"By Registered Post"

GOVERNMENT OF ODISHA

FOREST, ENVIRONMENT & CLIMATE CHANGE DEPARTMENT

*****

No. FE-ENV1-ENV-0005-2020/ 9708 /FE&CC, Dt. 11 .05.2023

From

Sri Ananta Vijaya Patnaik, OAS(SAG)

Additional Secretary to Government

To

The Consultant(Judicial),

Hon'ble NGT(PB), Faridkot House, Copernicus Marg, New Delhi- 110 001

Sub: Regarding compliance furnished by SPCB, Odisha to the directions of the Hon'ble NGT dtd. 27.01.2023 in O.A. No. 606/2018 in compliance to Solid Waste Management Rules, 2016 and Sewage Management.

Sir,

In inviting a reference to the subject cited above, I am directed to enclose herewith a copy of compliance furnished by SPCB, Odisha to the directions of the Hon'ble NGT dtd. 27.01.2023 in O.A. No. 606/2018 in compliance to Solid Waste Management Rules, 2016 and Sewage Management (para 34) and on grey water management for kind information.

Yours faithfully,

Enclosed: As above.

11.5.23

Additional Secretary to Govt.

Memo No. 9709 / FE&CC, Dt 11.05.2023

Copy forwarded to the Officer on Special Duty (OSD) cum Special Secretary to Chief Secretary, Odisha for kind information of the Chief Secretary.

11.5.23

Additional Secretary to Govt.

Memo No. 9710 / FE&CC, Dt 11.05.2023

Copy forwarded to the Senior PS to the Additional Chief Secretary, FE&CC Department for kind information of the Additional Chief Secretary, FE & CC Department/ P.S. to Principal Secretary, H & UD Dept./ PR & DW Dept. for kind information of Principal Secretary H & UD Dept/ PR & DW Dept./ PS to Commissioner cum Secretary, Health & FW dept. for kind information of Commissioner cum Secretary.

11.5.23

Additional Secretary to Govt.

Memo No. 9711 / FE&CC, Dt 11.05.2023

Copy forwarded to the Member Secretary, SPCB/ EIC, OWSSB for information and w.r.t. SPCB Letter No. 5813 dated 10.04.2023.

11.5.23

Additional Secretary to Govt.

Report of the Expert Committee constituted in compliance to Para 34 of Hon'ble NGT Order Dt. 27.01.2023 in the matter of OA 606 of 2018

Report of the Expert Committee constituted in compliance to Para 34 of Hon'ble NGT Order Dt. 27.01.2023 in the matter of OA 606 of 2018

Background

The Hon'ble National Green Tribunal (NGT) Dtd. 27.01.2023 in the matter OA No. 606 of 2018, in respect of State of Odisha for Compliance of Municipal Solid Waste Management Rules, 2016, has passed Judgment. As per Para-34 of the said order, an expert committee is to be constituted with Members of Central Public Health & Environmental Engineering Organization (CPHEEO) of MoHUA, GoI, CPCB, Odisha State Pollution Control Board, State Urban Development Department, IIT, Bhubaneswar and an expert from Agricultural university.

As per the said order, the committee shall furnish its views on environmental impact on discharge of treated grey water into leach pits in the State of Odisha and ascertain that whether grey water management is done as per "Tool Kit: Grey-water Management" (July 2021) brought out by Department of Drinking Water and Sanitation, Ministry of Jal Shakti, GoI. Further,

1. The committee shall conduct field survey and give its report with recommendations;
2. The committee shall examine if there can be better alternatives/options for utilizing the grey water for agriculture with applicable standards, pisciculture or other such purposes;
3. The Committee will be free to associate any other Department/Expert if felt necessary;
4. It will be desirable that there is geo-tag of sewage outfalls in the receiving water system and mark on GIS based maps with unique code, ensuring that the same are checked and no discharges to water bodies takes place.

Accordingly, the committee has been constituted vide Order No. 2993 dt. 28.02.2023. (Annexure – I). The Committee coopted the Engineer-in-Chief, Odisha Water Supply Sewerage Board (OWSSB) as Associate Member Vide Order No.3367 Dt. 06.03.2023 (Annexure – II). The meeting of the Committee was held on 16.03.2023 in physical mode under the chairmanship of the Member Secretary of State Pollution Control Board, Odisha.

Introduction

The Committee Meeting as per Para 34 of NGT 27.01.2023 order was held on 16.03.2023 in the conference Hall of SPCB, Odisha. The list of members present during the meeting is enclosed in Annexure –III. The agenda of the committee is enclosed. (Annexure –IV)

The Member Secretary, OSPCB welcomed all the Committee Members and briefed the purpose and the role of the committee.

The Committee discussed on Grey Water Management as a treatment option for

wastewater (both Urban and peri urban area); followed by the implementation of pilot Grey Water Management Plant at Jatni Municipality in Khordha District and Dhenkanal town in Dhenkanal District of Odisha.

The Commissioner-cum-Secretary and Director, Municipal Administration presented a brief overview of the grey water management that is being implemented in urban Odisha by Housing and Urban Development Department. He briefed about the policy adopted by Govt. of Odisha for management of grey and black water, the technology and decentralized approach. Odisha is on saturation mode for the black water management with construction of 119 SeTPs in 115 ULBs with a cumulative treatment capacity of 2.057 MLD. The excess treatment capacity created with a view to treat to the Urban as well as nearby rural areas under the Urban Rural Convergence for black water management.

Odisha's Grey water Management Approach

- Household level: Magic Soak Pits
- Lane level: Hybrid leach pit with absorption trenches
- Community level: Constructed Wetland/ waste stabilisation pond
- Outfall Level: Waste stabilisation pond and maturation pond

The grey water management was implemented in pilot mode in two towns in Odisha i.e. Dhenkanal and Jatni. The intervention treatment structures are planned at four different levels i.e. household, lane level, community level & outfall level. The project is divided into five different phases i.e. Inception, Data collection & analysis, Planning & Design, Implementations; and operation & maintenance (O & M).

Different stake holders and human resources will be hired for the project. TULIP engineers & Swachh Sathis (women self-help group) will be responsible for conducting ground survey, identifying polluters discharging faecal sludge in drains (discharging Black Water directly in drains) & IEC activities, to create awareness, collect information on the availability of space in backyard of house for magic pit construction and map the drains. The Grey Water Engineers will be responsible for lane survey, drain survey, soil percolation test, flow measurement in drains, data collection and analysis.

The GIS expert & M&E expert will prepare the GIS mapping of drainage map & also comprehensive database. The Grey Water Engineers along with support of ULB officials will design & plan the structures. The Greywater Engineer and Engineers of ULB will prepare estimate and the Executive Officer will issue work order to Mission Shakti Groups /Slum Development Associations for construction & Implementation under supervision of Greywater Engineer and ULB engineer. Phase –IV is implementation and monitoring; Phase –V is the monitoring and review along with O&M Phase.

Er. P.K. Mohapatra, EIC, OWSSB made a power point presentation on the technical aspects regarding site sketch & selection of site for different level of interventions, and the pilot project being implemented in line with the Grey Water management Tool kit. Soil percolation test are conducted as per IS standard methods. Copy of the presentation is enclosed in **Annexure -V**.

The grey water management strategy has been prepared along with training plan of key stakeholders, involvement of community partnership and preparation of SoPs and toolkit.

The Principal Secretary, H&UD Department described in detail regarding the discussion of Hon'ble NGT relating to the management of grey water in the State. He informed regarding the earmarking of funds to ensure the treatment and management of greywater. He has also enlightened the proposal of Rejuvenation of Water Bodies (Ponds) under "Mo Pokhari" scheme.

After detailed presentation, the experts suggested following

Suggestion by Experts:

1. Soil Percolation Tests to be carried out in three seasons to assess the soil capacity to absorb the grey water in the long run and to take extra load in the rainy season. In case of clogging of the media in trench or leach pit, the materials are to be taken out and cleaned and again filled up.
2. Steps to be taken to utilize the waste land for trench pits. The roads to be avoided for making soaking trenches as the traffic load may damage the system. The road to be paved instead of concreted to discharge surface runoff water
3. Proper design, maintenance, and safety precautions are critical to ensuring the safe and effective use of magic soak pits for grey water treatment.
4. In case of improper design & maintenance, issues like clogging, contamination of ground water, generation of unpleasant odors that can be a nuisance to nearby residents and may enhance the risk of waterborne diseases as well.
5. As per Central Ground Water Board data of April 2019 and August 2019, it is observed that majority of areas in Odisha (60% and 95% respectively) is showing Ground water Table depth below 5 meters. In leach pits design, the aspect of ground water table and its variation may be taken into account for its desired performance. Further, periodically the grey water and ground water are to be monitored and the quality is to be ensured.
6. GIS maps to use for geo tagging of the drainage system especially all drainage outfalls.
7. In the worst-case scenario, if there is intervention/mixing of grey water with black water at community level, sufficient treatment of FC to be made to maintain the quality of grey water. There should be penal provisions to the household / community in case of mixing of black water to grey water.
8. The option of magic soak pits to be adopted for isolated houses only. In general, magic soak pits at household level and soaking trenches at lane level are to be maintained periodically as there is possibility of ponding of sewage water and consequent problems. However, the Community level Constructed Wetland/ waste stabilisation pond and at outfall Level, Waste stabilisation pond and maturation pond and similar other low-cost technologies with low O&M to be adopted as brought out in Manual on sewerage and sewage treatment 2013 and also in Ready Reckoner on Used Water Management for Small and Medium towns, 2022.
9. Towns in general in country including those in Odisha are growing fast. The policy and approach of MoHUA which is prepared in view of growing urbanization should be preferred option.

10. All planning and design whether decentralized/ community level or at centralized level to be made keeping in to treat sewage only. Separating Grey water and black water and dealing treating separately would be a challenge and difficult to maintain at field, especially in urban areas as it grows.
11. They suggested that grey water/ treated sewage can be used in Agriculture after ensuring its quality along with heavy metal contamination. It is already implemented/being implemented in states of Haryana in almost all towns and being followed in Punjab and Gujarat. The example of Karad town in Maharastra in Satara Distirct can be emulated where revenue is being generated using treated sewage which is following GOI approach/principles of circular economy.
12. During the field visit it was observed that the wetland is construed by using grey water and the Canna indica Species which grows in the wetlands. It helps the greenery of the nearby agricultural filed.
13. The executive officer of Jatani Municipality has reported that the grey water treatment plan was started in the year 2021 and since then 67 magic pits and 22 leach pits and trench have been constructed, one major drain along with its secondary drains have been considered for the purpose. The self-help groups entrusted with the implementation and operation of the project explained in detail the operational procedure.
14. GIS tagging: Monitoring mechanism of so many soak pits and outlets of drains in the State will a difficult task from O&M and other purposes so adequate care is to be taken for proper O&M.

Grey water management in Lane, greenery development and community awareness

Constructed wetland

Recommendation and Conclusion;

Based on discussions with State Government and subsequent field visits, the following recommendations are made by committee;

1. The grey water management system may be designed, as per pilot plant at Jatni, which confirms to the "Tool Kit: Grey-water Management" and IS 12314: Code of Practice for Sanitation with Leaching Pits for Rural Communities" and also as per IS 2470 (part I & II) Code of practice for installation of septic tanks, design criteria and construction. However, in the towns, the option of magic soak pits to be adopted for isolated houses only. In general, magic soak pits at household level and soaking trenches at lane level to be maintained periodically as there is possibility of ponding of sewage water due to prevalent high ground water table in major parts of state and consequent problems. However, the Community level Constructed Wetland/ waste stabilisation pond and at outfall Level, Waste stabilisation pond and maturation pond and similar other low-cost technologies with low O&M and skill may be adopted as brought out in "Manual on Sewerage and Sewage Treatment 2013" and also in "Ready Reckoner on Used Water Management for Small and Medium towns, 2022", published by CPHEEO, Ministry of Housing and Urban Affairs, Govt of India.
2. In industrial clusters or areas where there is a greater potential for contamination of grey water, it may be advisable to consider a more comprehensive and advanced treatment system.
3. Facilities of proper maintenance, safety precautions and monitoring shall be ensured before adopting the technology.
4. While designing grey water management systems, the present and futuristic sanitation requirements of towns to be integrated. Further, while managing Grey water, effective system of black water separation, at household level, to be ensured. In present system explained, faecal septage from septic tanks, desludged once in 3 years or so, can be treated at available FSTPs, but effective plan for management of separated black water (effluent from septic tank on daily basis) need to be ensured at household level simultaneously.
5. The construction of soaking trenches below roads may be avoided and the same may be constructed in wasteland near road side as where available. Soaking trenches below paved area, footpaths may be properly constructed to avoid frequent clogging as frequent maintenance of the whole structure will entail cost and may cause inconvenience to commuters.

