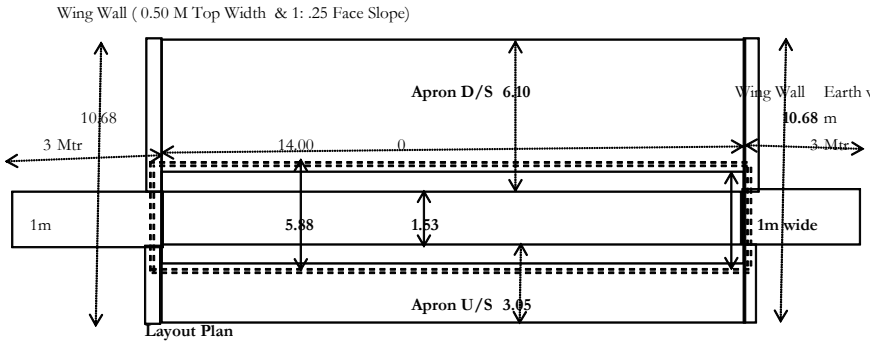
SNo.	Item No.	Particulars	A/U	Nos
1		Site clearance, cutting grass, raking into heaps and removing off the premises	Sqm	1
A		**Excavation for foundation**		
		For foundation of check dam main wall	Cum	1
		For foundation of Head wall extension L/S	Cum	1
		For foundation of Head wall extension R/S	Cum	1
		For Apron D/S	Cum	1
		For Apron U/S	Cum	1
		For Baffle Wall D/S	Cum	1
		For wing wall D/S	Cum	2
		For wing wall U/S	Cum	2
		E/w for extension of embank ments both side	Cum	2
		Total Qty. of E/W		
2		Back filling in foundation….with excavtaed soil		
		Total excvn - Qty of Masonary in foundation	Cum	
3		PCC in foundation in 1:3:6, C/C with 40mm metal		
		For foundation of check dam main wall	Cum	1
		For foundation of Head wall extension L/S	Cum	1
		For foundation of Head wall extension R/S	Cum	1
		For Apron D/S	Cum	1
		For Apron U/S	Cum	1
		For Baffle Wall D/S	Cum	1
		For wing wall D/S	Cum	2
		For wing wall U/S	Cum	2
		Total Qty. of PCC 1:3:6		
4		PCC in foundation in 1:2:4, C/C with 40mm metal		
		For foundation of check dam main wall Width	Cum	1
		For Super structure of check dam main wall Width	Cum	1
		For Head wall extension L/S	Cum	1
		For Head wall extension R/S	Cum	1
		For Apron D/S	Cum	1
		For Apron U/S	Cum	1
		For Baffle Wall D/S	Cum	1
		For wing wall D/S (0.60 + 1.5)/2	Cum	2
		For wing wall U/S	Cum	2
		PCC1:2:4	Cum	
5		12 mm thick Plastering in CM 1:4…		
		Over apron D/S	Sqm	1
		For head wall both side & top	Sqm	1
		for wing wall faces	Sqm	2
		Over apron U/S	Sqm	1
		Sides of baffle wall 1.0m D/S and .30 M U/S of baffle wall	Sqm	1
		Total area		

6		Farm work for all other structures……		
		For check dam main wall	Sqm	2
		For Head wall extension L/S	Sqm	2
		For Head wall extension R/S	Sqm	2
		For Apron D/S	Sqm	1
		For Apron U/S	Sqm	1
		For Baffle Wall D/S	Sqm	2
		For wing wall D/S	Sqm	4
		For wing wall U/S	Sqm	4
		Total Farm work	Sqm	
7		45 cm thick Stone pitching on U/s face of earthen structure		
		Upto HFL of the bunds	Sqm	2
		Total Materials Required		
		40 mm Metal	cum	45.72
		20 mm Metal	cum	238.78
		Sand	cum	248.94
		Cement	Bags	1815
		Stones	cum	7

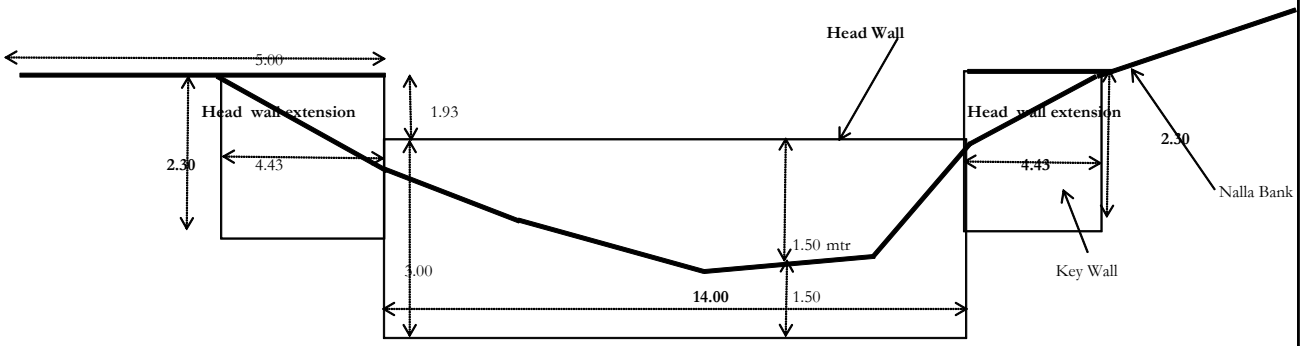
Drawing of Check dam Construction:







Approx capacity of the water body created by Check dam **7500** **Cum**



Drg. No-

Elevation of ……Check dam

(for height upto 3.00 meter)

Drg Not to scale,
All dimensions in Mtr

Cost Estimation of Check Dam 35:

Cost estimation of Check Dam													
Name of the work-Check dam Construction Tel & Terpa River River								**12.00**		**Metre**			
Village -Fakuli						**Gram panchayat-Fakuli**							
Bock -Jalalpur						**District Saran**							
dz	SOR Item no	Detailof work	No	Length	Width	Heieght /depth	Qty	Unit	Total Rate	Total amount	Labour rate	Labour amount	Material amount (7-9)
1		2	3	4	5	6	7	8	9	10	11	12	13
1	101	Cleaning and Grass Cutting of the Site with collection and disposal from the work Site											
			1	22.00	13.85		304.68	unit	1.80	548	1.80	548	
2	301	Soil work (depth 30 cm, width 1.50m) and greater than 10 sqm area digging and the excavated Soil lead upto 50 m and lift 1.50 m with removal of soil from Work site											
		Soft or Hard soil /Hard Murrum											
		For foundation of check dam main wall	1	12.00	6.00	1.50	108.07	cum					
		For foundation of Head wall extension L/S	1	4.56	2.00	1.50	13.69	cum					
		For foundation of Head wall extension R/S	1	4.56	2.00	1.50	13.69	cum					
		For Apron D/S	1	12.00	3.16	0.57	21.80	cum					
		For Apron U/S	1	12.00	2.58	0.29	8.90	cum					
		For Baffle Wall D/S	1	12.00	0.60	1.50	10.80	cum					
		For wing wall D/S	2	6.20	1.50	1.50	27.90	cum					
		For wing wall U/S	2	3.10	1.50	1.50	13.95	cum					
		E/w for extension of embank ments both side	2	5.00	4.50	0.50	22.50	cum					
		Total Qty. of E/W				Total	241.30	cum					
3	301b	Of which, soft soil/hard soil…. (@40%)					96.52	cum	110.30	10646	110.30	10646	0
4	302 a	Of which, SR/ hard conglonmerate/ Disintgrated rocks…….. (@60%)					144.78	cum	267.20	38685	267.20	38685	0
										49332		49332	0
5	304	E/W Excavation and riffling of Soil in the Trench or making bund,Levelling, Dressing with complete task as per direction of engr Incharge.											
		Total excvn - Qty of Masonary in foundation	1				59.89	cum	110.30	6606	110.30	6606	0

6	413b	PCC Work with Ratio of PCC(1:3:6) mixing , arrangement with 40 mm metal ,lifting ,pouring on the foundation with watering etc.											
		For foundation of check dam main wall	1	12	6.004	0.3	21.61	cum					
		For foundation of Head wall extension L/S	1	4.564	1.6109	0.15	1.10	cum					
		For foundation of Head wall extension R/S	1	4.564	1.6109	0.15	1.10	cum					
		For Apron D/S	1	12	6.1633	0.15	11.09	cum					
		For Apron U/S	1	12	3.08	0.15	5.55	cum					
		For Baffle Wall D/S	1	12	0.6	0.15	1.08	cum					
		For wing wall D/S	2	6.2	1.5	0.1	1.86	cum					
		For wing wall U/S	2	3.1	1.5	0.1	0.93	cum					
		Total Qty. of PCC 1:3:6				Total	44.33	cum	2527.00	112024	498.8	22112	89912
7	425g426	RCC Work with Ratio (1:2:4) Mixing of Metal 20mm ,lifting and pouring on column, wall, lentils, and roof with proper spreading cleaning and curing with complete task etc.											
		For foundation of check dam main wall	1	12.00	4.30	1.20	61.98	cum					
		For Super structure of check dam main wall Width	1	12.00	2.11	1.50	37.93	cum					
		For Head wall extension L/S	1	4.56	1.00	1.50	6.85	cum					
		For Head wall extension R/S	1	4.56	1.00	1.50	6.85	cum					
		For Apron D/S	1	12.00	6.16	0.42	31.40	cum					
		For Apron U/S	1	12.00	3.08	0.14	5.08	cum					
		For Baffle Wall D/S	1	12.00	0.50	1.00	6.00	cum					
		For wing wall D/S (0.50 + 1.2)/2	2	6.20	1.05	4.60	59.89	cum					
		For wing wall U/S	2	3.10	1.05	4.60	29.94	cum					
							245.91	cum	3731.20	917552	656.6	161467	756085
8	1007	12 MM Plaster on rub wall											
	k	Cement Mortar 1:4 (1 cement and 4 Sand)											
		Over apron D/S	1	12	6.16		73.96	sqm					
		For head wall both side & top	1	12	4.61		55.33	sqm					
		for wing wall faces	2	9.30	2.89		53.93	sqm					
		Over apron U/S	1	12	3.08		36.98	sqm					
		Sides of baffle wall 1.0m D/S and .30 M U/S of baffle wall	1	12	1		12.00	sqm					
		12 mm thick Plastering in CM 1:4…					232.21	sqm	103.90	24126	44.50	10333	13793

9	430-431	Removal of Shuttering from column, Roof, pillars and other part with collection one place .Complete task.											
		Farm work for all other structures……											
		For check dam main wall	2	12	0	3	72.00	sq m					
		For Head wall extension L/S	2	4.564	0	1.5	13.69	sqm					
		For Head wall extension R/S	2	4.56	0	1.5	13.69	sqm					
		For Apron D/S	1	12	0	0.57	6.89	sqm					
		For Apron U/S	1	12	0	0.28	3.45	sqm					
		For Baffle Wall D/S	2	12	0	1	24.00	sqm					
		For wing wall D/S	4	6.16	0	4.59	113.4	sqm					
		For wing wall U/S	4	3.082	0	4.5997	56.70	sq m					
		Total Farm work					303.82	sq m	211.00	64106	60.20	18290	45816
10	2310 ¼[k ½-2311	Pitching for Embankment of CD in U/s and D/S side , Pitching ,levelling of stone sand filling and cleaning of embankment etc.											
		45cm thick in 2 layer by hand stone pitching with 45x30x30 cm boulder size with gap of1.5 m extended header stone laying.	2	5.00	1.50	0.45	6.75	cu m	437.40	2952	268.60	1813	1139
		Total amount								1226579		319833	906746
1		Difference in enhancing the Labour Rate from 1 June 2015 , the additional labour wages (174-159)							15	0		0	
2		Provision for mate wage for supervision of the Work					154.29	Mdays	197.00	30394.48			30394
3		Provision for providing drinking water to the working Labours					154.29	Mdays	172.00	26537.31		26537	
4		First aid box, Jhula, Shade etc at the work site for workers Childrens					Lumpsump			1500			1500
5		Sign board and Photograh					Lumpsump			5000			5000
6		Miscellaneous					5%			64501			64501
							Total amount			**1354512**		**346370**	**1008141**
				Ratio		Amount		Percentage					
				Labour		346370		26	%				
				Material		1008141		74	%				
				Total		1354512		100	%				

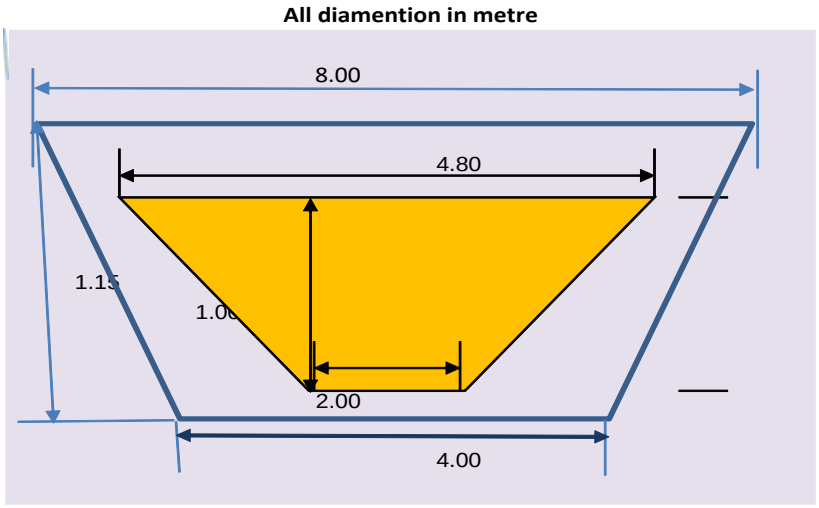
Cost estimation No -39

location lat,long		25.82036N, 84.688825E
Design of Pyne Work-No 39 Pyne excavation	**Length of pyne M**	**1000**
Climate Resilient Work	**Unit**	**Water Conveyance structure**
Name of Village	**Laxmipur**	**Techniwash**
Type of Pyne	Renovation of existing Pyne structure	
Shape of the Pyne		Trapezoidal
Catchment (Ha)	Ha	NA
Fetch length (Max length of Travel)	M	1400
Slope of the Area		0-3%
Type of Soil		loam
Existing Depth (d) of Pyne		1.00
Existing Top Width (TW) of Pyne	M	5.00
Exiting Bottom Width (BW) of Pyne	M	2.00
Proposed Depth of Pyne (including 0.15 m free board)		1.15
Total depth of channel (existing + proposed)	M	2.15
Proposed TW of Pyne	M	8.00
Proposed BW of Pyne	M	4.00
Proposed cross-sectional Area of Pyne (a= 1/2 (TW +BW)x Depth)	Sqm	12.90
Catchment Area of the pyne	Ha	60
Fetch length (Max length of Travel)	M	1400
Elevation difference from remote point to outlet of discharge		8
Command Area of the Pyne (ha)	Ha	235
Wetted Perimeter (p) ($p = Bw + 2(\sqrt{(d^2 + (1.5\,d)^2)} = Bw + 3.604d$)		11.75
Hydraulic Radius $R = a/p$		1.10
S (Slope) = H/L		0.01
$K = L/\sqrt{S}$,		18520.26
Time of Concentration (Tc = 0.0195K0.77) where $K = L/\sqrt{S}$, and S(slope) = H/L, L = Maximum length of travel = 1400 m, and H = difference in elevation between most remote point and outlet point = 8m (minimum)		37.68
Per day maximum rainfall (as per Climate modelling report)		235
Rain fall intensity (I) , as per climate variability report (one day max rain fall 150 MM/day)	mm/hr	374.19
coefficient of runoff © as per differnet catchment terrain May vary from 0.3 to 0.5		0.5
Manning's coefficient (n) may varies as per soil type of location		0.02
Discharge from drainage area (Q = CIA) Where C = Runoff coefficient = 0.4 for loamy soil arable land and slope rang 5-10%), I= Rainfall intensity (cm/hr), mean rainfall intensity for the design recurrence interval and for a duration equal to the time of concentration, A = Drainage Area (m^2)	cum/sec	31.18
S (Longitudinal gradient slope of channel) varies as per site slope and location(taking (1/6000)		0.00017
Velocity of water flow ($V = R^{2/3}S^{1/2}/n$)Where R= Hydraulic Radius, S = Longitudinal slope (may be assumed assume 1/6000 approx.), n = manning's coefficient = 0.02 for ordinary firm loam soil type		0.687
Maximum permissible velocities in non-vegetated canal for ordinary firm loam soil type (Reference table , After Fortier and Scobey, 1926)	Clean water =0.75m/sec	
	Water with Colloidal silt =1.05M/sec	
	Water with sand Gravel =0.68m/sec	
As the designed velocity is within the permissible velocities limit, so we can say that the design of pyne is suitable.		

