Government of Nepal
Ministry of Water Supply
Department of Water Supply and Sewerage Management

CWIS Approach for Municipalitywide Inclusive Sanitation in Nepal

Training of Trainers

Power Point Presentation Slide Note for Participant

Part II

August, 2023

Material and Learning Application:

This material is prepared by Environment and Public Health Organization (ENPHO) with the support from "CWISAN Thematic group" for Training Material Development and is to be used for training purposes only. Materials used in the package are for the reference to understand the concept and or to show the practices around the globe and at national level. The package development team do not claim for the materials used in the package as of their own but is the sole property of the respective organization.

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This is the continuation (second part) of the “CWIS TOT slidenotes”. For the earlier session slidenote refer to “CWIS TOT slidenote” part 1.

Introduction

This document, power point presentation with slide notes, is a supporting document for the trainers/presenter to conduct the " Citywide Inclusive Sanitation Training for Trainers" training. This is a compilation of all the slides to be presented in the training along with the notes for the trainer as of what to describe while prsenting the particular slide.

Objective

The main objective of the document is to guide the content that a presener would be discussing on each slide. To this, it also provides a preview of all the slides contained in the training along with the slide notes.

How to Use?

The document consist of slides from all session. Slide notes for each slide is presented just below the slide itself. The trainers or presenter can go through the notes and describe the slides as per the inforamation provide in the slide notes.

For the effective use of the documents, trainer or presenter is recommended to use simultaneously with the "Trainer Manal" with instructions.

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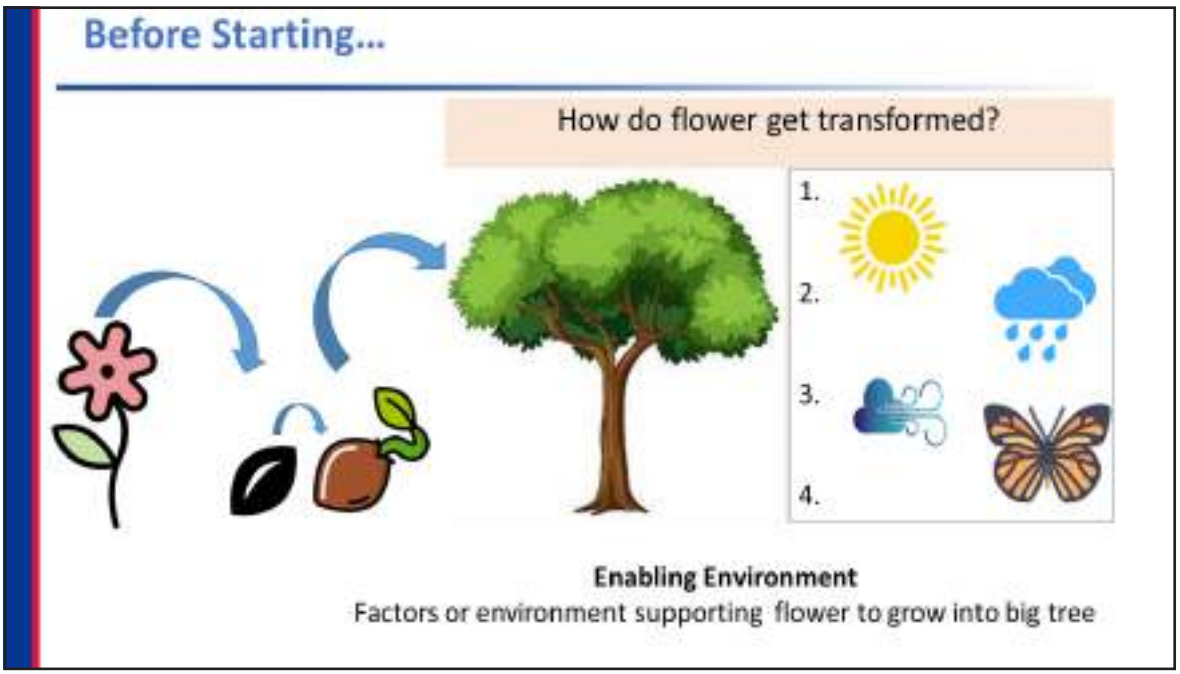
SESSION 9

Enabling Environment

Slide 1

Slide 2



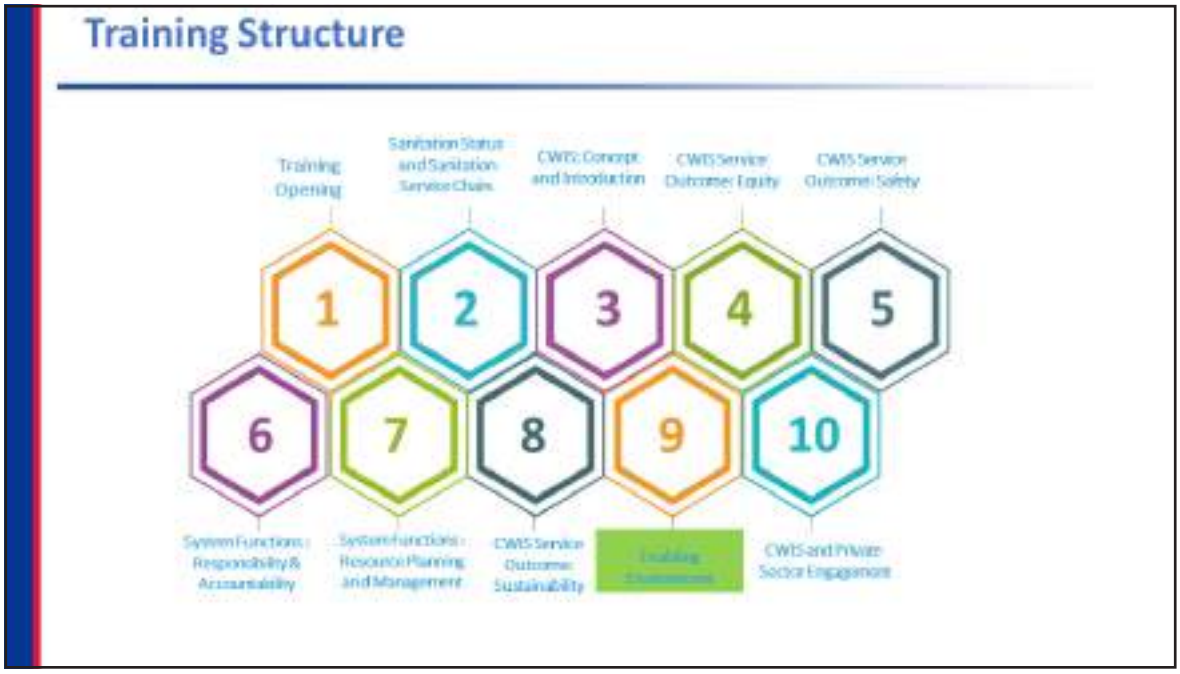
Slide 3

Remind the participants of the load shedding phase in Nepal, hours and hours of no electricity, every day life revolved around electricity. And now we have surplus electricity. Nepal declared hydropower as the National Priority Sector, and with this several provisions were made that supported the Upliftment of the sector. Today, Nepal has surplus hydropower...

After watching the given video; also discuss on the provisions that were made for the hydropower sector.

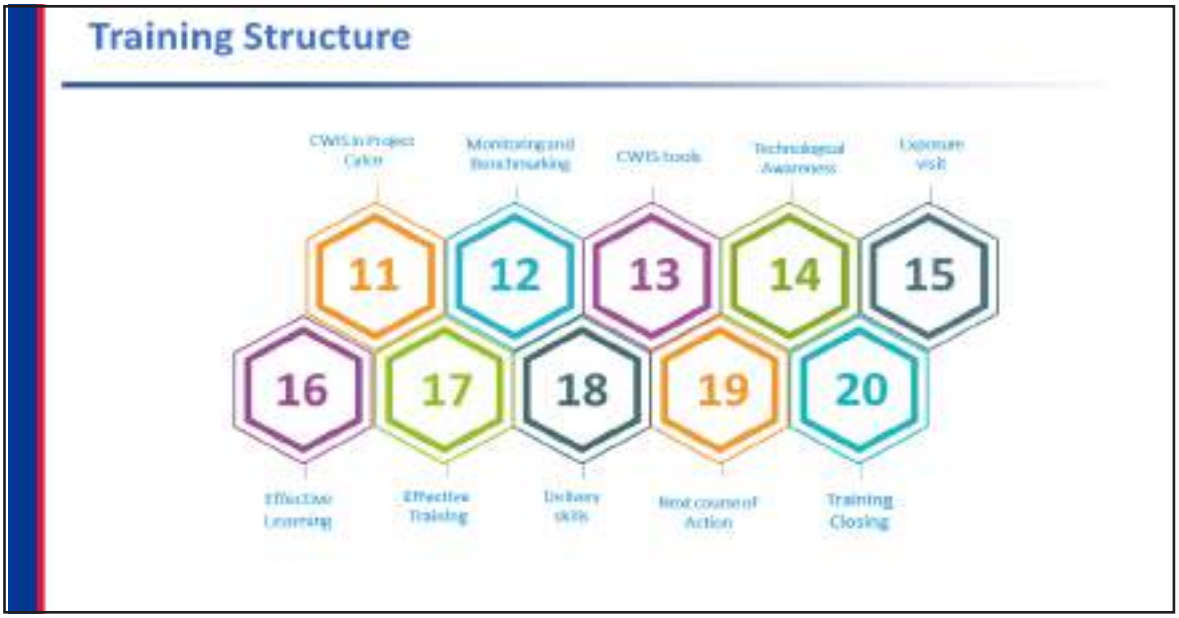
Discuss with participants what are the learnings from hydropower sector that we can apply to sanitation sector ??

Slide 4



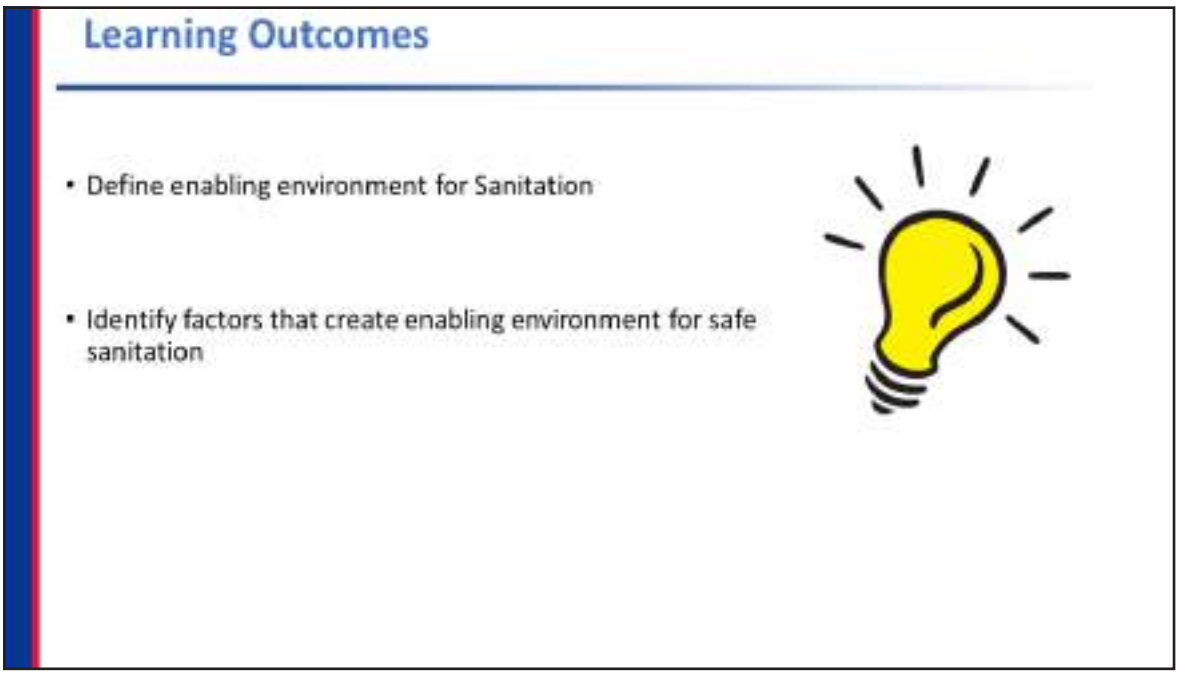
This training includes 20 main technical sessions, and are currently on session 9: Enabling Environment

Slide 5



This training includes 20 main technical sessions, and are currently on session 9: Enabling Environment

Slide 6



Slide 7

Presentation Outline

- Enabling Environment

1. Legal Instruments
2. Institutional Arrangement
3. Sector Financing
4. Service Provider Capacity
5. Regulatory Effectiveness
6. Infrastructure and Technology
7. Social Acceptance & Affordability
8. Private Sector Enablement

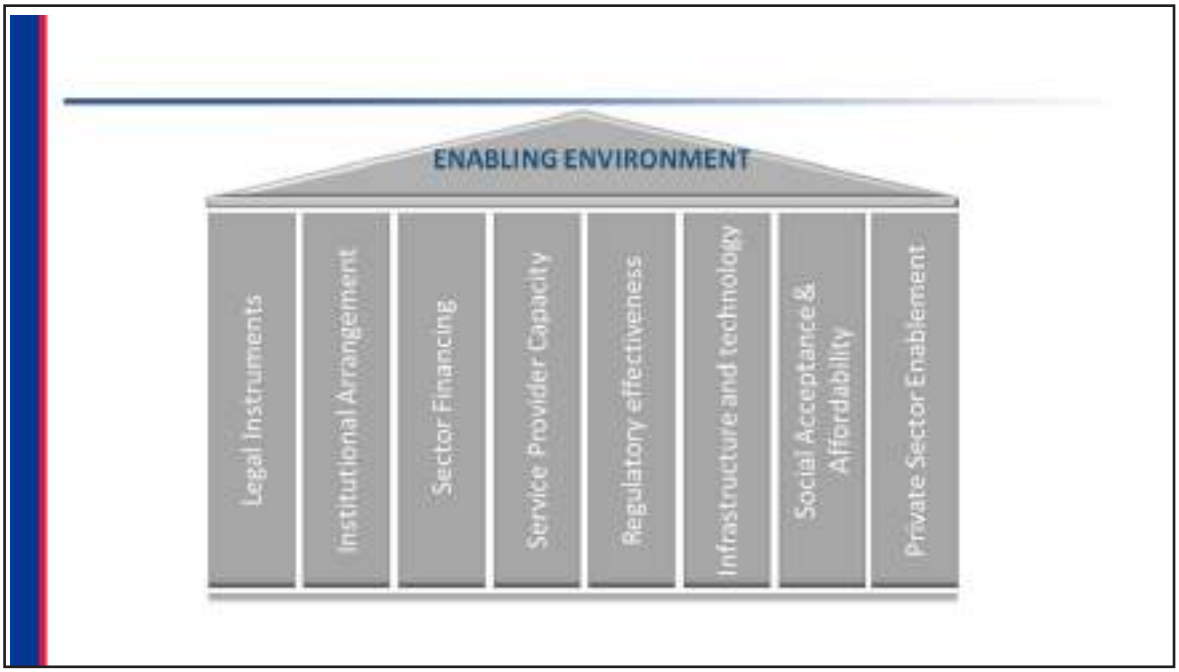
Slide 8

Enabling Environment

An **Enabling Environment** is a set of interrelated sector functions that impact the capacity of governments and public and private partners to engage in the WASH service delivery development processes in a sustained and effective manner

Slide 9

Slide 10



Link to the learning from hydropower sector. Inform the participants that as we go ahead on discuss we will analyse the aspects from hydropower case.

Slide 11

1. Legal Instruments

- National priority through clear provisions in policy framework
- Provide clear guidance for service delivery including investment
- Incentives and Penalties

Slide 12

1. Legal Instruments

i. Constitution of Nepal

Fundamental Rights (Section 3)

- Article 30 (1) – Every citizen has the **right to survive in a clean & healthy environment.**
- Article 35 (4) – Every citizen has the **right to access safe drinking water and sanitation.**
- Article 44 (1) – Every consumer shall have the **right to obtain quality goods and services.**
- Article 44 (2) – A person who has suffered injury from any substandard goods or services shall have the **right to obtain compensation** in accordance with law.

Slide 13

1. Legal Instruments

ii. Water Supply and Sanitation Act, 2079

Water Supply and Sanitation Rights

- Clause 3(2)(क) – Right to quality sanitation service easily and at affordable cost.

Water Supply and Sanitation Operation and Management

- Clause 7(1) – Safe and quality water supply and sanitation service operation and management need to be provided by Federal government, Provincial government & Local government.
- Clause 7(2) – The Federal government, Provincial government & Local government can do the water supply and sanitation service operation and management by their self or through organized organization.

Slide 14

1. Legal Instruments

ii. Water Supply and Sanitation Act, 2079

Water Supply and Sanitation Operation and Management

- Clause 7(3) - Through mutual coordination the Federal government, Provincial government & Local government needs to provide basic water supply and sanitation service operation and management by their self or by self owned or controlled organized organization.

Licensing

- Clause 9(1) – Need to take license to provide water supply and sanitation service, project or service network survey, construction, operation and management ....
- Provisions regarding the application for license, duration of license, cancellation of license, etc...

Slide 15

1. Legal Instruments

ii. Water Supply and Sanitation Act, 2079

Service to be provided

- Clause 18(1) – Licensed organization need to provide or arrange to provide water supply and sanitation service in justifiable way within their service area.

Tariff fixation commission

- Clause 28(1) – Provision for Tariff fixation commission for Water Supply and Sanitation service.

Set Quality Standard

- Clause 36(1) – The government can set Water Supply Quality Standard and Sanitation Service Standard.

Slide 16

1. Legal Instruments

ii. Water Supply and Sanitation Act, 2079

Mixing of Wastewater

- **Clause 37(1) – Prohibition to mix or discharge Fecal Sludge** mixed or not mixed wastewater in sewer network or discharge Fecal Sludge in river, pond, lake, dam, or society or public land that do not meet Effluent Quality Standard.

Service Monitoring and Inspection

- **Clause 39** – Ministry of Water Supply to **appoint an inspector for Quality Standard implementation, Monitoring and Inspecting.**
- **Clause 40** – Inspector to **regularly monitor wastewater effluent** standard based on the collected samples test and analysis.

Slide 17

1. Legal Instruments

ii. Water Supply and Sanitation Act, 2079

Service Monitoring and Inspection….

- **Clause 41** – Inspector to **regularly monitor service level of the licensed operator's sanitation service**

Crime and Punishment

- **Clause 42(1) – Activities considered as crime**:

(क) Without permission construction and operation, project or service system regarding Water Supply Service and Sanitation Service;

(ग) Water Supply and Sanitation Service use or its misuse without permission

Slide 18

1. Legal Instruments

ii. Water Supply and Sanitation Act, 2079

Crime and Punishment

- **Clause 42(1) – Activities considered as crime**:

(छ) Damaging or destroying of any structure or installed pipelines or goods or installed meter or purification system or any other equipments regarding Water Supply Service, Sanitation Service, Project or Service system;

(ज) Discharging of Wastewater with or without Faecal Sludge below Effluent Quality Standard in sewerage system, or discharging Faecal Sludge directly in river, stream, lakes, ponds, reservoir or public land.

(झ) If permitted organization takes tariff against the act provisioned tariff or approved basis or standard.

Slide 19

1. Legal Instruments

ii. Water Supply and Sanitation Act, 2079

Crime and Punishment

- **Clause 42(2) – Punishment:**

(क) Fine of NRs. 1 Lakh or 1 year imprisonment or both for crime as per Clause 42(1)(क);

(ख) Fine of NRs. 1 Lakh for crime as per Clause 42(1)(ख, ग, घ र ट);

(ग) 3 month to 1 year imprisonment or Fine of NRs. 5 Lakh or both for crime as per Clause 42(1)(ङ to ञ).

Slide 20

1. Legal Instruments

ii. Water Supply and Sanitation Act, 2079

Crime and Punishment

- **Clause 43 – Compensation:**

(2) Appropriate compensation for damaging Water Supply or Sanitation project or service system and their structures.

Slide 21

1. Legal Instruments

ii. Water Supply and Sanitation Act, 2079

Coordination Committee

- **Clause 55** – Formation of Intra government level coordination committee to suggest government of Nepal for policy & project planning and implementation on subjects related to Water supply and Sanitation;
  - Minister, Ministry of Water Supply – Chairman
  - State minister, Ministry of Water Supply; all 7 provinces Provincial Minister, Water Supply related Ministry; Secretary, Ministry of Water Supply; total 7 number including 3 women from Chairman or Vice-chairperson of Local Level representing from each province and appointed by Government of Nepal – Member
  - Joint Secretary of MoWS – Member Secretary

Slide 22

WASH Policy draft – Key features on sanitation

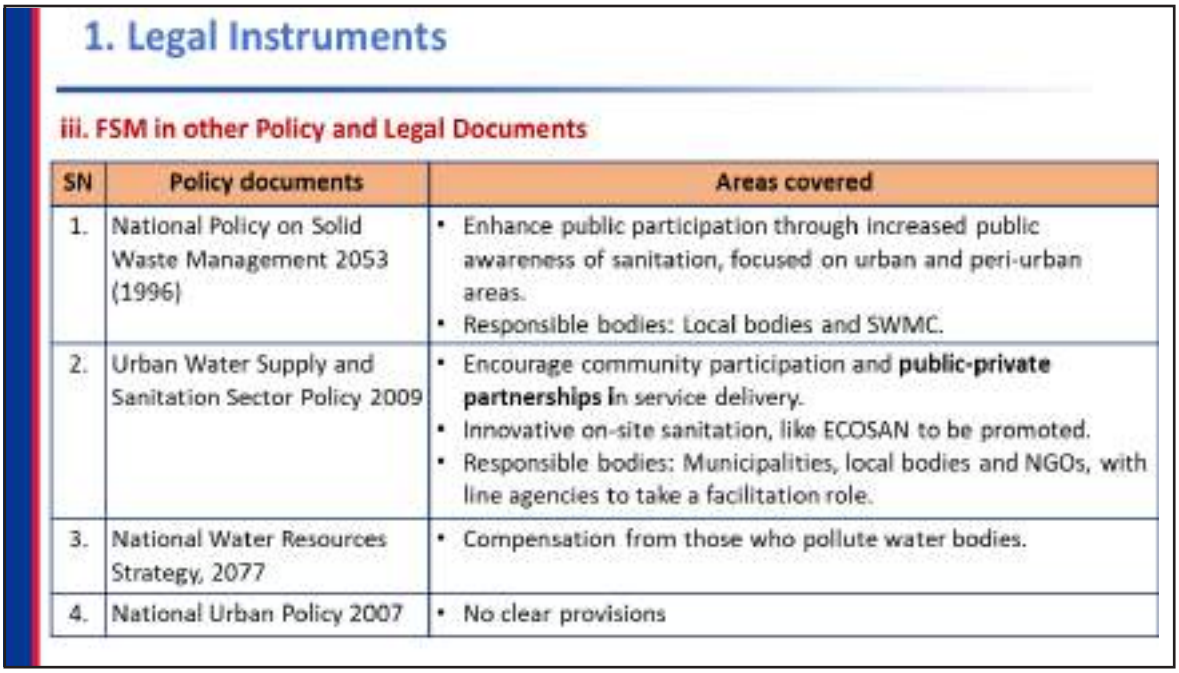
Strategy	Working Policies
Gradual improvement, strengthening and integration of water and sanitation service providers	• Enhancing province and local capacity in project planning, selection and implementation • Implementing capacity building programmes to strengthen service delivery capability of service providers and WUSCs • Refining policy, act, by-laws, standards and directives on water and sanitation

Slide 23

WASH Policy draft – key features on sanitation

Strategy	Working Policies
Reducing proportion of untreated wastewater and disposal with effective wastewater management	• Preparing and application of standards on disposal of domestic, industrial and agricultural wastewater • Expanding sewer network with treatment in dense urban areas. Unregulated disposal of untreated wastewater will be discouraged. On-site sanitation will be promoted in low dense areas • Implementing effective treatment systems in small and emerging towns, not connected to sewer network, to treat human waste • Operation and maintenance cost of sewer network will be done based on cost sharing with local levels and benefited population, • Facilitating in the construction of (public) toilets in each wards
Planning and implementing Faecal Sludge Management with treatment while ensuring clean and ambient river and lake quality and environment protection	• Prioritizing decentralized treatment systems while ensuring ambient quality in the river and streams • During the establishment of wastewater system and construction of treatment plant, federal and provincial government will provide loan or grant depending on need and co-financing arrangements with local levels and communities • Incentivizing engagement of private sector in wastewater management considering financing security and establishment of paripuak fund
Gradual improvement, strengthening and integration of water and sanitation service providers	• Enhancing province and local capacity in project planning, selection and implementation • Implementing capacity building programmes to strengthen service delivery capability of service providers and WUSCs • Refining policy, act, by-laws, standards and directives on water and sanitation

Slide 24



1. Legal Instruments

iii. FSM in other Policy and Legal Documents

SN	Policy documents	Areas covered
1.	National Policy on Solid Waste Management 2053 (1996)	• Enhance public participation through increased public awareness of sanitation, focused on urban and peri-urban areas. • Responsible bodies: Local bodies and SWMC.
2.	Urban Water Supply and Sanitation Sector Policy 2009	• Encourage community participation and **public-private partnerships i**n service delivery. • Innovative on-site sanitation, like ECOSAN to be promoted. • Responsible bodies: Municipalities, local bodies and NGOs, with line agencies to take a facilitation role.
3.	National Water Resources Strategy, 2077	• Compensation from those who pollute water bodies.
4.	National Urban Policy 2007	• No clear provisions

Slide 25

1. Legal Instruments

iii. FSM in other Policy and Legal Documents

SN	Policy documents	Areas covered
5.	Fifteenth Plan: 2076/77-2080/81	• Clarity on WWM, FSM, need of effluent discharge standard • Envisioned financing WWM/FSM and private sector engagement in the sector
6.	Sanitation and Hygiene Master Plan (2011)	• Decentralized sanitation options preferred. • **Community and private sector participation** in waste management. • Responsible bodies: Local bodies, government and sector stakeholders.
7.	Vision Paper, Ministry of Urban Development 2069 (2012)	• Increase public participation and awareness and adopt **PPP approach**. • Responsible bodies: MoUD, municipalities.
8.	Water Supply Management Board Act, 2063	• Provisions for Municipality level Water supply and sanitation service operation and management through formation Water supply management board.

Slide 26

1. Legal Instruments

iii. FSM in other Policy and Legal Documents

SN	Policy documents	Areas covered
9.	Local Government Operation Act - 2074	Local government responsible for • operation and management of local level projects, • Policy, law, standard, project planning, implementation and regulation of basic health, sanitation and water supply. • Pollution control and Awareness raising regarding sanitation • Collection, reuse, treatment, disposal and setting tariff regarding Solidwaste • Operation and management of water supply and sanitation
10.	Institutional and Regulatory Framework for FSM in Nepal	• Clear roles and responsibilities of different stakeholders on FSM.
11.	Total Sanitation Guideline	• A water-sealed toilet should be connected with properly designed septic tank at both household and institutional level for FSM

Slide 27

1. Legal Instrument – Municipal Level

FSM by-laws Mahalaxmi Municipality

FSM Policy Dhulikhel Municipality

Slide 28

2. Institutional Arrangements

- The term "**institutional framework**" refers to **a set of formal organizational structures, rules and informal norms for service provision**
- An **institutional framework** for **sanitation and water** management consists of a range of different organizations that are in place (or need to be in place) to develop and manage water resources and the delivery of water and sanitation services at different levels of society

Source: Sustainable Sanitation and Water Management(SSWM) tool box

How sanitation sector is positioned within the institutional structure at the National level and City level is important and determine its faith further on

Slide 29

2. Institutional Arrangement ...

i. National Level

SN	Organization	Responsibility
1.	Ministry of Water Supply	• Development of Policy, law, standard, regulation and project planning/ M&E of National level (or Large) water supply and sanitation projects.
2.	Department of Water Supply and Sewerage Management	• Project planning, implementation, M&E of National level (or Large) water supply and sanitation projects. • Prepare design, planning and O&M guidelines regarding water supply and sanitation projects
3.	Federal Water Supply and Sanitation Project Offices	• Project planning, implementation, M&E of National level (or Large) water supply and sanitation projects.
4.	Kathmandu valley Water Supply Management Board	• Asset owner of Water supply and sanitation system • Can hire operator for providing Water supply and sanitation services

Slide 30

2. Institutional Arrangement ...

i. National Level

SN	Organization	Responsibility
5.	Water Supply Management Board at Bharatpur, Hetauda, Dharan & Kavre	• Asset owner and operator of Water supply and sanitation services
6.	Kathmandu Upatyaka Khanepani Limited	• Development of Policy, law, standard, regulation and project planning/ M&E of National level (or Large) water supply and sanitation projects.
7.	Nepal Water Supply Corporation	• Provide water supply service at 22 municipalities.

Slide 31

2. Institutional Arrangement ...

ii. Provincial Level

SN	Organization	Responsibility
1.	Provincial Ministry working related to Water Supply and Sanitation	• Development of Policy, law, standard, regulation and project planning/ M&E of Provincial level water supply and sanitation projects.
2.	Provincial Water Supply and Sanitation Offices	• Project planning, implementation, M&E of Provincial level water supply and sanitation projects.

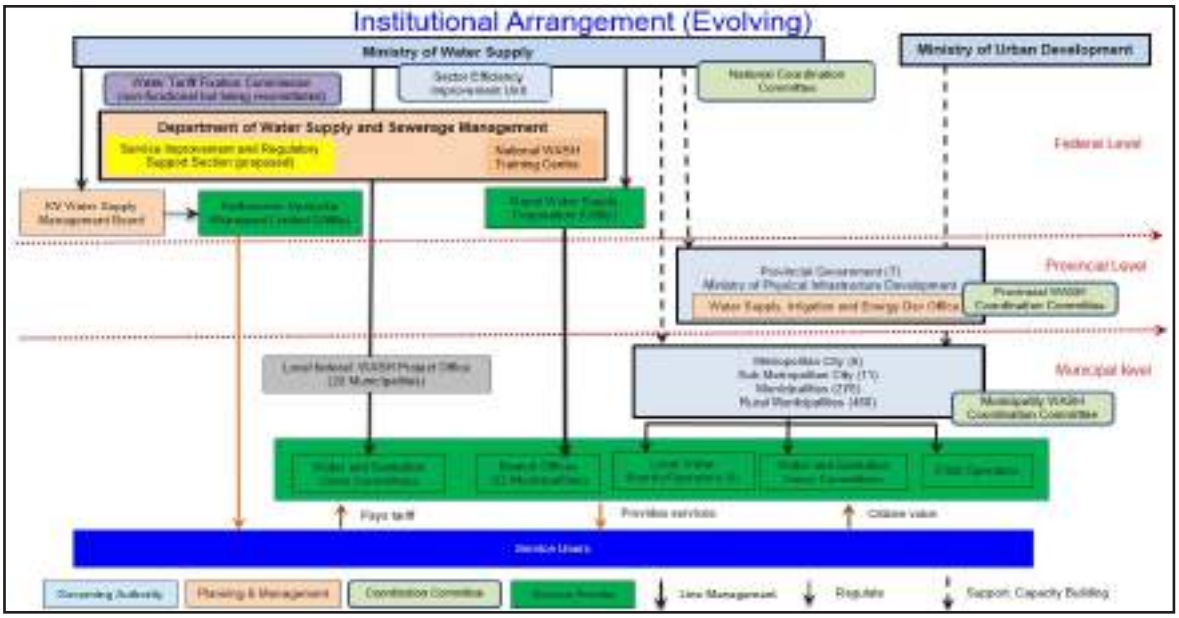
Slide 32

2. Institutional Arrangement ...

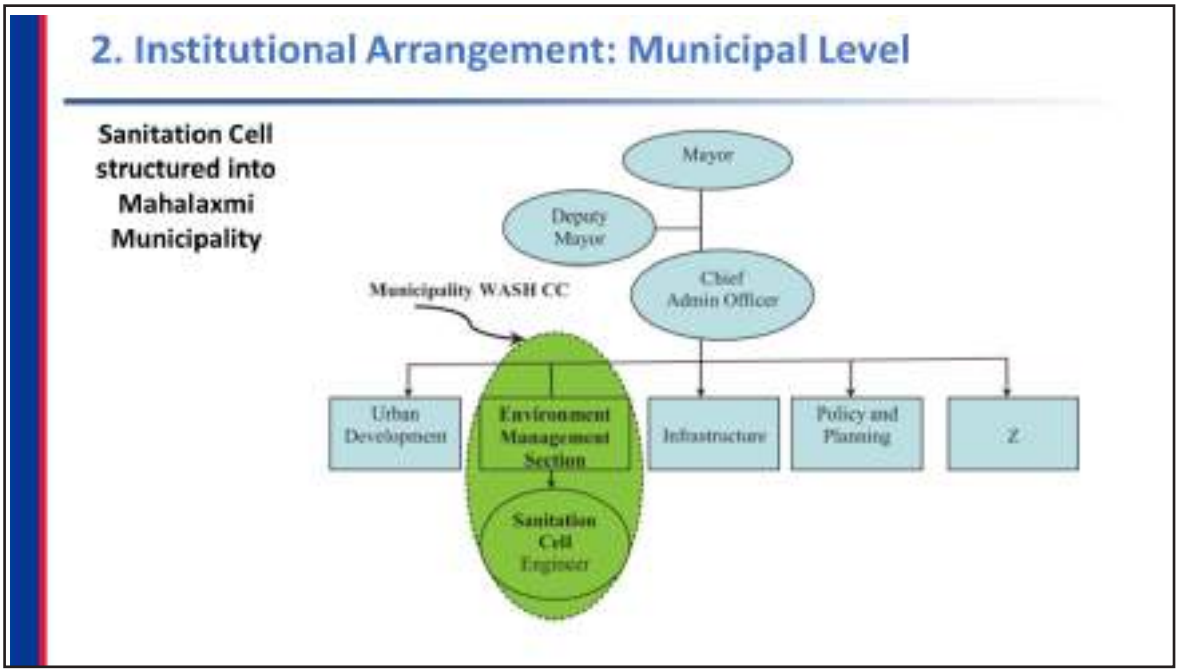
iii. Local Level

SN	Organization	Responsibility
1.	Municipality/ Rural municipality	• Development of Policy, law, standard, regulation, project planning/ M&E including operation and maintenance of Local level water supply and sanitation projects.
2.	Water Supply and Sanitation User's Committee	• Operation and maintenance of water supply and sanitation projects.

Slide 33



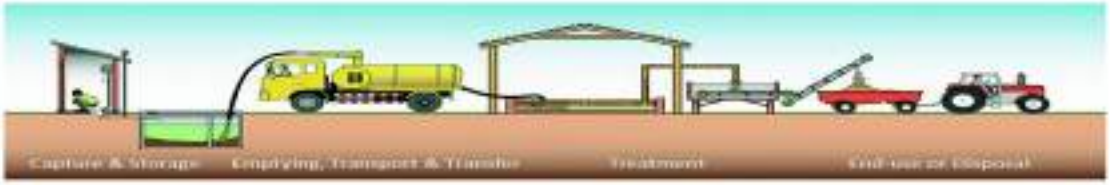
Slide 34



Slide 35

3. Sector Financing

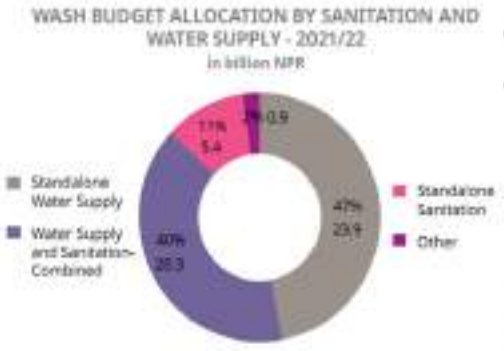
Investment is required across the sanitation chain: from the equipment used by sanitation entrepreneurs for collection; to the provision of decentralized transfer stations, essential for incentivizing FSM businesses to serve low-income areas; to faecal sludge treatment facilities, which ultimately secure positive citywide impacts on health, environment and wellbeing.



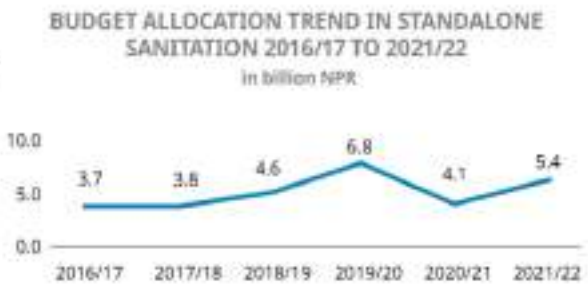
Slide 36

3. Sector Financing

i. Government Sector (all 3 Tiers)



- NPR 50.5 billion is 1.4 percent of the GDP and 2.8 percent of the federal and provincial combined overall budget
- Major financing source on WASH Sector
- Priority increasing to finance on FSM



Source???

Slide 37

3. Sector Financing

ii. Development Partners

- Different development partners contribute for the development of WASH sector. DPs provide technical and financial support for the developmental works
- Financing may be either on Loan or Grant

iii. Private Sector

- Private organizations are needed to provide ease service and for sustainable solutions
- To meet the National as well international commitments (like SDG), Private financing is essential. WASH sector needs to explore much for Private financing

Slide 38

4. Service Provider Capacity

- **FSM service provider** mainly work on **construction of toilets, its cleaning and transportation** of Faecal Sludge in Nepal.
- **Improving the operational efficiency of FSM service providers** will be essential in the short to medium term, positioning them to provide safe sanitation products and services in the long term without prolonged external support.

Slide 39

5. Regulatory Effectiveness

Safe and equitable FSM service provision depends on well-designed regulations to formalize the sector and provide clear guidelines for those working within it. Regulations cover every aspect of **sanitation service provision, from safe emptying practices to treatment and proper disposal/reuse including setting tariffs to support for businesses.**

Slide 40

5. Regulatory Effectiveness

Regulatory Works for FSM includes

- **Licensing** requirements **for FSM service provider,**
- **Set minimum standards for on-site sanitation facilities** in homes, for transportation of FSM, for treatment, effluent quality and disposal/reuse,
- **Development of guidelines & SOP for minimal standards** for FSM (including toilet design, toilet emptying procedures, and storage and treatment facilities)

The **Water Supply and Sanitation Act, 2079 (2022)** has envisioned

- Water Supply and Sanitation Tariff Commission, and
- Provision for appointing a Regulator by MoWS for inspection and regulation of water supply and sanitation services.

Slide 41

6. Infrastructure and Technology

Infrastructure and appropriate technology is required across the sanitation chain:

- from the construction of toilets and storage system;
- equipment used by sanitation workers to empty pits and septic tanks;
- to transfer the faecal sludge to the faecal sludge treatment facilities;
- installing appropriate FSTP and its proper O & M,

It helps for sustainable sanitation solutions which ultimately have citywide impacts on health, environment and wellbeing.

Accessibility, Affordability, Appropriateness and Easiness to use are the key things to be considered for selecting any Infrastructures or Technology.

Slide 42

7. Social Acceptance & Affordability

Social acceptance and affordability is one of the key factor essential for promotion and continuous use of the FSM infrastructure and products

Construction of toilet, its utilization, timely emptying the containments, construction of FSTP, utilization of FSTP etc. all depends on the social behaviour and the affordability of the public.

Slide 43

7. Social Acceptance & Affordability

Golbazar Municipality in Siraha struggling to keep poop in the loop

Aawaaj News; March 26, 2021

Kirtipur Municipality struggling in Fecal Sludge Management for want of treatment plant

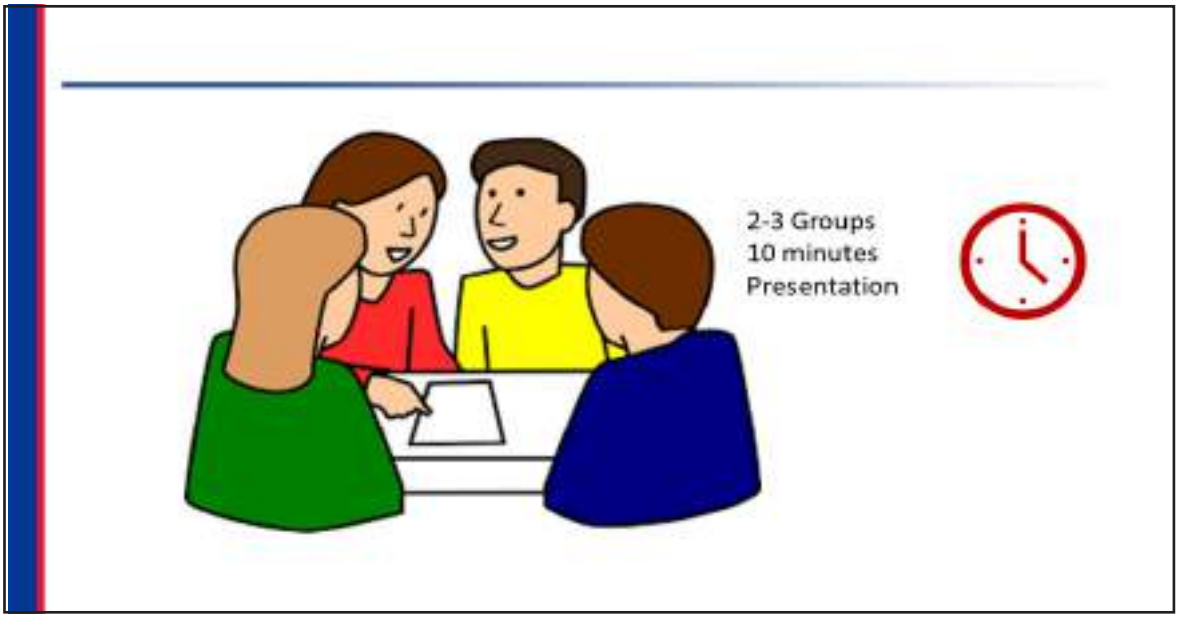
Aawaaj News; February 26, 2021

Slide 44

8. Private Sector Enablement

- Public Utility operators and local governments struggle to deliver safely managed sanitation to residents at the scale required to serve everyone in many municipalities.
- Private sectors in Sanitation have a critical role to play in helping to bridge the service gap, offering efficiency, innovation and flexibility to address complex issues.
- FSTP designing, Construction works, Cleaning of Septic tank, Transportation of Faeces, FSTP O & M are some of the examples of private sector involvement in the FSM. But their **involvement in the sector is very limited** which needs to be evolved for achieving the national and international targets as well as better environment.

Slide 45



Sanitation Workers Case Watch youtube video (https://www.youtube.com/watch?v=8Dx9PW-JSEyo&list=PLMI6wivbm5ZkXGnadUg23GTzmePw3M-HU)
Group work (10 minutes)
Group presentation (2 to 3 minutes each group)

For this group activity, divide the participants into two to three groups (not many to limit the time for the group presentation). After watching the video, ask the participants to identify the appropriate enabling environment to address this grim issue in our country. Consider all the enabling environment pillars discussed in the session. Refer to the youtube video on hydropower case shown during the introduction to this session.

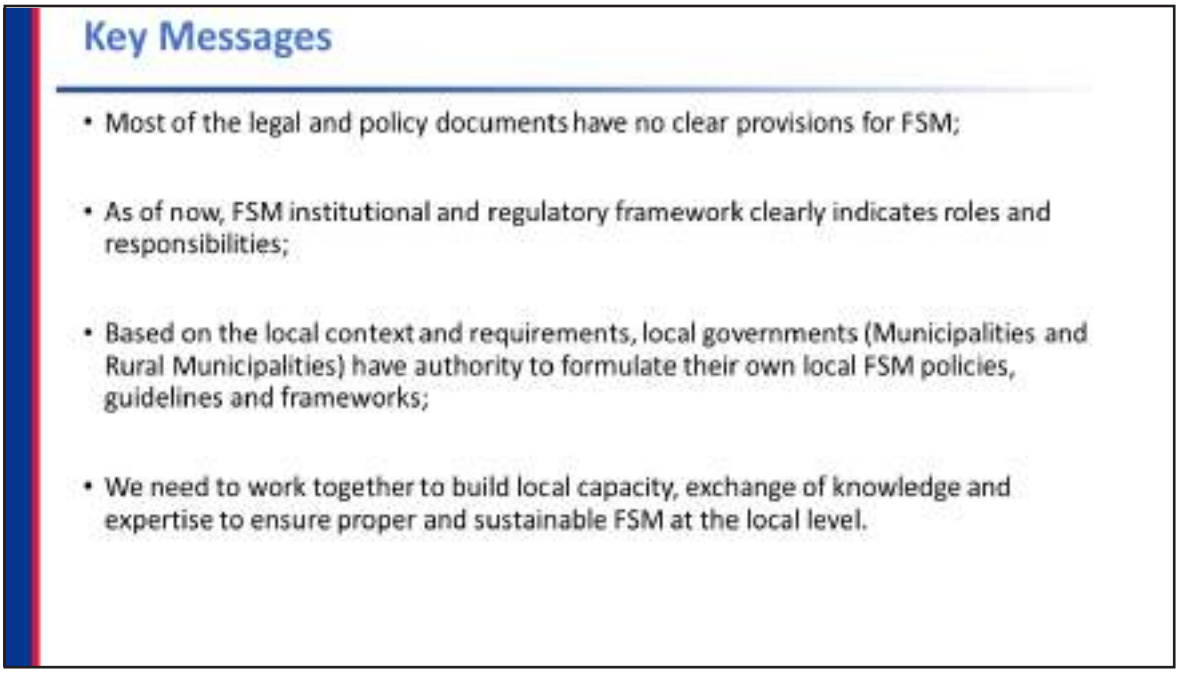
Slide 46

https://www.youtube.com/watch?v=8Dx9PWJSEyo&list=PLMI6wivbm5ZkXGnadUg23GTzme-Pw3M-HU (3:55 minutes)

Slide 47

Linking to India's experience to address such issue, inform the participants India's Garima project (Video showed during the safety case) addresses the needs and issues of sanitation workers in India. The icons included in the slides show some of the arrangements done by the Odisha government.
Government of Odisha has prioritize the issues of Sanitation workers, inform them that further information can be found in internet, it is good to understand how our neighbouring country is addressing such crucial issue on sanitation.

Slide 48



Slide 49

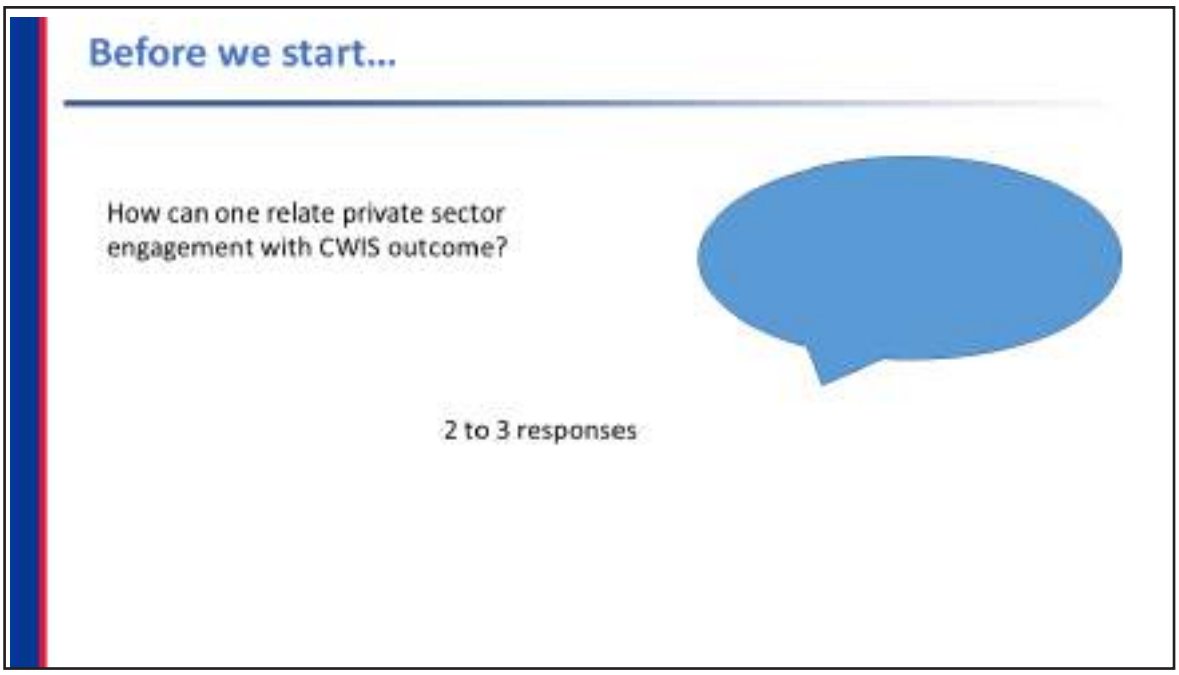
Slide 50

SESSION 10

Private Sector Engagement

Slide 1

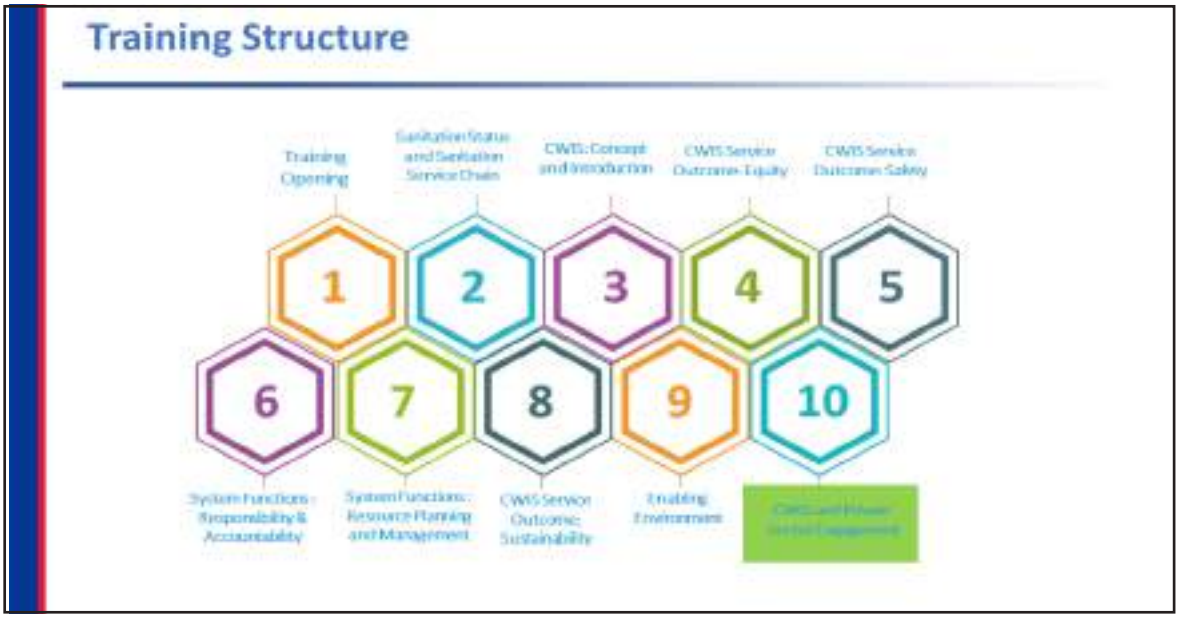
Slide 2



As discussed on earlier session, 'Enabling Environment' one of the important stakeholder for equitable, safe and sustainable outcomes is the engagement of private sector.

Ask participants how they can relate it- private sector engagement with CWIS outcome.
Collect 2 to 3 responses from participants

Slide 3



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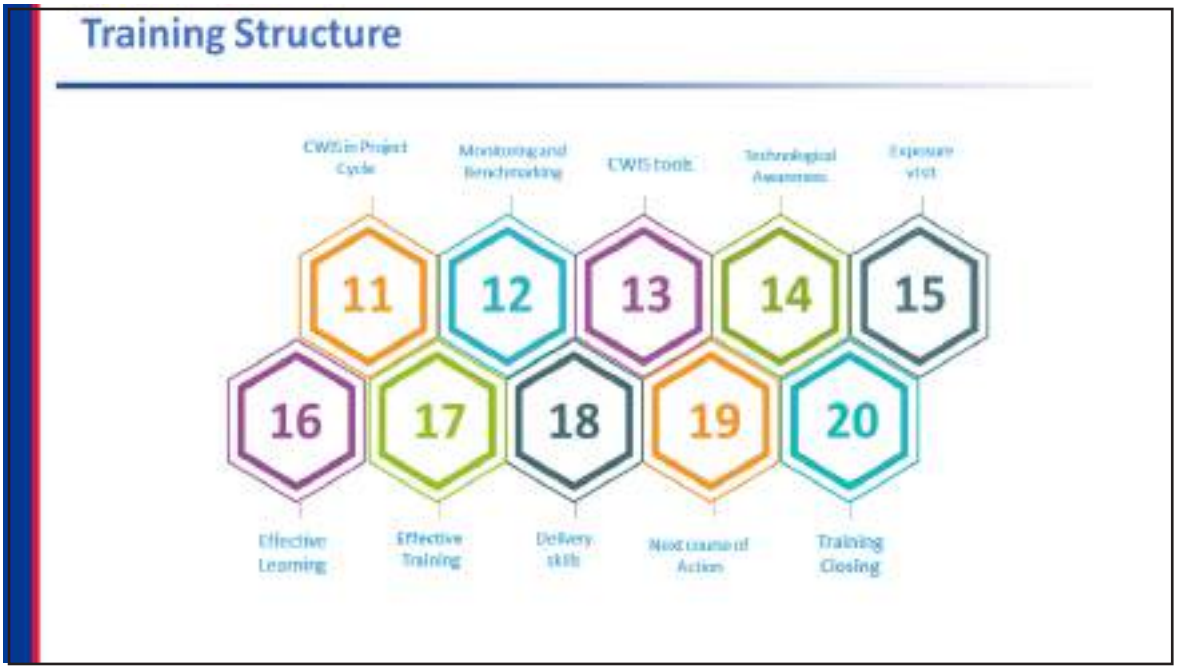
Slide 4



This training includes 20 main technical sessions, and are currently on session 13: CWIS Tools- SFD

Slide 5

Learning Outcomes

1. Define the role of private sector as a key stakeholder in CWIS implementation.
2. Analyze the engagement of private sector in sanitation service delivery based on experience sharing.

Slide 6

Presentation Outline

- Experiences Sharing
  - Initiatives in sanitation service provision
  - Opportunities and challenges while delivering the services
  - Scope of replication of the initiatives

Slide 7

Slide 8

Slide 9

Scope of Replication of the Initiatives

Slide 10

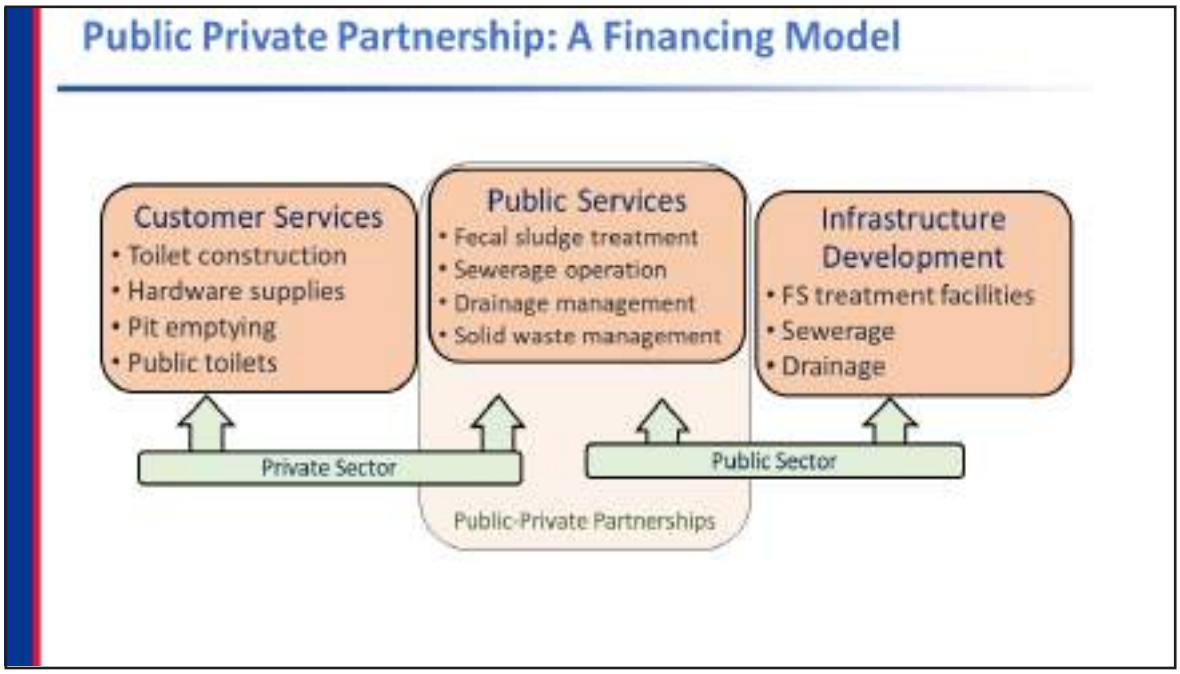
Structuring Private Sector Participation

Source: eawag

Slide 11

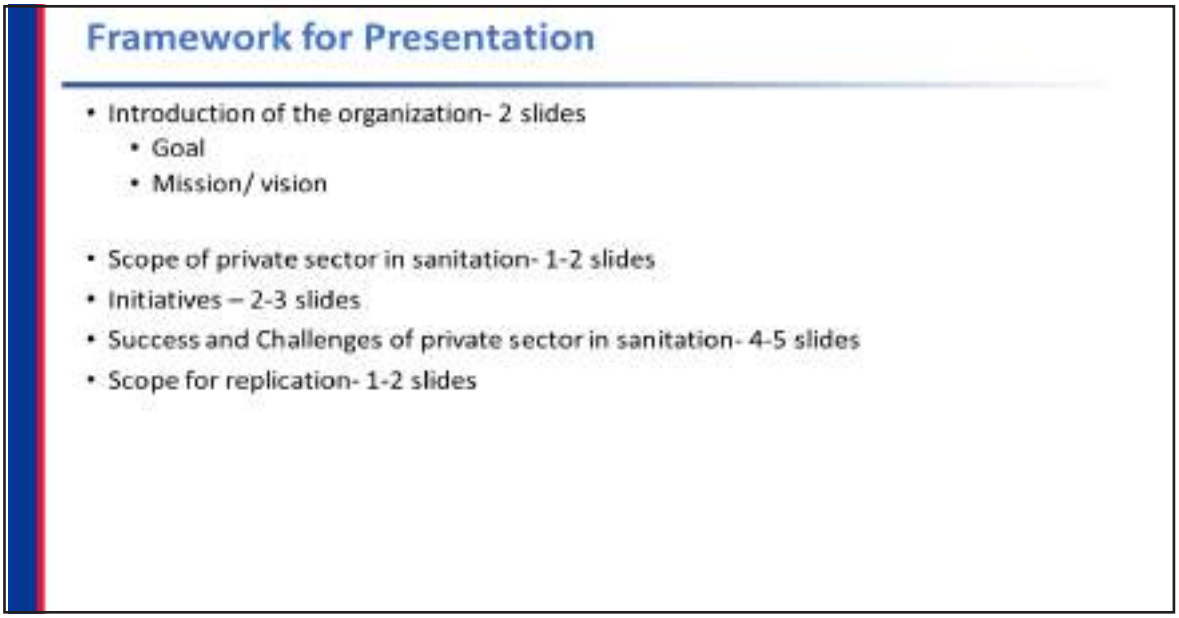
Ask the participants, where could be the positioning of free market, restricted market and PPP in the sanitation chain. (Free and Restricted market in the individual services, or the purchase of equipments (eps. In yellow areas) and PPP in green areas.

Slide 12



Many factors need to come together to achieve a positive sanitation outcome. These are some of the key ones. Both the public and private sectors will typically be involved. At the upstream end of the service chain, people are usually willing to pay to free themselves of fecal waste, but they may be less willing or able to pay for the public benefits provided by the downstream parts of the chain, so public funds are usually required as well. Whoever provides the services, effective local governance is needed to provide an enabling environment, which itself depends on the national policy, legal, institutional, regulatory and financial environment.

Slide 13



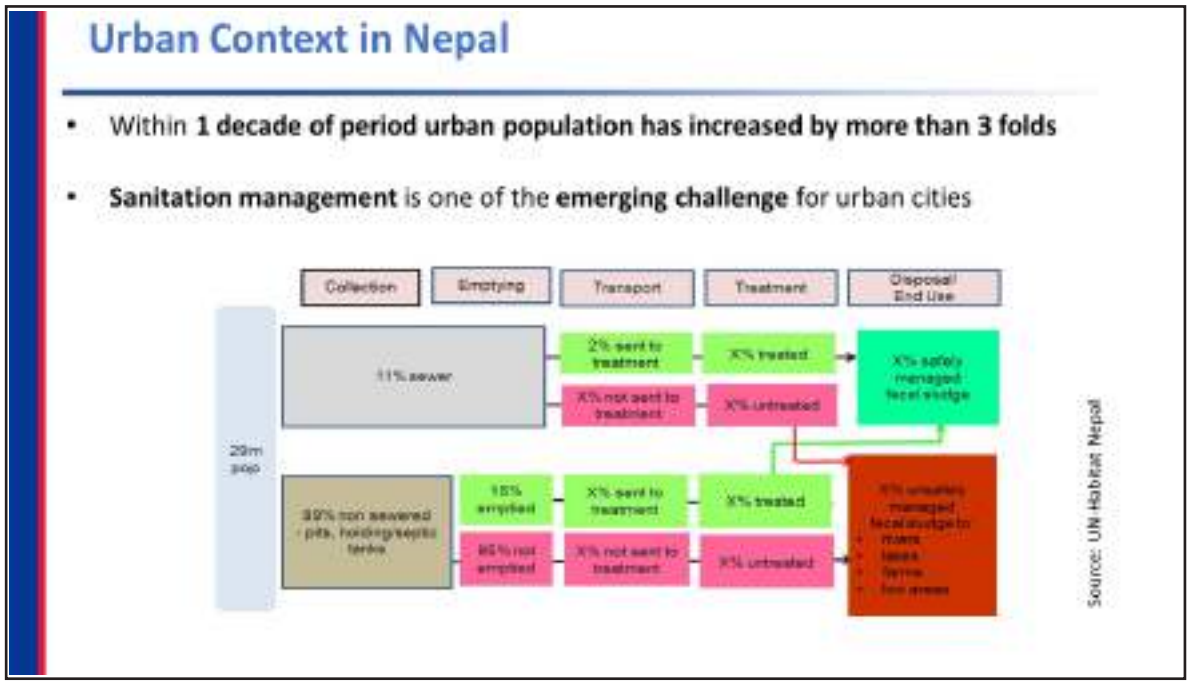
Slide 14

SESSION 11

Integrating CWIS in Project Cycle

Slide 1

Slide 2



Slide 3

CWIS Approach

- CWIS is an approach to urban sanitation **to achieve safely managed sanitation for all urban dwellers**
- **Holistic and comprehensive approach** to manage human waste throughout the sanitation service chain

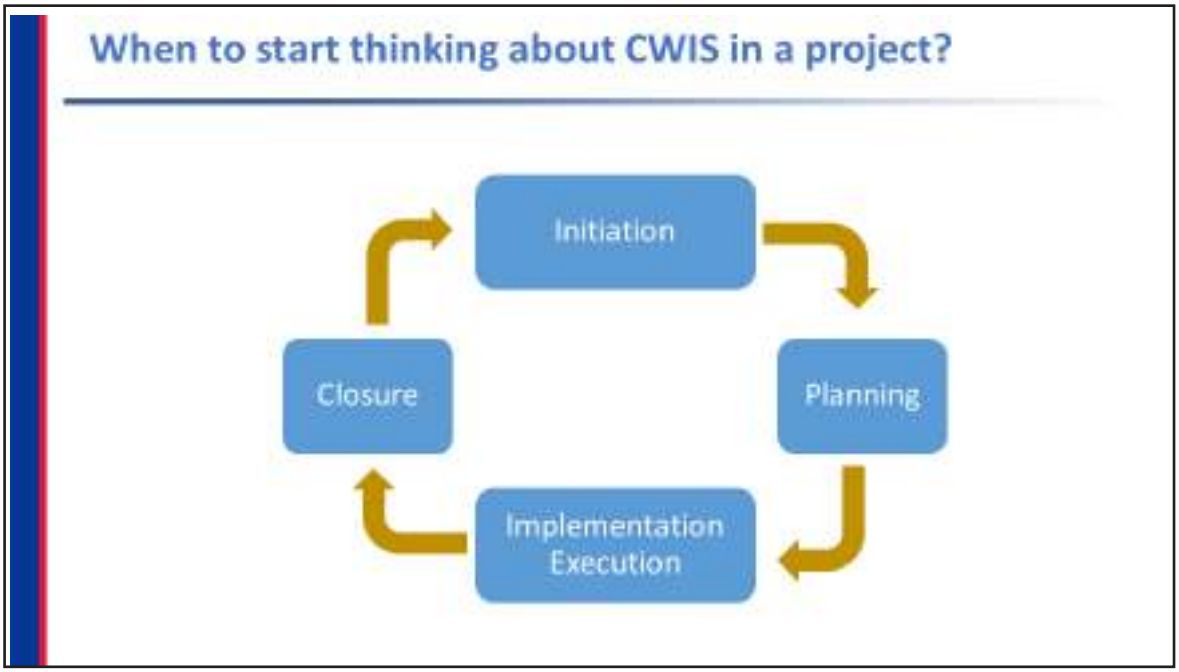
Slide 4

CWIS Approach

- **Inclusive and integrated sanitation services** for all urban residents including both off and onsite sanitation system
- Integrated urban sanitation solutions including drainage and solid waste management

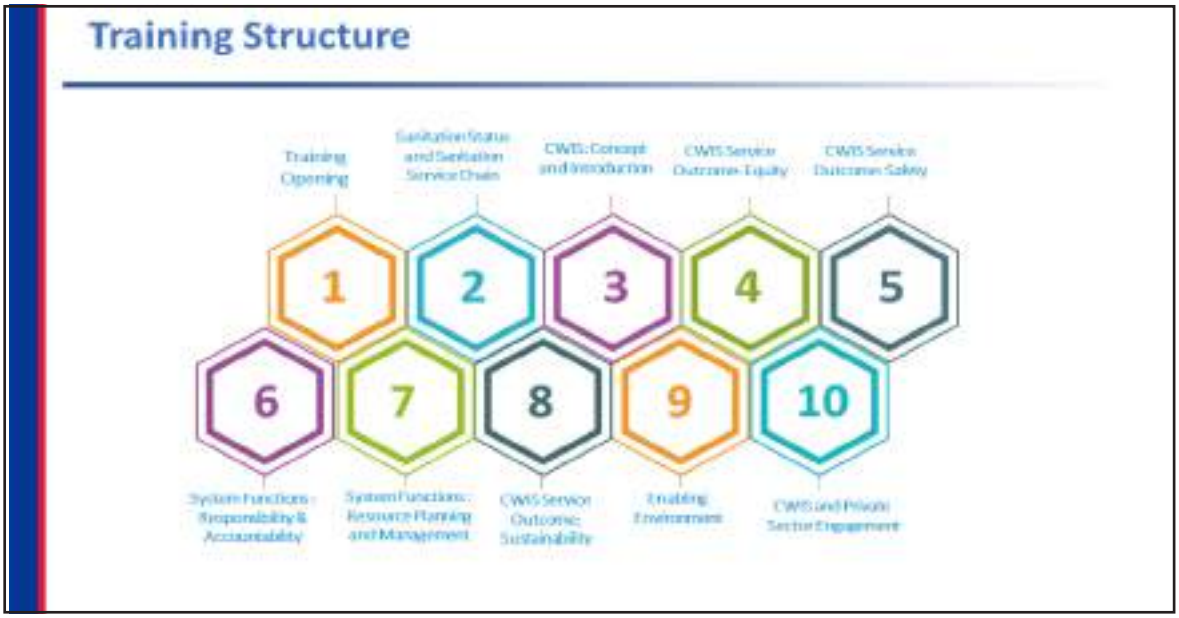
Slide 5

Slide 6



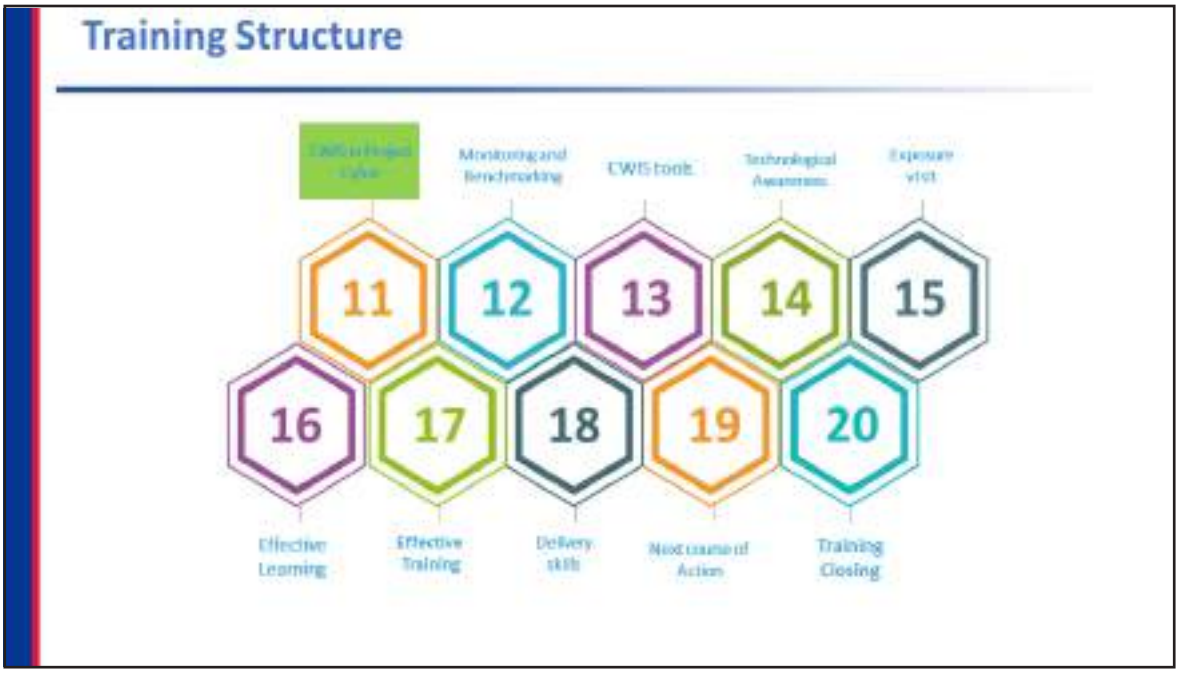
In most of the project cycle , project phases are similar , but, depending upon the nature of the project and its objectives, different steps and activities may be carried out

Slide 7



This training includes 20 main technical sessions, and are currently on session 10: Integrating CWIS in Project Cycle

Slide 8



This training includes 20 main technical sessions, and are currently on session 10: Integrating CWIS in Project Cycle

Slide 9

Learning Outcomes

- Relate all components of CWIS framework into a project cycle
- Apply CWIS approach in project planning, implementation and monitoring and evaluation of the project

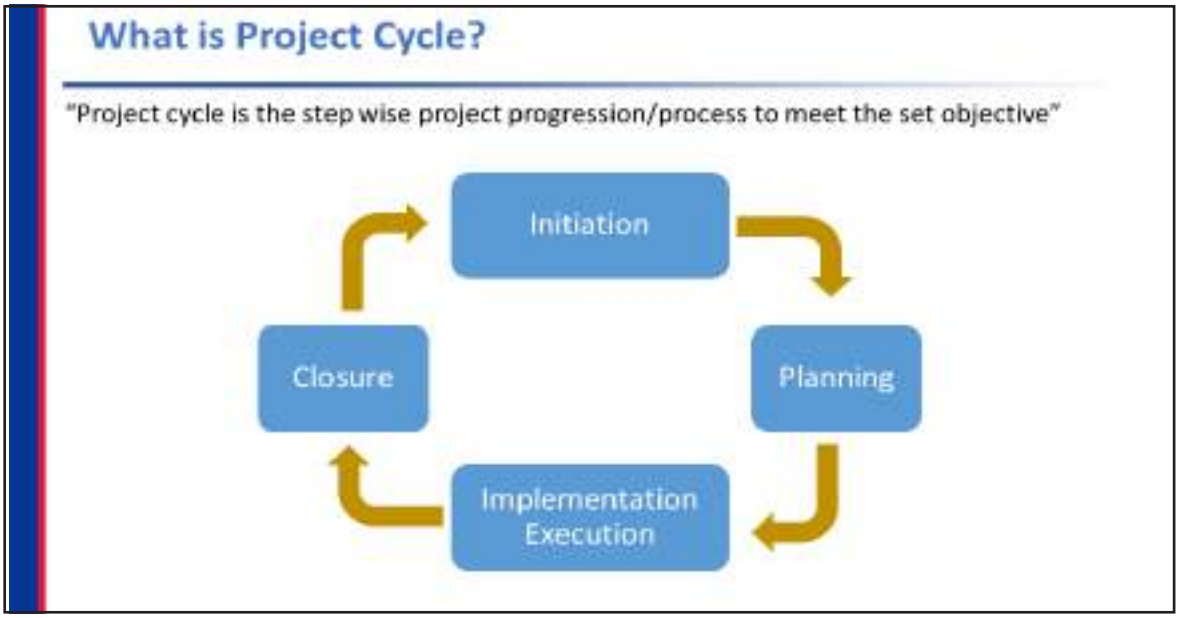
At the end of the session, participants will be able to …