6. While designing infiltrative loading rate of Grey water, requisite field tests is to carried out in the project area in consultation with Geo technical experts and/or State/Central Ground Water Board officials.
7. Periodically monitoring the level and quality of ground water and maintenance of database to ascertain the extent of recharging of ground water and the level of contamination as well.
8. Treated Grey Water treated to prevailing standards can be used in Pisciculture and Agriculture. However, farmers or pisciculturists may be properly trained. It is important to use appropriate irrigation methods that do not promote the spread of pathogens or contaminants.
9. As per Phase –IV, GIS and geo tagging is to be done to ensure that the black water is not mixed with grey water. In cases where space for soak pits after septic tanks is not available at household level, the black water for such houses may be conveyed to a common soak pit. Because of prevalence of High ground water in many parts of state, where soak pits/soaking trenches is not feasible, the sewage (grey and black water) need to be safely collected, conveyed and treated.
10. Sensitization of people at households and community level about safe sanitation and their duties towards it to be done extensively. The approach of connecting people especially women through SHGs is encouraging.
11. There should be penal provisions for any violations. However, often the people who have poor sanitation systems are financially not so good. This approach of penal provisions should not put them in further hardships.

03/04/23

Dr. K. Murugesan, IFS
Member Secretary SPCB, Odisha Cum Director Environment Cum Special Secretary to Govt. FE&CC Govt of Odisha

Sri. V.K. Chaurasia,
Joint Adviser (PHEE), Central Public Health & Environmental Engineering Organisation (CPHEEO), MoHUA, GOI

3/4/2023

Shri Sangramjit Nayak, IAS
DMA, & Ex-officio Additional Secretary & Mission Director, Swachh Bharat Mission (Urban), Govt of Odisha

Shri Mrinal Kanti Biswas
Regional Director, CPCB Kolkata

3/4/2023

Dr. Rajesh R. Dash,
Professor, School of Infrastructure, IIT, Bhubaneswar

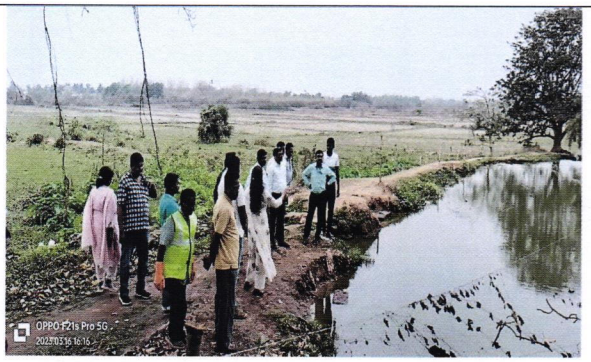
03.04.23

Dr. Bamasankar Rath,
HOD, Department of Agronomy, OUAT, Bhubaneswar

Dr. Simanchala Dash,
Addl. Chief Env. Engineer, SPCB, Odisha

3/4/2023

Er. P.K. Mohapatra,
EIC, OWSSB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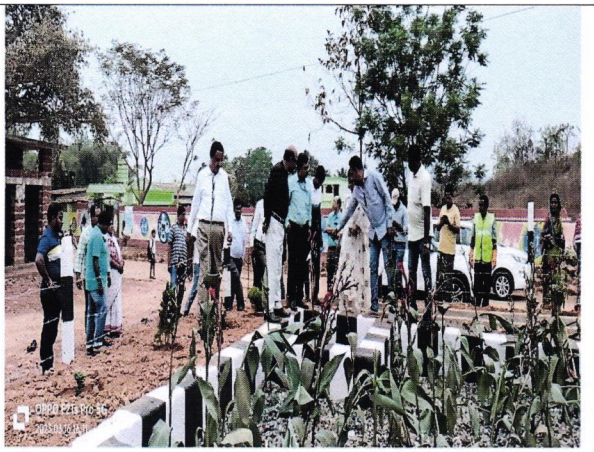

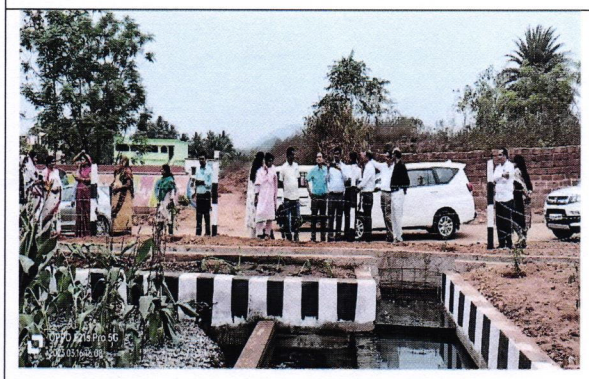

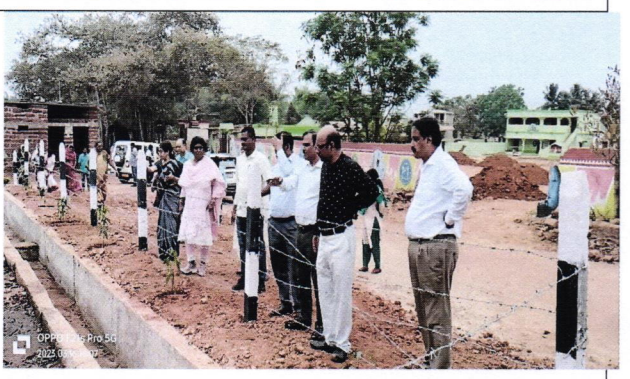


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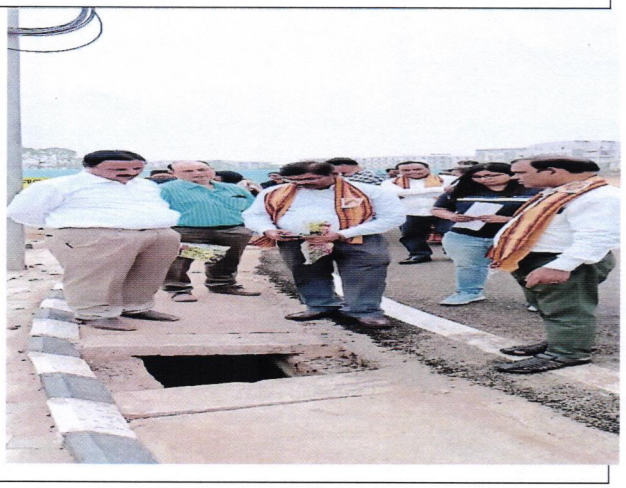

Annexure- I

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Website: www.ospcboard.org

STATE POLLUTION CONTROL BOARD, ODISHA

[DEPARTMENT OF FOREST & ENVIRONMENT, GOVERNMENT OF ODISHA]
Paribesh Bhawan, A/118, Nilakantha Nagar, Unit – VIII
Bhubaneswar – 751 012, INDIA

No. 2993 / IND-IV- IND-IV-MSW-190/2021 Date: 28.02.2023

OFFICE ORDER

In Pursuance to the direction of the Hon'ble National Green Tribunal (NGT) Dtd. 27.01.2023 in OA No. 606 of 2018, in respect of State of Odisha for Compliance of Municipal Solid Waste Management Rules, 2016 and other environmental issues, and in compliance with Para-34 of said Order an expert committee is hereby constituted with following members of Central Public Health & Environmental Engineering Organization (CPHEEO) of MoUD, GoI, CPCB, Odisha State PCB, State Urban Development Department, IIT Bhubaneswar and an expert from Agriculture University.

1	Member Secretary, SPCB Odisha	Chairperson
2	Additional Secretary State Urban Development Department, Govt. Odisha, Bhubaneswar	Member
3	Joint Advisor, MOHUA Central Public Health & Environmental Engineering Organisation (CPHEEO) of MoUD, GoI	Member
4	Additional Director at Central Pollution Control Board (CPCB), Eastern Zonal Office, Kolkota	Member
5	Professor, School of Infrastructure, IIT Bhubaneswar	Member
6	HOD, Department of Agronomy, OUAT, Bhubaneswar	Member
7	Addl Chief Environmental Engineer, SPCB, Odisha	Nodal Officer

Terms of Reference

1. The Committee shall furnish its views on environmental impact on discharge of treated grey water into leach pits in the State of Odisha and ascertain that whether grey water management is done as per "Tool Kit: Greywater Management"11, July 2021 brought out by Department of Drinking Water and Sanitation, Ministry of Jal Shakti, GoI
2. The committee shall field survey and give its report with recommendations within 25 days from the issue of this order.
3. The committee shall examine, if there can be better alternatives/options for utilizing the grey water for agriculture with applicable standards, pisciculture or other such purposes.

4. The Committee may associate any other Department/Expert if felt necessary.
5. It will be desirable that there is geo-tagging of sewage outfalls in the receiving water system and mark on GIS based maps with unique code, ensuring that the same are checked and no discharges to water bodies take place.
6. SPCB, Odisha will act like a nodal agency and will look after the work related to the above under the supervision of Member Secretary, SPCB, Odisha.
7. The TA/DA and sitting Fees will be paid by SPCB Odisha to Members as per Applicable Rules.

By Order of Chairman

28/2/23

MEMBER SECRETARY

Memo No. 2994 Dt. 28.02.2023

Copy to

1. Member Secretary, CPCB Delhi
2. Director, FE & CC
3. Person Concerned
4. Registrar NGT/ Registrar IIT, Bhubneswar / Registrar OUAT
5. Under Secretary to Govt. of India , MoHUA
6. PS to Principal Secretary H& UD / PS to ACS FE& CC

28/2/23

MEMBER SECRETARY

Annexure- II

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STATE POLLUTION CONTROL BOARD, ODISHA

[DEPARTMENT OF FOREST & ENVIRONMENT, GOVERNMENT OF ODISHA]
Paribesh Bhawan, A/118, Nilakantha Nagar, Unit - VIII
Bhubaneswar - 751 012, INDIA

No. 3367 / VI-SC(I&PR)-37/22-23 Date: 6.03.2023

To

The Principal Secretary,
H&UD Department, Govt. of Odisha

Sub : Associate Member in the Expert Committee meeting as per direction of Hon'ble NGT Dt. 27.01.2023 in OA No. 606 of 2018

Ref : This office letter No. 2993 dt. 28.02.2023

Sir

In inviting reference to above, it is to inform you that in accordance with the order of Hon'ble National Green Tribunal (NGT) Dtd. 27.01.2023 in OA No. 606 of 2018, an Expert Committee has been constituted (copy enclosed) to examine issues related to management of grey water. Considering the expertise and experience it is proposed to associate EIC, OWSSB for his views on grey water usage and management.

This is for kind information.

Yours faithfully,

MEMBER SECRETARY

Memo No. 3368 Dt. 6.03.2023

Copy forwarded to Expert committee members / EIC, OWSSB for information.