Cost estimate-39:

Site Location : Pyne CRW-39	**lat, long**					**25.82036N, 84.688825E**			
Diamentions	length (ft)	Top Width M	Bottom Width M	depth M					
Proposed	1000	8.00	4.00	1.15					
Existing dimentions	1000	5.00	2.00	1.00					
Abstract of Cost Estimation									
Description of the work- Ahar - Excavation									
Particulars	**Length**	**Top width**	**Bottom width**	**Depth**	**Qnty.**	**Unit**	**Rate**	**unit**	**Amount**
Cleaning of Site, Survey, alignment & layout.					8	mday	177	Rs	1416
Earthwork cutting in Soft /Hard soil with initial lift including rough dressing and breaking of clods to maximum 5cm to 7cm and laying in layers as per direction of the Engineer-in-charge.									
Proposed Surface layer cutting									
Lx(TW+BW)/2XHT	1000.0	8.00	4.00	1.15	6900.0	Cum			
Existing depth of the channel	**1000.0**	4.80	2.00	1.00	3400.0	Cum			
Actual Earth work to be excavated					3500.0	cum			
M**ale -Mandays calculation** :EW & Lift of soil from 0 to 5 ft depth and height ,the required Man days @80cft/m days soil cutting will be taken for male mdays of 2/3 total work .									
123970.0	cft				1033.1				
Female -Mandays calculation :EW & Lift of soil from 0 to 5 ft depth and height ,the required Man days @68cft/m days soil cutting will be taken for female mdays of 1/3 total work .									
123970.0	cft				607.7				
Total					1640.8	mdays	177	Rs	**291834**
Providing leveling, Ramming/ Rolling earth work in embankment side of Ahar manually with all complete job @1000cft/mdays and as per direction of Engineer in charge.									
Total EW/1000					124.0	mdays	177	Rs	21942.69
Providing provision of supervisor (mate) for completing the while jobs and as per direction of engr. In charge are taken in the ratio of (1:40) of Total man-days									
Total Mdays/40					1764.749	mdays			
Extra @ Rs 10 of 40 labour					50.725	Rs	10	Rs	507.25
Total Cost									**315700**
labour cess 1% of the total Cost									3156.999
Providing cost of sign board ,photography and others LS									3000
Grand Total cost of Irrigation Channel Excavation									**321857**

Drawing of Pyne Trench 39:



Cross section Area of pyne **12.90**

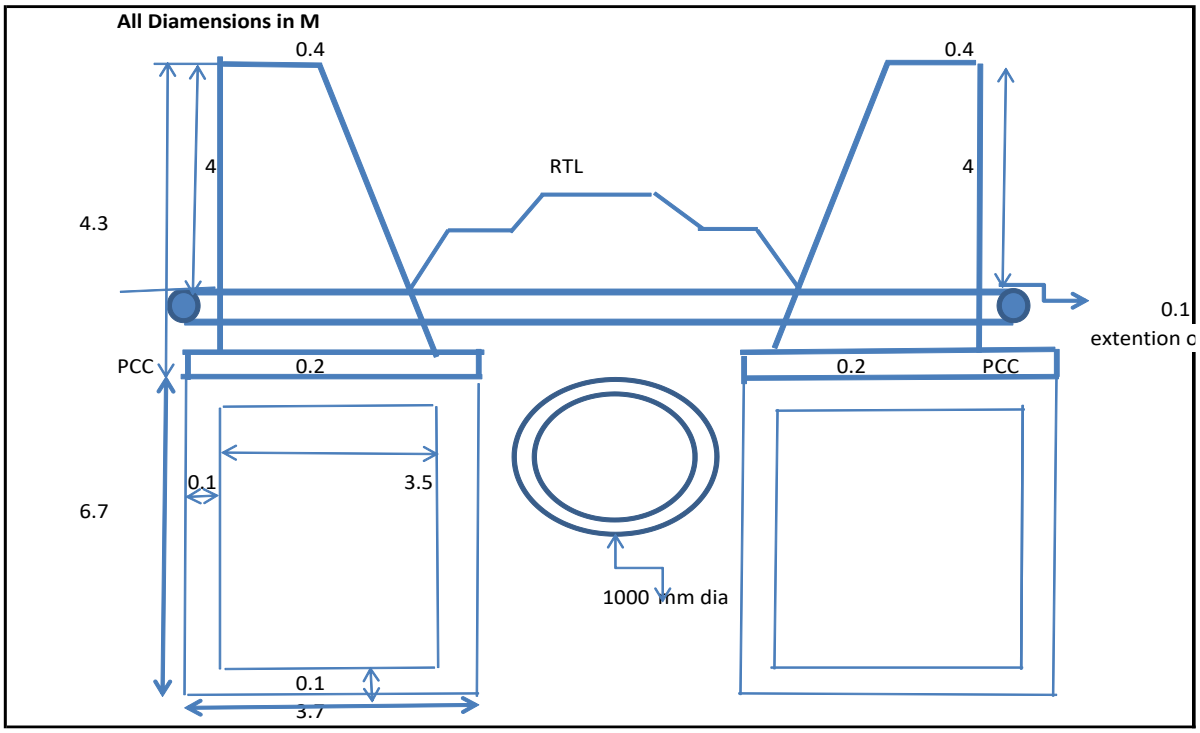
Plantation 39:

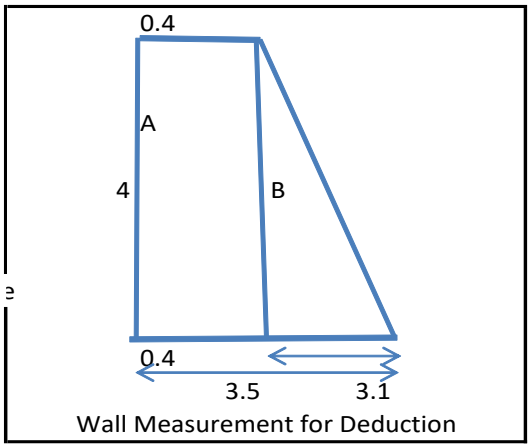
Cost Estimation of Community Plantation on luxmipur -Techniwas Pyne-39. (one Unit Plantation)					
Subject/ Operation	**Year- 01- Establishment**				
	Unit	Qty.	Rate	Description	Amount
A. Maintenance cost					
Maintaining 100 lenior AF/Fruit plant up to 5 year and security of the same plant by 4 no gardeners	No	At least maintenance of 100 Fruit plants up to five year or 60 month on the basis of living plants	7	100*12*5*4*7	168000
Pit Digging of 100 plant	No	100 Big Fruit plants with Pit size 0.60x0.60x0.60= 43.2 cum or 1524.31 cft/108=14 mdays	177	177*14	2478
	NO	100 AF plants with Pit size 0.30x0.30x0.30x200=5.4 cum or 190.56cft/108=2 mdays	177	177*2	354
Purchasing of Fruit Plants for 100 plants	No	100 fruit plants	35	100*35	3500
	No	100 No Agro forestry plants	15	100*15	1500
Installation of hand Pump	No	Two number on the site of fruit and agroforestry plantation @9500/hand pump	9500	2*9500	19000
Insecticide and pesticide treatment on 200 plants	Lump sump	year -1 after two month in 15 days gap LS@ 0.90 p/plant		200*20*0.90	3600
		year - 2 in 30 days gap LS@ 0.90 p/plant		200*10*0.9	1800
		year -3 in 30 days gap LS@ 0.90 p/plant		200*10*0.10	200
		year - 4 in 30 days gap LS@ 0.90 p/plant		200*10*0.11	220
		year - 5 in 30 days gap LS@ 0.90 p/plant		200*10*0.12	3600
Two bucket ,Mug, Jhara and clothes etc.		up to 5 year Lump sum Expenditure			4000
Permanent Net Fencing for 5 year and maintenance		400 plant fenced with permanent fencing @350/fencing		200x350	70000
		Total cost			**278252**
Miscellaneous expenditure		2 % of estimated cost			5565.04
		Grand Total			**283817.04**

Cost Estimation No -44

Location - Village Rewari							Lat ,Long	25.849848N, 84.687895E		
Cost Estimation of Culvert or Pulia Nirman										
Sl No	Particulars	No	L	W	H/D	Volume	Quantity	Unit	Rate	Amount
	Foundation -Earth work excavation									
1	Excavation of Foundation (one side)	1	6.7	3.7	4.3	106.60				
	Excavation of Foundation (2nd side	1	6.7	3.7	4.3	106.60		176.86/80cft work		
	Sub Total					**213.19**	**213.194**	Cum	**221**	47115.87
	Pre CementConcreate (PCC-1:4:8)	1	0.2	3.7	6.7	4.96				0
2	**Pre CementConcreate (PCC-1:4:8)**									0
	2nd Side Pre concreate(PCC-1:4:8)	1	0.2	3.7	6.7	4.96				0
	Total PCC					9.92	**9.916**	Cum	**3500**	34706
3	**B/W cement Mortar (1:4) or RCC(1:2:4)**									0
	B/W cement Mortar (1:4) or	1	4	0.4	6.7	10.72				0
	Cement Concreate wall (RCC-1:2:4)	1	3.5	4	6.7	46.90				0
	2nd Side Reinforce concreate Cement (RCC-1:2:4)					57.62	57.62			0
	Total RCC	2	0	0	0		**115.24**	Cum		0
	Volume of Two Wall		3.023	0.3787	3.14	3.59	**7.1898**			0
	Deduction (3.14Xr2xL)									0
	Actual B/W (1:4) Cement Mortar Or						**108.0502**	Cum	**6845**	739603.32
	RCC work(1:2:4)									0
4	Cost of 1000 mm dia or 1m dia RCC hume Pipe	3					3		**12500**	37500
5	Mason	12					12		**600**	7200
6	Labour	34					34		500	17000
7	Board	1					1		2000	2000
7	Micellaneous lump sump								5000	5000
	Total cost of Single Row Pipe Culvert									**890125.19**

Drawing of Culvert:





Sustainability

Chapter - 4

Sustainbility of structure: Sustainable development is important for the securing future of the world. India is one of the largest countries in the world needs to implement the policies for sustainabledevelopment. 70% Indian population lives in the rural area. Rural area still has maintain the ecological balance but the race of economical development can ruin the flora and fauna of the rural area. Sustainable development comprises social-economical-environmental development; lagging behind in any of the tree sectors is failure to attain sustainable development. MG-NREGA is the government's scheme which can be the pathway for achieving the sustainable development. Under MG-NREGA various works related to water conservation, Agricultural development, Land development has been completed and positive outcomes are coming.

Durability: Infrastructure should be durable in terms of minimizing the need for maintenance and promoting longevity therefore we promote design procedures in every SWC/WRD measures to calculate the peak surface runoff, safe disposal of excess water from the measures, water budgeting and balancing with actual crop water requirement for optimal use of water and its management. Therefore the design became durable, viable and climate resilient.

Livelihood diversifications: Enhance capacity building of communities on alternate livelihood solutions through adaptive measures eg.fishries,duckeries, vegetable cultivation and sustainable water harvesting with water management by strengthening institutions for distribution mechanism through PaniPunchayat, water user groups, farmers clubs SHGs, FPOs and federations.For example, Plantation works should be taken up around a water body (reservoir works) to strengthen the banks and the reservoir can be used for fisheries/duckries.

Inclusion: Worksite facilities and infrastructure should be responsive to the needs of women, children and marginalized people.

Integration: Infrastructure should consider integration and alignment among interlinked resources, stakeholders, plans and designs to realize increased social, environmental and economic benefits. For example, development of water bodies should be complemented by other programmes like the promotion of sprinklers/micro-irrigation, or water-efficient agriculture methods (such as system of rice intensification) or promotion of the crops/ crop varieties requiring less water.

Flexibility: Our ability to predict climate change and adapt to such changes is constantly evolving. Flexibility can be achieved through the introduction of new knowledge and technologies. In case of MGNREGA infrastructure, it also means considering and incorporating indigenous and traditional knowledge and practices in new ways.

Livelihood opportunity

Agriculture remains major livelihood options for the beneficiaries in saran the district. The report has however taken cognizance of River Rejuvenation and others towards diversification of livelihoods (e.g. *Poultary*, goatery, non-farm work such as embroidery, quilt making, collective marketing). Such efforts at a larger scale will have deeper and positive impact on the lives/livelihoods of the target farmers that would de-risk them from their sole dependency on farming.The beneficiaries have benefitted from the trainings provided by Jeevika, on the technological advancement at the production level viz line sowing and seed treatment. This has enhanced productivity as well as reduced cost of production.

The plan of Jeevika to market advanced agri-implements through collectives (i.e. PG, FPO) may improve its accessibility and usage which may improve the efficiency in agriculture practice, reduce the cost of production incrementally

Irrigation is the major risks faced by the producers in both the districts are water for irrigation. Nalanda has been declared drought hit district where the lack of rain and absence of irrigation infrastructure has resulted in 40-50% loss in the production of Kharif crop. In absence of insurance facility, the situation has further aggravated. Moreover, the rabi crop is already facing uncertainty as those farmers who cannot afford irrigation will leave the field fallow. Other risks faced by the producers are flood affecting the production.