Slide 10

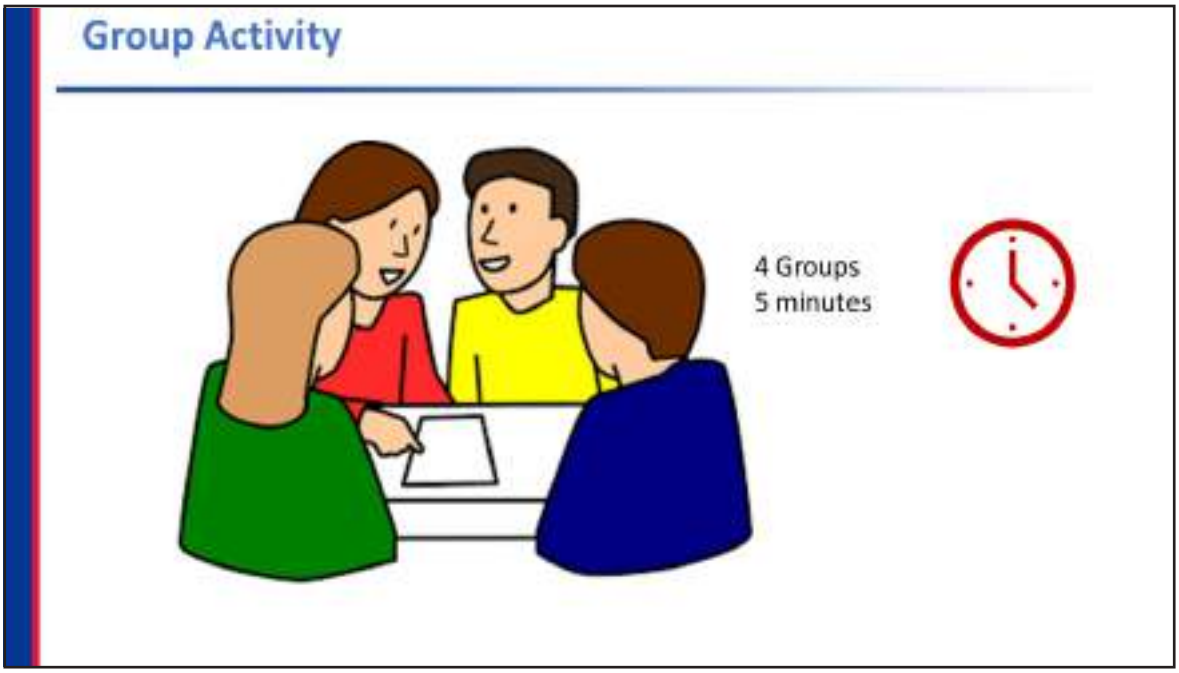
Presentation Outline

- What is Project cycle?
- Project cycle in CWIS
- Step I: Initiation of CWIS
- Step2: Planning and Organizing
- Step 3: Project implementation and monitoring
- Monitoring and Evaluation
- Case study
- Key Messages

Slide 11

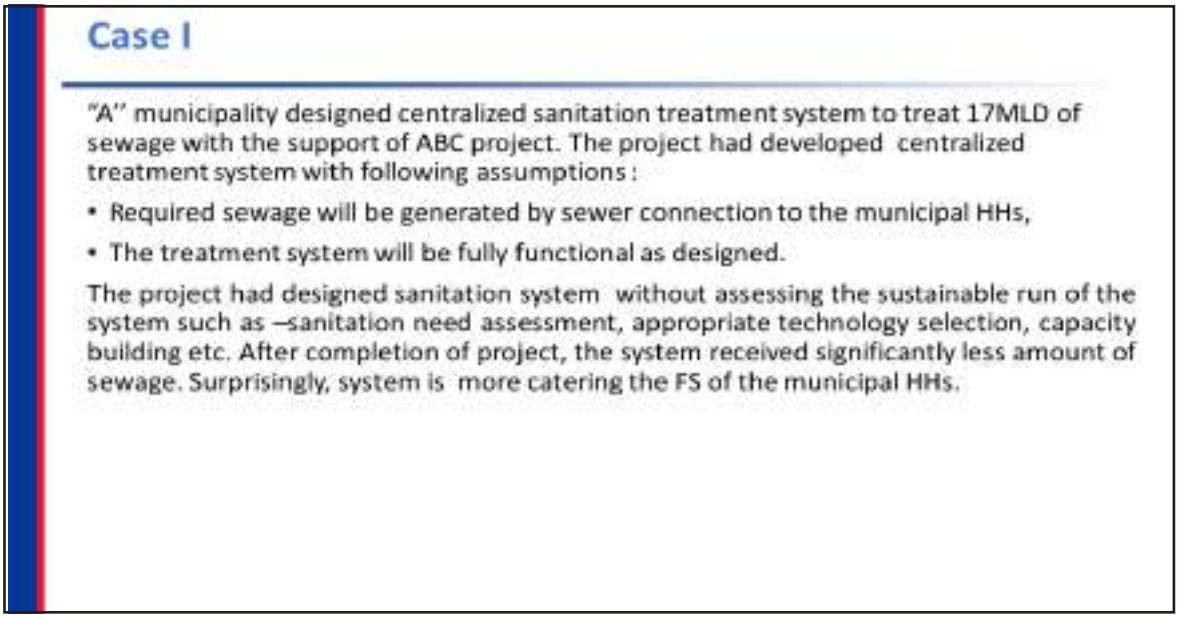


Slide 12

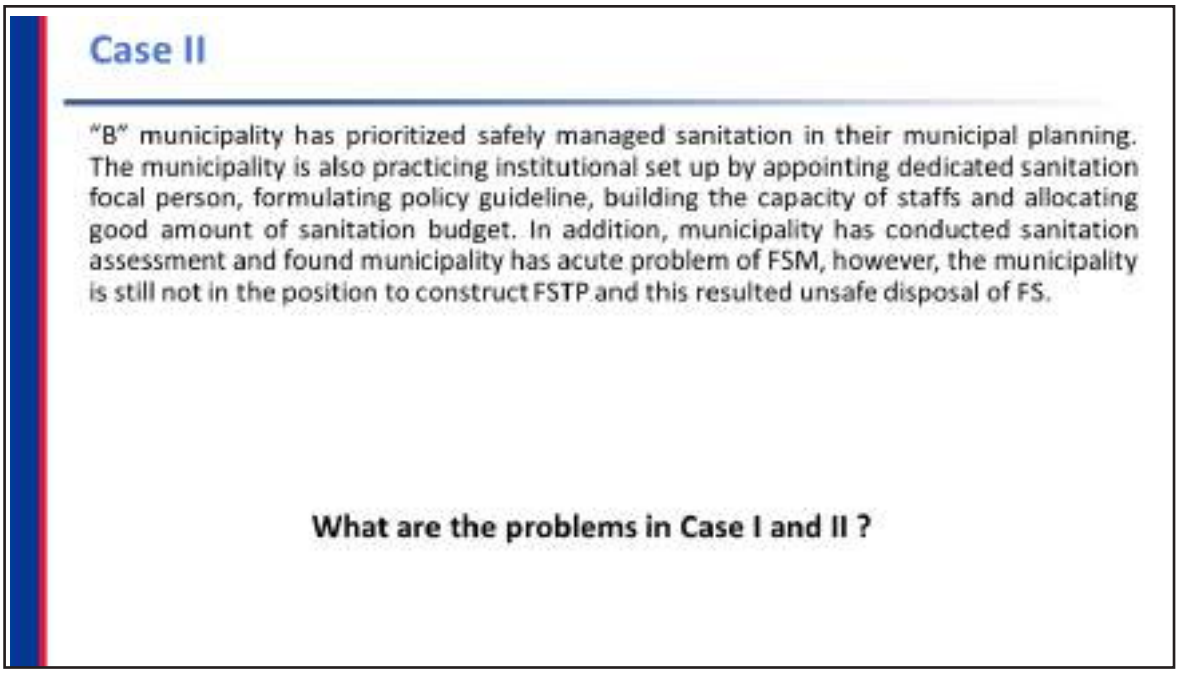


They are going for a group work. For this, participants will be provided a case and will be divided into 4 groups

Slide 13

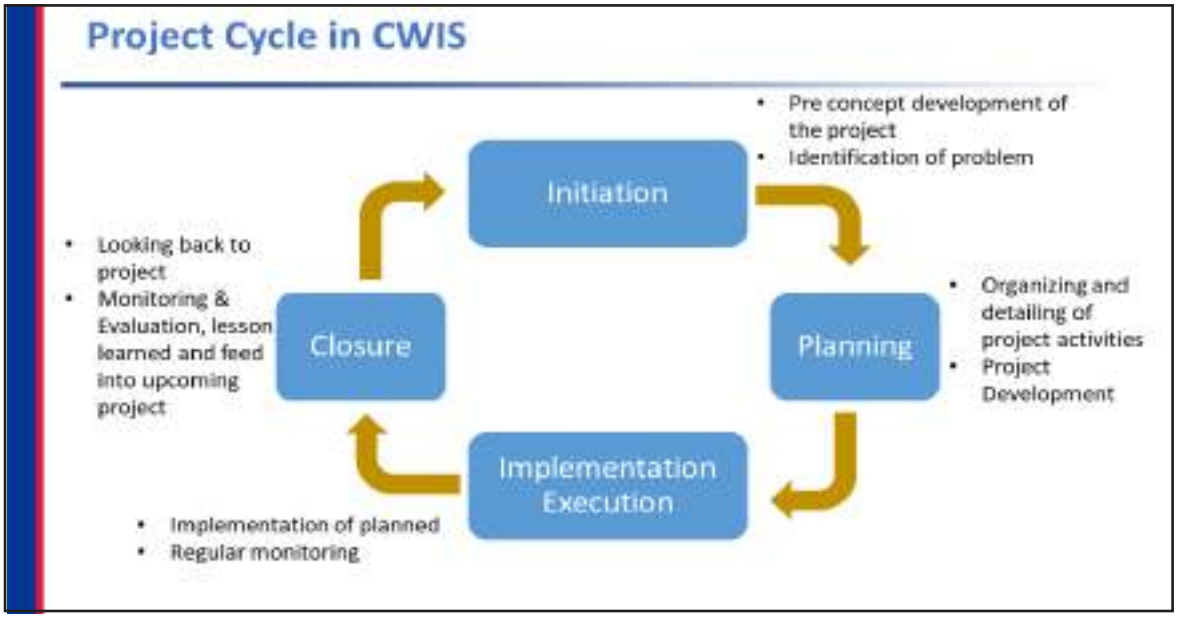


Slide 14



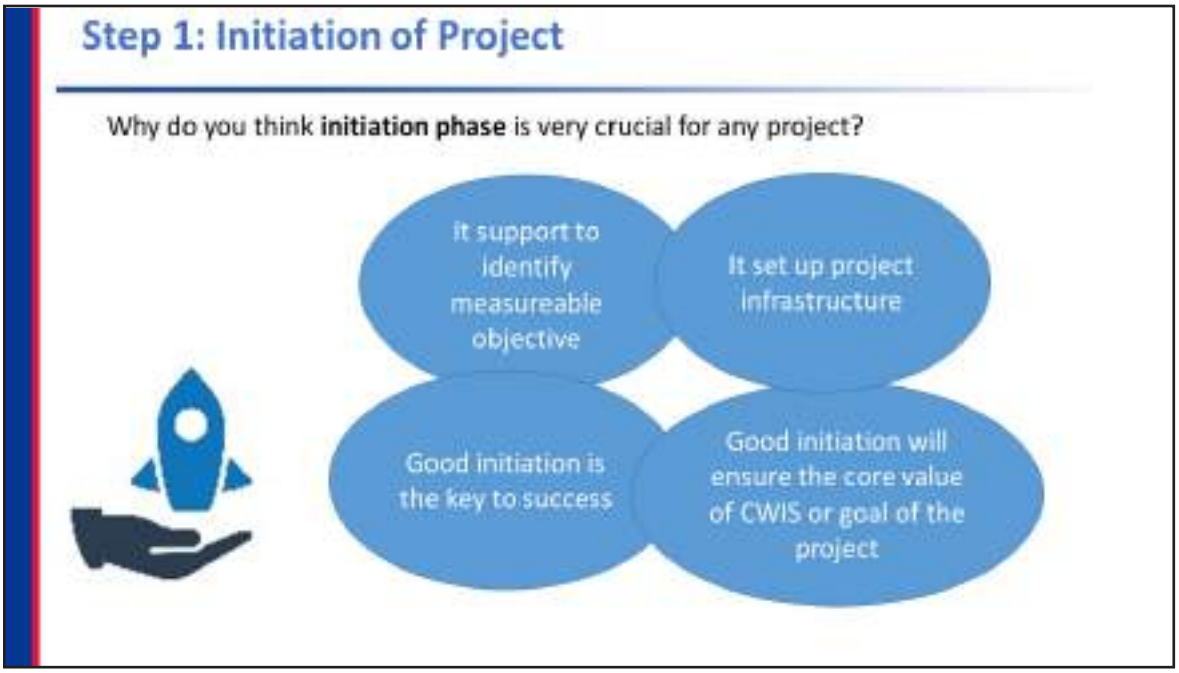
Five minutes will be provided to participants to read and understand problems of both cases. These case studies will facilitate participants to identify the problem during various stage of sanitation project. After discussion on both cases, upcoming slides will bridge the gaps in sanitation project by integrating CWIS approach in project cycle.

Slide 15



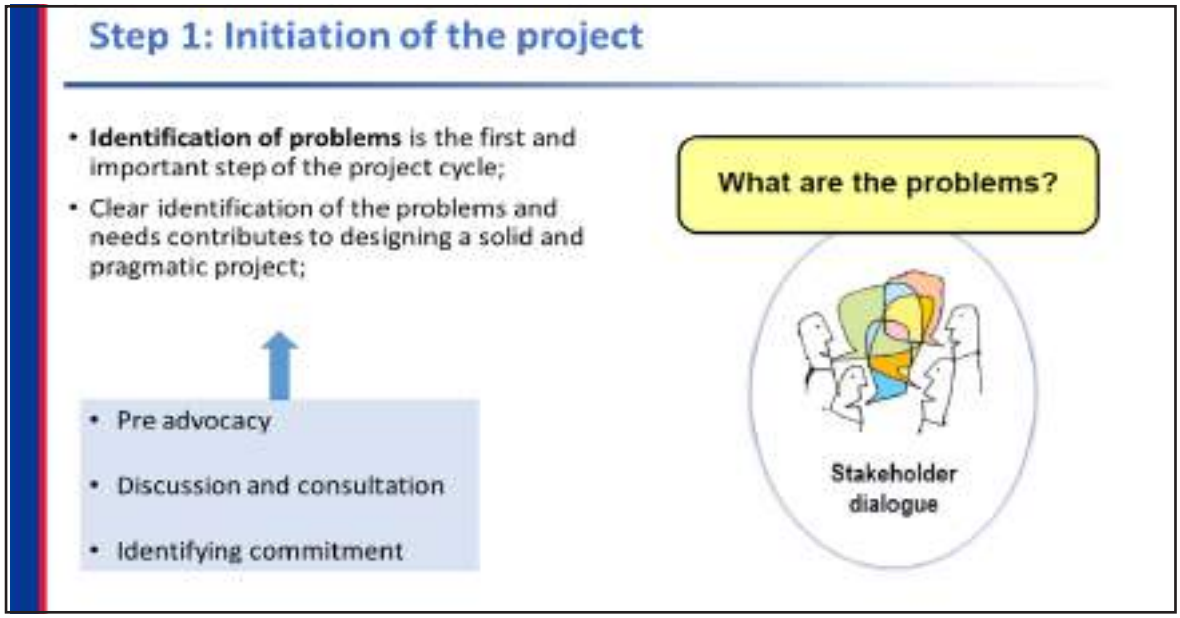
Implementation- regular update of the activities
Baseline survey- indicators must identified in planning phase (if resources are available), closure – impact assessment

Slide 16



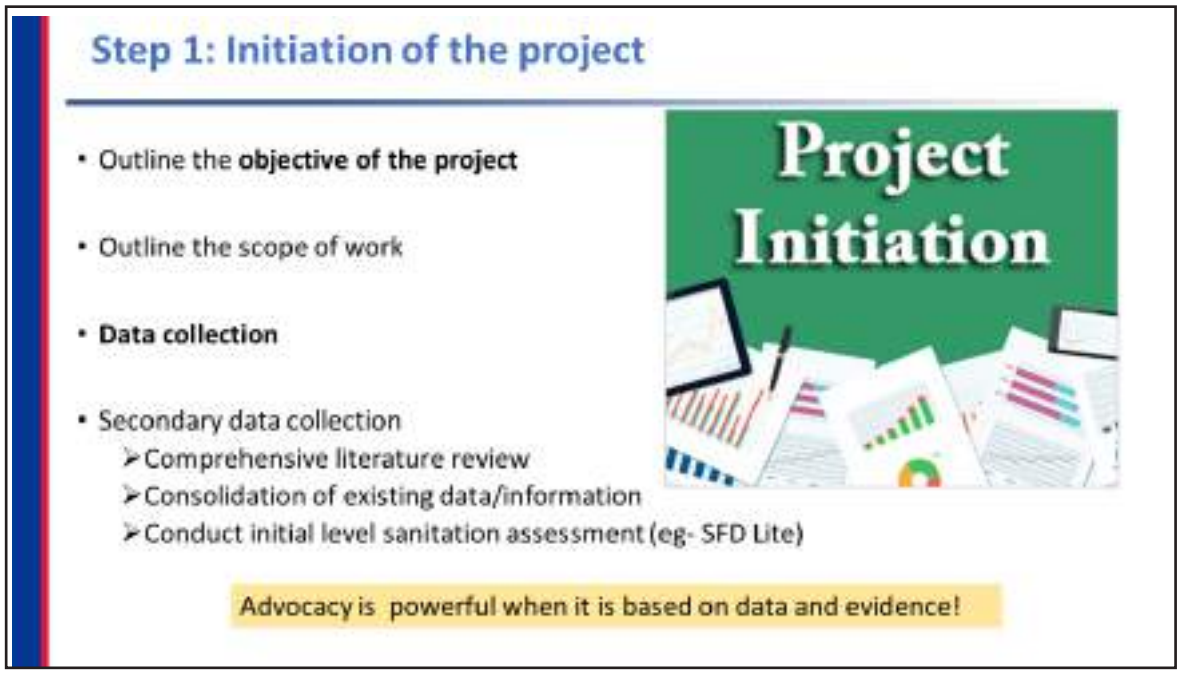
Brain storming at the beginning . Aims to know the understanding of the participants.

Slide 17



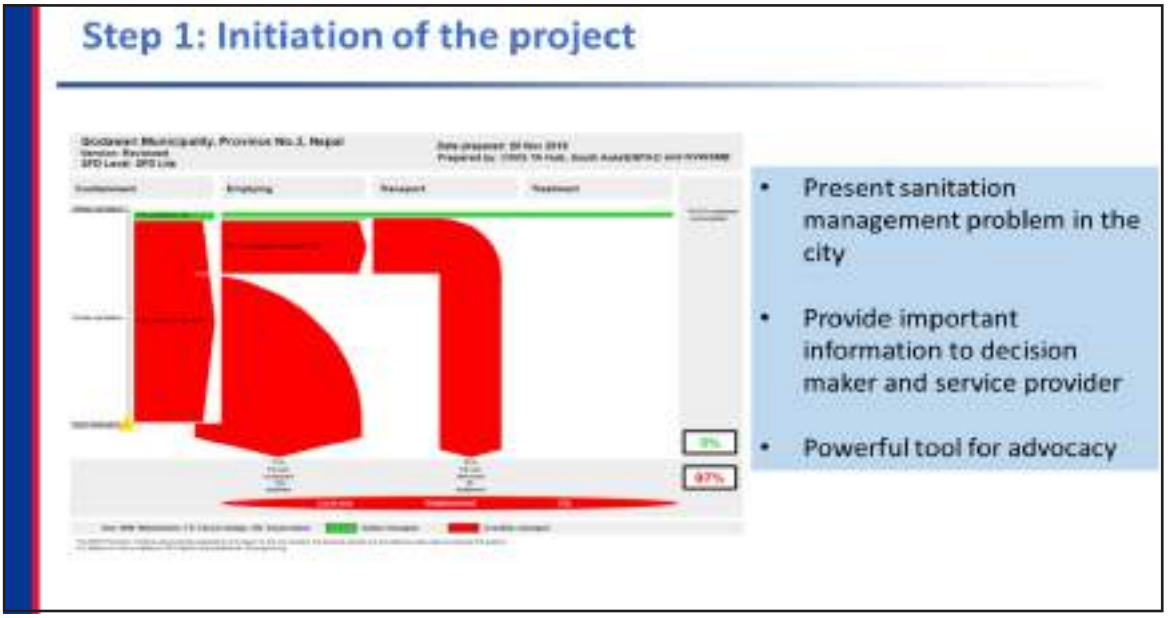
Pre advocacy on the project and FGD with municipal/city decision maker to identify the major problem and collect their vies.
Identify the municipality/city's commitment and willingness towards the project
This step need series of discussion and pre advocacy
Pre advocacy will be made through Sensitization on need of urban sanitation/ challenges (for decision makers) which will trigger them to provide commitment towards the project

Slide 18

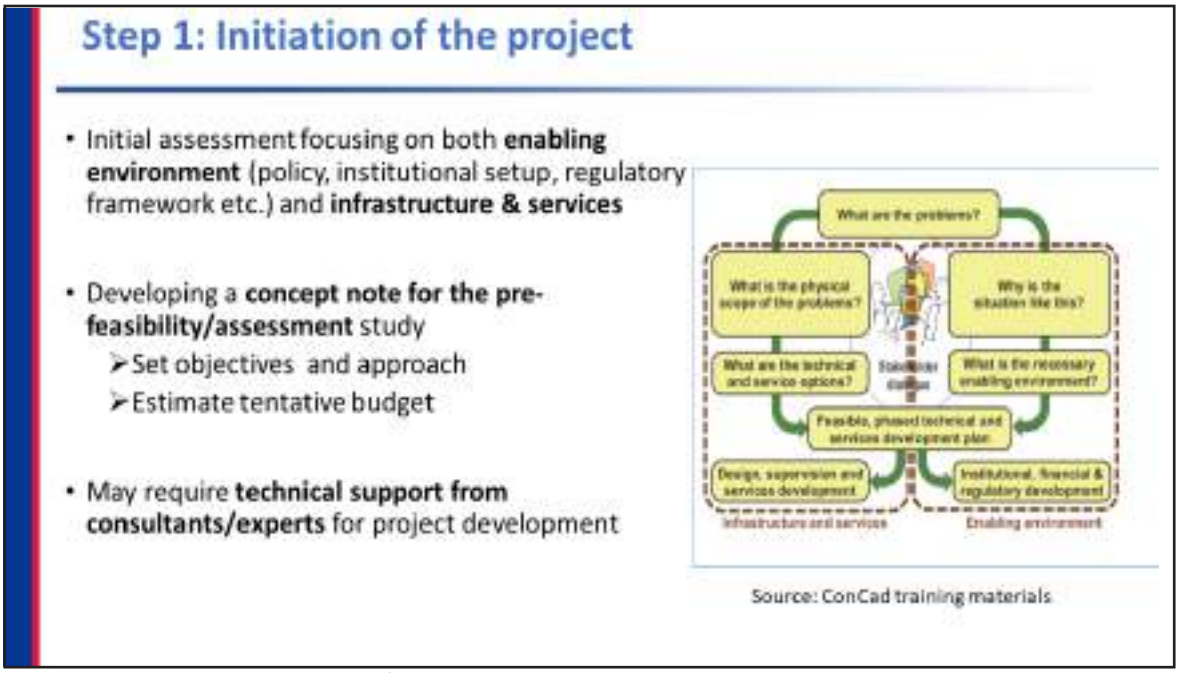


Consolidation of existing data- demographic information, sanitation situation
Data collection exists in the all phases project cycle.
Use lite SFD for initial sanitation assessment

Slide 19



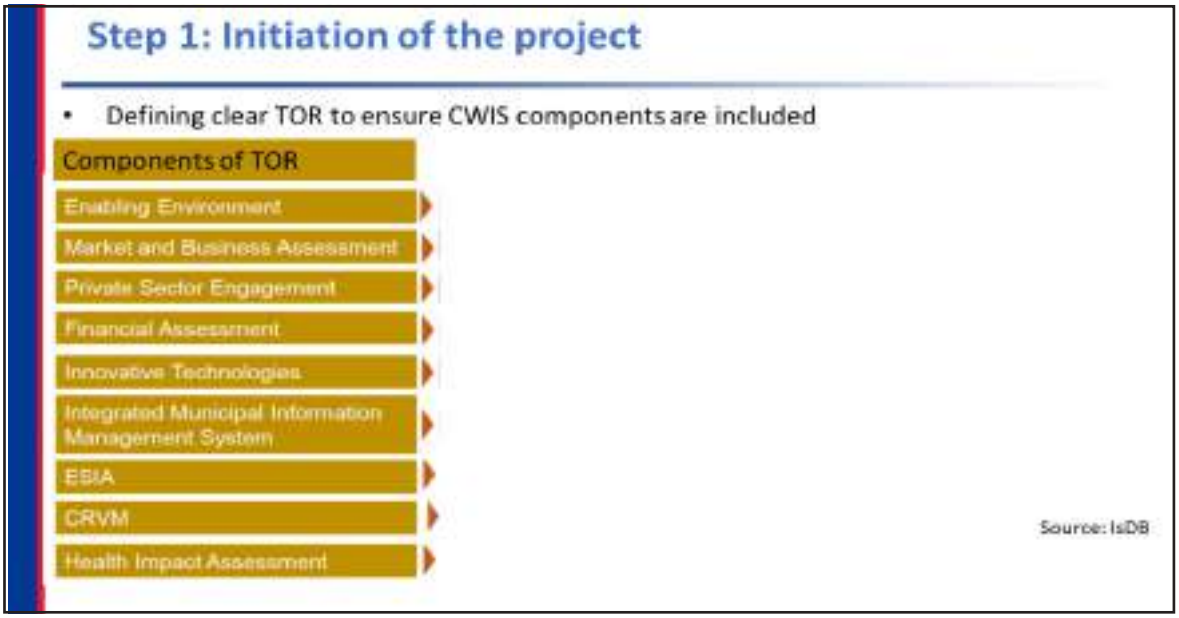
Slide 20



Source: ConCad training materials

Initial assessment will be more focus on meeting interaction, observation on their services, priority however the initial assessment must address both sanitation infrastructure and service and enabling environment for safely and sustainable sanitation

Slide 21



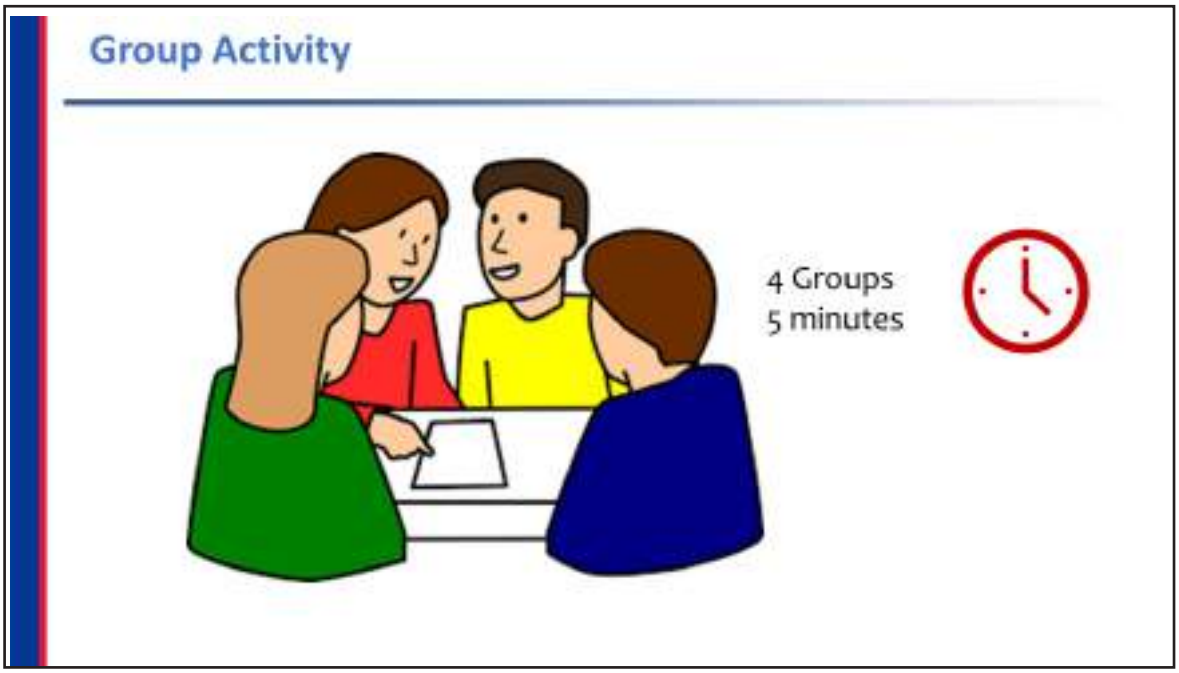
The idea here is to show that the design of TOR already addresses one or more than one of the CWIS outcomes and functions. While they might be particularly addressing one or more CWIS framework but integrally all of the components of 2*3 matrix are covered. And how they are and will be covered is dependent on the approach that we take. The ToR components are dependent upon the project of the nature. This example is from IsDB project output is delivered from consultancy services

Other components may require as per requirement

ESIA- Environmental and social impact assessment

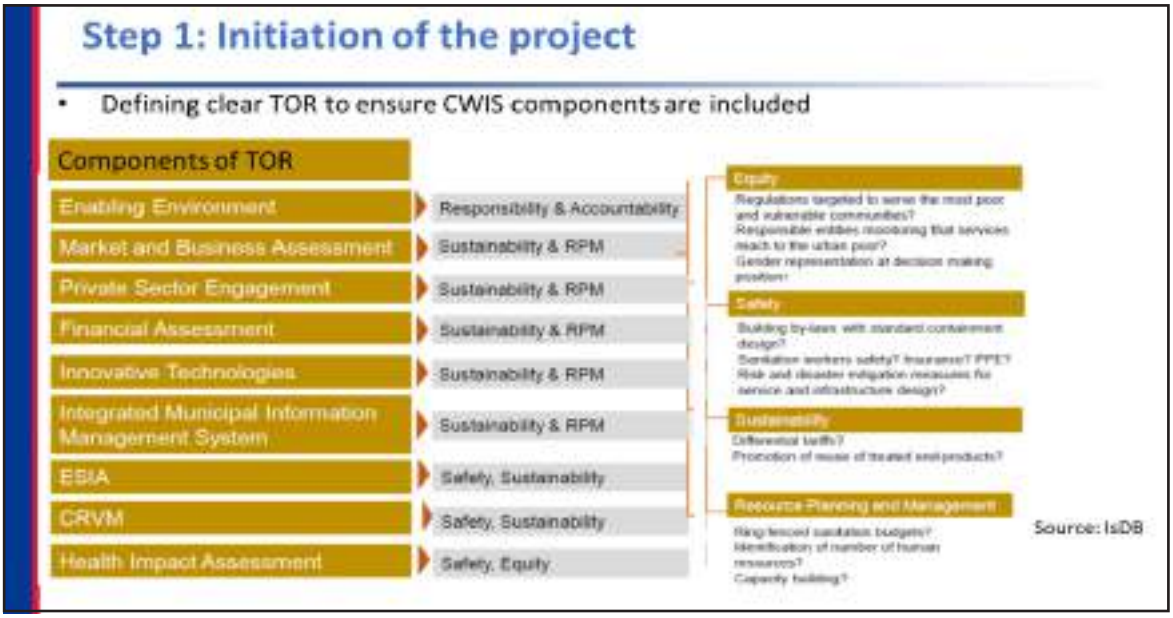
CRVM

Slide 22



They are going for a group work. Provide a handout to 4 groups from earlier activities and ask to discuss and write down/ note down which of the component of CWIS framework is addressed through each point of the components of ToR.

Slide 23



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Other components may require as per requirement

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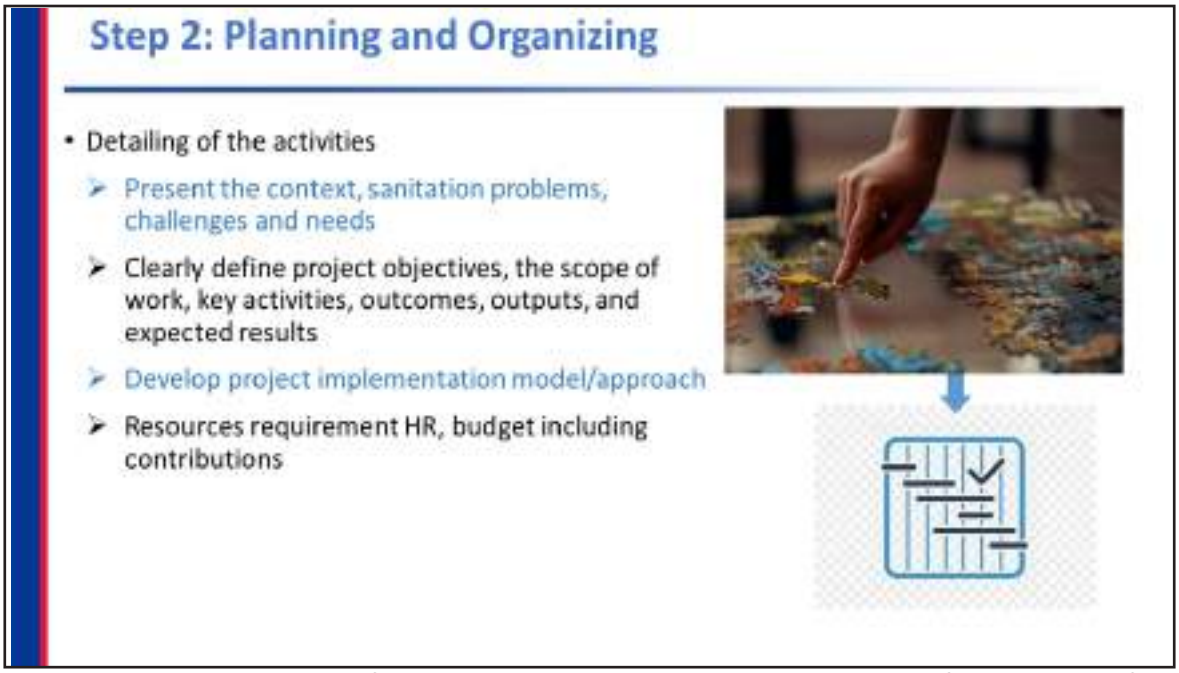
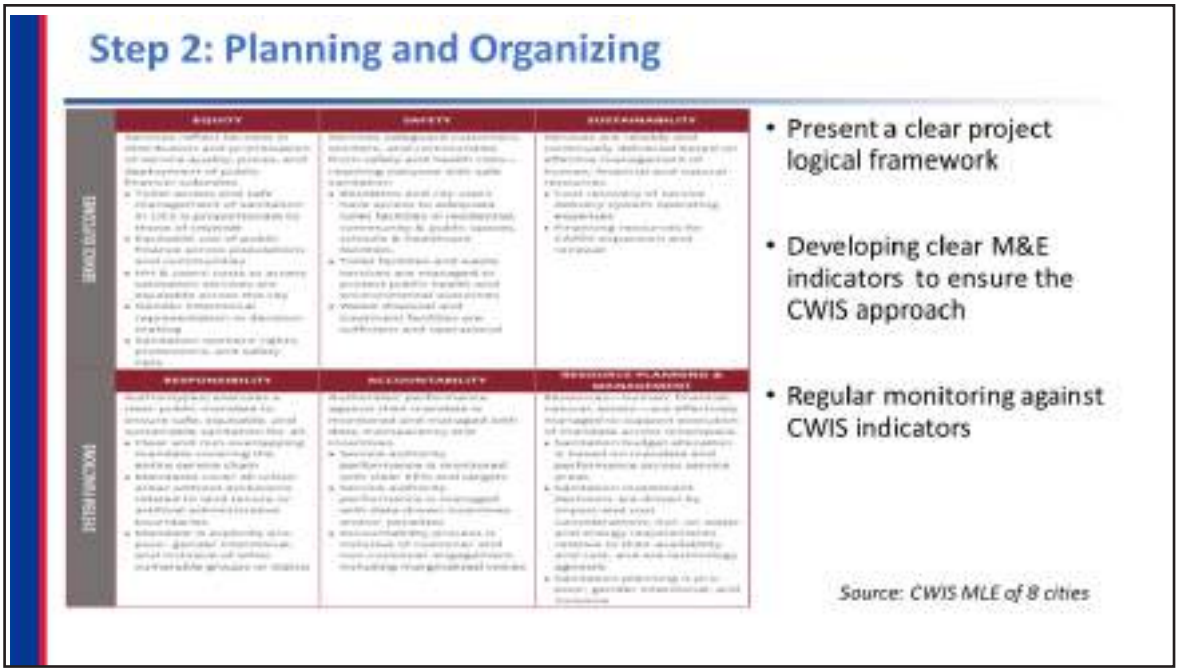


Objectives are may not static, for more clarity, objective may change during different phases of project

Slide 25

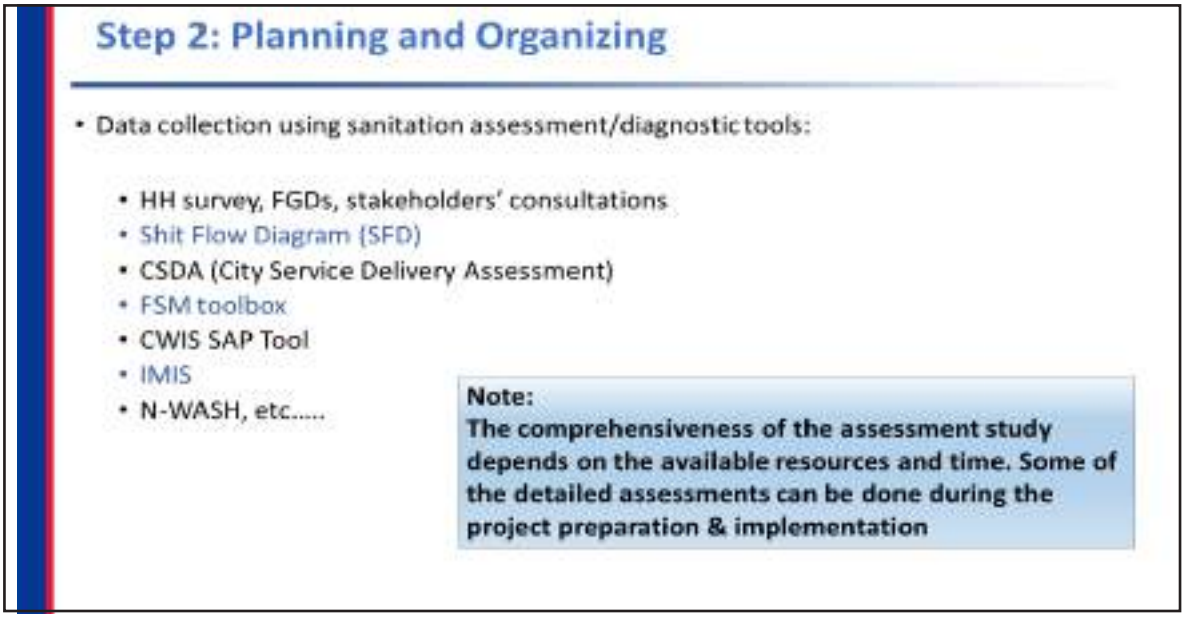
Identifying roles an responsibilities of stakeholders are very important because it will minimize the risk of confusion during project implementation and also reduce the risk of duplication which ultimately support to manage time and resource.
Note: This slide can be redesigned as per Nepalese context

Slide 26



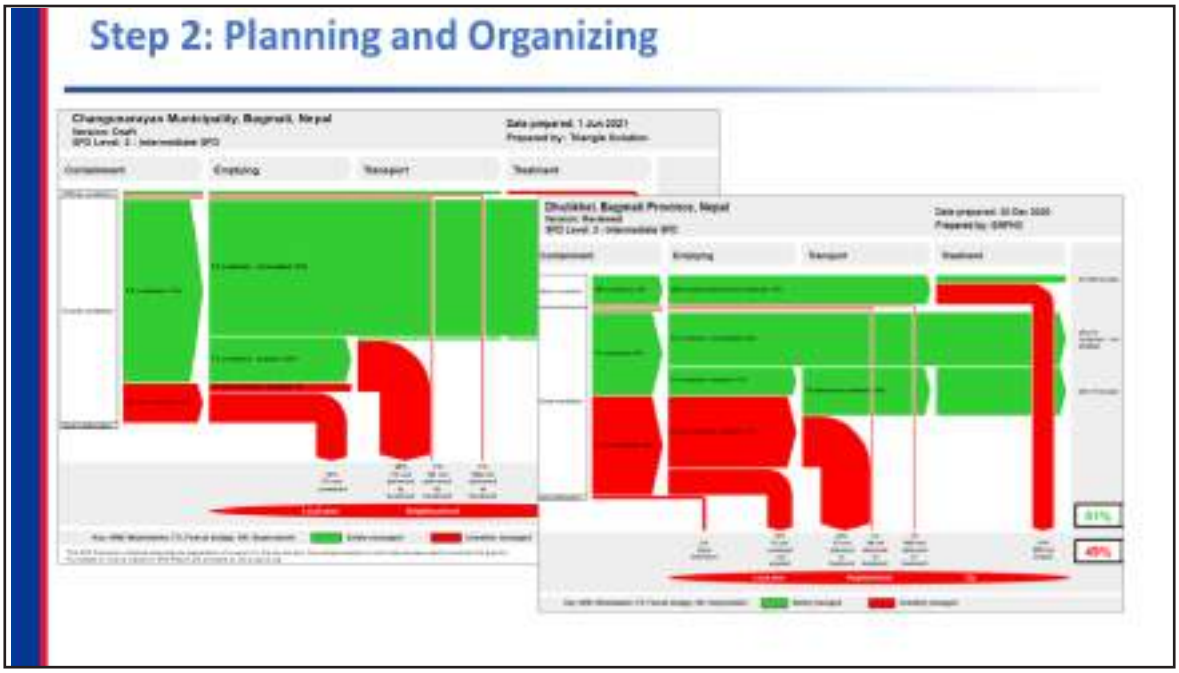
CWIS indicators map the six areas of CWIS framework. The indicators within the CWIS framework will support to measure the project progress, it will support to observe either project is in the right track or not to achieve the project objective. It is a project monitoring tool.

Slide 27



Normally detail level assessments are carried out to generate primary level data. These data support design need based activities during planning phase.

Slide 28

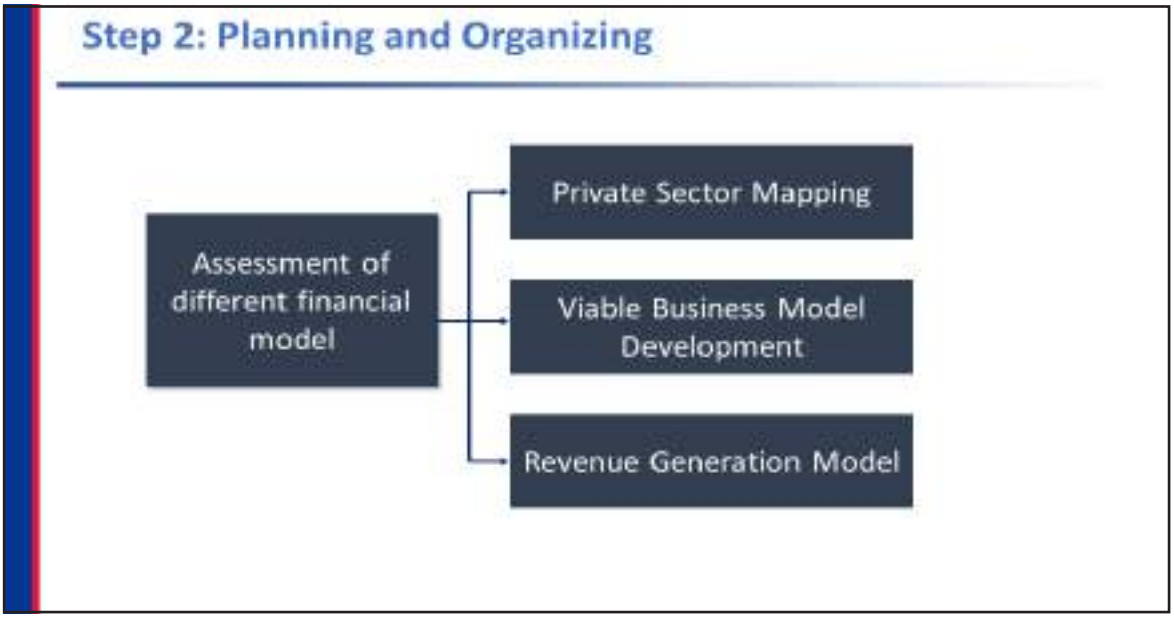


Slide 29

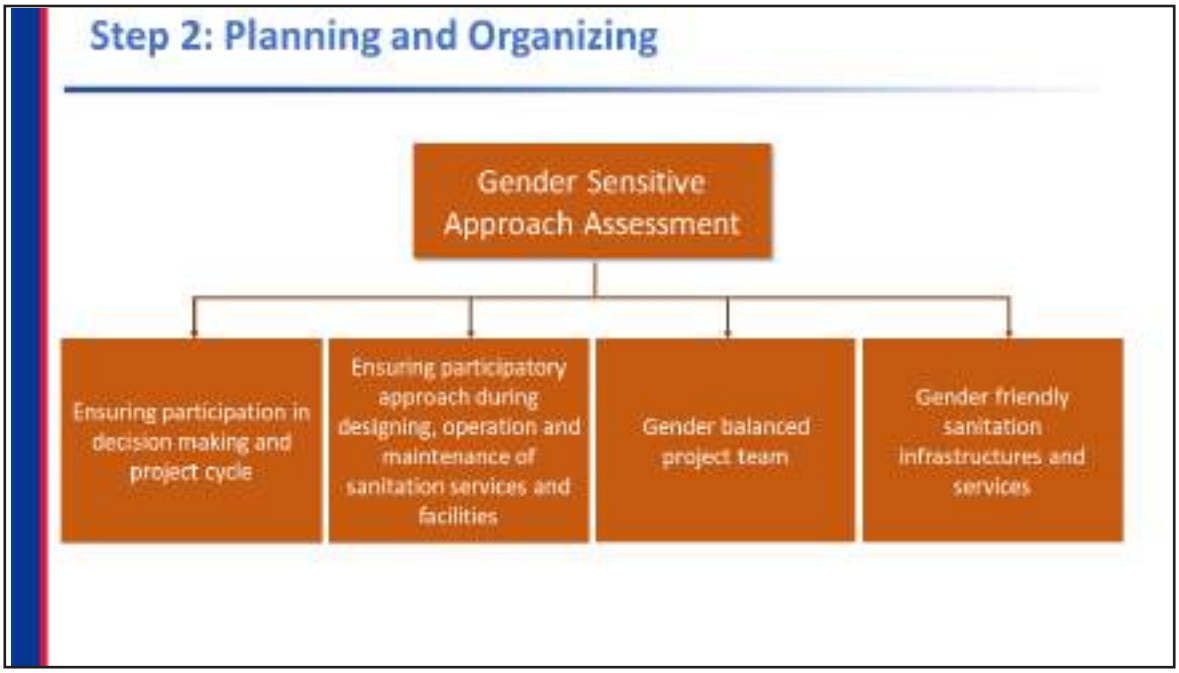
IMIS is a powerful tool which support the municipality for effective implementation, management and monitoring to CWIS project and its compoments

Slide 30

Slide 31



Slide 32



Slide 33

Slide 34

Slide 35

Step 3: Project Implementation and Monitoring

- Execution and implementation of designed activities
- Institutionalization of CWIS
  - ✓ Formulation and enforcement of policy , By-laws and regulation
  - ✓ Regular monitoring
  - ✓ Full functioning responsible section to run CWIS program

Slide 36

Step 3: Project Implementation and Monitoring

Regulatory Mechanism

Mechanism	Legal power	How applied	Examples
Guidelines	-	Advisory	– Toilet design
Standards	✓	Ex-post	– Re-use products; effluents; sanitary ware – Working procedures for sanitation workers – Sanitary performance of facilities and services
Permit	✓	Prior approval	– Building permits – sanitation facility standards – Discharge permits
Legal agreement	✓	Licence, Contract	– Pit and septic tank emptying – Sewage and faecal sludge treatment – Public toilet performance – Utility performance

Source: EWAG training module

The regulatory mechanism will ensure the CWIS approach

Slide 37

Step 3: Project Implementation and Monitoring

- Introduce **new financing system** for revenue generation
- Completion of **contracting process with private sector**
- **Construction and Implementation** of sanitation systems, facilities and services

The pictures show the different types of implementation according to objective of the sanitation project

Slide 38

Step 4: Monitoring and Evaluation

- Project evaluation can be done periodically – **half-yearly, yearly, and at the end of the project**
- Evaluate against the **CWIS M&E indicators**
- Indicators are designed to measure 6 aspect of CWIS
- Showcasing how the project is contributing to **SDG 6.2 target**
- If national sanitation database exists, project data/information can be integrated on it
- Document and disseminate

Slide 39

Case Study

Project name: Pilot implementation of FSM standard in Nepal

Project Area: Mahalaxmi Municipality Lalitpur

Slide 40

At Project Initiation level

Major Objective:

- To test the ISO 24521 guideline for the management of basic on- site domestic wastewater service and thereby help improve environment sanitation conditions in municipalities
- To draw lesson from this piloting experience and evidence to recommend implementation of the ISO 24521 guideline at the national level through policy ad practice changes

Integration of ISO 24521 Guidelines with CWIS Service Framework

The project has funded by BMGF therefore, in this case, major objective of the project was pre defined before it started in the municipality

Slide 41

Project Initiation

- Identifying the problem

✓Sanitation situation assessment 2/3 of the HHs have onsite sanitation system

✓Advocacy and sensitization for the decision makers of municipality

✓Orientation on CWIS and approach to the municipality officials

Slide 42

Project Planning and Designing

- Conducting regular planning meeting with the project team and sharing to the municipality
- Sharing of project activities and revisit
- Developing project implementation model and revising it in next phase of the project
- Identification and defining roles and responsibilities of key stakeholder

Slide 43

Project Planning and Designing

- **Set the indicators** to achieve CWIS framework

Slide 44

Project Planning and Designing

- Formation of technical team
- Identifying Necessary Assessment
  - Technical feasibility study

(3 FSTPs: Mahalaxmi, Dhobighat, Kodku)

  - Assessment for enabling enabling environment for both regulatory framework and infrastructure development , eg-Sanitation cell, by-laws, septic tank design manual
  - Development of business model for the sustainability
  - Planning for designing of IMIS tool
- Mapping of private sector engagement for desludging service

Slide 45

Project Implementation and Monitoring

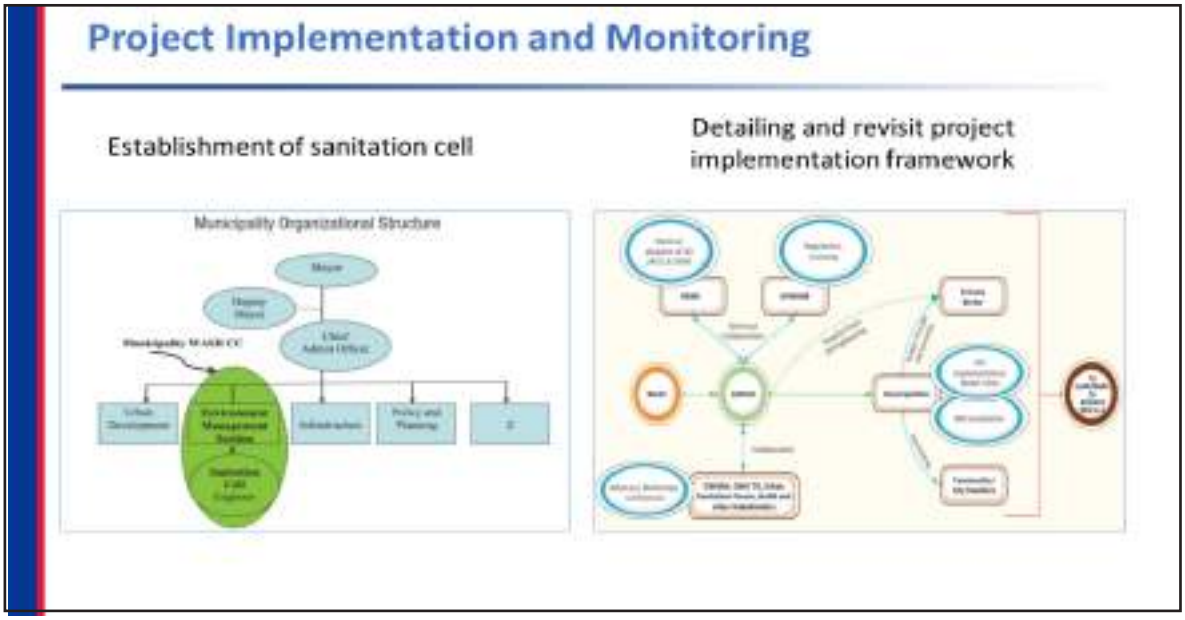
- Orientation and capacity building program
  - ✓ Orientation on standard septic tank to municipal engineers
  - ✓ Mason training on standard septic tank
- Awareness raising program
- Exposure visit programs
- Publication IEC and advocacy materials

Slide 46

Project Implementation and Monitoring

- Developed FSTP DPR (within municipality premises)
- Rehabilitation of existing FSTP
- Development of technical manual

Slide 47



Slide 48

CWIS approach can be institutionalized only through- creating enabling environment and developing necessary infrastructures and services

Slide 49

Project Implementation and Monitoring

- ✓ Appointment of **dedicated HR at the municipality** for **regular monitoring of standard septic tank** in the municipality
- ✓ **Development of institutional and monitoring mechanism** for the **inspection/monitoring of standard septic tank** in the municipality
- ✓ Development of PPP model

Elements	Desludging and Transport	FSTP
Operation	2 Private Desludging and Transport Operators (area delineation)	Private FSTP Operator
Operating Instrument	Licensing agreement between Municipality and operators	Construction and O&M Contract with built-in KPIs
Service Fees/Tariff	Business Model	O&M cost for 5 years provided for by KVWSMB in contract, sustained through fees earned by application of Business Model
Regulator	Municipality as per licensing agreement	KVWSMB for three years then handover to Municipality
Beginning 4th year, whole FSM service chain planned for operation by a FSM Utility Operator		

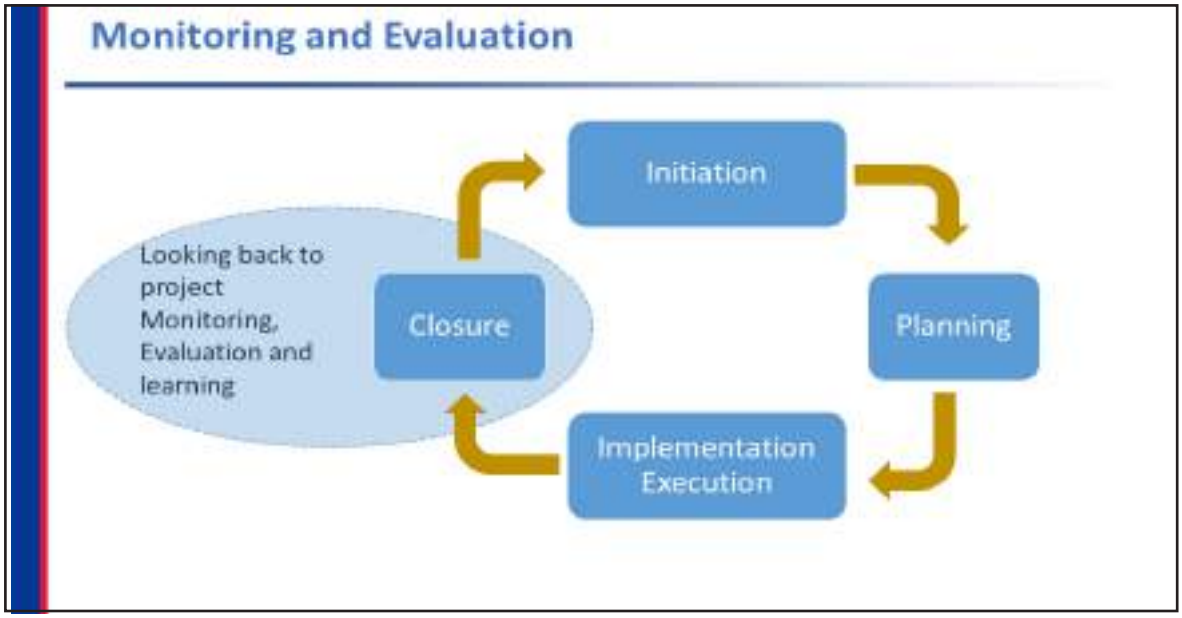
The pictures show the different types of implementation according to objective of the sanitation project

Slide 50

Project Implementation and Monitoring

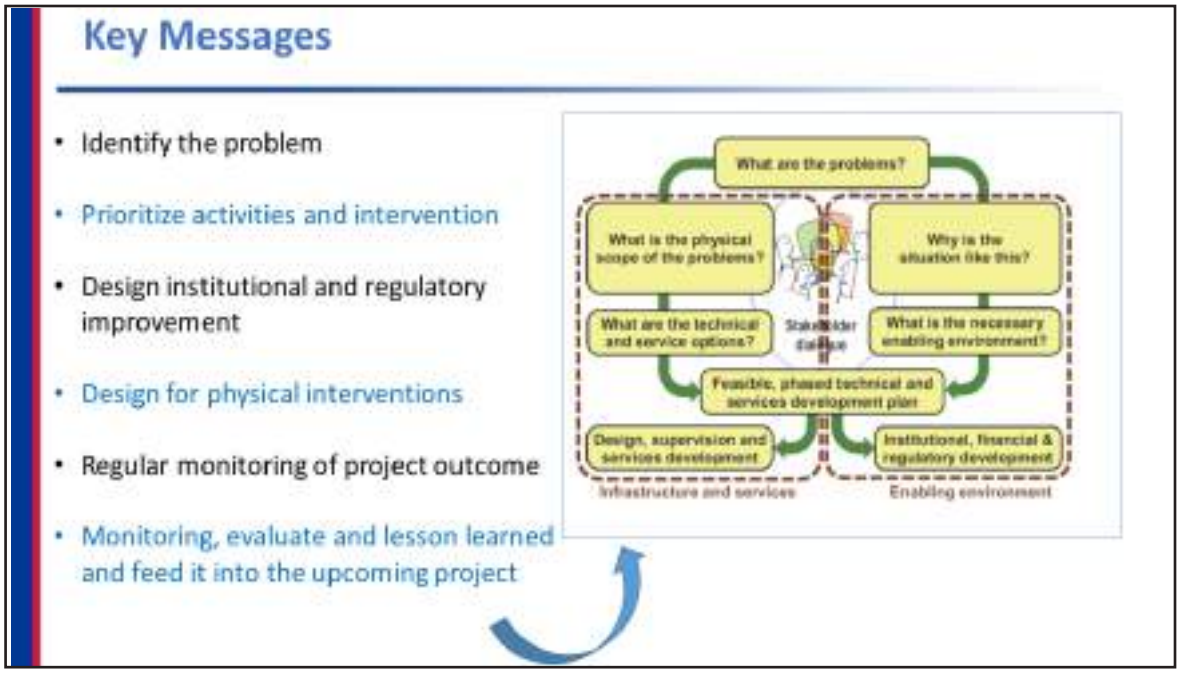
- Training, orientations, to the staff of municipality on IMIS
- Implementation of IMIS by municipality (eg. Tax, road, building permit section, etc.)
- Monthly planning, review, revisit, re-planning

Slide 51



The project has reached up to its implementation phase, however, the project is planning to measures its out come against its set indicators

Slide 52



In Summary, CWIS in project cycle…

Slide 53

Slide 54

SESSION 12

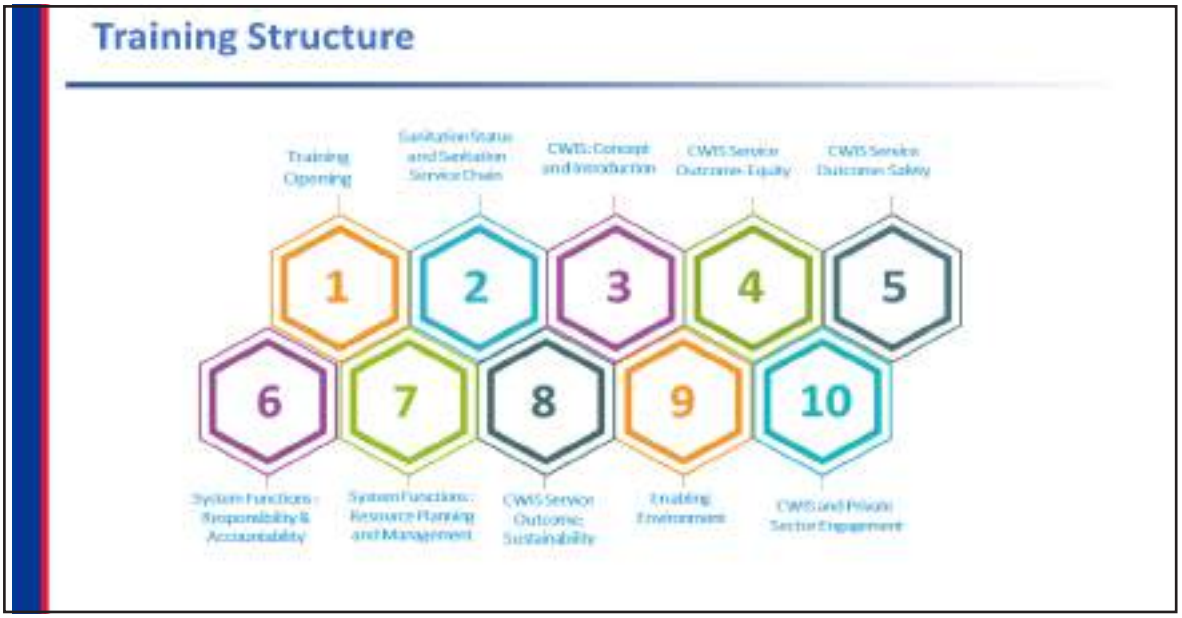
Monitoring and Benchmarking

Slide 1

Slide 2

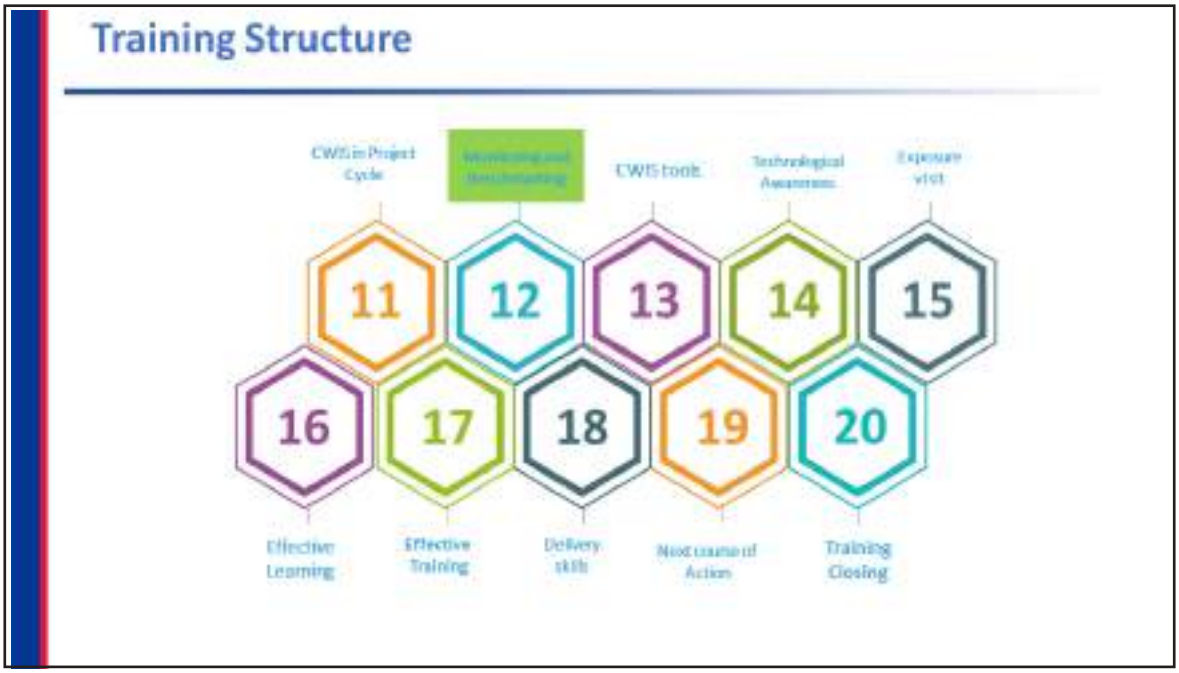
What it this?
(Note: Its DEWATS at Sunga, Thimi, that treats wastewater from small community).
Let one of the participant explain what it is. Add on if its necessary.
Click it is the plant that takes in waste water and Click lets out clean water so that wastewater from our houses doesn't impact the receiving water bodies and environment.
DEWATS is the natural system with low to no mechanical equipments.
Since it does not require too much people's touch, let's imagine nobody goes there, and let it do its work without any disturbance, ask questions
what do you think will happen ??
Do you think it is the right strategy to forget about it? If not what should be done??
Collect the responses from participants and add that regular site visits and few regular activities needs to be scheduled in to know that DEWATS is operating properly and add on the need to analyze the quality of ingoing and out coming water helps to regulate, check the blockage in the pipes, inspection of chamber for any wrongs are some of the activities that needs to be done. These activities are part of monitoring.
Conclude with one last click by mentioning that with monitoring and evaluation we can keep the effluent water clean and that is what we are going to discuss in the session.

Slide 3



This training includes 20 main technical sessions, and are currently on session 12: Monitoring and Benchmarking

Slide 4



This training includes 20 main technical sessions, and are currently on session 12: Monitoring and Benchmarking

Slide 5

Learning Outcomes

- Define the protocols for monitoring, evaluating and setting benchmarks in sanitation sector through CWIS perspective
- Explain monitoring and evaluation tools for the measurement of the CWIS indicators

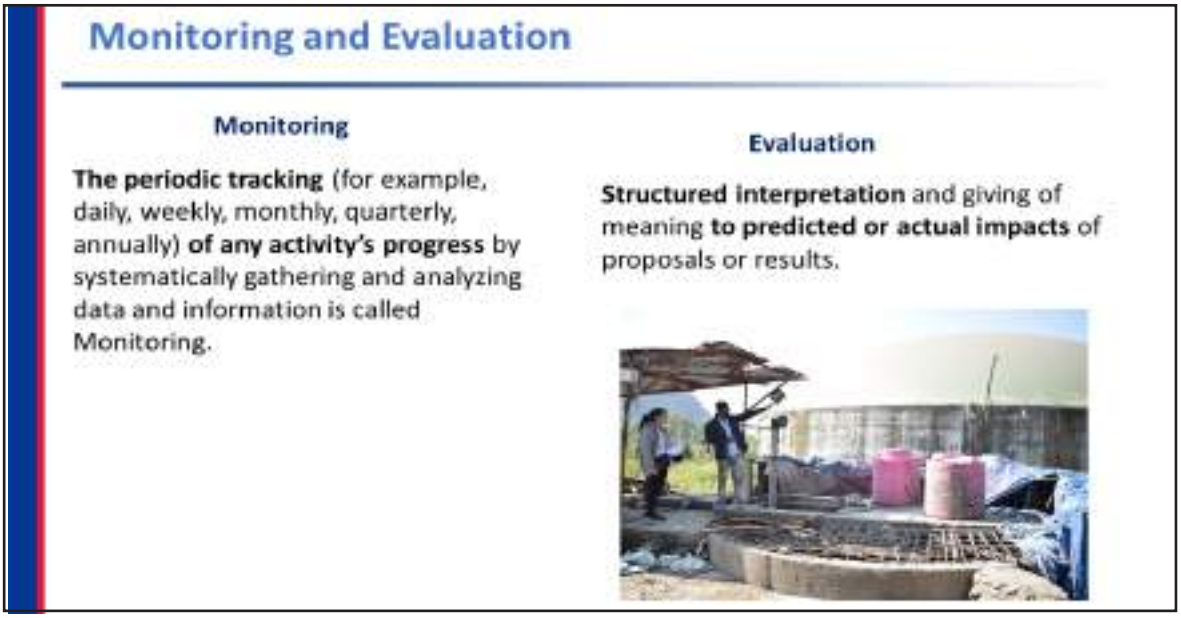
At the end of the session, participants will be able to …

Slide 6

Presentation Outline

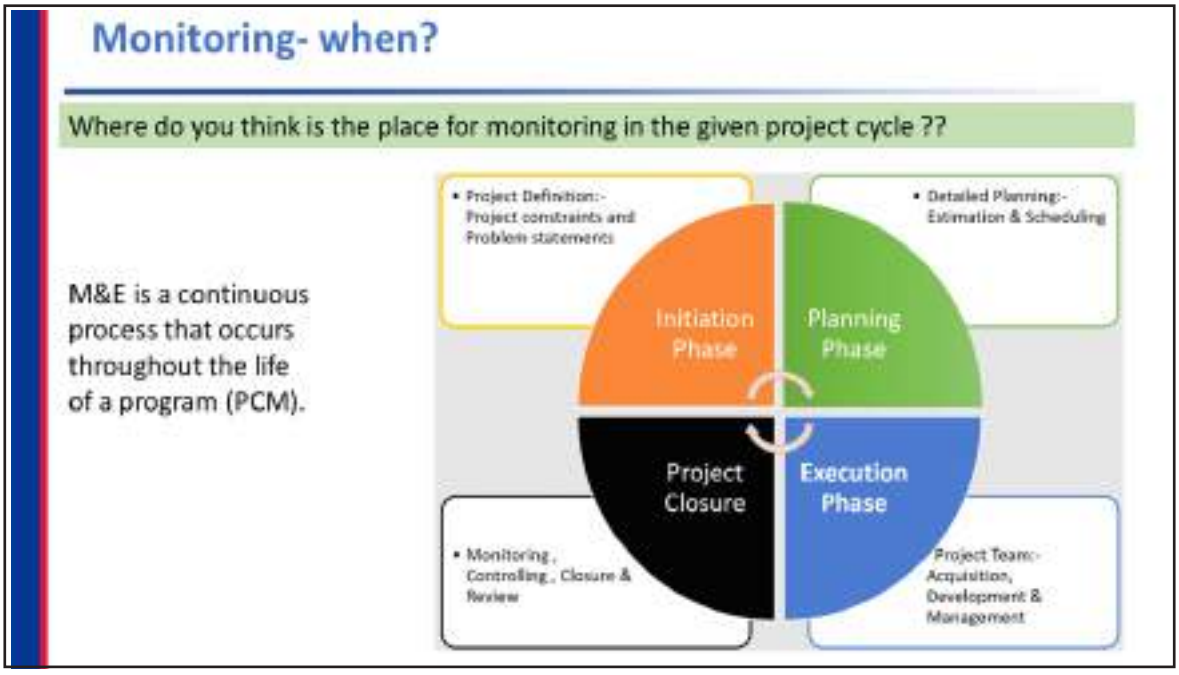
- Monitoring and Evaluation
- Why monitoring?
- Protocol for monitoring, evaluating and benchmarking
- Sanitation Monitoring Framework-India, Nepal
- Monitoring requirements
- Data and Information
- Monitoring methods
- CWIS Monitoring Framework
- Key Messages

Slide 7



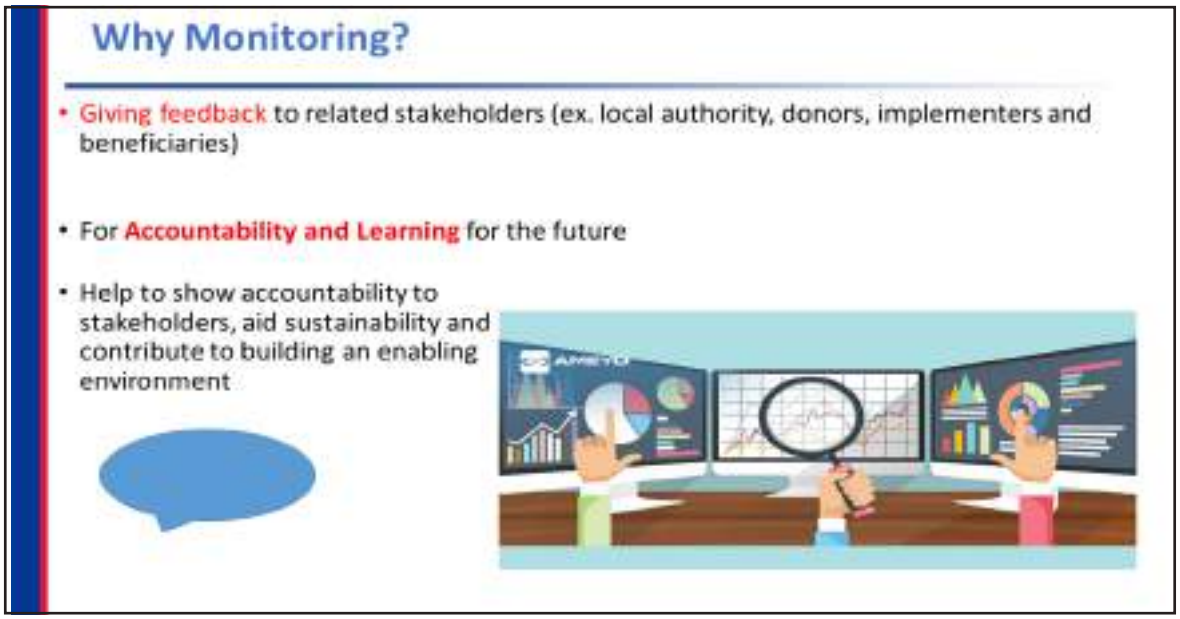
Monitoring is a continuous assessment that aims at providing all stakeholders with early detailed information on the progress or delay of the ongoing assessed activities.
The purpose of monitoring is to determine if the outputs, deliveries and schedules planned have been reached so that action can be taken to correct the deficiencies as quickly as possible

Slide 8



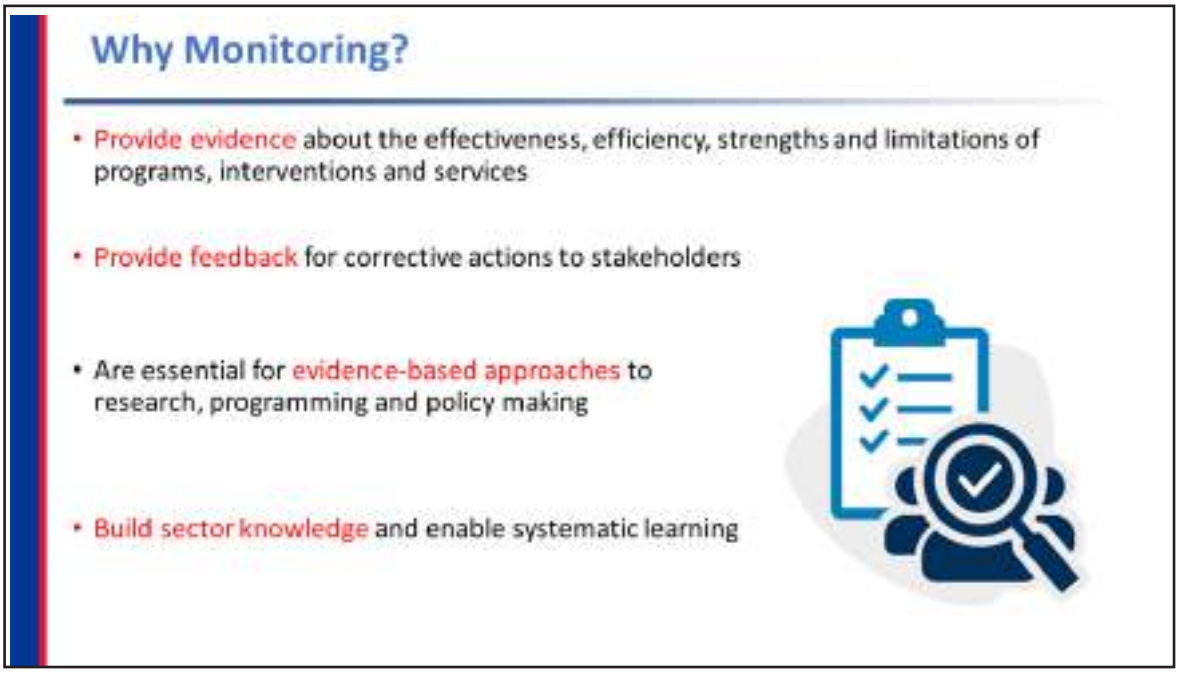
Monitoring is an ongoing data collection process of the program outputs. Particularly in the project pilot phase, it is important to gather detailed monitoring data to help identify and correct unforeseen weaknesses in the project design and to replicate successful features during scale-up.
Why is it important to monitor the implementation?
it provides a way to assess the crucial link between implementers and beneficiaries on the ground and decision-makers; it adds to the retention and development of institutional memory; it provides a more robust basis for raising funds and influencing policy.
Performance monitoring is a systematic and periodic observation of performance over time in order to develop or verify performance records, to uncover inefficient and ineffective practices, to identify needs for services, and most important, to detect underperformance timely to avoid the further deterioration of performance.
For this all, data seems to be key/ primary for all activities.

