

Onsite Training Programme on “Planning and Designing of Faecal Sludge Management Systems” (September 16-18, 2025)



PROMOTING SUSTAINABLE FSM IN SOUTH AFRICA

A PARTNERSHIP PROGRAMME ON SANITATION
AND WASTEWATER MANAGEMENT

September 13-25, 2025. South Africa

TRAININGS • FIELD ASSESSMENTS • MEETINGS • ACTION PLANNING

Session Title: Process for Detailed Project Report Preparation

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Presentation Structure

- What is systematic planning?
- What is feasibility study?
- What is DPR?
- Components of a DPR?
- How should we approach FSM planning & design? What things to keep in mind?

What is Systematic Planning ?

Systematic planning is a structured, step-by-step approach to decision-making that involves assessing needs, setting clear objectives, analyzing options, prioritizing actions, allocating resources, and monitoring outcomes to achieve sustainable and efficient results. It emphasizes order, logic, and evidence-based processes rather than ad-hoc or reactive measures.

- Planning should align with national missions and state-specific development strategies.
- Involves multiple stakeholders: ULBs, PHED, health departments, NGOs, and the community etc.

Objectives and Purpose of WASH Planning

- **Ensure universal access** to safe water and sanitation
- **Improve public health** by reducing waterborne diseases
- **Promote environmental sustainability**
- Support **economic development** and **livable cities/villages**

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Planning Frameworks

- Based on data collection, stakeholder consultation, and strategic goal setting.
- Involves formulation of time-bound, phased plans: immediate (0–2 yrs), mid-term (3–5 yrs), long-term (6–10 yrs and so on...)
- City Sanitation Plan (CSP) – for urban local bodies
- City Sanitation Action Plan (CSAP)
- City Water Balance Plan (CWBP)
- District or Village Water Sanitation Plan (VWSP) – under Jal Jeevan Mission (JJM)
- Gram Panchayat Development Plan (GPDP)
- Detailed Project Report (DPR) – for specific projects
- Faecal Sludge and Septage Management (FSSM) Plans
- City Level Reuse Action Plans (CLRAP)

Key components of a Plan

- Assessment of Existing Situations
- Demand Estimation
- Technology Options
- Infrastructure Planning
- Financial Planning
- Institutional Roles
- Policy and Regulation
- Monitoring and Evaluation

What is Feasibility Study?

A **feasibility study** of a project is a structured assessment done before starting the project to check whether it is **practical, viable, and worth investing in**. It helps decision-makers understand if the project can realistically be implemented with the available resources, within the given constraints, and whether it will achieve the intended goals.

Key Aspects of Feasibility Study?

- **Technical Feasibility** – Checks if the project can be implemented with available technology, skills, and infrastructure.
- **Financial Feasibility** – Assesses whether the project is affordable within budget and funding sources.
- **Economic Feasibility** – Evaluates the broader cost–benefit and value for society.
- **Legal & Regulatory Feasibility** – Ensures compliance with laws, policies, and approval requirements.
- **Environmental Feasibility** – Examines potential positive or negative impacts on the environment.
- **Operational Feasibility** – Reviews if the project can be managed, maintained, and sustained in practice.
- **Social & Institutional Feasibility** – Analyzes community acceptance and institutional capacity for long-term management.

What is Detailed Project Report (DPR)?

DPR stands for Detailed Project Report. It is a comprehensive document that outlines the technical, financial, institutional, environmental, and social aspects of a proposed project. In the context of infrastructure projects like water supply, sanitation, solid waste management, roads, housing, etc., a DPR is essential for project planning, appraisal, and implementation.

- **Blueprint for execution:** Acts as a detailed guide for implementing the project.
- **Decision-making tool:** Helps funders, governments, and stakeholders decide on project viability.
- **Financial approval:** Required to secure funding from central/state governments or donor agencies.

Key Sections in a Detailed Project Report (DPR)

- Project Context & Scope
- Situation Analysis & Gap Assessment
- Technical Design & Planning
- Financials, O&M & Resource Recovery
- Monitoring
- Enabling Environment

Contents of a Detailed Project Report (DPR)

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Key Sections in a Detailed Project Report (DPR)

- Detailed BOQ to be prepared for each technical module as well as allied works.
- Consolidated BOQ will be used for tender purposes.
- Local SOR to be used (as much as possible) – >Rate Analysis>DSR>Other State

1. Cost Estimate For Construction Of Screening Chamber

[illegible]

Why DPR for Faecal Sludge Treatment Plants (FSTP)?