Agriculture is the sole livelihood in this area, with rice as the main crop grown in the Kharif or monsoon season and wheat, pulses and maize as the other crops grown in the Rabi or winter season.Agriculture is mostly rain-fed, with production directly linked to the amount of rainfall. Most of the villagers who practice agriculture are marginal farmers, having less than half-an-acre of land. They used to cultivate traditional crops.Due to lack of knowledge and skills on non-traditional farming, and lack of or limited market avenues, farmers could not earn a steady income and hence lacked economic security.

Agriculture is the backbone of Bihar's economy. The percentage employed in agriculture production system in Bihar is estimated to be 77%, which is much higher than the national average. Nearly 24.84% of Gross Domestic Product (GDP) of the state (2011-12) is from agriculture sector – including forestry and fishing.

Agriculture is the single largest private sector employer in Bihar. Sunil Kumar Singh,agriculture production commissioner, stressed that third agriculture road map (2017-22) has coupled vegetable cultivation with the establishment of organic corridor along both sides of the Ganga, where farmers will practice organic farming with input subsidy from the state government. The objective of the livelihood initiative is to enhance sectoral size and productivity growth in key livelihood sectors for employment generation of the poor.

Opportunity Matrix for three block of Saran District

Items	Crops	Vegetables	Other activities
Value addition opportunity	Cleaning, grading, sorting, storage, and marketing	Sorting and grading	Storage and Marketing
Profile of people engaged	• Marginal and small holder • Members and non-members	• Marginal and small holder • Members and non-members	Economically weaker Section of society
Strength	• Large number of beneficiaries are engaged in crop production. • Round the year production • Adoption of new technology due to support from Jeevika	• One of the largest producers of vegetables in the state. • Quality of the vegetable is very good. • Cold storage facility for potatoes. • Off season production in small pockets	• Unique product, which has the potential to fetch much higher price. • Good demand by COMFED for their own produce.
Weakness	• Marketing is mostly done by the agents and Adhatiya. • Most of the profit is garnered by the traders. • Storage infrastructure not available to take the advantage of price volatility	• Absence of cold chain • Marketing infrastructure is weak and the commission charged by the traders is quite high (3%-4% from the sellers and 6%-8% by the traders). • No commercial production. • Varieties produced are traditional and not preferred by the processing firms.	• Seasonality. • Production limited to 4-6 months in a year. • The stored product remains stable only 8-10 days. Therefore, has to consumed within a short span of time
Opportunity	• Marketing of the produce through collectives. • Advisory services to the producers related to weather, agronomic practices, price, and insect pest incidence.	• Establishing rural haats or market in the nearby cities and town. • Advisory services to the producers related to weather, agronomic practices, price, and insect pest incidence.	• Jaggery made from Neera can be marketed in metros where the demand and price are quite high.
Threats	• Agriculture is dependent on rainfall. • Absence of irrigation infrastructure. • Price volatility . • High post harvest loss. • Absence of processing units •		• Seasonal production. • Stigma attached. • Low price for the jiggery. • Stabilization of the end product

Chapter - 5

Monitoring and Evalution

The substantial amount of funds involved in the implementation of MGNREGS coupled with its implementation across the country in two lakh GPs, makesthe monitoring and evaluation of the Scheme challenging. It was thus imperative to have a robust and efficient monitoring, evaluation and review mechanism of the Scheme. In addition, there are also increased demands for accountability and transparency in the execution of the programme by various stakeholders.

UNDP collaborates with the Government of India in addressing some of the challenges in implementing this programme, such as low levels of awareness among rural poor about entitlements under MGNREGP, weak social audit processes, and low capacity among communities for planning projects, and weak monitoring and evaluation systems.

Objectives

- Support improved implementation of MGNREGP through technical expertise, communication strategies, management information systems, training, etc
- Institute a model for a third-party concurrent monitoring of MGNREGP • Demonstrate innovationsto enhance human development outcomes aimed at addressing next generation challenges of MGNREGA such as skills, livelihoods, health and literacy of workers
- Demonstrate Information and Communication Technology (ICT) models to improve transparency and accountability in MGNREGP processes
- Develop models for enhancing capacities of communities to undertake social audit and local planning
- Support for developing models of Information and Communication Technology-based management information systems and monitoring and evaluation systems

The following suggestions have been made in the report to make the programme more effective and efficient:

♣ Mobilization of the communities/ villagers
♣ Training of Functionaries
♣ Staff Motivation
♣ Capacity building of the PRI functionaries
♣ Ensuring timely fund flow
♣ Ensuring Transparency and strengthening accountability measures
♣ Increase in Wages
♣ Ensuring wage - material ratio
♣ Ensuring participatory Planning
♣ Gender, Disability and Age Mainstreaming

Annexure

S. No.	Distance in last Point (Meter)	GPS Location in decimal 0rigional	GPS location in DMS modified	Existintusg status	Prposed work	Nearest village and GP	Any other detail (A)
1	0	25.948293N, 84.653705E	25°56'53.72"N, 84°39'13.30"E	Tw=30, Depth=2	Cleaning of channel (Tw=30m, depth= 2 m, L= 600 m) and plantation both Bank side	Rushi and bhatkesri (Bhatkesri)	
2	310	25.945597N, 84.653177E	25°56'43.81"N, 84°39'10.55"E	Pyne connected	cleaning of Pyne and plantation in both bank side (L=500, Tw=6, Bw=2, D=1.5)	Rushi	
3	290	25.943508N, 84.652972E	25°56'36.29"N, 84°39'10.93"E	Near Pulia on bhatkesro to rushi	Deeply excavation and embanment and plantation excavation of pond	Bhatkesri	25°56'31 .64"N, 84°38'59 .57"E, Pond in rushi road, distance =250m, 100*90* 10
4	200	25.941423N, 84.652532E	25°56'29.11"N, 84°39'9.10"E	Pond & meeting point both channel	plantation in 200 meter and proper way of channel		
5	100	25.940914N, 84.652183E	25°56'27.29"N, 84°39'7.86"E	Tw=11, Depth=1.5	Puliya with 3 hume pipe (dia 4feet)	Rushi & Bhatkesri (Bhatkesri)	Reason for chimney breaking per year embank ment
6	500	25.937272N, 84.64809E	25°56'14.17"N, 84°38'53.12"E	Pyne connected	Cleaning of Pyne (L=500, Tw=6, Bw=4, D=1.5), deep silted and kansa	Gamriha	
7	230	25.935656N, 84.646831E	25°56'8.36"N, 84°38'48.59"E	Pyne connected	Cleaning of channel (L=300, Tw=3, Bw=1, D=0.6), deep silted and kansa and plantation both bank side	Nathanpura (Nabada)	

8	60	25.935093N, 84.64673E	25°56'6.62"N, 84°38'48.09"E	Tw=10, Bw=7m, depth= 1.2 m	New puliya nirman with 3 hume pipe (Dia=4 feet)	Nathanpura (Nabada), Gamriha (Bhatkesri)	
9	500	25.931225N, 84.64588E	25°55'52.40"N, 84°38'45.17"E	River is deep silted (Tw=4.5, depth=1)	Embankment, Excavation & plantation	Ganga kanuli (Nawada)	fully silted coverd both side a big chaur
10	300	25.929013N, 84.64655E	25°55'44.45"N, 84°38'47.58"E	fully silted no shape only plain land called kumna nawada chaur	New river way (Tw= 15m, Depth=1.2m, length=1500 m) two puliya with 4 hume pipe (Dia=4 feet) and plantation both bank side and two injection well in chaur area or injection tubewell	Kumna, Nawada, Bhatkesri	fully silted coverd both side a big chaur
11	1700	25.915835N, 84.65175E	25°54'56.99"N, 84°39'6.13"E	Near ganga kanauli ghat, jalalpur to kumna road bridge,Tw= 30, Depth= 1.2		Kumna, Nawada	fully silted coverd both side a big chaur
12	3500	25.894761N, 84.664906E	25°53'41.14"N, 84°39'53.66"E	connected pyne	Cleaning of Pyne & plantation (Length 385, Tw=5, Depth=1m), New river way (Tw= 15m, Depth=1.2m, length=3000 m) Four puliya with 4 hume pipe (Dia=4 feet) and plantation both bank side and four injection well or injectionn tubewell in chaur area	Ghoghauliya (Deveriya), Khorodih (vishanpura)	fully silted coverd both side a big chaur
13	150	25.89414N, 84.665097E	25°53'38.89"N, 84°39'54.32"E	Tw=20, depth= 2	Cleaning (length=350m, Tw=20m, depth=2 m) and a pyne (length 100m, Tw= 6m, Bw=3m, Depth=1m)		
14	100	25.89356N, 84.664873E	25°53'36.80"N, 84°39'53.54"E	Pyne connected (L=100, Tw=6, Bw=3, Depth=1)			

15	250	25.890833N, 84.664435E	25°53'26.99"N, 84°39'51.96"E	Near Puliya on basdiha to jalalpur road			
16	10	25.890708N, 84.664950E	25°53'26.55"N, 84°39'53.66"E	Pyne connected	Cleaning & excavation (L=2000, Tw=7, Depth=1.3) and inlet outlet structure	Chainpur (Savri)	
17	700	25.886763N, 84.664018E	25°53'12.33"N, 84°39'50.46"E	Tw=16, depth=1.2	Embankment of river, Excavation (Length 500 m, Tw= 16m, deptjh=1.2m	Patila (savri)	
18	50	25.886323N, 84.663833E	25°53'10.76"N, 84°39'49.80"E	Pyne connected	pyne (L=430, Tw=6, Bw=2.5, D=1.2) Cleaning, excavation & Plantation	Patila (savri)	Connected pond (60*65*2.3)
19	100	25.88548N, 84.664303E	25°53'7.58"N, 84°39'52.16"E	Pond connected	Pond cleaning (45*20*3), already connected with Pyne no 18	Patila (savri)	
20	70	25.885017N, 84.664911E	25°53'6.06"N, 84°39'53.68"E	2 Pond connected (25*25*3)(30*30*3)	Cleaning	Patila (savri)	
21	120	25.884132N, 84.665378E	25°53'2.84"N, 84°39'55.34"E	Puliya on chatra bajar to hasulahi road (Tw=16, Depth=1.2)	Embankment of river, Excavation (Length 1800 m, Tw= 17m, deptjh=1.4m and both bank side plantation four injection well in chaur area and pond cleaning and bank side plantation	Patila (savri)	25.884253N, 84.661994E - Pond near in 250 m (100*100*3)
22	450	25.880372N, 84.66656E	25°52'49.31"N, 84°39'59.60"E	Ex status of River Tw=17 to 25, Depth=1.4		Patila (savri)	
23	600	25.875967N, 84.668842E	25°52'33.61"N, 84°40'8.19"E	Ex status of River Tw=17 to 25, Depth=1.4		Chatra (samauta), Baluatola (Ashok nagar chaukadha)	
24	1000	25.870094N, 84.677603E	25°52'12.34"N, 84°40'39.37"E	Pond connected (65*80*4)		Baluatola	

25	750	25.865738N, 84.679277E	25°51'56.60"N, 84°40'45.39"E	Pond connected (100*50*2.3)		Ramnagar (Rewadi), Chaukda (ANC)	Both side coverd big chaur
26	400	25.863083N, 84.680657E	25°51'46.91"N, 84°40'50.36"E	Tw=18, D=1.2	Embankment of river, Excavation (Length 5500 m, Tw= 18m, deptjh=1.4m) and both bank side plantation four injection well in chaur areaand a Puliya with 3 hume pipe (Dia=4 feet) , 2 chek dam structure in both river Tel and telpa connected point (6 meter creast length), Ex river (Tw=12 m, Depth=1.5m)	Ramnagar (Rewadi), Chaukda (ANC)	Both side coverd big chaur
27	900	25.857128N, 84.685922E	25°51'25.63"N, 84°41'9.32"E	Puliya on Piradi ramnagar road (Tw=20, Depth=1.5)		Ashok nagar (ANC), Majhvaliya (Rewari), Majlispur (ANC), Pirari (Rewari)	Both side coverd big chaur
28	900	25.849848N, 84.687895E	25°50'59.33"N, 84°41'16.41"E	nera a break puliya		Ashok nagar (ANC), Majhvaliya (Rewari), Majlispur (ANC), Pirari (Rewari)	Both side coverd big chaur
29	620	25.845168N, 84.6897E	25°50'42.55"N, 84°41'22.90"E	deep siltation and kansa		Rewari, Majhwalia	Both side coverd big chaur
30	2500	25.831495N, 84.699898E	25°49'53.32"N, 84°41'59.61"E	connected point with Telpa river		Rewari, Naini sadar	Both side coverd big chaur
31	600	25.828778N, 84.69928E	25°49'43.58"N, 84°41'57.47"E	Tw=12, Depth=1.2	Embankment of river, Excavation (Length 1000 m, Tw= 12m, deptjh=1.5m) and both embankment side plantation	Rewari, Naini sadar	Both side coverd big chaur
32	400	25.826755N, 84.697477E	25°49'36.78"N, 84°41'51.32"E	Tw=11, Depth=1.5		Rewari, Naini sadar	Both side coverd big chaur
33	300	25.825017N, 84.696095E	25°49'30.03"N, 84°41'45.94"E	Pyne connected (L=1000, Tw=5, Bw=2, depth=1)	Pyne cleaning (L=1000, Tw=5, Bw=3, Depth=1) and plantation both side embankment	Fakuli	
34	350	25.822915N, 84.694185E	25°49'22.27"N, 84°41'38.53"E	near pond (60*12*2.5)	Embankment and Plantation	Fakuli	
35	180	25.82383N, 84.692787E	25°49'25.77"N, 84°41'33.82"E	Tw=50, Depth=2	Chek dam (Creast length 12m)	Fakuli, rewari	

36	100	25.822982N, 84.692813E	25°49'22.56"N, 84°41'34.11"E	connected Pond (50*50*2.3)	Embankment and Plantation	Fakuli	
37	150	25.821825N, 84.692447E	25°49'18.56"N, 84°41'32.81"E tel river branch	Tel river branch (L=4000, Tw=6m, Bw=3, d=2.8) and three pond (50*40*1.5)(50*12*1.5)(50*25*1.5)	Second branch excavation (Length=4000m, Tw=6m to 20 m in start to end, Bw=3 m to 15 m, and depth 2.8m) and inlet outlet with 2 hume pipe (4 feet)	Fakuli	
38	180	25.82129N, 84.690405E	25°49'16.64"N, 84°41'25.46"E	Tw=50, Depth=4.5	Plantation 2 unit both side embankment	Luxmipur (Tekniwas) , Fakuli (Sadar)	
39	230	25.82036N, 84.688825E	25°49'13.27"N, 84°41'19.77"E	sulic gate on pyne	Channel cleaning and plantation (L=1100, Tw= 8, Bw= 4, d=1)	Luxmipur (Tekniwas)	
40	300	25.818342N, 84.687425E	25°49'5.33"N, 84°41'14.97"E	sulic gate on pyne	Channel cleaning and plantation (L=1100, Tw= 8, Bw= 4, d=2)	Luxmipur (Tekniwas)	
41	360	25.815838N, 84.689648E	25°48'56.97"N, 84°41'22.72"E	sulic gate on pyne	channel cleaning (L=1100, Tw= 8, Bw= 4, d=2.3)	fakli (sadar), Jakhua (Tekniwas)	
42	750	25.811535N, 84.685517E	25°48'41.51"N, 84°41'7.86"E	near railway crossing (Tw=40, depth 2)	channel cleaning	Jakhua (Tekniwas), Auli (J. Sadar)	
43	250	25.811397N, 84.683103E	25°48'41.01"N, 84°40'59.17"E	connected pyne	channel cleaning (L= 560, Tw=12, Bw=8, depth=3m)	fakli (sadar), Jakhua (Tekniwas)	
44	300	25.809517N, 84.683948E	25°48'34.08"N, 84°41'1.94"E	near salimpur puliya, Tw= 30 to 40, depth=10	Puliya repairing	Salimpur (Mukrera)	