MEMBER SECRETARY

Annexure- III

ATTENDANCE SHEET FOR 1ST EXPERT COMMITTEE MEETING FOR COMPLIANCE TO DIRECTION OF HON'BLE NGT DTD. 27.01.2023 IN O.A. NO. 606 OF 2018 on 16.03.2023 AT CONFERENCE HALL OF SPC BOARD, ODISHA

SL. No.	NAME AND DESIGNATION	SIGNATURE
1.	Dr. K. Murugesan, Member Secretary, SPCB	16/3/23.
2.	Sri. V.K. Chaurasia, Joint Advisor, MOHUA, Central Public Health & Environmental Engineering Organization (CPHEEO) of MoUD, GoI	
3.	Sri. Sangramjit Nayak, IAS, Commissioner-cum-Secretary & Director Municipal Administration	
4.	Mrinal Biswas, Additional Director, CPCB, Eastern Zonal Office, Kolkata	
5.	Dr. Rajesh R. Dash, Professor, School of Infrastructure, IIT, Bhubaneswar	16/3/23
6.	Dr. Bamasankar Rath, HOD, Department of Agronomy, OUAT, Bhubaneswar	
7.	Er. P. K.Mohapatra, EIC, OWSSB	
8.	Sri Pravat Kumar Mahapatra, Additional Secretary, Urban Development Department, Govt. of Odisha	
9.	Dr. Nihar Ranjan Sahoo, Chief Environmental Engineer, SPCB, Odisha	
10.	Dr. Simanchala Das, Addl. Chief Environmental Engineer, SPCB, Odisha	
11.	Sangabasi Majhi, Project Engineer, OWSSB	

SL. No.	NAME AND DESIGNATION	SIGNATURE
12.	Atanu Kumar Samanta City Engineer, CMC, Cuttack	
13.	Rasmita Mishra Municipal Engineer. Dhenkanal (M)	16.03.2023
14.		
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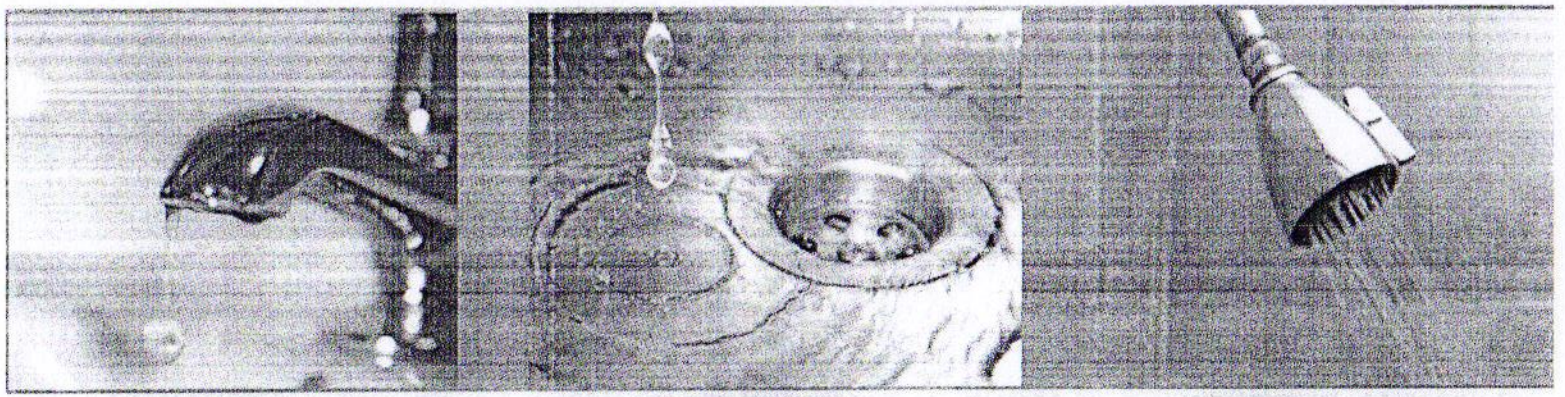
Annexure- IV

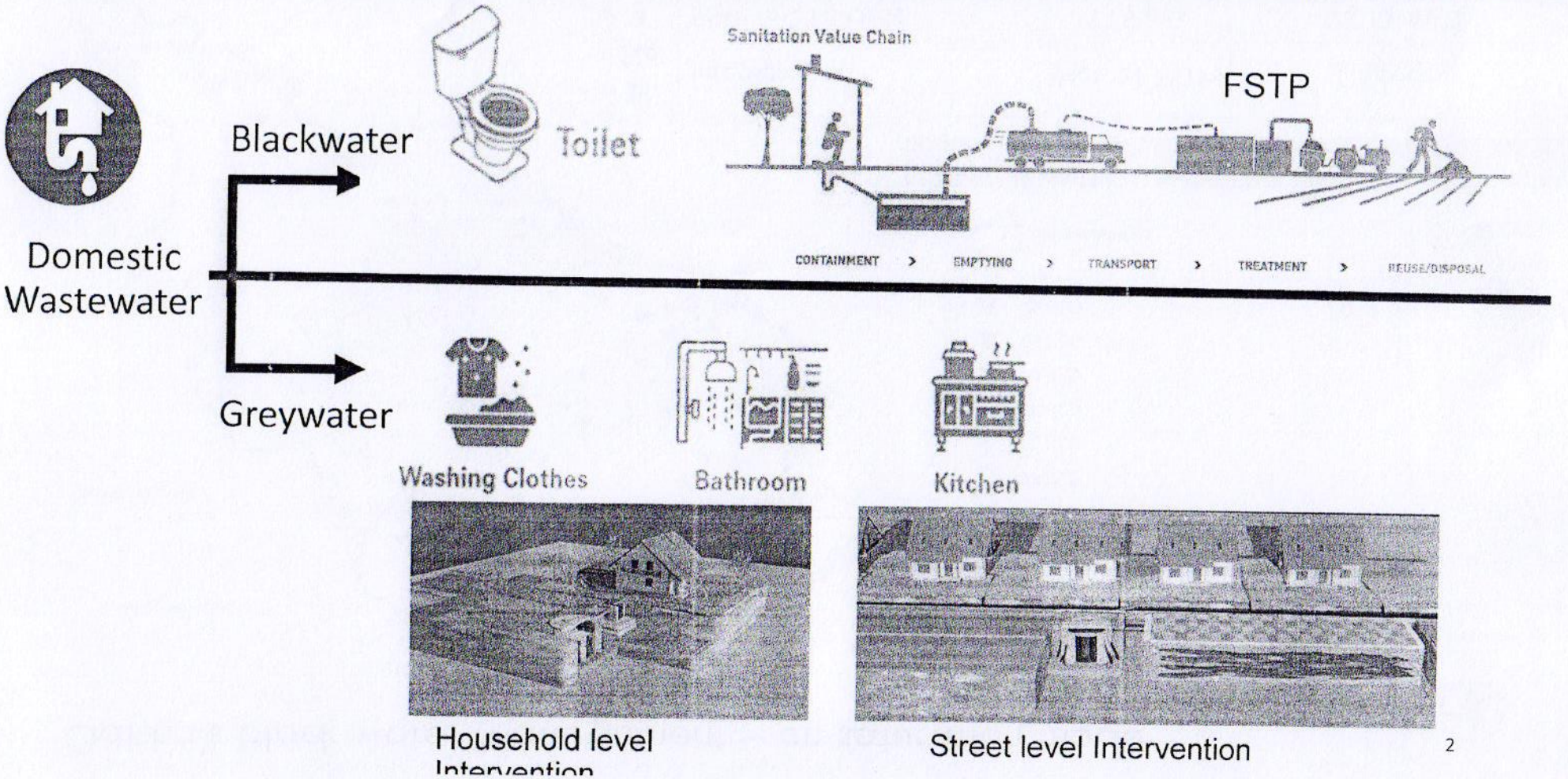
AGENDA OF THE 1ST EXPERT COMMITTEE MEETING AS PER PARA 34 OF HON'BLE NGT ORDER DT. 27.01.2023 IN O.A. 606/2018 IN THE CONFERENCE HALL OF SPCB, ODISHA, BHUBANESWAR

11:00 AM– 11:20 AM	Introduction by Dr. K. Murugesan, Member Secretary SPCB, Odisha
11:20 AM -1:00 PM	Presentation of Grey Water Management in the State of Odisha by Er. P.K. Mohapatro EIC, OWSSB, Bhubaneswar
1:00 PM – 1:30 PM	Discussion
1:30 PM – 3:00PM	Lunch Break
3:00 PM – 5:00 PM	Field Visit to pilot plant for grey water Management Pilot Plant at Jatni

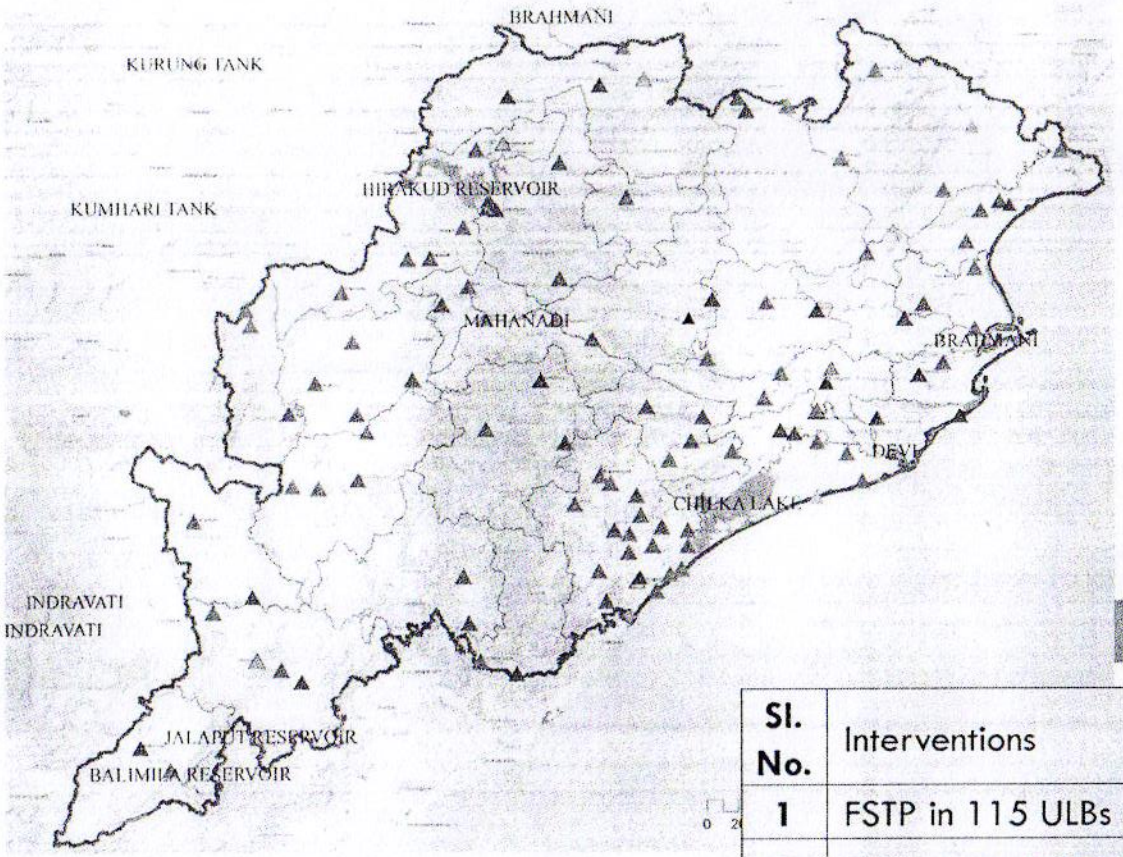
Greywater Management in Odisha



Wastewater Management in Odisha



Odisha's black water Management – on saturation mode



LEGEND

FSTP Capacity

- 10 KLD
- 12 KLD
- 18 KLD
- 20 KLD
- 27 KLD
- 30 KLD
- 40 KLD
- 50 KLD
- 60 KLD
- 75 KLD

State boundary

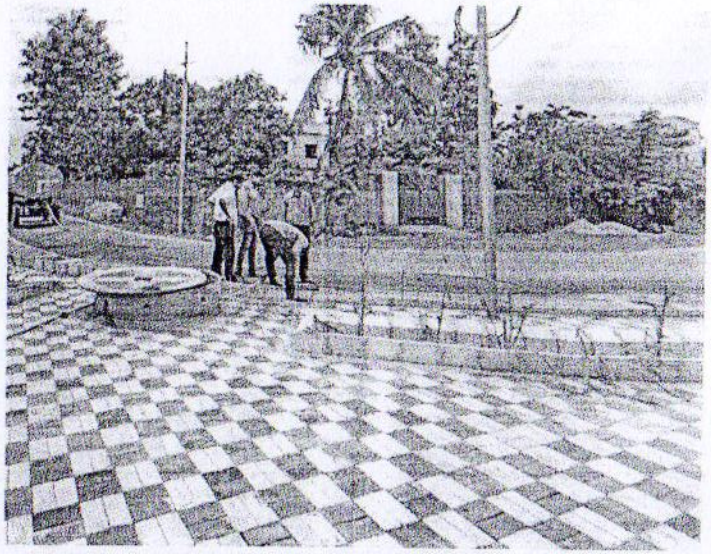
Faecal sludge generation in 115 ULBs = 1.572 MLD

Sl. No.	Interventions	Nos. of FSTPs	Capacity
1	FSTP in 115 ULBs	119 nos.	2.057 MLD
2	FSTPs commissioned	110 nos.	1.917 MLD
3	FSTPs under construction	9 nos.	0.140 MLD