Slide 9



M&E for accountability commonly focuses on upward accountability to government or the funding agency. M&E is often an obligation to demonstrate that contracted work has been conducted in compliance with agreed standards or to report on results vis-à-vis plans. Downward accountability involves making accounts and plans transparent to the primary stakeholders: clients.
M&E for learning requires continuous and conscious involvement of evaluators and stakeholders in collaborative learning, allowing stakeholders to share their views, perspectives and ideas, without fear of negative consequences (Kusters et al., 2011).

Slide 10



Both monitoring and evaluation are essential components of effective management and together they bring the listed outcomes.
Provide evidence about the effectiveness, efficiency, strengths and limitations of programs, interventions and services;
Provide feedback to stakeholders, such as funders, community members, local authorities, regulators and other sectors;
Are essential for evidence-based approaches to programming and policy making;
Build sector knowledge and enable systematic learning;
Build an evidence base for research, policy and practice;
Enable diagnostically accurate and targeted corrective action;
Help to show accountability to stakeholders, aid sustainability and contribute to building an enabling environment.

Slide 11

Monitoring helps to assess on:

1. Whether or not **resources are available to and used** by the constituent units within the limits of an authorized budget and stipulated timeframe
2. Whether or not **expected outputs are achieved in a timely and cost-effective manner**
3. What is the **level of implementation capacity**?
4. What kind of **problems and constraints** are being faced and what kind of **remedial measures** are called for?

Slide 12

Sanitation & Hygiene (Ladder of services)

Monitoring doesn't just mean measurements it also links with the resource planning to achieve the service ladders. Whether the resource is enough or not should also be monitored

Slide 13

Protocols for monitoring, evaluating and Benchmarking

- Planning the monitoring requirement
- How monitoring and evaluation planned across the project cycle (Monitoring framework)
- What are the data and information requirements ??
- How to collect those data and information? ? (Monitoring Methods)
- Benchmark should be in place to assess the position
- Ensure the flexibility of project/program to incorporate feedbacks from M&E i.e. to incorporate the learning's (Adjustments as per the feedbacks

Monitoring provides data for making operational decisions, reporting findings and taking corrective action

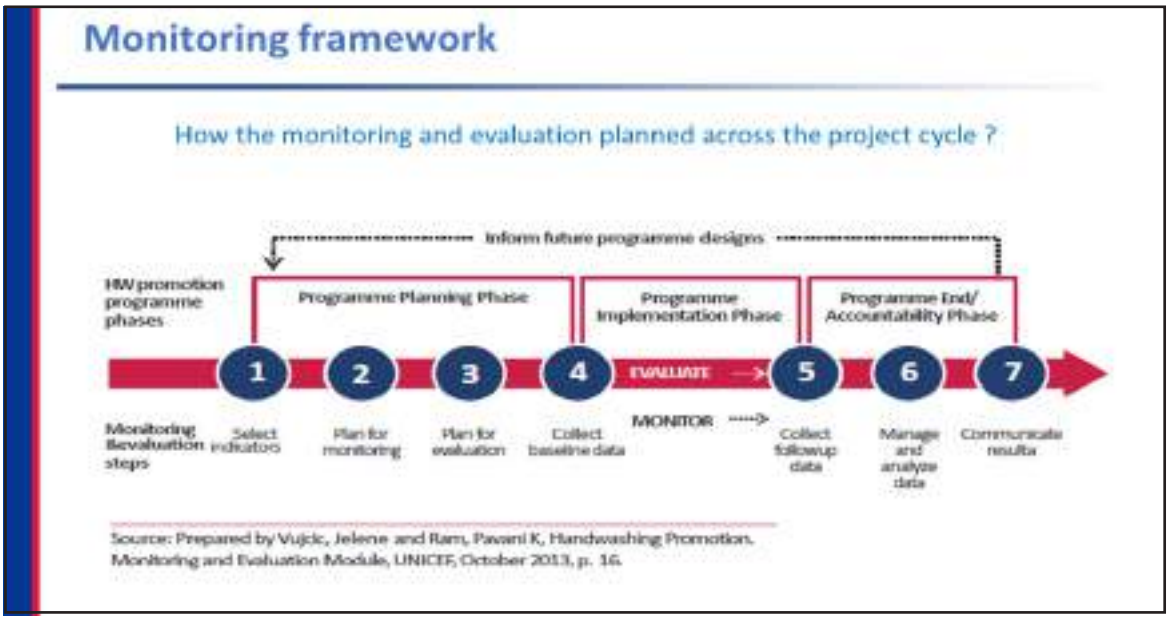
Slide 14

Monitoring requirement (and by whom)

What to monitor?

- Design of septic tanks/pits/onsite wastewater treatment
- Quality of desludging service
- Checking of permits/ licenses
- Recordkeeping
- Treatment performance
- Quality if treatment product

Slide 15



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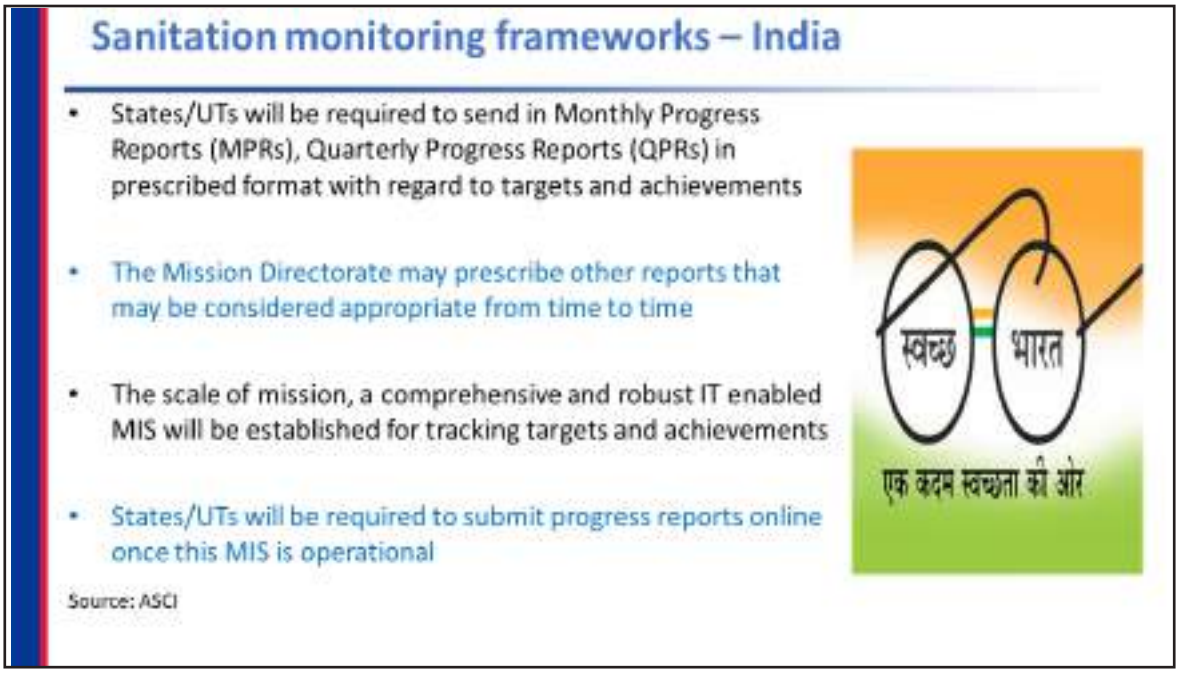


Uts= Union Territories

Slide 17

Sanitation monitoring frameworks – India

- Monitoring activities will include, but not be limited to., third party evaluation, impact evaluation studies, etc.
- The evaluation of the mission will be undertaken during the course of its implementation to effect mid-term correction and align the mission to achieve its objectives

Source: ASCI

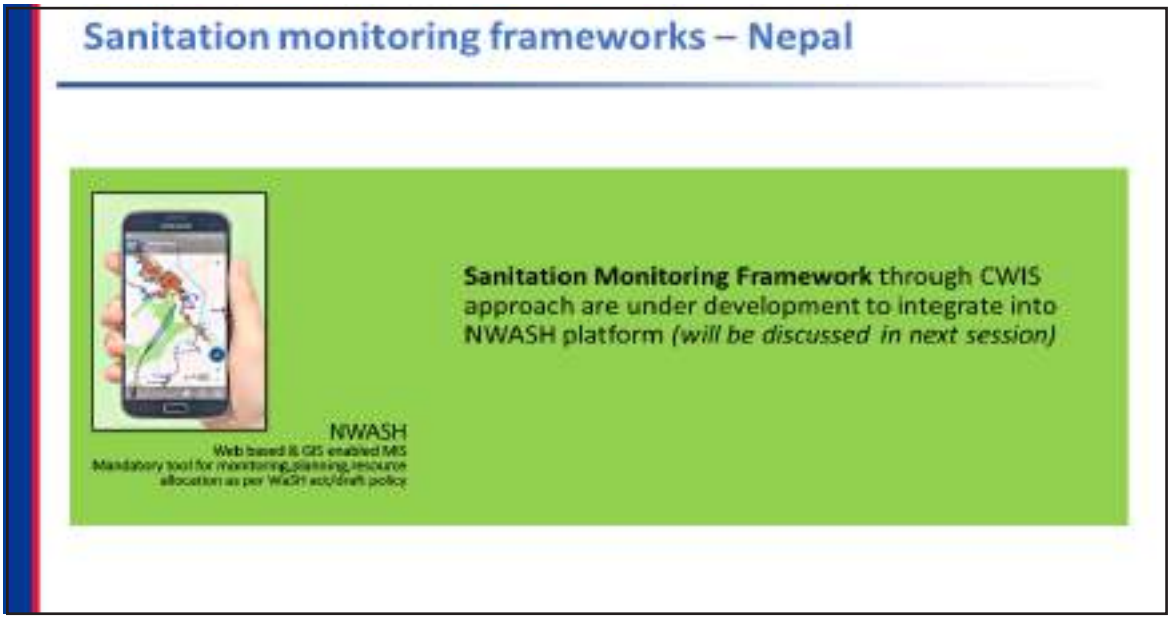
Slide 18

Sanitation monitoring frameworks – India

- A District Level Review and Monitoring Committee (DLRMC) will be constituted with a view to fulfill the objective of ensuring satisfactory monitoring of projects under the chairpersonship of a member of Parliament
- Detailed guidelines for this purpose will be issued separately by the SBM National Mission Directorate

Source: ASCI

Slide 19



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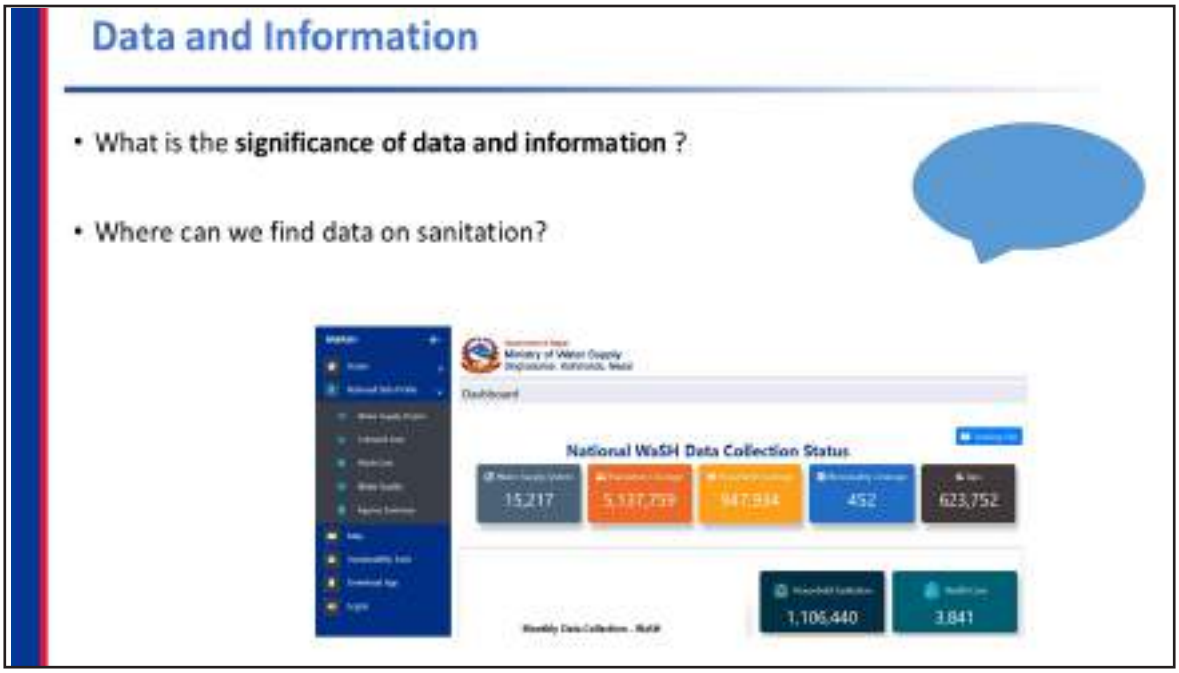
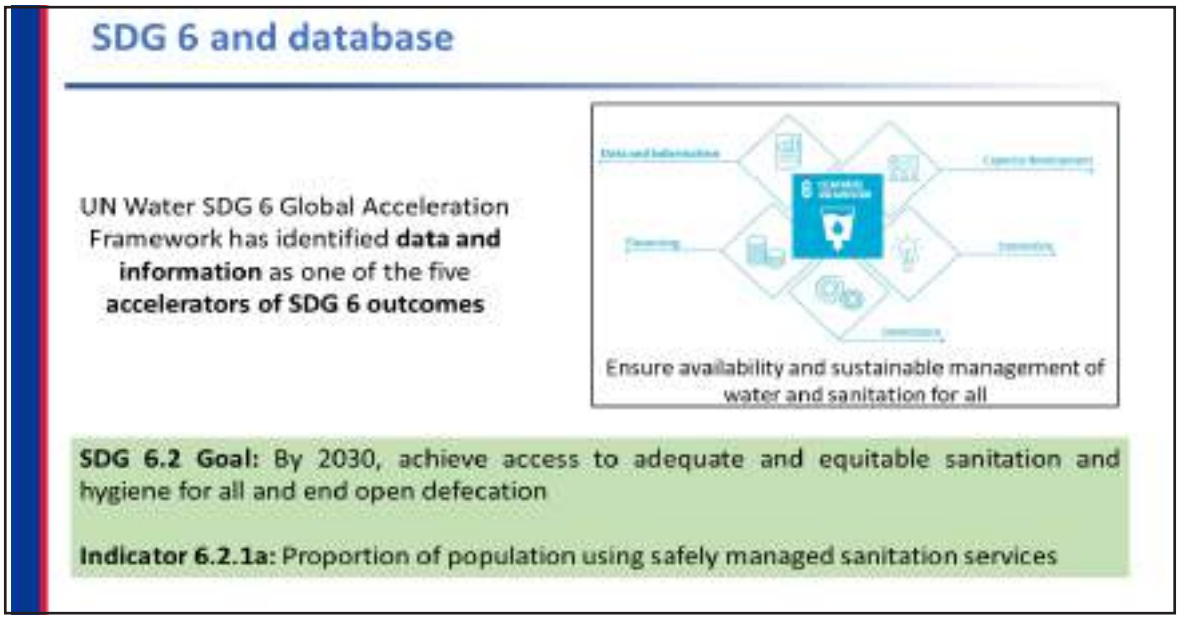


Ask with participants what are the significance of data and information, especially in monitoring?

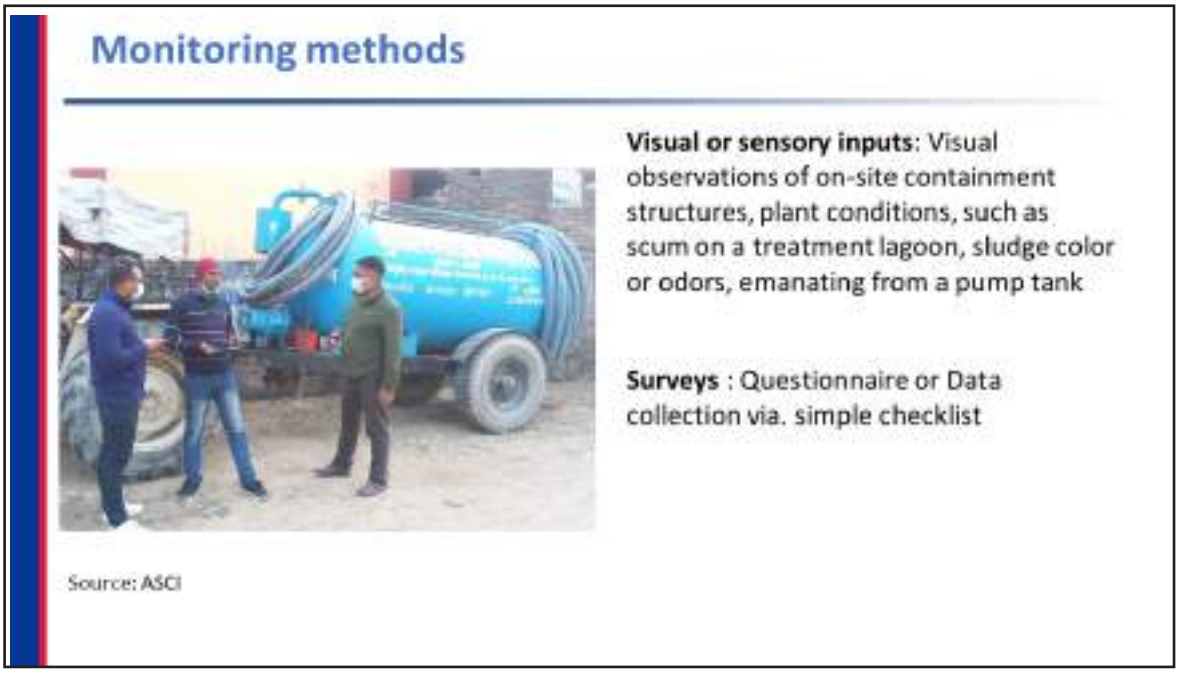
Also, ask participants second questions and emphasize that the sanitation data are fragmented in different sectors.

Slide 21



-UN Water SDG 6 Global Acceleration Framework has identified "DATA" as one of the five accelerators of the SDG 6 outcome.
-The SDG 6.2 Goal is one of the goals set within SDG 6 that states By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation
-To measure this,
-The 6.2.1a indicator highlights the proportion of population using safely managed sanitation services as an indicator for achieving the 6.2 goal
-Ask the audience where the proportion related information/ data is obtained/generated/ acquired from? (SDG 6.2.1a indicator)

Slide 22



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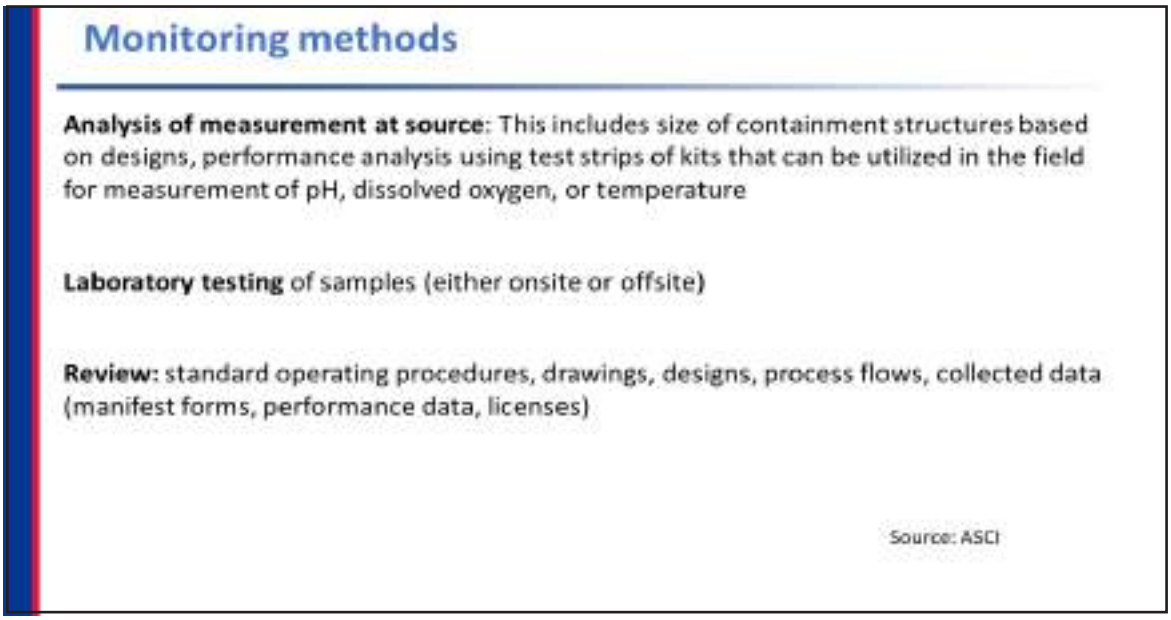

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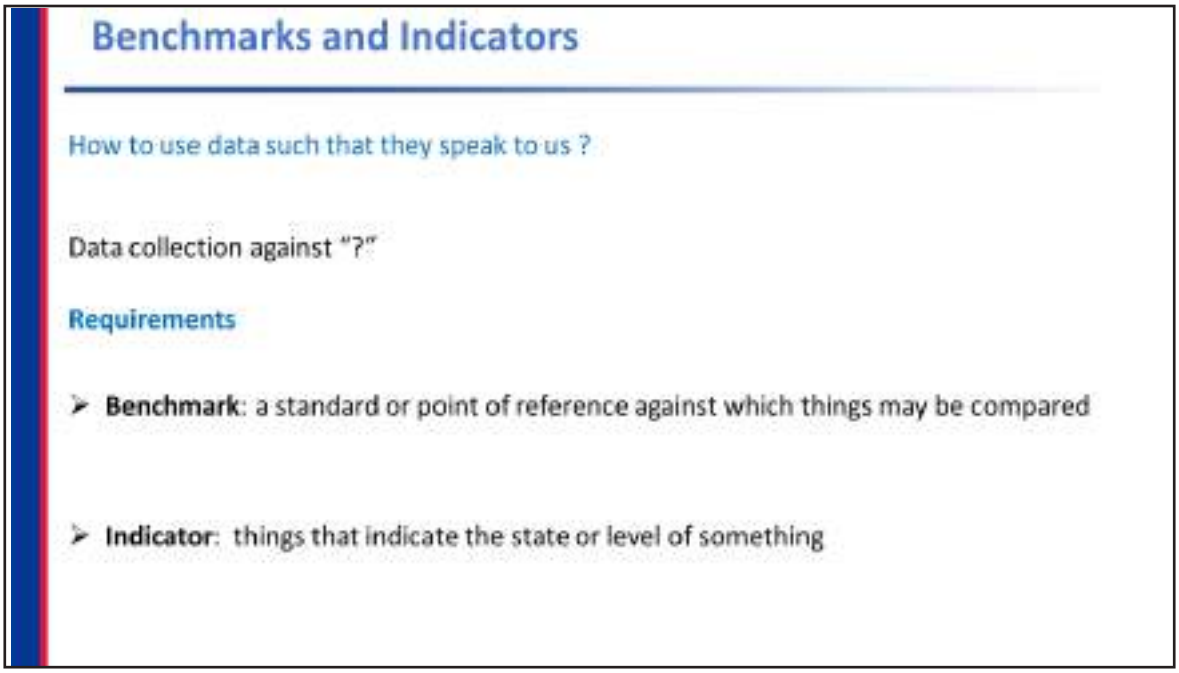
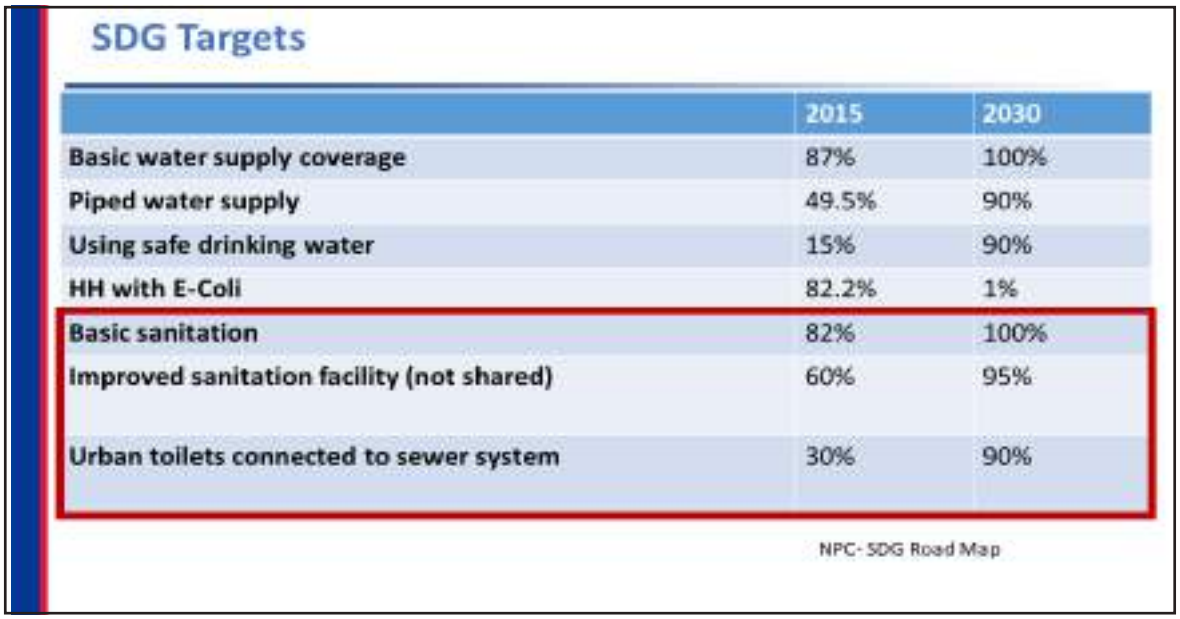


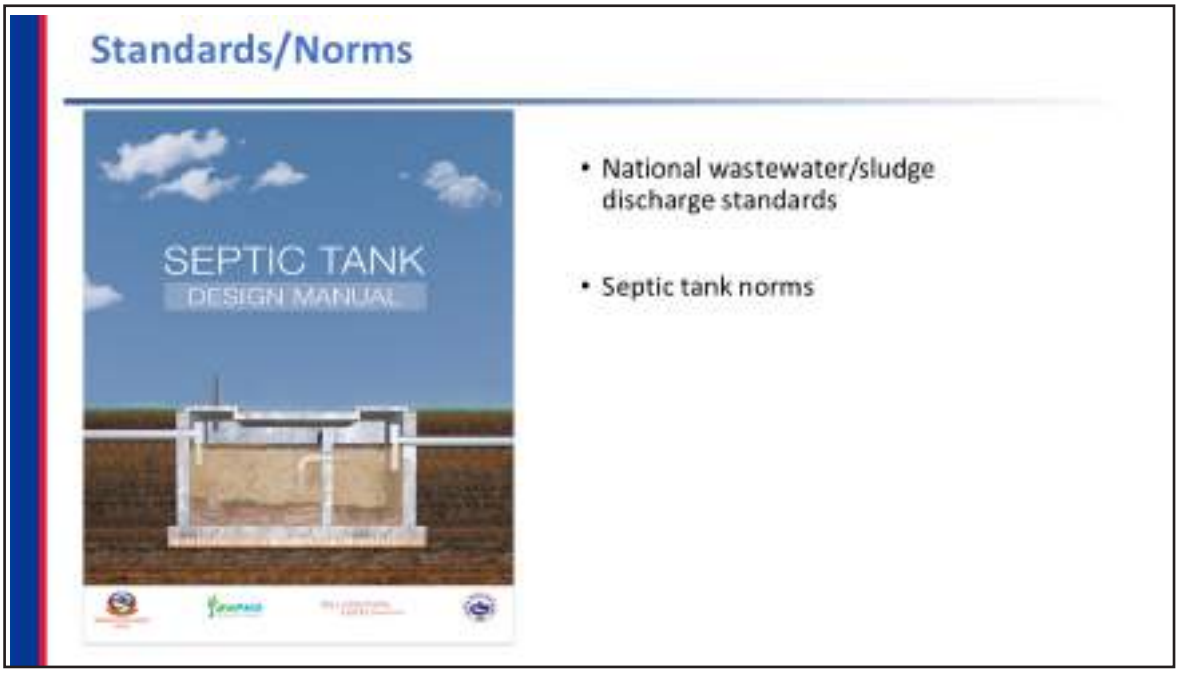
Link with Accountability

Slide 25



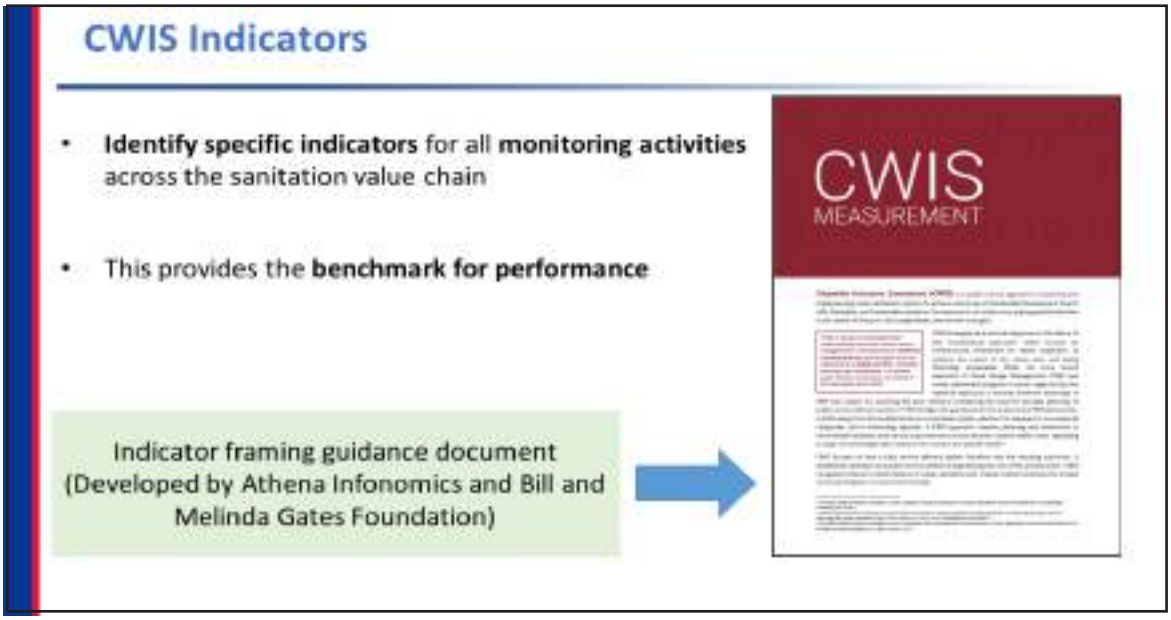
These indicators are not aligned properly with the SDG 6.2 goals and hence NPC is planning to revisit these goals .

Slide 26



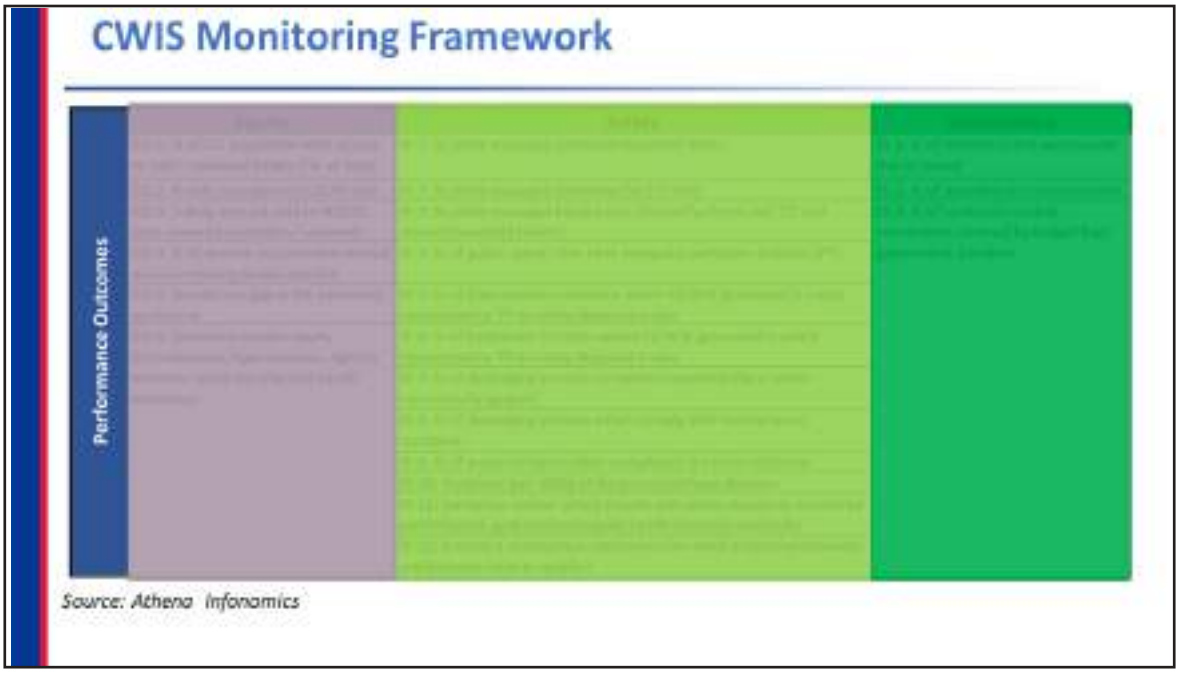
Some examples as a benchmarks

Slide 27



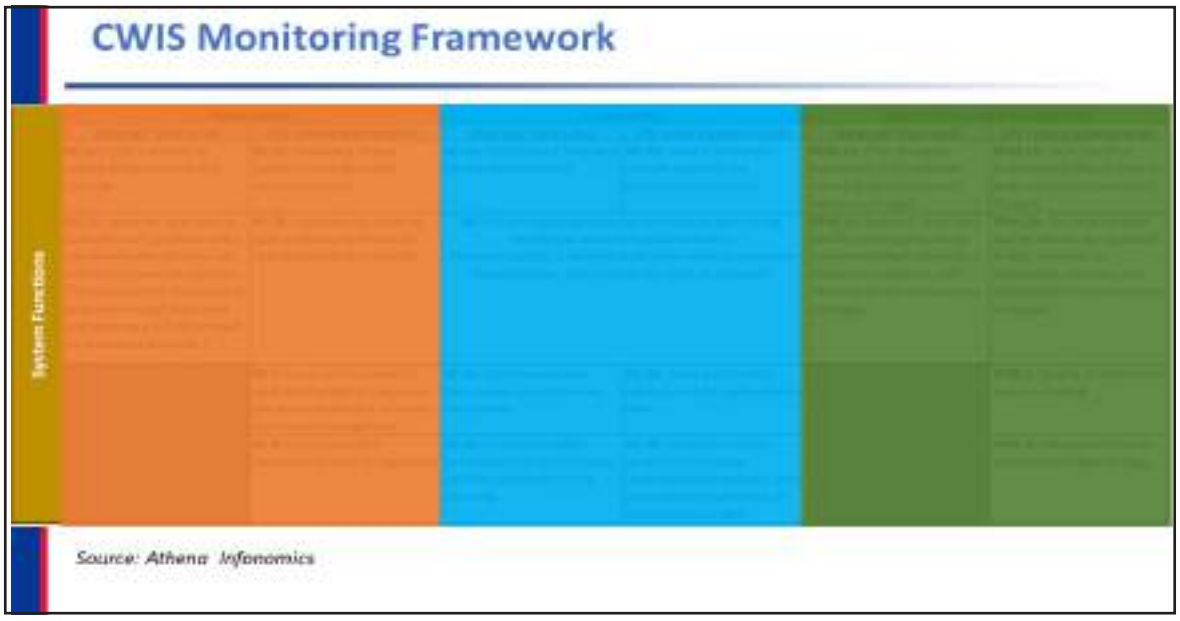
Inform the participants that currently Nepal is in the process of localizing CWIS indicators based on the guidance.

Slide 28



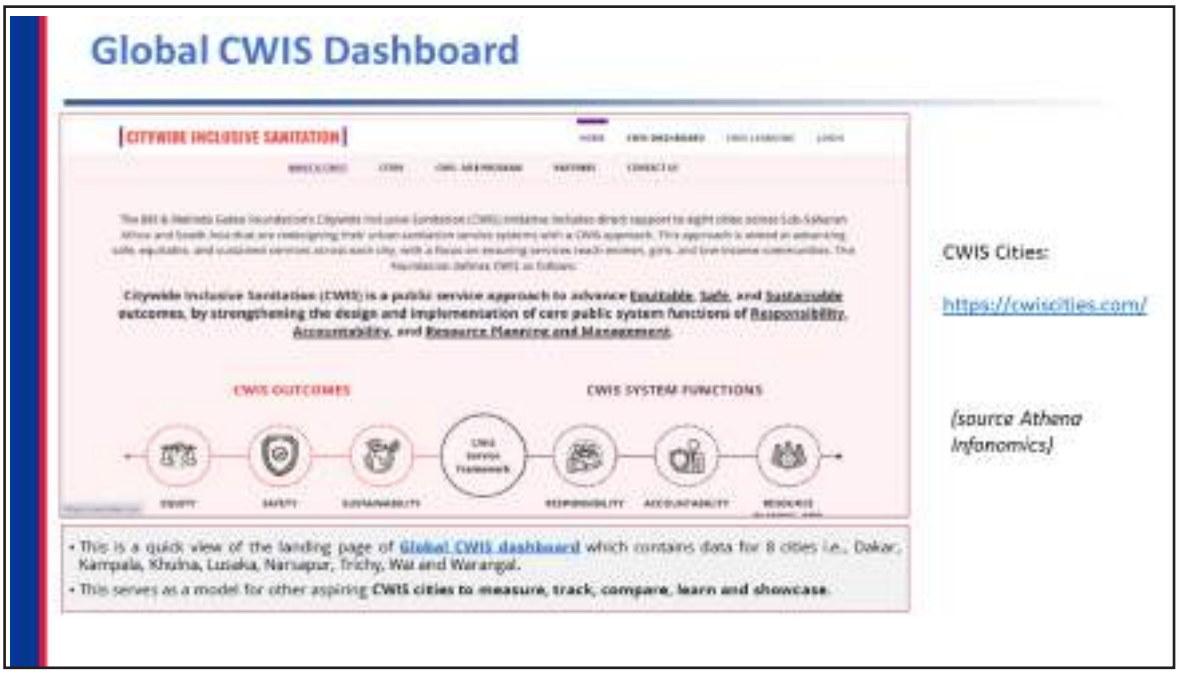
As discussed in respective topic, the indicators on CWIS framework has been discussed for the global context developed by Athena infonomics. The total indicators on CWIS outcomes are…

Slide 29



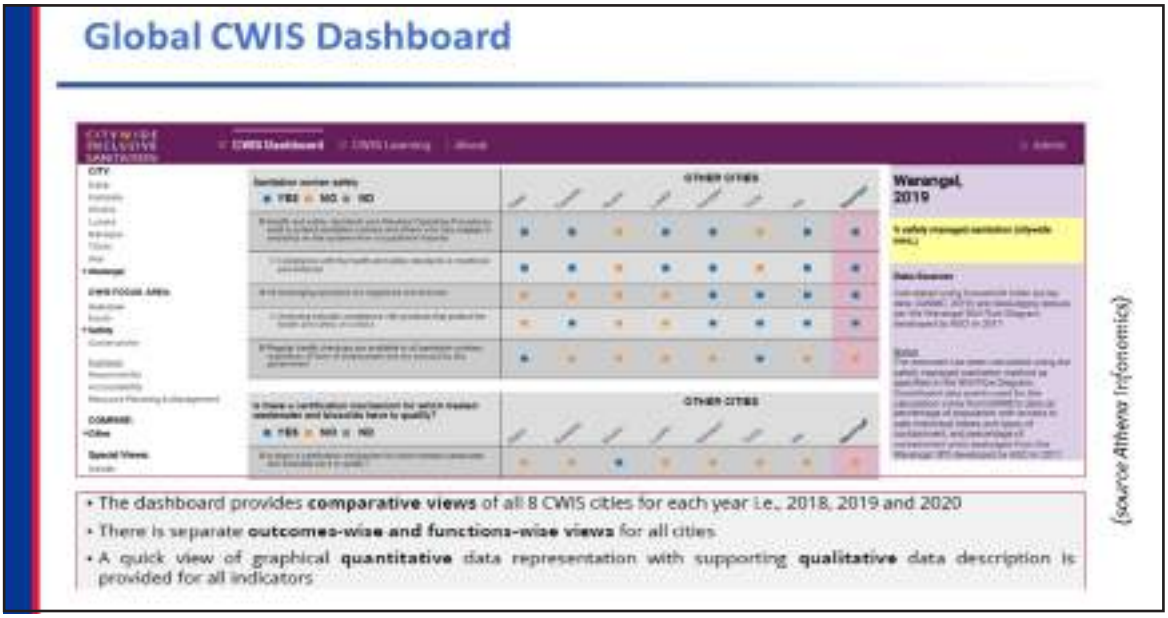
As discussed in respective topic, the indicators on CWIS framework has been discussed for the global context developed by Athena infonomics. The total indicators on CWIS functions are…

Slide 30



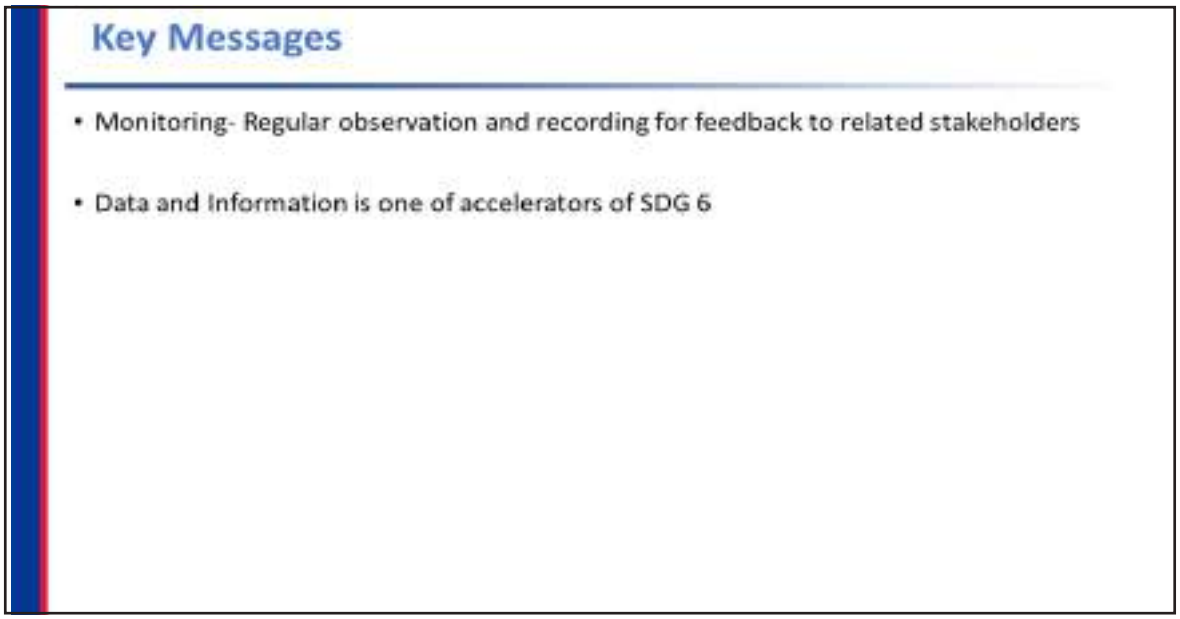
If possible, visit the https://cwiscities.com/ site and present on how CWIS indicators can be measured.

Slide 31



Slide 32

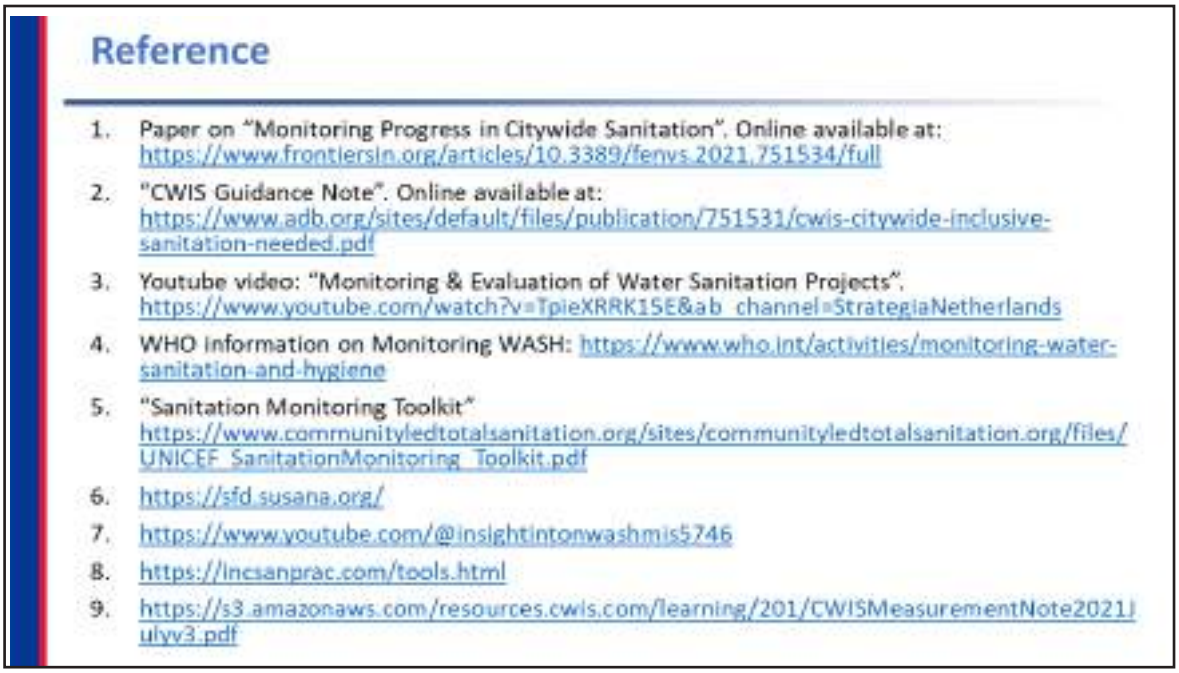
Slide 33



Hence, Monitoring is a regular observation and recording for progress updates and must be carried out continuously at different phases, giving feedback to the related stakeholders to be followed by Action points.

For monitoring one needs data and such data can be compiled through a system as IMIS, a useful management system for government, utilities and service providers which can be then presented to the stakeholders for advocacy or could be used to analyze the situation for the development of appropriate interventions through different sanitation tools like SFD and CSDA

Slide 34



Slide 35

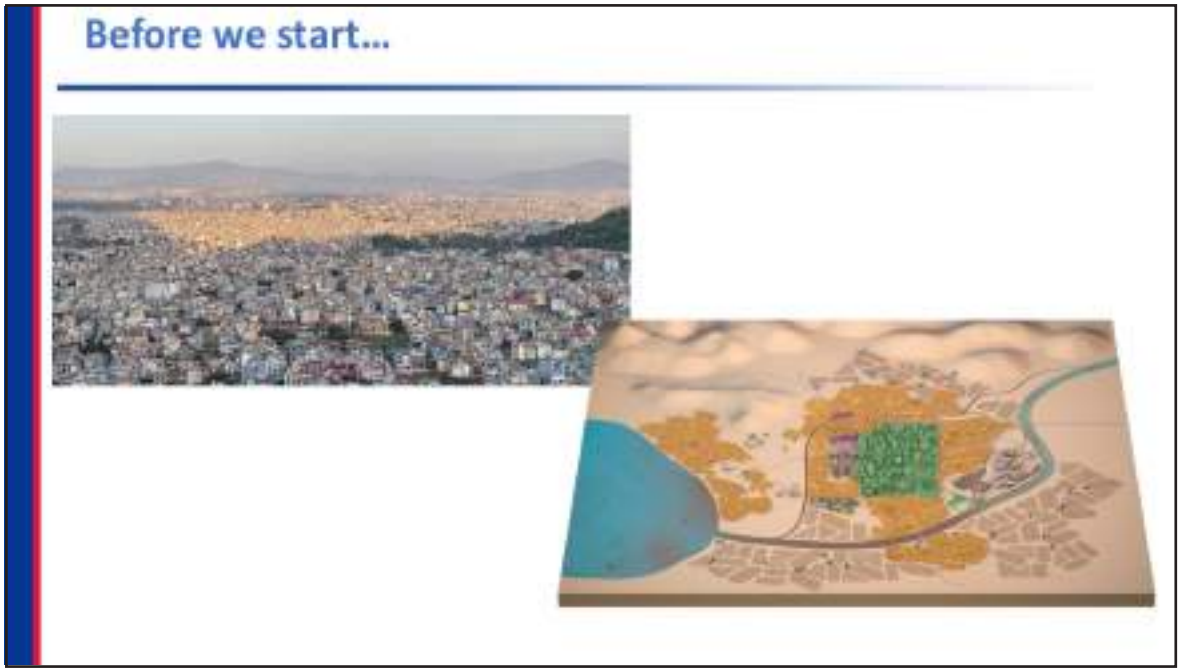
Thank you!
धन्यवाद !
Ministry of Water Supply
Department of Water Supply and Sewerage Management
Technical Support

SESSION 13

CWIS Tools and Platform

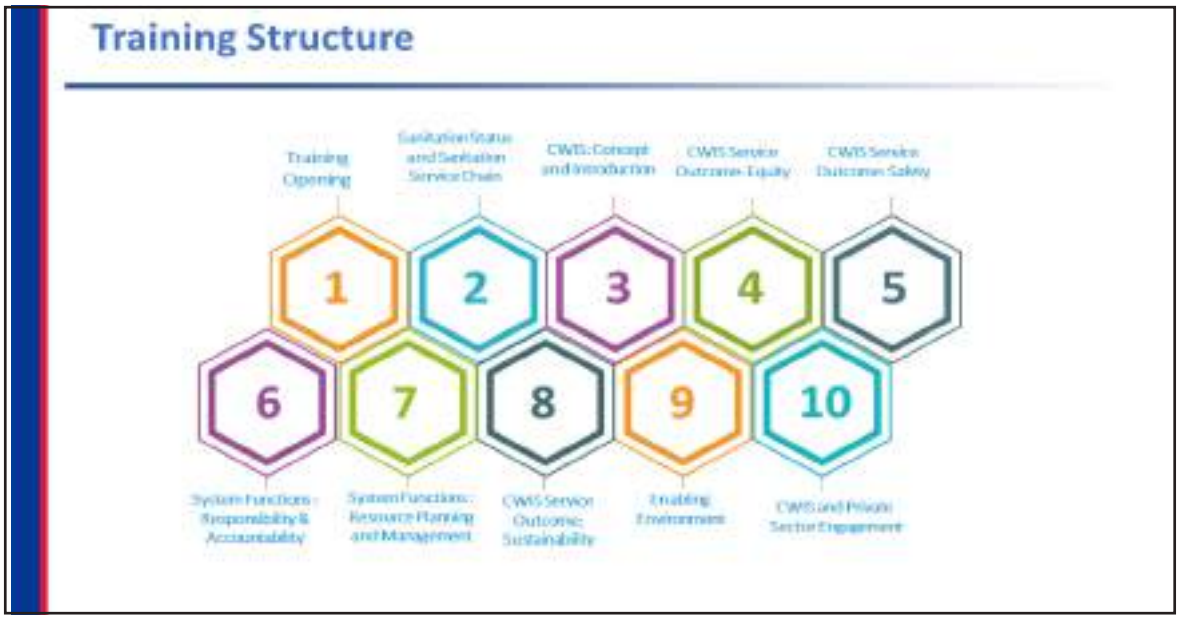
Slide 1

Slide 2



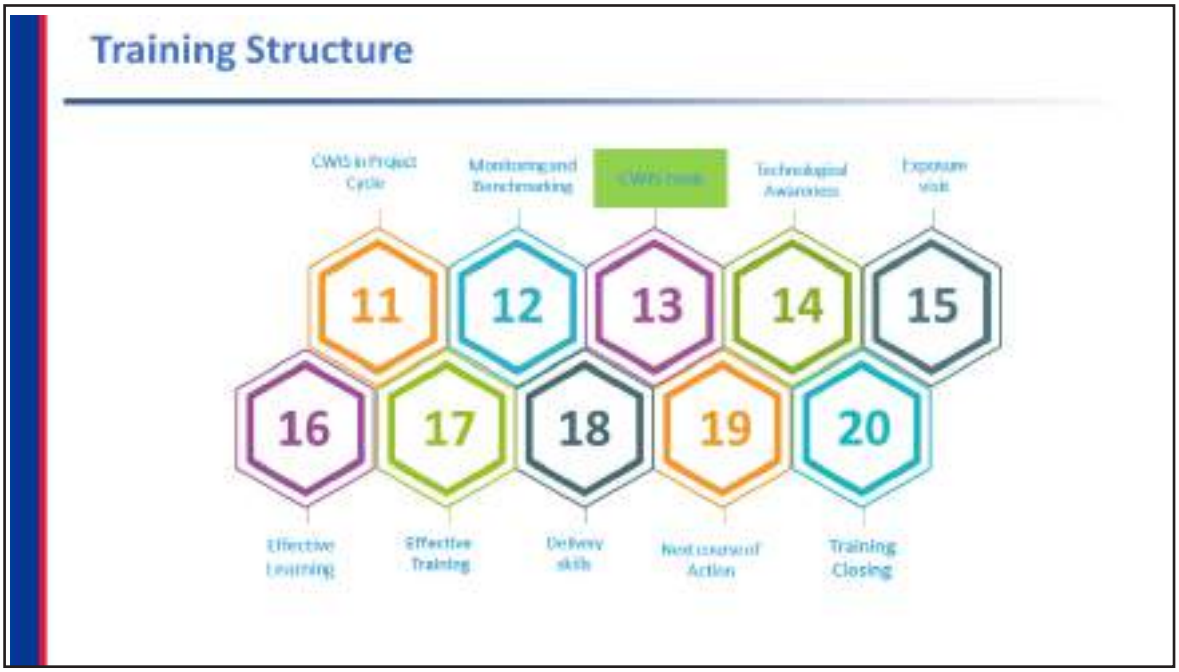
If you are going for the planning of sanitation systems and services, to cover the whole city, you need to understand the city first. You want to get a common vision with all the key stakeholders and for the reason, collecting information should be used to get them engaged in the process. Several tools exist to help do such an assessment work with stakeholders and render the results in a visual way.
And in the session will be discussing on 2 such diagnostic tools along with the data compilation platform for the same.

Slide 3



This training includes 20 main technical sessions, and are currently on session 13: CWIS Tools - SFD

Slide 4



This training includes 20 main technical sessions, and are currently on session 13: CWIS Tools - SFD

Slide 5

Learning Outcomes

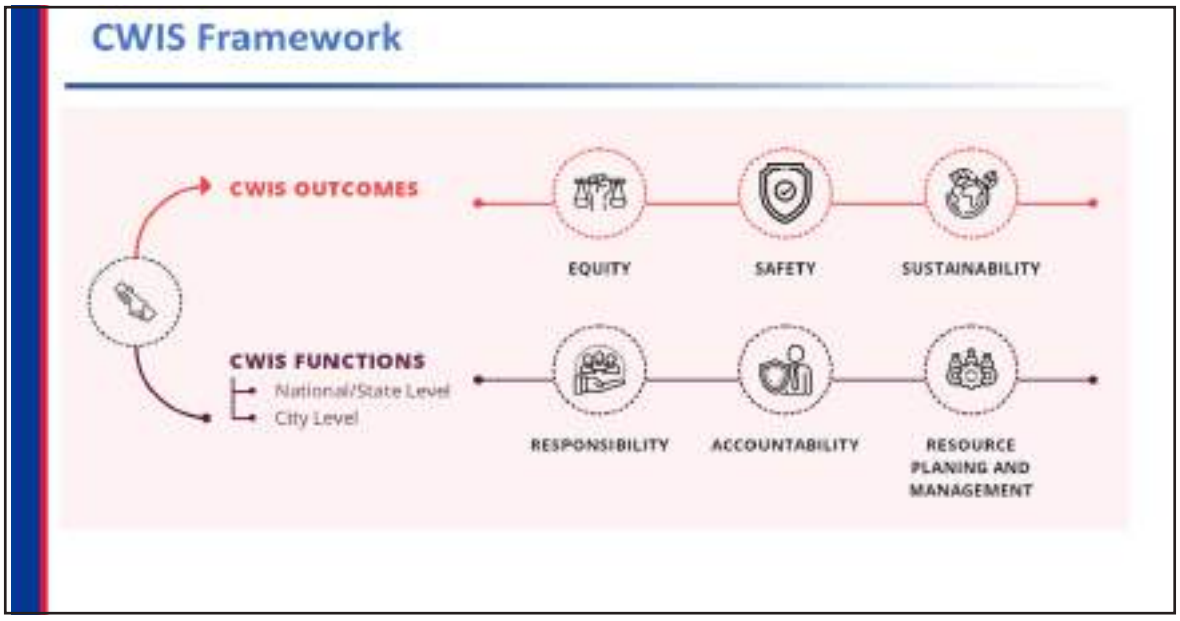
- Discuss briefly on different CWIS tools and platform for data compilation

Slide 6

Presentation Outline

- CWIS Tools
  - Shit Flow Diagram (SFD) and some examples
  - CWIS Service Delivery Assessment (CSDA)
- Platform
  - N-WASH
  - IMIS

Slide 7



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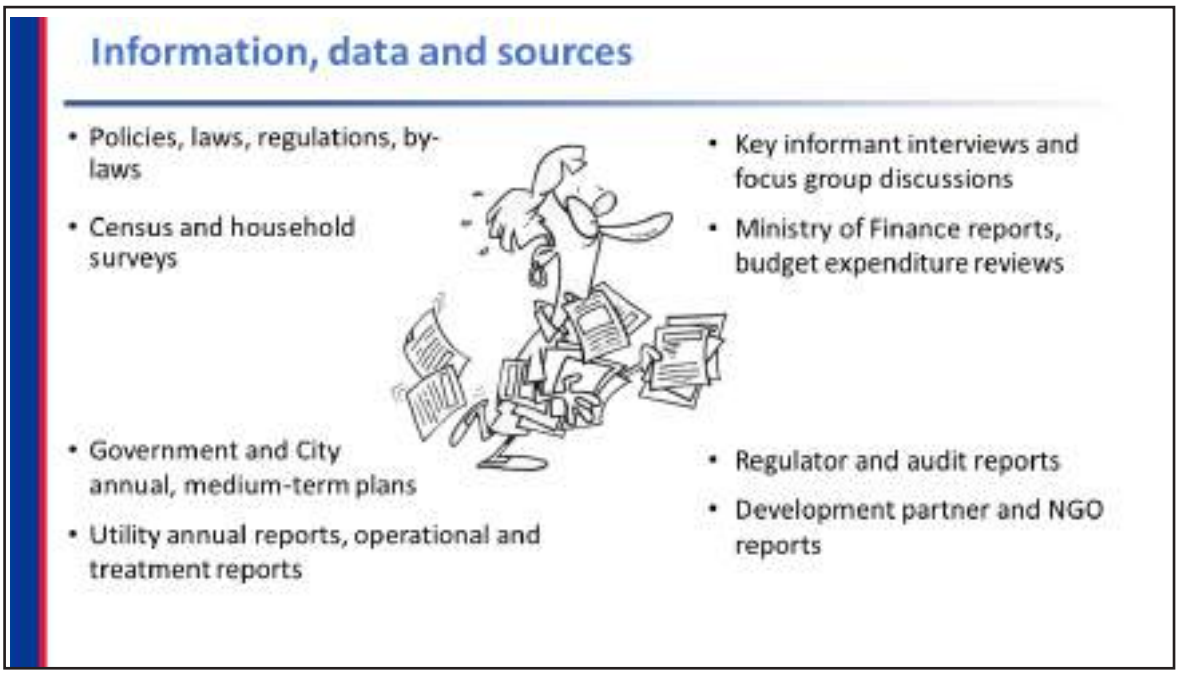

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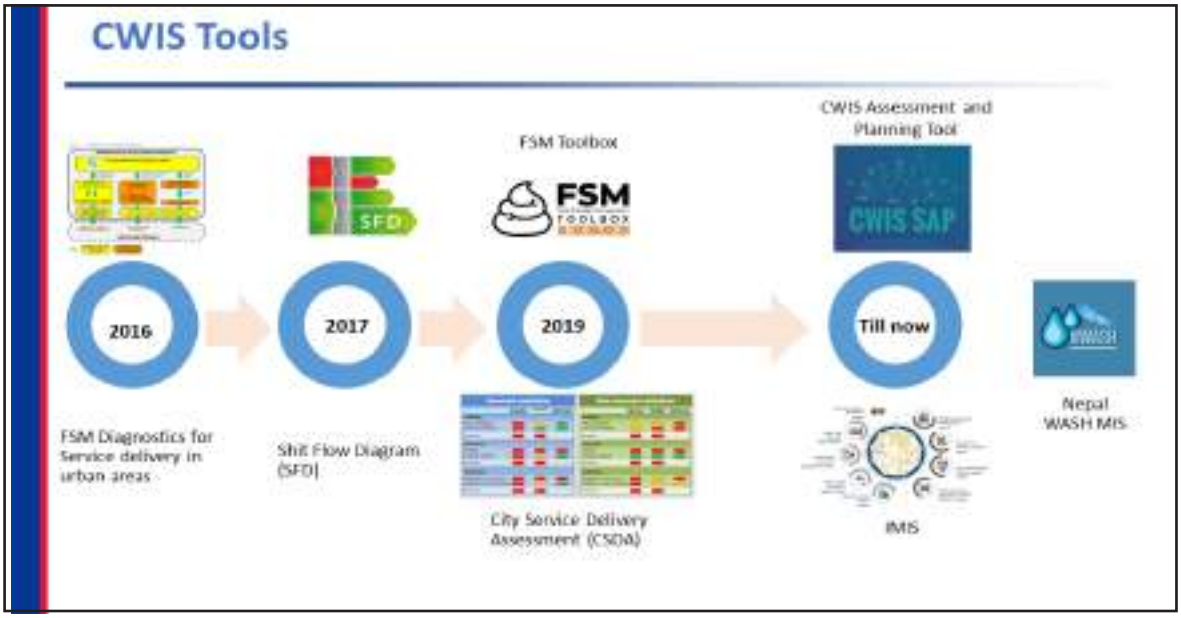

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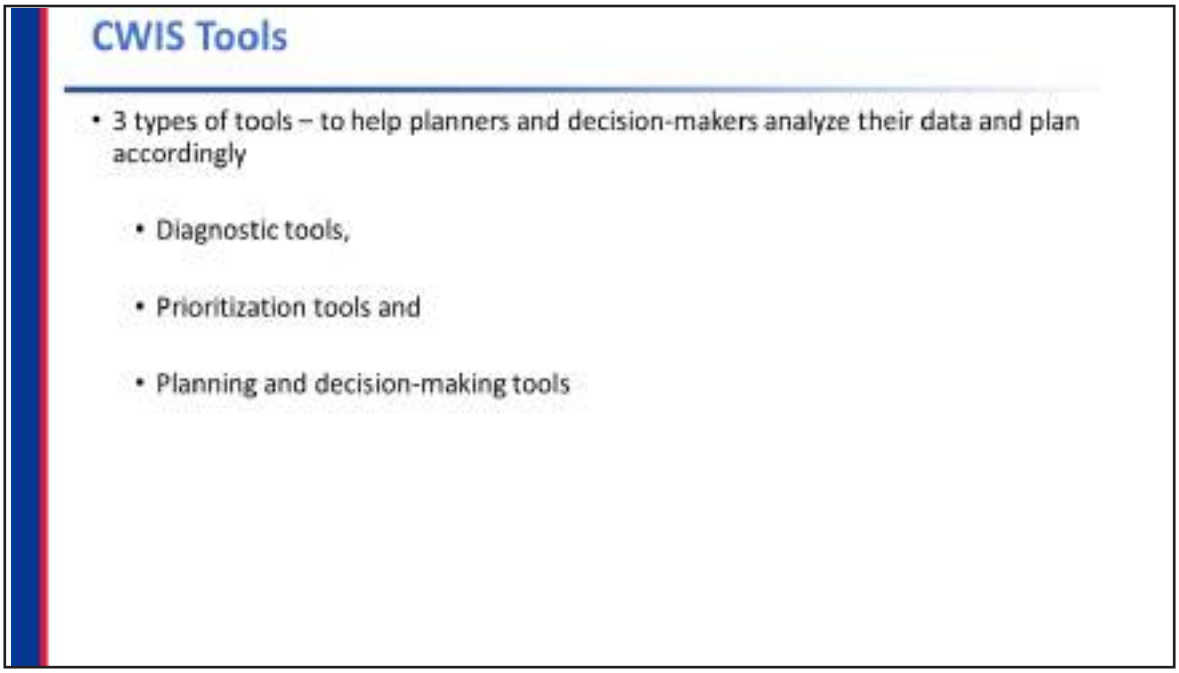
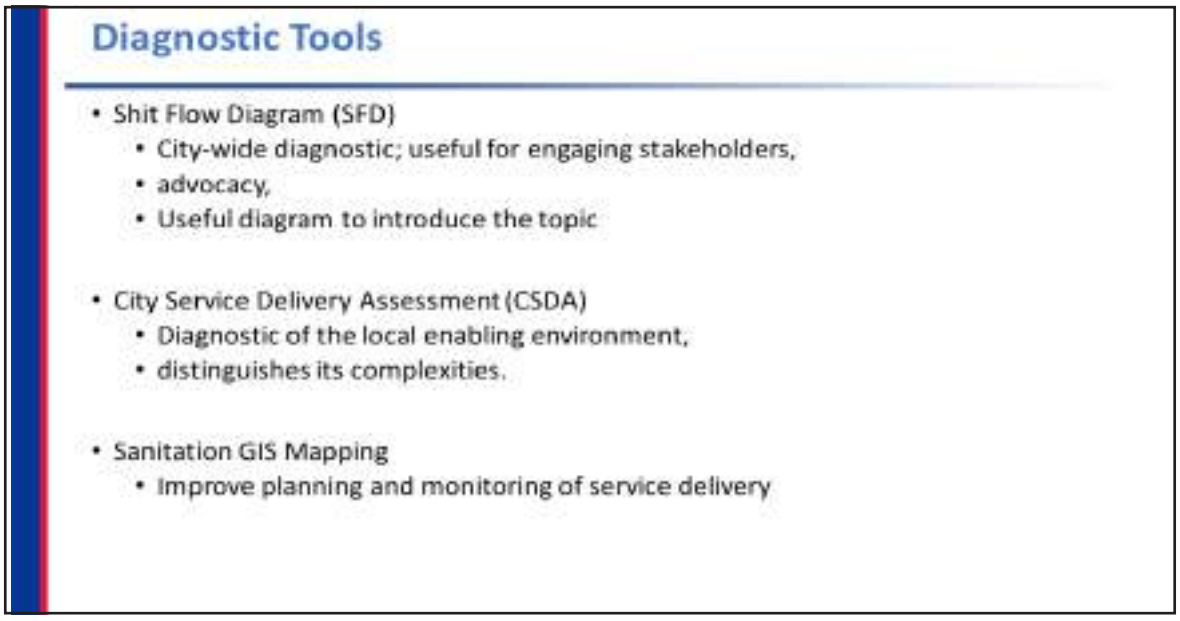


As discussed earlier, to serve the whole city with the right blend of sanitation systems and services, there are 3 types of tools to help planners and decision makers analyze their data and plan accordingly.

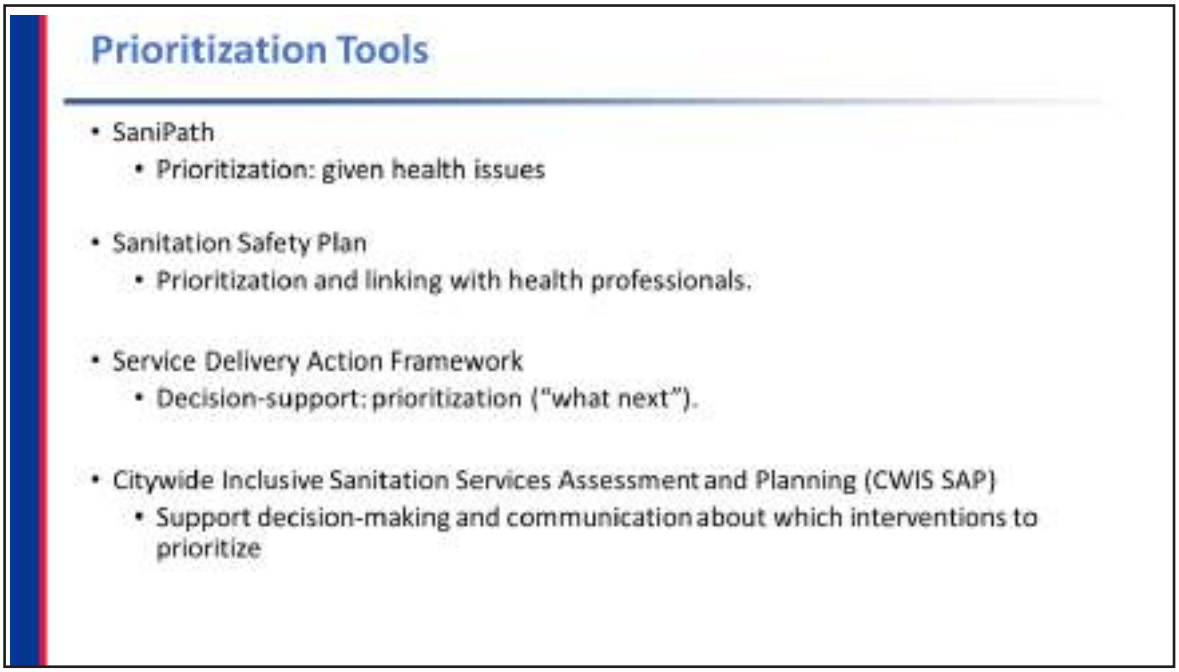
Slide 11



For the situation analysis, diagnostic tools are used.

In the session, participants will be discussing on SFD and CSDA in a brief as an intro to different tools.

Slide 12



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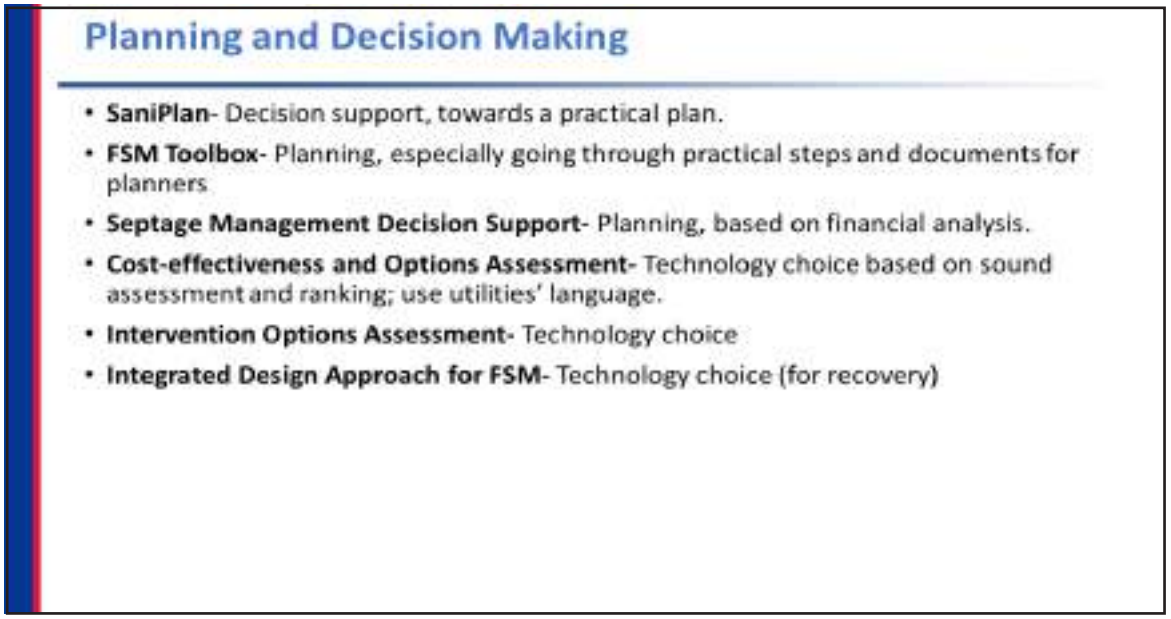


Among these all, as an introduction to the tools, will be discussing further on SFD and CSDA. Later, will be more focusing on the platform for the data compilation, that is, N-WASH at national level and IMIS at local government level.