45	280	25.80764N, 84.685428E	25°48'27.50"N, 84°41'7.54"E	Tw=30, Depth=6.5	Cleaning way of river (length=4000m, tw=30 m, depth= 10 m)	Salimpur (Mukrera)	
46	600	25.803497N, 84.688563E	25°48'13.02"N, 84°41'18.78"E	near highway to tekniwas bridge (Tw= 40, depth=10)		Methwalia, Salimpur (Mukrera)	
47	560	25.799558N, 84.691868E	25°47'58.40"N, 84°41'30.72"E	Near arjun setu (Tw=30, depth=10) & near 3 pond		Methwalia	(200*200*3)(180*140*3)(70*80*4)
48	730	25.79478N, 84.695407E	25°47'41.57"N, 84°41'43.81"E	near Karinga brij , Tw= 30, depth=10		Methwalia & auli (Mukrera)	
49	1500	25.789242N, 84.702275E	25°47'22.57"N, 84°42'8.41"E-54	Bramhpur brij, Tw= 25, depth=10		Bramhpur sadar	
50	1300	25.77978N, 84.700153E	25°46'47.18"N, 84°42'0.54"E	Tw=20, Depth=7		Bramhpur sadar	
51	400	25.778957N, 84.69684E	25°46'44.21"N, 84°41'48.94"E	Tw=30, Depth=1		Bramhpur sadar	

Annexure A II (152)
(Colly)

Place:-

Kumana, Manesar,Chapara,Saran

Place: -

Ramnager, Samhota, Chapara, Saran

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Place: -

BRAHAMPUR SLUICE GATE, CHAPRA

Place: -

BRAHAMPUR SLUICE GATE, CHAPRA

Annexure A II 58

जलालपुर के चंवरों में 40 फीसदी भी नहीं हो सकी रबी फसलों की बुआई

जलालपुर प्रखंड में रबी फसल की बुआई इस वर्ष गंभीर संकट में फंस गई है। प्रखंड के दो दर्जन से अधिक गांवों की चंवरों में अब तक 40 फीसदी भी रबी फसल की बुआई नहीं हो सकी है। इसका मुख्य कारण दो महीने पूर्व आए मोंथा तूफान के दौरान हुई भारी बारिश बताई जा रही है, जिससे क्षेत्र की चंवरों में व्यापक जलजमाव हो गया। जलनिकासी के समुचित प्रबंध नहीं होने और प्राकृतिक निकासी मार्गों के अवरुद्ध हो जाने से खेतों में अब भी पानी जमा है।

अपनी अपने अखबार हिन्दुस्तान के बोले छपरा अभियान के तहत अपनी परेशानियों को साझा करने के लिए जुटे जलालपुर प्रखंड के किसान। इन्होंने कई अहम सुझाव भी दिए।

ज[illegible]

[illegible]

प्रस्तुति: [illegible]

सुझाव-शिकायतें

सुझाव

1. जलजमाव वाले खेतों से पानी निकालने के लिए तत्काल [illegible] और [illegible] जलनिकासी व्यवस्था की जाए।
2. नहरों और पईनों की युद्धस्तर पर सफाई कर प्राकृतिक [illegible] को तुरंत चालू किया जाए।
3. जलजमाव से प्रभावित खेतों का विस्तृत सर्वे कर फसल नुकसान का आकलन करते हुए उचित मुआवजा दिया जाए।
4. कृषि विभाग द्वारा देर से बोई जाने वाली वैकल्पिक फसलों के लिए किसानों को तकनीकी मार्गदर्शन और बीज उपलब्ध कराया जाए।
5. भविष्य में समस्या से बचाव के लिए स्थायी जलनिकासी योजना तैयार कर उसे प्रभावी रूप से जमीन पर लागू किया जाए।

शिकायतें

1. चंवर क्षेत्रों में वर्षों से जलनिकासी की कोई स्थायी व्यवस्था नहीं होने से [illegible] हर बारिश में खेत जलमग्न हो जाते हैं।
2. नहरों और पईनों की नियमित सफाई नहीं होने से पानी निकासी बाधित है, जिससे खेती योग्य भूमि लंबे समय तक डूबी रहती है।
3. किसानों द्वारा हर साल समस्या उठाने के बावजूद प्रशासनिक स्तर पर कोई ठोस और स्थायी समाधान नहीं किया जाता।
4. भारी फसल नुकसान के बावजूद अब तक सरकारी स्तर पर नुकसान का सर्वे नहीं कराया गया, जिससे किसान मुआवजे से वंचित हैं।

हमारी भी सुनिए

फसलों के नुकसान का अब तक नहीं कराया गया सर्वे

जलालपुर प्रखंड की चंवर भूमि में लगातार बने जलजमाव का असर अब केवल फसलों तक सीमित नहीं रह गया है, बल्कि इसका सीधा प्रभाव ग्रामीण अर्थव्यवस्था और किसानों के सामाजिक जीवन पर भी पड़ने लगा है। रबी फसल से होने वाली आय पर ही किसान पूरे वर्ष की आर्थिक योजना तैयार करते हैं।

[illegible]

इनकी पीड़ा

"मोंथा तूफान के बाद से उनके खेतों में लगातार पानी जमा है और अब तक जलनिकासी की कोई व्यवस्था नहीं की गई है। सरसों की बुआई का समय पूरी तरह निकल गया और गेहूं की बुआई भी नहीं हो सकी, जिससे पूरे साल की आमदनी पर गहरा संकट खड़ा हो गया है। - गोपाल राम

"हर वर्ष जलजमाव की समस्या सामने आती है, लेकिन इस बार हालात बेहद गंभीर हैं। खेतों में खड़ा पानी निकलने का नाम नहीं ले रहा है, जिससे खेती पूरी तरह ठप हो गई है और किसान लागत निकाल पाने को लेकर भी चिंतित हैं। - नितेश कुमार

"गेहूं की बुआई की अंतिम तिथि 25 दिसंबर मानी जाती है, लेकिन खेतों में पानी भरे होने के कारण बुआई संभव नहीं हो सकी। देर से बुआई होने पर उत्पादन कम होता है, जिससे किसान को भारी आर्थिक नुकसान उठाना पड़ता है। - विष्णु प्रसाद यादव

"चंवरों में अब भी एक से डेढ़ फीट तक पानी जमा है। उन्होंने कहा कि छोटे और सीमांत किसान सबसे ज्यादा प्रभावित हैं क्योंकि उनकी जीविका पूरी तरह खेती पर निर्भर है और कोई वैकल्पिक साधन उपलब्ध नहीं है। जलजमाव का असर अब ग्रामीण अर्थव्यवस्था पर पड़ रहा है। - पवन कुमार

"बारिश के कारण अभी तक बहुत से चंवर में जलजमाव बना हुआ है। ज्यादा नीची जमीन में लगी मेढ़ी धान की फसल गल गई। [illegible] बुआई हो ही नहीं सकी [illegible] अब आमदनी के रास्ते [illegible] परेशानी और बढ़ गई है।

"नहरों और पईनों की वर्षों से सफाई नहीं होने के कारण जलनिकासी पूरी तरह बाधित है। प्रशासन से बार-बार शिकायत के बावजूद कोई ठोस कदम नहीं उठाया गया, जिसका खामियाजा किसानों को भुगतना पड़ रहा है। सरकार को इसे गंभीरता से लेना चाहिए और इसपर कड़े कदम उठाने चाहिए। - रामेश्वर सिंह कामा

कब तक सुधरेंगे हालात

"उम्मीद है कि जिला प्रशासन इस गंभीर समस्या को समझते हुए शीघ्र हस्तक्षेप करेगा। उन्होंने कहा कि यदि समय रहते कार्रवाई हो जाए तो किसानों को कुछ राहत मिल सकती है और भविष्य की खेती बचाई जा सकती है। - विकास सिंह

"हर साल अस्थायी समाधान की बात होती है, लेकिन स्थायी जलनिकासी व्यवस्था नहीं बन पाती। चंवर क्षेत्र के लिए अलग से दीर्घकालिक योजना बनाई जानी चाहिए, ताकि आम लोगों को इसका लाभ मिल सके। - सच्चिदानंद तिवारी

"यदि प्रशासन पंपिंग सेट लगाकर अस्थायी रूप से भी पानी निकलवा दे तो कुछ खेतों में देर से ही सही बुआई संभव हो सकती है। इससे किसानों को आंशिक राहत मिल सकती है। नहीं तो किसानों को बहुत नुकसान हो रहा है। - सुधीर सिंह

"क्षेत्र में जलजमाव की समस्या गंभीर है और इसे लेकर संबंधित विभागों को अवगत कराया गया है। आशा है कि जल्द ही समाधान के लिए प्रयास किए जाएंगे, ताकि किसानों को राहत मिल सके। - अनिल कुमार मिश्र

"रबी फसल से होने वाली आय से ही घर का खर्च और बच्चों की पढ़ाई चलती है। इस बार खेती प्रभावित होने से पूरा परिवार कर्ज के बोझ के [illegible] बिगड़ गया है और भविष्य को लेकर चिंता लगातार बढ़ती जा रही है। - लौरिक राय

"सरसों की फसल नहीं लग पाने से तेलहन उत्पादन में भारी गिरावट आएगी। इसका सीधा असर किसानों की आय के साथ-साथ स्थानीय बाजार पर भी पड़ेगा, क्योंकि क्षेत्र की बड़ी आबादी इसी फसल पर निर्भर रहती है। - राधेश्याम यादव

"लगातार जलजमाव से खेतों की मिट्टी की उर्वरता भी प्रभावित हो रही है। लंबे समय तक पानी भरे रहने से जमीन की संरचना खराब हो जाती है, जिससे आने वाले सीजन में भी फसल उत्पादन पर नकारात्मक असर पड़ेगा। - सुरेन्द्र शर्मा

"जलजमाव की समस्या हर वर्ष सामने आती है, लेकिन प्रशासन और जनप्रतिनिधियों की ओर से कोई स्थायी समाधान नहीं किया जाता। केवल आश्वासन देकर किसानों की समस्या को टाल दिया जाता है। - शैलेंद्र सिंह

"यदि जल्द ही जलनिकासी और मुआवजे की घोषणा नहीं की गई तो किसान आंदोलन करने को मजबूर होंगे। नालों और पईनों की सफाई कराई जाए तथा प्रभावित किसानों के लिए वैकल्पिक फसल योजना और मुआवजे की घोषणा हो। - मिट्टू तिवारी

"सरकार से फसल क्षति के बदले आर्थिक सहायता, कर्ज पर ब्याज माफी और अगली फसल के लिए विशेष पैकेज देने की मांग की गई ताकि किसान दोबारा खेती के लिए तैयार हो सकें। - संजय कुमार सिंह

"खेतों में लंबे समय तक पानी जमा रहने से कीट और रोग का खतरा भी बढ़ गया है। इससे न केवल मौजूदा फसल बल्कि भविष्य की खेती पर भी नकारात्मक असर पड़ने की आशंका है। सरकार को इसे गंभीरता से लेना चाहिए। - संतोष कुमार

"अपने लंबे खेती जीवन में ऐसी स्थिति बहुत कम देखी है, जब रबी फसल की बुआई ही नहीं हो पाई हो। जलजमाव की समस्या ने किसानों की कमर तोड़ दी है और सरकार से मदद की आस बनी हुई है। - नितेश कुमार तिवारी

"जब समय पर खेती नहीं हो पाती है तो युवाओं को खेती से भरोसा उठने लगता है। लगातार नुकसान होने से मजबूरी में पलायन करना पड़ता है, जिससे गांवों की सामाजिक और आर्थिक संरचना भी कमजोर होती जा रही है। - संजय कुमार

": जलालपुर प्रखंड की यह समस्या वर्षों पुरानी है, लेकिन आज तक इसका स्थायी समाधान नहीं निकाला गया। जिला स्तर पर ठोस योजना बनाकर जलनिकासी की व्यवस्था सुनिश्चित की जाए। - रामपूजन राय

Chapra Speaks:

Waterlogging Halts Rabi Crop Sowing: Only 40% Sowing Completed in Jalalpur Fields, Wheat and Mustard Crops at Risk

Photo

Report by: Teerthraj Sharma

Introduction: Rabi crop sowing in Jalalpur block is facing a serious crisis this year. Less than 40% of the Rabi crop has been sown so far in the fields of more than two dozen villages in the block. The main reason is attributed to the heavy rains during Cyclone Monta two months ago, which caused widespread waterlogging in the fields. Due to the lack of proper drainage systems and the blockage of natural drainage channels, water is still accumulated in the fields. Farmers in several panchayats, including Nawada, Kumna, Bhatkeshari, Sanwari, Ashok Nagar, Rewari, and Samhota, are most affected by this problem. Farmers say that the ideal time for sowing mustard has already passed, and the last date for sowing wheat is considered to be December 25th, which has now also passed. Therefore, a significant drop in production is feared. The continuously increasing costs and decreasing yields have further increased the farmers' worries.

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Main News

The agricultural system in Jalalpur block is currently grappling with a severe waterlogging problem. The torrential rains following Cyclone Monta have completely submerged the fields in the area. Normally, by this time, plowing is complete and the sowing of wheat and mustard is in its final stages, but this year the situation is quite the opposite.

In many villages, one to two feet of water still remains in the fields. Drainage is completely stalled due to the lack of cleaning of canals and irrigation channels for years. Encroachments and soil deposits have blocked the natural flow of water. Farmers say that if drainage arrangements had been made in time, this situation would not have arisen.

The mustard crop is sown in October-November, but due to the waterlogged fields, most farmers have had to abandon mustard sowing. Now it was time for wheat, but sowing wheat after December 25th directly impacts production. According to agricultural experts, wheat sown late results in smaller ears and weaker grains.

Farmers said that they had already purchased seeds, fertilizers, and diesel, but the fields could not be prepared. This has resulted in a double blow for them – on one hand, they couldn't sow the crops, and on the other hand, their investment is stuck. Small and

marginal farmers, whose livelihoods depend entirely on agriculture, are the most affected.

There is widespread anger among the farmers due to the lack of any concrete action at the block level so far. They say that the problem of waterlogging arises every year, but they only receive assurances in the name of solutions. If drainage and alternative crop planning are not addressed soon, the entire Rabi season could be ruined.