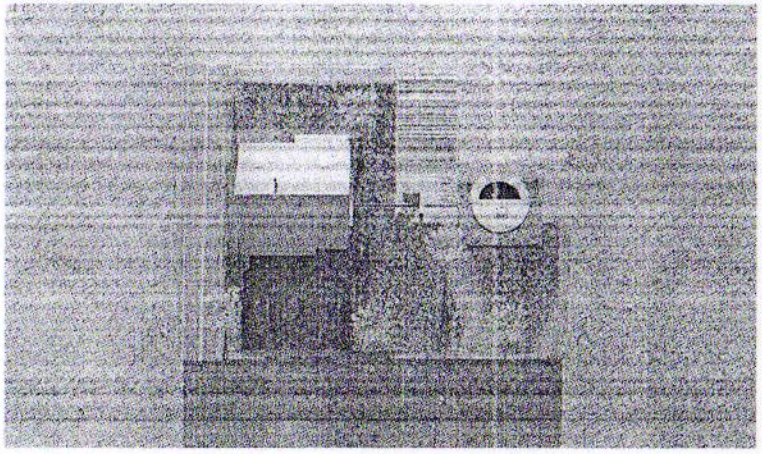
Odisha's greywater management approach

Interventions

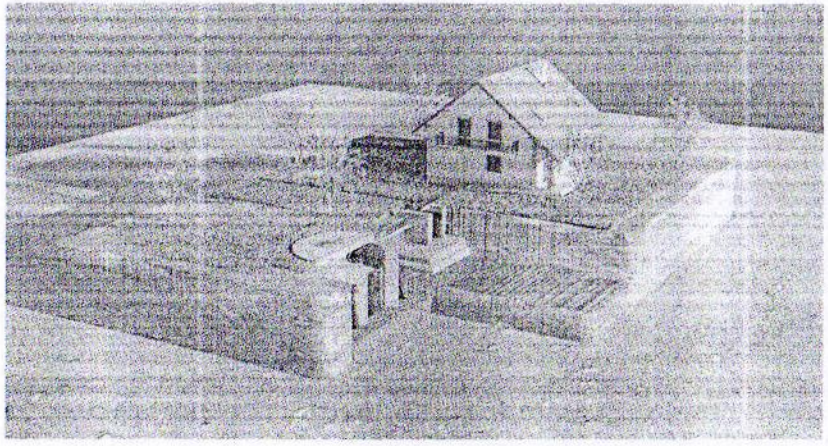
- Household level: Magic Soak Pits
- Lane level: Hybrid leach pit with absorption trenches
- Community level: Constructed Wetland/ waste stabilisation pond
- Outfall Level: Waste stabilisation pond and maturation pond



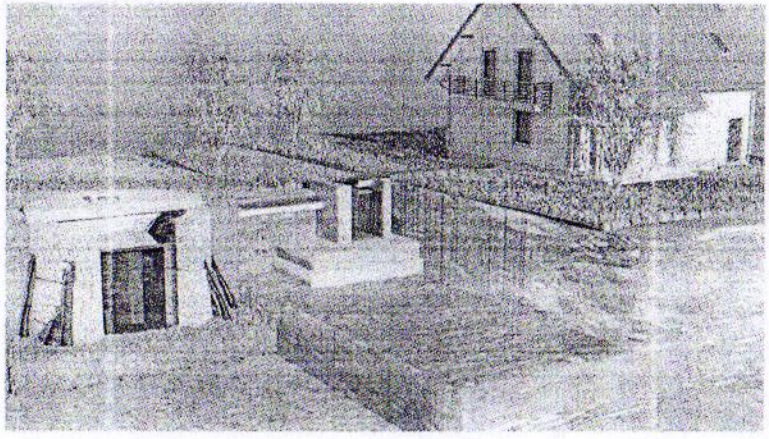
Dealing Greywater at Household Level: Magic soak pit