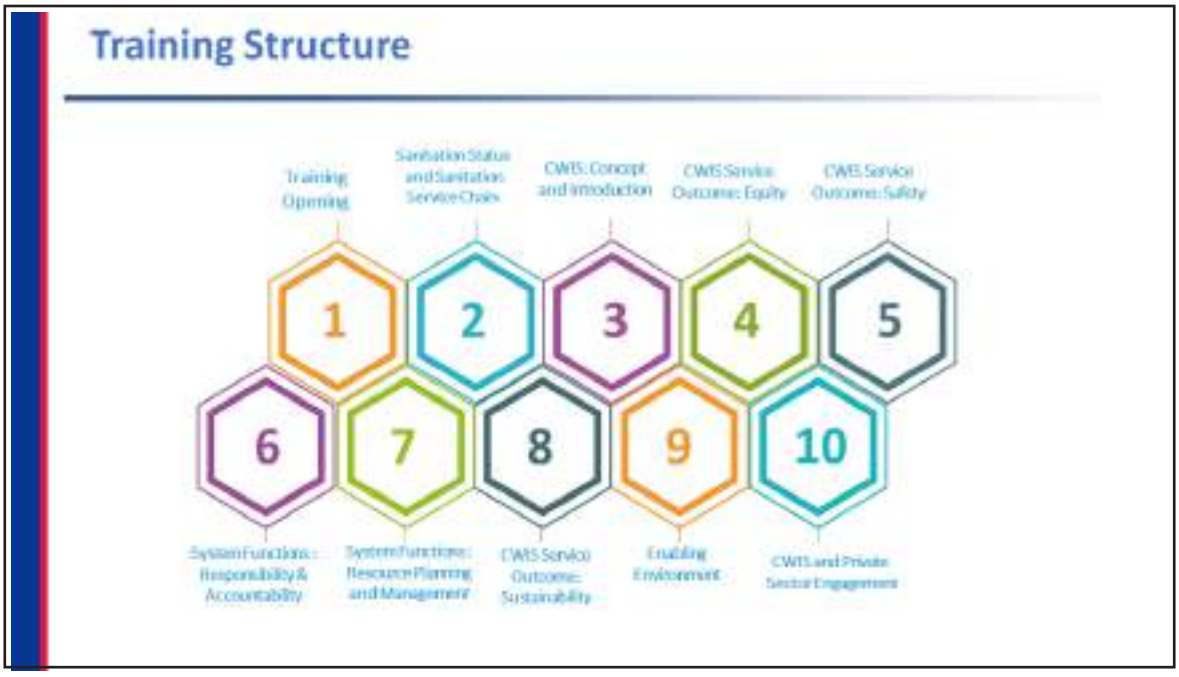
Slide 14

SESSION 13.1

CWIS Tools: Shit Flow Diagram

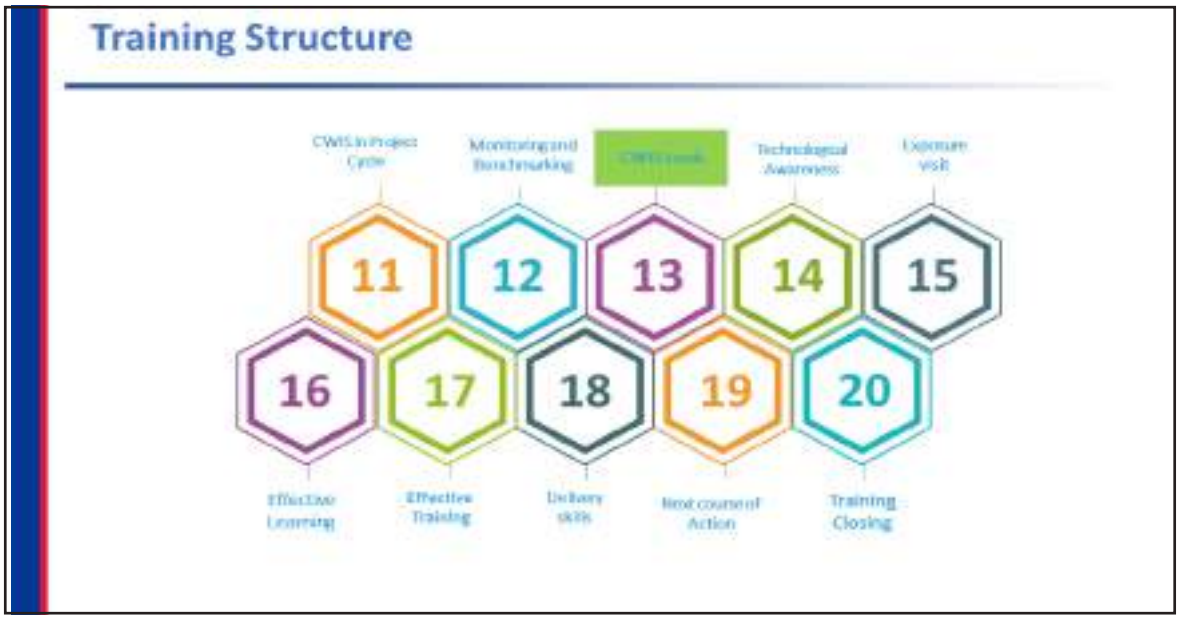
Slide 1

Slide 2



This training includes 20 main technical sessions, and are currently on session 13: CWIS Tools - SFD

Slide 3



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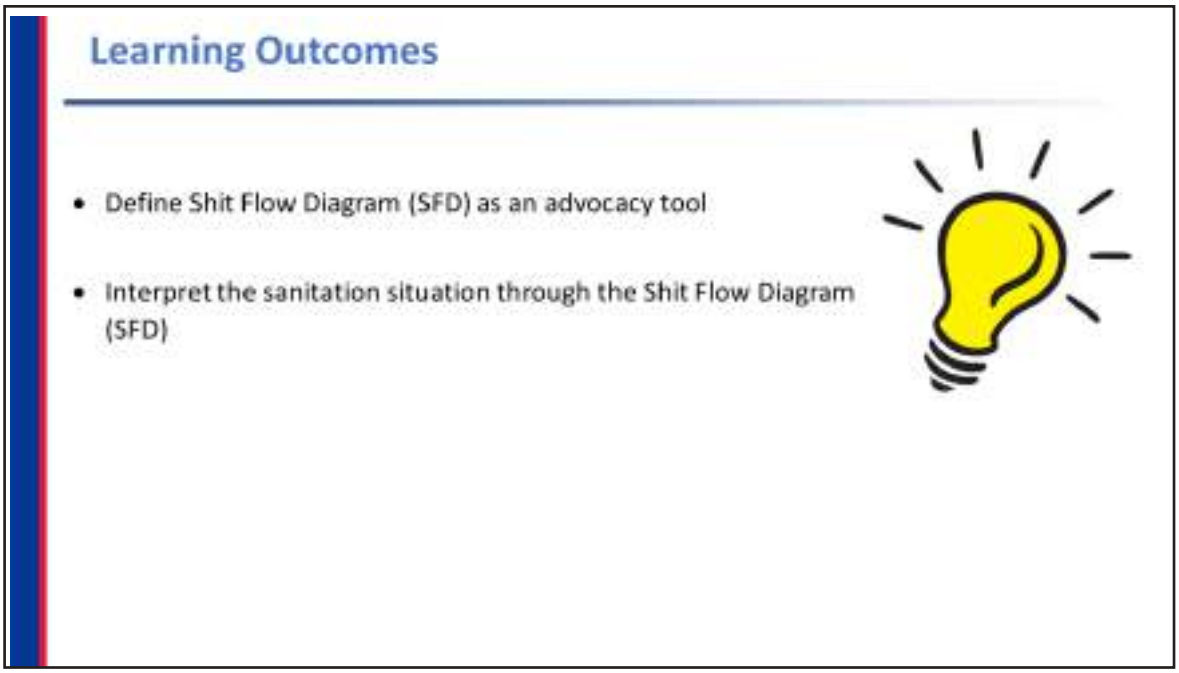


Slide 5

Presentation Outline

- Representation of Data
- Advantange of data representation
- Shit Flow Diagram (SFD) and some examples
- Level of SFD

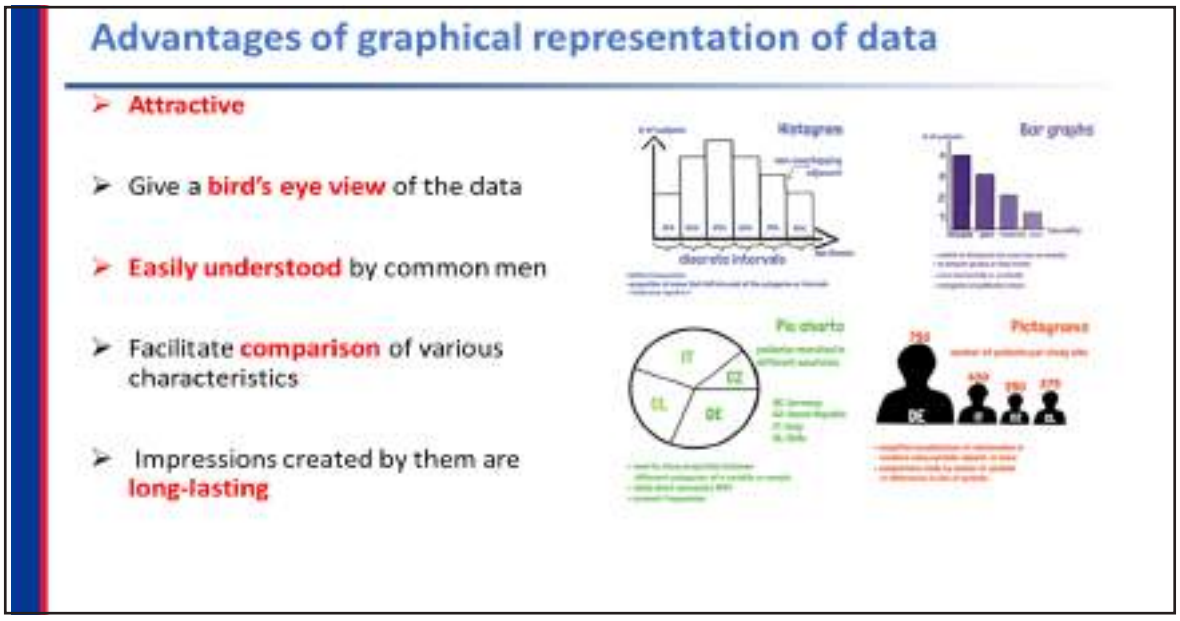
Slide 6

Representation of Data

- Tabular Representation of Data
- Graphical Representation of Data

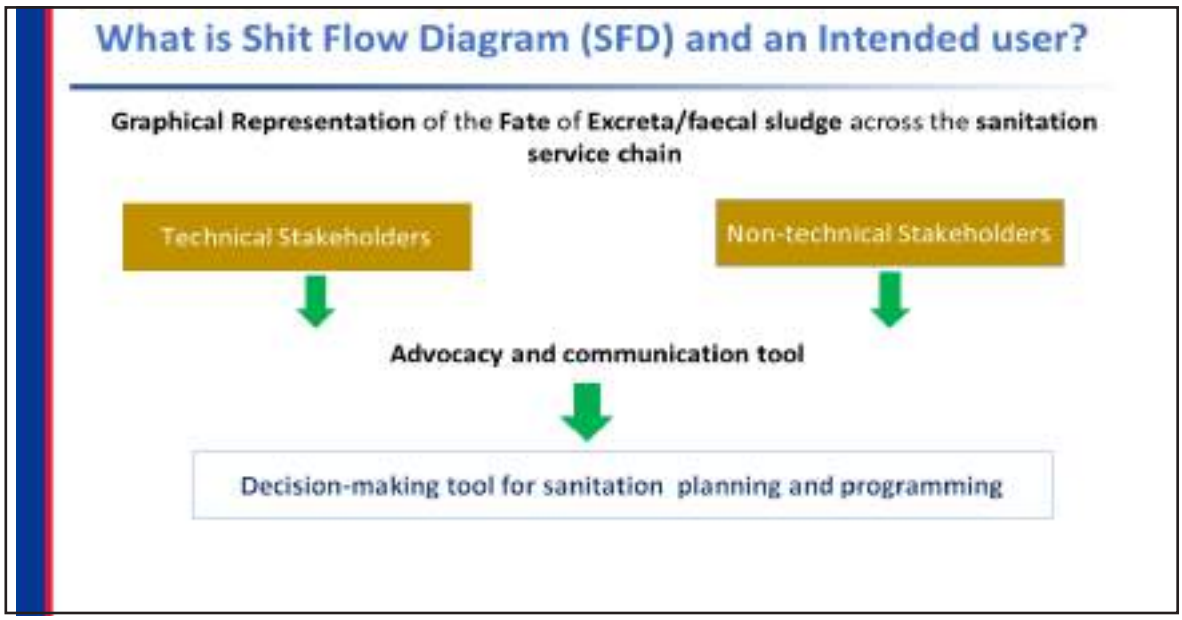
S.N.	Name of company	Production (NRs.)	Sales (NRs.)
1	XYZ	600,000	700,000
2	ABC	800,000	600,000
3	QRS	500,000	500,000
4	MNO	1,000,000	1,200,000

Slide 7



Slide 8

Slide 9



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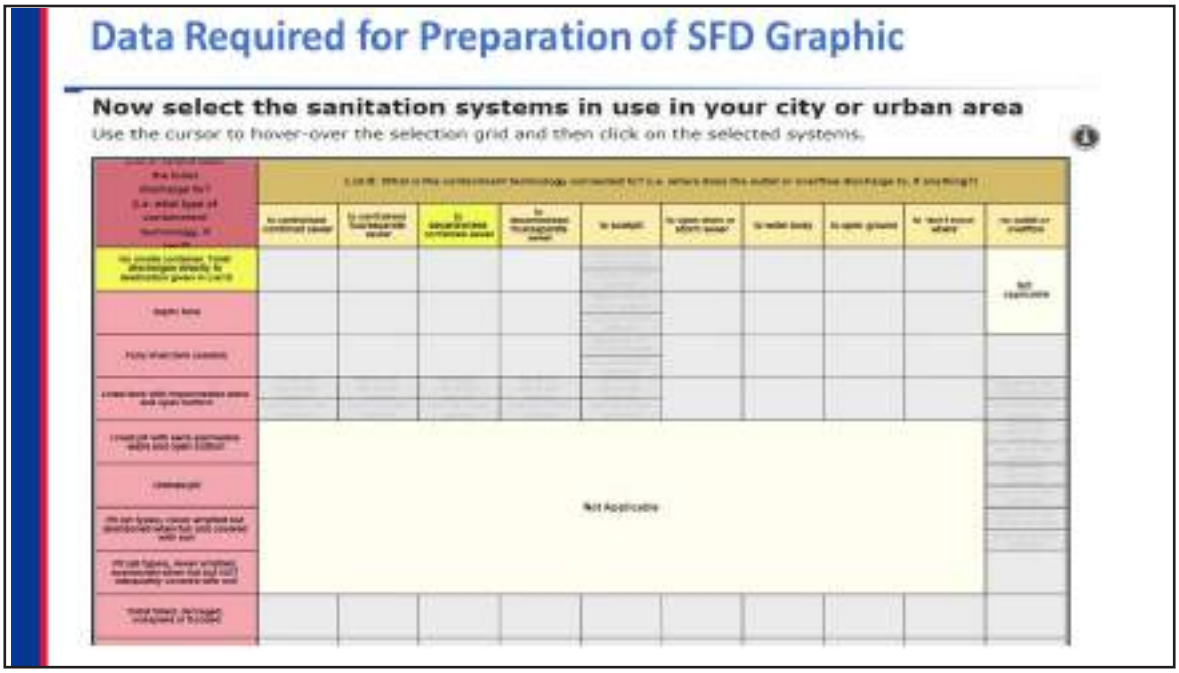

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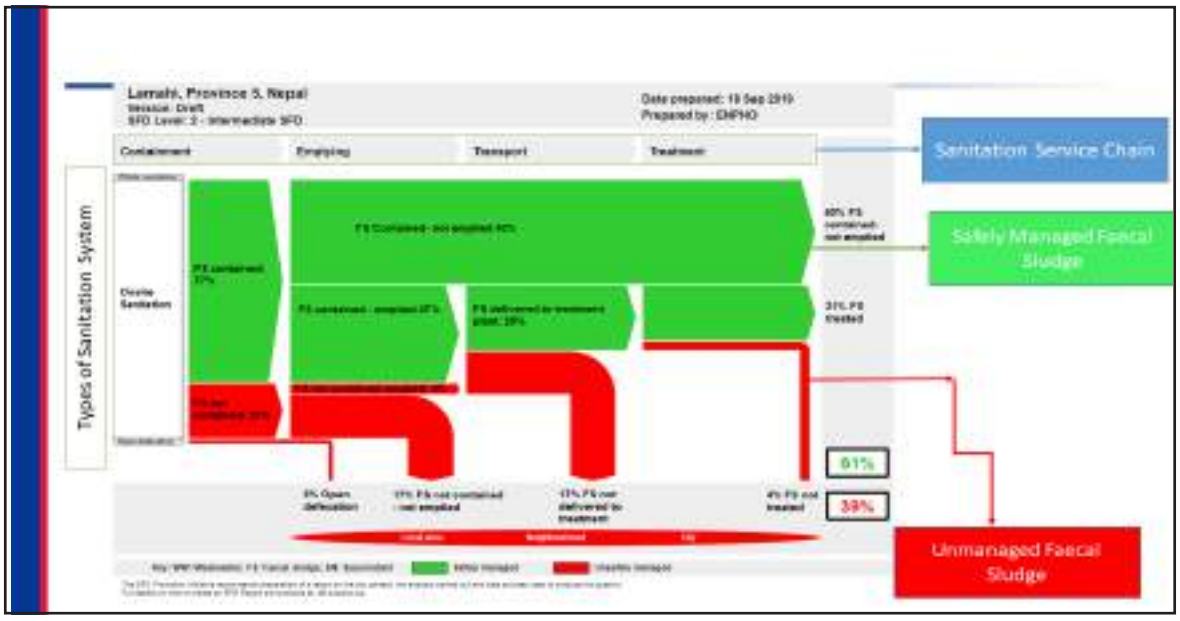

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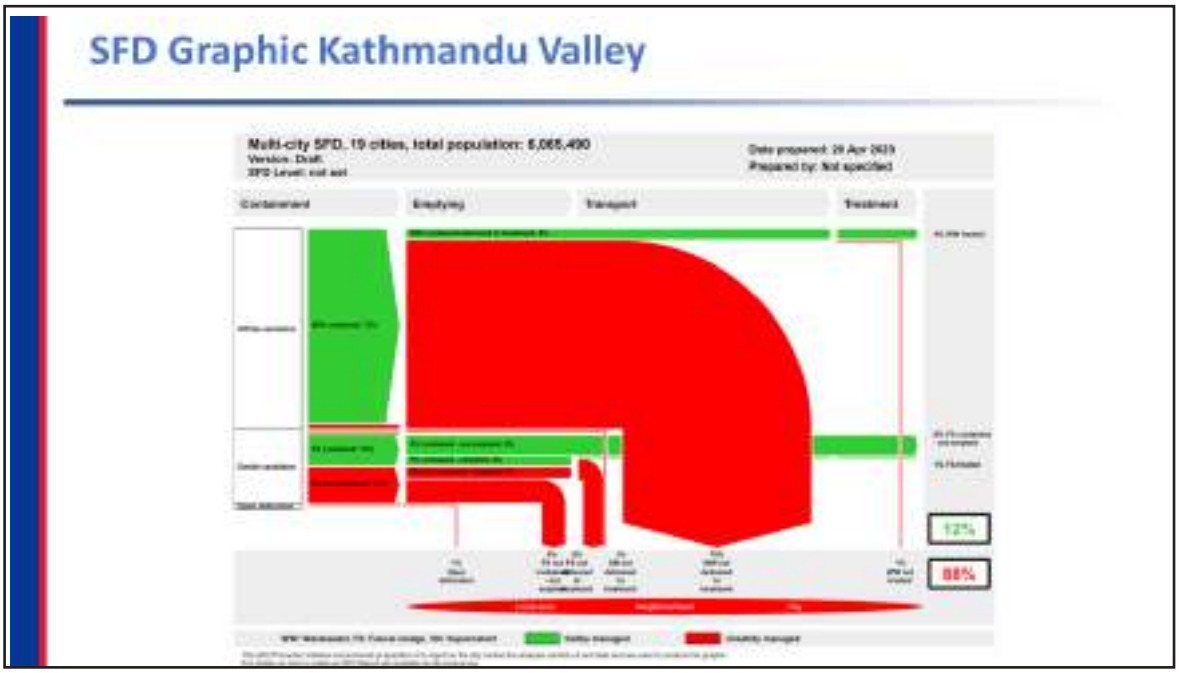

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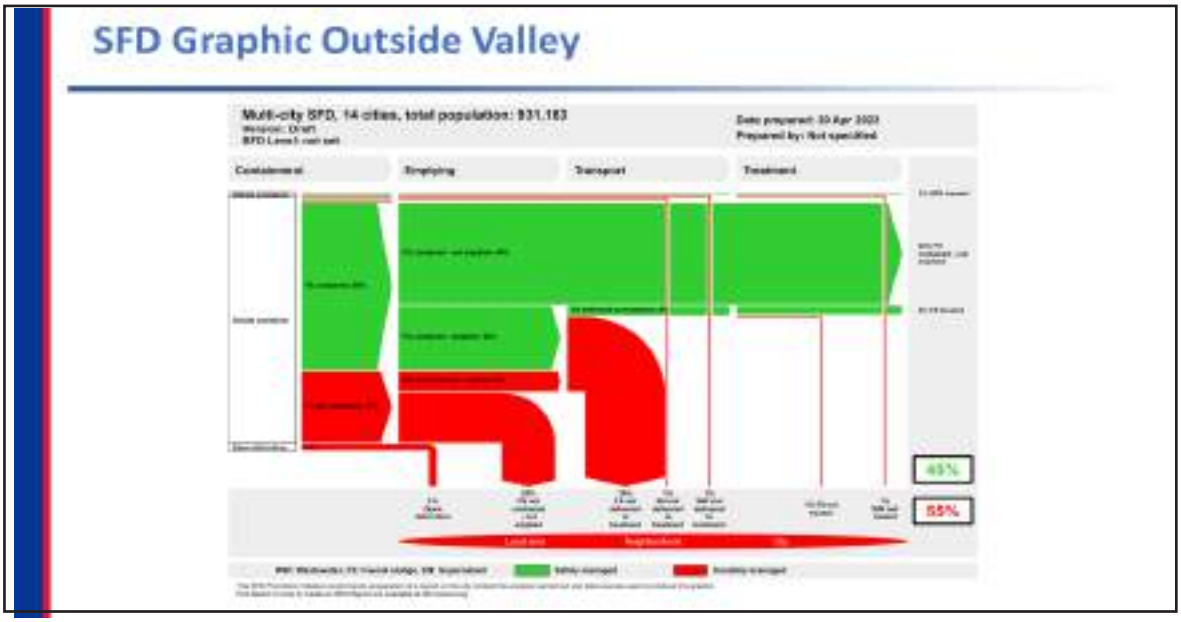

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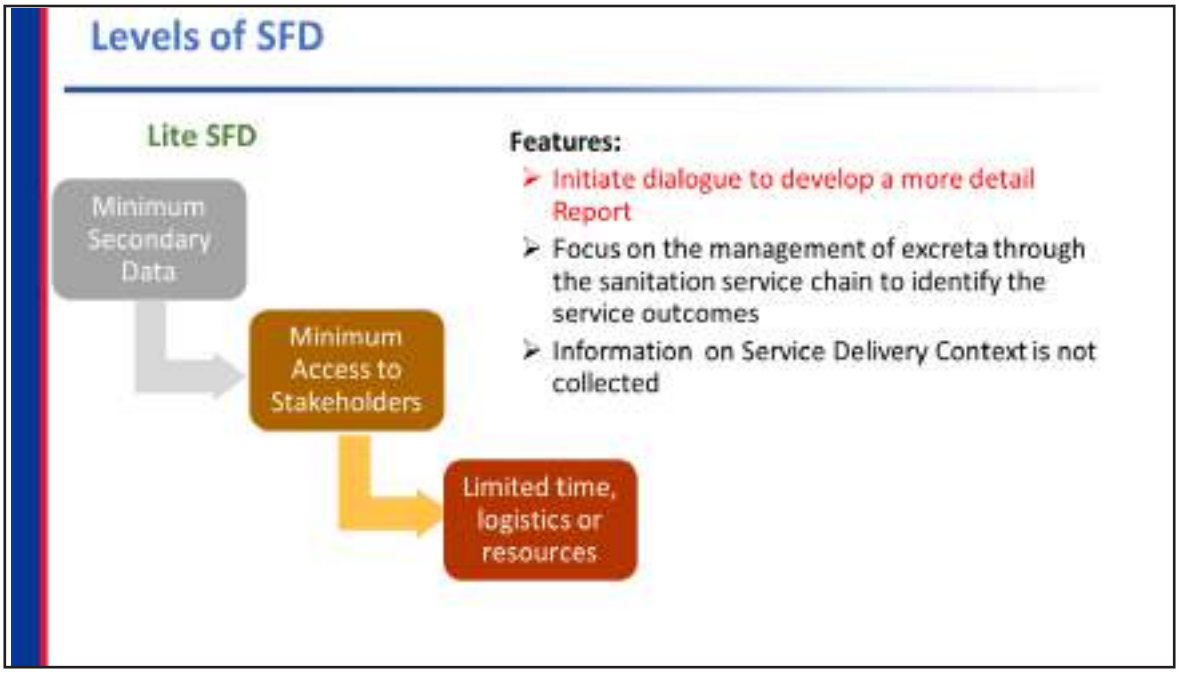

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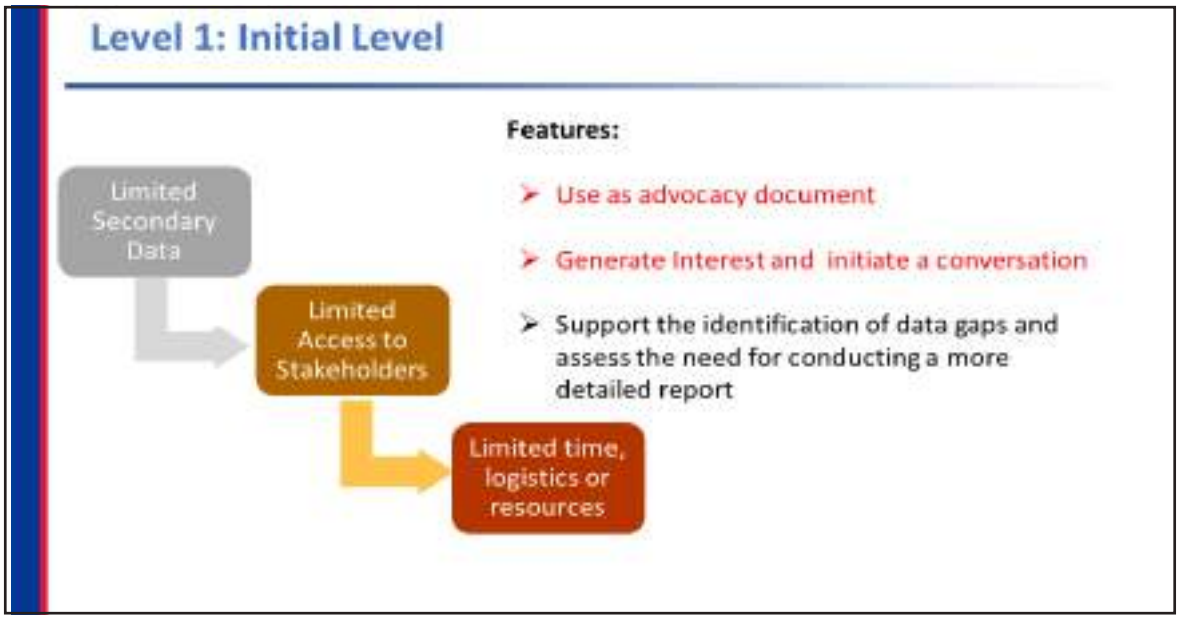

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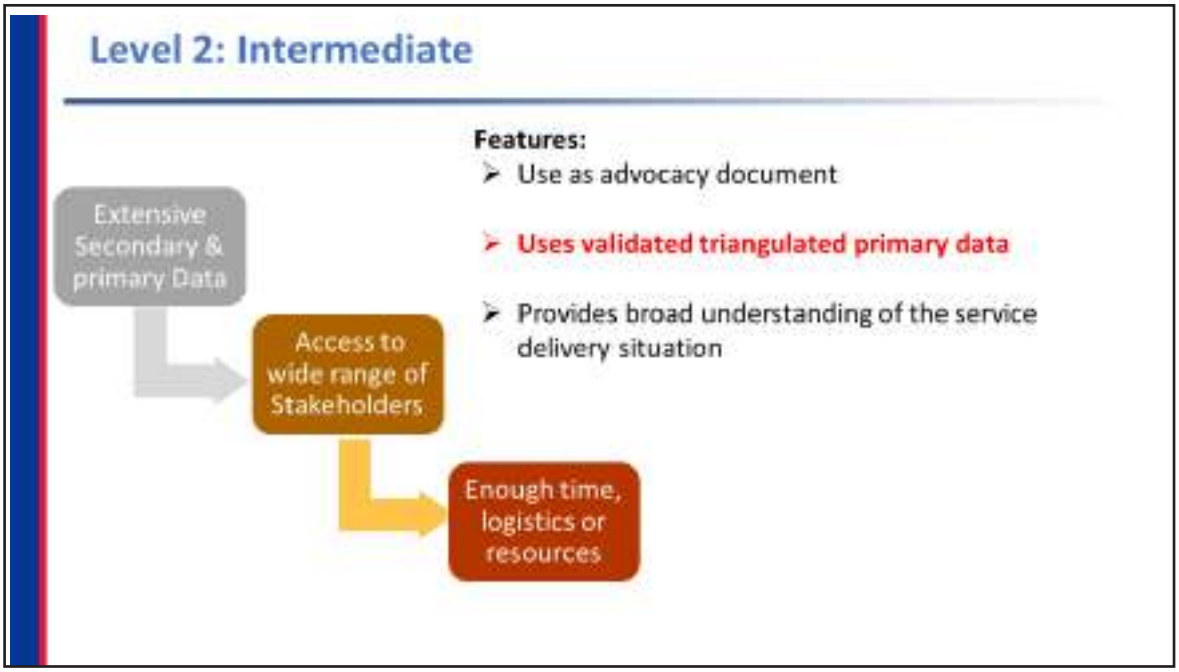

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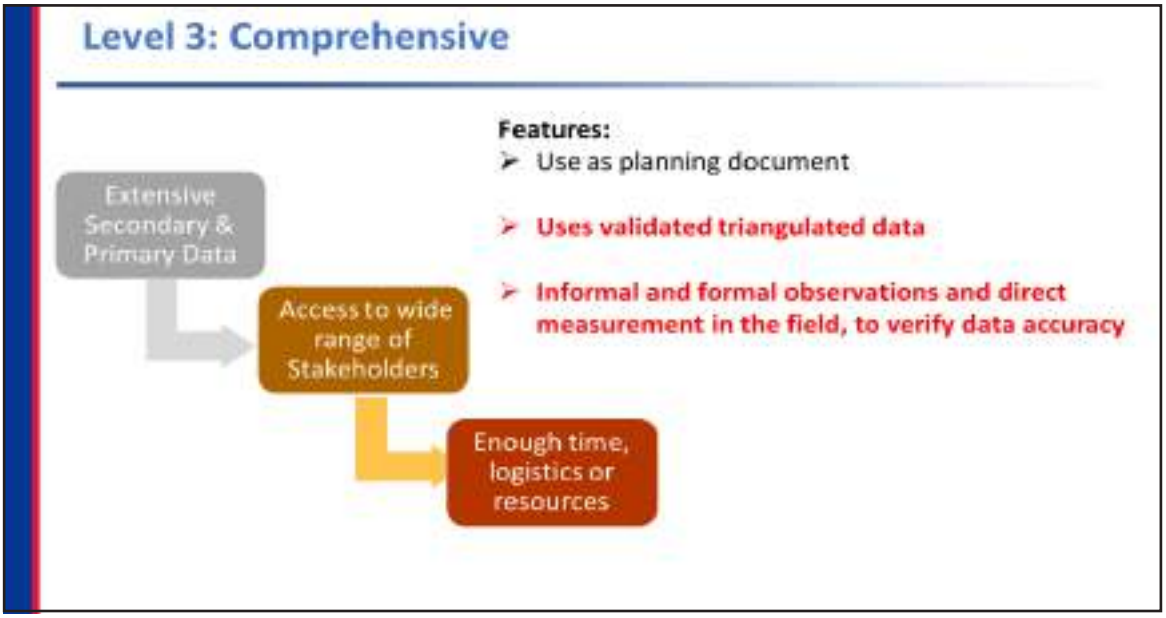
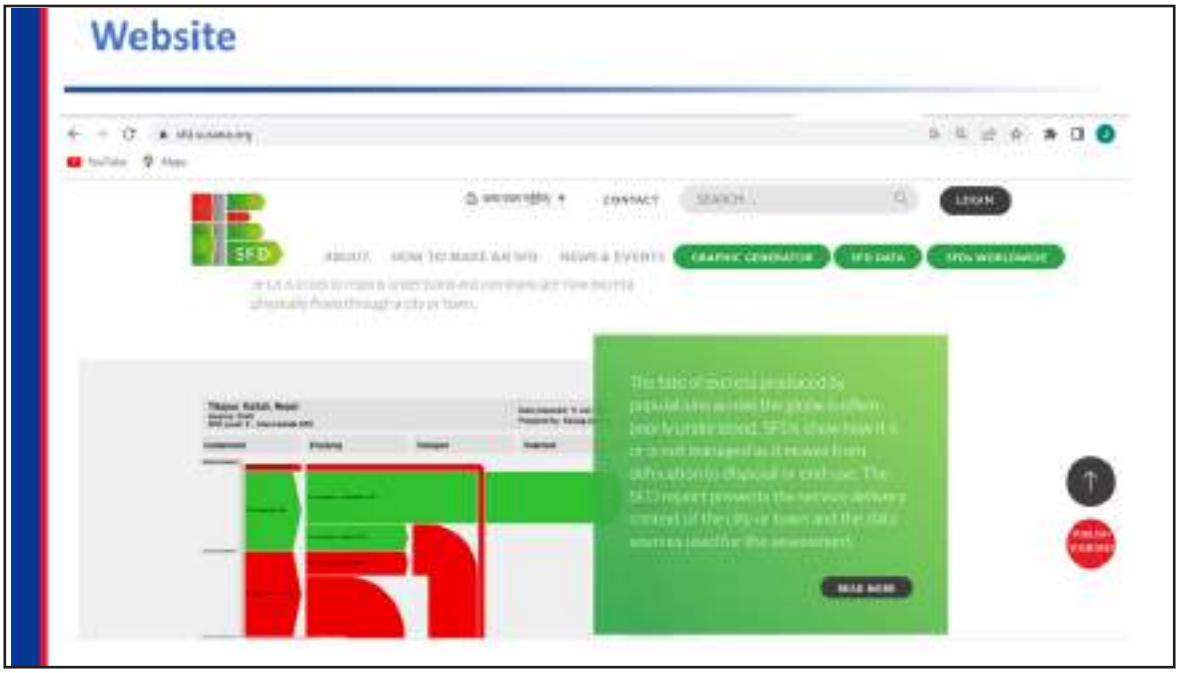


Slide 18



Slide 19

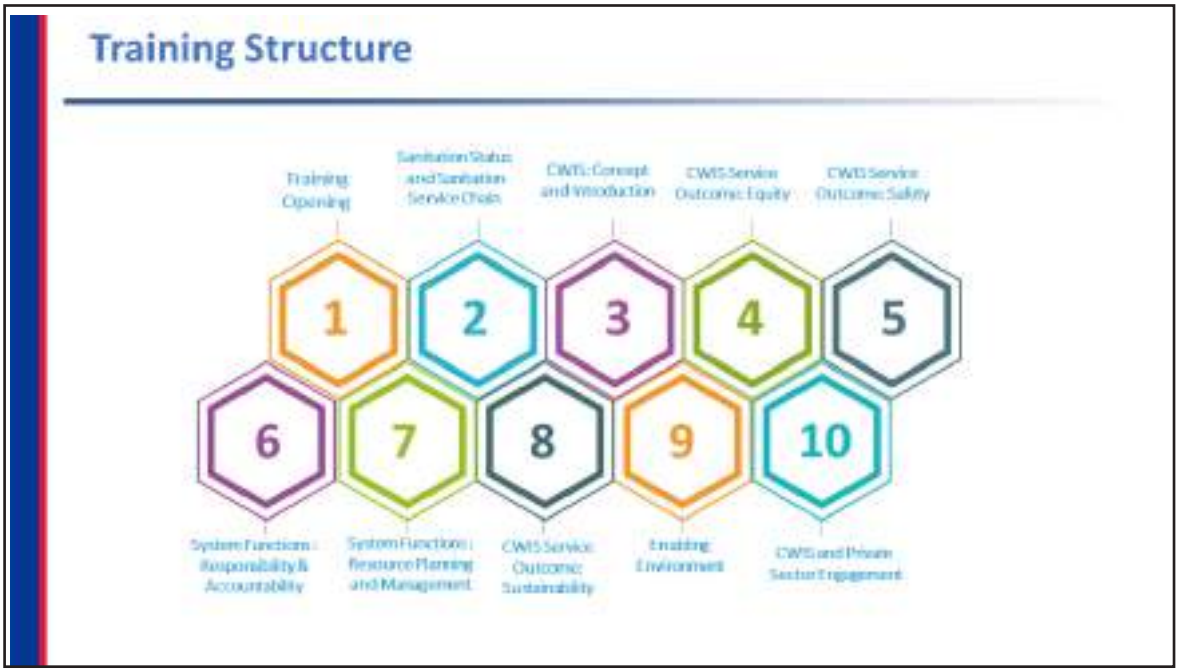
Slide 20

SESSION 13.2

CWIS Tools: CSDA

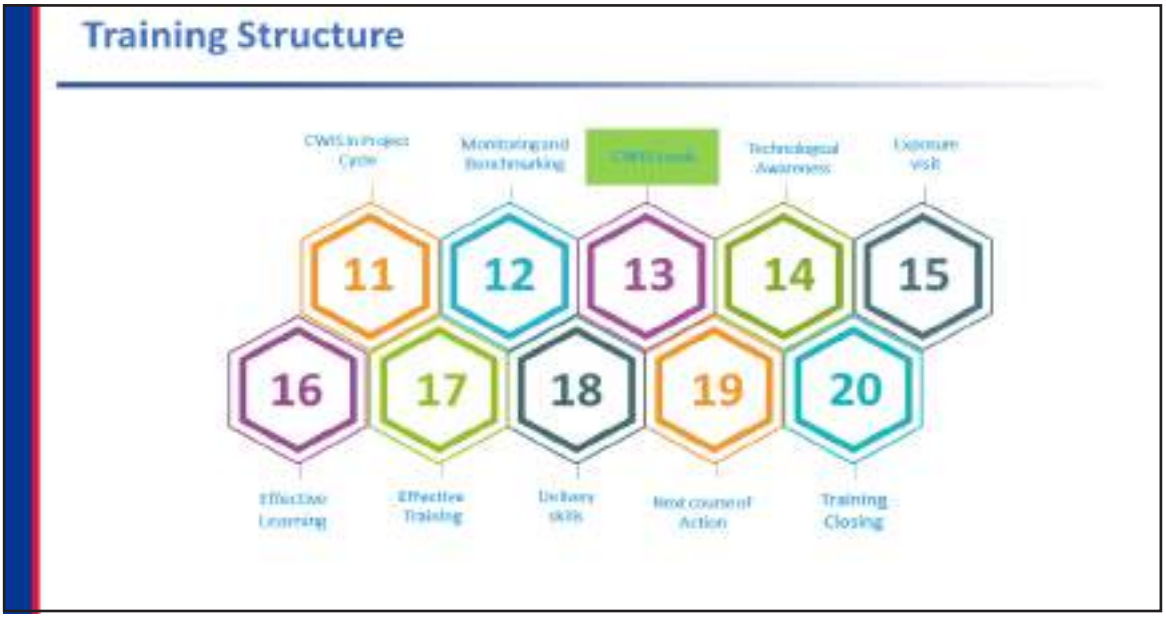
Slide 1

Slide 2



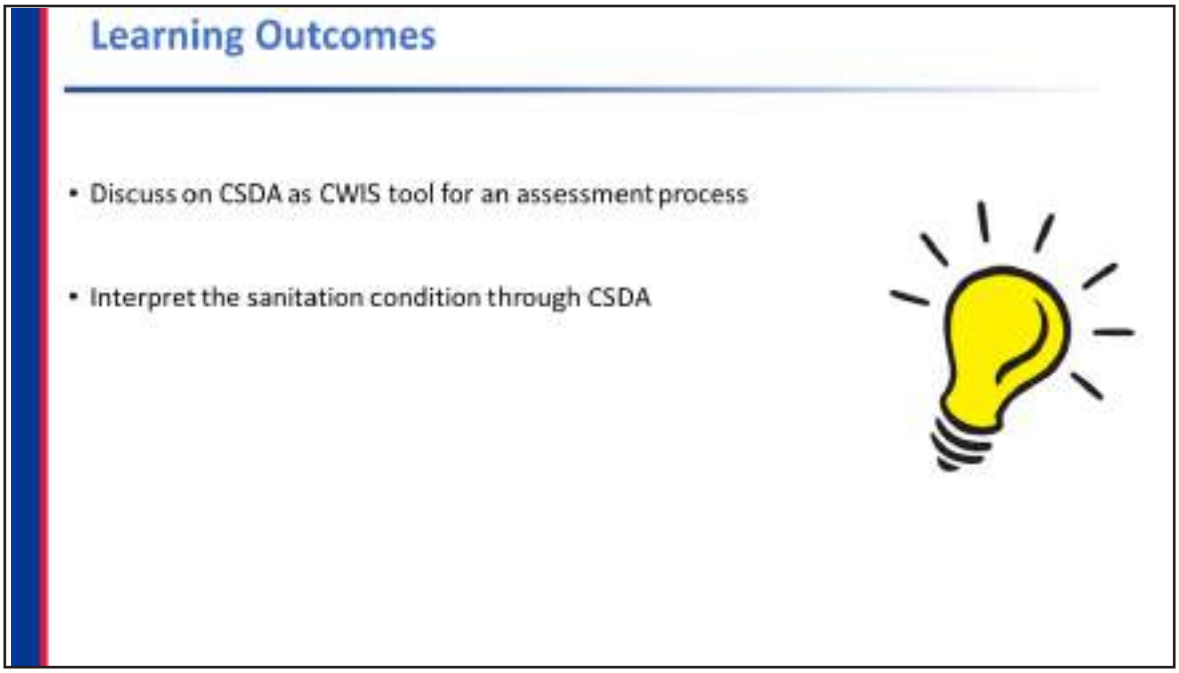
This training includes 20 main technical sessions, and are currently on session 13: CWIS Tools – City Service Delivery Assessment (CSDA)

Slide 3



This training includes 20 main technical sessions, and are currently on session 13: CWIS Tools – City Service Delivery Assessment (CSDA)

Slide 4



At the end of the session, participants will be able to …

Slide 5

Presentation Outline

- What does a CSDA do?
- The enabling environment
- Fitting the CSDA into the project cycle
- The CSDA output

Slide 6

Shit Flow Diagram (SFD)

- Overview of how sanitation is working or not working in a city:
  - Shows **% of population** contributing to each faecal waste flow
  - Shows % **safely managed** and **% unsafely managed** excreta
  - Reflects how **inclusive** the sanitation service is
  - Is effective for **advocacy** and awareness raising, but not technical design

What are the cause for these issues and challenges in sanitation?

Slide 7

CSDA for CWIS

- CSDA assesses why this is happening:
- Facilitates assessment of **enabling environment** for CWIS
- Generates **graphics** to support a systematic process for **stakeholders**
- Addresses both **sewered** and **non-sewered** sanitation
- Includes an Action Checklist to **identify and prioritise actions** to improve sanitation

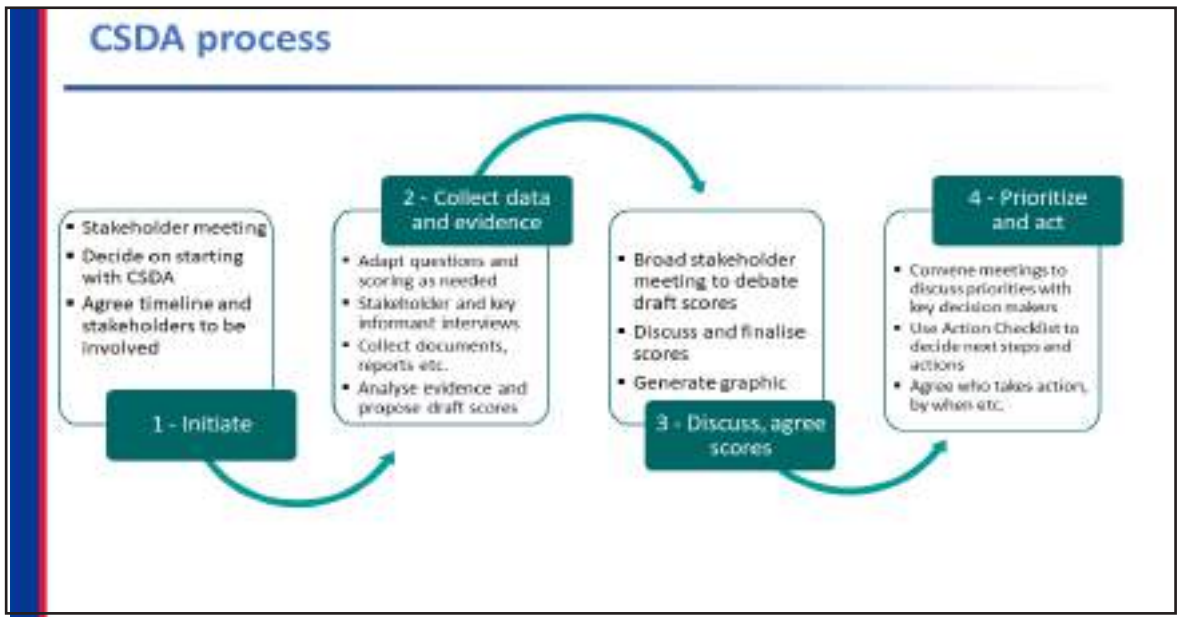
Slide 8

Purpose of CSDA

- It supports the **assessment** of the enabling environment for CWIS using structured questions
- It generates simple **graphics** to support a systematic process
- It addresses **sewered and non-sewered** sanitation.
- It includes an **action checklist** to help identify and prioritise actions to improve sanitation

At the end of the session, participants will be able to …

Slide 9



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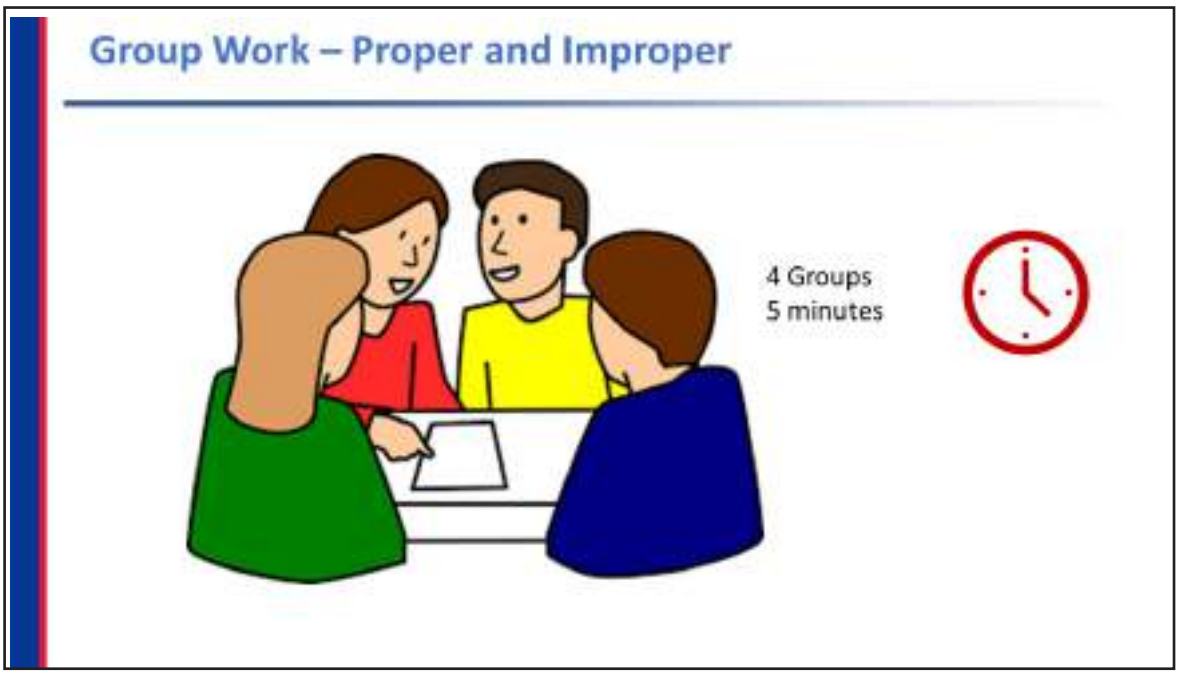
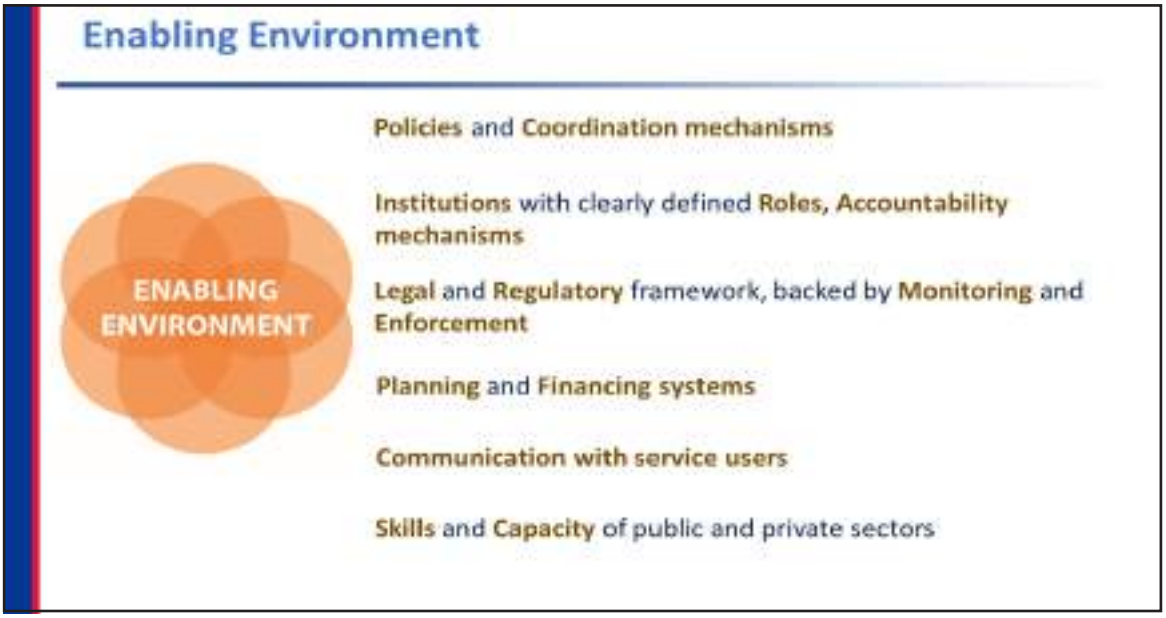


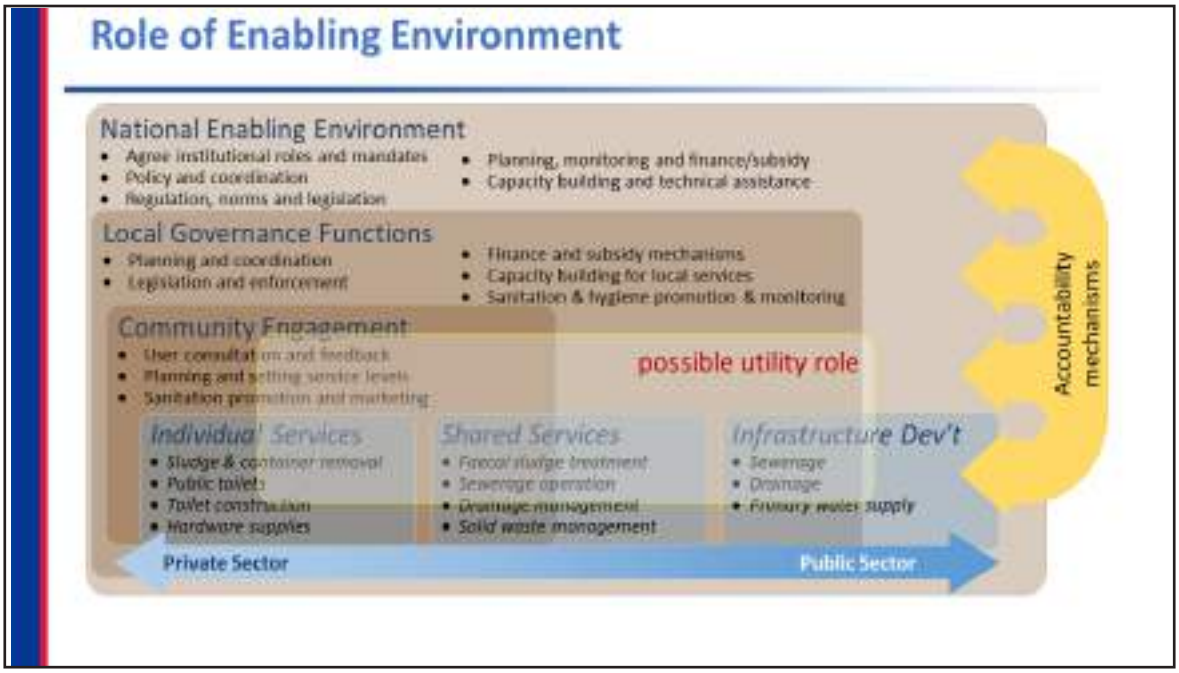
They are going for a group work. For this, participants will be provided a case and will be divided into 4 groups

Slide 11



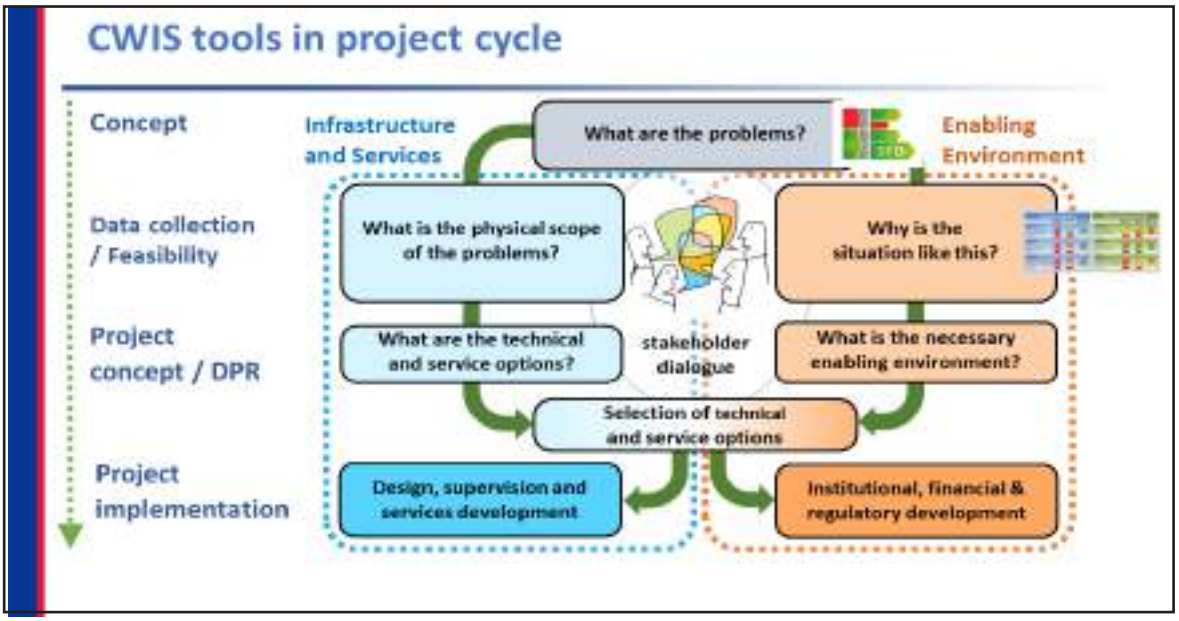
Explain how CSDA is linked with enabling environment.

Slide 12



Link between CSDA and 3 tiers of Government

Slide 13



Link of CSDA with CWIS tools in project cycle

Slide 14

Pillars, building blocks and questions

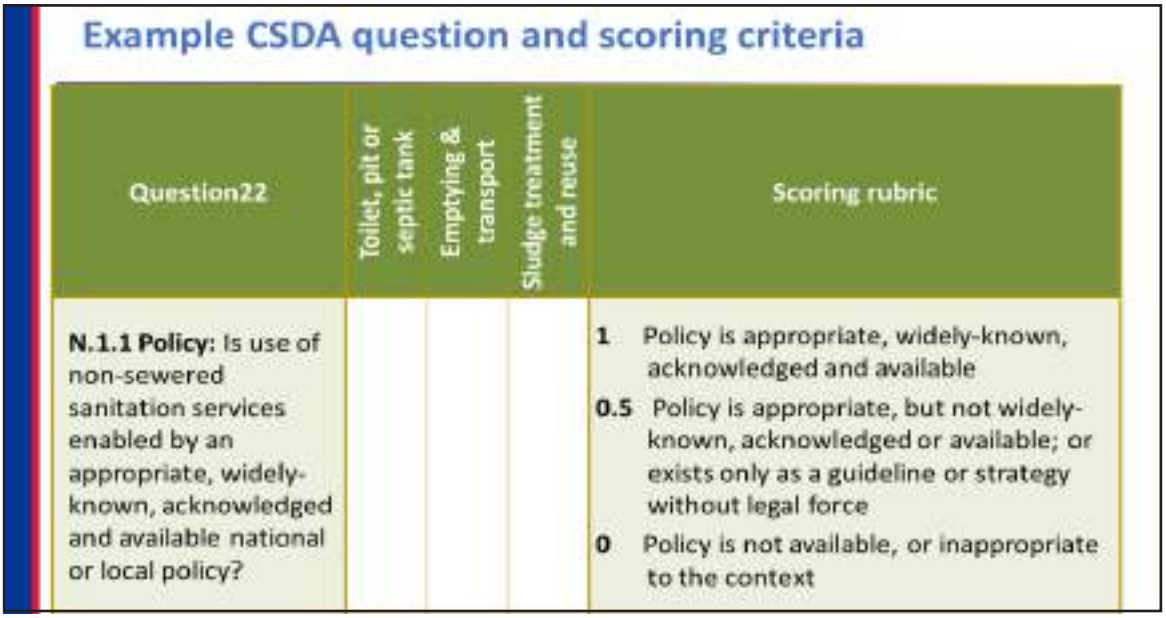
Pillar	Building block	Questions in the framework
Enabling	Policy	Policies, institutions, regulation
	Planning and budgeting	Targets, budget lines
	Inclusion	In planning and budgets
Delivering	Funding	Investment plan, adequacy, coordination
	Capacity, outreach	Institutional capacity, staffing/autonomy, outreach
	Inclusion	Technology, funding
Sustaining	Regulation and cost recovery	Staffing, staff development, health and safety, capacity building
	Service providers	Marketing, service provider development
	Inclusion	Growth, planning from evidence, outcomes

As we've already seen, the CSDA has three pillars – enabling, delivering and sustaining services. These are shown on the left side of the table. Each pillar is divided into three building blocks, as shown in the middle column. A score for each building block is calculated by the stakeholders, by answering a series of objective questions.

For example, in the 'Enabling' pillar under the 'Policy' building block, the questions address policy, institutions and regulation.

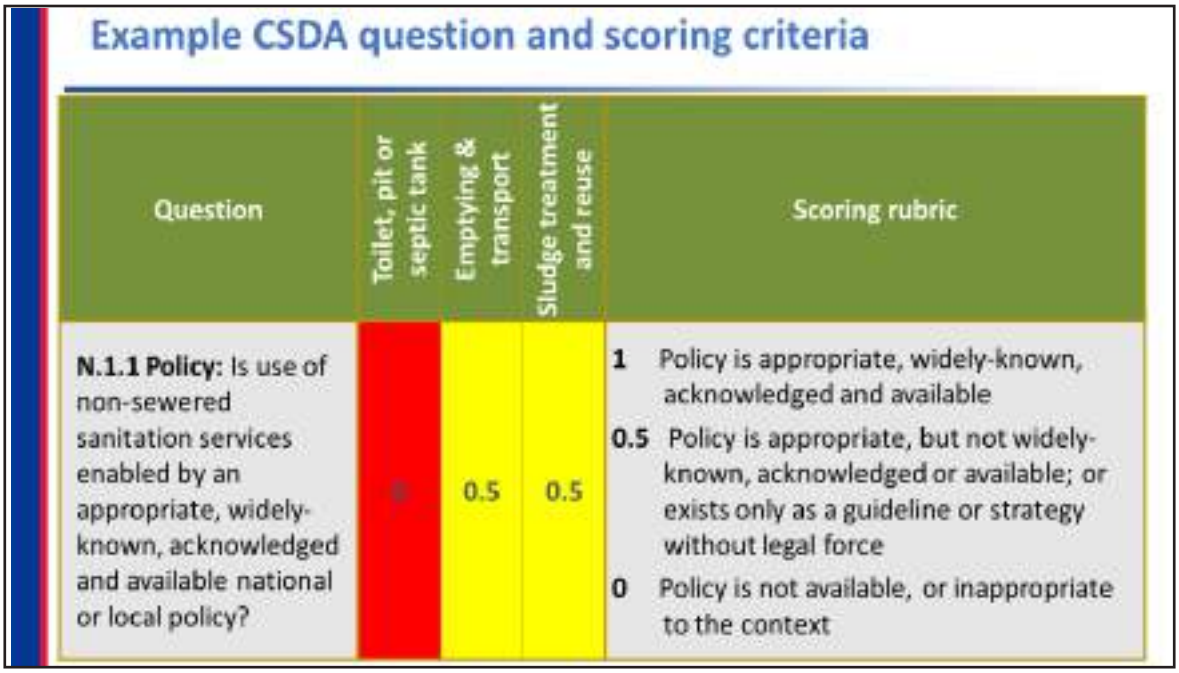
Or, taking another example, the building block 'Inclusion' in the 'Developing' pillar asks questions about the availability of different affordable technical options and whether funding is available for services to support poor and vulnerable people.

Slide 15



-Here's an example of a question from the 'Policy' building block of the 'Enabling' pillar for non-sewered sanitation services: "Is use of non-sewered sanitation services enabled by an appropriate, widely-known, acknowledged and available national or local policy?" It illustrates that, although the CSDA is focused on the city, national and regional or state policies may also apply.
-On the right side you can see the scoring rubric. If there's a relevant and appropriate policy (or draft) that's acknowledged and readily available, you score one. If there's an appropriate policy or draft but it's not acknowledged or not widely available, then score half. If there's no policy or it's inappropriate, then score zero.
-Each question is answered three times – once for each stage of the sanitation chain.

Slide 16



Once a number is typed into the spreadsheet, the appropriate colour will automatically appear.

Slide 17

Question	Toilet, pit or septic tank	Emptying & transport Sludge treatment and reuse	Scoring rubric
S2.7 Technology: Are there affordable, appropriate, safe and adaptable technologies available to meet the needs of poor and vulnerable people, according to the agreed definition?			**1** There are suitable options available to address the needs of most poor and vulnerable people **0.5** There are options that address the needs of some poor and vulnerable people, but they are not sufficient or complete **0** Options available to meet the sanitation needs of poor and vulnerable people are grossly inadequate

-Here's a question from the 'Inclusion' building block of the 'Delivering' pillar: "Are there affordable, appropriate, safe and adaptable technologies available to meet the needs of poor and vulnerable people, according to the agreed definition?" The inclusion questions are the same for both sewered and non-sewered sanitation, because they address access to acceptable sanitation services, of whatever type.
-As for all the questions, there are three possible scores. If there are suitable options available to address the needs of most poor and vulnerable people, you score one. If there are options that address the needs of some poor and vulnerable people, but they are not sufficient or complete, then score half. If the options available to meet the sanitation needs of poor and vulnerable people are grossly inadequate, then score zero.

Slide 18

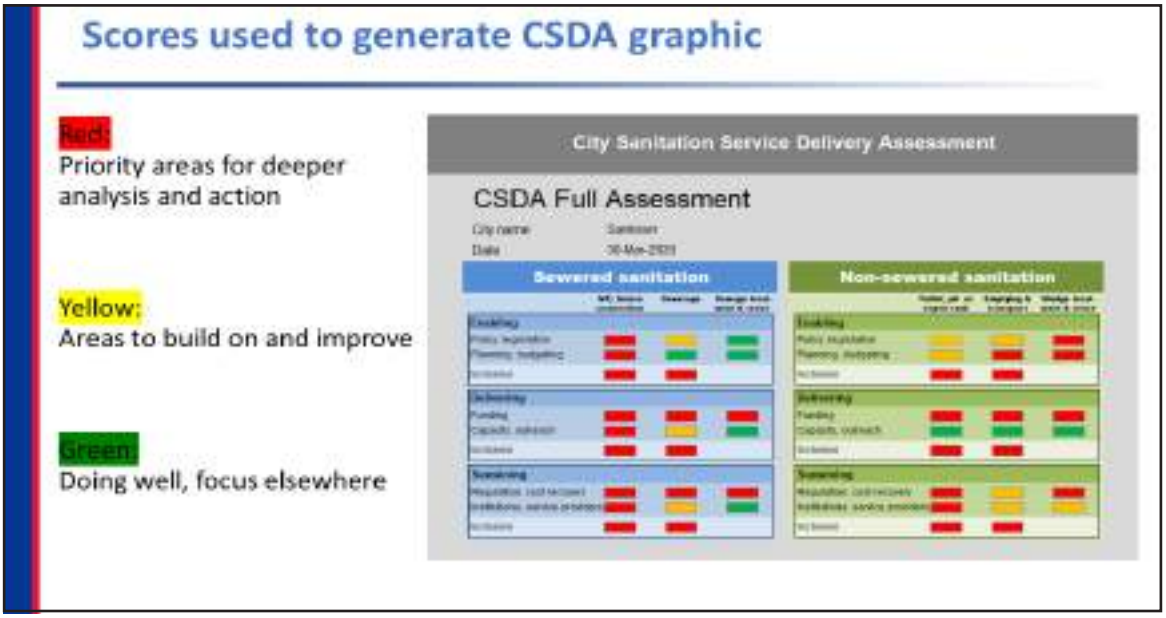
Aggregation of question scores

- Several questions for each building block
- Others could be added if necessary
- Scores added & normalised for each building block and step in service chain

Pillars	Indicators	Numbers of questions: Toilet, pit or septic tank	Emptying & transport	Sludge treatment & reuse
Enabling	Policy	3	3	3
	Planning and budgeting	2	2	2
	Inclusion	1	1	-
Developing	Funding	3	3	3
	Capacity, outreach	3	3	3
	Inclusion	2	2	-
Sustaining	Regulation and cost recovery	3	3	3
	Service providers	4	4	4
	Inclusion	3	3	-
Total		24	24	18

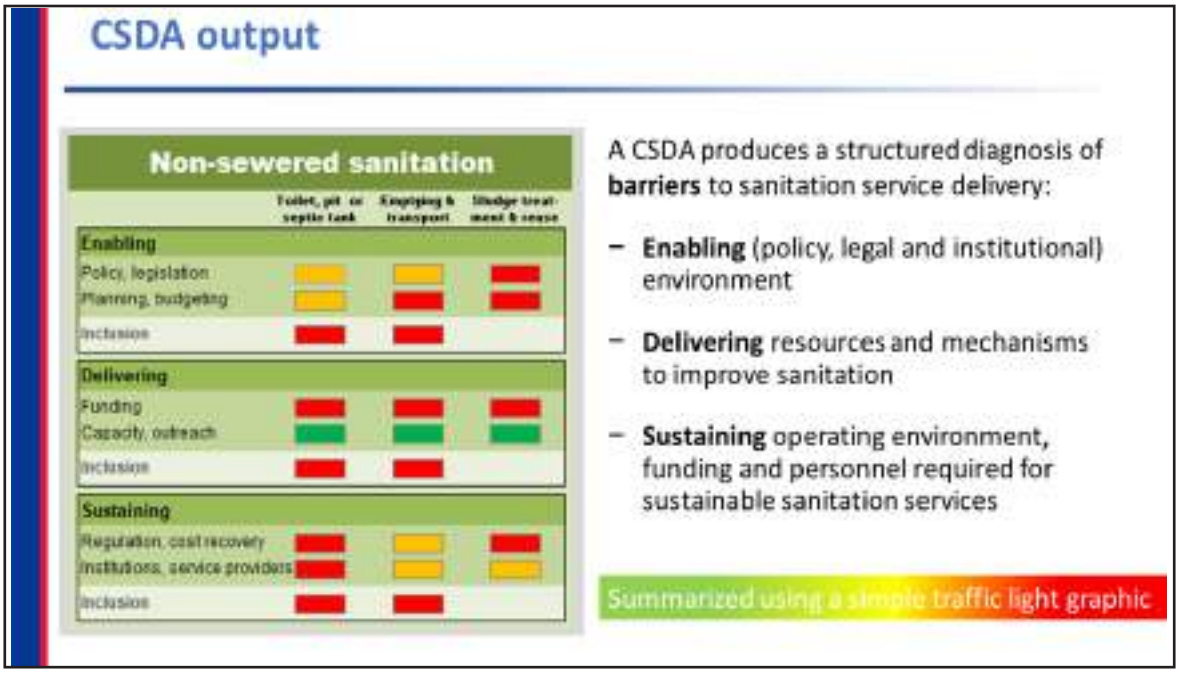
There are from 1 to 4 questions under each building block, apart from the inclusion building blocks related to treatment. These have no questions, as there is no difference in how waste from different people is treated – or not treated.
More questions can be added if needed, but it's not recommended to use too many per building block. If more questions are added, the tool must be adjusted to accommodate them and calculate the aggregated scores correctly.
The spreadsheet automatically adds up the individual question scores for each building block. It then normalizes the scores for each building bock to a value between zero and one, which is used to assign a corresponding traffic light colour.
The online FSM ToolBox version will also calculate the scores automatically. However you will not be able to add more questions, although editing the wording and terminology is still possible.

Slide 19



The assigned colours are presented in the graphic that you see here. It is clear and easy for everyone to understand, whatever their technical background, and so can be used to facilitate discussion about priorities and next steps.
Red indicates priority areas that require deeper analysis and substantial stakeholder follow-up and action.
Yellow indicates that there is something to build on, improve and develop. Or in some situations, maybe to finalise and make widely available.
Green suggests that the issue is well managed, and priorities may lie elsewhere.