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Related News

The waterlogging in the fields of Jalalpur is not only affecting crops but is also impacting the rural economy. Farmers rely on the income from the Rabi crop to pay for their children's education, household expenses, and loan repayments. This year, the crop damage will make it difficult for farmers to repay loans from moneylenders and banks. According to the agriculture department, if the water is drained in time, alternative crops that can be sown later might be considered in some areas, but this requires swift action. Farmers are demanding that the government assess the damage, provide compensation, and implement a permanent drainage plan before the next Kharif season. Local representatives have also visited the area and acknowledged the problem, but no concrete action has been taken on the ground so far. Farmers hope that the district administration will intervene and provide relief from this crisis.

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Complaint

No permanent drainage system in the fields for years

Water drainage obstructed due to lack of cleaning of canals and drains

Administrative neglect despite raising the issue every year

No survey of crop damage conducted so far

No clear plan for alternative crops or compensation

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Solution

Arrangement of pumping sets for immediate water drainage

Cleaning of canals and drains on a war footing

Annexure A IV (159)

अन्नदाताओं की मेहनत, लागत और भविष्य तीनों ही संकट में, अब मजबूरी में किसान निजी बोरिंग और ट्यूबवेल का सहारा ले रहे

सारण में पानी के लिए तरस रहीं नदियां, बढ़ रहा सिंचाई संकट


सारण में सूखने के कगार पर सुखमयी नदी। • हिन्दुस्तान

छपरा, नगर प्रतिनिधि। सारण जिले की धरती, जो कभी नदियों की गोद में लहलहाती फसलों के लिए जानी जाती थी, आज पानी के लिए तरस रही है। नदियों के सूखने से सिंचाई का संकट लगातार गहराता जा रहा है और दिन-प्रतिदिन स्थिति और भयावह होती दिख रही है। इसका सीधा असर जिले के अन्नदाताओं पर पड़ रहा है, जिनकी मेहनत, लागत और भविष्य तीनों ही संकट में हैं।

सारण की नदियां केवल जलधारा नहीं थीं, बल्कि यहां की खेती, संस्कृति और जीवनशैली का आधार थीं। इनके सूखने से सिर्फ खेत नहीं सूख रहे, बल्कि किसानों की उम्मीदें भी दरक रही हैं। यदि नदियों को बचाने के लिए तत्काल ठोस प्रयास नहीं हुए, तो आने वाले समय में सारण का कृषि परिदृश्य पूरी तरह बदल सकता है। आज जरूरत है कि सरकार, प्रशासन और समाज मिलकर नदियों को फिर से जीवन देने का संकल्प लें। क्योंकि नदियां बचेंगी, तभी खेत बचेंगे। खेत बचेंगे, तभी अन्नदाता और अन्न दोनों सुरक्षित रहेंगे। सारण के ग्रामीण अंचलों रिविलगंज, दरियापुर, मढ़ौरा, तरैया, मांझी सहित कई इलाकों से होकर गुजरने वाली सहायक नदियों में जलस्तर खतरनाक रूप से घट गया है। महो, तैल, गंडकी और खदरा जैसी छोटी नदियां, जिन्हें कभी जिले की जीवनरेखा कहा जाता था, आज कई स्थानों पर केवल नाम भर की रह गई हैं। नदी की जगह कहीं सूखी मिट्टी दिखाई देती है तो कहीं गड्ढों में ठहरा गंदा पानी।

पांच दशक पहले का हराभरा सारण, आज सूखे का साया: करीब पांच दशक पहले तक इन नदियों में साल भर पानी बहता था। आसपास के खेतों को प्राकृतिक सिंचाई मिलती थी, भू-जल स्तर संतुलित रहता था और किसान कम लागत में अच्छी पैदावार ले पाते थे। नदी का पानी खेतों तक पहुंचता था तो मिट्टी में नमी और उर्वरता बनी रहती थी लेकिन समय के साथ मानवीय लापरवाही, अंधाधुंध दोहन और प्रशासनिक उदासीनता ने इन नदियों को समाप्ति के कगार पर ला खड़ा किया। मढ़ौरा के प्रगतिशील किसान रणविजय व अन्य का कहना है कि यदि समय रहते इन नदियों के संरक्षण की पहल की जाती, तो आज हालात इतने भयावह नहीं होते। नदी किनारे अतिक्रमण, अवैध मिट्टी खनन, कचरा डंपिंग और जल प्रवाह को रोकने वाले निर्माण कार्यों ने नदियों की स्वाभाविक धारा को बाधित कर दिया। रिविलगंज क्षेत्र में तैल नदी और तरैया क्षेत्र में खदरा नदी से वर्षों से अंधाधुंध मिट्टी खनन किया जा रहा है। इससे नदी का तल असंतुलित हो गया है और जल धारण क्षमता खत्म होती जा रही है। बरसात में थोड़े दिनों के लिए पानी आता भी है, तो वह टिक नहीं पाता और जल्द ही सूख जाता है। मढ़ौरा में डबरा नदी की स्थिति और भी चिंताजनक है। नदी के कई हिस्सों को कचरा डंपिंग जोन में तब्दील कर दिया गया है। घरेलू कचरा, प्लास्टिक और अपशिष्ट सामग्री के कारण नदी का पानी विषाक्त हो चुका है। इससे न केवल जलीय जीवन समाप्त हो गया, बल्कि आसपास के खेतों में जाने वाला पानी भी खेती के लिए अनुपयोगी हो गया है।

02 लाख 70,245 हेक्टेयर भूमि है सारण में

01 लाख 99,300 हेक्टेयर भूमि खेती के योग्य है

01 लाख 01,611 हेक्टेयर भूमि सिंचित है

- डीजल और बिजली का खर्च किसानों की कमर तोड़ रही है
- खेतों में जाने वाला पानी भी खेती के लिए अनुपयोगी हो गया है

फसल चक्र में बदलाव, परंपरागत खेती से दूरी

रिविलगंज, दरियापुर और मांझी क्षेत्र में पहले जौ और बाजरा की खेती बड़े पैमाने पर होती थी। ये फसलें कम पानी में भी अच्छी पैदावार देती थीं और किसानों की खाद्य सुरक्षा का आधार थीं लेकिन अब सिंचाई संकट और बाजार की अनिश्चितता के कारण किसान इन फसलों से परहेज करने लगे हैं। किसान सुशील कुमार, उमेश राम का कहना है कि जौ-बाजरा की खेती में लाभ कम दिखता है, जबकि लागत लगातार बढ़ रही है। नतीजतन, परंपरागत फसलें धीरे-धीरे खेतों से गायब होती जा रही हैं और किसान ऐसी फसलों की ओर मजबूर हो रहे हैं, जो ज्यादा पानी और खर्च मांगती हैं।

सिंचाई संकट का सीधा असर खेती पर

नदियों के सूखने से सबसे बड़ा संकट सिंचाई को लेकर खड़ा हो गया है। जिले में खेती की उत्पादकता पर इसका प्रतिकूल प्रभाव साफ नजर आने लगा है। दरियापुर के किसान रामावतार का कहना है कि जब नदी के पानी से सिंचाई होती थी, तो खेतों का पाट बन यानी पहली और मुख्य फसल बेहतर होती थी। पैदावार अधिक होती थी और जमीन की उर्वर शक्ति भी बनी रहती थी। अब मजबूरी में किसान निजी बोरिंग और ट्यूबवेल का सहारा ले रहे हैं। इससे लागत कई गुना बढ़ गई है। डीजल और बिजली का खर्च किसानों की कमर तोड़ रहा है। इसके बावजूद नदी के पानी जैसी गुणवत्ता और उत्पादन नहीं मिल पा रहा है। कई किसानों ने बताया कि ट्यूबवेल के पानी से जमीन धीरे-धीरे कठोर हो रही है और फसलों में पहले जैसी चमक नहीं रही।

जिले में भू-जलस्तर पर भी मंडराया खतरा

नदियों के सूखने का असर केवल सतही सिंचाई तक सीमित नहीं है, बल्कि इससे भू-जल स्तर भी तेजी से गिर रहा है। पहले नदियाँ भू-जल रिचार्ज का बड़ा स्रोत थीं। अब जब नदियां ही सूख रही हैं, तो जमीन के अंदर पानी भरने की प्रक्रिया बाधित हो गई है। विशेषज्ञों का मानना है कि यदि यही स्थिति बनी रही, तो आने वाले वर्षों में जिले के कई हिस्सों में पेयजल संकट भी गहरा सकता है। हैंडपंप और बोरिंग सूखने लगेंगे, जिससे ग्रामीण जीवन और भी कठिन हो जाएगा।

पहले नदी से सिंचाई होती थी, अब बोरिंग करानी पड़ रही है

तरैया के किसान रामबचन सिंह कहते हैं, पहले खदरा नदी से ही खेतों की सिंचाई हो जाती थी। बोरिंग से पानी निकालना पड़ता है। डीजल का खर्च इतना बढ़ गया है कि खेती घाटे का सौदा बनती जा रही है। रिविलगंज के किसान अशोक प्रसाद बताते हैं, तेल नदी जब बहती थी, तब जमीन में जान थी। फसल अच्छी होती थी। अब नदी में मिट्टी ही मिट्टी है। पानी नहीं रहा तो खेती कैसे बचेगी? मांझी क्षेत्र के एक किसान ने चिंता जताते हुए कहा, अगर यही हाल रहा तो आने वाले समय में खेती छोड़कर मजदूरी करनी पड़ेगी। नई पीढ़ी तो खेती से पहले ही दूर हो रही है।

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06/01/2026

• The cost of diesel and electricity is breaking the backs of farmers.

• The water reaching the fields has also become unsuitable for agriculture.

Chapra, City Representative. The land of Saran district, once known for its lush crops nurtured by the rivers, is now parched for water. The drying up of the rivers is continuously deepening the irrigation crisis, and the situation is becoming more and more dire every day. This is directly affecting the farmers of the district, whose hard work, investment, and future are all in jeopardy.

The rivers of Saran were not just waterways, but the foundation of the region's agriculture, culture, and lifestyle. Their drying up is not only causing the fields to dry up, but also shattering the hopes of the farmers. If immediate and concrete efforts are not made to save the rivers, the agricultural landscape of Saran could completely change in the coming years. Today, there is a need for the government, administration, and society to come together and resolve to revive the rivers, because only if the rivers survive will the fields survive. Only if the fields survive will the farmers and the food supply be secure. The water level in the tributaries flowing through the rural areas of Saran, including Revelganj, Dariyapur, Marhaura, Taraiya, Manjhi, and several other areas, has dangerously decreased. Small rivers like Mahi, Tel, Gandaki, and Khadra, which were once considered the lifelines of the district, are now merely names in many places. In place of the river, one sees dry soil in some places and stagnant, dirty water in puddles in others.

The lush green Saran of five decades ago, now under the shadow of drought:

Until about five decades ago, these rivers flowed with water throughout the year. The surrounding fields received natural irrigation, the groundwater level remained balanced, and farmers were able to get good yields at low cost. When the river water reached the fields, the soil retained moisture and fertility, but over time, human negligence, indiscriminate exploitation, and administrative indifference have brought these rivers to the brink of extinction. Progressive farmers like Ranvijay and others from Marhaura say that if steps had been taken to conserve these rivers in time, the situation would not be so dire today. Encroachment on riverbanks, illegal sand mining, garbage dumping, and construction activities that obstruct water flow have disrupted the natural course of the rivers. For years, indiscriminate sand mining has been carried out in the Tel River in the Revelganj area and the Khadra River in the Taraiya area. This has unbalanced the riverbed and is depleting its water-holding capacity. Even when water flows during the monsoon season, it doesn't last long and dries up quickly. The situation of the Dabara River in Marhaura is even more alarming. Several parts of the river have been turned into garbage dumping zones. Household waste,

Let's Save Our Rivers

Drought and Irrigation Crisis Directly Affecting Agriculture

The drying up of rivers has created a major irrigation crisis. The adverse impact on agricultural productivity in the district is clearly visible. Ramavatar, a farmer from Dariyapur, says that when irrigation was done with river water, the first and main crop was better. The yield was higher, and the soil's fertility was maintained.

Now, farmers are forced to rely on private borewells and tube wells. This has increased costs manifold. The cost of diesel and electricity is breaking the backs of farmers. Despite this, they are not getting the same quality and yield as with river water. Several farmers reported that the soil is gradually becoming harder due to tube well water, and the crops lack their former luster.

Earlier, irrigation was done with river water; now, borewells are necessary.

Threat Looms Over Groundwater Levels in the District

Changes in Cropping Patterns, Shift Away from Traditional Farming

In the Revelganj, Dariyapur, and Manjhi areas, barley and millet were previously cultivated on a large scale. These crops yielded good harvests even with less water and were the basis of food security for the farmers. However, due to the irrigation crisis and market uncertainty, farmers are now avoiding these crops. Farmers Sushil Kumar and Umesh Ram say that barley and millet cultivation yields less profit, while costs are constantly increasing. As a result, traditional crops are gradually disappearing from the fields, and farmers are being forced to cultivate crops that require more water and expense.

Rambachan Singh, a farmer from Taraiya, says, "Earlier, the fields were irrigated by the Khadra River. Now, we have to extract water from borewells. The cost of diesel has increased so much that farming is becoming a loss-making venture." Ashok Prasad, a farmer from Revelganj, says, "When the Tail River flowed, the land was fertile. The crops were good. Now, there is only mud in the river. If there is no water, how will farming survive?" A farmer from the Manjhi area expressed his concern, saying, "If this continues, we will have to abandon farming and work as laborers in the future." Ram Bachan Singh, a farmer from Nai Taraiya, says, "Earlier, the fields were irrigated by the Khadra River. Now we have to pump water from borewells."

The cost of diesel has increased so much that farming is becoming a loss-making venture. Ashok Prasad, a farmer from Revelganj, says, "When the Tail River flowed, the land was fertile. The crops were good. Now there is only mud in the river. If there is no water, how will farming survive?" A farmer from the Manjhi area expressed his concern, saying, "If this continues,

we will have to abandon farming and work as laborers in the future. The new generation is already moving away from farming."

The drying up of rivers is not only affecting surface irrigation, but it is also causing the groundwater level to fall rapidly. Earlier, rivers were a major source of groundwater recharge. Now that the rivers are drying up, this process of replenishing groundwater has been disrupted.

Experts believe that if this situation persists, the drinking water crisis could deepen in many parts of the district in the coming years.

Handpumps and borewells are starting to dry up, which will make rural life even more difficult.