Top view

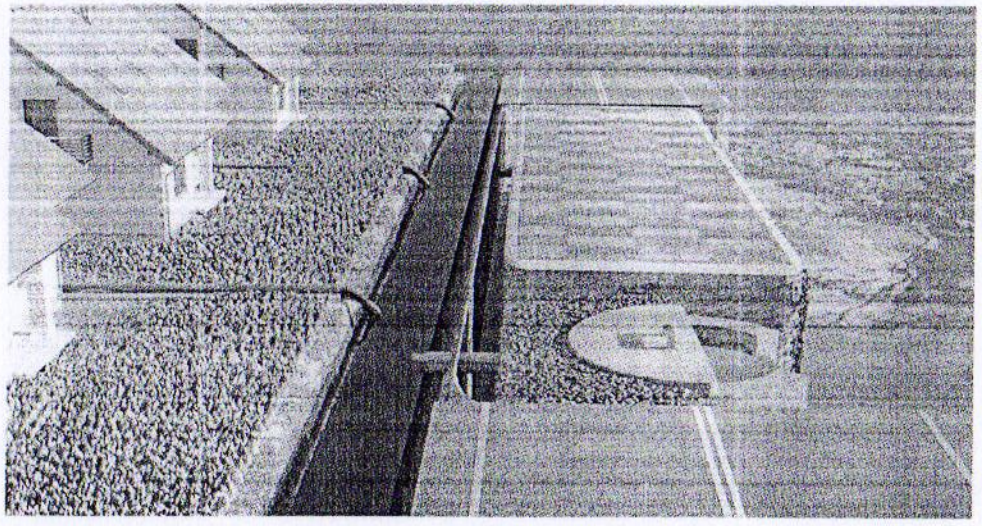


Side-Angle View

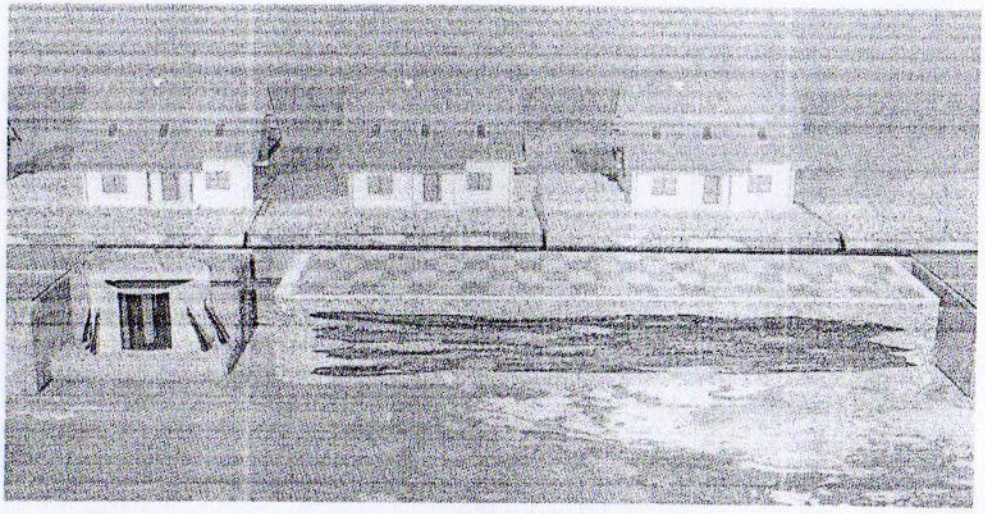


Cross-sectional view

Lane level interventions: Leach pit and Trench structure

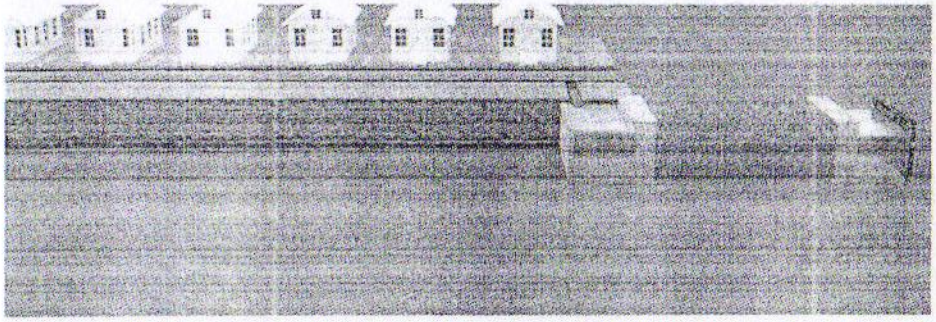


Top view

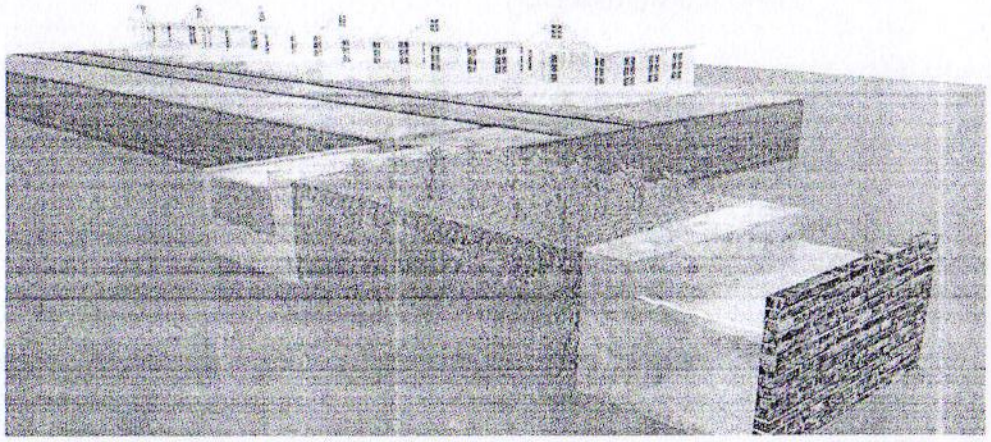


Cross-sectional view

Community-level Interventions: Constructed Wetland



Cross-sectional view

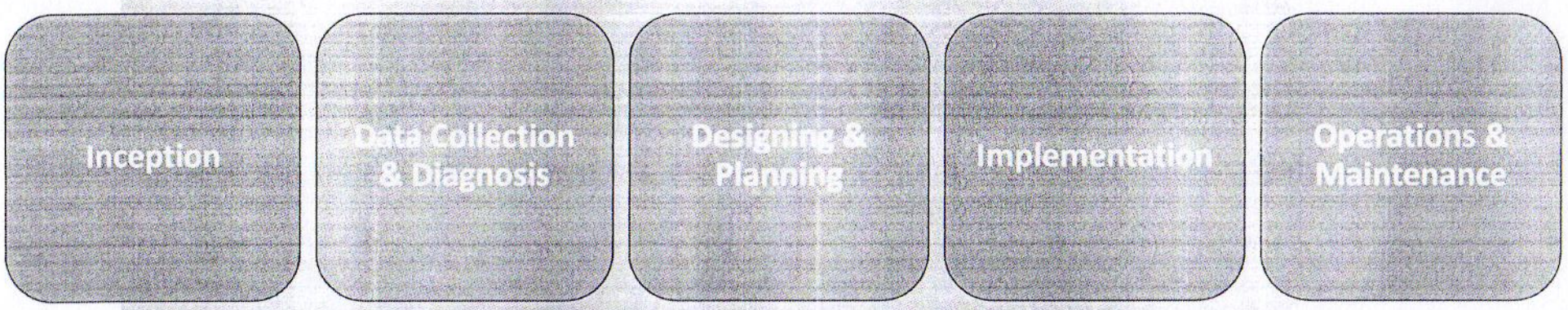


Cross-sectional side angle view

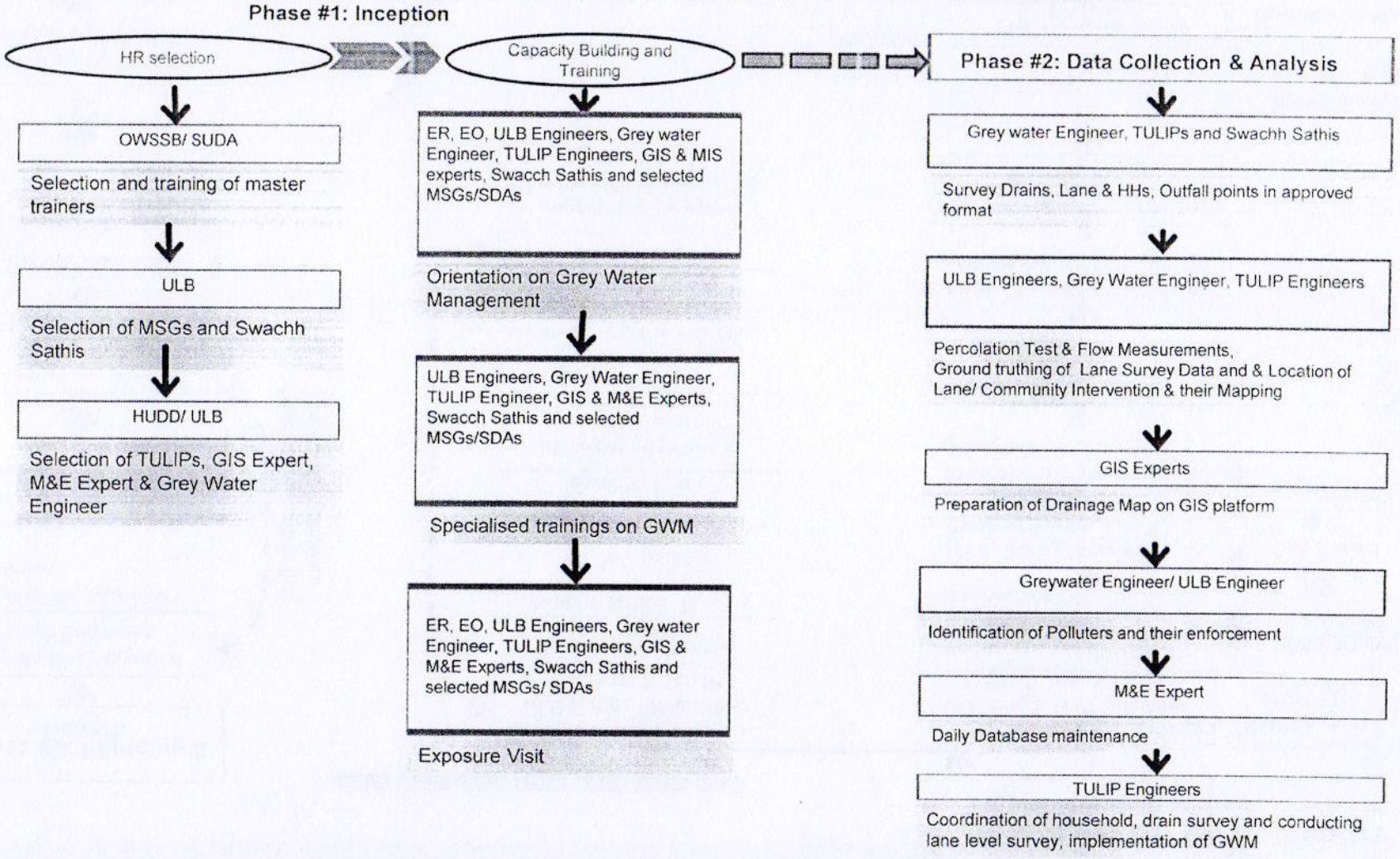
Odisha's greywater management implementation steps

1. Select a catchment of one main drain + its branch drains & tertiary drains
2. Conduct survey of households in the catchment (involving Swachh Sathis)
   - Train the women Self Help Groups
   - Identify polluters discharging faecal sludge in drains
   - Availability of space in backyard of house for magic pit construction
   - Map the drains
3. Conduct lane-level survey
   - Road type & width
   - locate lane level interventions (leach pit + trench)
4. Percolation test of soil to determine absorption capacity
5. Flow measurement in drains
6. Trench structure sizing
7. Construction of structures at Household, lane level, community (involving women Self Help Groups)
8. Flow measurement in drains after construction, u/s & d/s

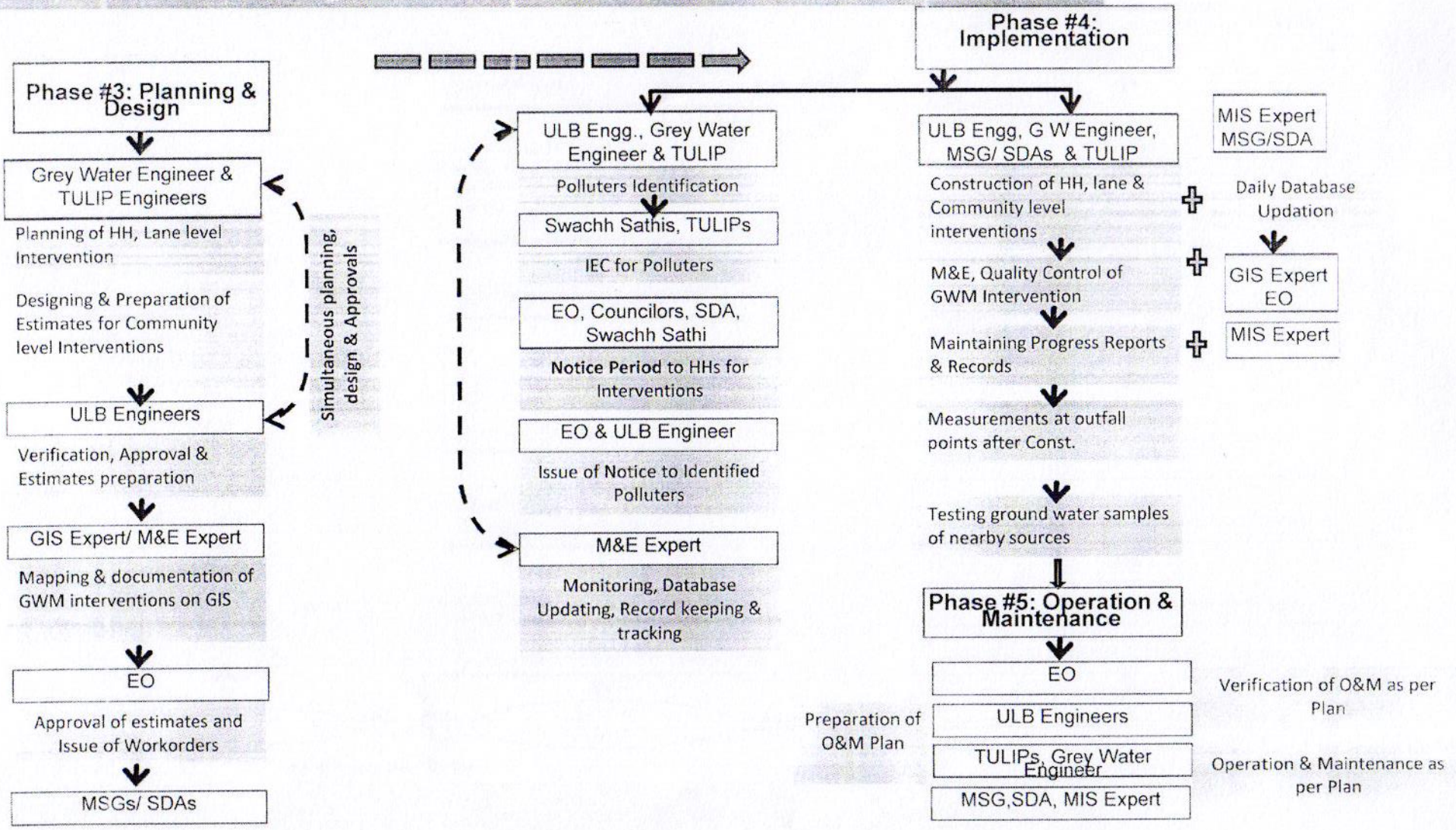
Greywater Management Strategy



Grey Water Management Project Lifecycle (1/2)



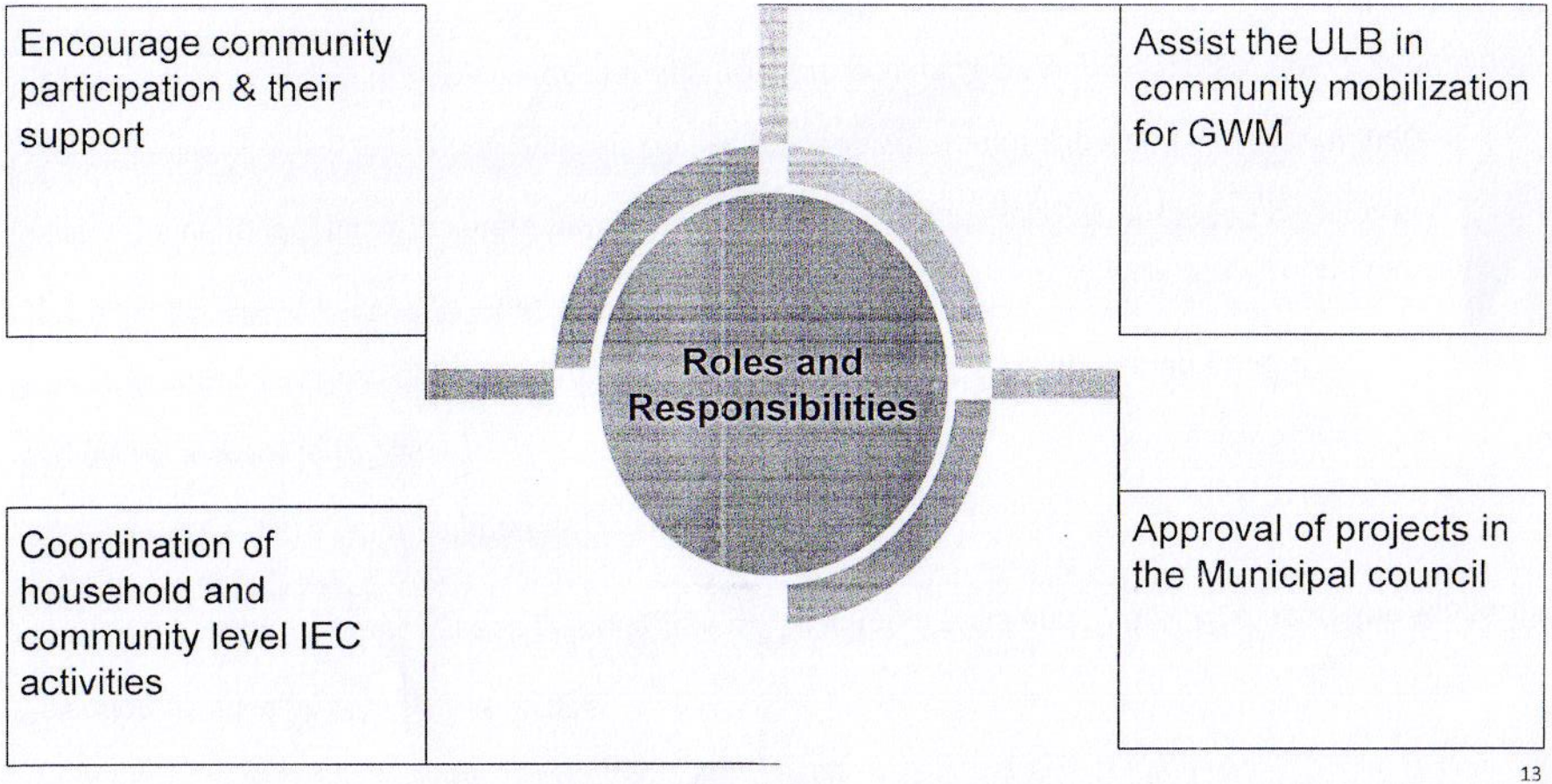
Grey Water Management Project Lifecycle (2/2)



Roles and Responsibilities of EO

1. Selection of Swachh Sathis and MSGs.
2. Guide Grey water Engineer in assigning zones to Swachha Sathis and TULIP Engineers for household and lane level survey.
3. Administrative approval of estimates
4. Issuing work order to MSG
5. Providing administrative support and necessary approvals for the GWM implementation
6. ULB level monitoring of GWM implementation
7. Issuing notice to identified polluters and imposing section 133 of CrPC on repeated offenders
8. Overall approval of GWM project by MUKTA Committee, ward committee and ULB committee
9. Overall implementation of Grey water management projects including construction, QA/QC and timely completion of the project
10. Ensuring naming and shaming of repeated offenders
11. Fortnightly review of grey Water Management projects