Slide 20



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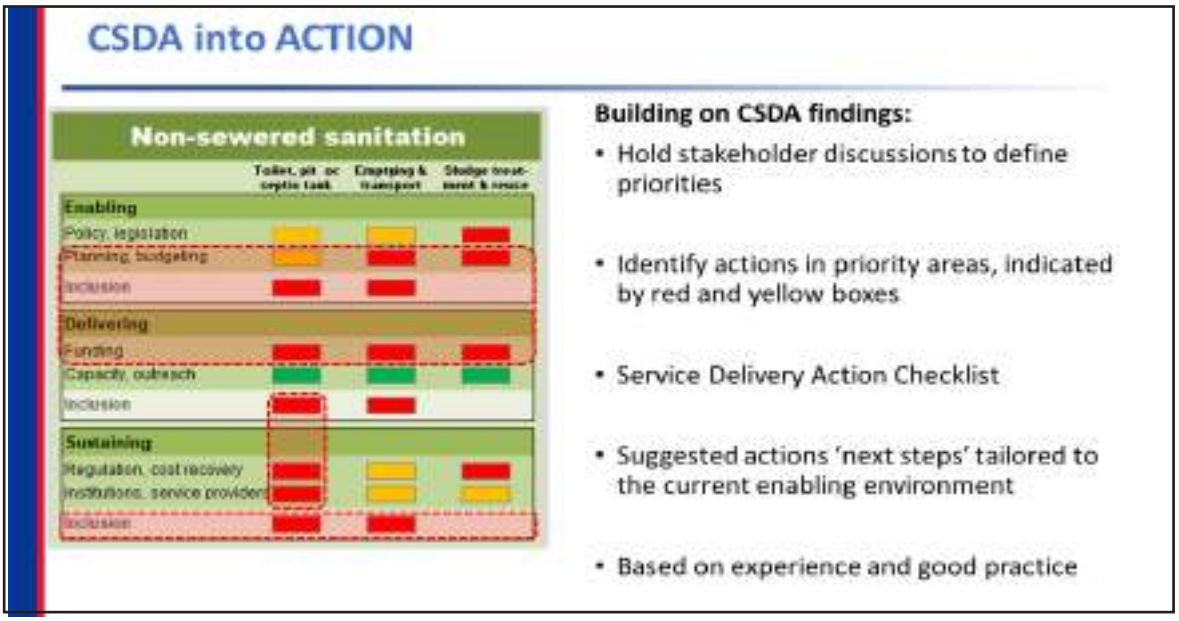

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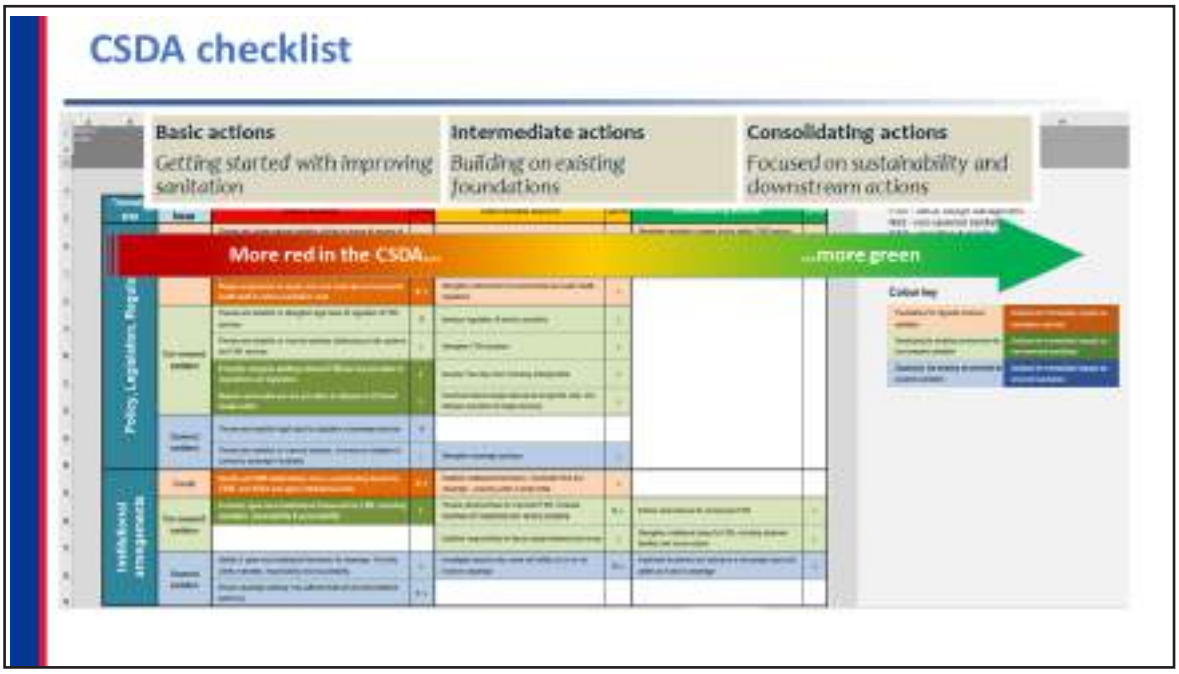

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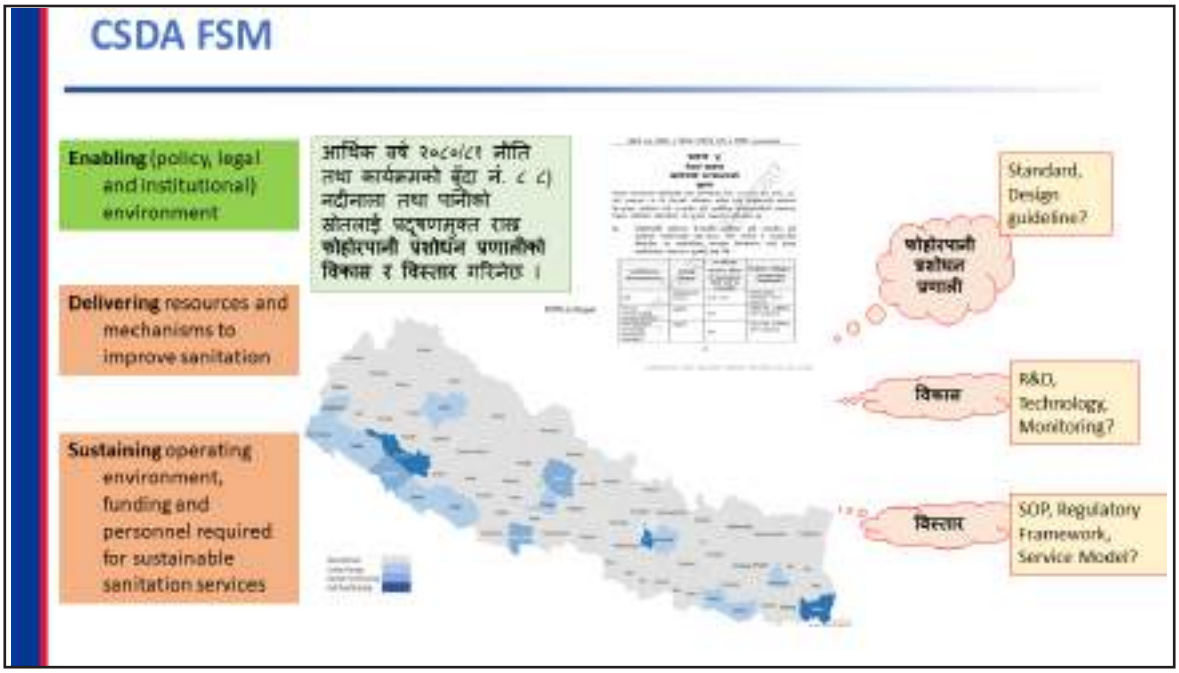

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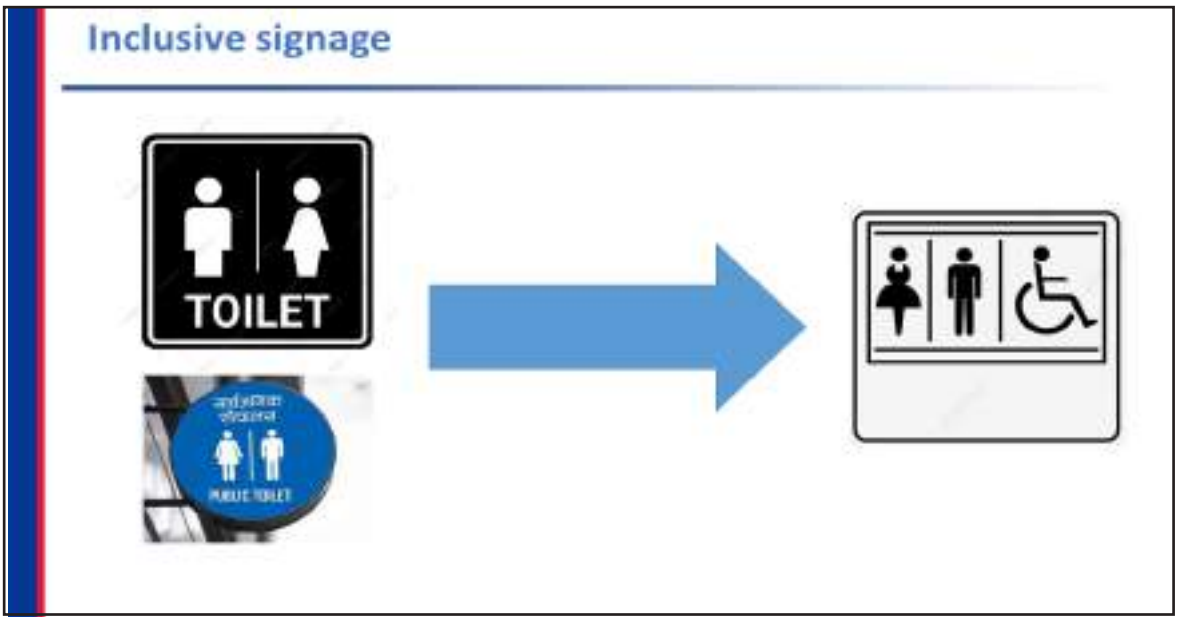
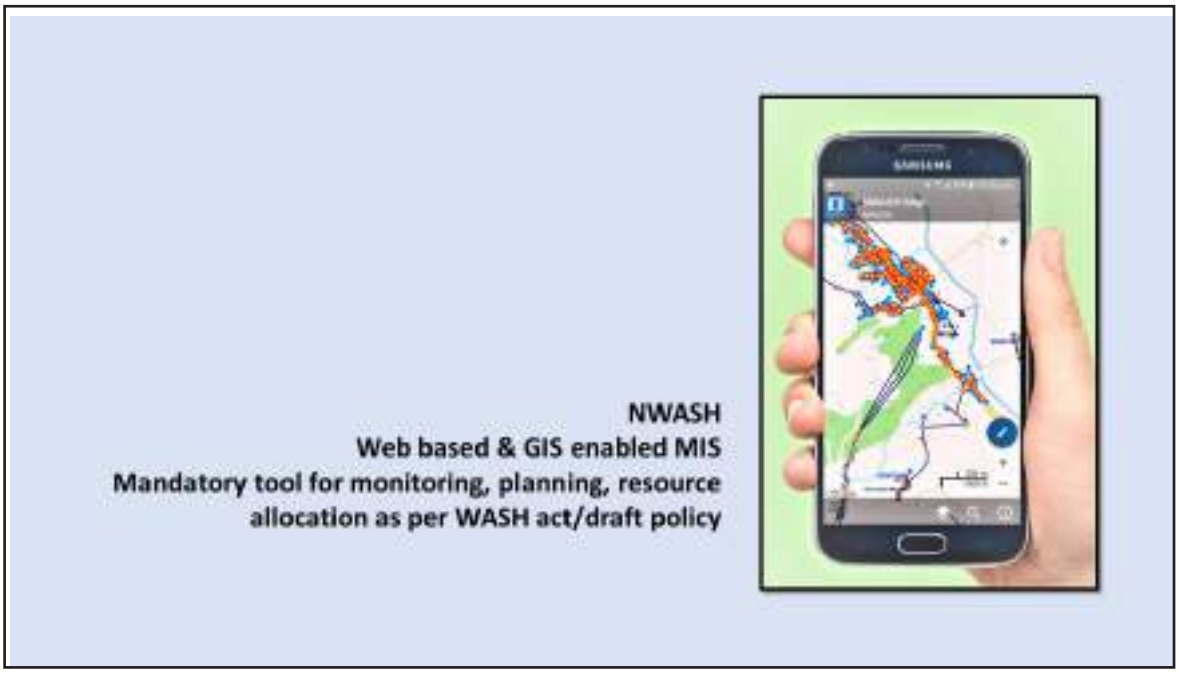


Slide 26



Government of Nepal Ministry of water supply has launched the integrated platform for collecting all the information which are to be monitored for 6.1 and 6.2 it is webbased GIS enabled MIS .

Slide 27

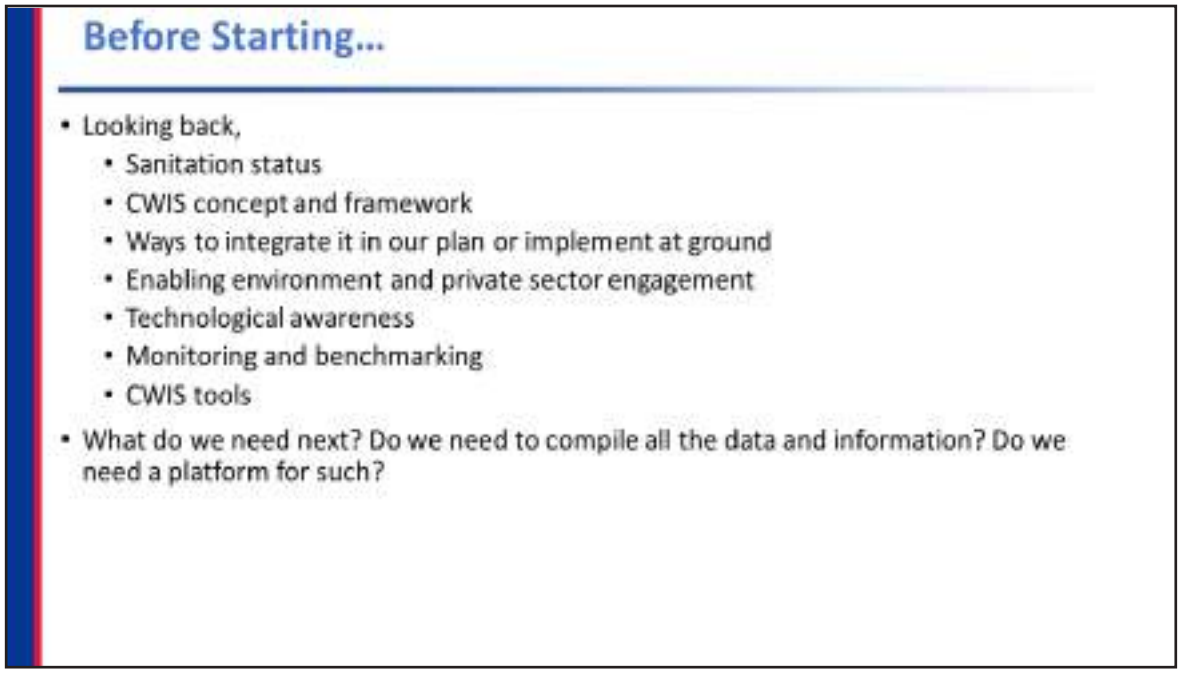
Thank you!
धन्यवाद !
Ministry of Water Supply
Department of Water Supply and Sewerage Management
Technical Support

SESSION 13.3

CWIS Tools: NWASH

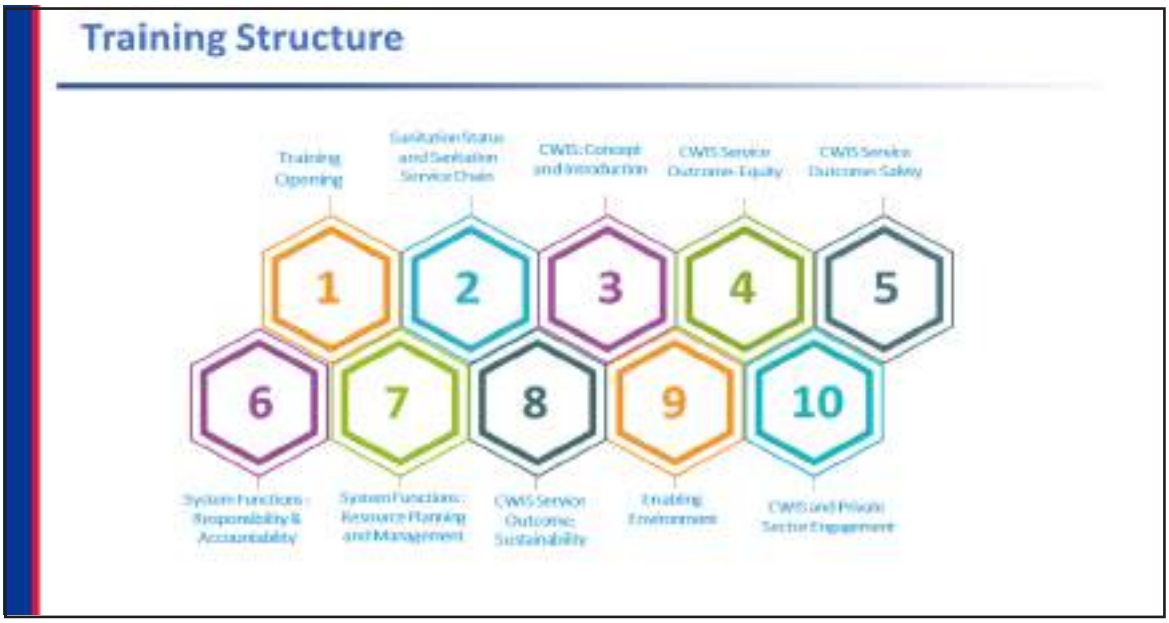
Slide 1

Slide 2



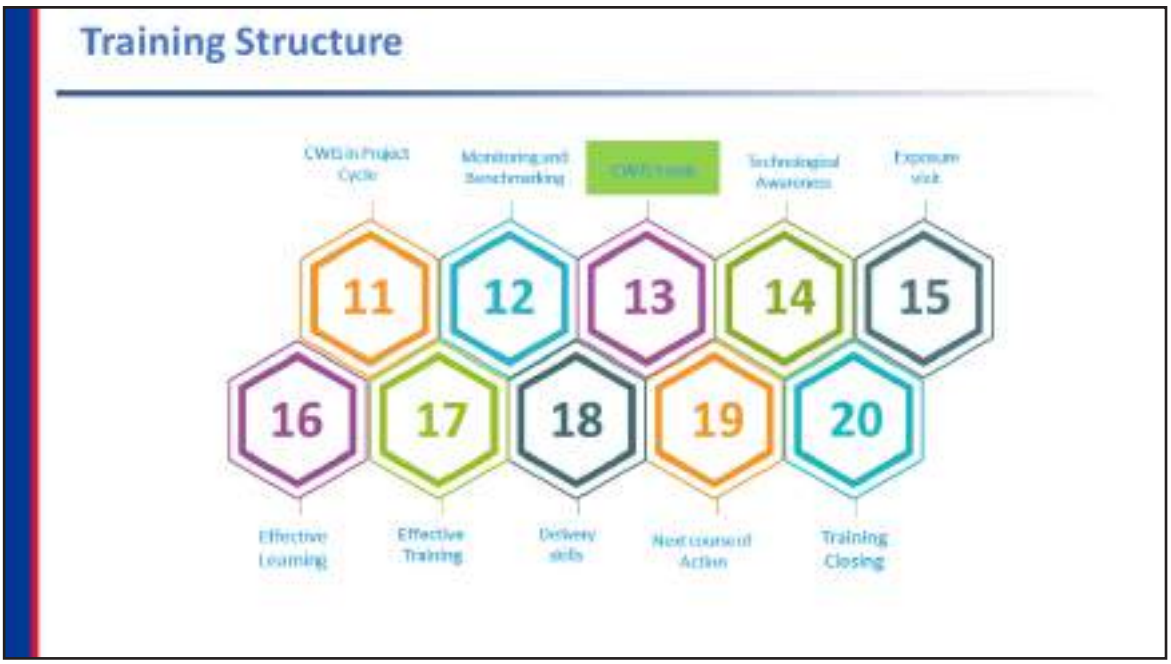
Till the date, throughout the training, we have been discussing on all the topics. As of now, after the discussion on monitoring and benchmarking along with CWIS tools, what do we need next? Do we need to compile all the data and information? And for the same, do one need a platform?
E/A: Yes,
Hence, now we are going to discuss on one of such platform available at center level, NWASH

Slide 3



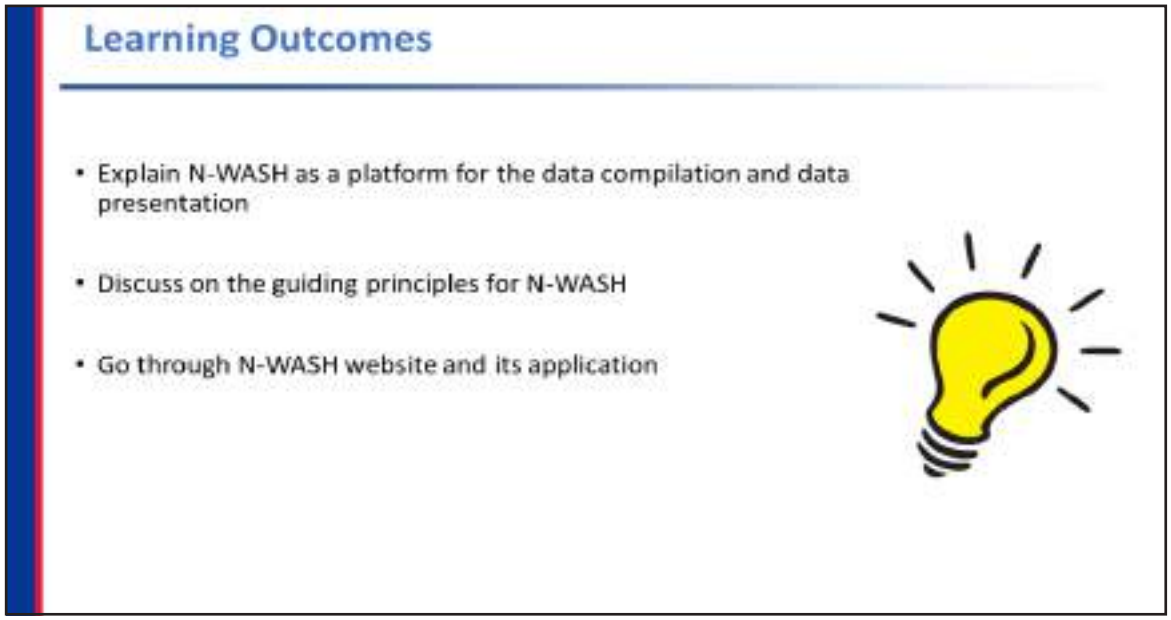
This training includes 20 main technical sessions, and are currently on session 13: CWIS Tools - NWASH

Slide 4



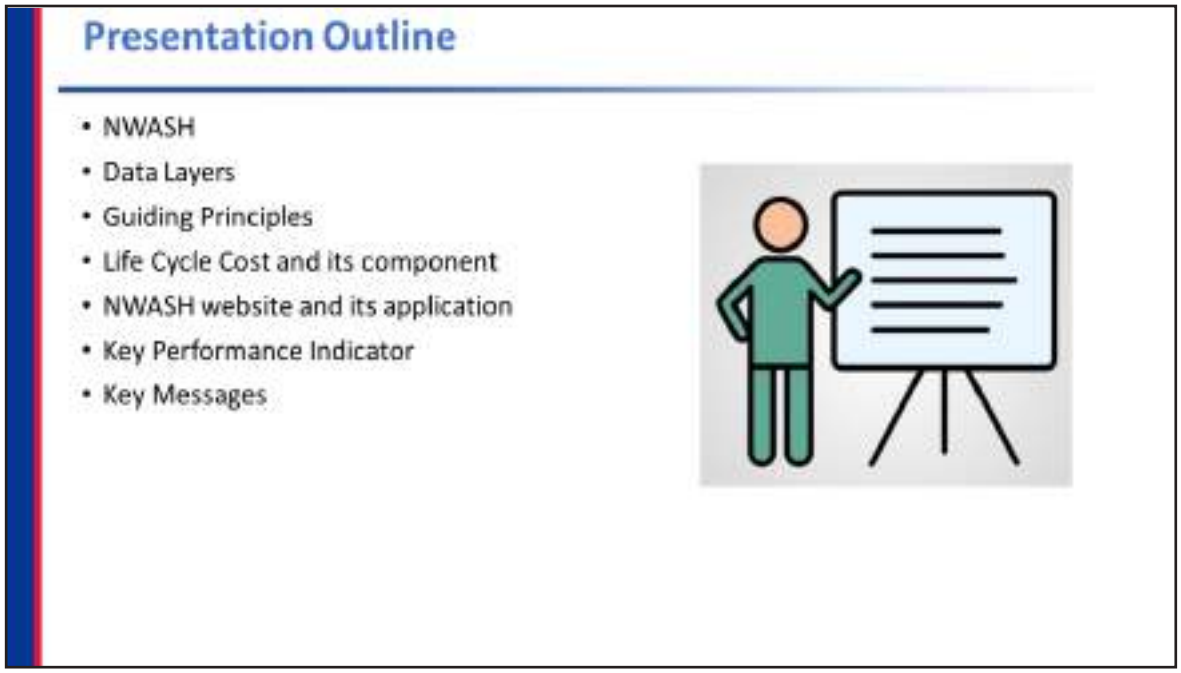
This training includes 20 main technical sessions, and are currently on session 13: CWIS Tools - NWASH

Slide 5



At the end of the session, participants will be able to …

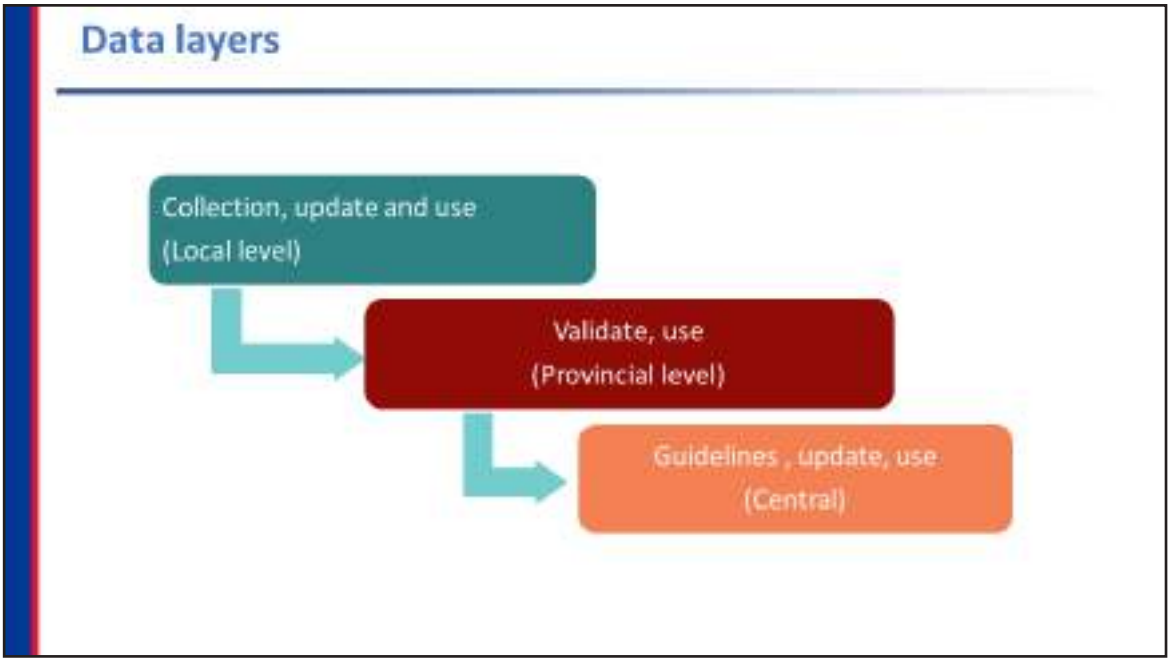
Slide 6



Slide 7

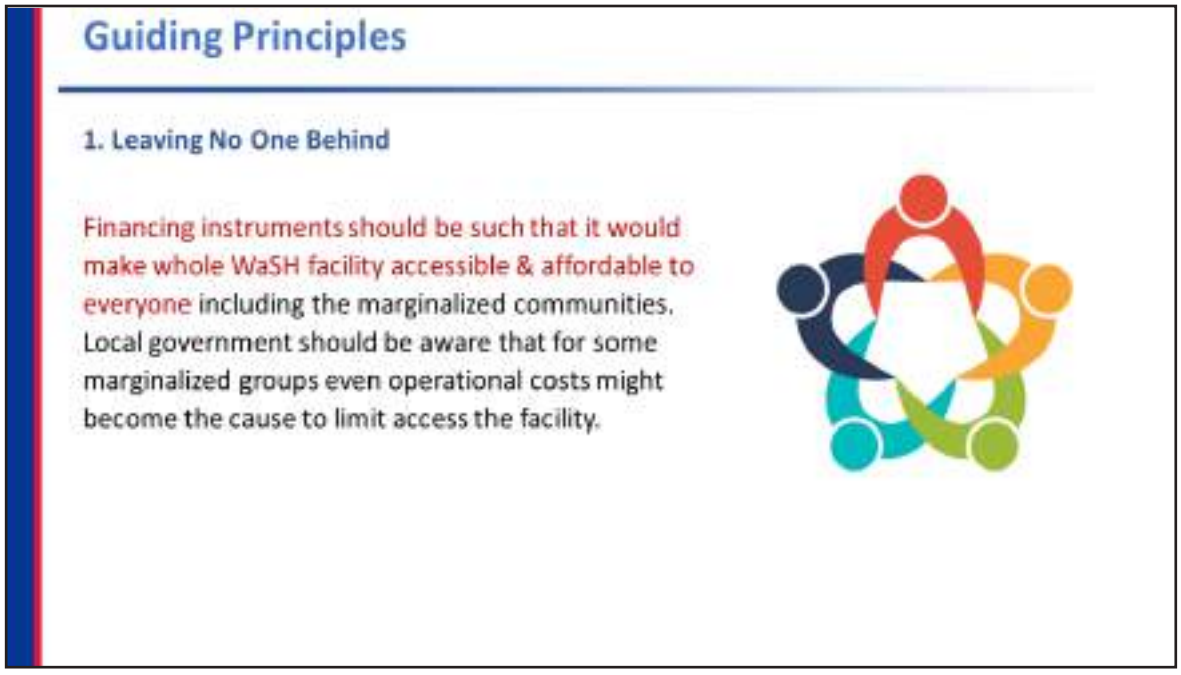
Government of Nepal Ministry of water supply has launched the integrated platform for collecting all the information which are to be monitored for 6.1 and 6.2 it is webbased GIS enabled MIS .

Slide 8



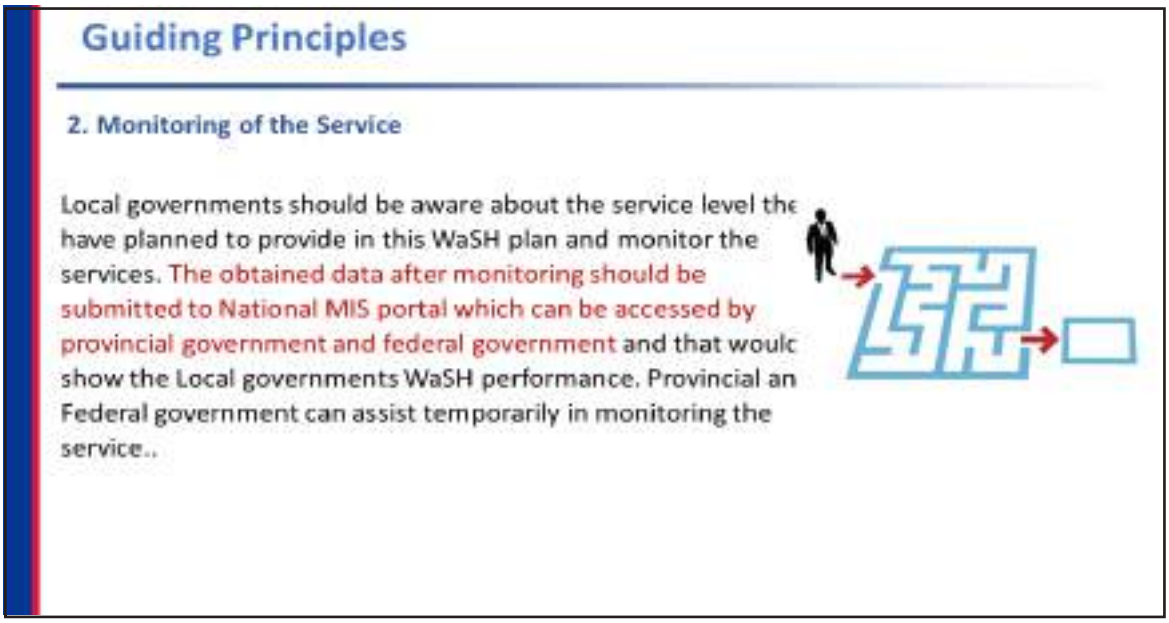
Slide 9

Slide 10



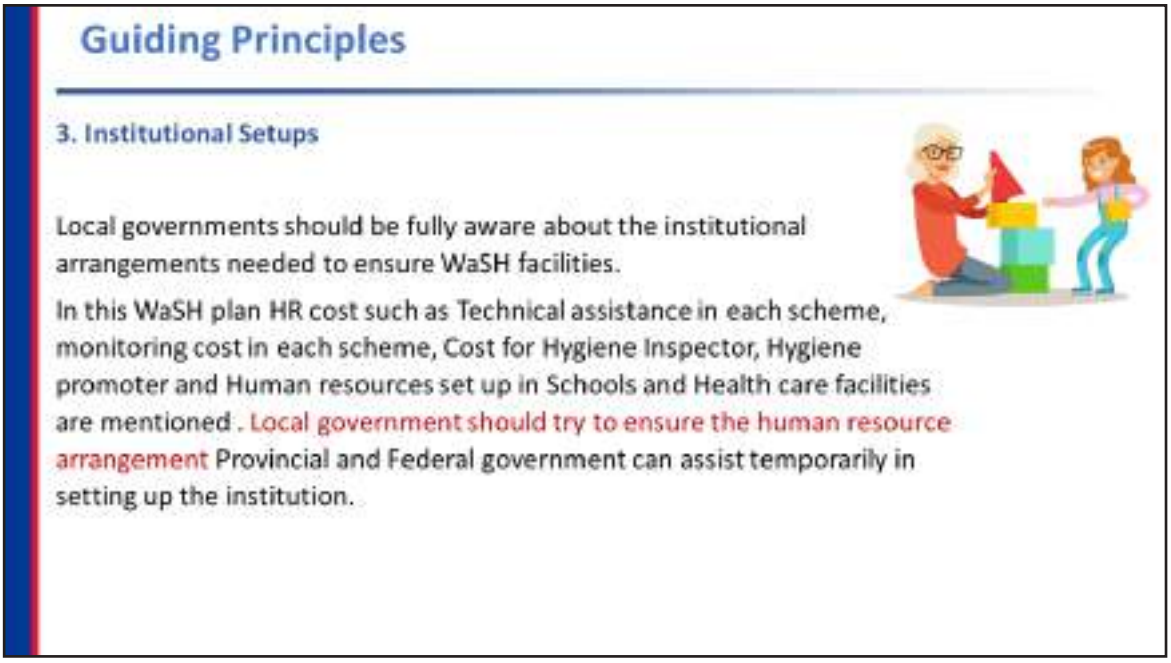
While monitoring we should think about the tariff and other barriers

Slide 11



Local governments should be assessed to know whether they are capable enough to operate the national MIS. It should be continuously monitored.

Slide 12



Local governments should be assessed to know whether they are capable enough to provide SDG 6.2, HR, legal frameworks,lab set ups, financing instruments should be properly placed and they should be monitored too.

Slide 13

Guiding Principles

4. Capacity Development

This WaSH plan has estimated the resources for capacity development. However before developing the capacity the current capacity should be assessed. Depending upon the human resource and sustainability requirements from MIS data capacity development master plan of local government can be formulated. Local government can develop their capacity based upon the requirements suggested by MIS. This can be assisted by Provincial and Federal governments.

TOR should be linked with capacity development, the impact of capacity development should be monitored and the process should be iterative

Slide 14

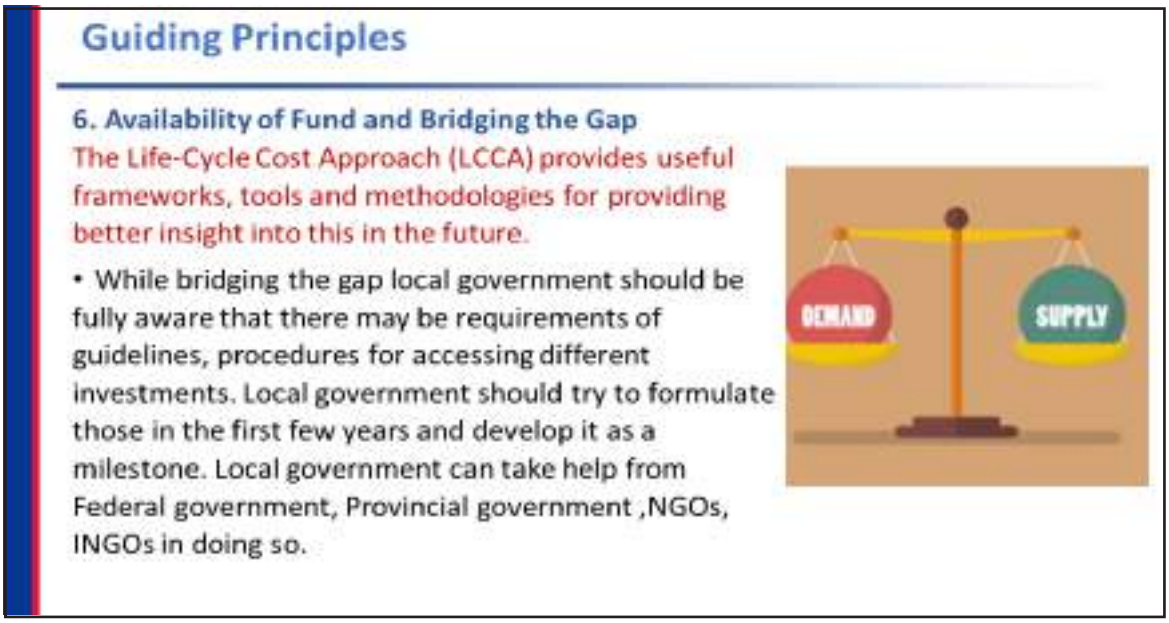
Guiding Principles

5. Priority Setup

While setting up the Priority it is expected that the planners would keep special considerations in development of managerial capacity of the utilities in first few years, small level capital investments in medium term and ,big capital investments in later years so that investment generation becomes easier. It should be done by local governments

To set the priority, the local government should be aware about the importance of sanitation services, local governments should be assessed whether they are aware enough or not.

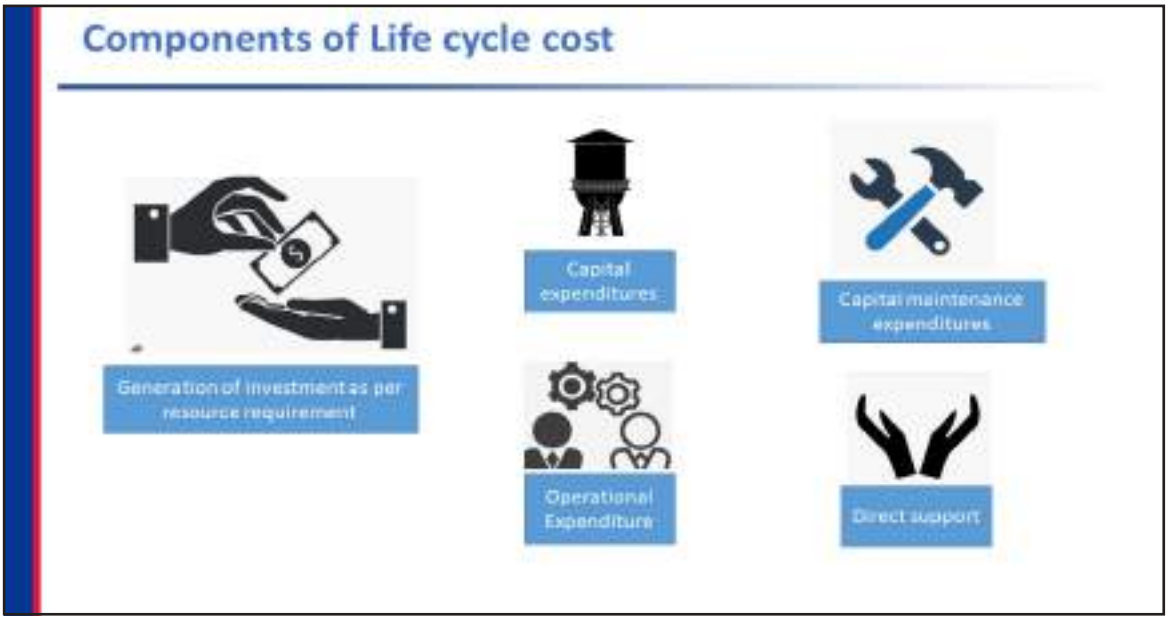
Slide 15



Costing calculations will be the recommendation of monitoring

Slide 16

Slide 17



Slide 18

The recent planning process includes the sanitation systems, it checks the household sanitation systems in NWASH and community safely managed services such as feacal sludge management,solid waste managed,sewers with waste water treatment units

Slide 19

The recent planning process includes the sanitation systems, it checks the household sanitation systems in NWASH and community safely managed services such as feacal sludge management,solid waste managed,sewers with waste water treatment units

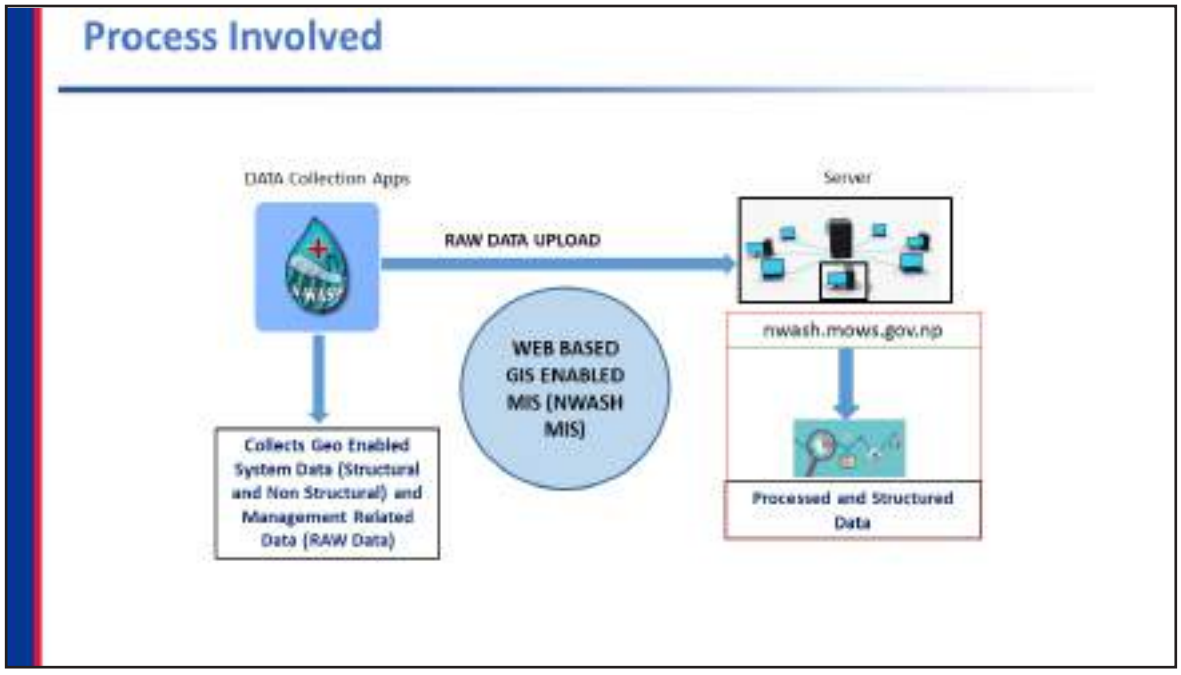
Slide 20

The trainer needs to have the hands-on idea of NWASH-MIS and he/she should be able to pitch the system demo of 10 minutes.

Slide 21

The data are collected through the mobile application. It has separate application to create the household level sanitation data sets.

Slide 22



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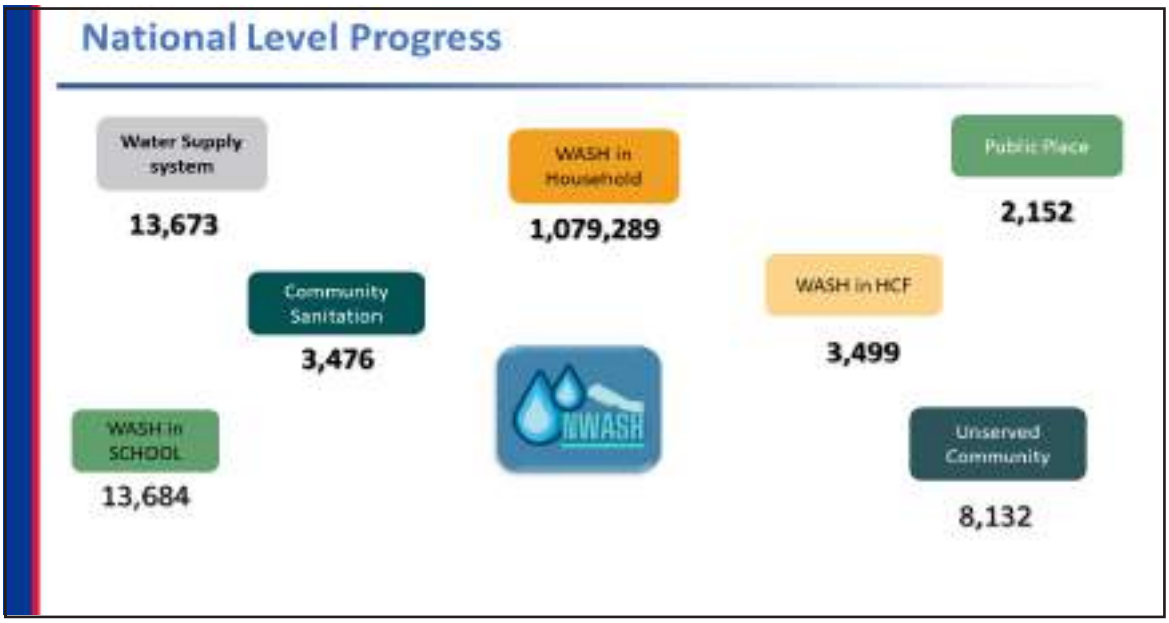
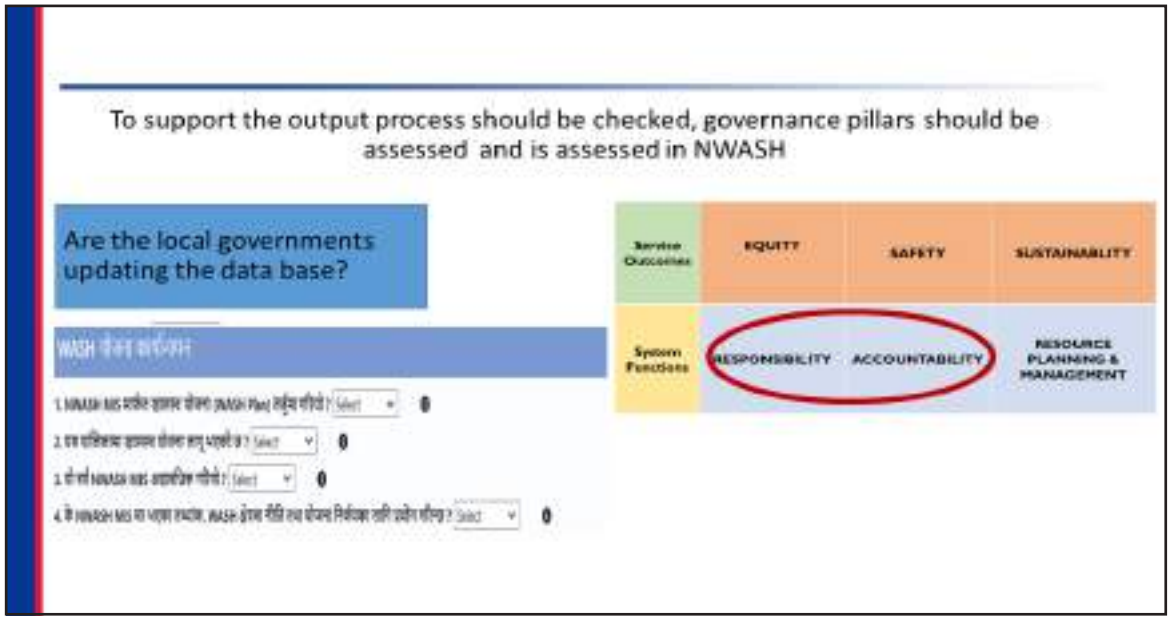


Lot of household sanitation related data has been collected. The data can be aligned to monitor the CWIS performance. Similarly the system is now monitoring and assessing the local level governance where the capacity of the local governments is assessed and there also the data can be used to implement the CWIS.

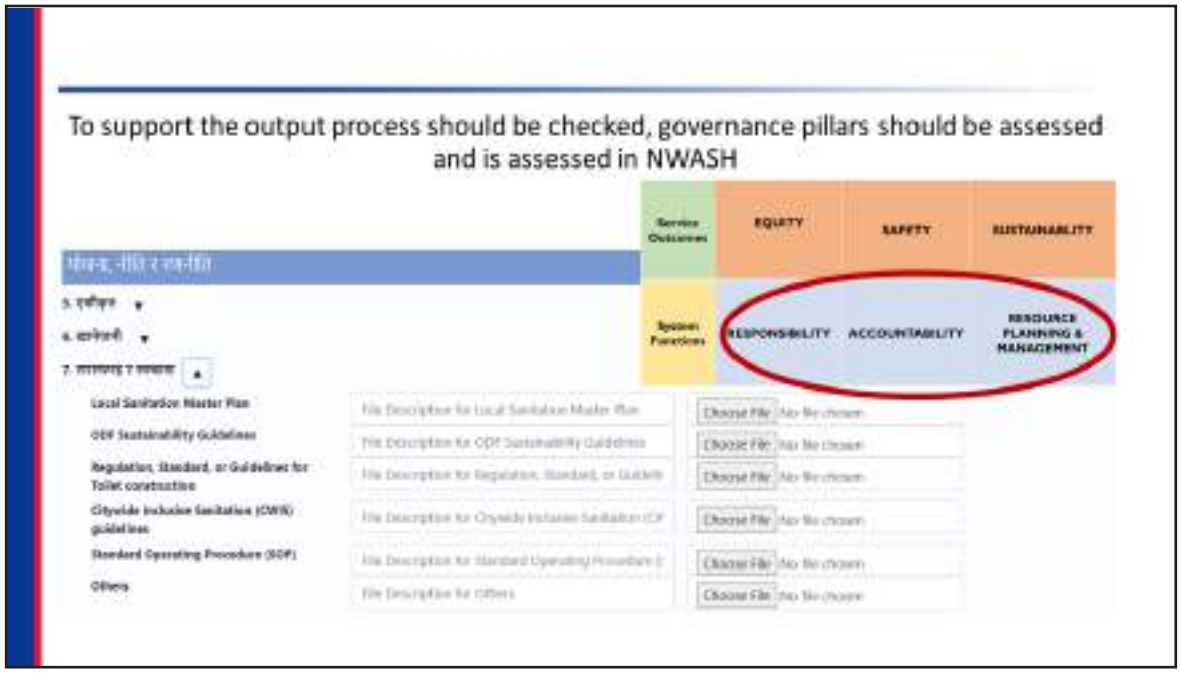
Slide 24

Slide 25



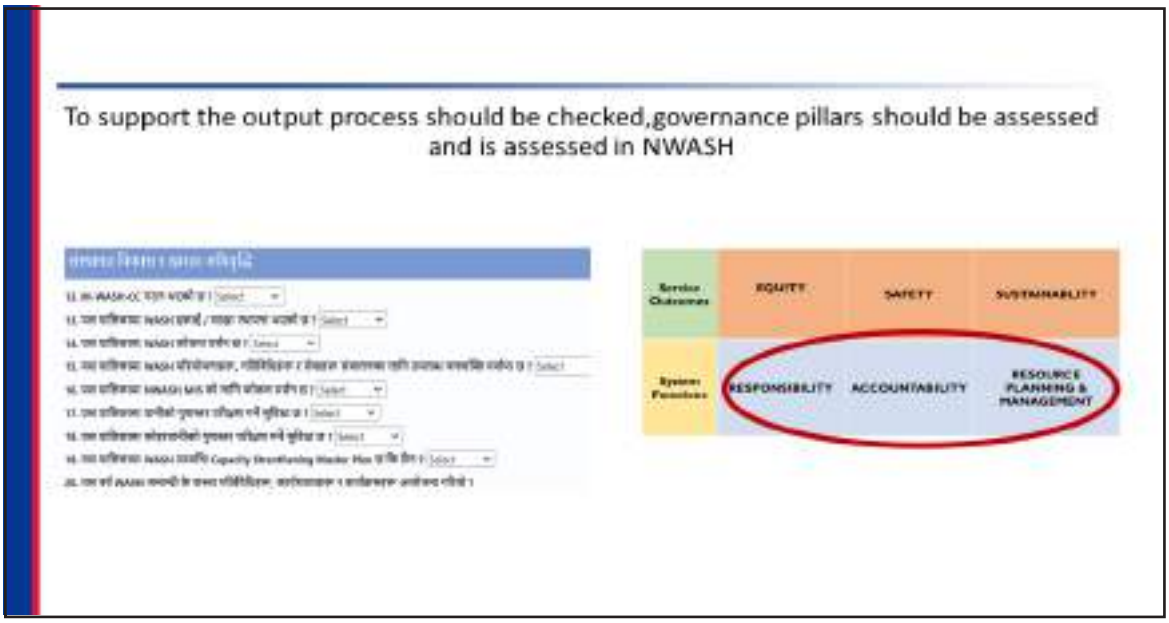
We are improving the dashboard as per the need of goal 6.2

Slide 26



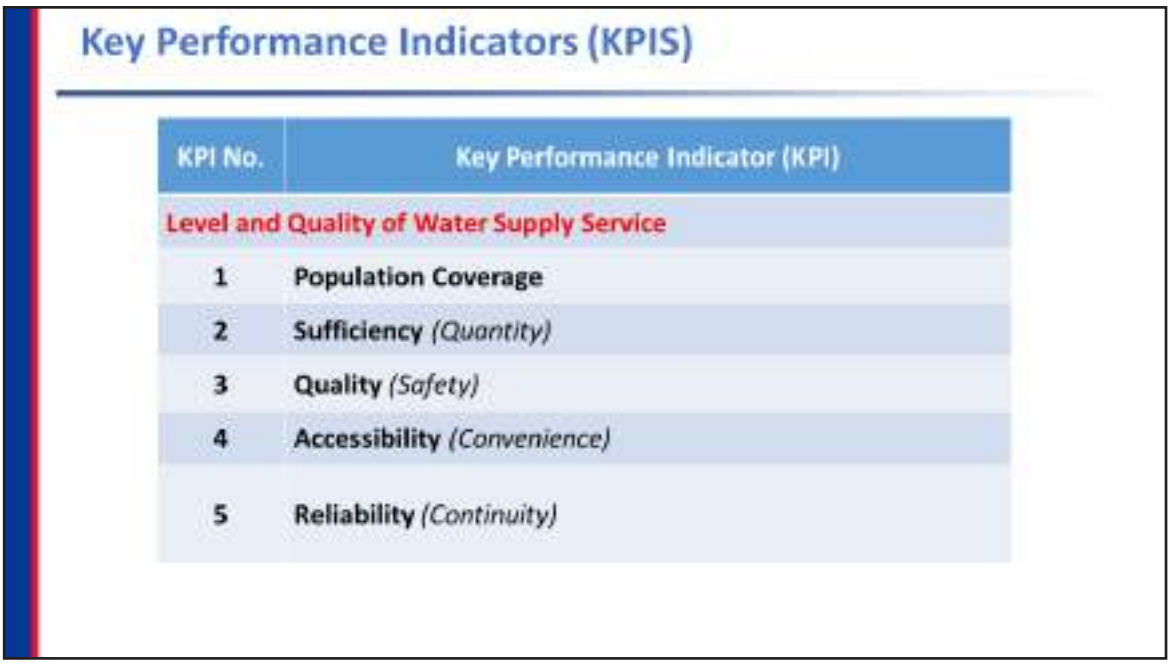
Assessed whether they have the legal frameworks ,equipments ready to move ahead? We are improving the dashboard as per the need of goal 6.2

Slide 27

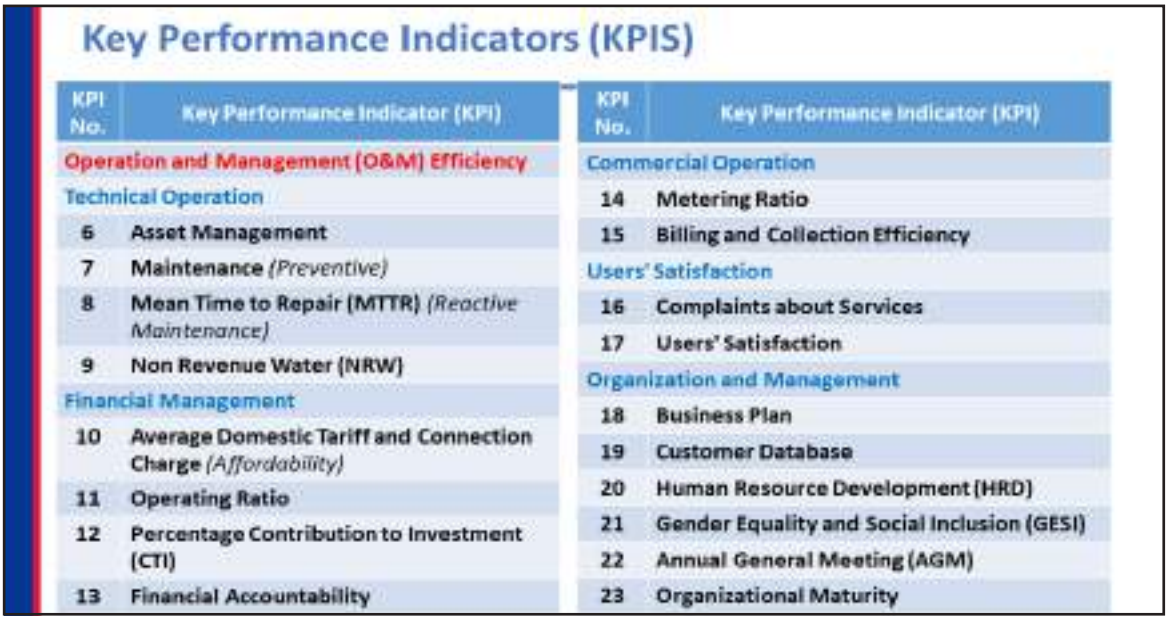


Assessing the lab facilities,TOR of the people and capacity development plans

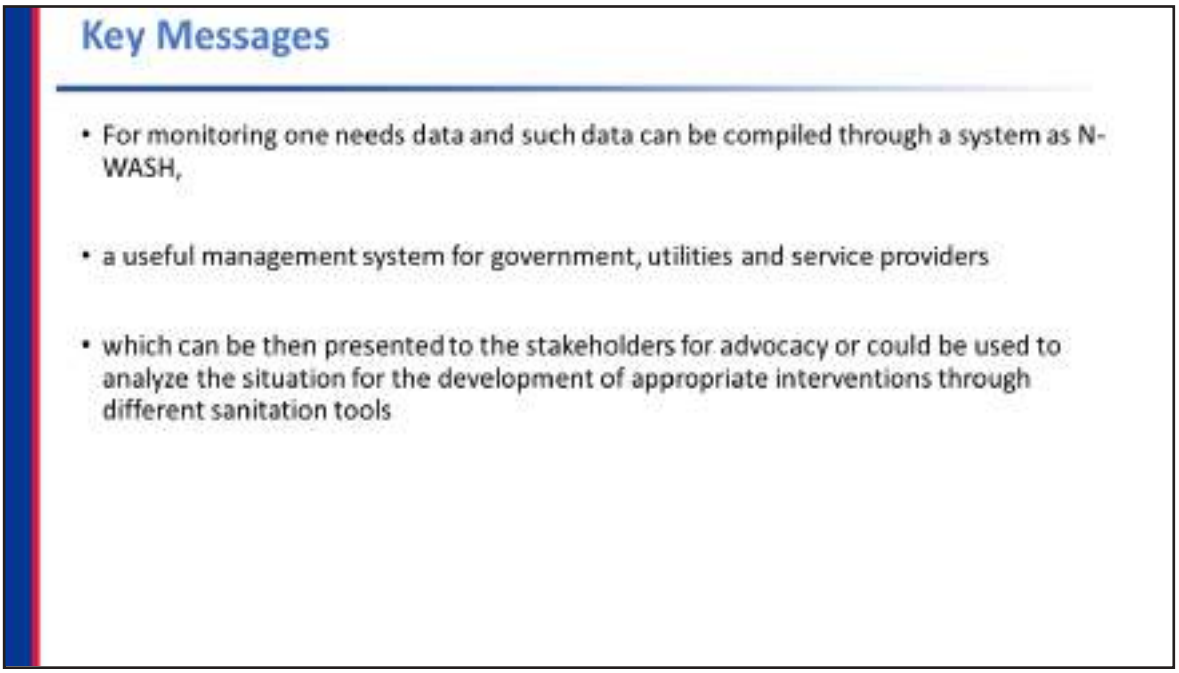
Slide 28



Slide 29



Slide 30



Hence, Monitoring is a regular observation and recording for progress updates and must be carried out continuously at different phases, giving feedback to the related stakeholders to be followed by Action points.

For monitoring one needs data and such data can be compiled through a system as IMIS, a useful management system for government, utilities and service providers which can be then presented to the stakeholders for advocacy or could be used to analyze the situation for the development of appropriate interventions through different sanitation tools like SFD and CSDA

Slide 31

IMIS

- For monitoring one needs data and such data can be compiled through a system as IMIS, a useful management system for government, utilities and service providers which can be then presented to the stakeholders for advocacy or could be used to analyze the situation for the development of appropriate interventions through different sanitation tools like SFD and CSDA

Slide 32

Digital Data Integration

Integration of various data in digital format with geo-referenced maps

Slide 33

Thank you!
धन्यवाद !
Ministry of Water Supply
Department of Water Supply and Sewerage Management
Technical Support

SESSION 13.4

CWIS Tools: IMIS

Slide 1

Slide 2

Many International Financing Institutes (IFIs) , have endorsed IMIS as integral part of any CWIS projects to ensure that mandated authorities are fulfilling their responsibility to ensure accountability and transparency.

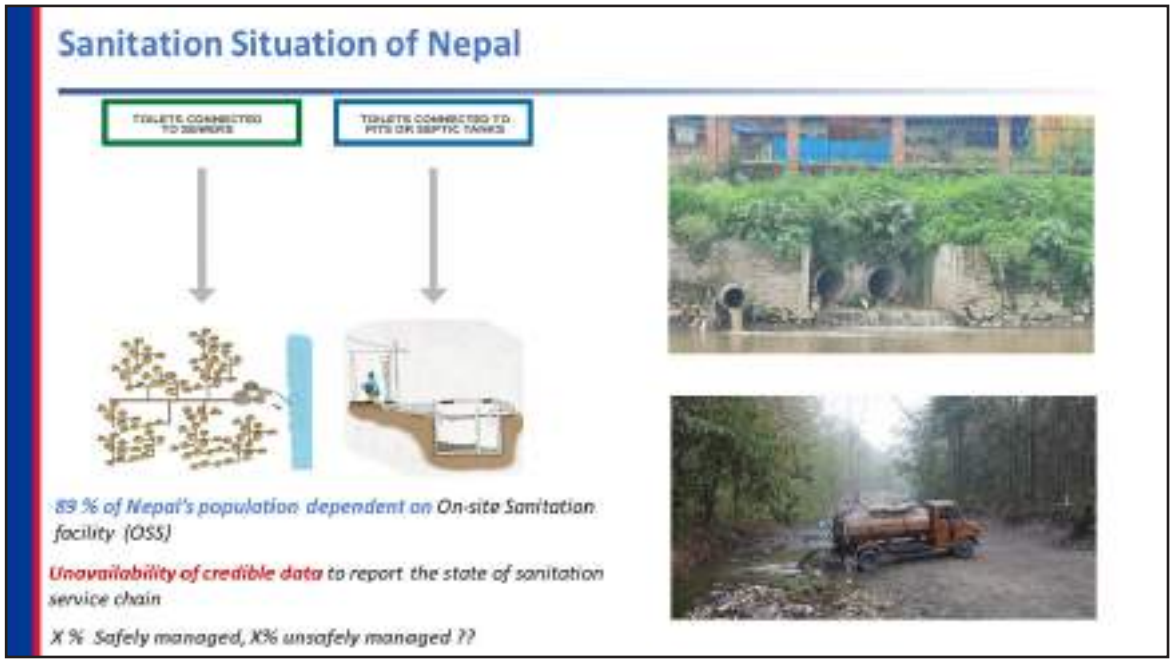
Slide 3

Sanitation data is usually limited availability.

Comprehensive Data & information needed on each aspect of the sanitation chain

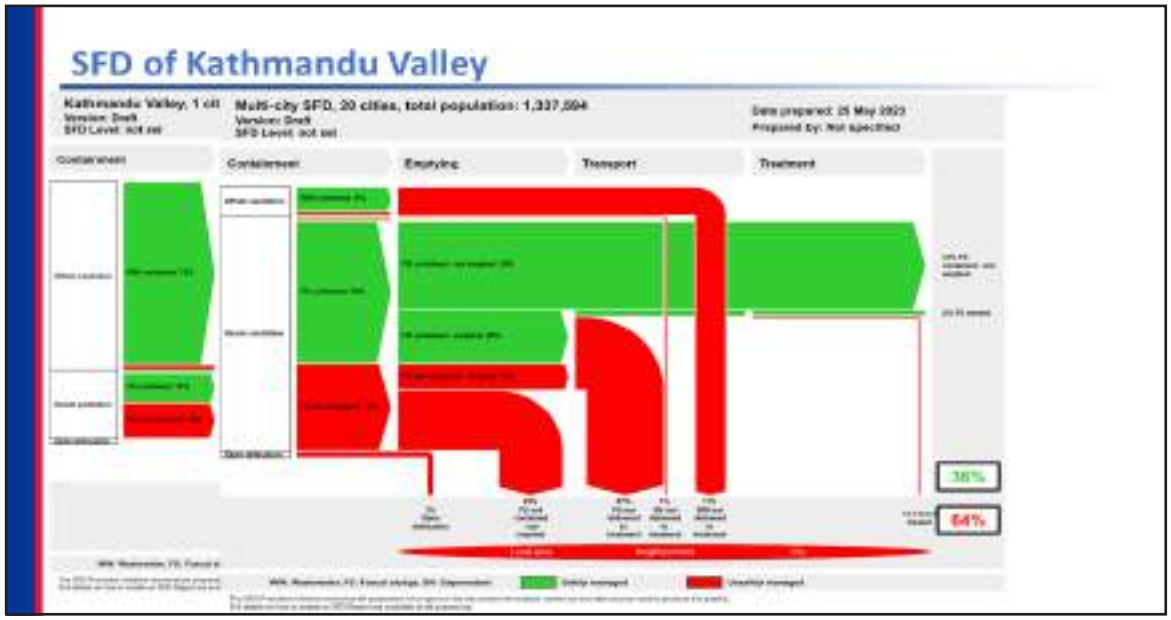
2. …that maximize health, environmental and economic gains

Slide 4



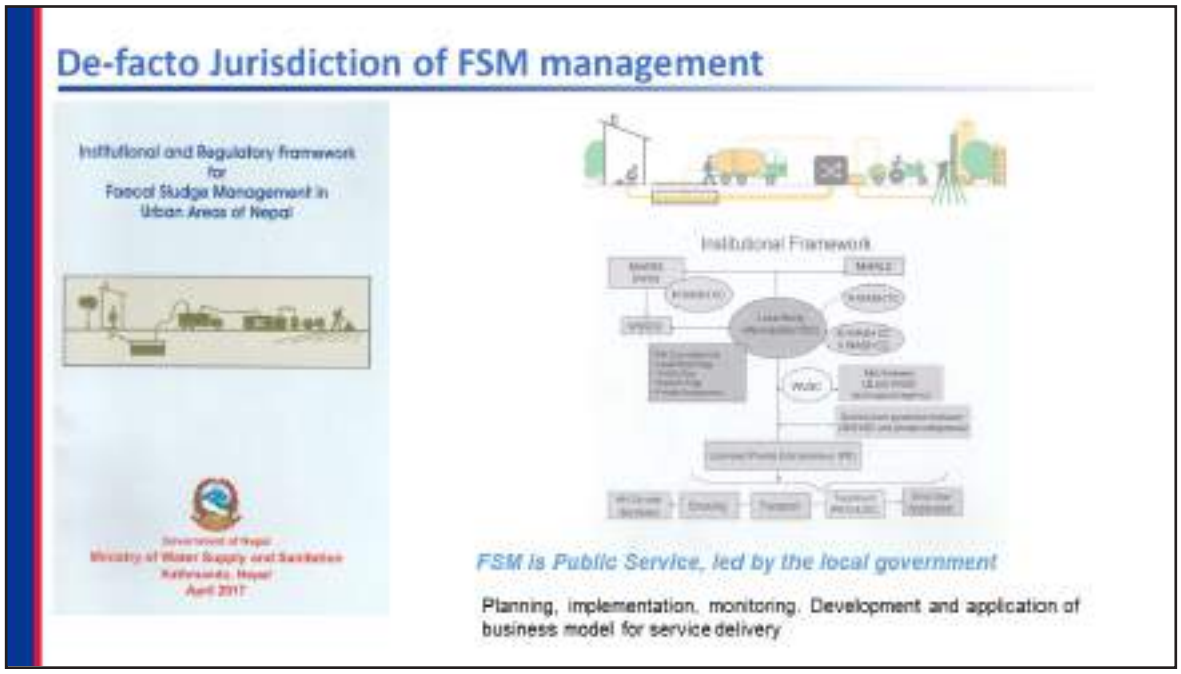
Most investment has been for centralized wastewater treatment and sewerage. Extending such sewer systems
to low-income and informal settlements can be challenging and costly
A 5 m3 truck of faecal sludge dumped into the open is the equivalent of 5,000 people defecating in the open.
MICS survey

Slide 5



KV- no FSTP at all, lubhu 6m3/week with prefrabricated components (BRODA, CDD, ENPHO).. 2016

Slide 6

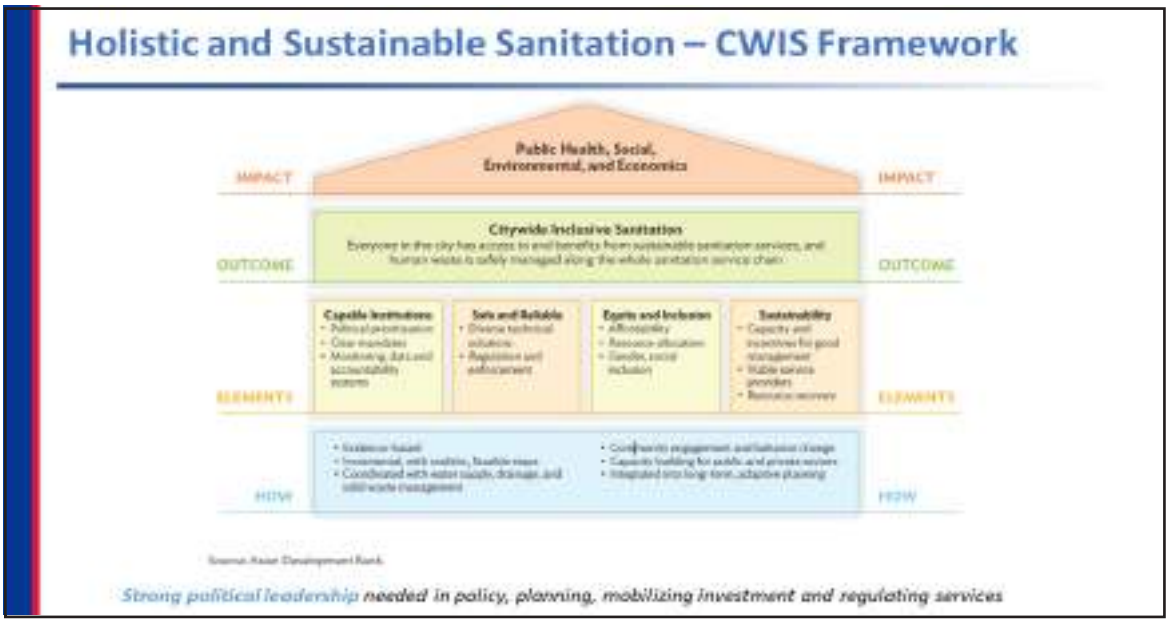


In Nepal, we are good at forming policy, but implementation on the ground is weak.

LG may seek technical and management help

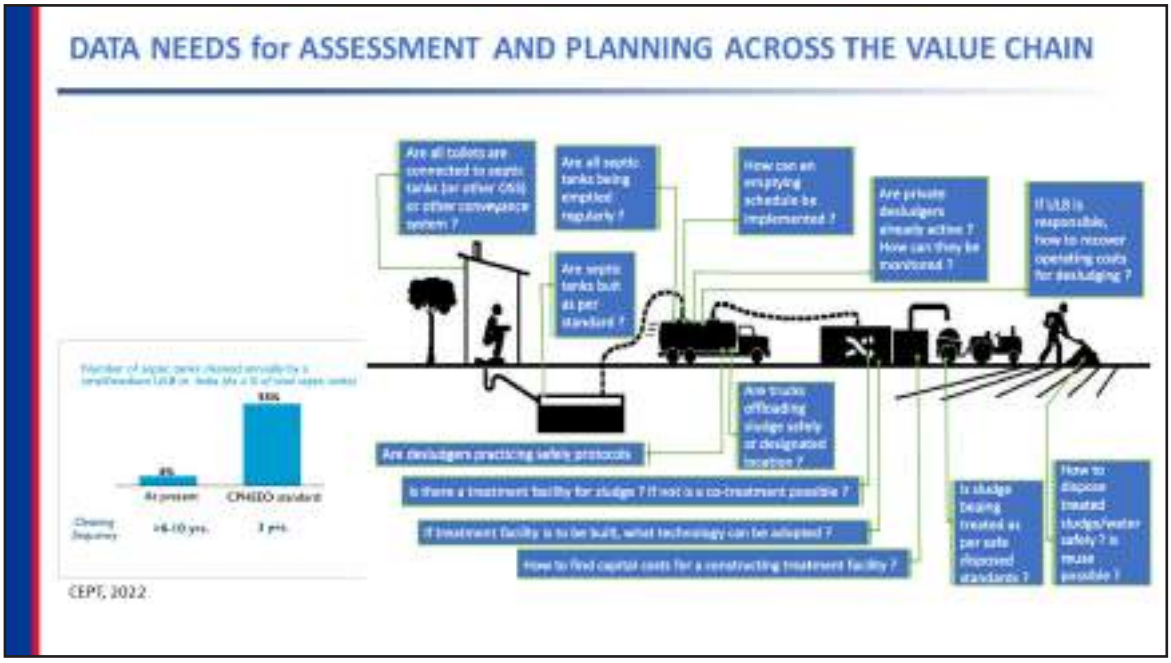
Municipal function: framework, functional entity (dedicated sanitation department), functionaries (equipped staffs) , Finance (Finance)

Slide 7



Safe sanitation: for public health and environmental quality
Inclusive, particularity focusing on urban poor, vulnerable population, women and children
City wide – not just for select area
Leaving no one behind,
pro-poor, inclusive mandates

Slide 8

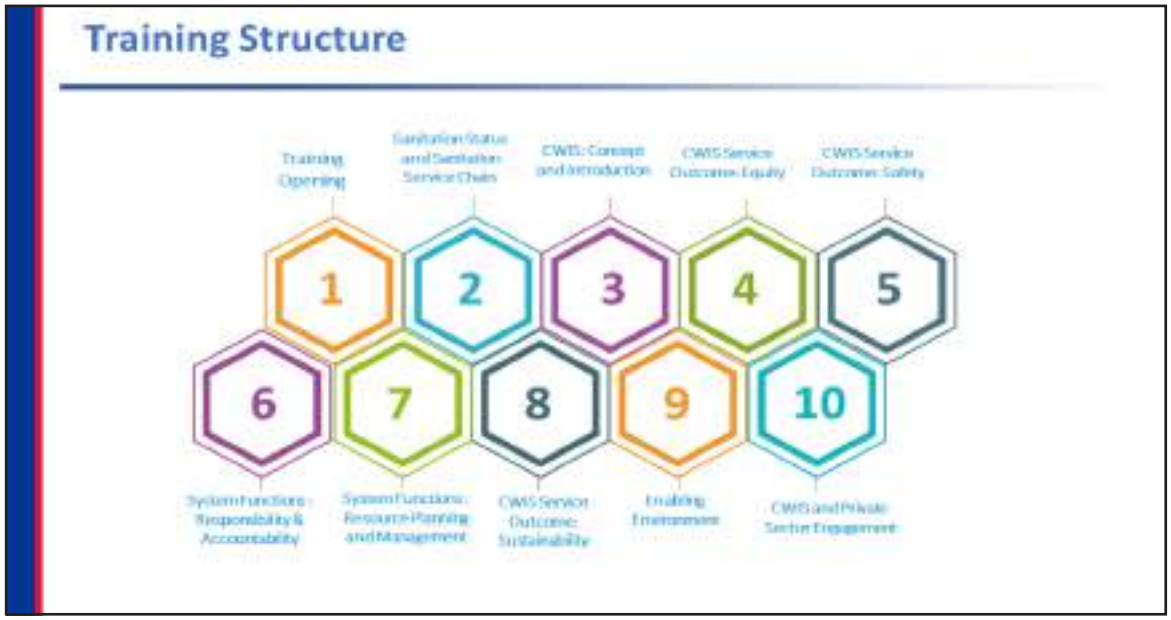


Monitor all these data to allow evidence-based strategic
and tactical changes to optimize performance and service delivery.