Survey of waterlogged areas and provision of compensation

Guidance on alternative crops that can be sown later

Implementation of a permanent drainage plan

–

Statement 1: Since Cyclone Monta, their fields have been continuously waterlogged, and no drainage system has been put in place yet. The time for sowing mustard has completely passed, and wheat sowing has also not been possible, which has created a serious crisis for the entire year's income. - Gopal Ram

Statement 2: The problem of waterlogging arises every year, but this time the situation is extremely serious. The standing water in the fields is not receding, due to which farming has come to a complete standstill, and farmers are worried about even recovering their costs. - Nitesh Kumar

Statement 3: The last date for sowing wheat is considered to be December 25th, but due to waterlogged fields, sowing has not been possible. Late sowing results in lower production, causing heavy financial losses for the farmers. - Bishnu Prasad Yadav

Statement 4: There is still one to one and a half feet of water accumulated in the low-lying areas. He said that small and marginal farmers are the most affected because their livelihood depends entirely on farming, and no alternative means are available. - Pawan Kumar

Statement 5: Due to the rains, waterlogging persists in the Bathari area. My paddy crop on two and a half bighas of land has rotted. It couldn't even be harvested. I have suffered losses worth thousands. Sowing of the Rabi crop is impossible. - Jagadwan Singh

Statement 6: Due to the lack of cleaning of canals and irrigation channels for years, drainage is completely blocked. Despite repeated complaints to the administration, no concrete steps have been taken, and the farmers are bearing the brunt of it. - Rameshwar Singh Kaka

Statement 7: Continuous waterlogging is also affecting the fertility of the soil in the fields. Prolonged waterlogging damages the soil structure, which will negatively impact crop production in the coming season as well. - Surendra Sharma

Statement 8: The inability to plant the mustard crop will lead to a significant decline in oilseed production. This will directly impact farmers' income as well as the local market, as a large population of the region depends on this crop. - Radheshyam Yadav

Statement 9: This problem in Jalalpur block is years old, but a permanent solution has not been found to date. A concrete plan should be made at the district level to ensure proper drainage so that farmers can get relief. - Ramdular Rai

Statement 10: When farming cannot be done on time, young people start losing faith in agriculture. He said that continuous losses force them to migrate, which is weakening the social and economic structure of the villages. - Sanjay Kumar

Statement 11: Household expenses and children's education depend on the income from the Rabi crop. This time, due to the affected farming, the entire household budget has been disrupted, and worries about the future are constantly increasing. - Lorik Rai

Statement 12: In my long farming life, I have rarely seen a situation where the Rabi crop could not be sown at all. The waterlogging problem has broken the backs of the farmers, and they are hoping for help from the government. - Jitesh Kumar Tiwari

Statement 13: We demanded that the administration conduct an immediate survey of the damage and provide compensation. He said that without government assistance, small farmers will not be able to recover from this loss and will be forced to abandon farming.

- Shailendra Singh

Statement 14: The problem of waterlogging in the area is serious, and the concerned departments have been informed about it. He assured that efforts will be made soon to find a solution so that farmers can get relief.

- Anil Kumar Mishra

Statement 15: Prolonged waterlogging in the fields has also increased the risk of pests and diseases. This is likely to have a negative impact not only on the current crop but also on future farming. - Santosh Kumar Singh

Statement 16: If the administration installs pumping sets to temporarily drain the water, sowing might be possible in some fields, even if late. This could provide partial relief to the farmers. - Raghuveer Singh

Statement 17: The government has been urged to provide financial assistance for crop damage, waive interest on loans, and offer a special package for the next crop season so that farmers can prepare for cultivation again. - Rajesh Kumar Singh

Statement 18: Every year, temporary solutions are discussed, but a permanent drainage system is never established. He emphasized that a separate long-term plan should be made for the Chawar region.

- Sachchidanand Tiwari

Statement 19: The angry farmer warned that if drainage and compensation are not announced soon, the farmers will be forced to launch a protest. He said that their patience is running out. - Mintu Tiwari

Statement 20: The farmers expressed hope that the district administration will understand this serious problem and intervene promptly. They said that if action is taken in time, farmers can get some relief and future farming can be saved. - Vikas Singh

No water sample as the chaur has changed to dry grassland

Annexure AV

(NO)

(165)

Annex 2: Format for preparing Brief Document

State / ~~Union Territory~~: Bihar

Name and address of person(s) compiling this information

Section 1: Identification, Location and Jurisdiction

1.1 Name of the Wetland (Alternative names, including in local language should be given in parenthesis after official name)

Gamharia chaur

1.2 Name of the Village(s) , Tehsil(s), Municipal area (s)

village name? Telalpur block, Saran district

1.3 Name of the District(s) in which wetland complex is located

Saran

1.4 Geographical coordinates (Latitude and Longitude, to degree, minutes and second)

Latitude: From 25.91573 to

Longitude: From 84.64253 to

1.5 Name of the Department / Agency which has jurisdiction over the wetland / wetlands complex

Govt land & Private land

Section 2: Site Characteristics

2.1 Area of wetland / wetlands category (ha) 396 hect (as per NWA 2010)

2.2 Wetland type (Please tick appropriate categories and sub-categories)

Category	Subcategory
☑ Natural (Inland)	☐ Permanent lakes ☐ Seasonal/ intermittent lakes ☐ Permanent streams/ creeks ☐ Seasonal/ intermittent streams/ creeks ☐ Oxbow ☑ River floodplain ☐ Permanent freshwater marshes ☐ Seasonal/ intermittent freshwater marshes ☐ Shrub-dominated wetlands ☐ Tree-dominated wetlands ☐ Geothermal wetlands ☐ Karst and other subterranean hydrological systems

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☐ Natural (Coastal)	☐ Coastal lagoon ☐ Estuary ☐ Intertidal mud, sand or salt flats ☐ Mangroves ☐ Coral reefs
☐ Human-made	☐ Aquaculture pond ☐ Tank ☐ Saltpan ☐ Dam / Reservoir

2.3 Depth (m) Average _____ Maximum Dried area _____

2.4 Elevation (m above mean sea level) 7 m

2.5 Water regimes

a) Main source of water (tick all applicable)

☑ Rainfall ☐ Groundwater ☑ Catchment runoff ☐ Direct / indirect inflow from river

☐ Others, please specify Flood water from river direct / indirect

b) Water permanence

☐ Mostly permanent ☑ Mostly intermittent

c) Destination of water from wetland

☑ Feeds groundwater ☐ To downstream catchment ☐ To river ☐ To sea

d) Water pH

☐ Acid (< 5.5) ☐ Circumneutral (5.5 - 7.4) ☐ Alkaline (> 7.4)

☑ Not known

e) Water salinity

☑ Fresh (< 0.5 g/l) ☐ Brackish (0.5 - 30 g/l)) ☐ Euhaline (30- 40 g/l)

☐ Hypersaline (>40g/l) ☐ Not known

f) Nutrient in water

☐ Eutrophic ☐ Mesotrophic ☐ Oligotrophic

☑ Not known

2.6 Climatic setting

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a) Annual Rainfall /Snowfall(mm) 1140 mm

b) Temperature (°C) Minimum 10°c Maximum 42°c

c) Humidity (%) Minimum 50% Maximum 95%

2.7 Area of zone of influence (in ha) _____ [Ref. paras 32-34 of the guidelines on wetlands]

2.8 Major land use within zone of influence (provide as approximate % of catchment area)

Forests _____%

Plantation _____%

Agriculture 60% % (50% agri + 10% Grass land)

Settlements (Rural) 40% %

Settlements (Urban) _____%

Industrial _____%

2.9 Map of wetland complex and zone of influence

(To be enclosed as Annex I and II to this proposal)

Section 3: Biodiversity

3.1 Notable plant species present in wetland

Nil, Grasses.

3.2 Notable animal species present in wetland

Nil. Dried area

3.3 Species of conservation significance (rare, endangered, threatened, endemic species)

3.4 Major plant invasive alien species

3.5 Major animal invasive alien species

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Section 4: Ecosystem services

Importance	Relevant for the site (please tick yes or no)	If Yes, Details (upto 50 words for each category)
Source of drinking water for people living and around	☐Yes ☑No	
Source of water for agriculture	☐Yes ☑No	
Fisheries	☐Yes ☑No	
Cultivation of aquatic food plants	☐Yes ☑No	
For buffalo wallowing and use of domesticated animals	☐Yes ☑No	
Medicinal plants	☐Yes ☑No	
Is a recreational site	☐Yes ☑No	
Buffering communities from extreme events as floods and storms	☑Yes ☐No	
Groundwater recharge	☑Yes ☐No	
Water purification	☐Yes ☑No	
Acts as a sink for sediments	☐Yes ☐No	
Has significant cultural and religious values	☐Yes ☑No	
Is a site for recreation and tourism	☐Yes ☑No	
Supports noteworthy plants species	☐Yes ☑No	
Supports noteworthy animal species	☐Yes ☑No	
Site of high congregation of migratory water birds	☐Yes ☑No	
Supports life cycle of fish or amphibians	☑Yes ☐No	
Mining	☐Yes ☐No	
Any other, please list		

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Section 5: Pre-Existing Rights and Privileges

Nature of right and privilege	Relevant for the site (please tick yes or no)	Does this negatively impact the wetland's ecological health?	Brief description (upto 50 words for each category)
Community Fishing (without any lease or permission from government department)	☑Yes ☐No	☐Yes ☐No ☑Not assessed	
Fishing under lease from government department	☐Yes ☑No	☐Yes ☐No ☐Not assessed	
Harvest of plants (without any lease or permission from government department)	☑Yes ☐No	☐Yes ☐No ☑Not assessed	
Harvest of plants under lease from government department	☐Yes ☑No	☐Yes ☐No ☐Not assessed	
Agriculture or horticulture within wetland	☑Yes ☐No	☐Yes ☐No ☑Not assessed	
Grazing	☑Yes ☐No	☐Yes ☐No ☑Not assessed	
Religious practices	☐Yes ☑No	☐Yes ☐No ☐Not assessed	
Withdrawal of water for domestic use	☐Yes ☑No	☐Yes ☑No ☐Not assessed	
Withdrawal of water for agriculture or fisheries	☐Yes ☑No	☐Yes ☐No ☑Not assessed	
Bathing or wallowing of domestic animals	☐Yes ☐No	☐Yes ☐No ☐Not assessed	
Plying of boats	☐Yes ☑No	☐Yes ☐No ☑Not assessed	
Any other, please list here	☐Yes ☐No	☐Yes ☐No ☐Not assessed	

Section 6: Present and Potential Threats

Threat	Degree	Present or Potential	Additional information, if any
Changes in water inflow and outflow	☑High ☐Medium ☐Low	☑Present ☐Potential	
Pollution	☐High ☐Medium ☑Low	☐Present ☑Potential	
Unsustainable harvest of biological resources	☐High ☐Medium ☑Low	☐Present ☑Potential	
Mining	☐High ☐Medium ☐Low	☐Present ☐Potential	
Siltation	☐High ☑Medium ☐Low	☑Present ☐Potential	
Encroachment	☐High ☐Medium ☐Low	☐Present ☐Potential	
Spread of invasive species	☐High ☐Medium ☐Low	☐Present ☐Potential	
Any other, please list	☐High ☐Medium ☐Low	☐Present ☐Potential	

Section 7: Activities Proposed to be Prohibited (other than those listed in Rule 4(2) of Wetland Rules and Regulated

Activity	Whether prohibited or regulated	Regulation within wetlands or zone of influence	If regulated, indicate the level of regulation (in terms of people, restricted area or any other)	Name of department / agency responsible for regulation / prohibition	Additional information, if any
Withdrawal of water / impoundment/diversion or any other hydrological intervention	Prohibited	☑ Wetland / Wetlands complex boundary ☐ Zone of influence			
Harvesting of resources (living / non-living)	Regulated	☑ Wetland / Wetlands complex boundary ☐ Zone of influence			
Grazing	Regulated	☑ Wetland / Wetlands complex boundary ☐ Zone of influence			
Discharge of treated sewage/ effluent / wastewater	Prohibited	☑ Wetland / Wetlands complex boundary ☐ Zone of influence			

Construction of boat jetties, and facilities for temporary use , as pontoon bridges	Regulated	☑ Wetland / Wetlands complex boundary ☐ Zone of influence			
Aquaculture, agriculture and horticulture activities within the wetland boundaries.	Regulated	☑ Wetland / Wetlands complex boundary ☐ Zone of influence			
Any other, please list		☐ Wetland / Wetlands complex boundary ☐ Zone of influence			

Section 8: Activities Proposed to be permitted

Activity	Place a tick mark if relevant	Within wetlands or zone of influence	Additional information, if any
	☐	☐ Wetland / Wetlands complex boundary ☐ Zone of influence	
	☐	☐ Wetland / Wetlands complex boundary ☐ Zone of influence	
	☐	☐ Wetland / Wetlands complex boundary ☐ Zone of influence	
	☐	☐ Wetland / Wetlands complex boundary ☐ Zone of influence	
	☐	☐ Wetland / Wetlands complex boundary ☐ Zone of influence	
	☐	☐ Wetland / Wetlands complex boundary ☐ Zone of influence	
		☐ Wetland / Wetlands complex boundary ☐ Zone of influence	

Section 9: Listing of Available Scientific Resources Used

_____

_____

_____

_____

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CHECKLIST

- ☐ Responsible agency has been clearly identified and details of contact person included
- ☐ Wetland/ wetlands complex boundary has been delineated using GIS and firmed up by adequate ground truthing
- ☐ Wetland/ wetlands complex map has been provided at required scale
- ☐ Zone of influence has been delineated and included in wetland map or a separate map
- ☐ Wetland zone of influence is sufficient to manage all activities
- ☐ Site's importance have been listed, and for major categories, justification is provided
- ☐ Site's biodiversity values are listed, and for major categories, justification is provided
- ☐ List of pre-existing rights and privileges is provided
- ☐ Consistency or inconsistency of pre-existing rights and privileges is indicated to be best of available knowledge
- ☐ Threats to site are listed, and for major categories details are provided
- ☐ Activities prohibited, other than those listed in Rule 4(2) have been mentioned
- ☐ List of activities to be regulated within wetlands and zone of influence is provided
- ☐ List of activities to be permitted is provided

Annexure A VI (173)

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Format for Preparing Brief Document of Wetlands for Notification under Wetland Rules 2017

State / Union Territory: Bihar

Name and address of person (s) compiling this information _____

Section 1: Identification, Location and Jurisdiction

1.1 Name of the Wetland (Alternate names, including in local language should be given in parenthesis after official name)

Bhatkesri chaur

1.2 Name of the Village (s), Tehsil (s), Municipal area (s)

Bhatkesri, Rusi Block-Jalalpur

1.3 Name of the District (s) in which wetlands complex located

Saran

1.4 Geographical coordinates (Latitude and Longitude, to degree, minutes and second)

Latitude: From 25·948265 to _____

Longitude: From 84·653865 to _____

1.5 Name of the Department / Agency which has jurisdiction over wetland / wetlands complex

Private & Govt

Section 2: Site Characteristics

2.1 Area of wetland / wetlands category (ha) 129 ha as per NWA (2010)

2.2 Wetland type (Please tick appropriate categories and sub-categories)

Category	Subcategory
☑ Natural (Inland)	☐ Permanent lakes ☐ Seasonal/ intermittent ~~lakes~~ chaur ☐ Permanent streams/ creeks ☐ Seasonal/ intermittent streams/ creeks ☐ Oxbow ☑ River floodplain ☐ Permanent freshwater marshes ☐ Seasonal/ intermittent freshwater marshes ☐ Shrub-dominated wetlands ☐ Tree-dominated wetlands

	☐Geothermal wetlands ☐Karst and other subterranean hydrological systems
Category	**Subcategory**
☐Natural (Coastal)	☐Coastal lagoon ☐Estuary ☐Intertidal mud, sand or salt flats ☐Mangroves ☐Coral reefs
☐Human-made	☐Aquaculture pond ☐Tank ☐Saltpan ☐Dam / Reservoir

2.3 Depth (m) Average _____ Maximum 4-6ft

2.4 Elevation (m above mean sea level) 7 m

2.5 Water regimes

a) Main source of water (tick all applicable)

☑Rainfall ☐Groundwater ☐Catchment runoff ☑Direct / indirect inflow from river

☐Others, please specify_____

☑Name of River/Canal system Tel river stream

b) Water permanence

☐Mostly permanent ☑Mostly intermittent

c) Destination of water from wetland

☑Feeds groundwater ☐To downstream catchment ☐To river ☐To sea

d) Water pH

☐ Acid (< 5.5) ☐ Circumneutral (5.5 – 7.4) ☐ Alkaline (> 7.4) ☐Not known

e) Water salinity

☑Fresh (< 0.5 g/l) ☐Brackish (0.5 – 30 g/l)) ☐Euhaline (30- 40 g/l)

☐Hypersaline (>40g/l) ☐Not known

f) Nutrients in water

☐Eutrophic ☐Mesotrophic ☐Oligotrophic ☑Not known

175

2.6 Climatic setting

a) Annual Rainfall /Snowfall (mm) 1140 mm

b) Temperature (°C) Minimum 10°c Maximum 42°c

c) Humidity (%) Minimum 50% Maximum 98%

2.7 Area of zone of influence (in ha) _____

2.8 Major land use within zone of influence (provide as approximate % of catchment area)

Forests _____ %

Plantation _____ %

Agriculture 60 %

Settlements (Rural) 40 %

Settlements (Urban) _____ %

Industrial _____ %

2.9 Map of wetland complex and zone of influence

(To be enclosed as Annex I and II to this proposal)

Section 3: Biodiversity

3.1 Notable plant species present in wetland

?