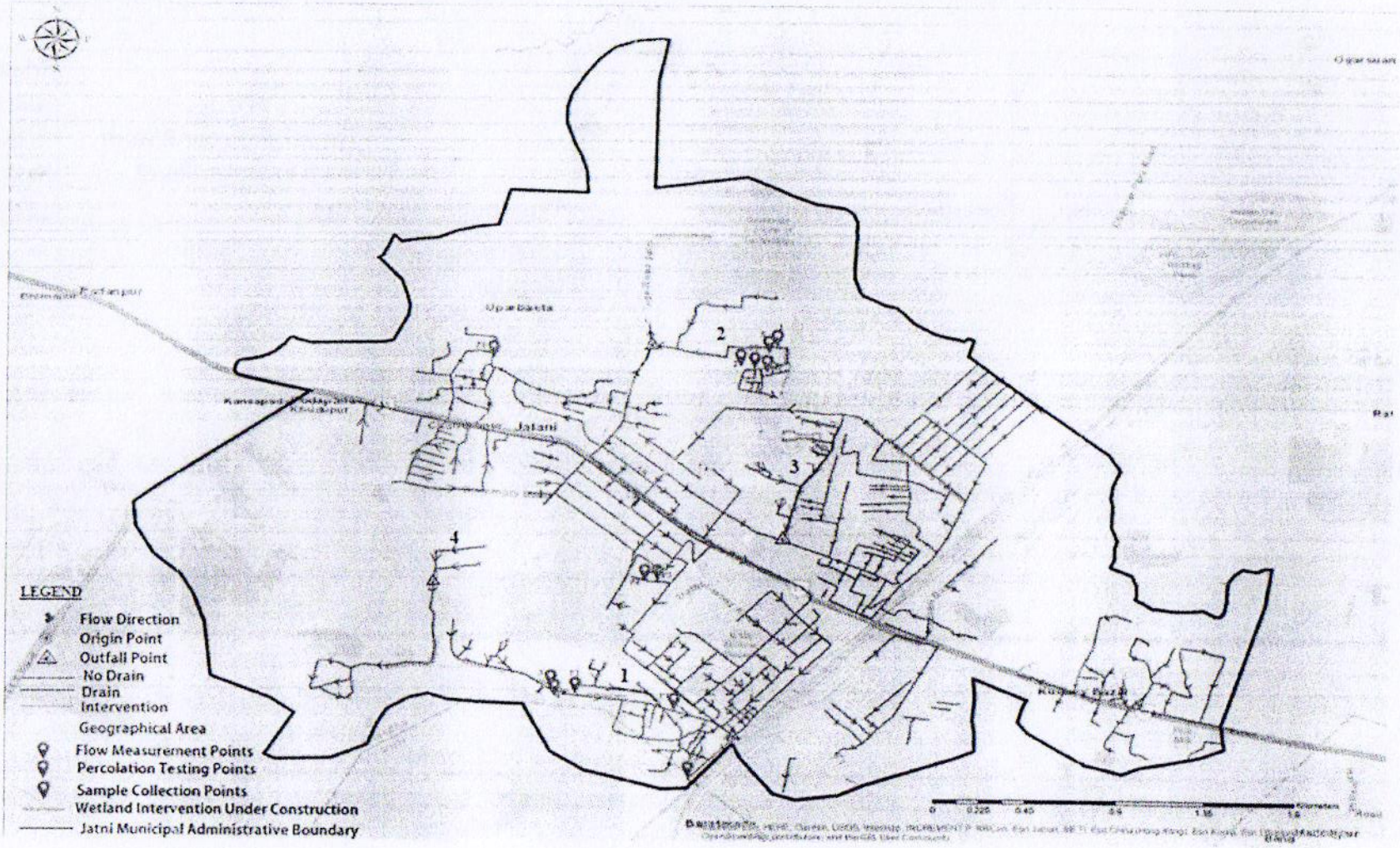
Roles and Responsibilities of Elected Representatives



13

Drain mapping in GIS (Jatni Town)

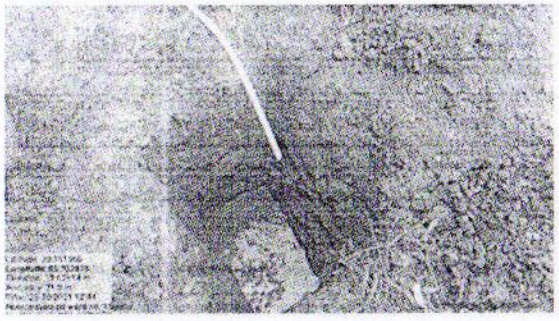
Drain Survey:
Jatni
Municipality
(4 pilot areas)



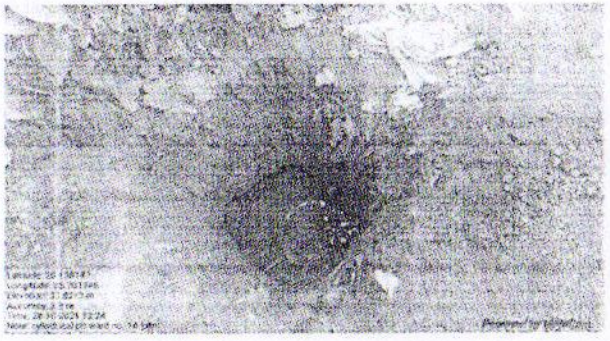
Percolation Test: Determine Allowable rate of effluent application in soil absorption system

Percolation Test: Jatni Municipality

Sl. No.	Ward No	Landmark	Type of Pit	Time Taken for 25mm drop in water level (min)	Maximum allowable rate of Effluent Application (l/m2/day)
1	15	In house No 12	Square	18.75	47
2	14	Near Lake	Circular	15	53



Square pit dugged in ward no. 15 in house no. 12 for percolation test (28 October, 2021)



Circular pit dugged in ward no. 14 near the pond for percolation test (28 October, 2021)

Percolation Test- Determine Allowable rate of effluent application in soil absorption system

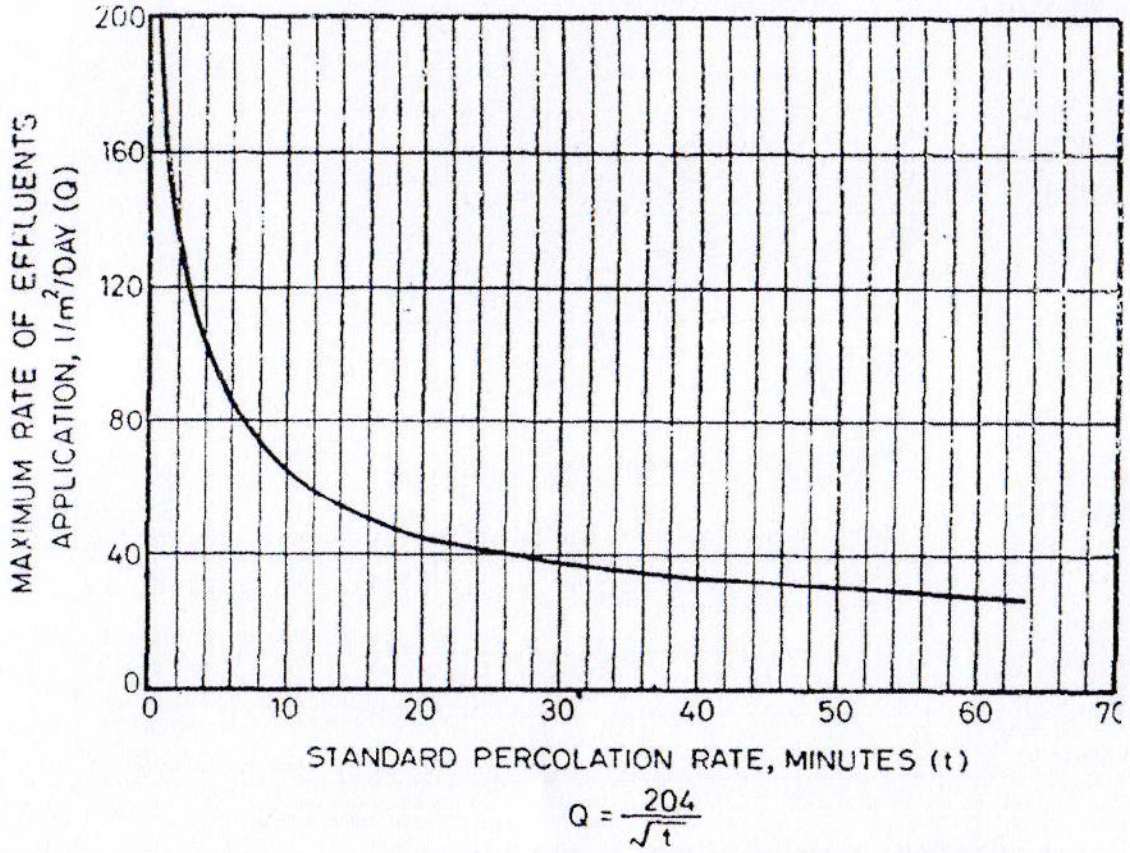
Test No-1

Location of Test: Ward No 15 in House no 12	
Date of Test: 27.10.2021 & 28.10.2021	
Tested by: Arun Balan/Manu Tyagi	
Dimension of Percolation test Pit: Pit depth 1m (Square pit)	
Depth of water level in percolation test pit after overnight swelling Period, mm: 0 mm	
Time of water level measurement (periodically for every 30 min or 10 min)	Depth of water level above gravel, mm]
1:15 PM	150 to 120 mm
1:45 PM	150 to 140 mm
2: 15 PM	150 to 125 mm
2: 45 PM	150 to 90 mm
3:15 PM	150 to 120 mm
3:45 PM	150 to 100 mm
4:15 PM	150 to 100 mm
4:45 PM	150 to 110 mm
Water level drop in last 30 min, mm: 40 mm	
Percolation rate (time taken to drop 25 mm water), min: 18.75min	
Suitability of soil for Soil absorption system (Suitable/ Non suitable): Suitable for all soakaway systems	
Maximum rate of effluent application l/m2/day (Q): 47 l/m2/day	

Test No-2

Location of Test: Ward No 14 near the lake	
Date of Test: 27.10.2021 & 28.10.2021	
Tested by: Arun Balan/Manu Tyagi	
Dimension of Percolation test Pit: Pit depth 1m (Circular pit)	
Depth of water level in percolation test pit after overnight swelling Period, mm: 0 mm	
Time of water level measurement (periodically for every 30 min or 10 min)	Depth of water level above gravel, mm
12.30pm	150 to 55mm
1.00pm	150 to 60mm
1.30pm	150 to 85mm
2.00pm	150 to 90mm
2.30pm	150 to 90mm
3.00pm	150 to 100mm
3.30pm	150 to 100mm
4.00pm	150 to 100mm
Water level drop in last 30 min, mm: 50mm	
Percolation rate (time taken to drop 25 mm water), min: 15min	
Suitability of soil for Soil absorption system (Suitable/ Non suitable): Suitable for all soakaway systems	
Maximum rate of effluent application l/m2/day (Q): 53 l/m2/day	

Percolation Test: Determine Allowable rate of effluent application in soil absorption system



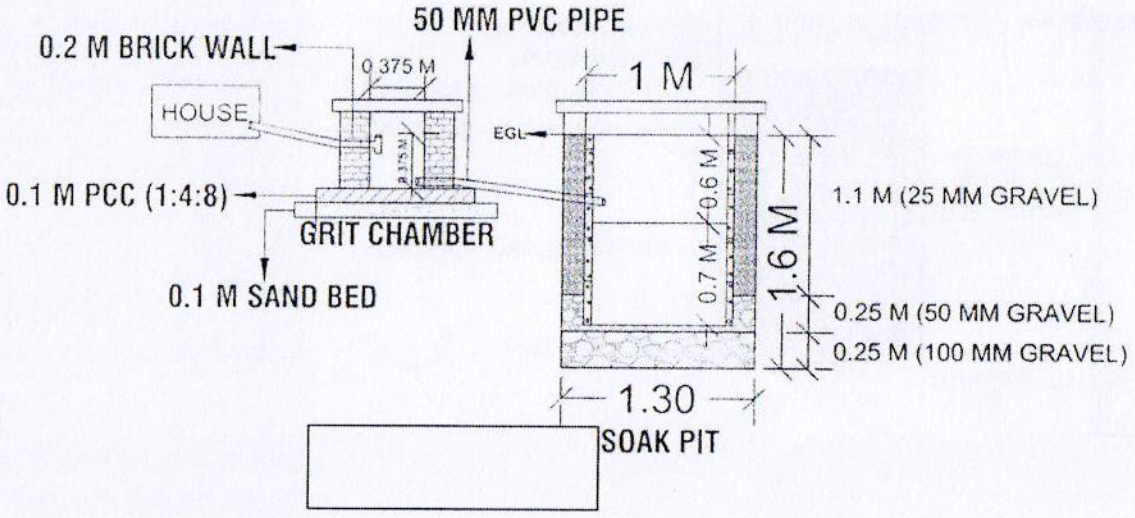
$$Q = \frac{204}{\sqrt{t}}$$

Maximum allowable rate of effluent application (Q) is calculated from the percolation rate (t) as per IS 2470- part 2