Need of an information system to manage all these information at all these information.

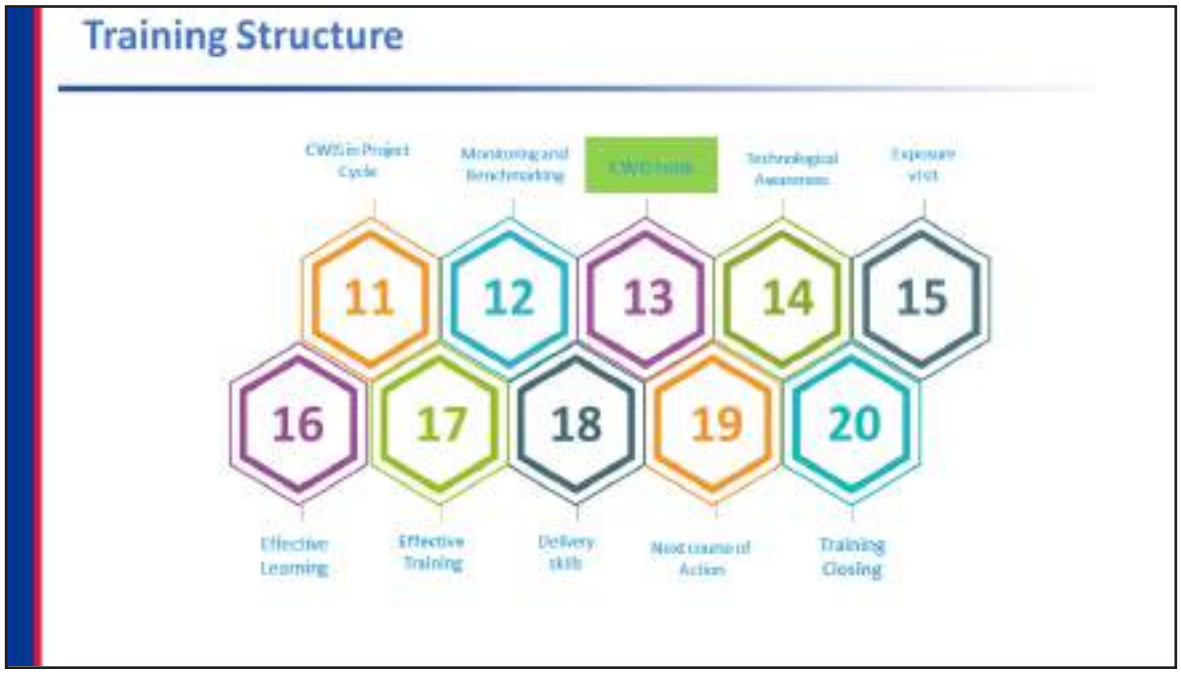
Crux of accountability functions…

Slide 9



This training includes 20 main technical sessions, and are currently on session 13: CWIS Tools - NWASH

Slide 10



This training includes 20 main technical sessions, and are currently on session 13: CWIS Tools - NWASH

Slide 11

Learning Outcomes

- Explain IMIS as a platform for the data compilation and data presentation
- Discuss IMIS for planning, management, monitoring and evaluation and for data source of other tools

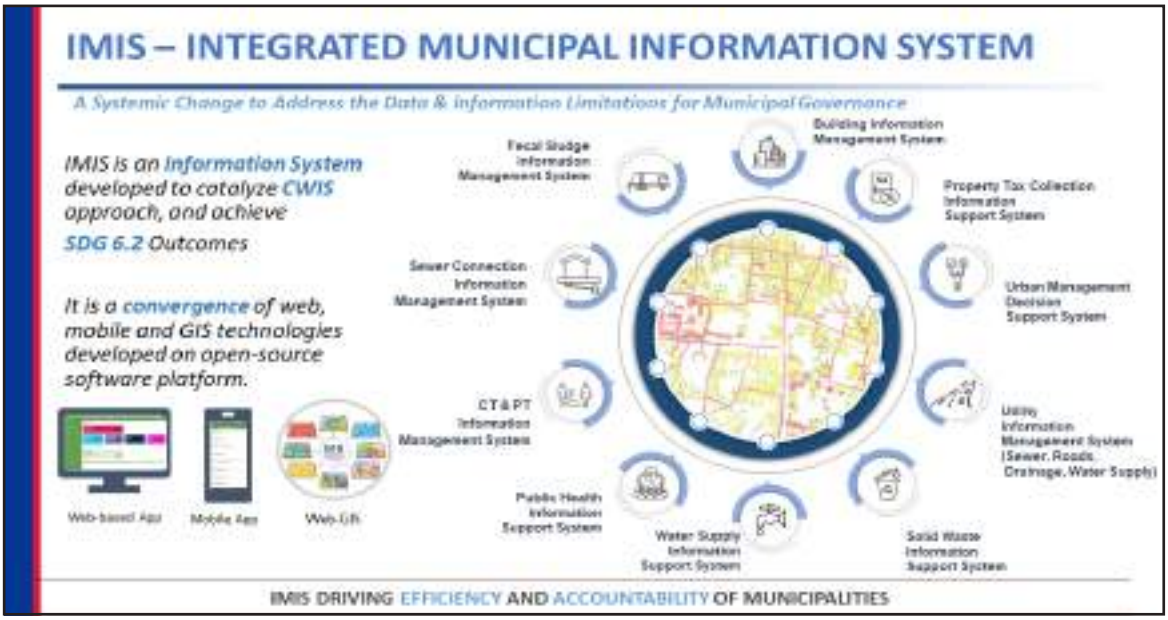
At the end of the session, participants will be able to …

Slide 12

Presentation Outline

- IMIS
- IMIS for Planning
- IMIS for Management
- IMIS for Monitoring and Evaluation
- IMIS for data source of other tools
- Key Messages

Slide 13



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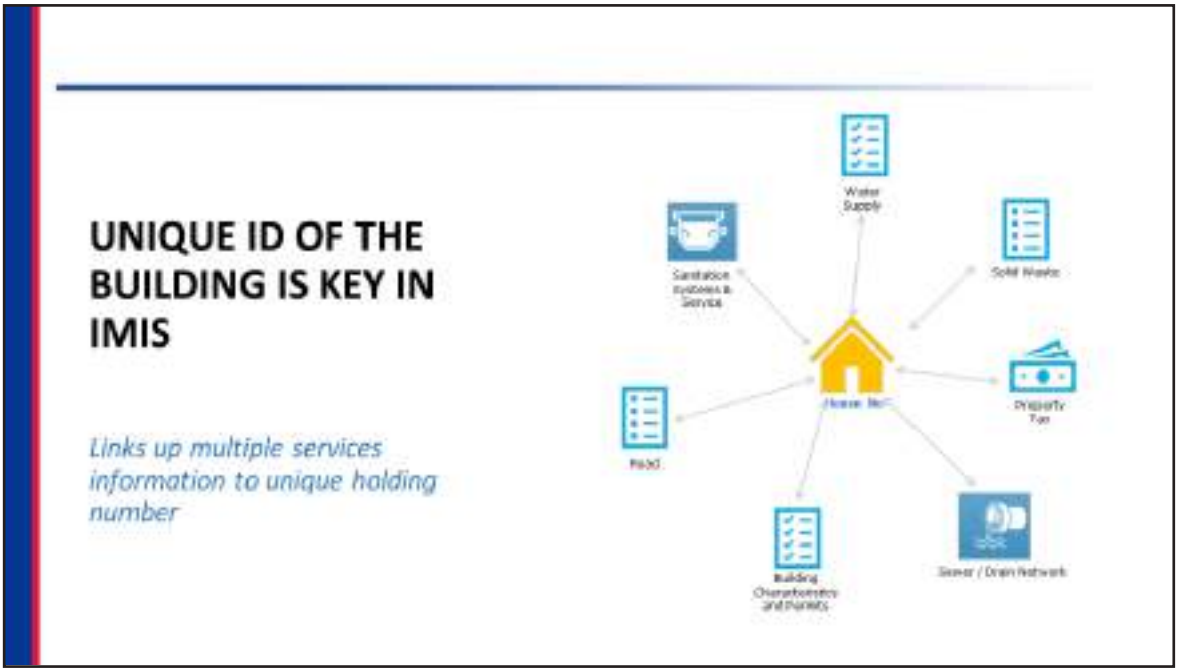

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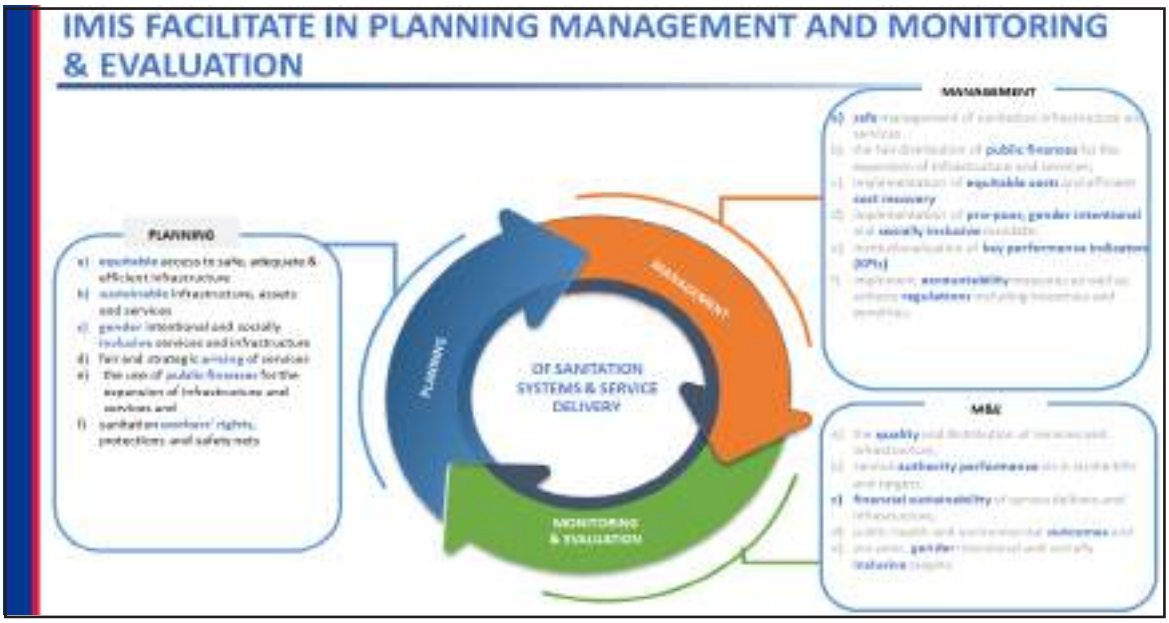
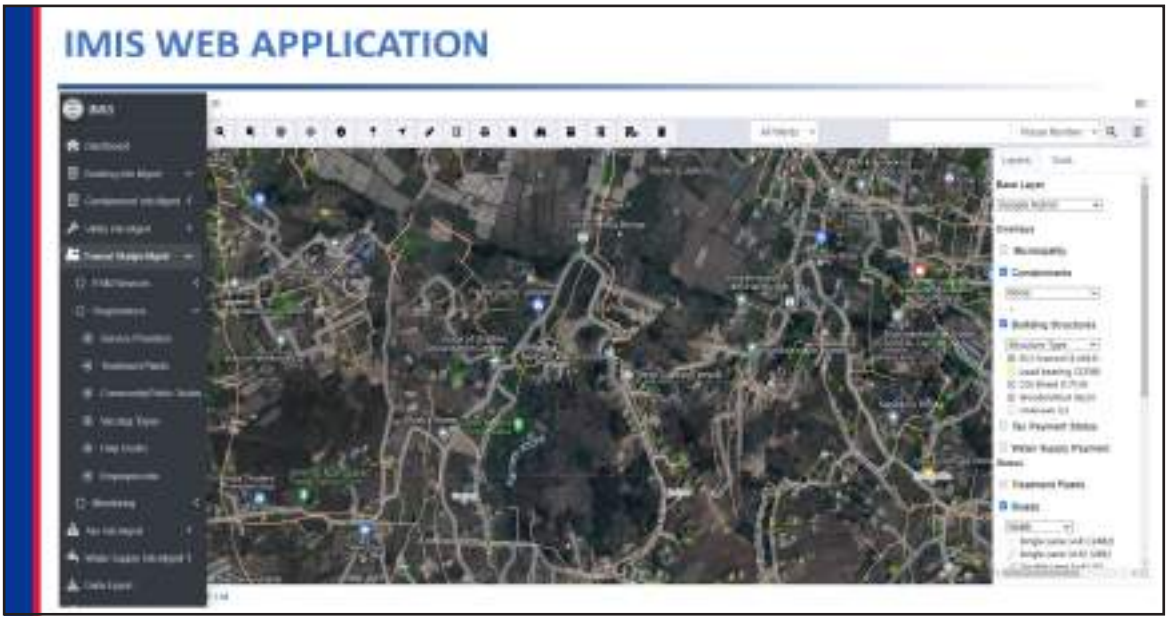


Identifying the appropriate sanitation system (sewage or non-sewage) based on the population density, land use pattern, topography, environmental vulnerabilities of areas, etc
Identifying best locations and capacity of gender intentional and socially inclusive services and infrastructure specially for shareable infrastructure and services such as public toilet / community toilet fair and strategic pricing of services with special focus for households in low and vulnerable areas and the sharable services.
Identifying the best locations for STP and FSTP and developing investment plan using proximity analysis
Establish baseline, prepare plans and EMP (outcome indicators, process indicators), management, performance monitoring, assessing impact and sustainability.
Update and improvement based on evaluation.

Slide 16

Slide 17



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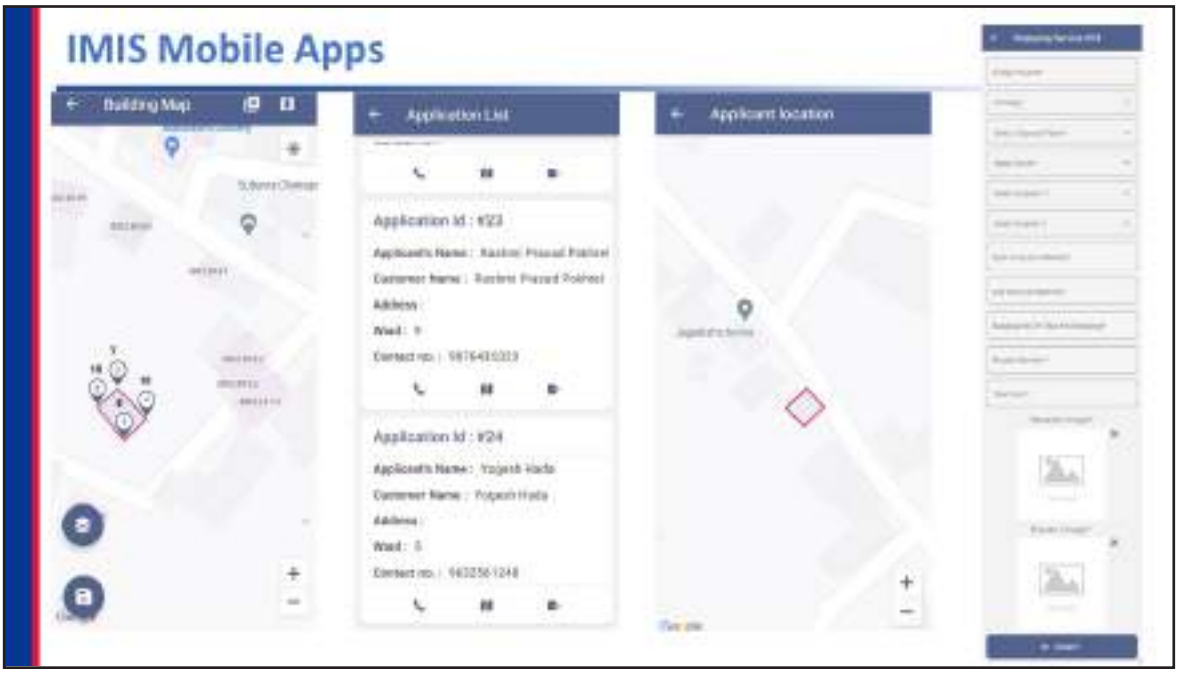
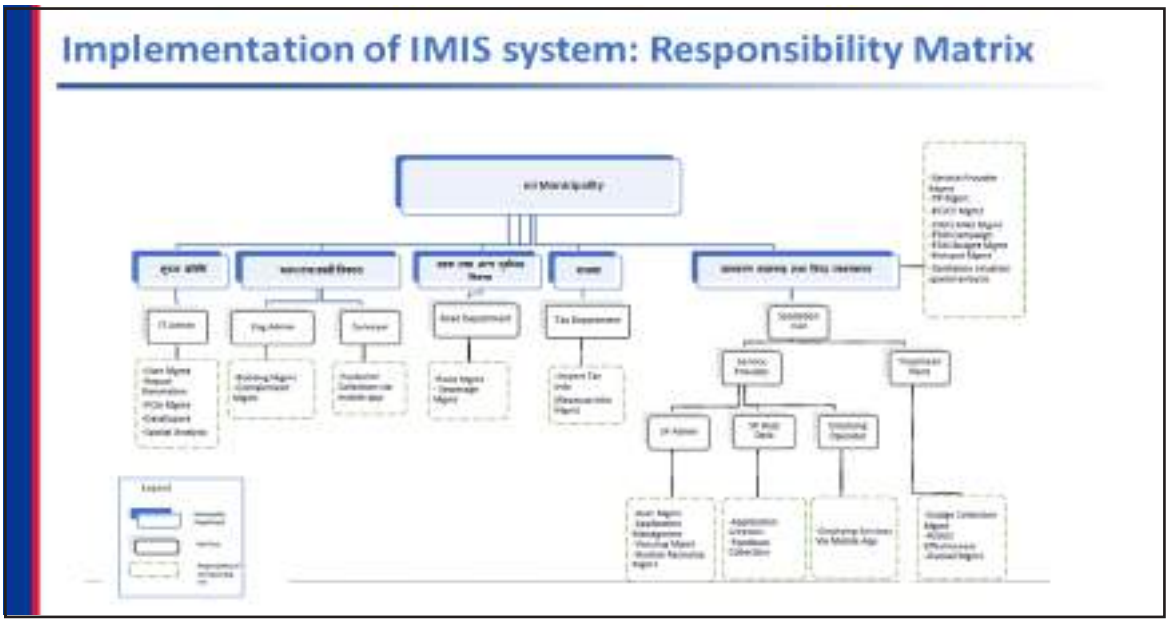


Single mobile app, based on the credentials relevant app is shown.

Emtypers log in app for performing emptying list

Slide 19



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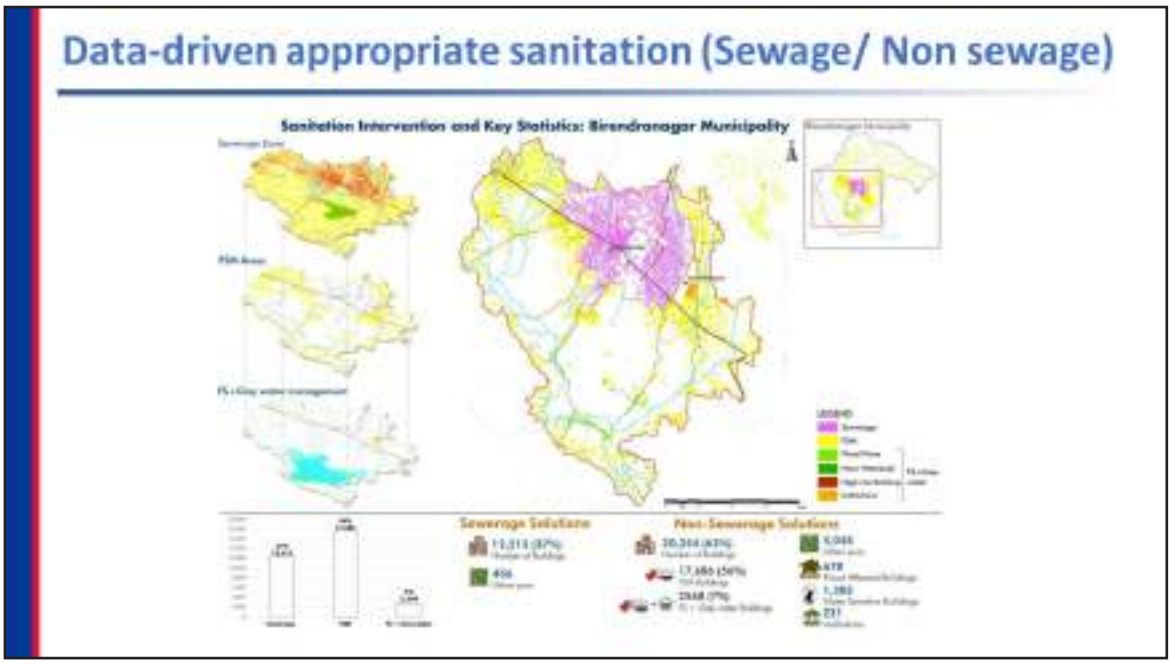
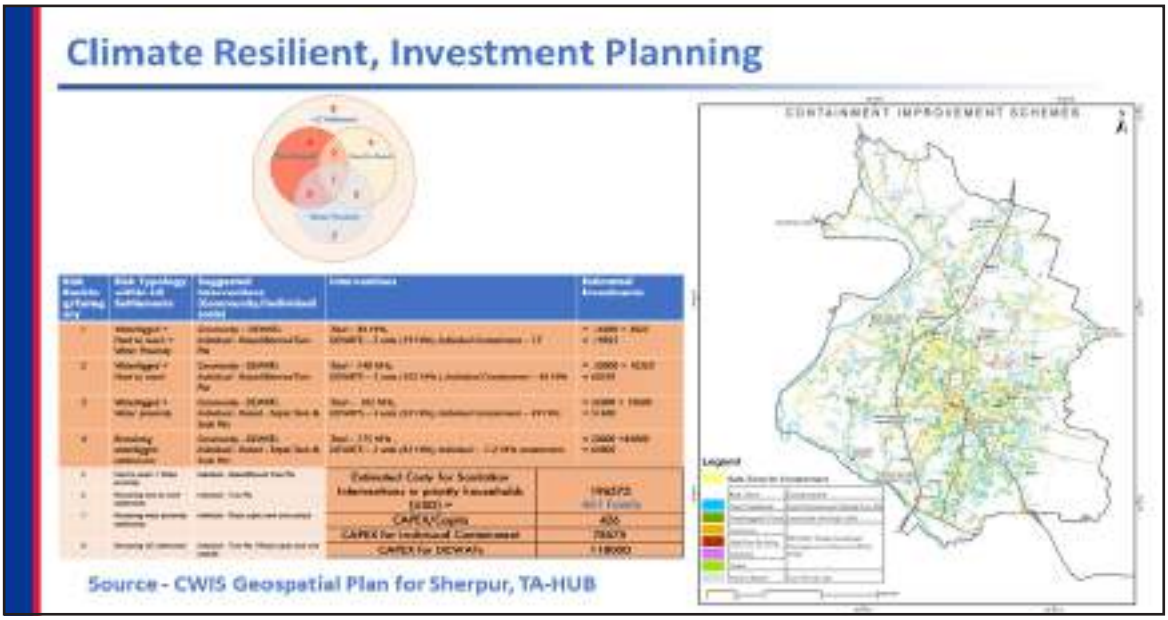


Identifying the appropriate sanitation system (sewage or non-sewage) based on the population density, land use pattern, topography, environmental vulnerabilities of areas, etc

Slide 21



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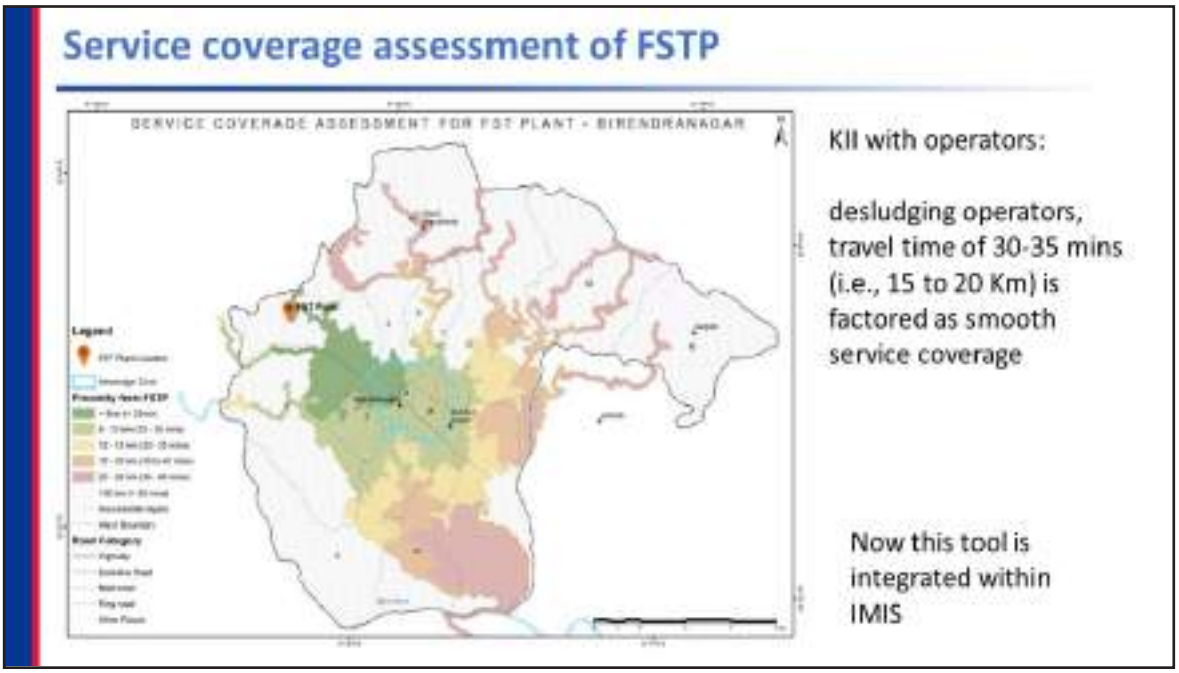

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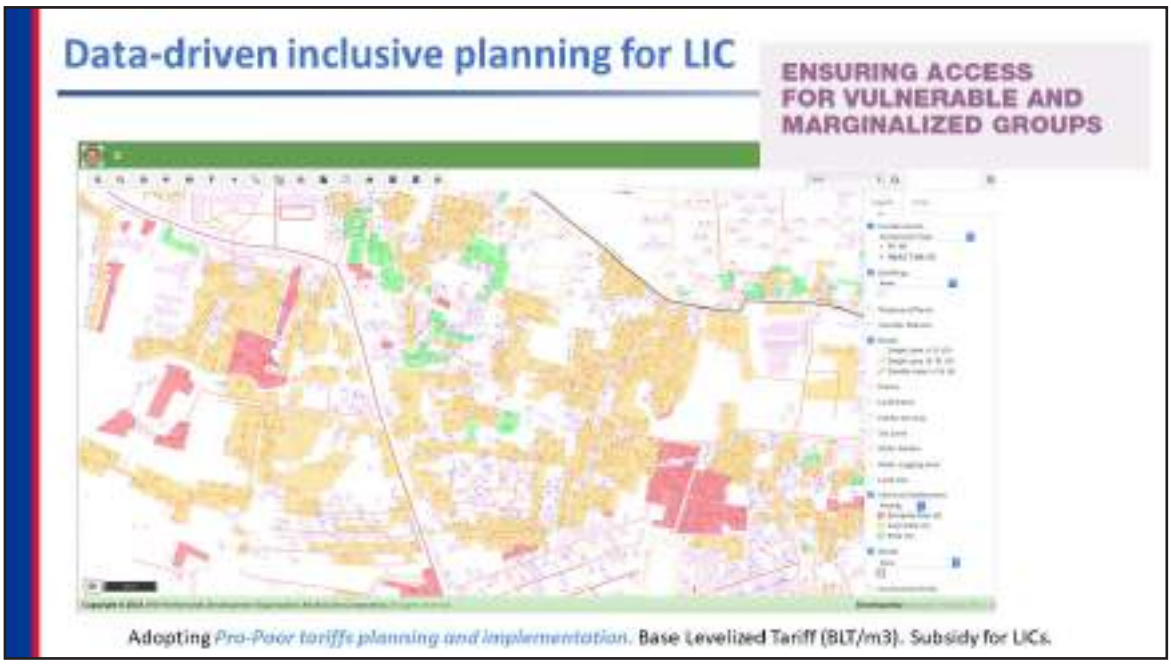

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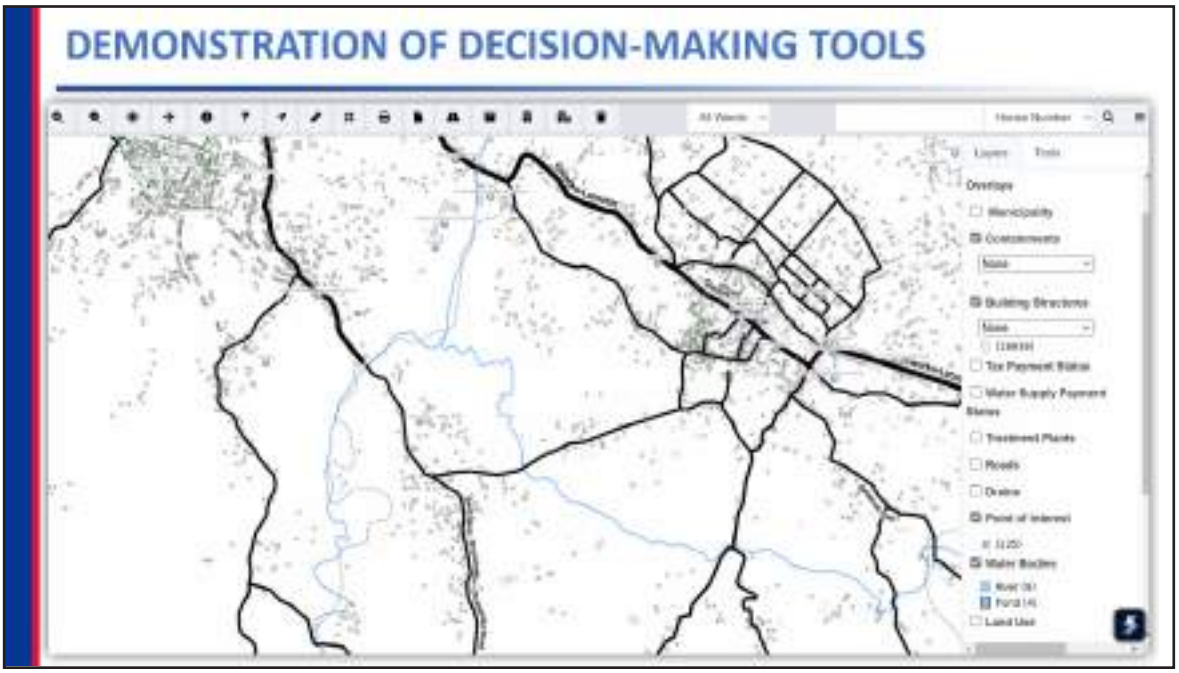
Slide 26



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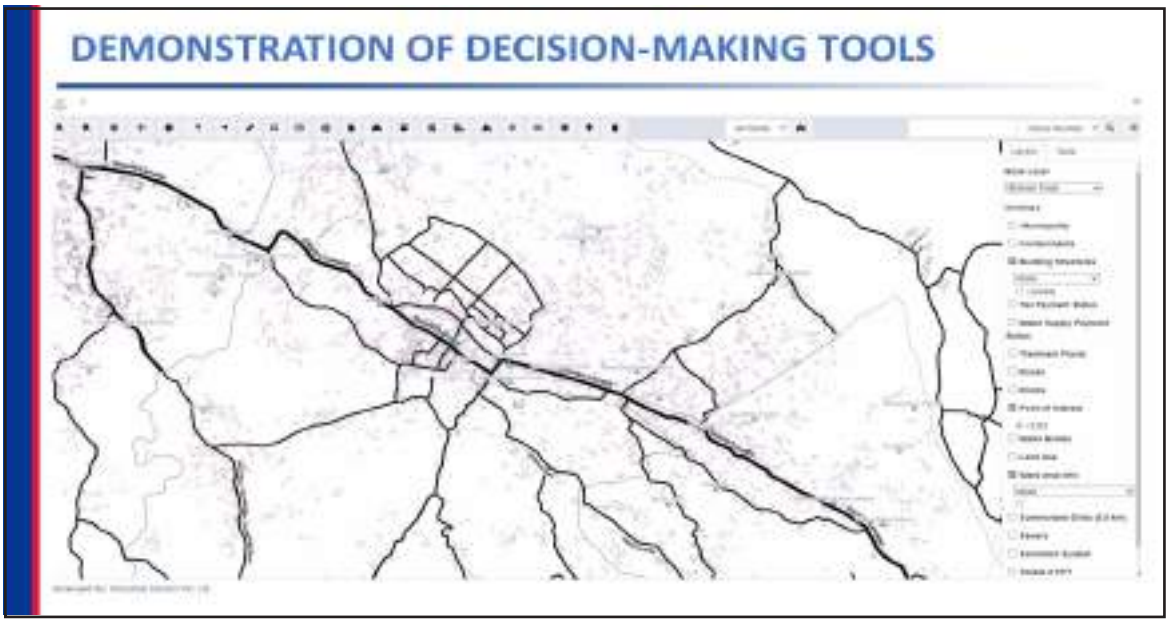


Slide 28

Slide 29

In some cases, in Bangladesh, SSP providers also maintain detail inventory of insurance benefits, salary payment status

Slide 30

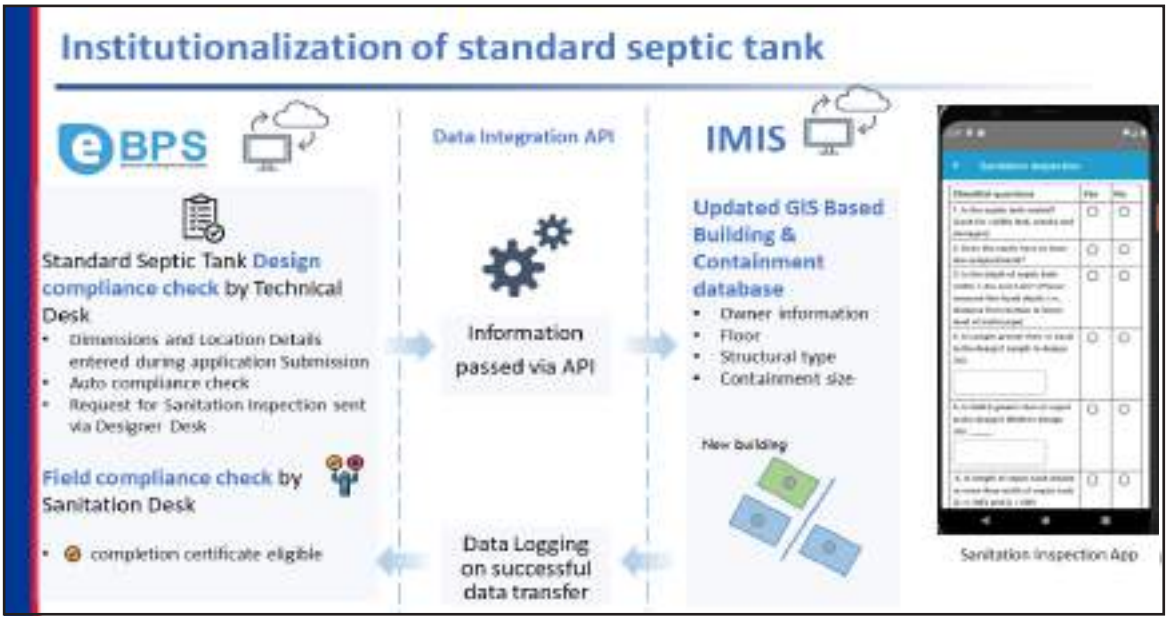
Slide 31

Human waste is safely managed along the service chain, starting from containment

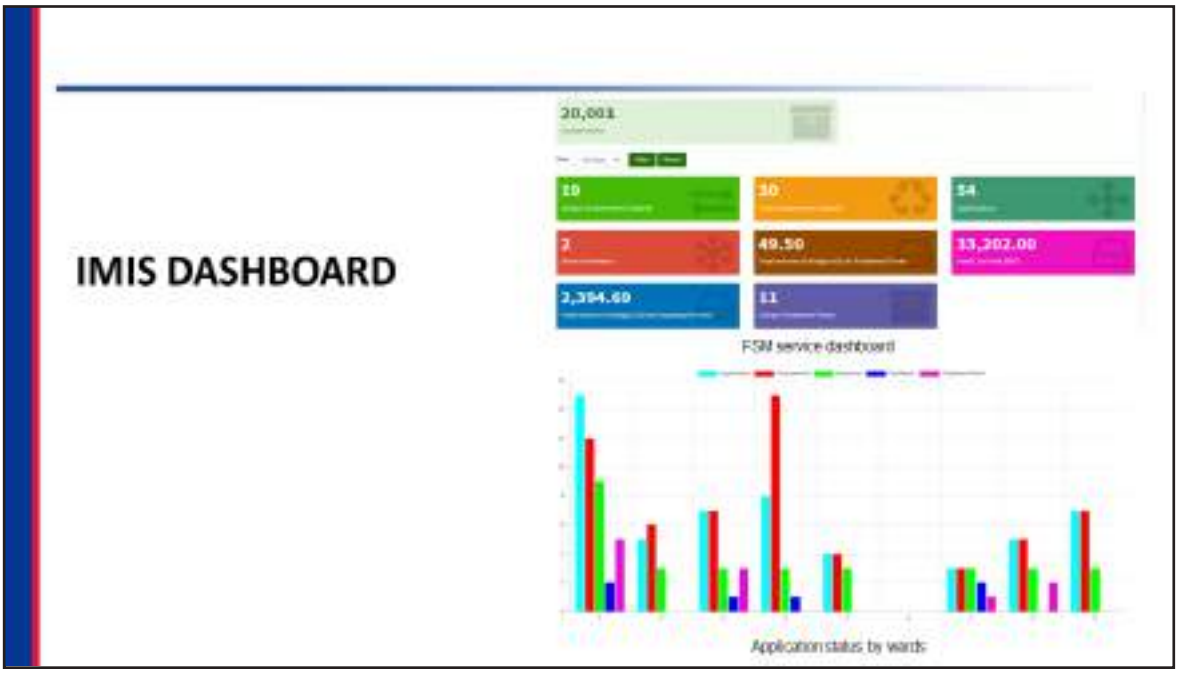
Slide 32

18925 HH 10501 reported as septic tank
400 HH census survey, 362 reported to have septic tank.
Municipality.
Rectangular in shape 2. Two chambers inside 3. Sealed all four walls and base 4. Outlet at the top of the tank

Slide 33



Slide 34



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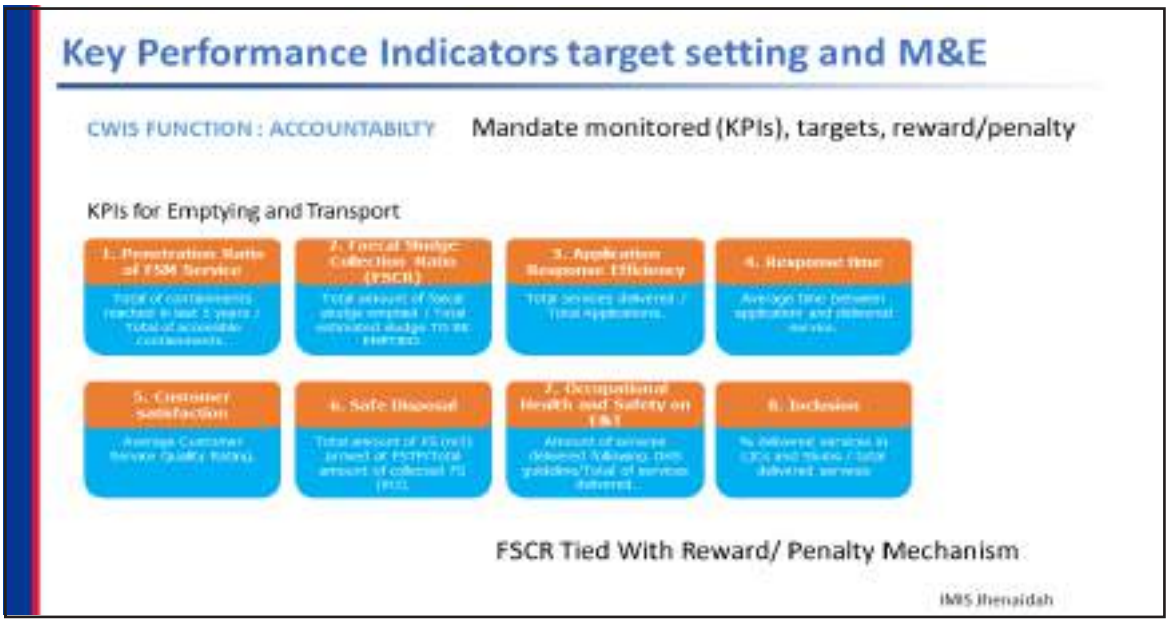
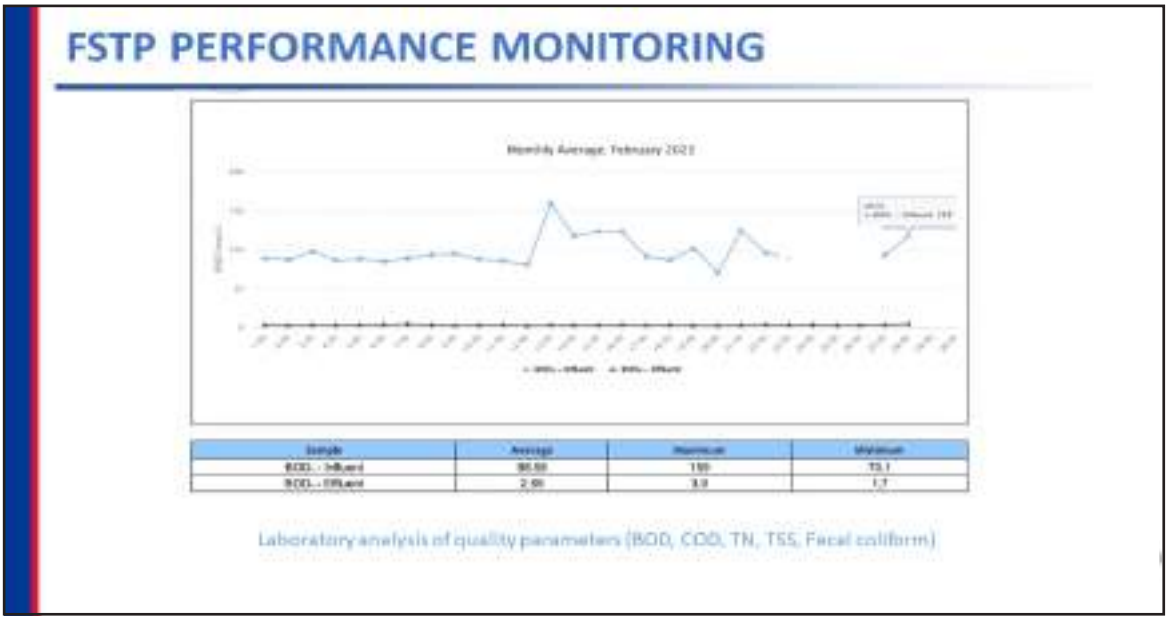


Slide 36

Slide 37



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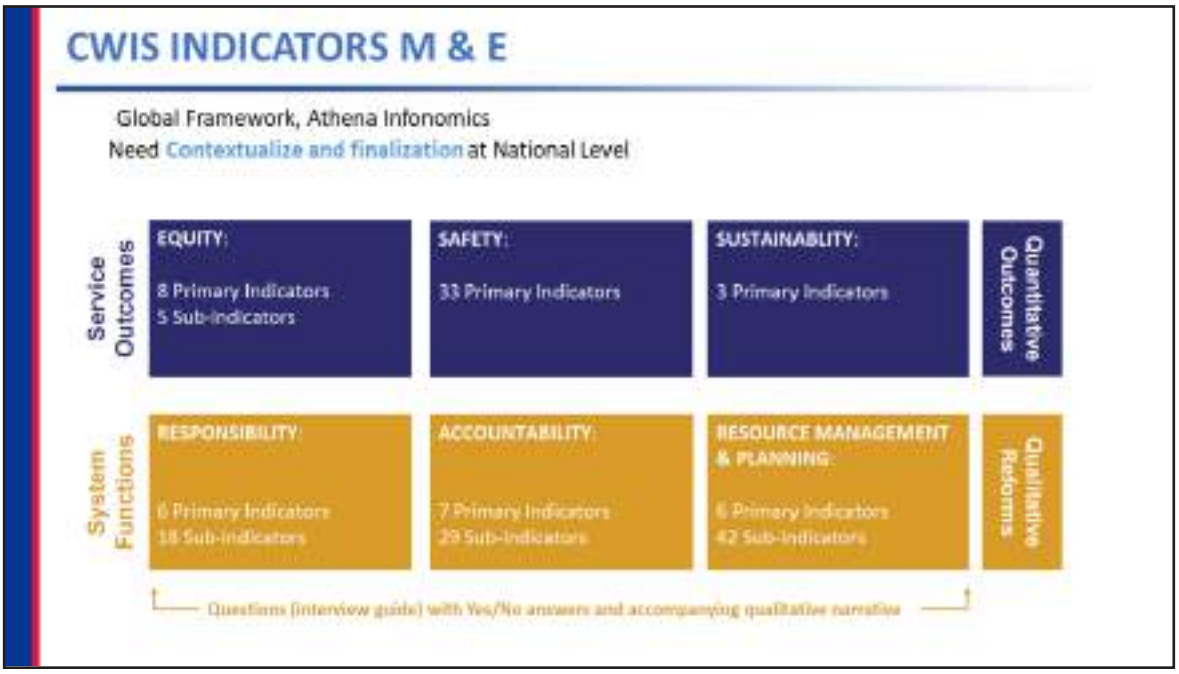
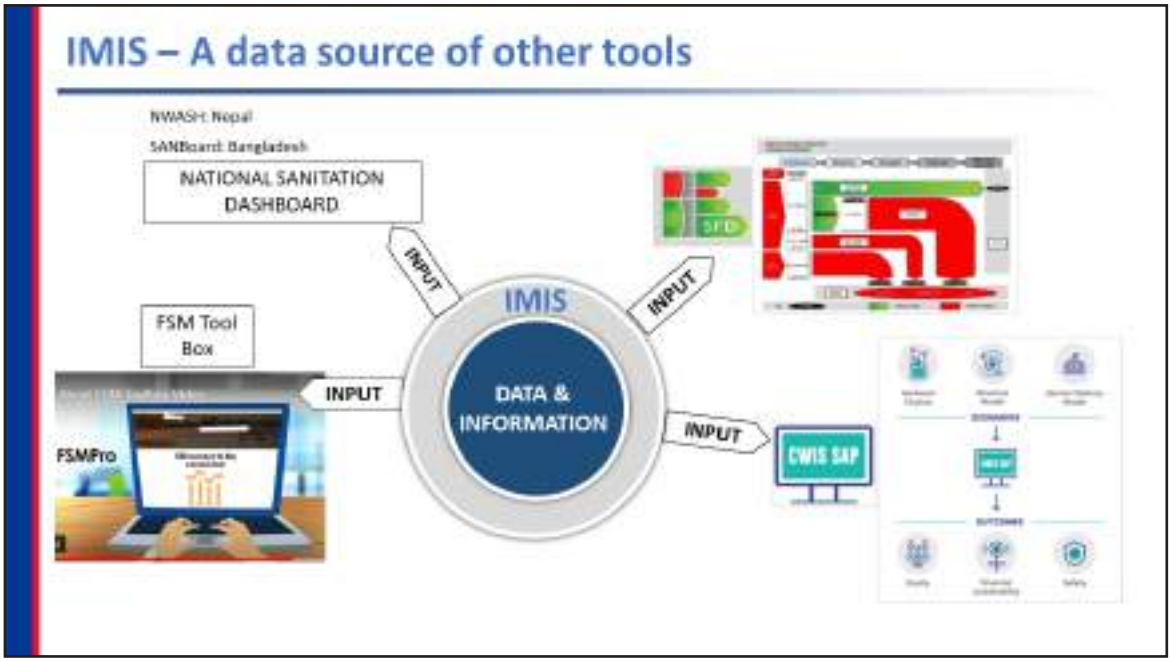


Indicator definitions and calculations can be accessed from www.cwiscities.com
Mentor cities practice In Bangladesh, 600 score

1. % of treated FS and WW that is reused
2. % of O&M cost recovered for sanitation infrastructure
3. % of sanitation capital investments covered by budget line/government transfers

Slide 39

Slide 40



IMIS as data repository that can be used for data input,,,

Slide 41

Key Take Aways

- IMIS is a **sub-national Public Data System (PDS)**, driven by **ULB and utility providers** so that information along the service chain gets collected during the actual service delivery in **real-time**
- IMIS facilitates for **efficient and effective planning, management, M & E** of sanitation systems & sanitation service delivery to through harnessing power of **Information Technology (IT)**
- IMIS enables **better information decision-making, targeted investment planning** not only for sanitation but for overall urban management of the city.
- **IMIS is a robust monitoring** mechanisms to track policy and regulation (FSM – Bylaws) to ensure **Accountability & Transparency**

Slide 42

IMIS FOR SCHEDULED DESLUDGING

20.2 Scheduled emptying of septic tanks or other containment systems at an interval of 2-3 years as recommended by CPHEEO Manual, Ministry of Urban Development advisory on Septage management (2013).

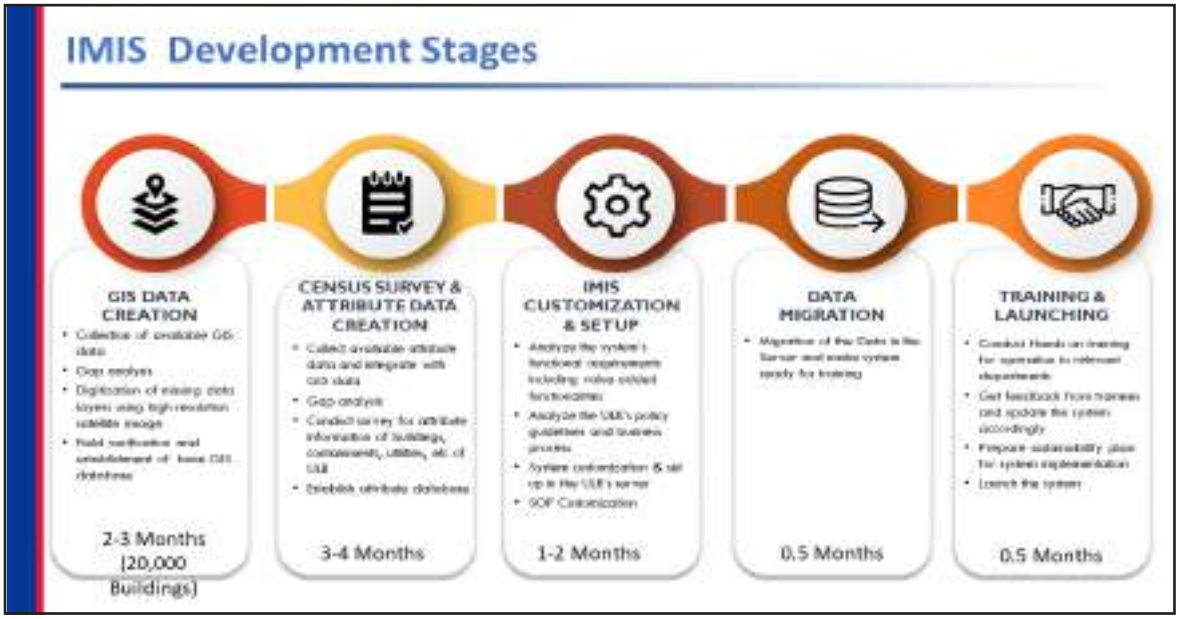
Scheduled desludging vs on-demand desludging

	Scheduled Desludging	On-demand Desludging
Nature	Mandatory	Voluntary
Implementation	Scheduled by the municipality	Requested by the households
Customers	Registered	—
Institutional	Requires a citywide managing service provider	—

INFORMATION REQUIREMENT FOR SCHEDULE DESLUDGING

- ✓ *City level containment database with building categories*
- ✓ *Zonation of city for desludging*
- ✓ *Daily and monthly desludging plan*
- ✓ *Desludging vehicle route planning*
- ✓ *Issue Schedule notice to customers*
- ✓ *Finance administration for payment to private operator*
- ✓ *Finance administration for monitoring "Sanitation Tax" collection*
- ✓ *Periodic Reporting*

Slide 43



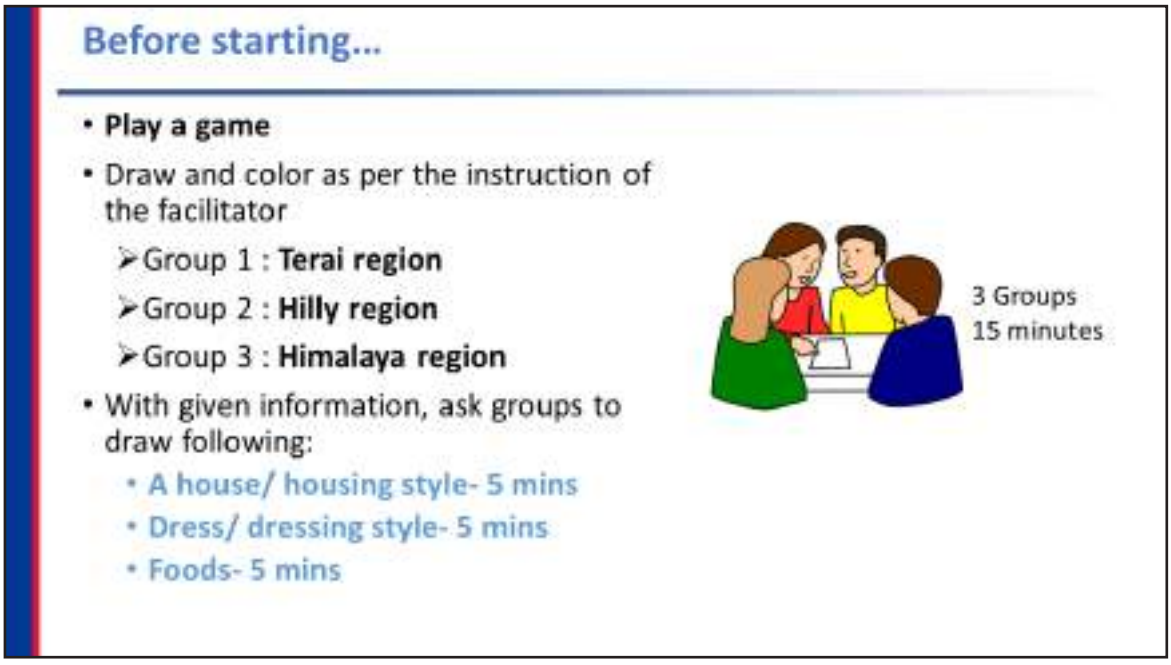
Slide 44

SESSION 14.1

Technological Awareness 1

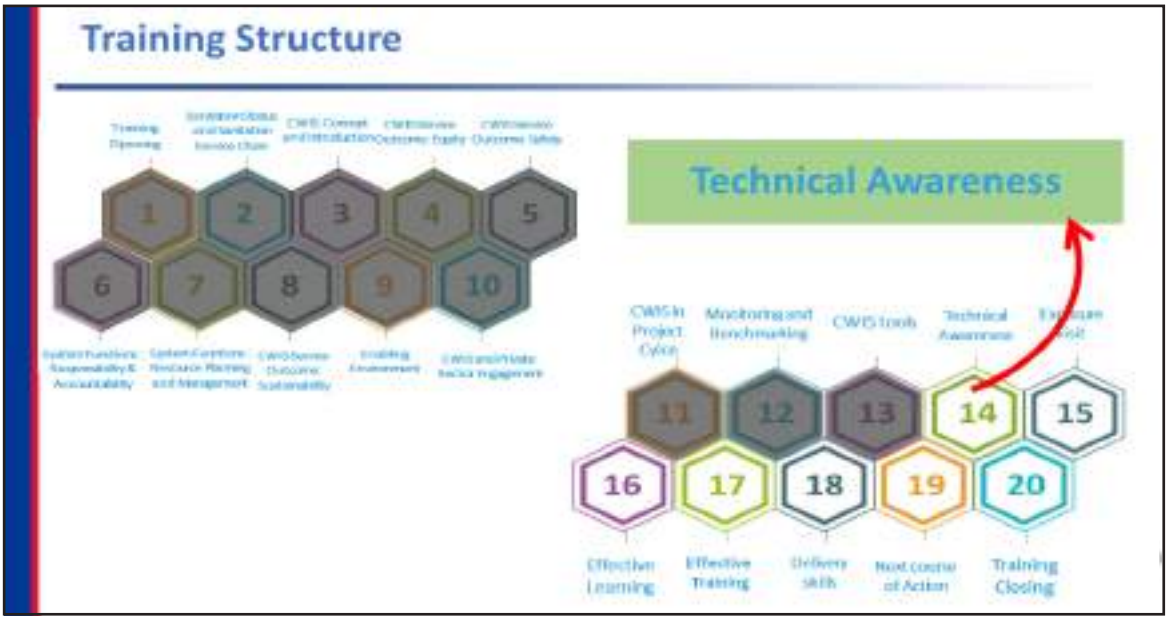
Slide 1

Slide 2



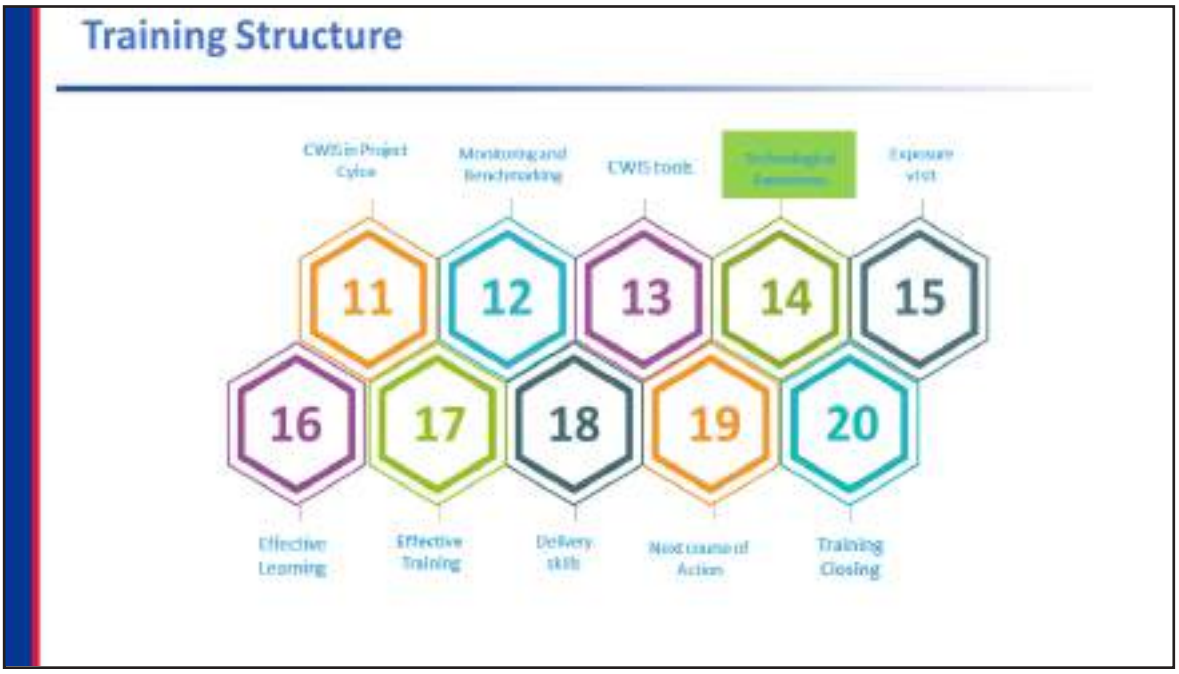
Provide 1 newsprint paper to each group,
1 group will have a newsprint paper with Terai region written on a meta-card
1 group will have a newsprint paper with Hilly region written on a meta-card
1 group will have a newsprint paper with Himalaya region written on a meta-card
Optional: 1 group will have a newsprint paper with America or Europe written on a meta-card
As per the given information on the newsprint paper, ask groups to draw
a house/ housing style- 5 mins
Dress/ dressing style- 5 mins
Foods- 5 mins
After the time ask to paste the newsprint only on the walls or at the front of the hall and act as you are surprised as you provided same instructions but you got different pictures, ask why
Link: similar to these difference, with same reasons, don't you think the sanitation facilities should also differ?

Slide 3



This training includes 20 main technical sessions, and are currently on session 14: Technical Awareness

Slide 4



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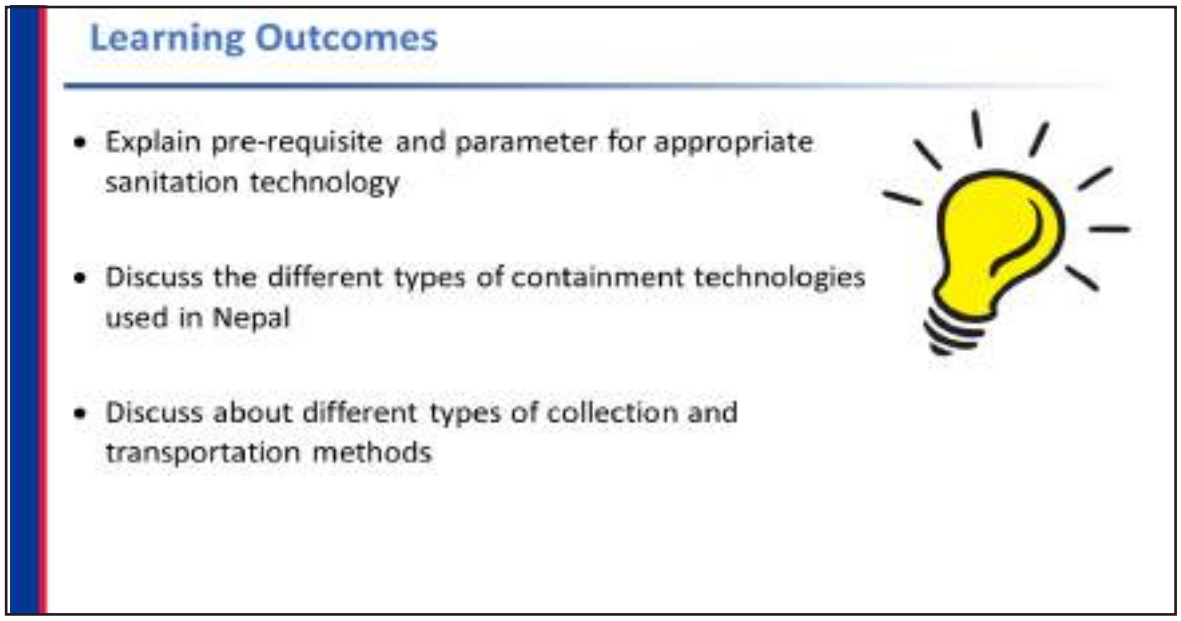
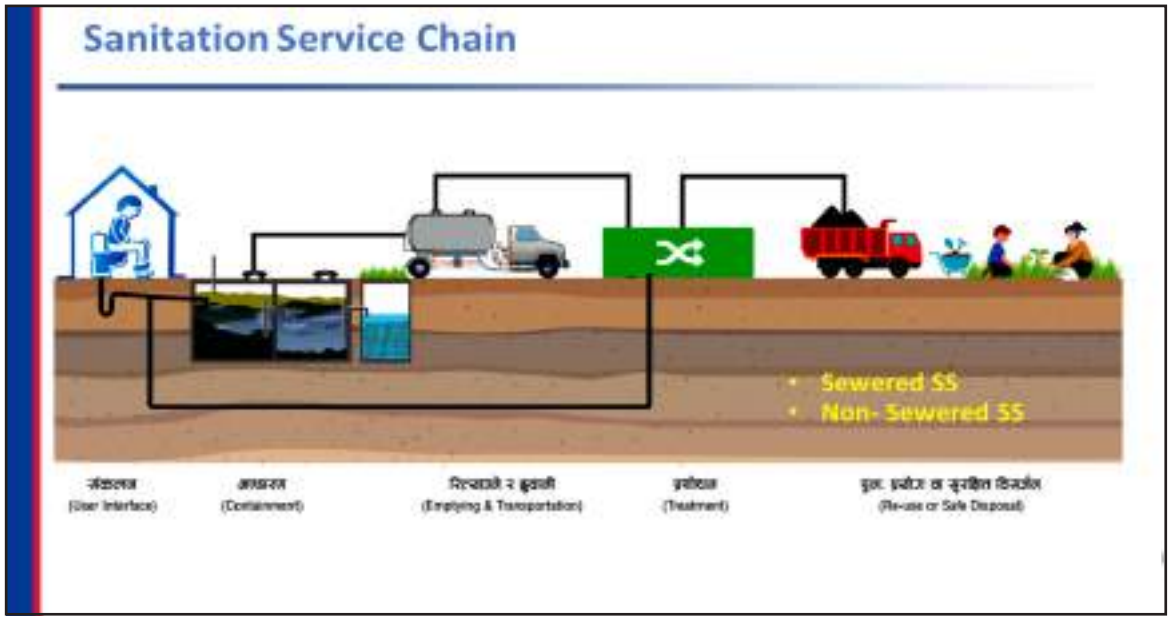
Slide 5



Linking to earlier session, where the need to update the sanitation technology was highlighted, inform participants that the particular session will be discussing on it.

Slide 6

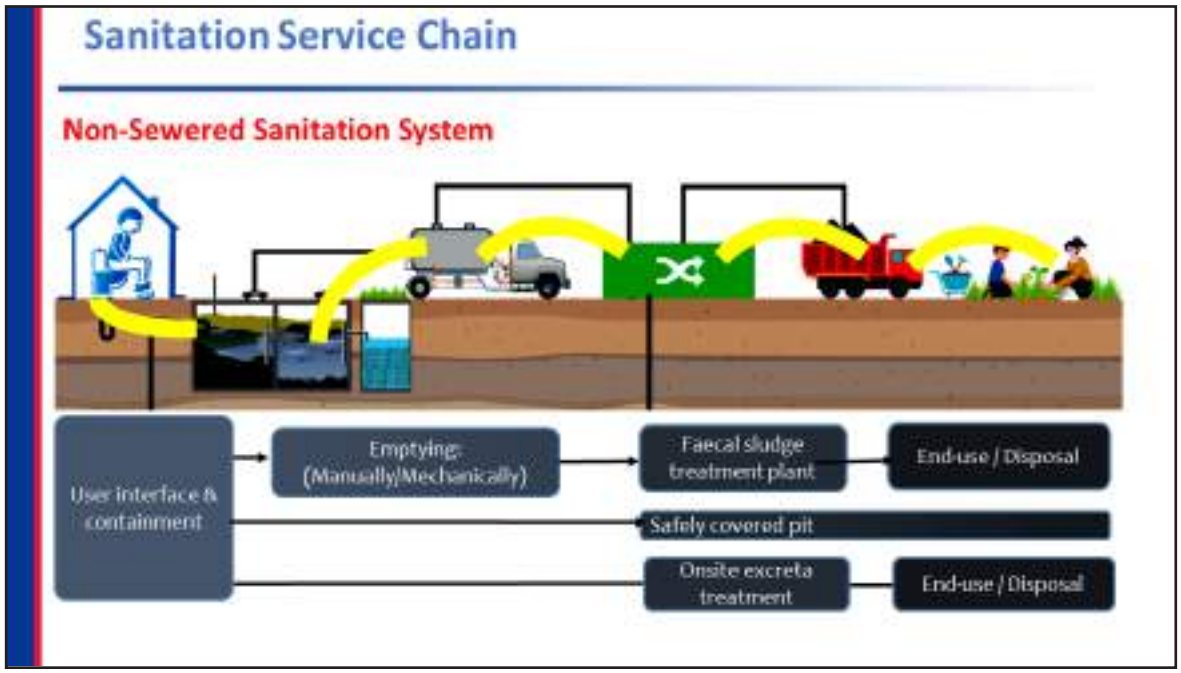
Slide 7



Explain sanitation system as it is a chain of services starting from the origin of waste/ waste generation to the end use or disposal. The whole sanitation system comprises of 5 components namely:

1. User interface
2. Containment
3. Emptying and transportation
4. Treatment
5. Reuse and safe disposal

Slide 8



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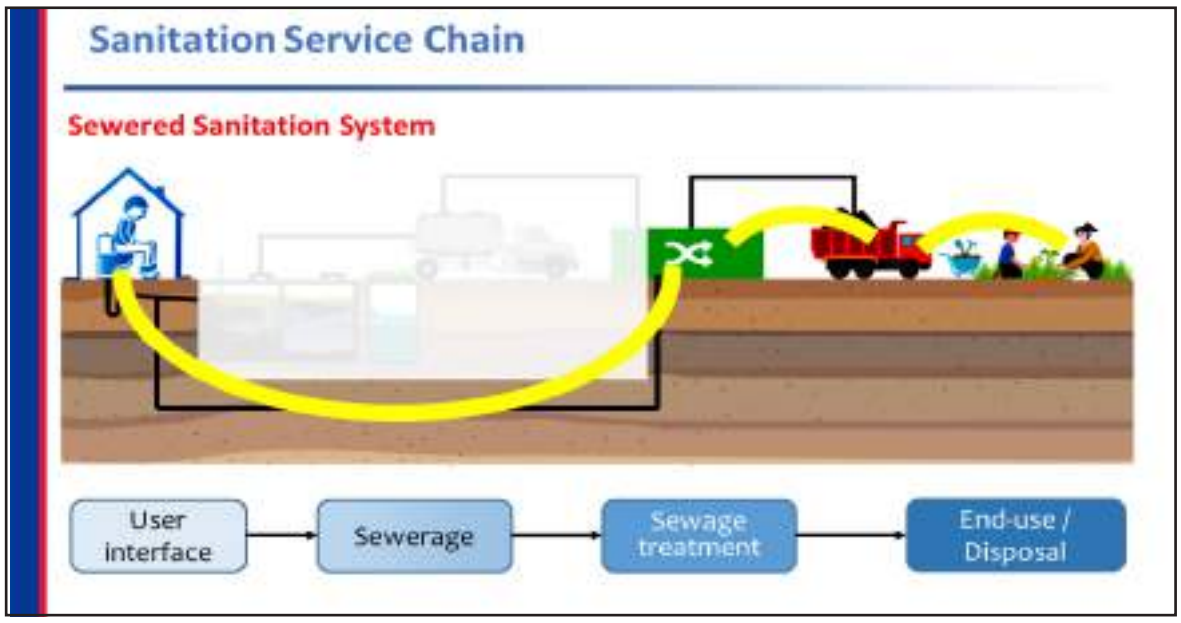
Slide 9



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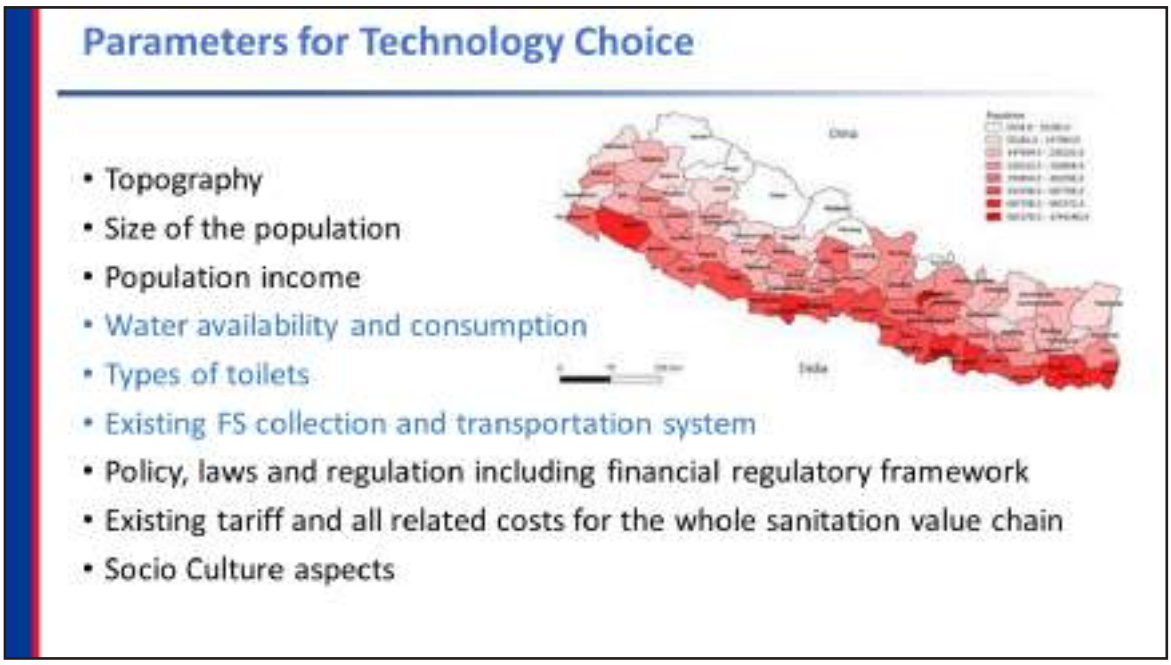


In their earlier group, ask participants to list out the parameters for appropriate sanitation technology.