3.2 Notable animal species present in wetland

Openbills, Cormorant

3.3 Species of conservation significance (rare, endangered, threatened, endemic species)

?

3.4 Major plant invasive alien species

?

3.5 Major animal invasive alien species

?

Section 4: Ecosystem Services

Importance	Relevant for the site (please tick yes or no)	If Yes, Details (up to 50 words for each category)
Source of drinking water for people living and around	☐Yes ☑No	
Source of water for agriculture	☑Yes ☐No	
Fisheries	☑Yes ☐No	
Cultivation of aquatic food plants	☐Yes ☑No	
For buffalo wallowing and use of domesticated animals	☑Yes ☐No	
Medicinal plants	☐Yes ☑No	
Is a recreational site	☐Yes ☑No	
Buffering communities from extreme events as floods and storms	☑Yes ☐No	
Groundwater recharge	☑Yes ☐No	
Water purification	☐Yes ☐No	
Acts as a sink for sediments	☐Yes ☐No	
Has significant cultural and religious values	☐Yes ☑No	
Is a site for recreation and tourism	☐Yes ☑No	
Supports noteworthy plants species	☐Yes ☐No	
Support noteworthy animal species	☐Yes ☐No	
Site of high congregation of migratory water	☐Yes ☐No	

birds		
Supports life cycle of fish or amphibians	☑Yes ☐No	
Mining	☐Yes ☐No	
Any other, please list	☐Yes ☐No	

Section 5: Pre-Existing Rights and Privileges

Nature of right and privilege	Relevant for the site (please tick yes or no)	Does this negatively impact the wetland's ecological health?	Brief description (upto 50 words for each category)
Community Fishing (without any lease or permission from government department)	☑Yes ☐No	☐Yes ☐No ☑Not assessed	
Fishing under lease from government department	☐Yes ☑No	☐Yes ☐No ☐Not assessed	
Harvest of plants (without any lease or permission from government department)	☑Yes ☐No	☐Yes ☐No ☑Not assessed	
Harvest of plants under lease from government department	☐Yes ☑No	☐Yes ☐No ☐Not assessed	
Agriculture or horticulture within wetland	☑Yes ☐No	☐Yes ☐No ☑Not assessed	
Grazing	☑Yes ☐No	☑Yes ☐No ☐Not assessed	
Religious practices	☐Yes ☑No	☐Yes ☐No ☐Not assessed	
Withdrawal of water for domestic use	☐Yes ☑No	☐Yes ☐No ☐Not assessed	
Withdrawal of water for agriculture or fisheries	☑Yes ☐No	☐Yes ☐No ☑Not assessed	
Bathing or wallowing of	☑Yes ☐No	☐Yes ☐No	

domestic animals		☑Not assessed	
Nature of right and privilege	**Relevant for the site (please tick yes or no)**	**Does this negatively impact the wetland's ecological health?**	**Brief description (upto 50 words for each category)**
Plying of boats	☑Yes ☐No	☐Yes ☑No ☐Not assessed	Drawing water availability
Any other, please list here	☐Yes ☐No	☐Yes ☐No ☐Not assessed	

Section 6: Present and Potential Threats

Threat	**Degree**	**Present or Potential**	**Additional information, if any**
Changes in water inflow and outflow	☑High ☐Medium ☐Low	☑Present ☐Potential	
Pollution	☐High ☐Medium ☑Low	☐Present ☑Potential	
Unsustainable harvest of biological resources	☐High ☐Medium ☑Low	☐Present ☑Potential	
Mining	☐High ☐Medium ☐Low	☐Present ☐Potential	
Siltation	☐High ☑Medium ☐Low	☑Present ☐Potential	
Encroachment	☐High ☑Medium ☐Low	☑Present ☑Potential	
Spread of invasive species	☐High ☐Medium ☑Low	☐Present ☐Potential	
Any other, please list	☐High ☐Medium ☐Low	☐Present ☐Potential	

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Section 7: Activities Proposed to Be Prohibited (other than those listed in Rule 4 (2) of Wetlands Rules and Regulated

Activity	Whether prohibited or regulated	Regulation within wetlands or zone of influence	If regulated indicates the level of regulation (in term of people, restricted area or any other)	Name of department/agency responsible for regulation/prohibition	Additional information, if any
Withdrawal of water / impoundment/diversion or any other hydrological intervention	prohibited	☑ Wetland/ Wetlands complex boundary ☑ Zone of influence			
Harvesting of resources (living / non-living)	regulated	☑ Wetland/ Wetlands complex boundary ☐ Zone of influence			
Grazing	regulated	☑ Wetland/ Wetlands complex boundary ☐ Zone of influence			
Discharge of treated sewage/ effluent / wastewater	Prohibited	☑ Wetland/ Wetlands complex boundary ☐ Zone of influence			
Construction of boat jetties, and facilities for temporary use , as pantoon bridges	N A	☐ Wetland/ Wetlands complex boundary ☐ Zone of influence			
Aquaculture, agriculture and horticulture activities within the wetland boundaries.	Regulated	☐ Wetland/ Wetlands complex boundary ☑ Zone of influence			
Any other, please list		☐ Wetland/ Wetlands complex boundary ☐ Zone of influence			

Section 8: Activities Proposed to be permitted

Activity	Place a tick mark if relevant	Within wetlands or zone of influence	Additional information, if any
	❒	❒ Wetland/ Wetlands complex boundary ❒ Zone of influence	
	❒	❒ Wetland/ Wetlands complex boundary ❒ Zone of influence	
	❒	❒ Wetland/ Wetlands complex boundary ❒ Zone of influence	
	❒	❒ Wetland/ Wetlands complex boundary ❒ Zone of influence	
	❒	❒ Wetland/ Wetlands complex boundary ❒ Zone of influence	
	❒	❒ Wetland/ Wetlands complex boundary ❒ Zone of influence	
	❒	❒ Wetland/ Wetlands complex boundary ❒ Zone of influence	

Section 9: Listing of Available Scientific Resources Used

_____

_____

_____

_____

_____

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WETLANDS ECOSYSTEM HEALTH CARD – Bhatkesri chaur ~~TALAB~~, DISTRICT Sonan

COORDINATES 25.944265, 84.653865

S. No	Features	Indicator	Desired Value	Actual Value	Category					Score
					A	B	C	D	E	
1.	Area	% wetland converted to non-wetland use since year 2000	0%	D (13%)	0%	1-5%	6-10%	11-20%	More than 20%	D
2.	Hydrology and Catchments	Ratio of number of natural inlets choked and diverted to total number of natural inlets	<0.2	D (0.75)	0-0.2	0.3-0.4	0.4-0.6	0.7-0.8	More than 0.8	D
		Ratio of number of natural outlets choked and diverted to total number of natural outlets	<0.2	B (0.35)	0-0.2	0.3-0.4	0.4-0.6	0.7-0.8	More than 0.8	13
3.	Water Quality (2019-20) No water sample	pH value	6.5 – 8.5	?	80-100% sample meet the criteria	60-80% sample meet the criteria	40-60% sample meet the criteria	20-40% sample meet the criteria	Less than 20% sample meet the criteria	
		Dissolved Oxygen	6mg/l or more	?	80-100% sample meet the criteria	60-80% sample meet the criteria	40-60% sample meet the criteria	20-40% sample meet the criteria	Less than 20% sample meet the criteria	
		Biological Oxygen Demand	3 mg/l or less	?	80-100% sample meet the criteria	60-80% sample meet the criteria	40-60% sample meet the criteria	20-40% sample meet the criteria	Less than 20% sample meet the criteria	
		Chemical Oxygen Demand (*for urban wetland)	<50mg/l	?	80-100% sample meet the criteria	60-80% sample meet the criteria	40-60% sample meet the criteria	20-40% sample meet the criteria	Less than 20% sample meet the criteria	
4.	Biodiversity	% wetland area covered by invasive Macrophytes	<10%	A	<10%	11-20%	21-30%	31-40%	More than 40%	

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		Annual Bird Species Richness	-	-	-	-	-	-	-	-
5.	Governance	Clearly demarcated wetlands map	Wetlands map prepared and approved by SWA/ GoMP	Wetlands map prepared and under consideration of SWA	Wetlands map prepared and approved by GoMP	Wetlands map prepared and under consideration of SWA	Wetlands map prepared but not placed in SWA	Wetlands map under Preparation	Wetlands map not prepared	D
		Wetlands management plan	Management Plan prepared by nodal/Implementing agency and approved by GoI	No Management Plan	Management Plan prepared and approved by GoI	Management Plan prepared and submitted to GoI	Management Plan prepared, not submitted to GoI	Management Plan under preparation	No Management Plan	E
		Wetlands Notification	Wetlands notified under extant regulation	No regulation	Notification under Wetland Rule (2017)	Draft notification	Regulation under process	Regulation planned, process initiated	No regulation	DE

	Frequency	Assigned	Weight	
Number of indicators in Rank A	0 1	1.0	0.0	0.1
Number of indicators in Rank B	0 1	0.8	0.0	0.8
Number of indicators in Rank C	0	0.6	0.0	0
Number of indicators in Rank D	0 3	0.4	0.0	1.2
Number of indicators in Rank E	0 5	0.2	0.0	0.6
	8	TOTAL	0.0	3.8

Wetland Score	0

0.45 (E)

Remark
A+ If indicator score between 1 to 0.95
A- If indicator score between 0.91 to 0.95
B+ If indicator score between 0.86 to 0.90
B- If indicator score between 0.81 to 0.85
C+ If indicator score between 0.76 to 0.80
C- If indicator score between 0.71 to 0.75
D If indicator score between 0.60 to 0.70
E If indicator score between Below 0.60

Annexure A-VII 183

Format for Preparing Brief Document of Wetlands for Notification under Wetland Rules 2017

NO

State / Union Territory: Bihar

Name and address of person (s) compiling this information

Section 1: Identification, Location and Jurisdiction

1.1 Name of the Wetland (Alternate names, including in local language should be given in parenthesis after official name)

Mangolapeer Chaur

1.2 Name of the Village (s), Tehsil (s), Municipal area (s)

Mangolapeer, Jalalpeer block.

1.3 Name of the District (s) in which wetlands complex located

Saran

1.4 Geographical coordinates (Latitude and Longitude, to degree, minutes and second)

Latitude: From 25.906839 to

Longitude: From 84.665838 to

1.5 Name of the Department / Agency which has jurisdiction over wetland / wetlands complex

Revenue + Pwd private land.

Section 2: Site Characteristics

2.1 Area of wetland / wetlands category (ha) 317 ha. as per NWI, 900 bigha as per local

2.2 Wetland type (Please tick appropriate categories and sub-categories)

Category	Subcategory
☑ Natural (Inland)	☐ Permanent lakes
	☑ Seasonal/ intermittent ~~lakes~~ chaur
	☐ Permanent streams/ creeks
	☐ Seasonal/ intermittent streams/ creeks
	☐ Oxbow
	☑ River floodplain
	☐ Permanent freshwater marshes
	☐ Seasonal/ intermittent freshwater marshes
	☐ Shrub-dominated wetlands
	☐ Tree-dominated wetlands

Since no water has there no samples were taken.

	☐Geothermal wetlands ☐Karst and other subterranean hydrological systems
Category	**Subcategory**
☐Natural (Coastal)	☐Coastal lagoon ☐Estuary ☐Intertidal mud, sand or salt flats ☐Mangroves ☐Coral reefs
☐Human-made	☐Aquaculture pond ☐Tank ☐Saltpan ☐Dam / Reservoir

2.3 Depth (m) Average 7 Maximum 4/5 ft Dried this season.

2.4 Elevation (m above mean sea level) _____ m

2.5 Water regimes

a) Main source of water (tick all applicable)

☑Rainfall ☐Groundwater ☐Catchment runoff ☑Direct / indirect inflow from river

☐Others, please specify_____

☐Name of River/Canal system _____

b) Water permanence

☐Mostly permanent ☑Mostly intermittent

c) Destination of water from wetland

☑Feeds groundwater ☐To downstream catchment ☐To river ☐To sea

d) Water pH

☐ Acid (< 5.5) ☐ Circumneutral (5.5 – 7.4) ☐ Alkaline (> 7.4) ☑Not known

e) Water salinity

☑Fresh (< 0.5 g/l) ☐Brackish (0.5 – 30 g/l)) ☐Euhaline (30- 40 g/l)

☐Hypersaline (>40g/l) ☐Not known

f) Nutrients in water

☐Eutrophic ☐Mesotrophic ☐Oligotrophic ☑Not known

2.6 Climatic setting

a) Annual Rainfall /Snowfall (mm) 1140 mm

b) Temperature (°C) Minimum 10°c Maximum 42°c

c) Humidity (%) Minimum 50% Maximum 95%

2.7 Area of zone of influence (in ha) _____

2.8 Major land use within zone of influence (provide as approximate % of catchment area)

Forests _____ %

Plantation _____ %

Agriculture 60 %

Settlements (Rural) 40 %

Settlements (Urban) _____ %

Industrial _____ %

2.9 Map of wetland complex and zone of influence

(To be enclosed as Annex I and II to this proposal)

Section 3: Biodiversity

3.1 Notable plant species present in wetland

Grasses of Graminea family

3.2 Notable animal species present in wetland

Lesser whistling teal, Cormorant

3.3 Species of conservation significance (rare, endangered, threatened, endemic species)

3.4 Major plant invasive alien species

?