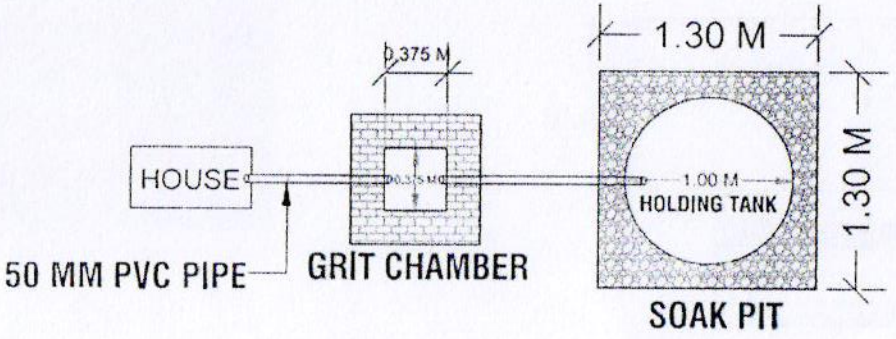
Percolation Rate *Min*	Maximum Rate of Effluent Application l/m²/day
1 or less	204
2	143
3	118
4	102
5	90
10	65
15	52
30	37
45	33
60	26

Interventions: Household Magic Soak pit

SECTION



PLAN

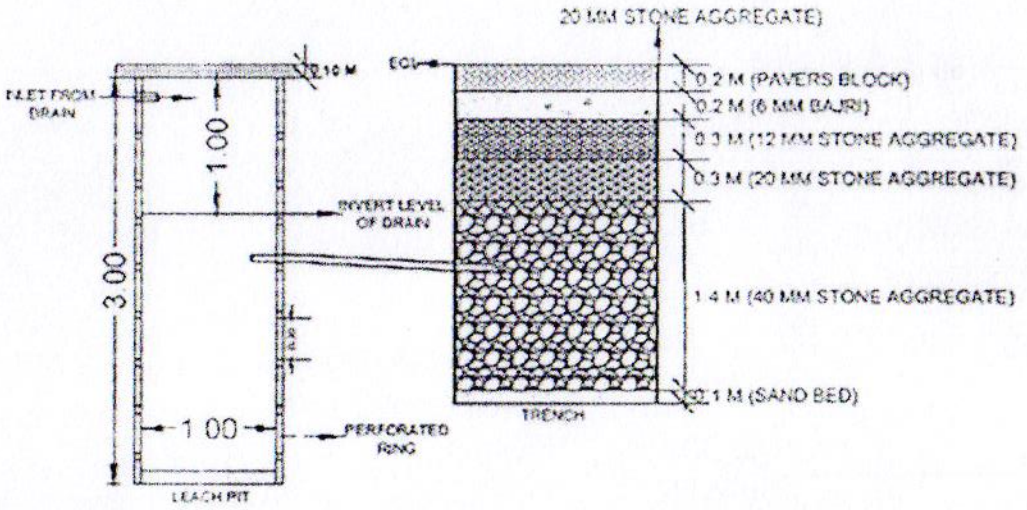


Design Criteria:

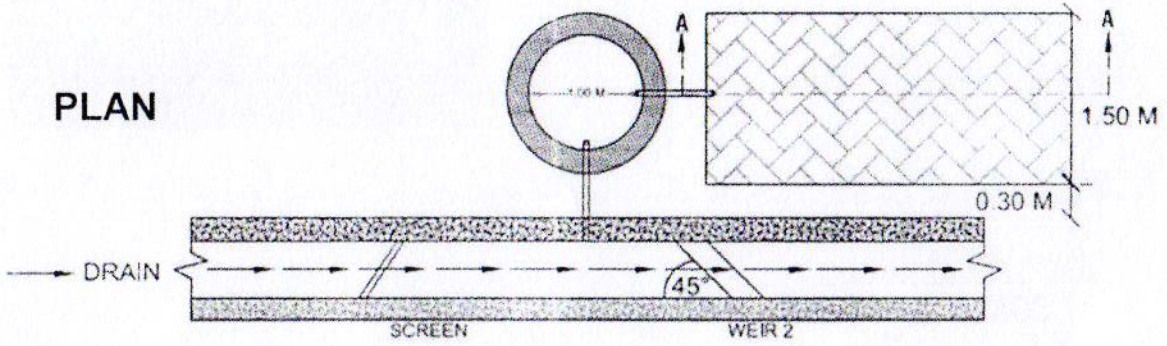
- Volume of holding tank is designed to hold one day greywater volume.
- Size is designed to percolate greywater generated considering maximum allowable rate of effluent application

Lane level Interventions: Leach pit and Trench structure

SECTION



PLAN



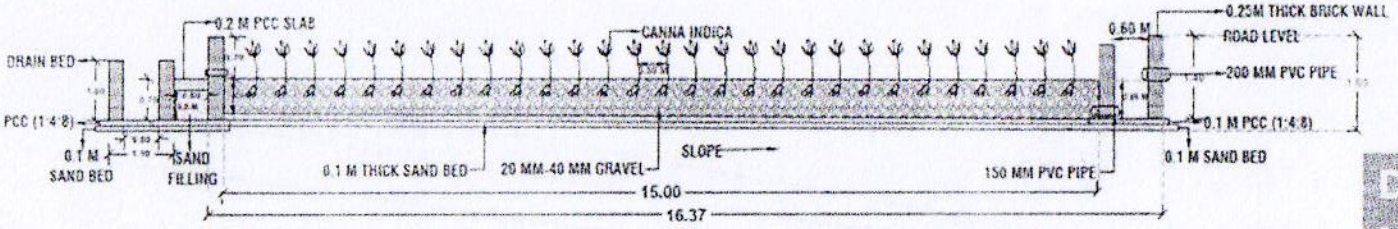
Leach Pit and Trench structure

Design Criteria:

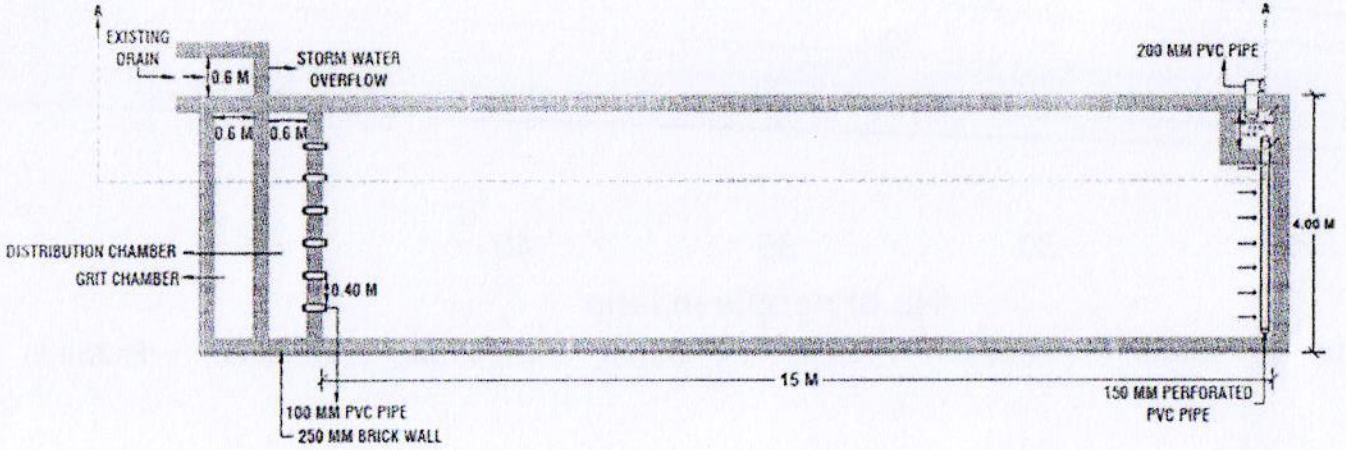
- Drain is connected to leach pit and then to the absorption trench
- Grit & silt settles in Leach pit and to prevent their entry to the absorption trench
- Trench is filled with metals/aggregates
- Top of trench is converted to foot path/road.
- Absorption capacity of trench is calculated considering maximum allowable rate of effluent application