FSTPs are crucial for safely managing faecal sludge in towns lacking sewerage networks. A DPR for FSTP ensures:

- Technical soundness of treatment technology and modules
- Compliance with environmental regulations
- Proper planning for land, cost, and O&M
- Alignment with national/state sanitation policies and FSSM guidelines

Conceptualization and Data Collection

Data collection is the foundation of DPR preparation. It involves:

- Demographic data: population, floating population, expansion trends
- Water supply: sources, quantity, consumption pattern, metering data
- Wastewater generation: toilet types, containment systems (septic tanks, pits, direct discharge), desludging frequency
- Stormwater: drains and connectivity with wastewater

Survey methods:

- Household surveys
- Transect walks for gradient and outfall study
- Stakeholder interviews (residents, engineers, NGOs)

Technical tests:

- Soil and topographic surveys
- Water and wastewater quality analysis

Feasibility and Gap Assessment

Feasibility studies evaluate the practicality of proposed interventions:

- Technical feasibility – Can selected treatment handle expected load?
- Economic feasibility – CAPEX and OPEX estimates, affordability
- Practical feasibility – Land availability, access to site, construction constraints

Gap assessment:

- Compare current sanitation status with policy/national goals
- Identify infrastructure and service delivery gaps
- Map opportunities for co-treatment or integration with existing infrastructure

Technology Options and Module Selection

Technology selection depends on treatment objectives and site conditions:

- Options: Planted/unplanted drying beds, co-composting, anaerobic baffled reactors, constructed wetlands, mechanical systems (if feasible)
- Criteria: treatment efficiency, area availability, cost considerations, O&M requirements

Right-sizing:

- Hydraulic and organic load calculations
- Dimensioning of modules based on flow and pollutant load
- Placement of units considering slope, reuse proximity, aesthetics

The concept plan consolidates design into a technical blueprint:

- Layout plan of treatment units
- Hydraulic profile (flow balance, levels, gradients)
- Structural and architectural drawings
- Good-for-Construction (GFC) drawings for contractors

Circular economy integration:

- Reuse of treated effluent for landscaping/agriculture
- Co-composting of dried sludge with municipal solid waste
- Resource recovery models

Financial & Institutional Planning

Financial Planning:

- Preparation of detailed Bill of Quantities (BOQ) for all modules
- CAPEX (construction, land, equipment) and OPEX (energy, manpower, chemicals)
- Rate analysis using SOR/DSR norms
- Exploration of revenue models (user charges, compost sale, treated water reuse)

Institutional Planning:

- Roles of ULB, water utility, private contractors, community groups
- Long-term O&M strategy – PPP models, performance-based contracts
- Training and capacity building for operators

Approval & Clearances

Before DPR implementation, clearances and approvals are mandatory:

- Land acquisition or long-term lease confirmation
- No Objection Certificate (NOC) from ULB/landowners
- Technical Sanction (TS) by competent authority
- Administrative and Financial (A&F) approval by state/ULB
- Policy resolutions by elected representatives

Clearances ensure legal, financial, and institutional backing for project execution.

Procurement & Tendering

- Preparation of Request for Proposal (RFP) / Bid documents
- Pre-bid meetings to clarify technical queries
- Floating of tenders and wide circulation
- Bid analysis, evaluation, and acceptance
- Award of contract to selected agency

Transparency in procurement ensures quality contractors and reduces project delays.

Implementation & Commissioning

Implementation involves supervised construction of FSTP modules as per DPR:

- Site preparation and civil works
- Installation of treatment units
- Quality control checks during construction

Commissioning:

- Hydraulic and operational testing
- Trial runs to validate treatment capacity
- Calibration of monitoring systems
- Handover to ULB/operator

O&M and Monitoring

Operation and maintenance ensures long-term sustainability:

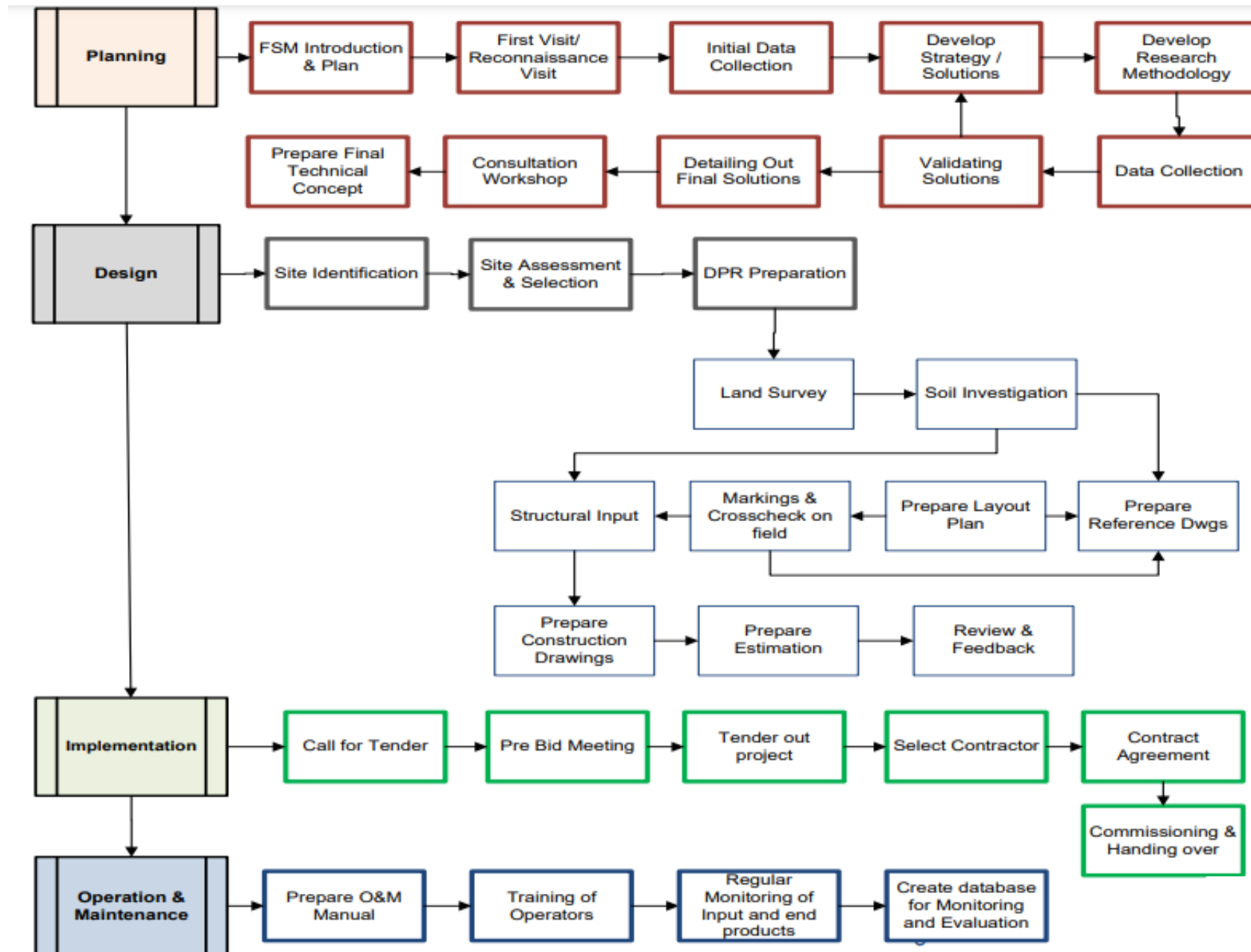
- Routine desludging, module cleaning, minor repairs
- Record keeping of inflow, treatment efficiency, sludge volume
- Performance monitoring – effluent quality, reuse quantities
- Use of ICT/smart tools for real-time monitoring

A well-structured O&M plan prevents system failure and extends plant life.

Key Learnings

- Principle: What cannot be maintained, should not be design and built
- Community engagement is critical for acceptance and sustainability
- Climate-resilient design ensures robustness against floods/drought

Step by Step Process of town level FSM Implementation



Key factors – FSTP design considerations

- The **characteristics of the sludge and its characterization ratios** determine the **degree of stabilization and dewaterability** etc.
- The **frequency of desludging** affects the quality of the sludge. Hence, if the frequency of the desludging is high, there is a possibility of having partially digested faecal sludge. In that case, stabilization of sludge becomes important.
- **Climate** plays an important role in case of all-natural treatment mechanisms such as **evaporation, evapotranspiration, drying and stabilization**.
- **Land availability** and its **cost** of acquisition must also be considered before finalizing the treatment mechanisms. In cases where the land is not available and acquisition of it is costly or time consuming, it is advisable to go for treatment mechanisms demanding less area.
- If there is interest in the **use of end products** of treatment then treatment mechanisms suitable to produce those end products in demand should be chosen. Ex. In cases where there is a demand for **biochar, pyrolysis** will be suitable treatment mechanisms for pathogen reduction.

THANK YOU

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