3.5 Major animal invasive alien species

?

Section 4: Ecosystem Services

Importance	Relevant for the site (please tick yes or no)	If Yes, Details (up to 50 words for each category)
Source of drinking water for people living and around	☐Yes ☑No	
Source of water for agriculture	☑Yes ☐No	
Fisheries	☑Yes ☐No	
Cultivation of aquatic food plants	☐Yes ☑No	
For buffalo wallowing and use of domesticated animals	☐Yes ☑No	
Medicinal plants	☐Yes ☑No	
Is a recreational site	☐Yes ☑No	
Buffering communities from extreme events as floods and storms	☑Yes ☐No	
Groundwater recharge	☑Yes ☐No	
Water purification	☐Yes ☐No	
Acts as a sink for sediments	☑Yes ☐No	
Has significant cultural and religious values	☐Yes ☑No	
Is a site for recreation and tourism	☐Yes ☑No	
Supports noteworthy plants species	☐Yes ☐No	
Support noteworthy animal species	☐Yes ☐No	
Site of high congregation of migratory water	☐Yes ☐No	

birds		
Supports life cycle of fish or amphibians	☑Yes ☐No	
Mining	☐Yes ☐No	
Any other, please list	☐Yes ☐No	

Section 5: Pre-Existing Rights and Privileges

Nature of right and privilege	Relevant for the site (please tick yes or no)	Does this negatively impact the wetland's ecological health?	Brief description (upto 50 words for each category)
Community Fishing (without any lease or permission from government department)	☑Yes ☐No	☐Yes ☐No ☑Not assessed	
Fishing under lease from government department	☐Yes ☑No	☐Yes ☐No ☑Not assessed	
Harvest of plants (without any lease or permission from government department)	☑Yes ☐No	☐Yes ☐No ☑Not assessed	
Harvest of plants under lease from government department	☑Yes ☑No	☐Yes ☐No ☑Not assessed	
Agriculture or horticulture within wetland	☑Yes ☐No	☑Yes ☐No ☐Not assessed	
Grazing	☑Yes ☐No	☑Yes ☐No ☐Not assessed	
Religious practices	☐Yes ☑No	☐Yes ☐No ☑Not assessed	
Withdrawal of water for domestic use	☐Yes ☑No	☐Yes ☐No ☑Not assessed	
Withdrawal of water for agriculture or fisheries	☑Yes ☐No	☐Yes ☐No ☑Not assessed	
Bathing or wallowing of	☑Yes ☐No	☐Yes ☐No	

domestic animals		☑Not assessed	
Nature of right and privilege	**Relevant for the site (please tick yes or no)**	**Does this negatively impact the wetland's ecological health?**	**Brief description (upto 50 words for each category)**
Plying of boats	☐Yes ☑No	☐Yes ☐No ☑Not assessed	
Any other, please list here	☐Yes ☐No	☐Yes ☐No ☐Not assessed	

Section 6: Present and Potential Threats

Threat	**Degree**	**Present or Potential**	**Additional information, if any**
Changes in water inflow and outflow	☑High ☐Medium ☐Low	☑Present ☐Potential	
Pollution	☐High ☐Medium ☑Low	☐Present ☐Potential	
Unsustainable harvest of biological resources	☐High ☐Medium ☑Low	☐Present ☑Potential	
Mining	☐High ☐Medium ☐Low	☐Present ☐Potential	
Siltation	☐High ☑Medium ☐Low	☑Present ☐Potential	
Encroachment	☐High ☐Medium ☐Low	☐Present ☐Potential	
Spread of invasive species	☐High ☐Medium ☑Low	☐Present ☑Potential	
Any other, please list	☐High ☐Medium ☐Low	☐Present ☐Potential	

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Section 7: Activities Proposed to Be Prohibited (other than those listed in Rule 4 (2) of Wetlands Rules and Regulated

Activity	Whether prohibited or regulated	Regulation within wetlands or zone of influence	If regulated indicates the level of regulation (in term of people, restricted area or any other)	Name of department/agency responsible for regulation/prohibition	Additional information, if any
Withdrawal of water / impoundment/diversion or any other hydrological intervention	prohibited	☑ Wetland/ Wetlands complex boundary ☑ Zone of influence			
Harvesting of resources (living / non-living)	regulated	☑ Wetland/ Wetlands complex boundary ☐ Zone of influence			
Grazing	regulated	☑ Wetland/ Wetlands complex boundary ☐ Zone of influence			
Discharge of treated sewage/ effluent / wastewater	Prohibited	☑ Wetland/ Wetlands complex boundary ☐ Zone of influence			
Construction of boat jetties, and facilities for temporary use , as pantoon bridges	NA	☐ Wetland/ Wetlands complex boundary ☐ Zone of influence			
Aquaculture, agriculture and horticulture activities within the wetland boundaries.	Regulated	☐ Wetland/ Wetlands complex boundary ☑ Zone of influence			
Any other, please list		☐ Wetland/ Wetlands complex boundary ☐ Zone of influence			

Section 8: Activities Proposed to be permitted

Activity	Place a tick mark if relevant	Within wetlands or zone of influence	Additional information, if any
	❒	❒ Wetland/ Wetlands complex boundary ❒ Zone of influence	
	❒	❒ Wetland/ Wetlands complex boundary ❒ Zone of influence	
	❒	❒ Wetland/ Wetlands complex boundary ❒ Zone of influence	
	❒	❒ Wetland/ Wetlands complex boundary ❒ Zone of influence	
	❒	❒ Wetland/ Wetlands complex boundary ❒ Zone of influence	
	❒	❒ Wetland/ Wetlands complex boundary ❒ Zone of influence	
	❒	❒ Wetland/ Wetlands complex boundary ❒ Zone of influence	

Section 9: Listing of Available Scientific Resources Used

_____

_____

_____

_____

_____

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CHECK LIST

- ☐ Responsible agency has been clearly identified and details of contact person included
- ☐ Wetland/wetlands complex boundary has been delineated using GIS and firmed up by adequate ground truthing
- ☐ Wetland/wetlands complex map has been provided at required scale
- ☐ Zone of influence has been delineated and included in wetland map or a separate map
- ☐ Wetland zone of influence is sufficient to manage all activities
- ☐ Site's importance have been listed, and for major categories, justification provided
- ☐ Site's biodiversity values are listed, and for major categories, justification provided
- ☐ List of pre-existing rights and privileges provided
- ☐ Consistency or, inconsistency of pre-existing rights and privileges indicated to be best of available knowledge
- ☐ Threats to site listed, and for major categories details provided
- ☐ Activities prohibited, beyond those already listed in Rule 4 (2) have been mentioned
- ☐ List of activities to be regulated within wetlands and zone of influence is provided
- ☐ List of activities to be permitted is provided

Name of District, Block, Village Saran, Talapur, Mangalapur	Wetland Type - Natural/Inland/Man made - Reservoir/Pond/Tank/Aquaculture Pond
Name of Wetland Mangalapur Chaur	Name of Person/ Jyoti Kumari
Rural/ ~~Urban~~ Rural	Designation & Dept. Forest Guard
Area (Ha.)	Mob. No.& Email 9905738851
Signature - Jyoti kumari	

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WETLANDS ECOSYSTEM HEALTH CARD – Mangolpuri chaur TALAB, DISTRICT Seoan

COORDINATES 25°.90.68.39, 84°.66.58.38

S. No	Features	Indicator	Desired Value	Actual Value	Category					Score
					A	B	C	D	E	
1.	Area	% wetland converted to non-wetland use since year 2000	0%	9% (21.)	0%	1-5%	6-10%	11-20%	More than 20%	D
2.	Hydrology and Catchments	Ratio of number of natural inlets choked and diverted to total number of natural inlets	<0.2	D (0.7)	0-0.2	0.3-0.4	0.4-0.6	0.7-0.8	More than 0.8	D
		Ratio of number of natural outlets choked and diverted to total number of natural outlets	<0.2	B (0.35)	0-0.2	0.3-0.4	0.4-0.6	0.7-0.8	More than 0.8	B
3.	Water Quality (2019-20)	pH value	6.5 – 8.5		80-100% sample meet the criteria	60-80% sample meet the criteria	40-60% sample meet the criteria	20-40% sample meet the criteria	Less than 20% sample meet the criteria	
		Dissolved Oxygen	6mg/l or more	weeds	80-100% sample meet the criteria	60-80% sample meet the criteria	40-60% sample meet the criteria	20-40% sample meet the criteria	Less than 20% sample meet the criteria	
		Biological Oxygen Demand	3 mg/l or less		80-100% sample meet the criteria	60-80% sample meet the criteria	40-60% sample meet the criteria	20-40% sample meet the criteria	Less than 20% sample meet the criteria	
		Chemical Oxygen Demand (*for urban wetland)	<50mg/l	no	80-100% sample meet the criteria	60-80% sample meet the criteria	40-60% sample meet the criteria	20-40% sample meet the criteria	Less than 20% sample meet the criteria	
4.	Biodiversity	% wetland area covered by invasive Macrophytes	<10%	A	<10%	11-20%	21-30%	31-40%	More than 40%	

		Annual Bird Species Richness	-	-	-	-	-	-	-	-
5.	**Governance**	Clearly demarcated wetlands map	Wetlands map prepared and approved by SWA/ GoMP	Wetlands map prepared and under consideration of SWA	Wetlands map prepared and approved by GoMP	Wetlands map prepared and under consideration of SWA	Wetlands map prepared but not placed in SWA	Wetlands map under Preparation	Wetlands map not prepared	D
		Wetlands management plan	Management Plan prepared by nodal/Implementing agency and approved by GoI	No Management Plan	Management Plan prepared and approved by GoI	Management Plan prepared and submitted to GoI	Management Plan prepared, not submitted to GoI	Management Plan under preparation	No Management Plan	E
		Wetlands Notification	Wetlands notified under extant regulation	No regulation	Notification under Wetland Rule (2017)	Draft notification	Regulation under process	Regulation planned, process initiated	No regulation	E

	Frequency	Assigned	Weight	
Number of indicators in Rank A	0 1	1.0	0.0	1
Number of indicators in Rank B	0 1	0.8	0.0	0.8
Number of indicators in Rank C	0	0.6	0.0	0
Number of indicators in Rank D	0 3	0.4	0.0	1.2
Number of indicators in Rank E	0 2	0.2	0.0	.4
	7	**TOTAL**	**0.0**	

Wetland Score		

0.49 (E)

Remark
A+ If indicator score between 1 to 0.95
A- If indicator score between 0.91 to 0.95
B+ If indicator score between 0.86 to 0.90
B- If indicator score between 0.81 to 0.85
C+ If indicator score between 0.76 to 0.80
C- If indicator score between 0.71 to 0.75
D If indicator score between 0.60 to 0.70
E If indicator score between Below 0.60

CHECK LIST

- ☐ Responsible agency has been clearly identified and details of contact person included
- ☐ Wetland/wetlands complex boundary has been delineated using GIS and firmed up by adequate ground truthing
- ☐ Wetland/wetlands complex map has been provided at required scale
- ☐ Zone of influence has been delineated and included in wetland map or a separate map
- ☐ Wetland zone of influence is sufficient to manage all activities
- ☐ Site's importance have been listed, and for major categories, justification provided
- ☐ Site's biodiversity values are listed, and for major categories, justification provided
- ☐ List of pre-existing rights and privileges provided
- ☐ Consistency or, inconsistency of pre-existing rights and privileges indicated to be best of available knowledge
- ☐ Threats to site listed, and for major categories details provided
- ☐ Activities prohibited, beyond those already listed in Rule 4 (2) have been mentioned
- ☐ List of activities to be regulated within wetlands and zone of influence is provided
- ☐ List of activities to be permitted is provided

Name of District, Block, Village Saran, Jalalpur, Mangolapur	Wetland Type - Natural/Inland/Man made - Reservoir/Pond/Tank/Aquaculture Pond
Name of Wetland Mangolapur Chaur	Name of Person/ Jyoti Kumari
Rural/ ~~Urban~~ Rural	Designation & Dept. Forest Guard
Area (Ha.)	Mob. No.& Email 9905738851
Signature - Jyoti kumari	

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From
Wing Commander (Retd) Dr B.N.P.Singh
General Secretary
Veterans Forum for Transparency in Public Life
B-124, Swarn Nagri, Greater Noida
Dist-G.B.Nagar (UP) 201315
E-mail- 2bnpsingh@gmail.com

To
Secretary
Rural Development Department
Govt of Bihar
Old Secretariat, Patna-800015
E-mail-rersec-bih@nic.in

Sub- Revival & Rehabilitation of Tel River of Saran District

Sir

1. The following fact is brought to your kind notice for perusal and necessary action.

2. Tel river (Saran district) originates from three wetlands, notified by Bihar State wetland authority, details of which are appended below:

i. Name of wetland- Bhatkesari
Village- Bhatkesari
Panchayat- Bhatkesari
Block- Jalalpur
Area- 98.5 hectares

ii. Name of wetland- Gamarhia
Village- Kumna
Panchayat- Kumna
Block- Jalalpur
Area- 326 hectares

iii. Name of Wetland- Mangolpur
Village- Nawada
Panchayat—Nawada
Block—Jalalpur
Area- 317 hectares

3. During course of flow, Tel river crosses villages of Jalalpur, Revelganj and Chapra sadar Block covering an area of 38350 sqkms and finally it drains into Gaghara river near Enai village. Due to encroachment and obstruction, the very existence of Tel River has been endangered and free flow of water has been obliterated, which has resulted into severe water logging over fertile land. Due to severe water logging almost 70% of fertile lands of said Blocks have become unfit for agriculture purpose resulting into misery of farmers.

4. A detailed report regarding subject matter has been published by Dainik Hindustan (27.12.2025). Copy of said report along with English translation is attached herewith.

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5. Foreign, Commonwealth Development office (an UK Govt body) has prepared and submitted a Detail Project Report on Tel River. The DPR is exhaustive and covers all aspect of revival and rehabilitation of Tel River. Copy of said DPR is attached herewith.

6. It is therefore humbly requested that you may kindly examine and take necessary step as envisaged in the said DPR, sothat perpetual water logging spread over Jalalpur, Revelganj, Manjhi anmd Chapra Sadar Blocks is mitigated.

Thanking You

Date- 31.12.2025

Yours Sincerely

Copy to

District Magistrate, Saran

E-mail- dm-saran.bih@nic.in

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Place:-

CAUFFER DAM IN FRONT OF VIP SCHOOL

MUKRERA, CHAPRA

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Place:-

CAUFFER DAM IN FRONT OF VIP SCHOOL

MUKRERA, CHAPRA