Community level Interventions: Constructed Wetland

SECTION



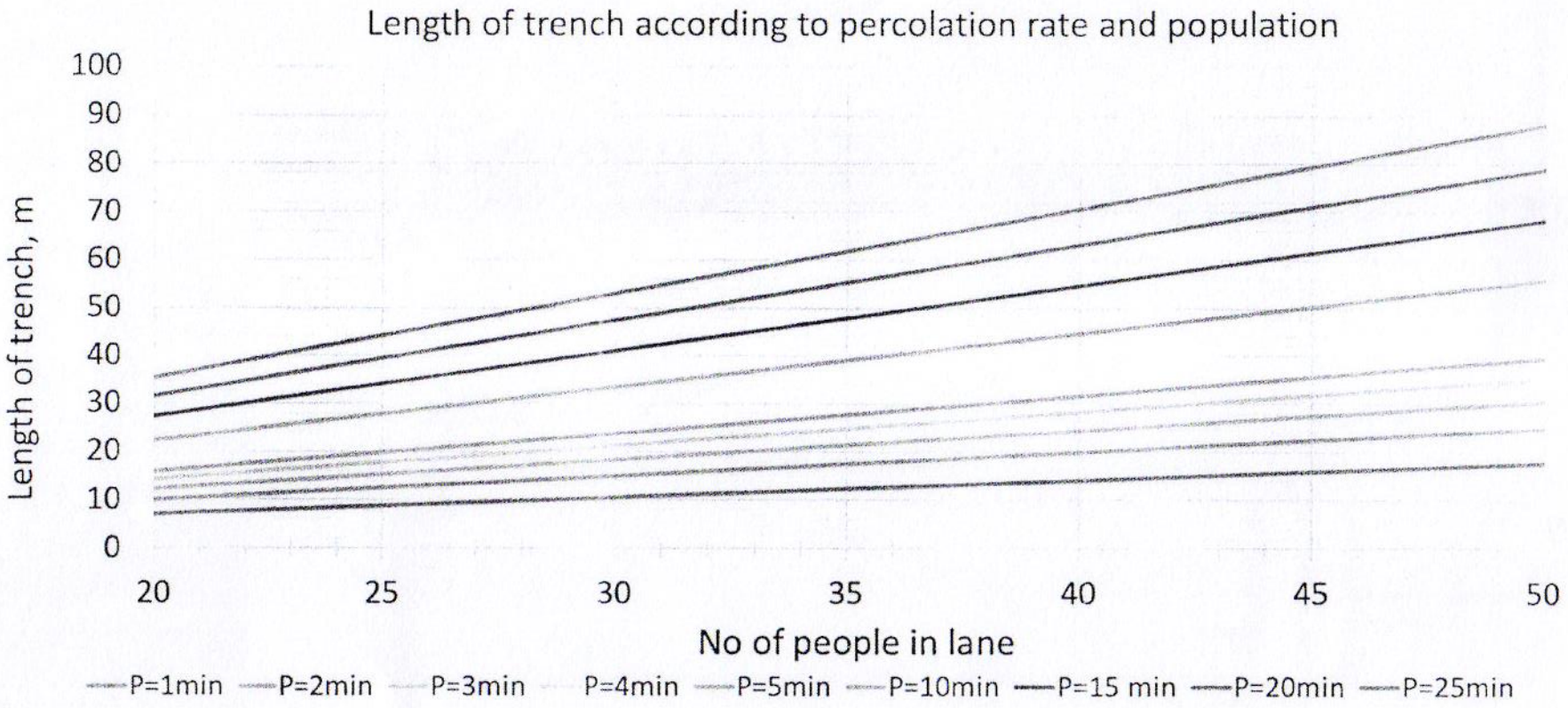
PLAN



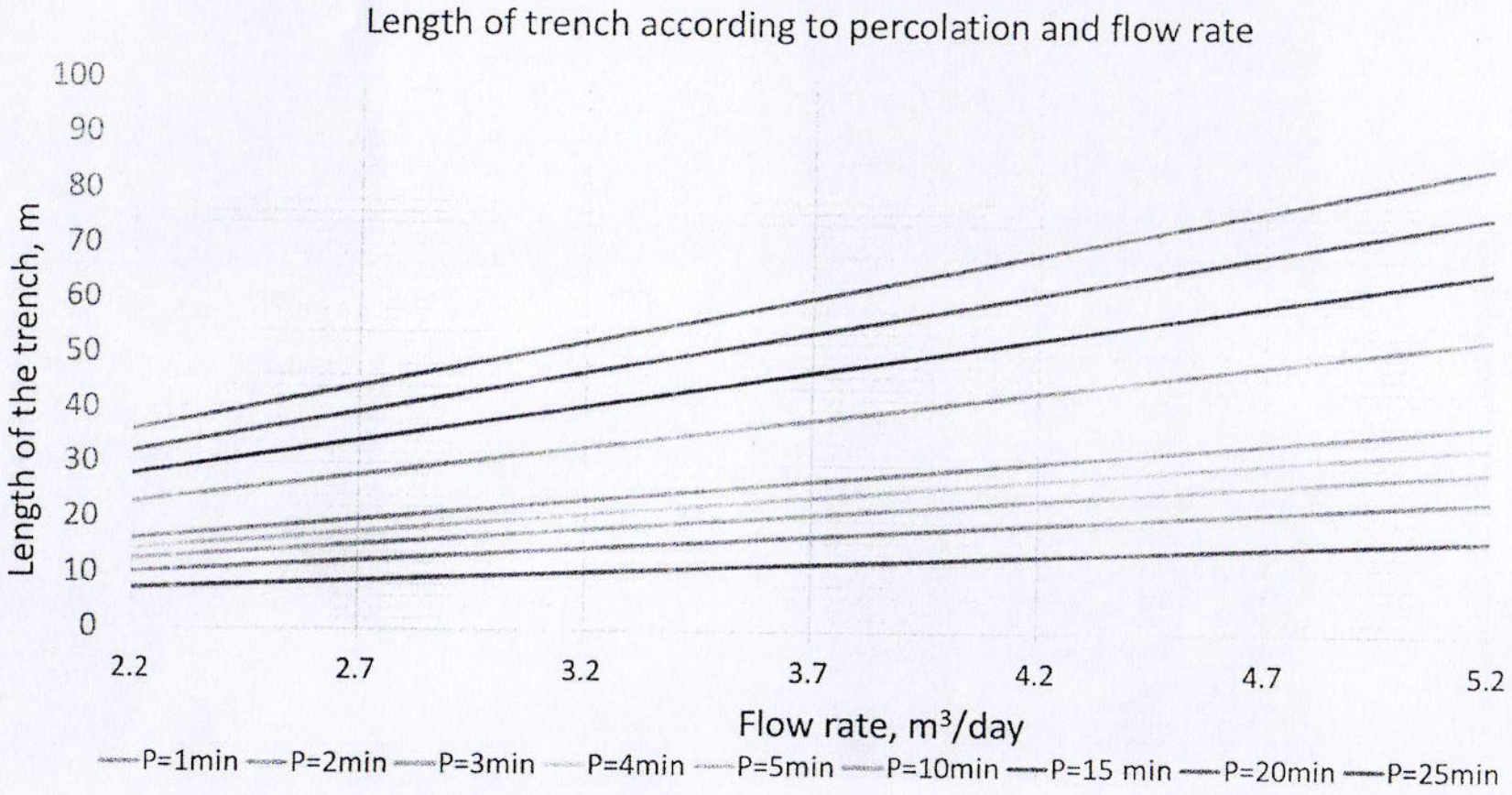
Design Criteria:

- Constructed wetland is designed as per space available in the community.
- If space available is not sufficient, partial treatment is achieved
- Remaining treatment can be

Design Nomograph - Determine length of absorption Trench in street

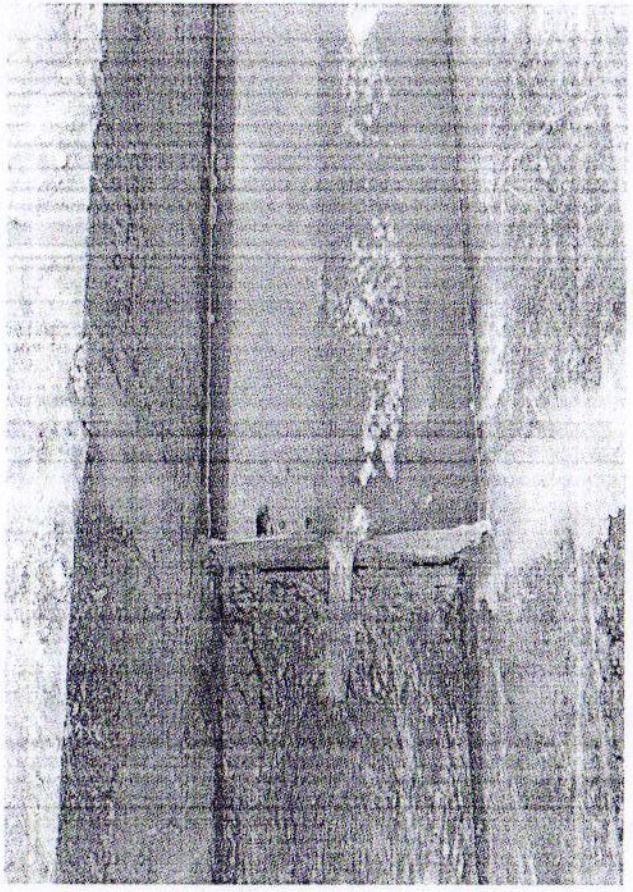


Design Nomograph : Determine length of absorption trench in street



Flow test in drains

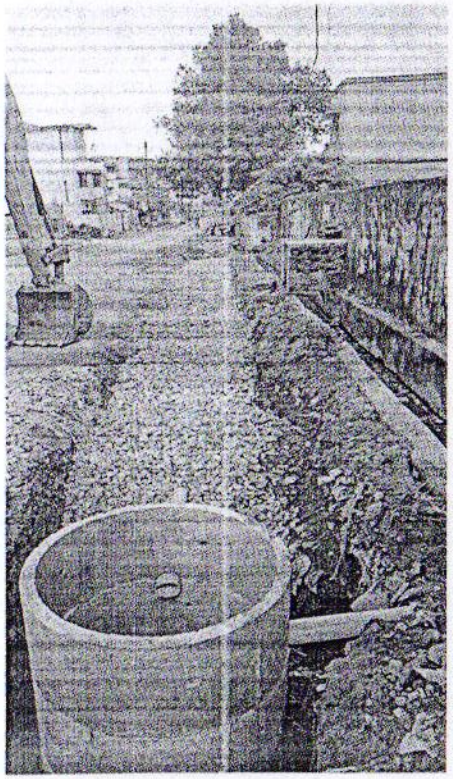
Flow measurement at U/sLane level Structure 1 (geographical Area 2) in Jatni

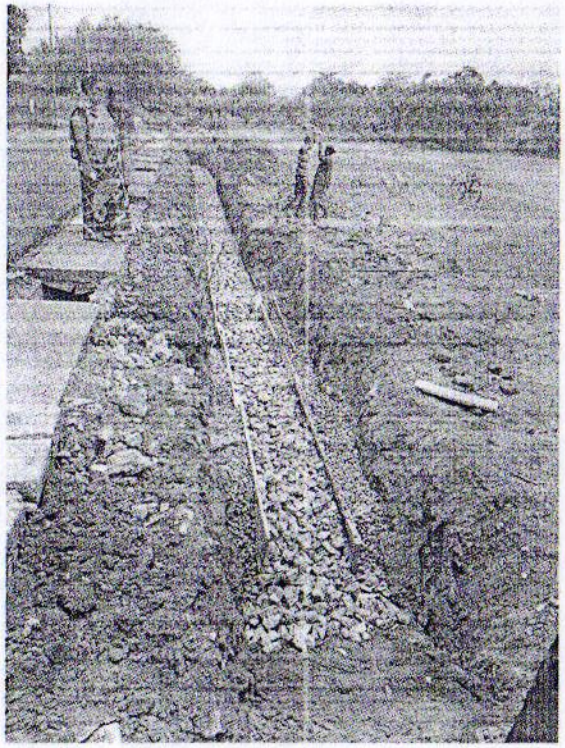


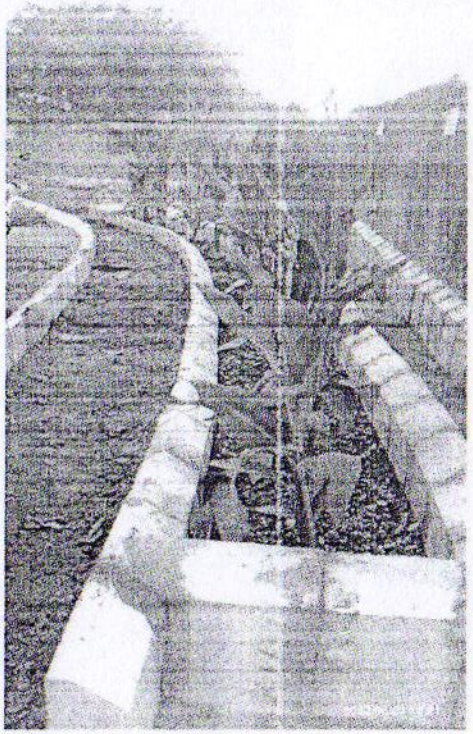
Flow measurement at Lane level Structure 1 (geographical Area 2) in Jatni

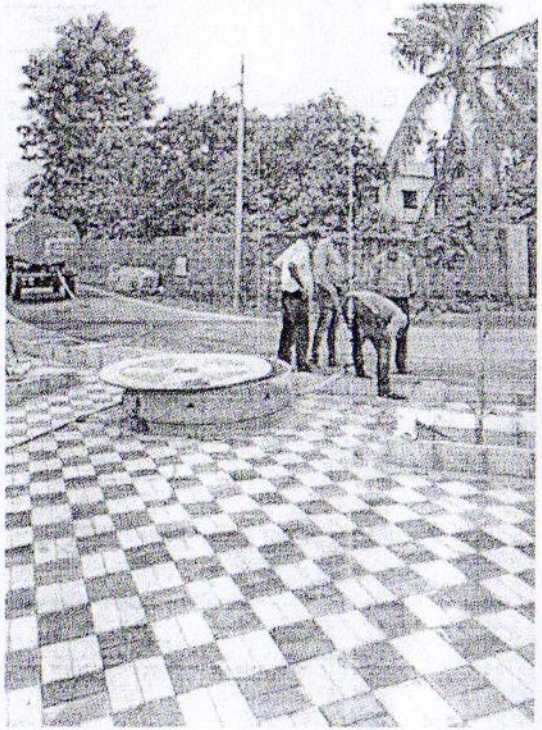
Household-level Intervention: Magic Soakpit

Lane level Intervention: Leach Pit and Trench









Cost of Trench Structure

						Jatni		Dhenkanal	
	Trench structure	L	B	H	Qnty	Rate	Amount	Rate	Amount
1	Earthwork excavation in all kinds of soil	1.00	1.50	1.50	2.25	197.57	444.53	159.27	358.36
2	Filling in foundation with sand	1.00	1.50	0.10	0.15	290.36	43.55	365.31	54.80
3	40 mm filter media	1.00	1.50	0.60	0.90	1431.14	1288.03	1295.33	1165.80
4	20 mm filter media	1.00	1.50	0.20	0.30	1757.89	527.37	1619.14	485.74
5	12 mm filter media	1.00	1.50	0.20	0.30	1801.32	540.40	1656.28	496.88
6	6 mm filter media	1.00	1.50	0.20	0.30			1290.57	387.17
7	Paver block	1.00	2.10	0.20	0.42	643.69	270.35	762.25	320.15
8	Crusher dust	1.00	2.10	0.10	0.21	505	106.05	593.49	124.63
9	PVC pipe	1.00			1	400	400.00	384.49	384.49
	Total						**3620.28**		**3778.02**

Cost of Leach Pit

							Jatni		Dhenkanal	
	Leach Pit		L	B	H	Qnty	Rate	Amount	Rate	Amount
1	Earthwork excavation in all kinds of soil	0.786	1.3	1.3	3	3.985	197.57	787.32	159.27	634.69
2	Filling in foundation with sand	0.786	1.3	1.3	0.1	0.1328	290.36	38.57	365.31	48.53
3	RCC rings					10	1000	10000.00	1000	10000.00
4	PVC pipe					1.00	400	400.00	384.49	384.49
5	Back filling	3.145	1.2	0.2	3	2.2644	131.713	298.25	106.18	240.43
6	Lead of excavated earth					1.3283	151.16	200.79	151.16	200.79
7	Bar screen				1	1	2000.00	2000.00	2000.00	2000.00
	Total							**13724.93**		**13508.94**

500