Slide 11

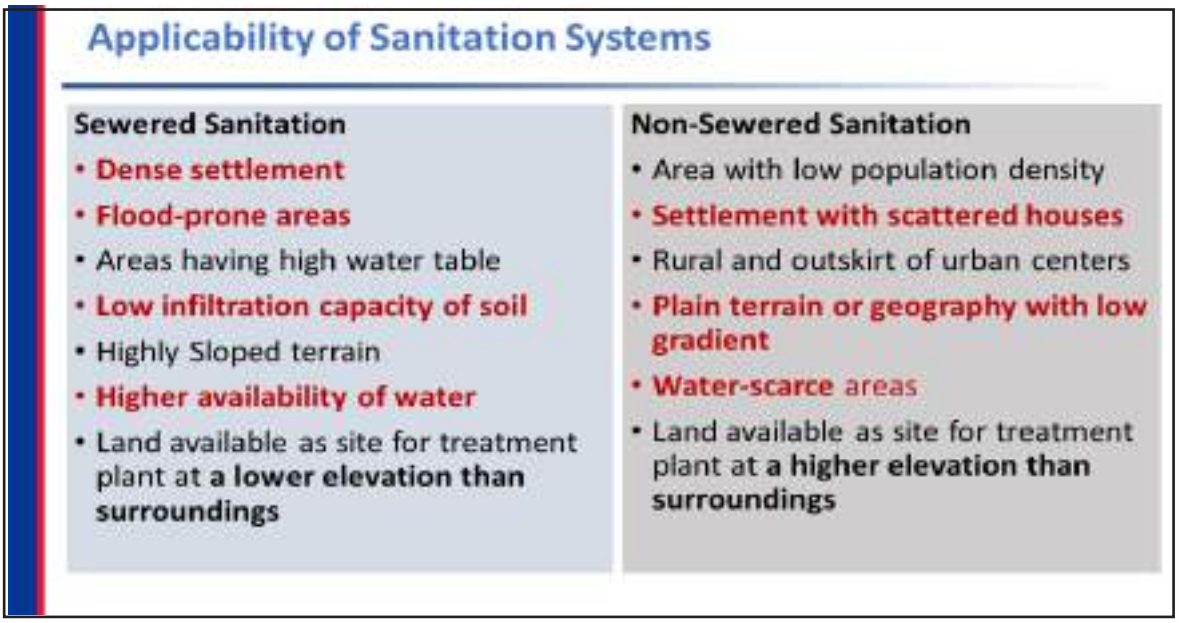
Pre-requisite for Technology Choice

- **Accessibility** (particularly for women, girls, elderly, disabled and sick)
- **Affordability** (for low-income individuals and communities)
- **Functionality and efficiency** - simple and smart
- Durability
- Minimum land requirement
- Minimum Operation and maintenance (O&M) Cost
- **Meeting environmental and health compliance** (No water pollution, No nuisance in surroundings, effluent quality should meet the standard, No air pollution, No noise pollution)
- **Resource recovery** of water, water and biogas
- **Maintain gravity flow system**/No use of electricity or mechanical system

Slide 12

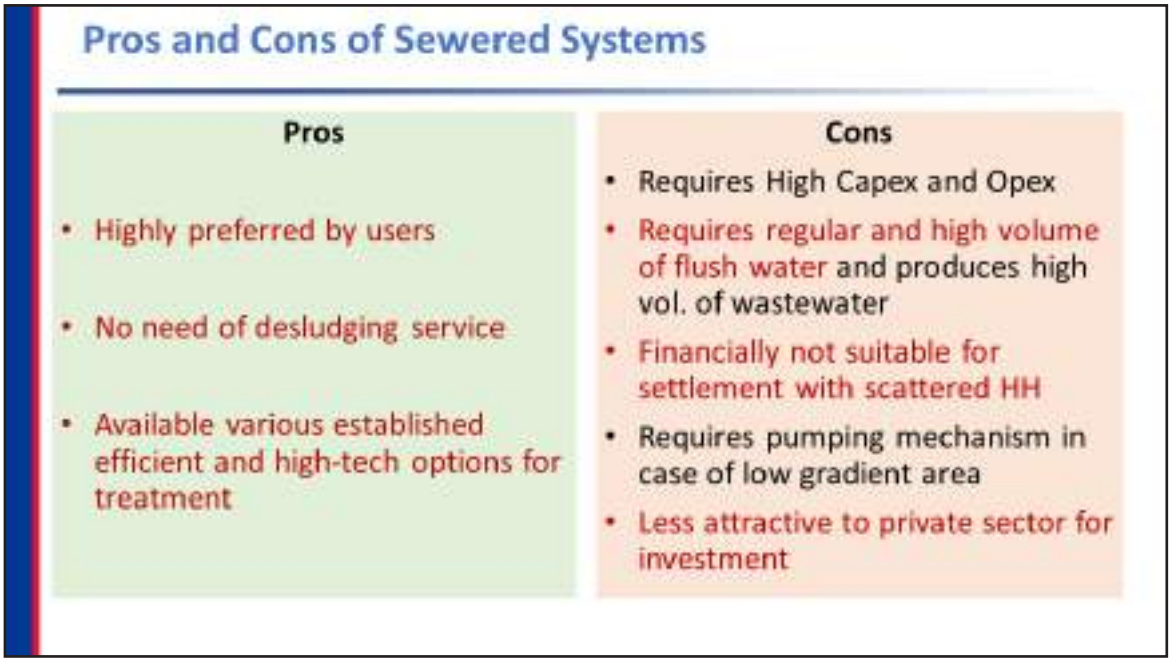
Choose your technology

Slide 13



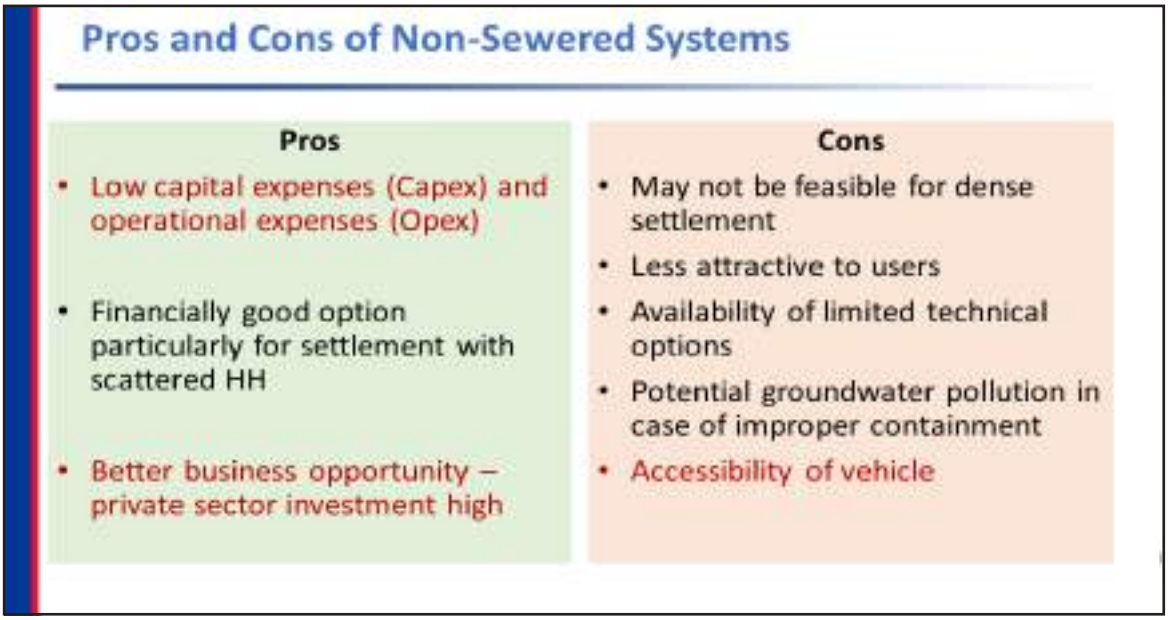
Ask participants to think about the applicability of SS
Provide a minute time to think on sewered sanitation system and ask participants to share their thoughts
Take 3 to 4 points from participants and present the points of sewered sanitation
Similarly, ask participants to share their thoughts on non-sewered sanitation
Take 3 to 4 points from participants and present the points of sewered sanitation

Slide 14



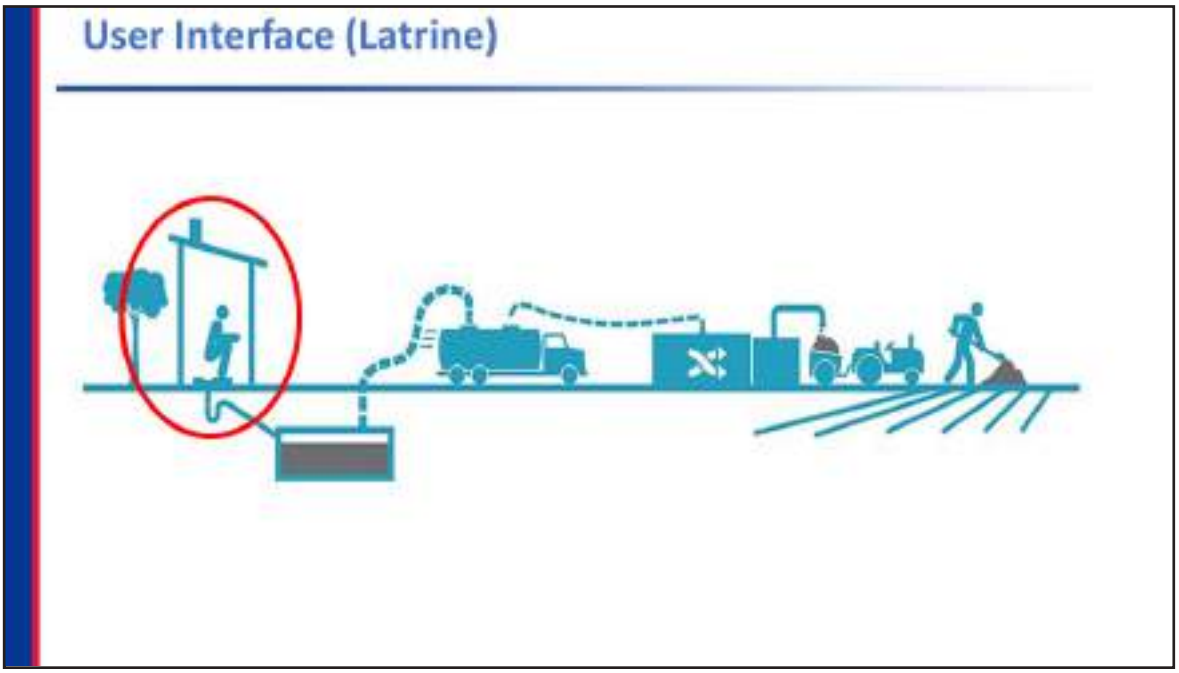
Similarly, present the advantages and limitations of SS to participants with the slide.
Capex- Capital Expenses
Opex- Operational Expenses

Slide 15



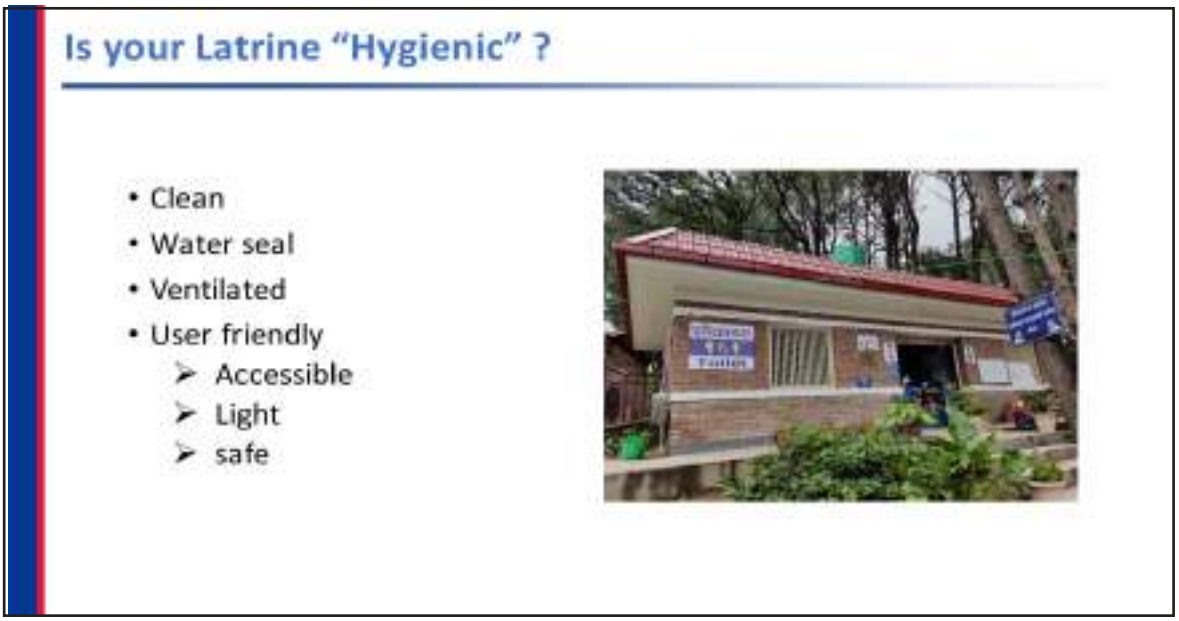
Similarly, present the advantages and limitations of Non-SS to participants with the slide.

Slide 16



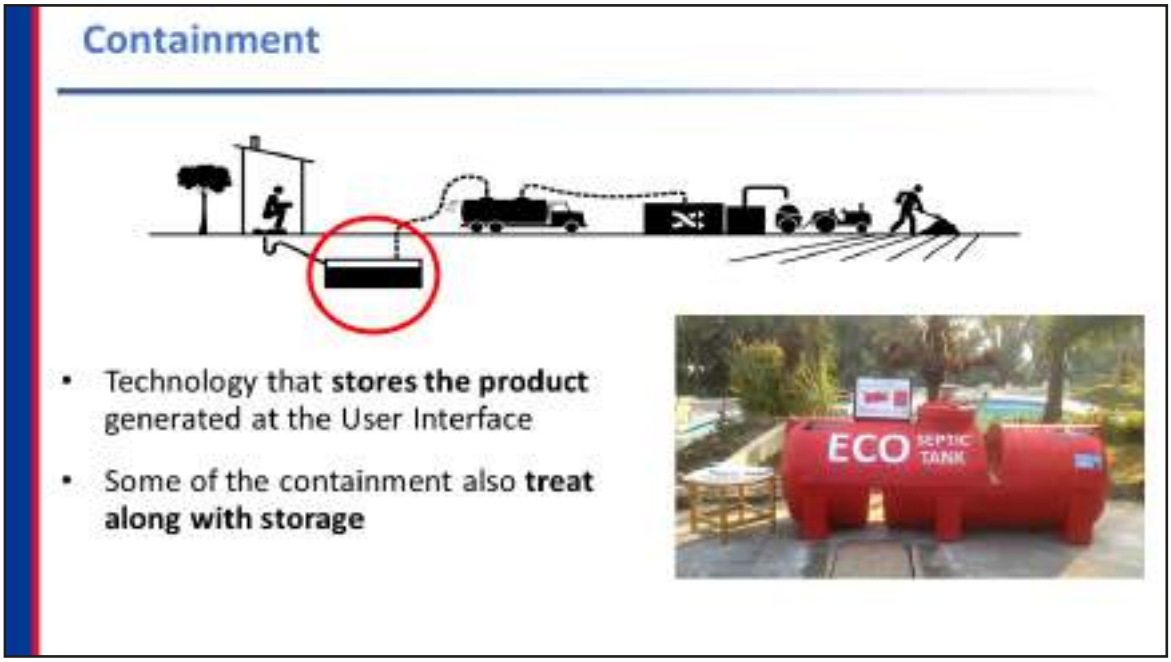
Explain participants that they are going to discuss in each components of sanitation system, starting from user interface or latrine/ toilet.

Slide 17



A hygienic latrine would include all of the following:
1. Clean with no feacal traces
2. Sealing of the passage between the squat hole and the pit to effectively block pathways for flies and other insect vectors, thereby breaking the cycle of disease transmission, and
3. Venting out of foul gases generated in the pit through a properly positioned vent pipe to keep latrine odor free and encourage its continual use.

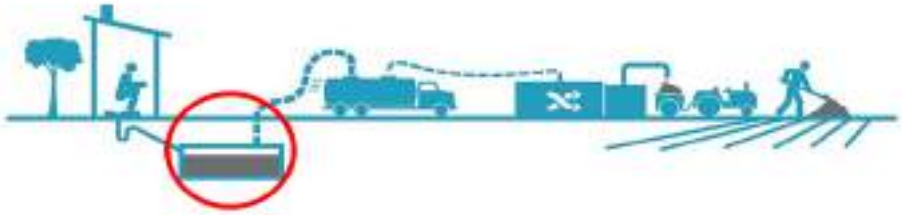
Slide 18



Slide 19

Types of Containments

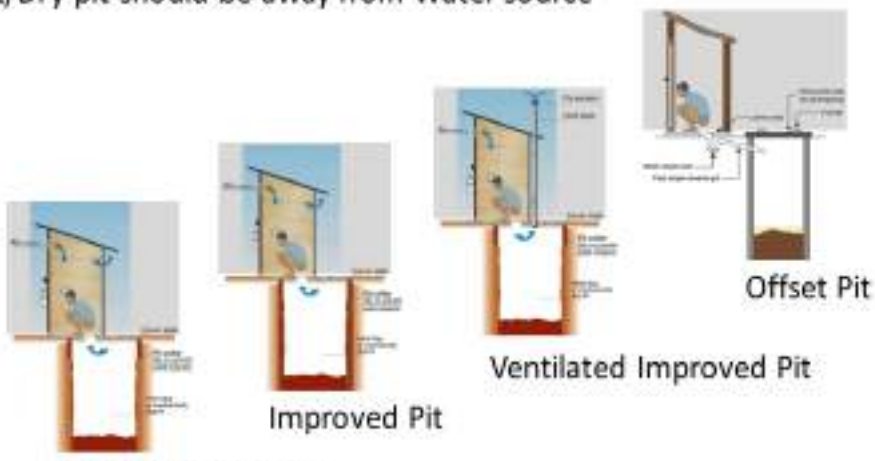
- ❑ Simple containment
  - Simple / Dry pit
  - Improved/ Simple Lined Pit
  - Ventilated Improved Pit
  - Offset Pit
  - Twin Pits
  - Holding tank
- ❑ Septic Tank
- ❑ Ecosan Vault
- ❑ Biogas Digester



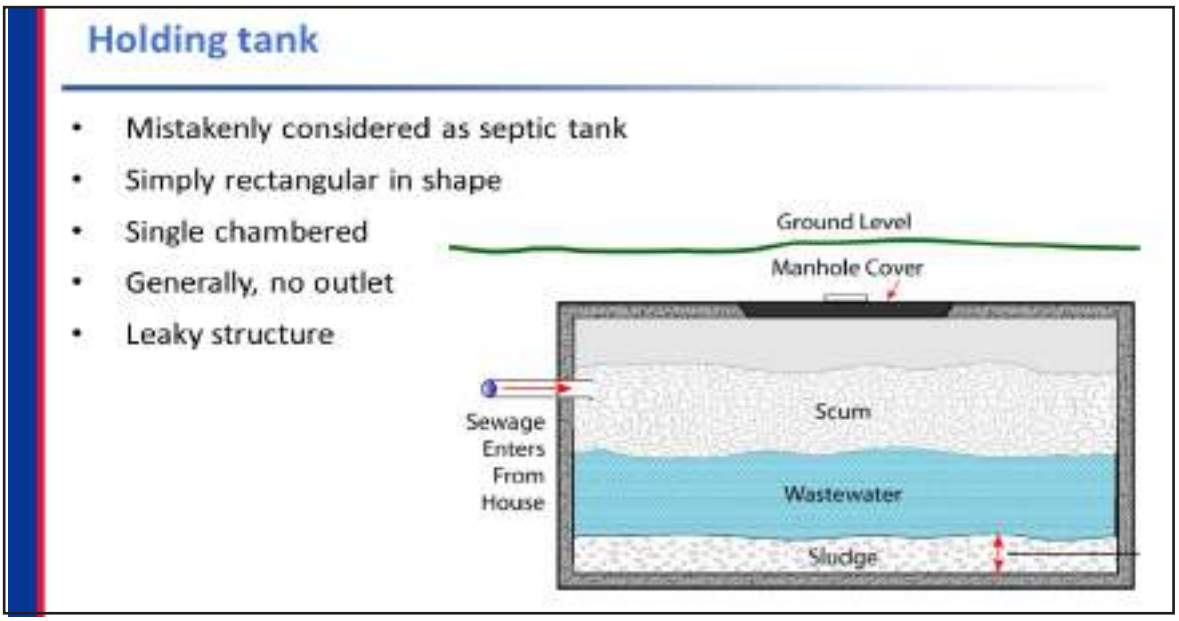
Slide 20

Types of Pit

Simple pit/Dry pit should be away from Water source



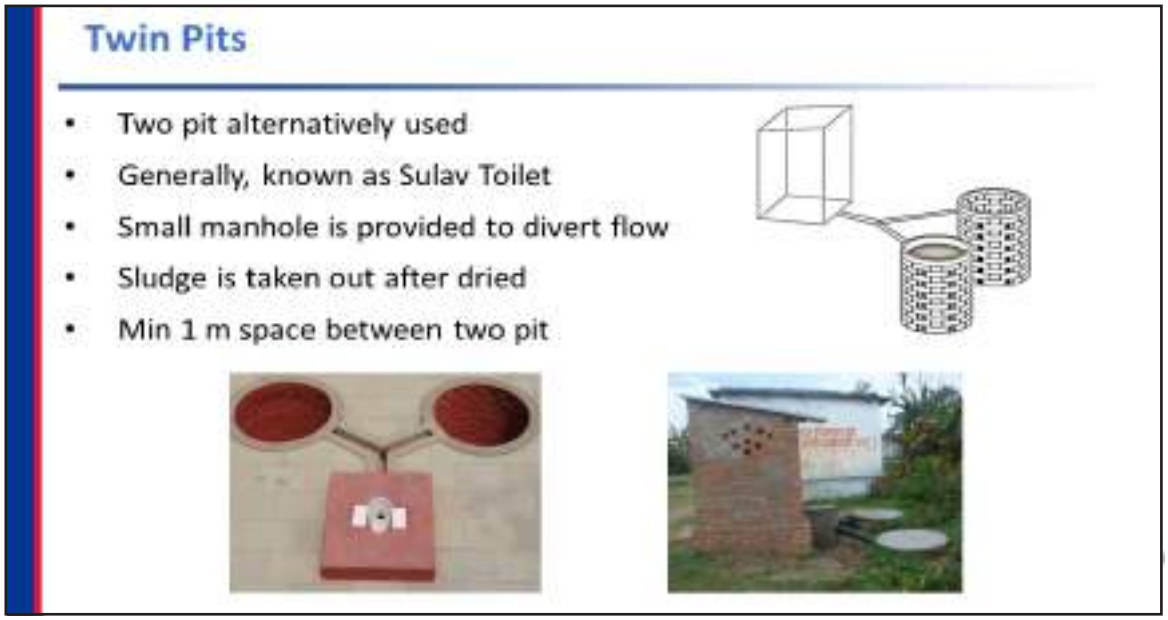
Slide 21



In this system also, the pits are used ulternatively. It is used for flush toilets where diversion system is installed to use the pits alternatively.

Slide 22

Slide 23



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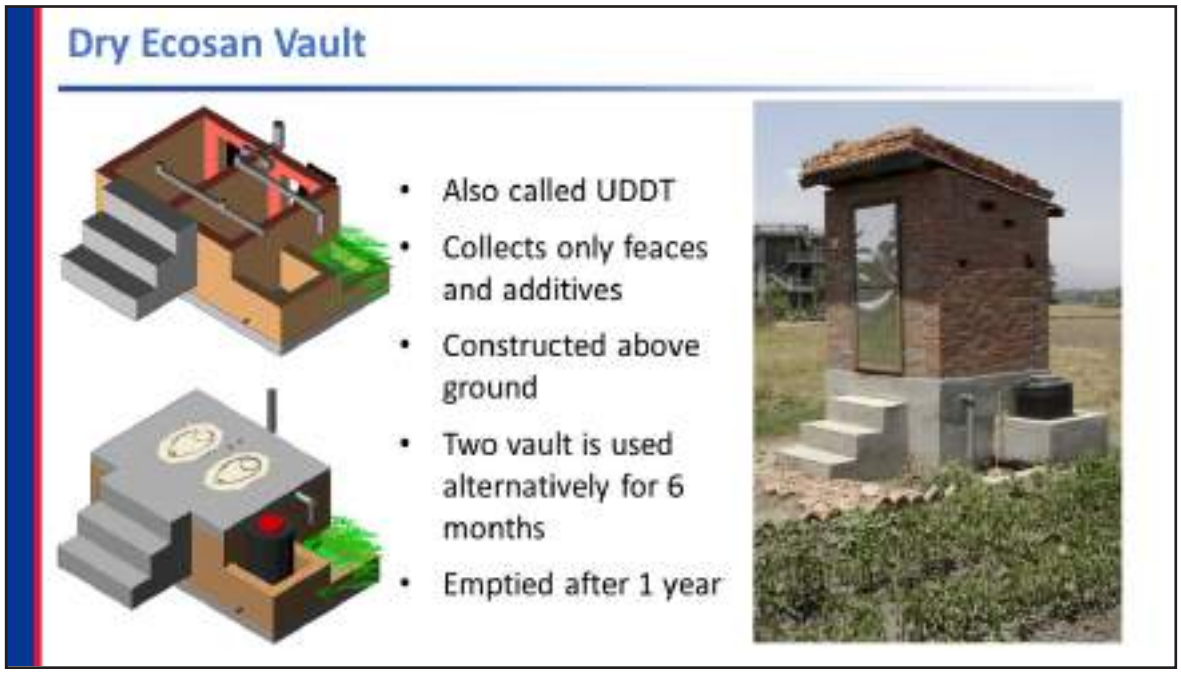
Slide 24

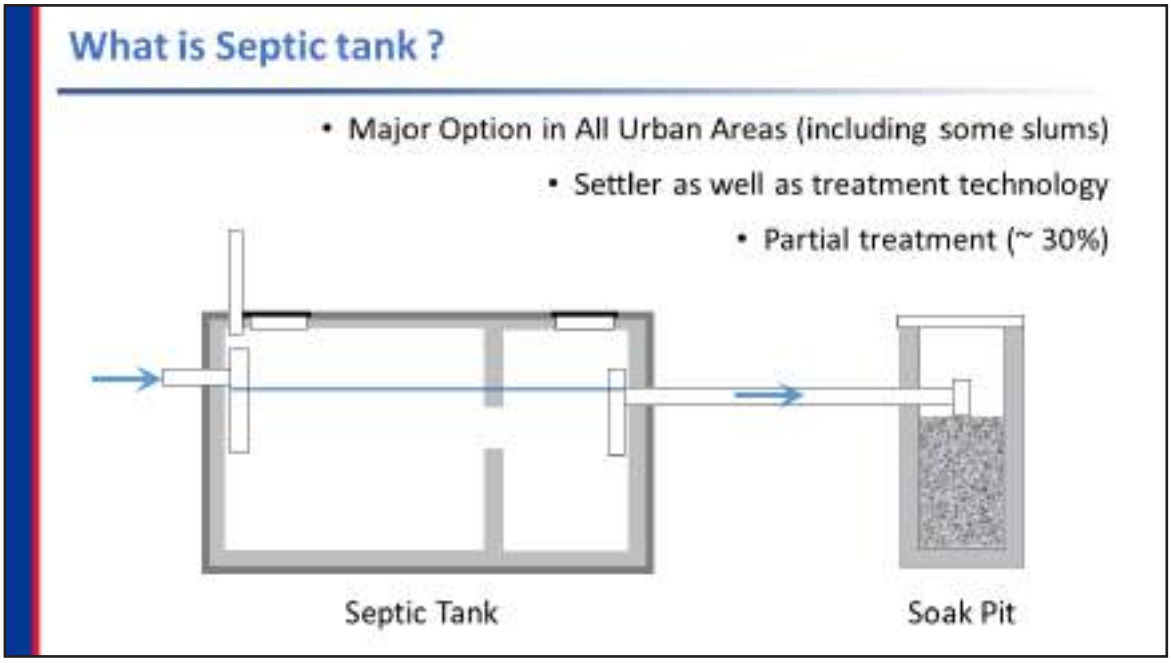


In this type of toilet, urine and excreta are collected separately. Excreta is collected in dehydration vaults where ashes is applied after each defecation. Urine are collected in plastic container. The anal cleansing water is connected to soak pit/wetland. The dehydration vaults are used alternatively.

Slide 25

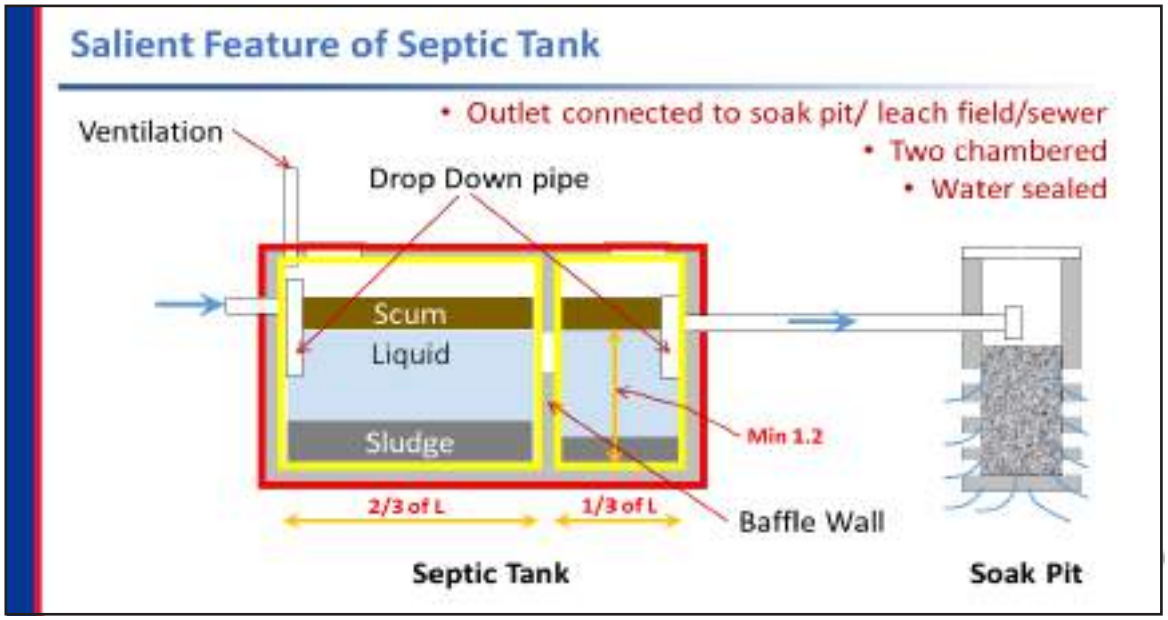
The popular biogas in Nepal is Gober gas. In this type of biogas plant, the animal exceta(especially from cows, buffalo) are used for biogas plant in which the excreta from household toilet is also connected. Organic waste are also mixed. The biogas obtained is used for cooking. The digested sludge obtained is called bio-slurry which is used in farming.

Slide 26



Septic tank is one of the infrastructure for containment of the FS. Around 30-40% waste is treated in the septic tank, hence the septage (FS) needs to be taken for further treatment. One of the major component of the septic tank is soak-pit.
The minimum depth of the septic tank should be 1.2 meters while the first compartment of the septic should be of 2/3 of the total length leaving 1/3 of the total length for the second compartment.
Septic tank is one of the major option in all urban areas including some slums.

Slide 27



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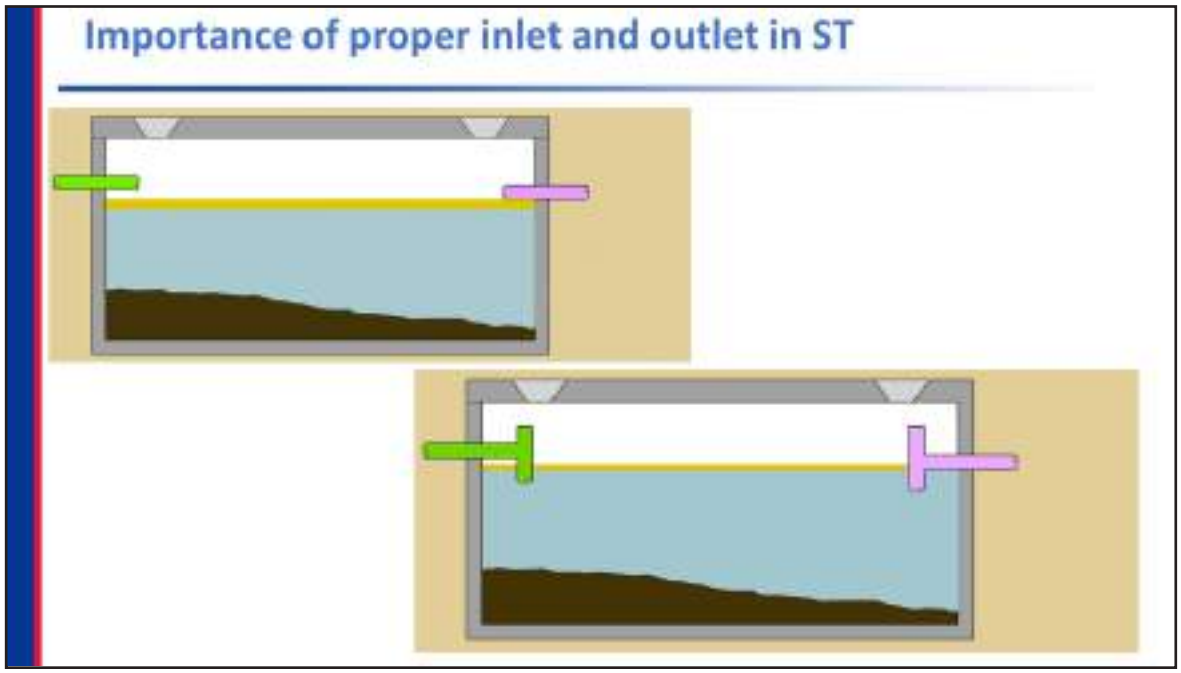
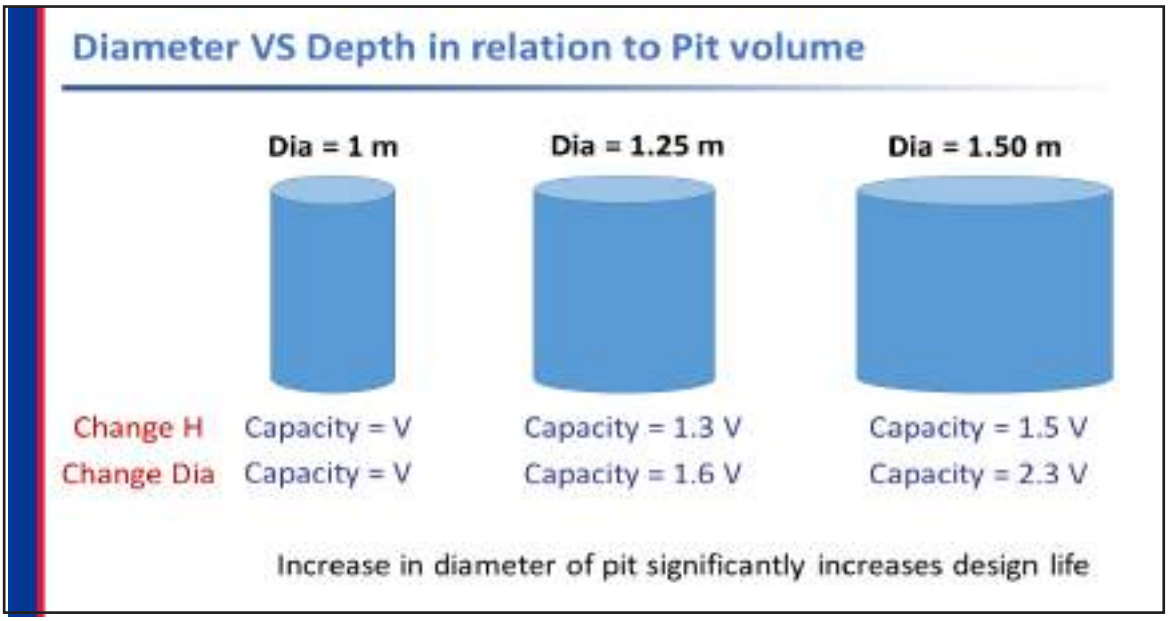
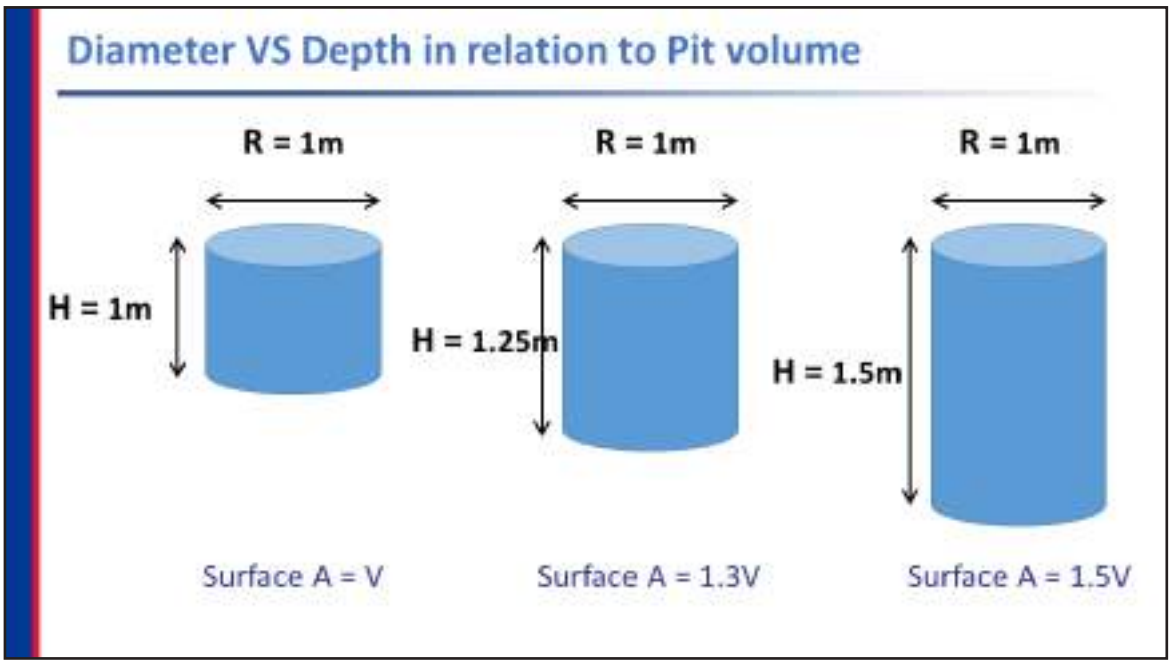


Slide 29



Just make the point that if ring is bigger, it will last long. Do not discuss on technical details.

Slide 30



Just make the point that if ring is bigger, it will last long. Don't talk about the technical details.

Slide 31

Slide 32

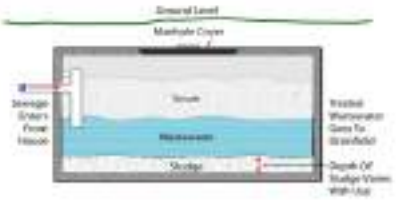
Size of Septic tank

In Nepalese context

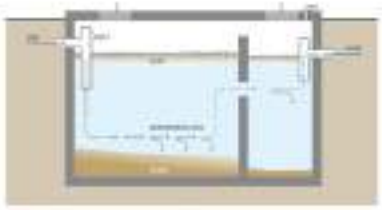
HRT	24					18						
User Nos	5	10	15	20	25	50	75	100	150	200	250	300
Length (m)	1.50	2.10	2.60	2.90	3.10	3.60	4.40	4.90	5.90	6.70	6.90	7.50
Breadth (m)	0.80	1.00	1.30	1.40	1.60	1.80	2.20	2.40	2.90	3.30	3.50	4.00
Height (m)	1.30	1.50	1.40	1.50	1.50	1.80	1.80	2.00	2.10	2.10	2.30	2.30

Slide 33

Rectangular tank is not septic tank



- Only collects and stores
- Does not have outlet
- Need frequent desludging
- Single chambered
- Leaky tank



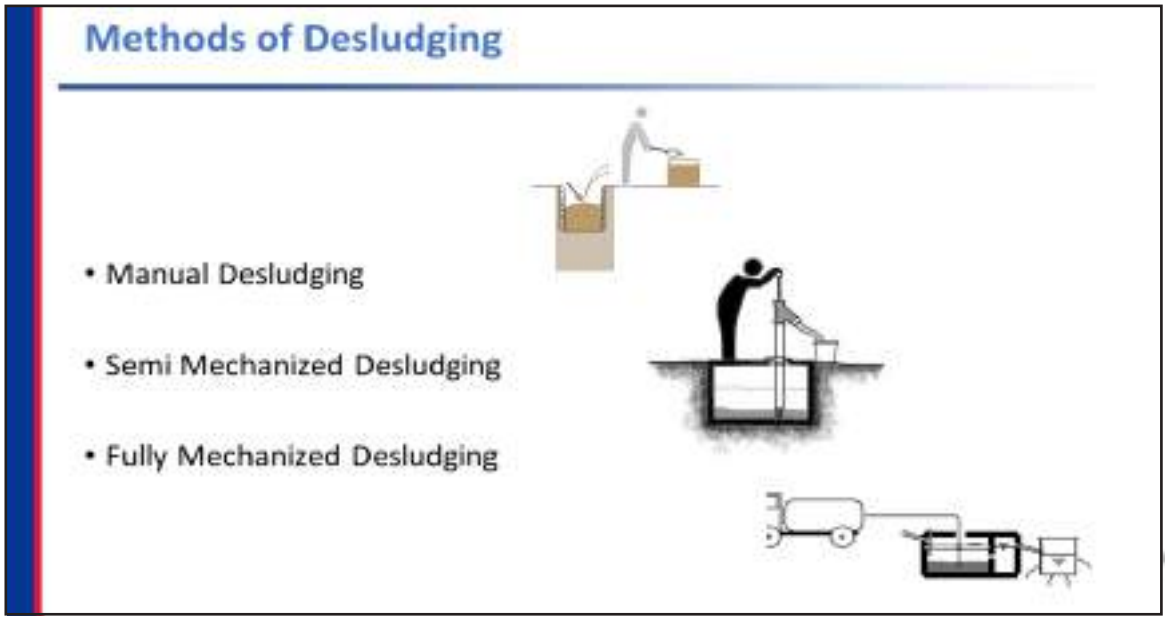
- Treat wastewater
- Provision of outlet connected to Soak pit/sewer
- Requires less desludging
- Double chambered
- Water sealed

Slide 34

Desludging Service

- Desludging : manually, semi mechanical and mechanical
- Transport : Manually, semi manually and vehicle

Slide 35



Slide 36

The first picture is desludging of septic tank or pit whereas the second picture is desludging of containment of a dry ecosan toilet.

Dry ecosan toilet:

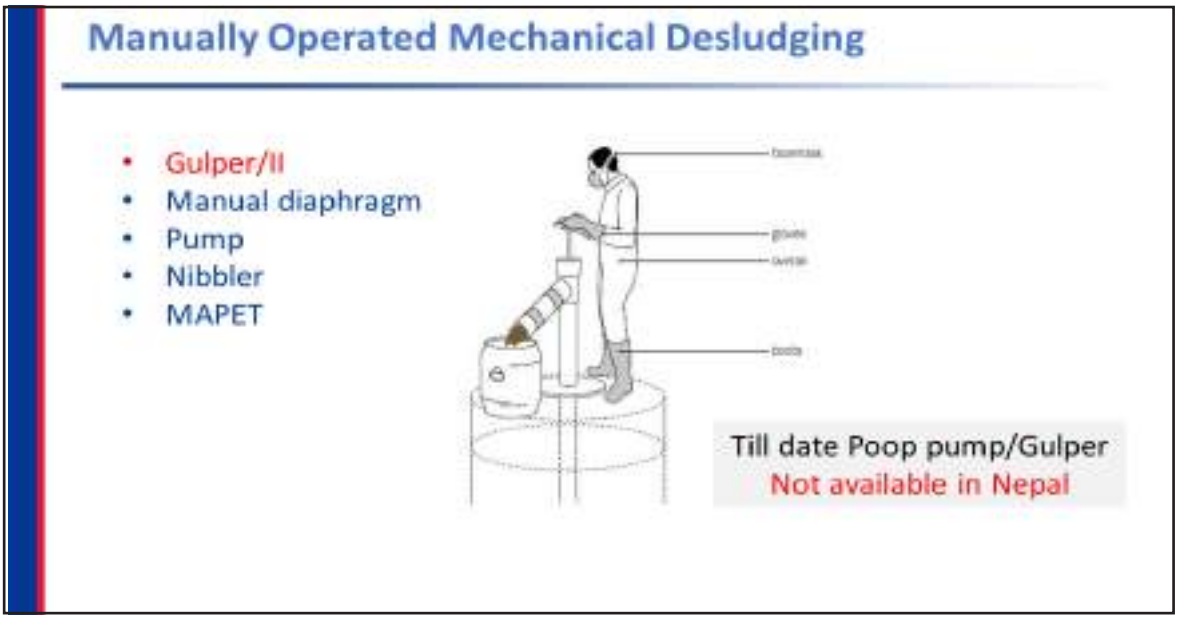
is a urine diverting dry toilet (UDDT) that operates without water. It uses a differently designed pan or comode which separates feces and urine.

Thus, separated feces is composted and used as a soil conditioner andurine is used as liquid fertilizer.

It was introduced in 2002 by ENPHO in Nepal,

Manual desludging, in general is not safe, and is also prohibited by the government. However manual desludging of dry ecosan toilet and sulav toilet is safe.

Slide 37



Poop pump/Gulper is a manual operated pump which is used to pump out sludge from containment. This is basically useful and financially viable both for an entrepreneur and house owner to empty small sized containment. This equipment is not available in Nepal till date.

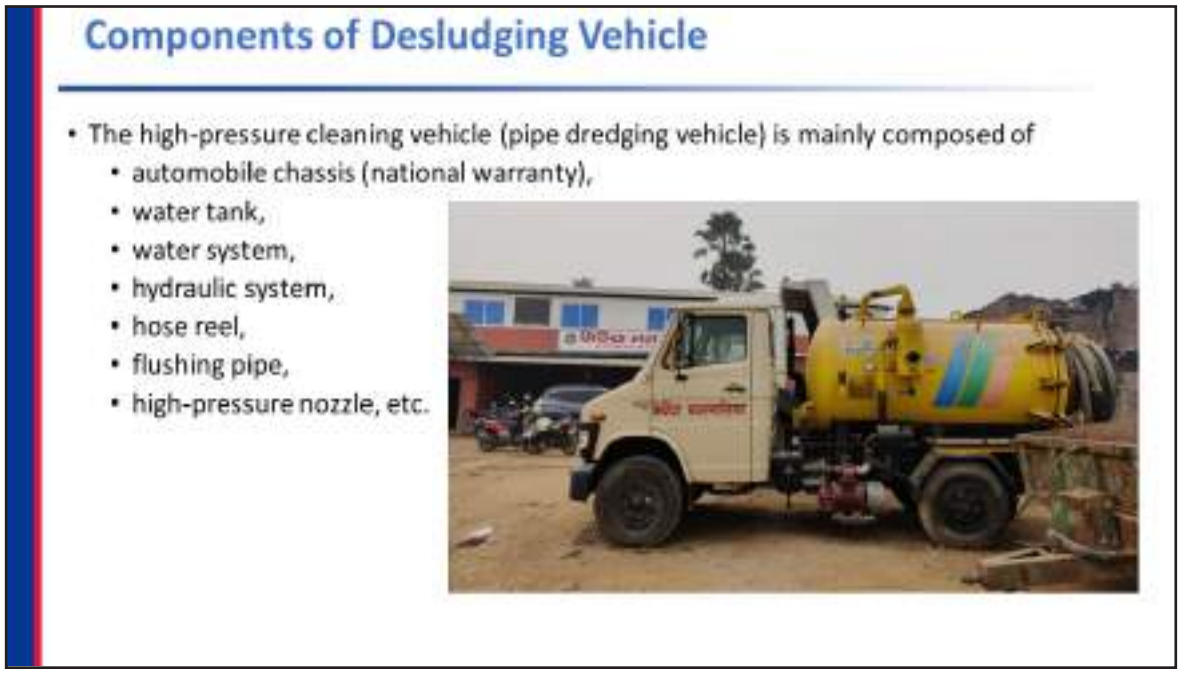
Slide 38

Gulpers are used for collecting sludge in Faridpur Municipality

Slide 39

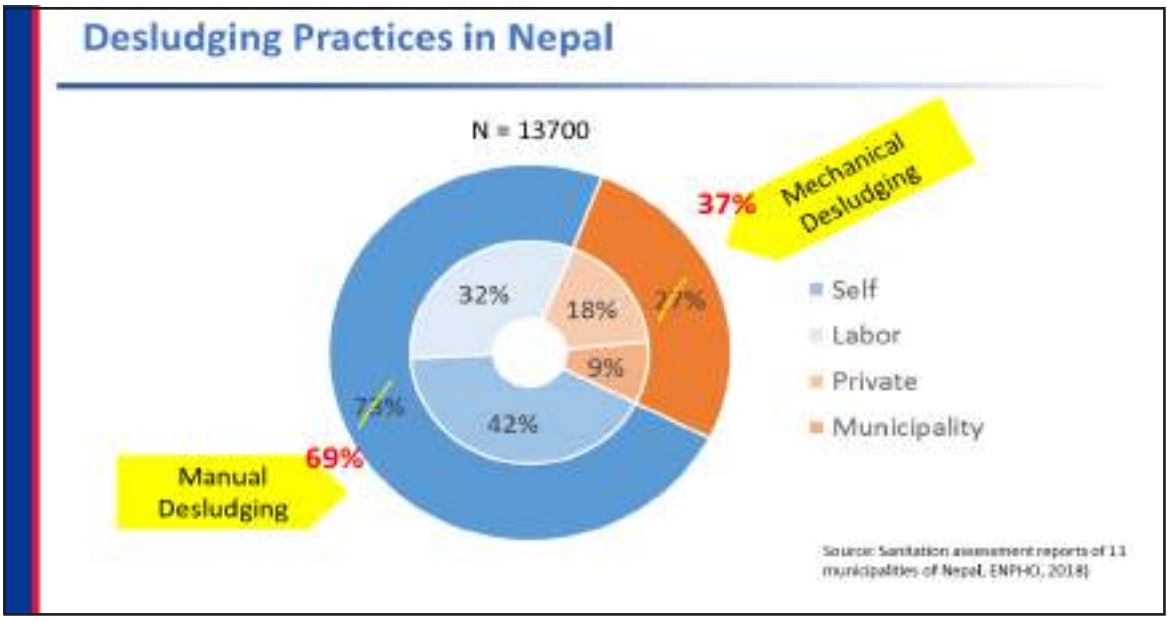
Vacutug mini-tanker manufactured in Bangladesh. Source: EAWAG/SANDEC (2008)
•A small-scaled motorised alternative to trucks.
•Designed for areas where big trucks can not enter.
•0.5 m3 steel vacuum tank, vacuum pump, gasoline engine.
•The vehicle has a speed of 5 km/h (level ground)
•Emptied by gravity or pressure

Slide 40



It is done using a truck is fitted with a pump which is connected to a hose that is lowered down into a tank (ex. septic tank) or a pit and the sludge is pumped up into the holding tank on the vehicle

Slide 41



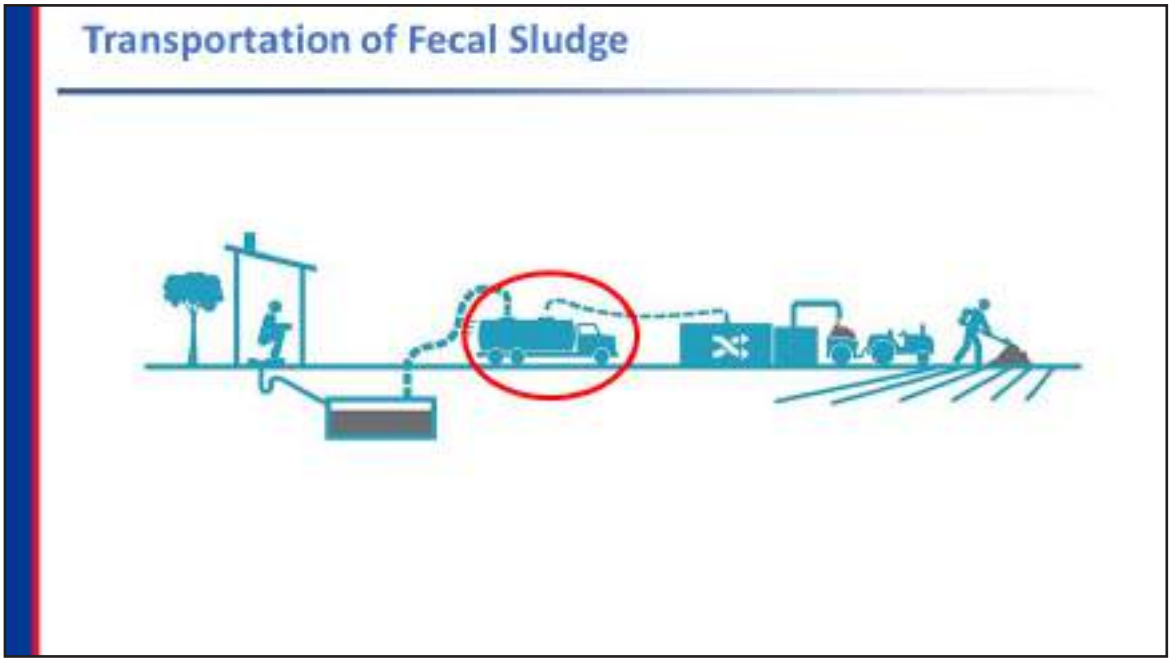
Study conducted by ENPHO (2018) reveals that approximately 31% of households with pits or septic tank has been emptied at least once. Among which 73% of people do desludging of their containment manually either using labor or by house owner themselves. While, mechanical desludging practice covers 27% of the population due to various reasons. Some of the major reasons are

-affordability,

-accessibility and

-availability of desludging services.

Slide 42



Slide 43

Add an example of tuk tuke

Slide 44

Slide 45

Desludging service is growing in the city. There are several companies who provide desludging service in the cities.

Interesting fact is, sewer line is laid down to collect fecal matter but discharging of fecal sludge into the drain is illegal. Since there is not sufficient treatment facilities in the cities, these companies discharge sludge into river via sewer, or open land. Some of the private companies dispose FS openly into their own land.

Most of the companies discharge it in a designated place with small intervention making discharge station and it goes into sewer network whereas few companies/service providers are dumping it into their private land away from the city area.
Average cost for desludging is 3-5 thousand, depending up on cities, haulage distance and containment volume

Slide 46

Technical Challenges

Location of containment
Access to containment
Accessibility to containment
No regular desludging practice
Old equipment and vehicles – low efficiency
Lack of proper disposal site

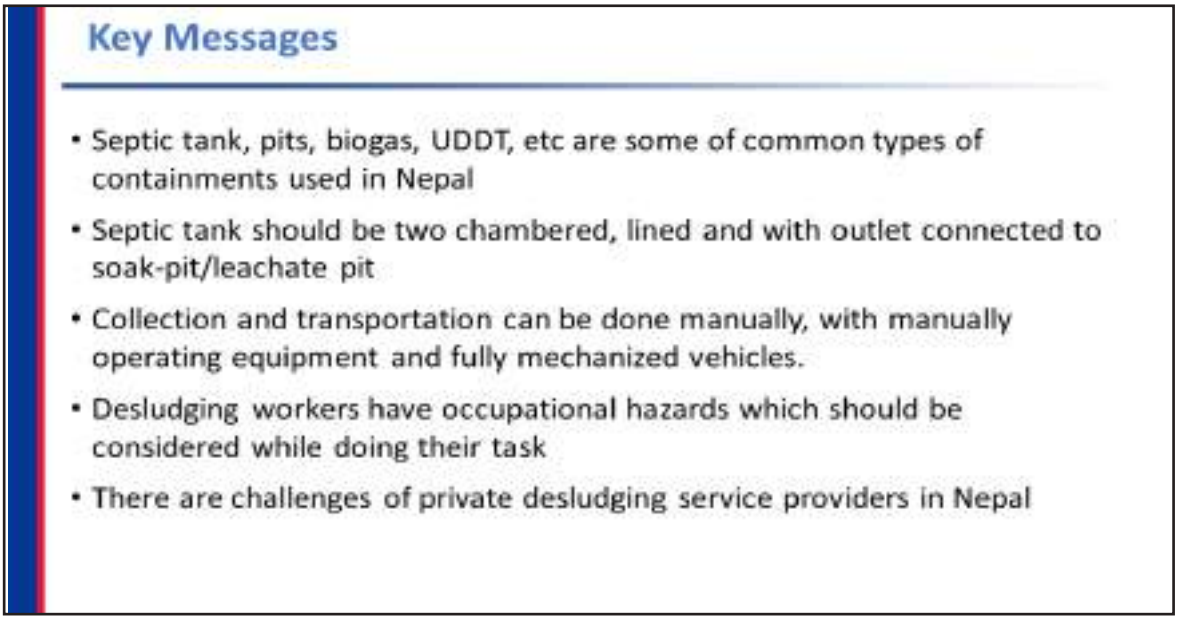
Behavioral Issues

Flushing solid waste into containment
Desludging only after overflow
Health and personal hygiene of the operators
Social stigma

Rules and Regulations

Licensing system
Lack of rules and regulations

Slide 47



UDDT- Urine Diverting Dry Toilet

Slide 48

Slide 49

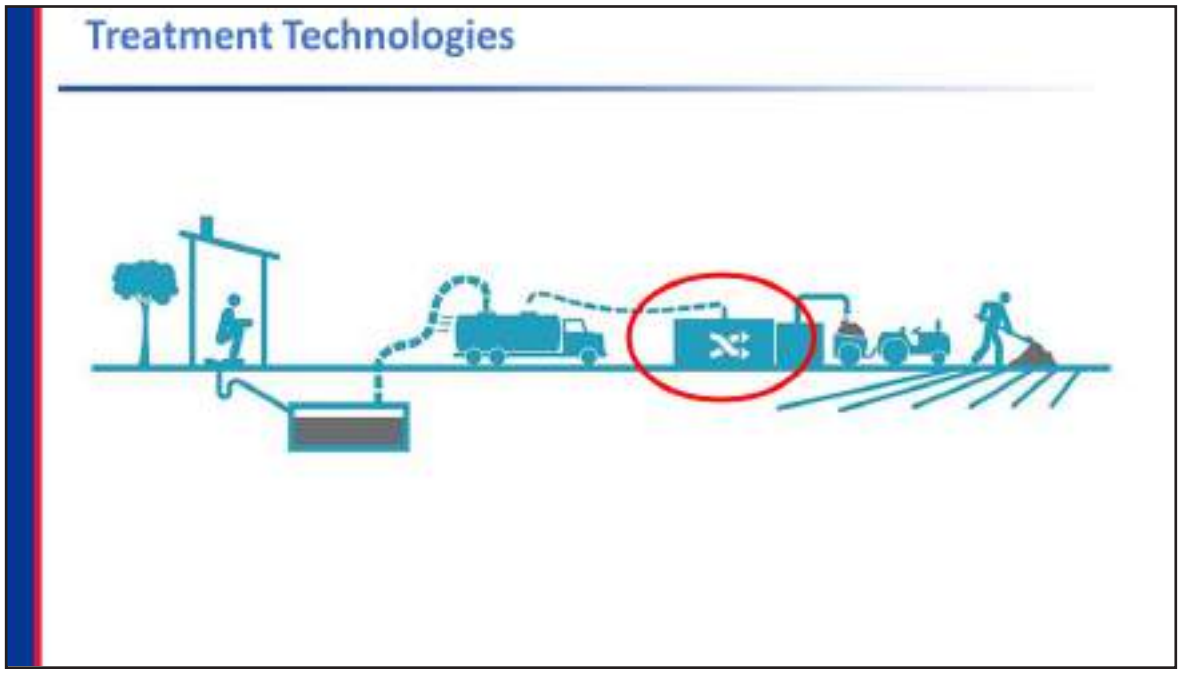
Thank you!
धन्यवाद !
Ministry of Water Supply
Department of Water Supply and Sewerage Management
Technical Support

SESSION 14.2

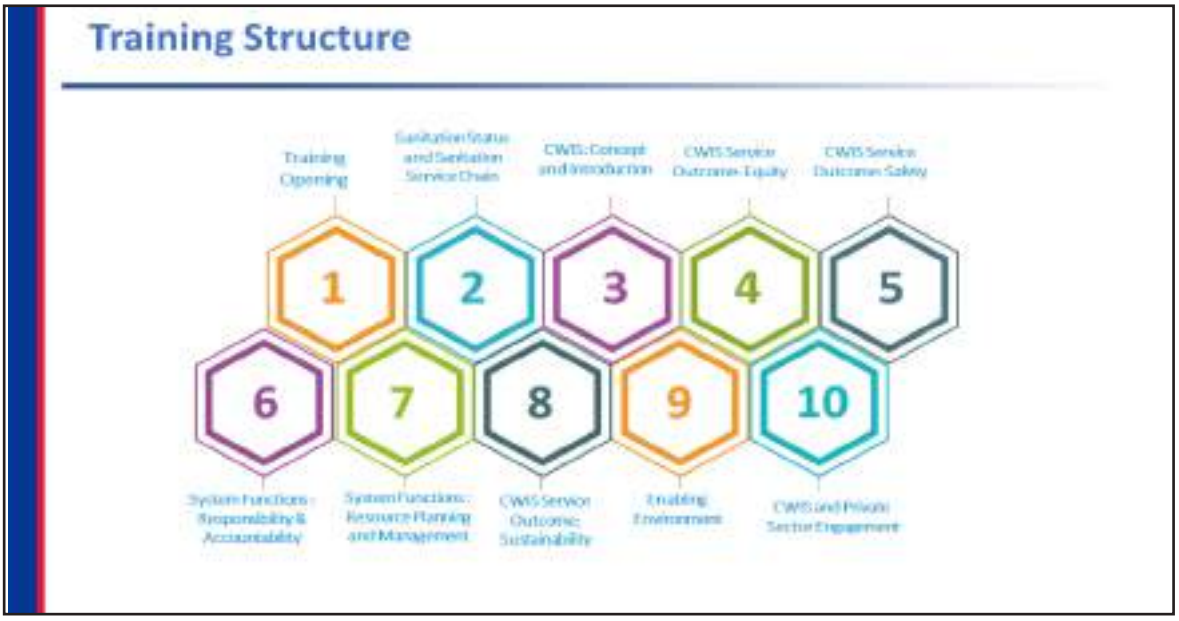
Technological Awareness 2

Slide 1

Slide 2

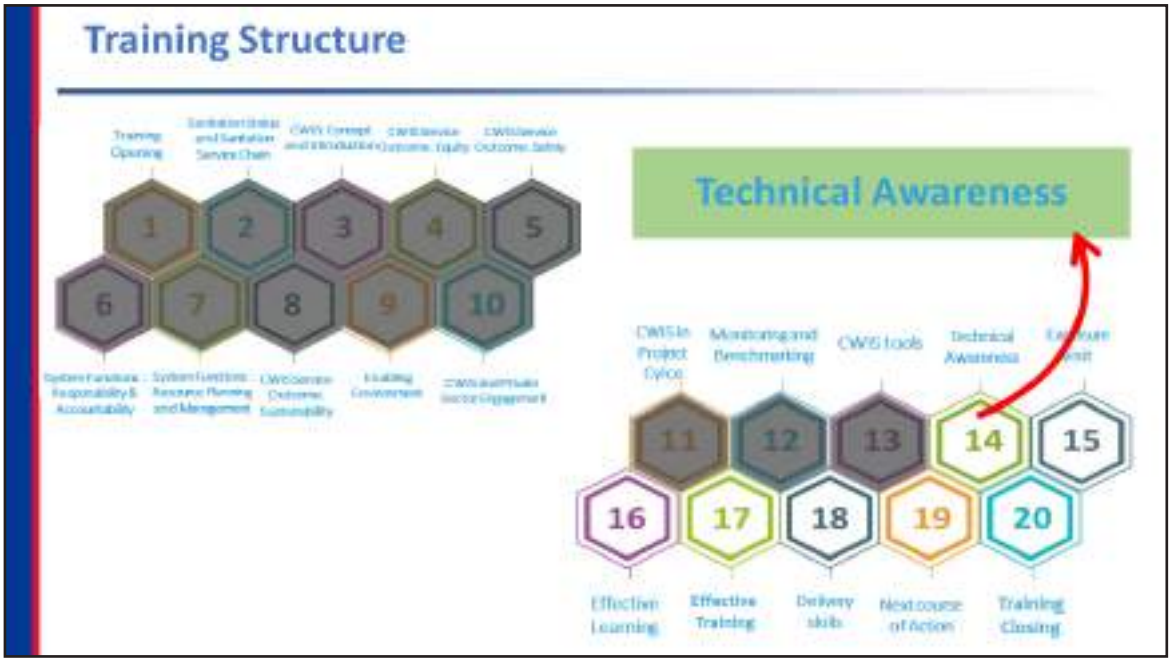


Slide 3



This training includes 20 main technical sessions, and are currently on session 14.2, Technical Awareness 2

Slide 4



This training includes 20 main technical sessions, and are currently on session 14.2, Technical Awareness 2

Slide 5

Learning Outcomes

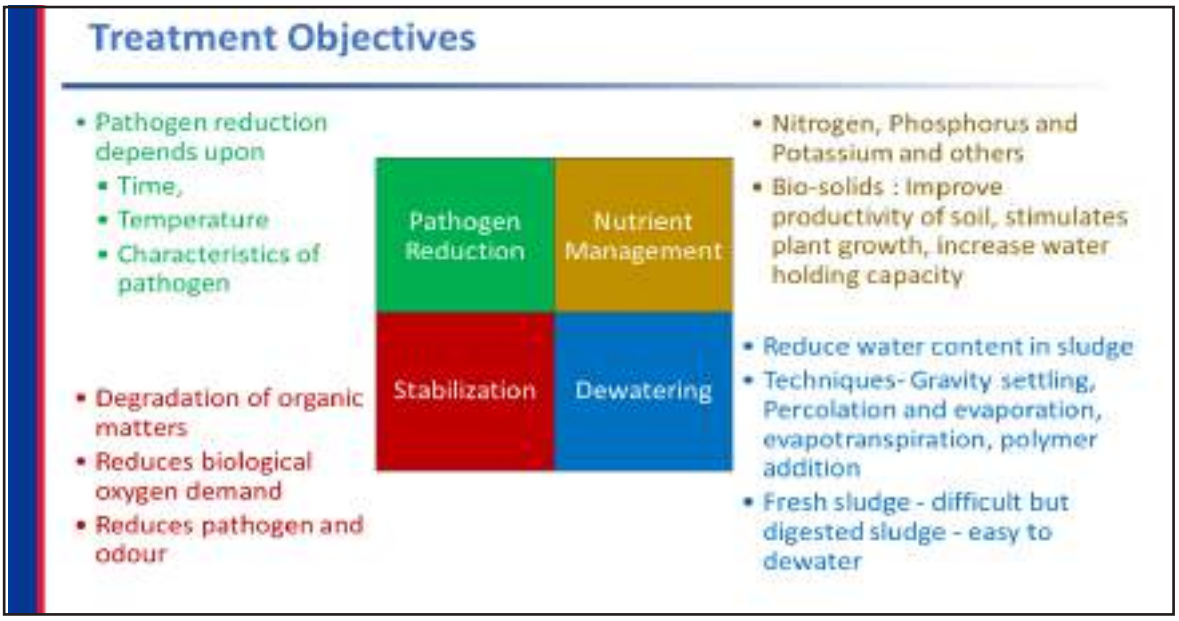
- Explain objectives of Faecal Sludge Treatment Technologies
- Identify FS treatment technologies
- Discuss on the treatment technologies used in Nepal

Slide 6

Presentation Outline

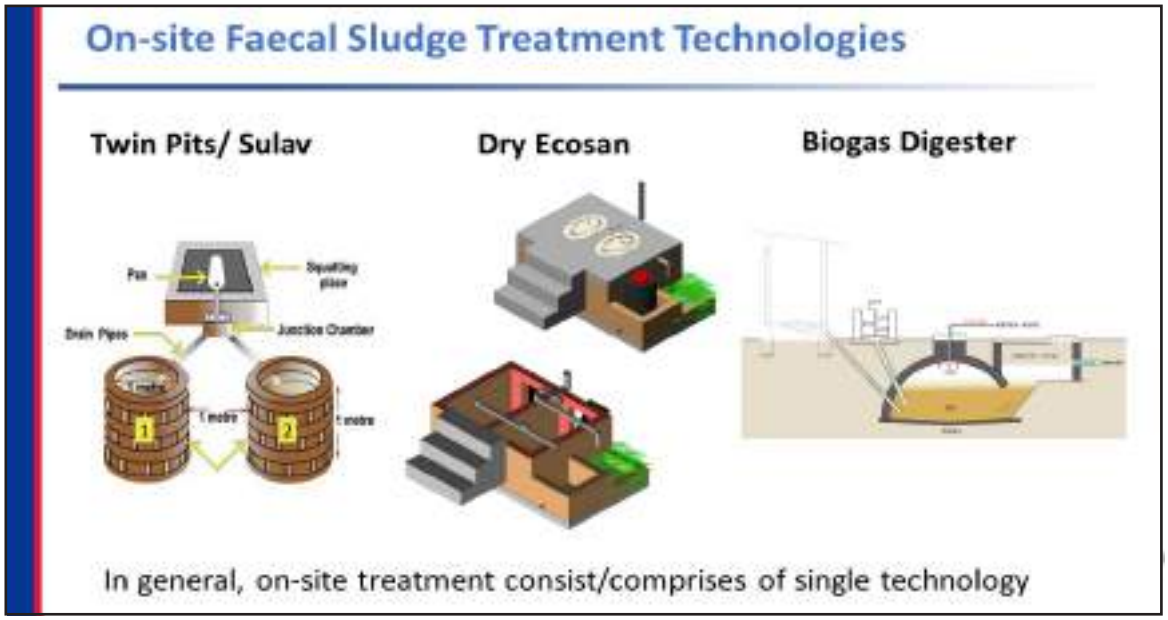
- Treatment Objectives and Process
- Types of treatment systems
- Reuse/safe Disposal

Slide 7



Slide 8

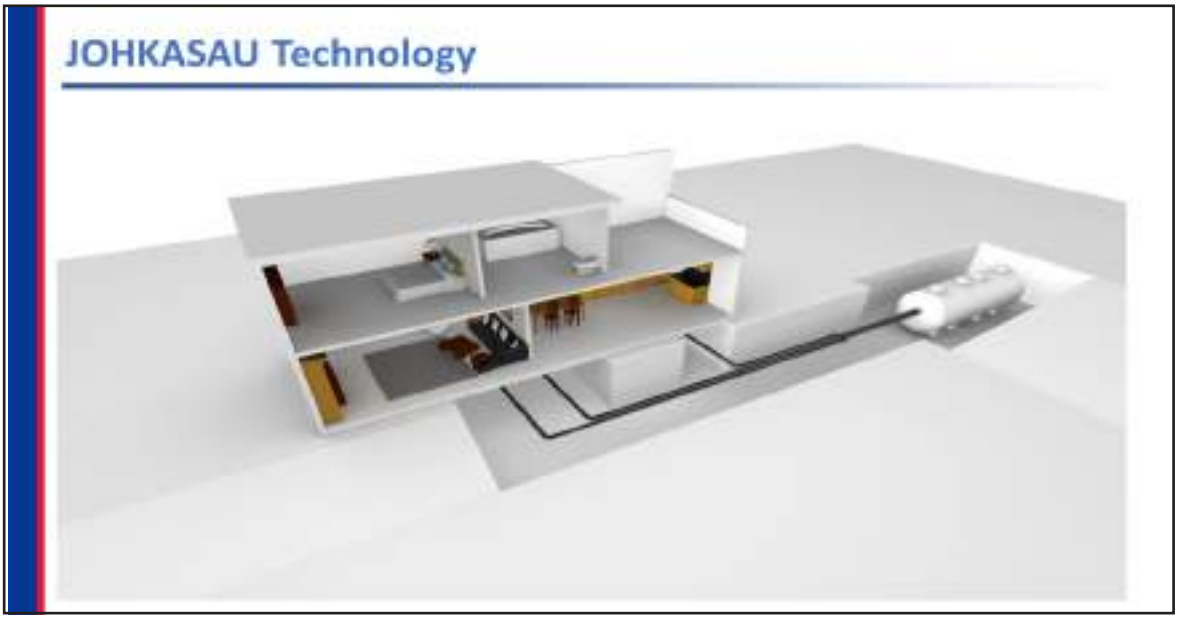
Slide 9



Twin-pit for pour-flush toilets are improved pit latrines, which allow on-site treatment and transformation of fecal sludge into a hygienized soil amendment.
This technology consists of two alternating pits connected to a pour flush toilet. Fecal sludge is collected in the pits and allowed to slowly infiltrate into the surrounding soil. Over time, the solids are sufficiently dewatered and can be manually removed with a shovel and reused on-site, much like compost, to improve soil fertility and fertilize crops

Slide 10

Slide 11



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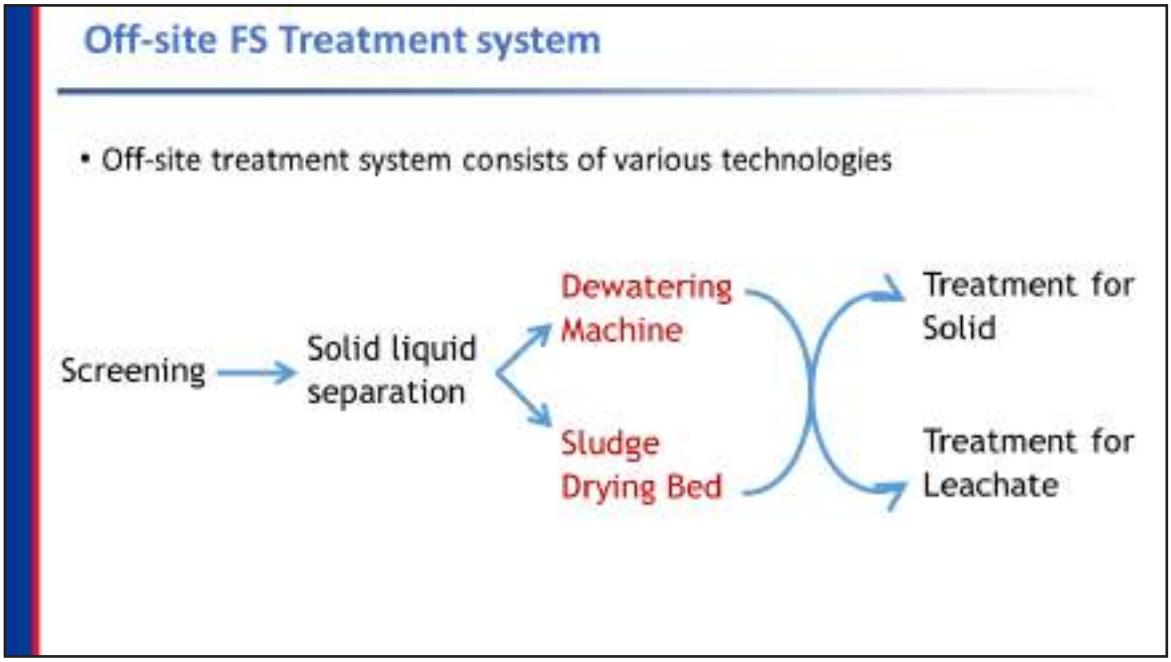
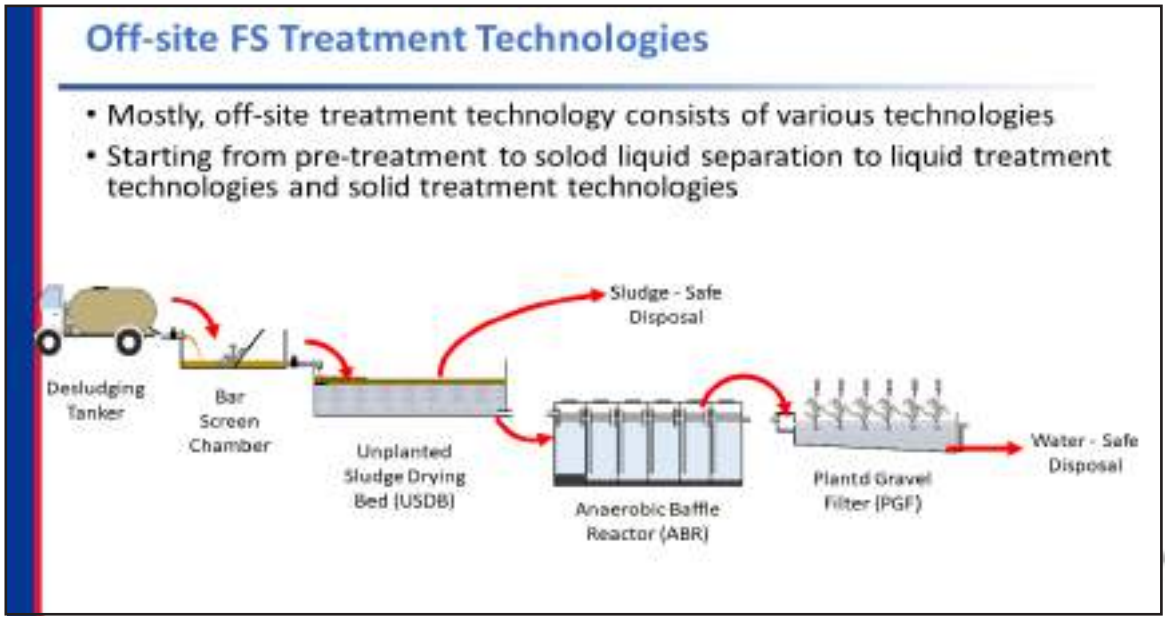
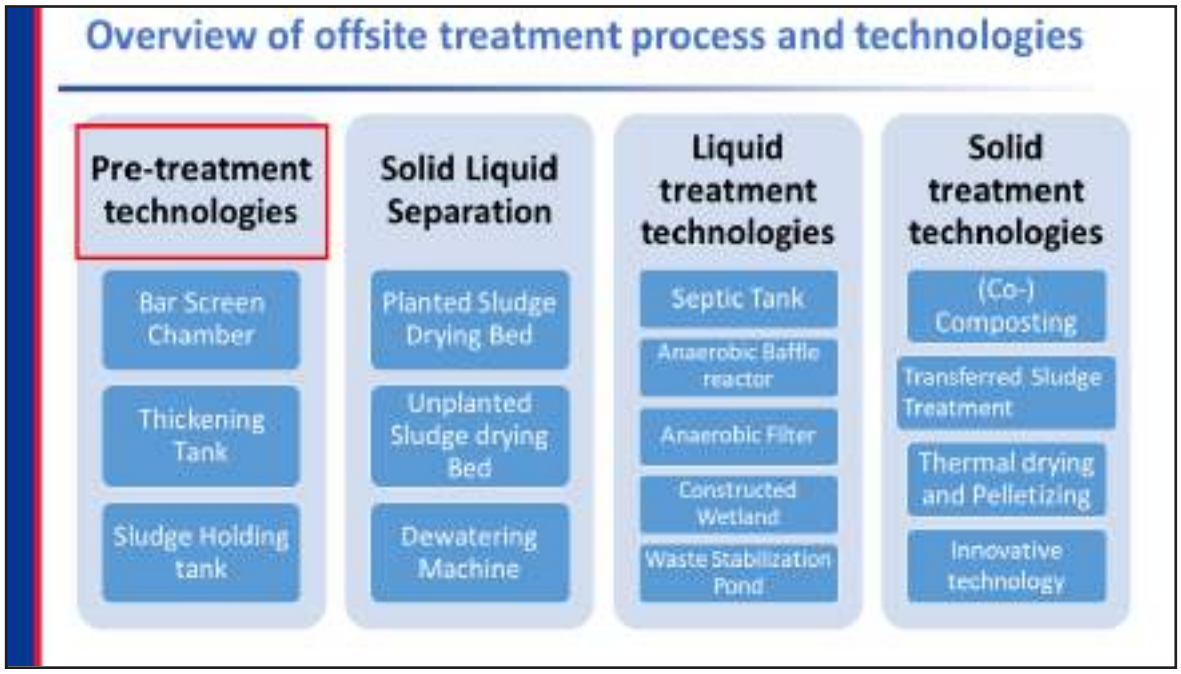


Slide 13



Slide 14

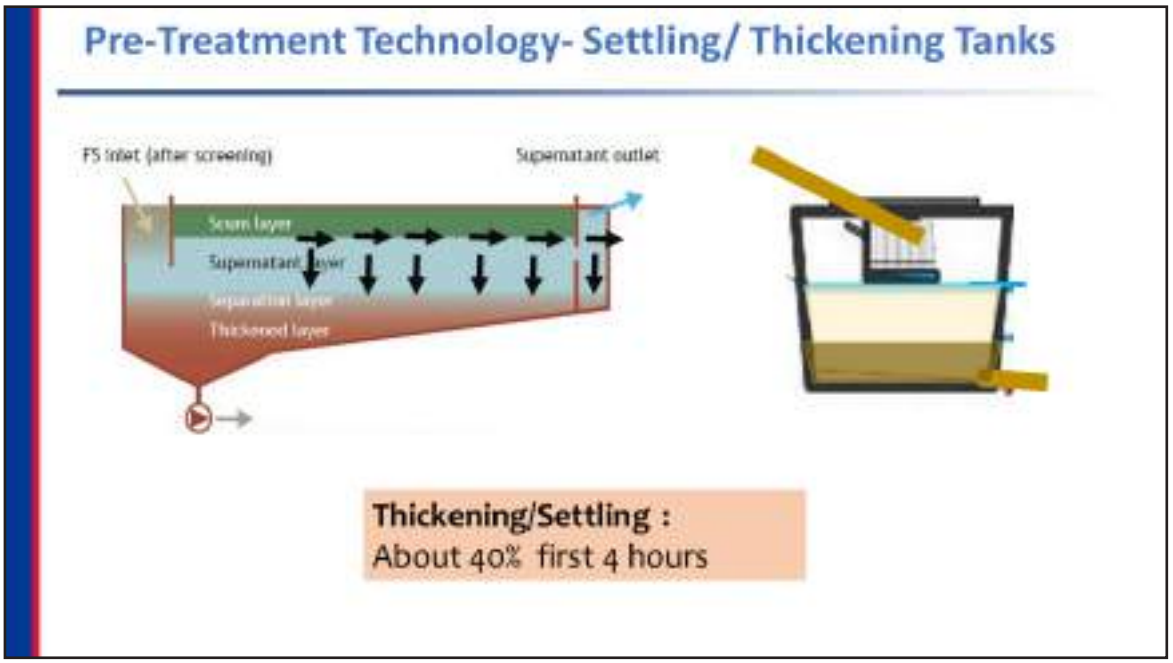


These are some of the example of treaetment technologies under various stages of treatment process. There could be more to this example.

Slide 15

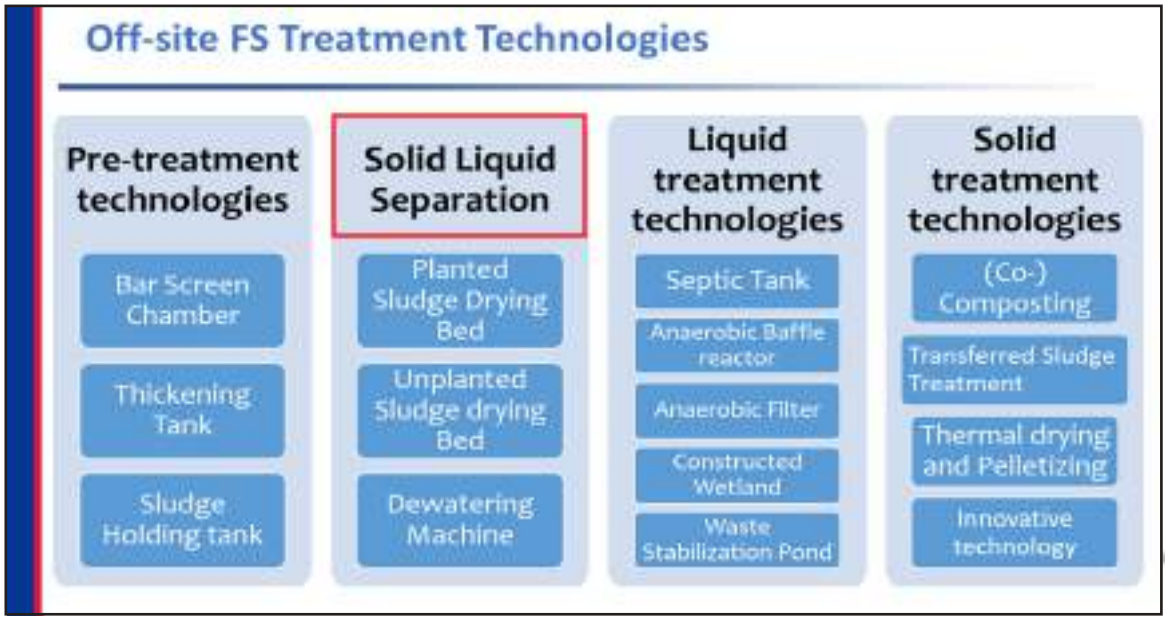
Passing through a barrier, Screening - solids are screened by various barriers depending on the size of the solids.
Coarse material, such as rocks, sticks, leaves, plastics and other debris, should be removed because they could damage pumps or settlers. Screening devices such as bar racks and screens are recommended for this kind of pre-treatment.

Slide 16

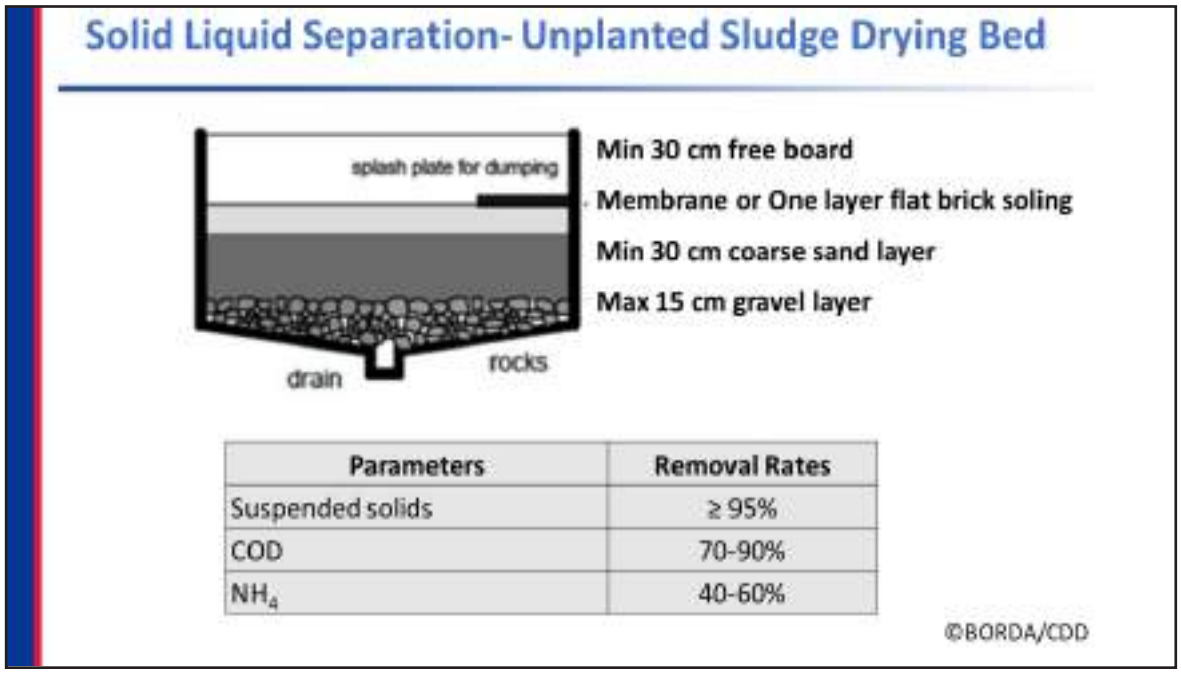


Settling thickening tank : for solid and liquid separation
Primarily used also in wastewater treatment plant
It is designed with settling velocity more than the flow velocity due to which the solid particle retains below and only supernatant passes out outlet.
The FS should undergo screening before input to settling tank to avoid the solidwaste in the tank.
There are mainly 3 layers in the tank: scum layer, supernatant layer and thickened sludge layer
scum layer: oil and grease that floats in liquid
supernatant layer: layer with liquid portion
thickened sludge layer: layer of sludge at bottom which has thickened over time due to addition of sludge on top of eachother
The mean settling efficiency of operating tanks and ponds is about 50-60% of SS in the
settled volume. This efficiency can reach up to 80% where the tanks have been adequately designed and operated (Heinss et al., 1999).

Slide 17

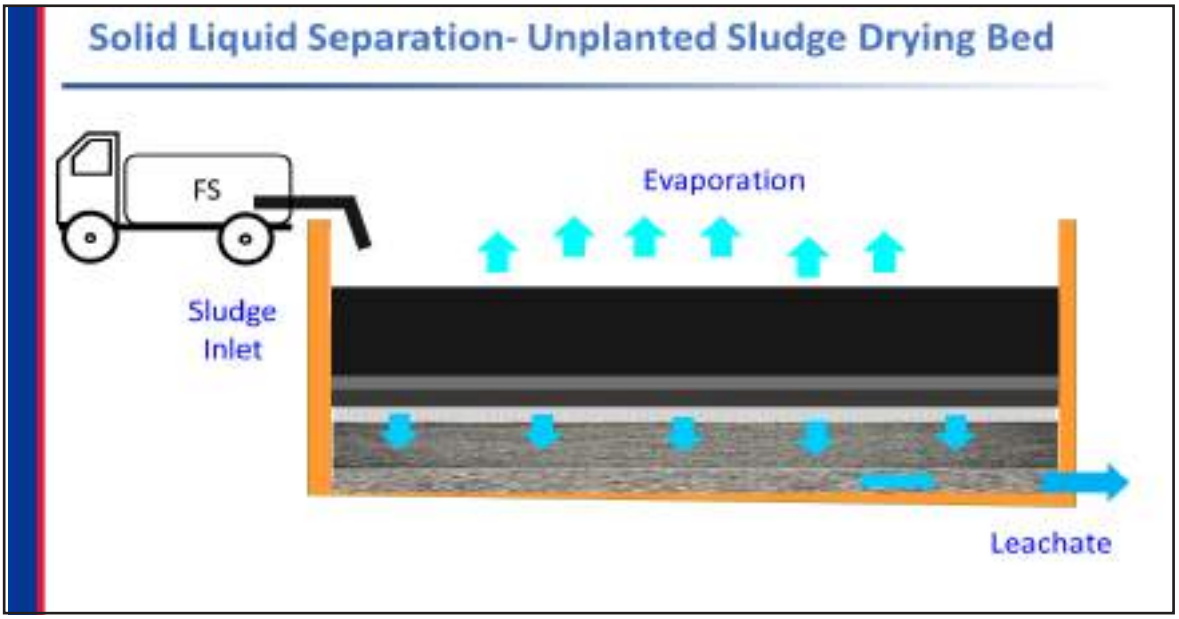


Slide 18



Unplanted drying bed is one of the established technology for sludge dewatering. The bed consists of filter media of 40 cm depth with 20 cm depth of 15-30 mm size gravel layer at bottom, 10 cm depth of 7-15mm size gravel at middle and 10cm of 0.2-0.6mm size sand layer at top. Generally the it is designed for sludge layer of 30cm.

Slide 19



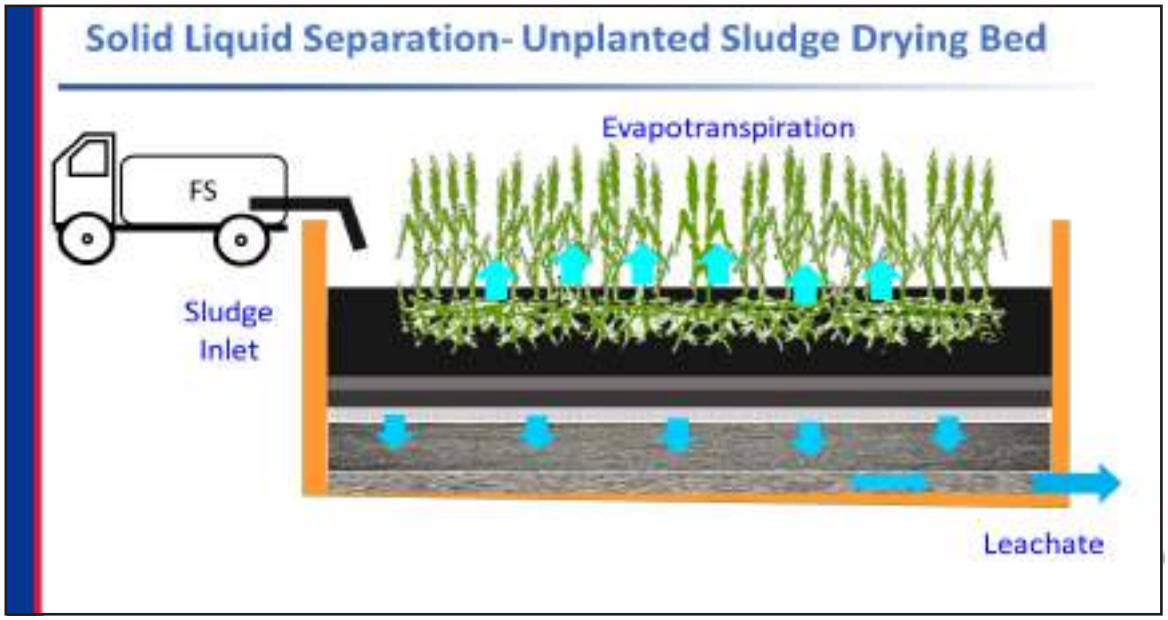
When the sludge is applied at the top, the dewatering process occurs by filtration from filter bed where solid retains and leachate is drain out from drainage pipe at the bottom. Besides filtration, evaporation also plays important role in dewatering

Dried sludge is obtained from this treatment technology

Slide 20

Example of the unplanted sludge drying bed

Slide 21



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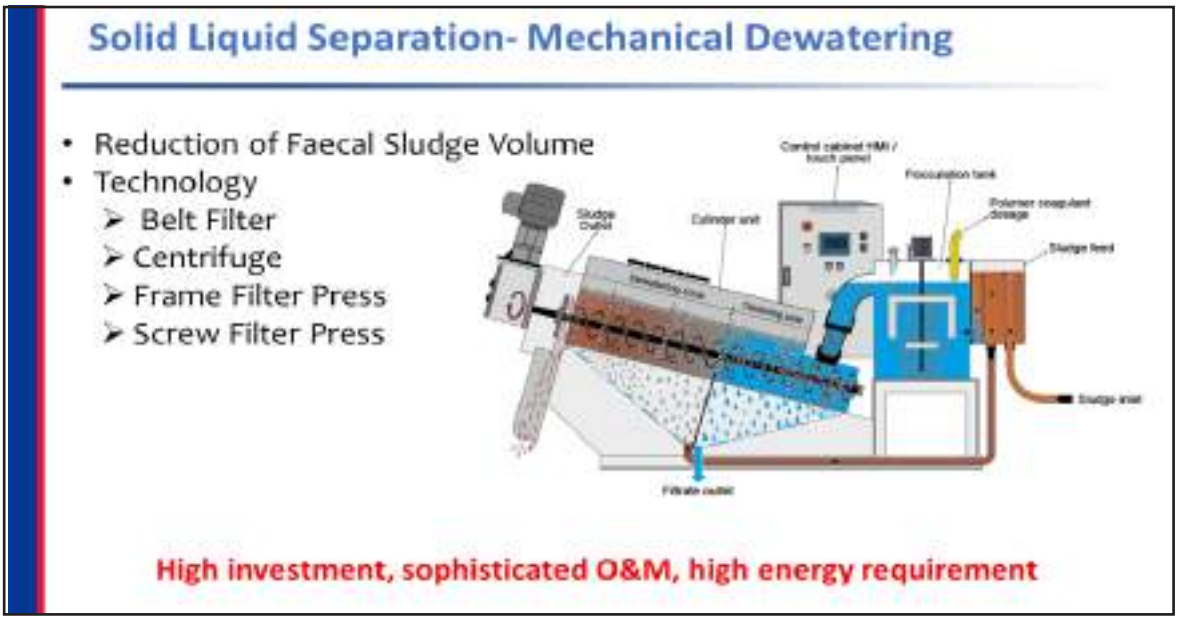
Dried sludge is obtained from this treatment technology

Slide 22

-Depth and characteristics of filter media same as unplanted drying bed
-Plantation of reeds, cana, cattails, bulrushes, etc on filter media
-sludge dewatered by filtration, evaporation and evapo-transpiration
-Liquid fraction flows vertically downwards through media and is collected at bottom and treated separately
-Sludge retention time is 2-3 years depending on sludge loading rate TS

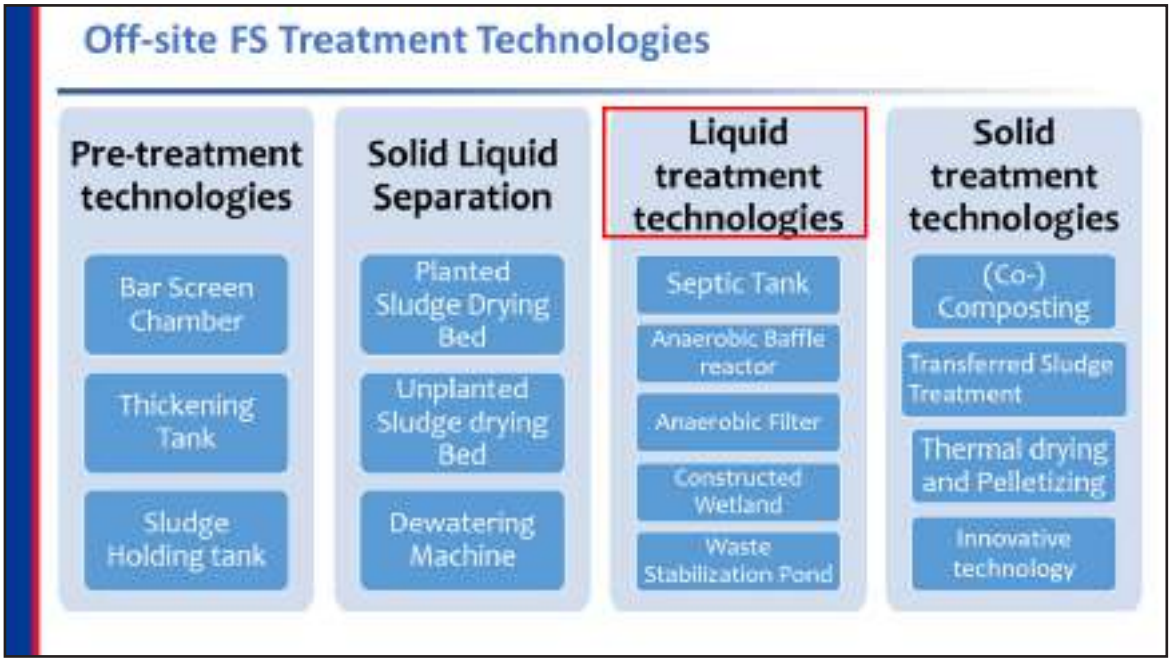
Slide 23



Mechanical dewatering conducted by machine process such as centrifugation or pressing.
belt filter: sludge compressed between two belts.
centrifuge: cylinder rotating around its horizontal axis, due to the centrifugal force
frame filter press: porous vertical frames fixed in two walls that are positioned in front one of the other to create a chamber.
screw press: rotational screw placed in a perforated cylinder

Mobile Dewatering-

Slide 24



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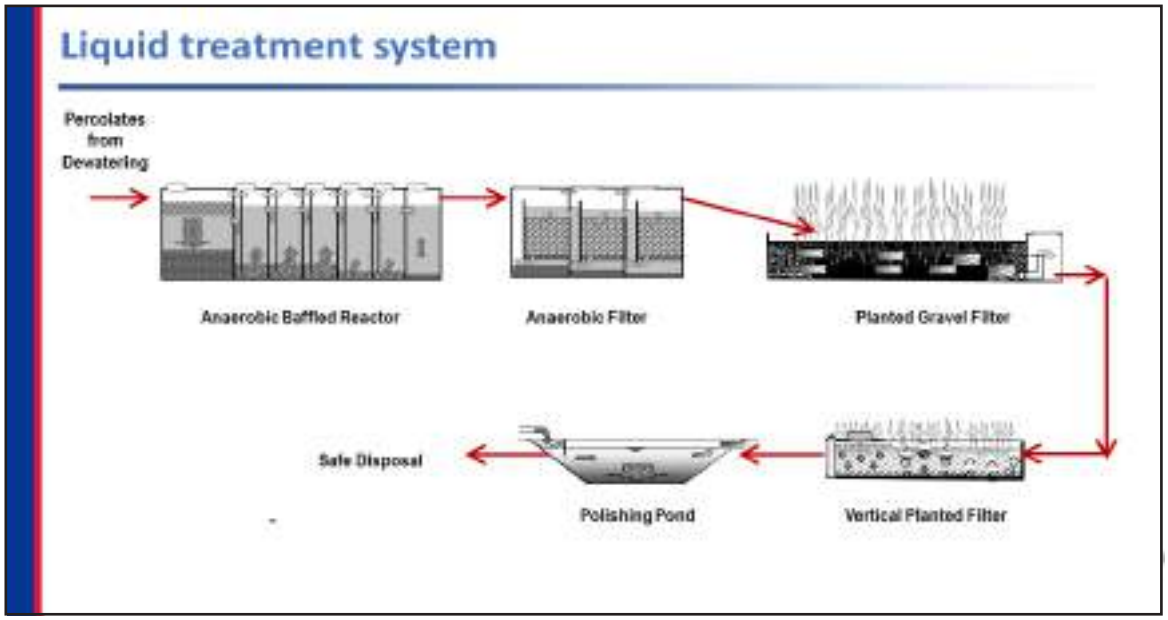
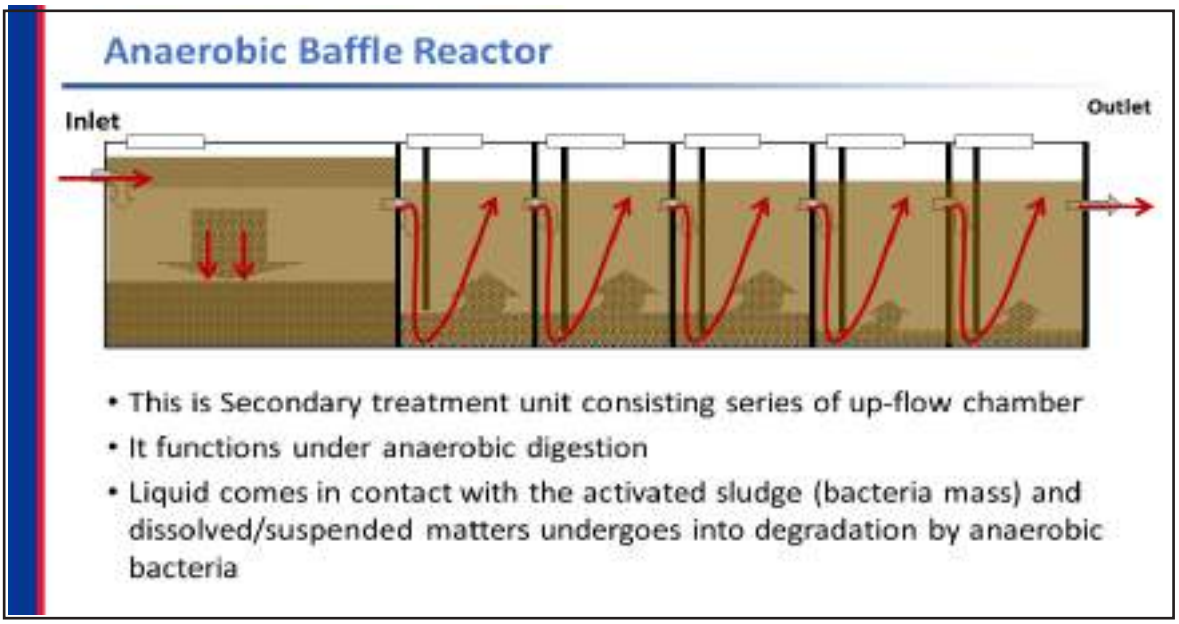


Slide 26

-Anaerobic treatment (in the absence of oxygen)
-Wastewater passes a series of up-flow chambers
-Bacteria mass (activated sludge) at bottom of each chamber
-Further treatment (degradation) of suspended and dissolved solids by anaerobic bacteria
-Efficiency 75% - 85%
-Desludging is needed only if excess sludge is generated

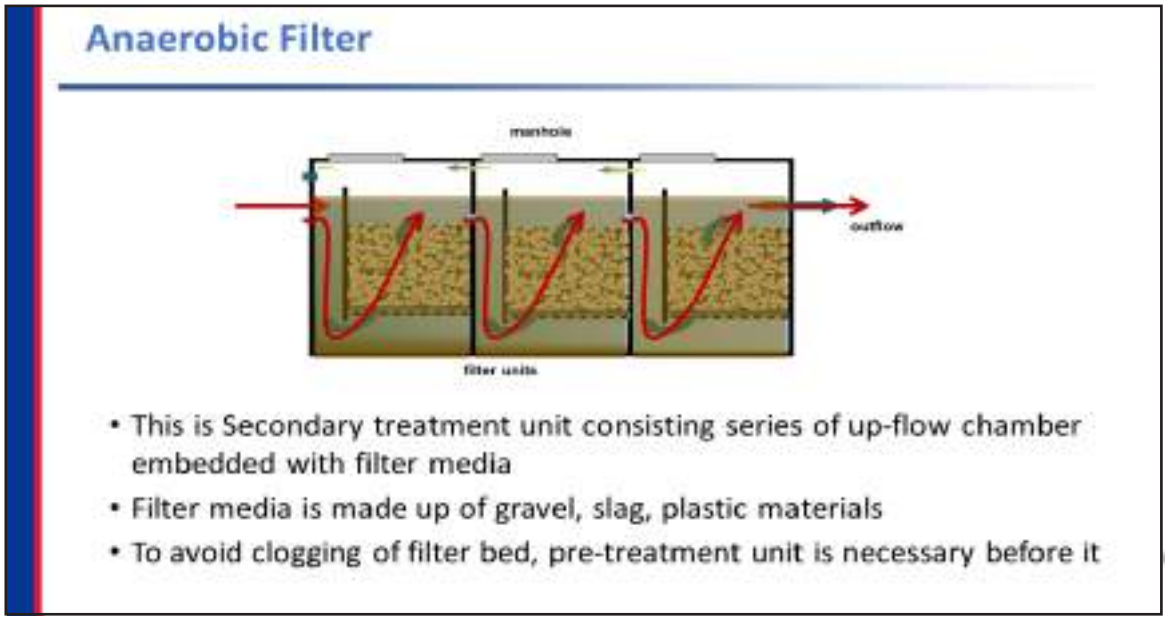
Slide 27



Slide 28

-Anaerobic treatment (in the absence of oxygen)
-Wastewater passes in a series of up-flow chambers with carrier material (filter material)
-The filter is made out of gravel, slag or plastic elements
-To avoid plugging pre-treatment (sedimentation) is necessary.
-Efficiency 75% - 90%
-Desludging is needed only if excess sludge is generated

Slide 29



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-Efficiency 75% - 90%
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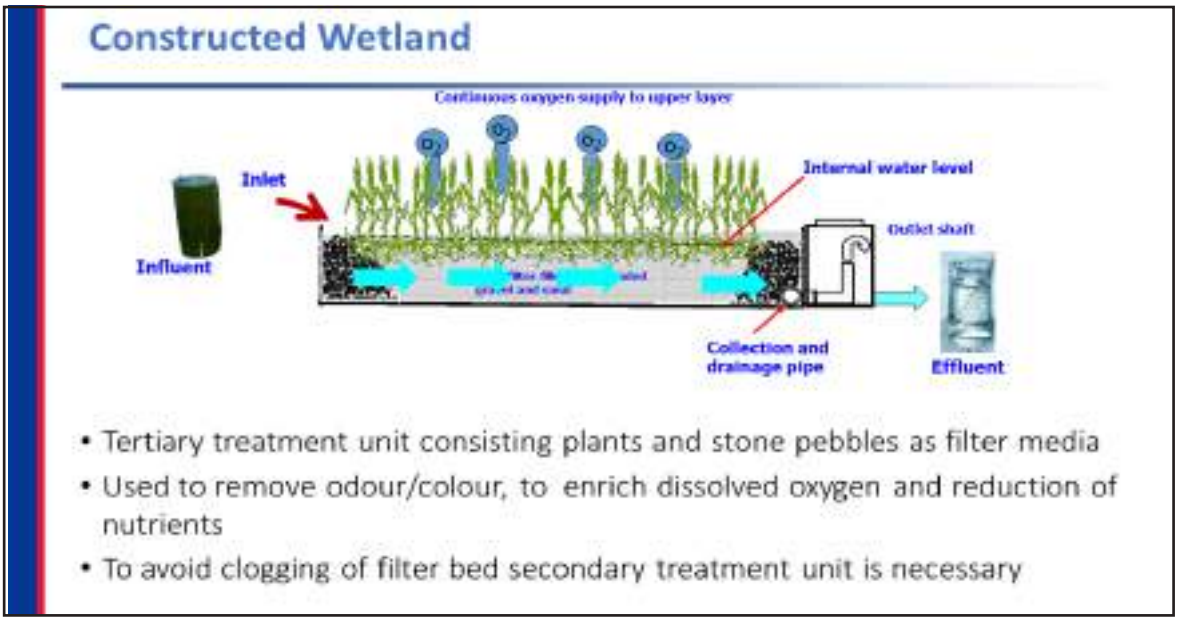
Slide 30

Constructed wetlands are treatment systems that use natural processes involving wetland vegetation, soils, and their associated microbial assemblages to improve water quality.
Wetland plants also foster the necessary conditions for microorganisms to live there. Through a series of complex processes, these microrganisms also transform and remove pollutants from the water. Nutrients, such as nitrogen and phosphorous, are deposited into wetlands from stormwater runoff, from areas where fertilizers or manure have been applied and from leaking septic fields. These excess nutrients are often absorbed by wetland soils and taken up by plants and microorganisms.
Picture source: (Sketch- https://www.frtr.gov/matrix/Constructed-Wetlands/)
https://upload.wikimedia.org/wikipedia/commons/1/1b/S_Koirala_Hospital_Constructed_Wetland_%284975034182%29.jpg

Slide 31



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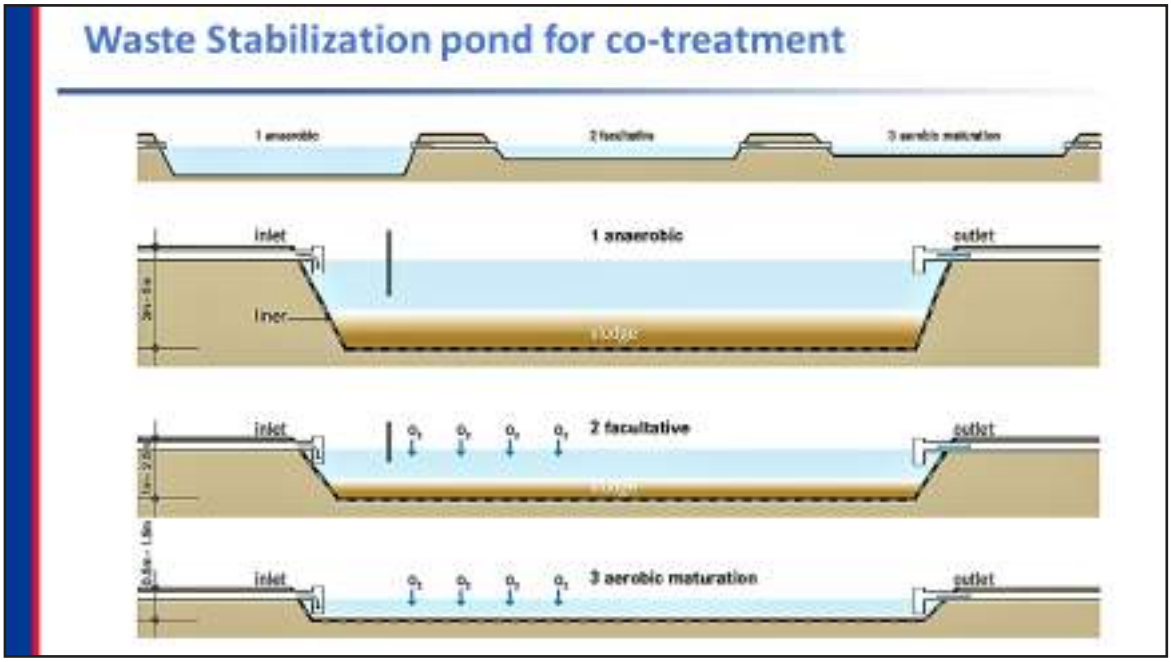
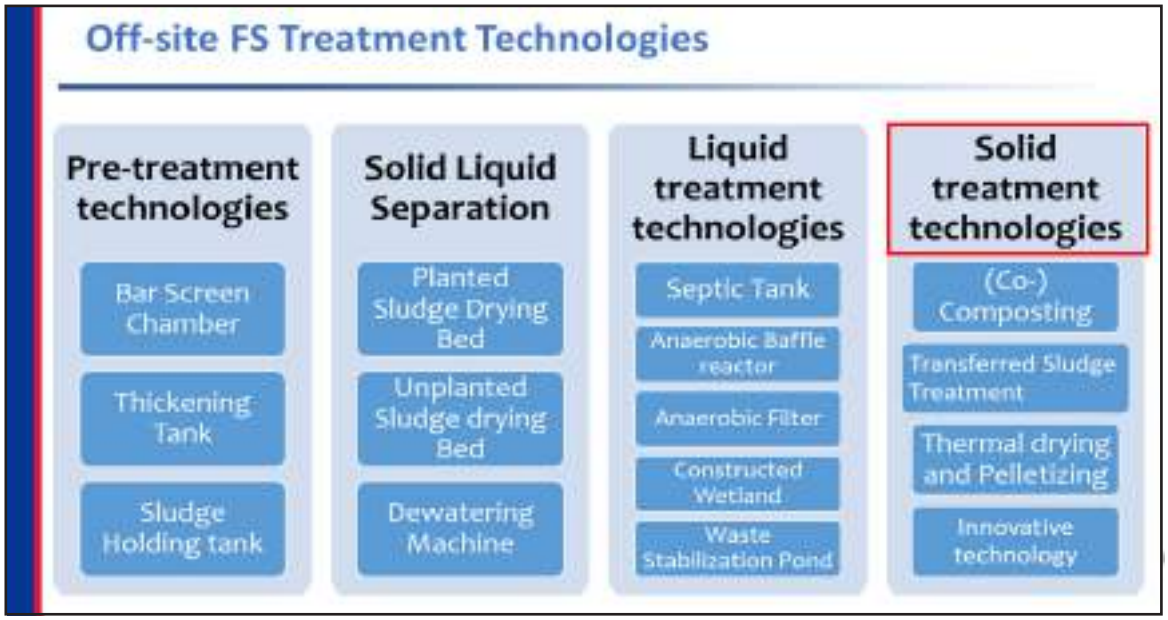
Picture source: (Sketch- https://www.frtr.gov/matrix/Constructed-Wetlands/)
https://upload.wikimedia.org/wikipedia/commons/1/1b/S_Koirala_Hospital_Constructed_Wetland_%284975034182%29.jpg

Slide 32



Waste stabilization ponds (WSPs or stabilization ponds or waste stabilization lagoons) are ponds designed and built for wastewater treatment to reduce the organic content and remove pathogens from wastewater. They are man-made depressions confined by earthen structures. Wastewater or "influent" enters on one side of the waste stabilization pond and exits on the other side as "effluent", after spending several days in the pond, during which treatment processes take place. (Wikipedia)
Waste stabilization ponds consists of 3 types of ponds: anaerobic, facultative and aerobic maturation pond Anaerobic pond is deeper (2-5)m for anaerobic condition to occur at bottom of pond. Facultative ponds are (1-2)m where both anaerobic and aerobic condition occurs. The aerobic pond are shallower (0.5-1)m to allow aerobic condition in pond.
Picture source: https://sswm.info/taxonomy/term/3932/waste-stabilization-ponds-%28wsp%29

Slide 33



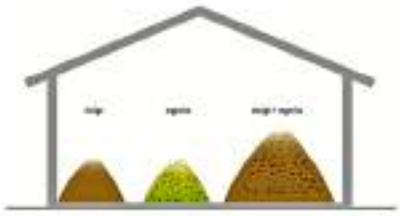
Slide 34

Co-composting is process in which Faecal sludge is composted along with municipal solid waste. We have to know about composting before going to co-composting
Composting: Decomposing of organic matter under controlled predominantly aerobic condition. It is basically of two types: open composting and closed composting. Open composting is cheaper and requires lots of space. Closed composting are windrow method and box composting where the space is minimized

Slide 35

Preconditions for proper co-composting process

- Carbon to nitrogen ratio (C:N): 20-30:1
- Oxygen concentration: 5-10%
- Moisture content: 40-60% by weight
- Particle diameter < 5 cm for static pile
- Composting period: 6-8 weeks
- Peak heap temperature: 60°C - 70°C



Sketch Source: TILLEY et al. (2014)

Slide 36

Types of Composting

Slide 37

Pathogen inactivation in Co-composting

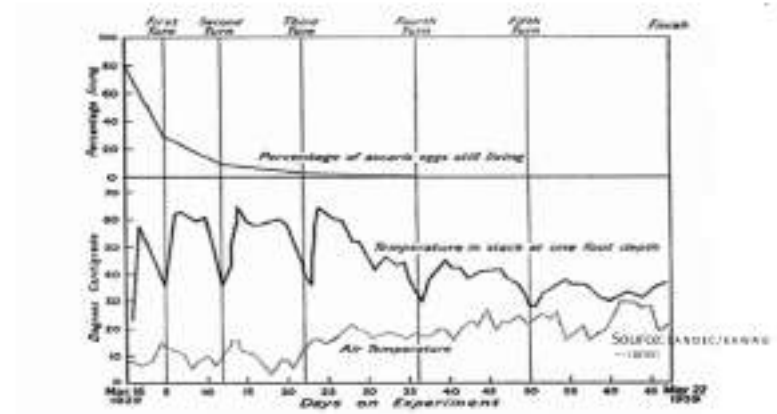


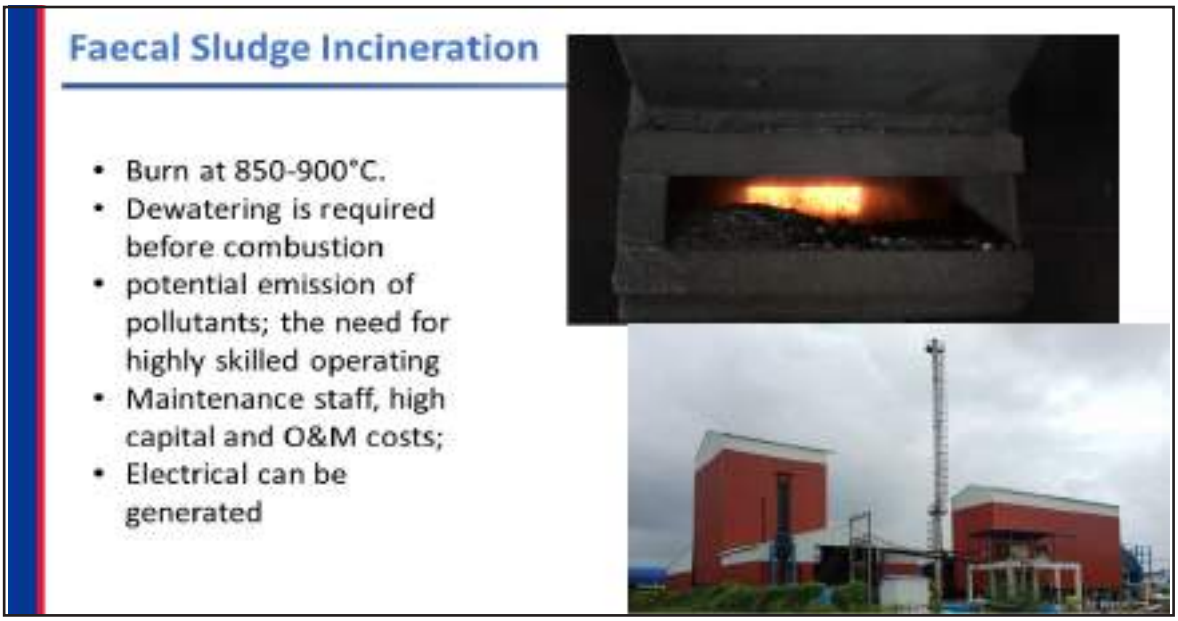
Figure 5 Ascaris egg inactivation in thermophilic stack co-composting of faeces (69 % of raw material), vegetable matter (20 %), soil (10 %), and ash (1 %) (Scott 1952)

Co-composting is process in which Faecal sludge is composted along with municipal solid waste.
We have to know about composting before going to co-composting
Composting: Decomposing of organic matter under controlled predominantly aerobic condition.
It is basically of two types: open composting and closed composting. Open composting is cheaper and requires lots of space. Closed composting are windrow method and box composting where the space is minimized
optimal composting parameters to be controlled
C:N=20-30:1
carbon- source of energy for organisms
nitrogen- source for building cell structure for organisms
Higher C:N ratio- optimal growth of microbial population due to insufficient nitrogen
- degradation process becomes slower
- when the soil with higher C:N ratio is applied in soil, it robs the available nitrogen hindering its availability for plants
Oxygen concentration: 5-10% for aerobic microbiological decomposition and oxidation
Moisture content: 40-60% by weight
Temperature rises upto 60-70% in heap. In the maximum temperature, pathogen die off.

Cocomposting with Municipal solid waste:
organic solid waste of moisture 40-60%
Dewatered sludge with Total solid higher than 20%.
Mix in 3:1 proportion

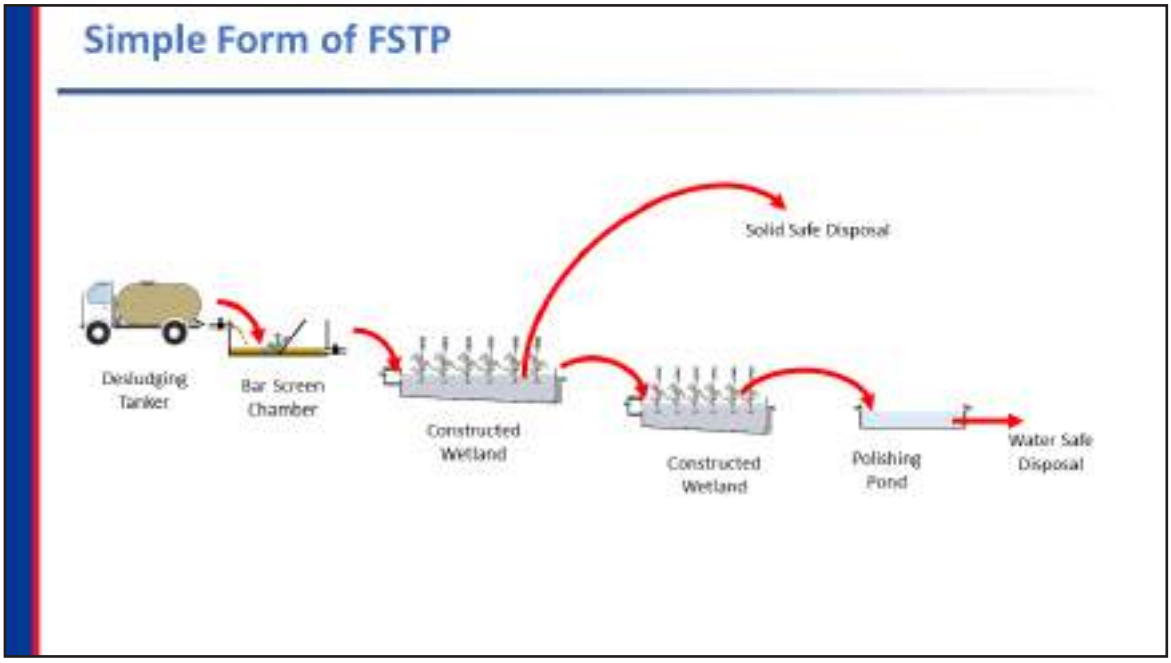
can obtain good compost which can be used for good soil conditions

Slide 38



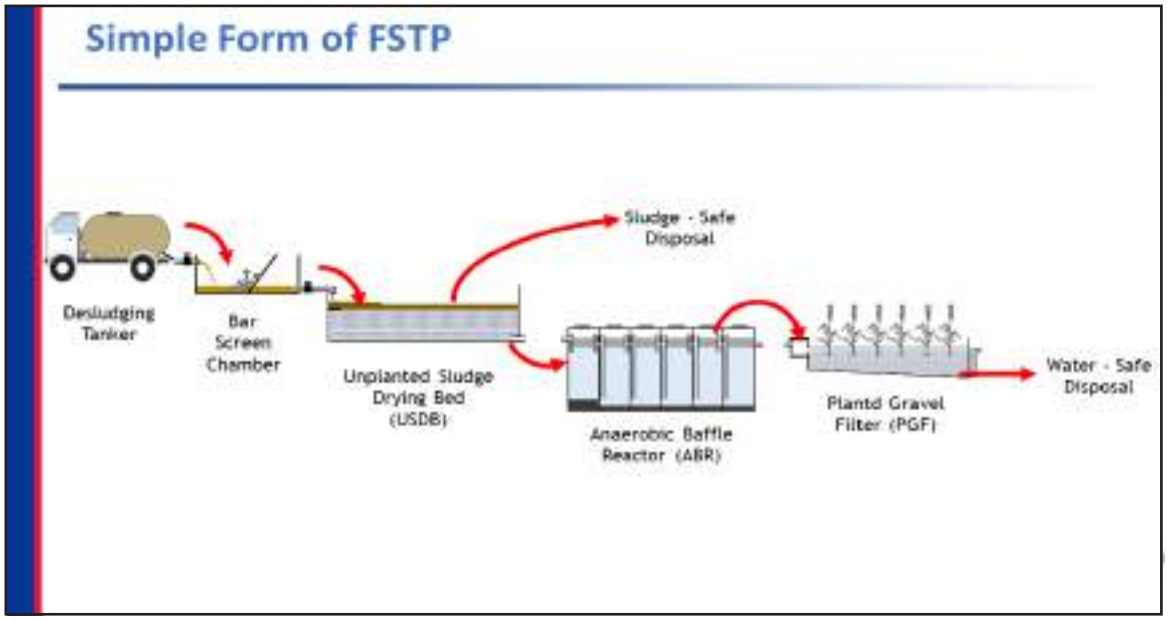
Widely used technologies for Faecal sludge treatment plant
Deep row entrenchment: traditional and simpler technology
Unplanted drying bed: Dewatering of sludge in filter bed
Planted drying bed: Dewatering of sludge in filter bed with the help of plants
Co-composting: mixing of sludge with municipal waste and composting it together
settling thickening tanks: helps in solid liquid separation

Slide 39

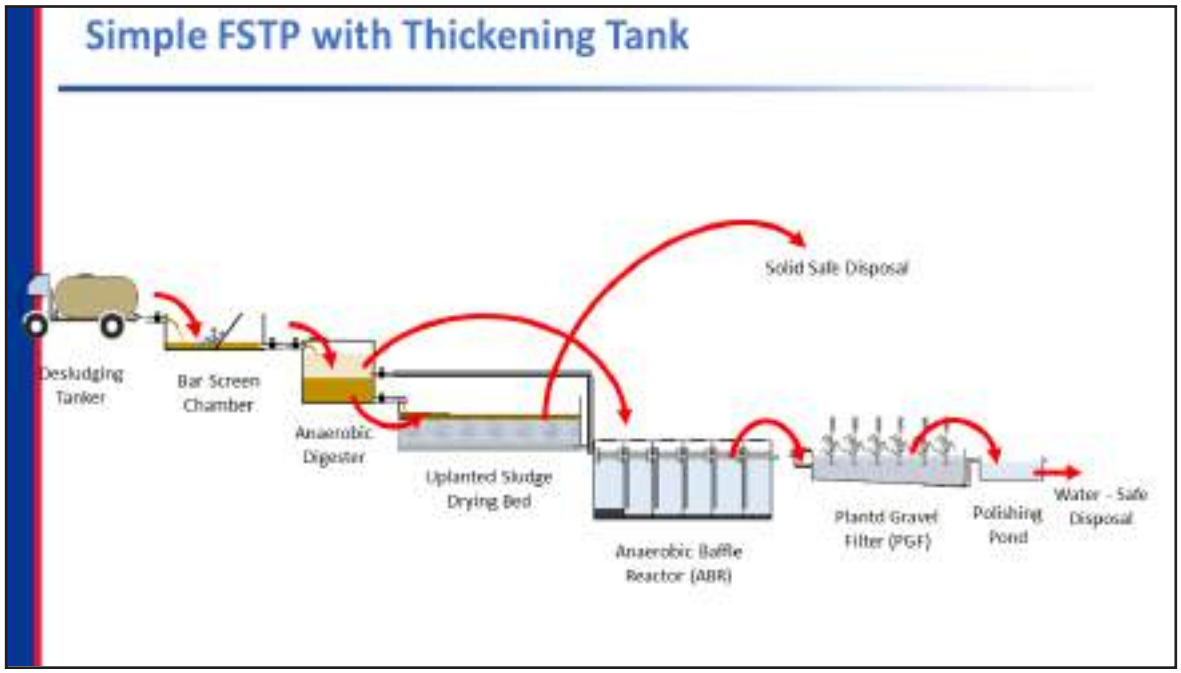


The combination of each of these technologies of the different process of the FS treatment makes a treatment system or treatment plant.
Ex. the above shown example is a very simple form of FSTP.

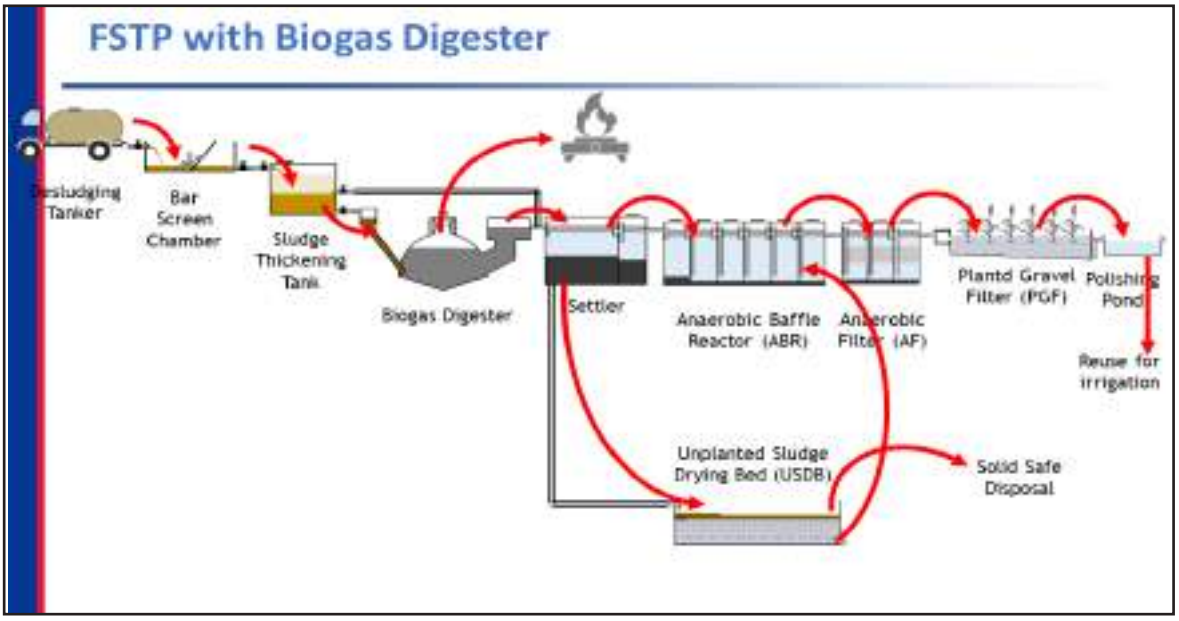
Slide 40



Slide 41



Slide 42



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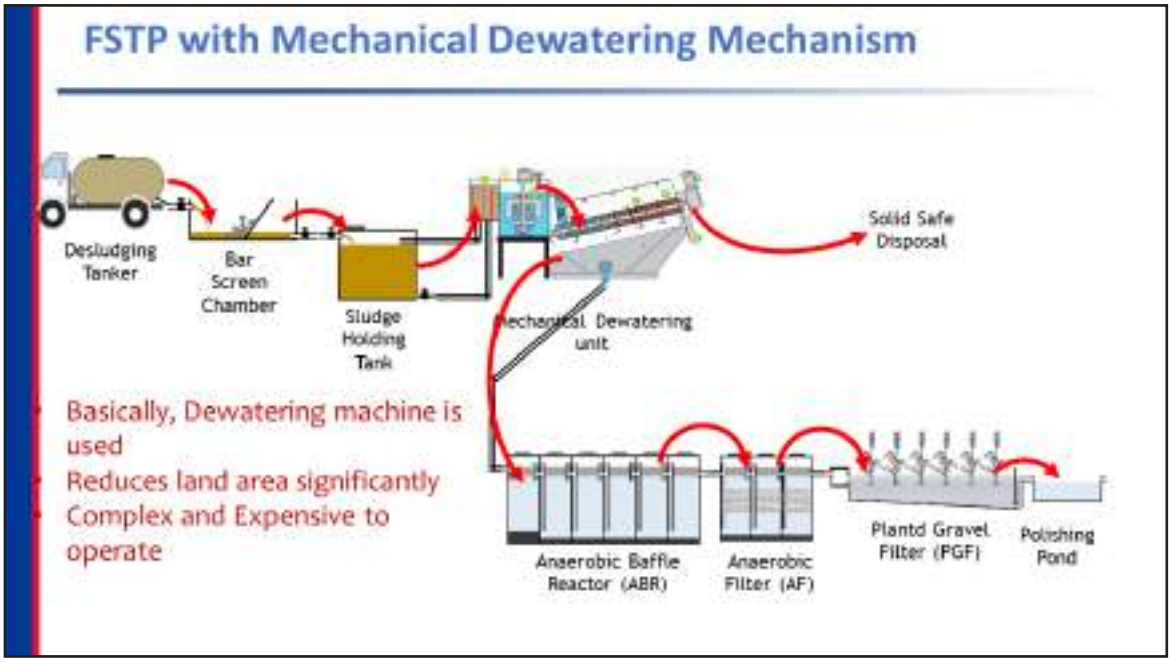
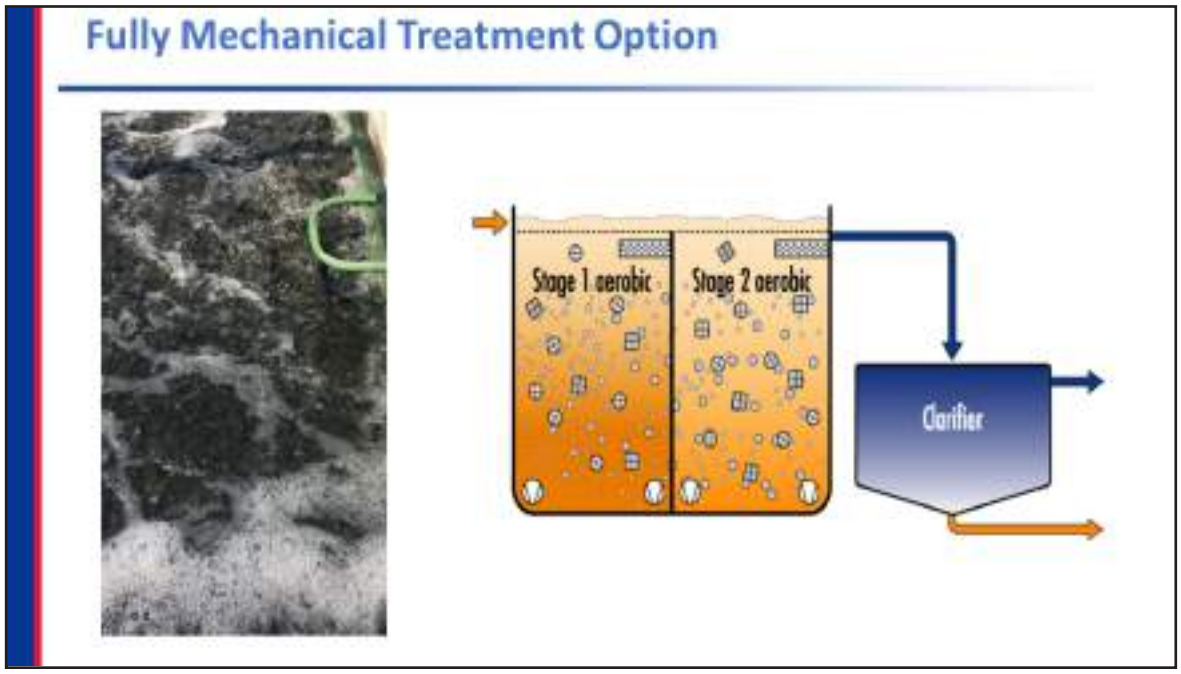


Slide 44

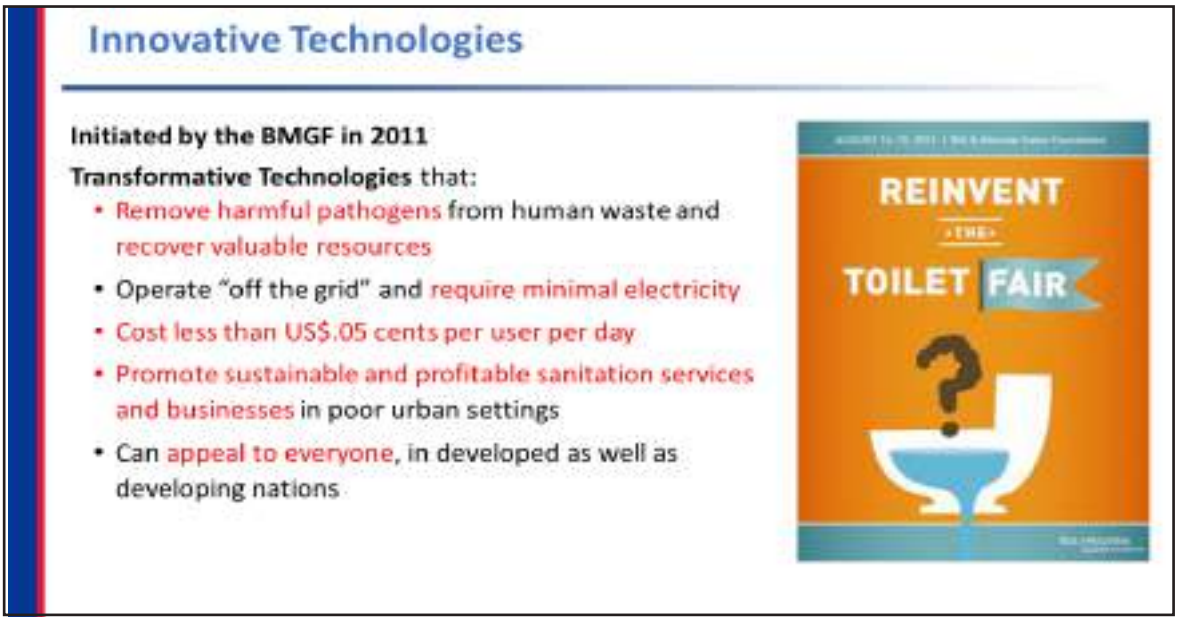
Ex. Guheswori WWTP

Slide 45



Ex. Guheswori WWTP

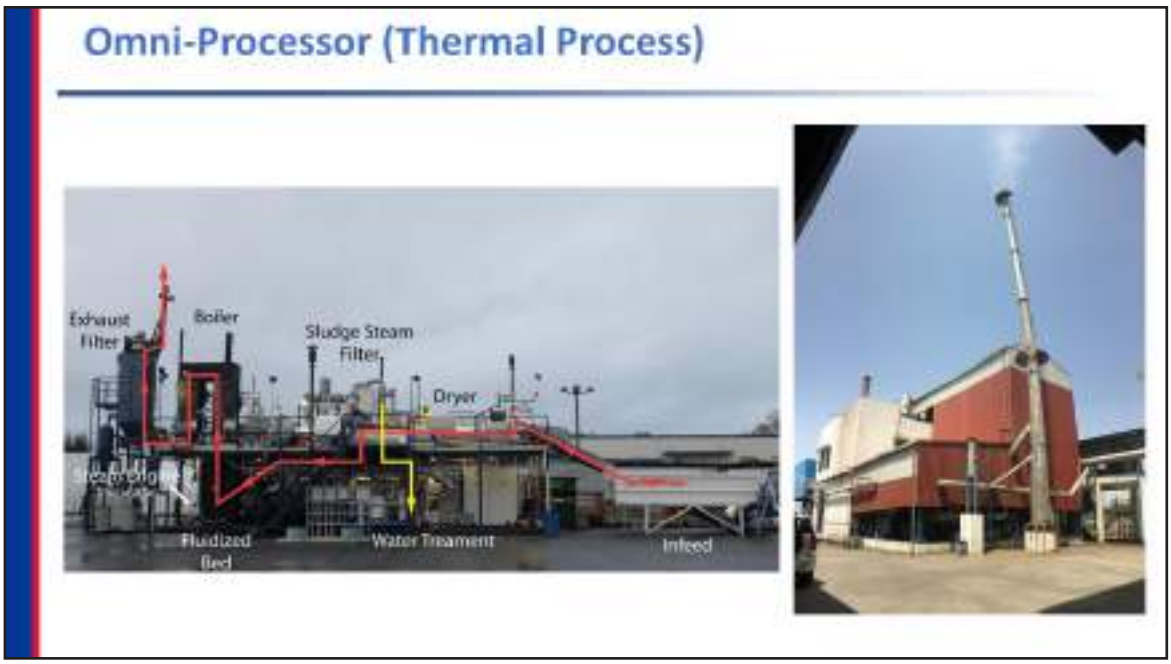
Slide 46



"Reinvent the Toilet Challenge" initiated by the BMGF in 2011, continues today and supports the development and commercialization of products that:
Remove harmful pathogens from human waste and recover valuable resources such as energy, clean water, and nutrients
Operate "off the grid" without connections to water and sewers and require minimal electricity
Cost less than US$.05 cents per user per day
Promote sustainable and profitable sanitation services and businesses in poor urban settings
Can appeal to everyone, in developed as well as developing nations

In addition, there have been other initiatives aimed at developing "transformative technologies" – that can quickly contribute to improving safely managed sanitation.

Slide 47



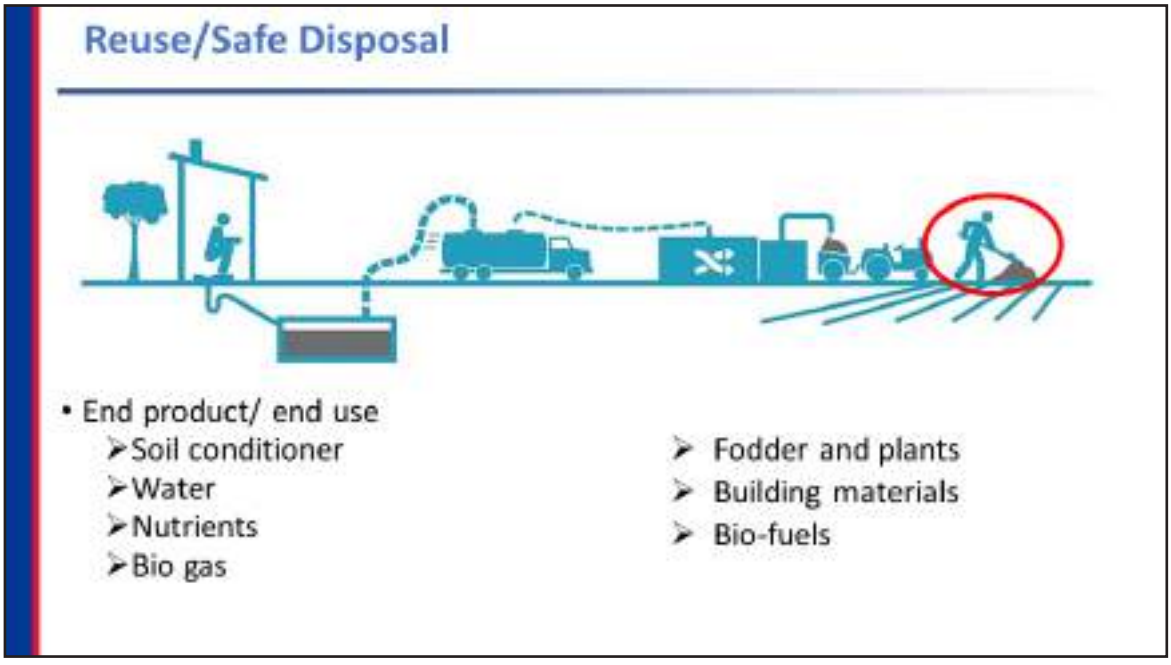
Slide 48

Slide 49

Nano-membrane toilet: Cranfield University

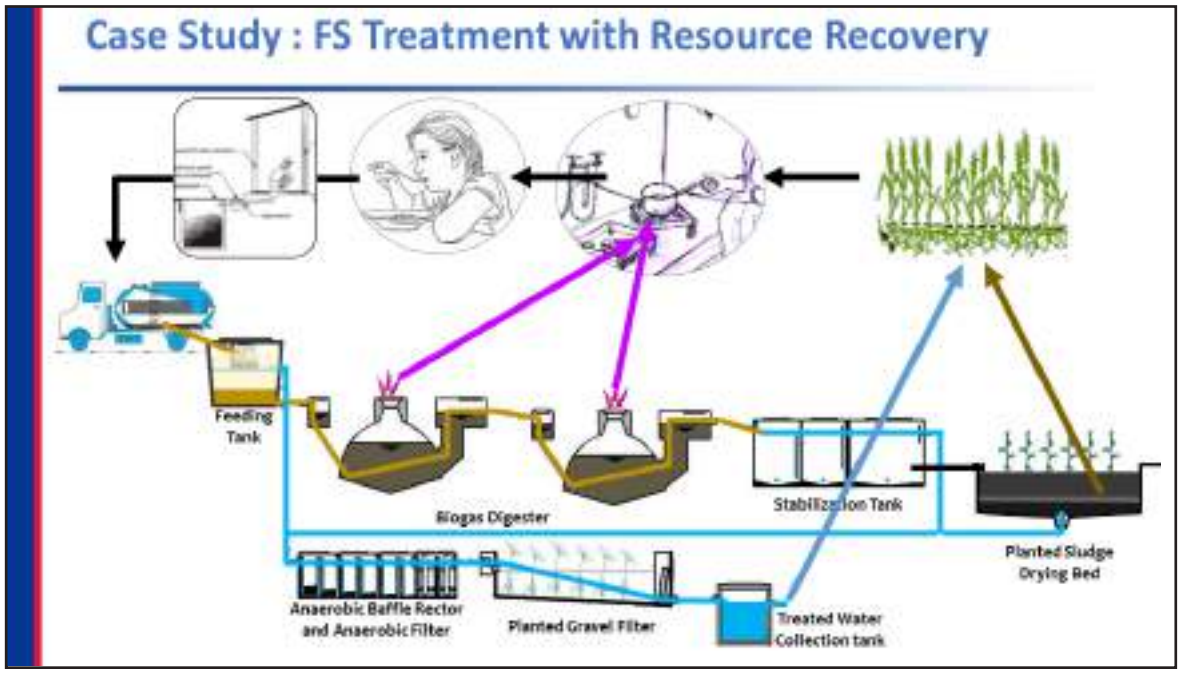
Slide 50

Slide 51



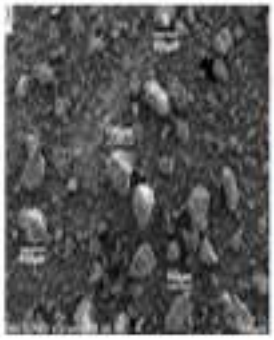
Slide 52

Slide 53



Slide 54

Other reuse of sludge



Pellets Biochar Briquettes

Slide 55

References

- https://www.youtube.com/watch?v=9H_3i2A-onw&t=8s
- https://www.youtube.com/watch?v=-qlxyxsNqhI
- https://www.youtube.com/watch?v=bVzppWSIFU0
- https://www.youtube.com/watch?v=tRzEtOHLeBk
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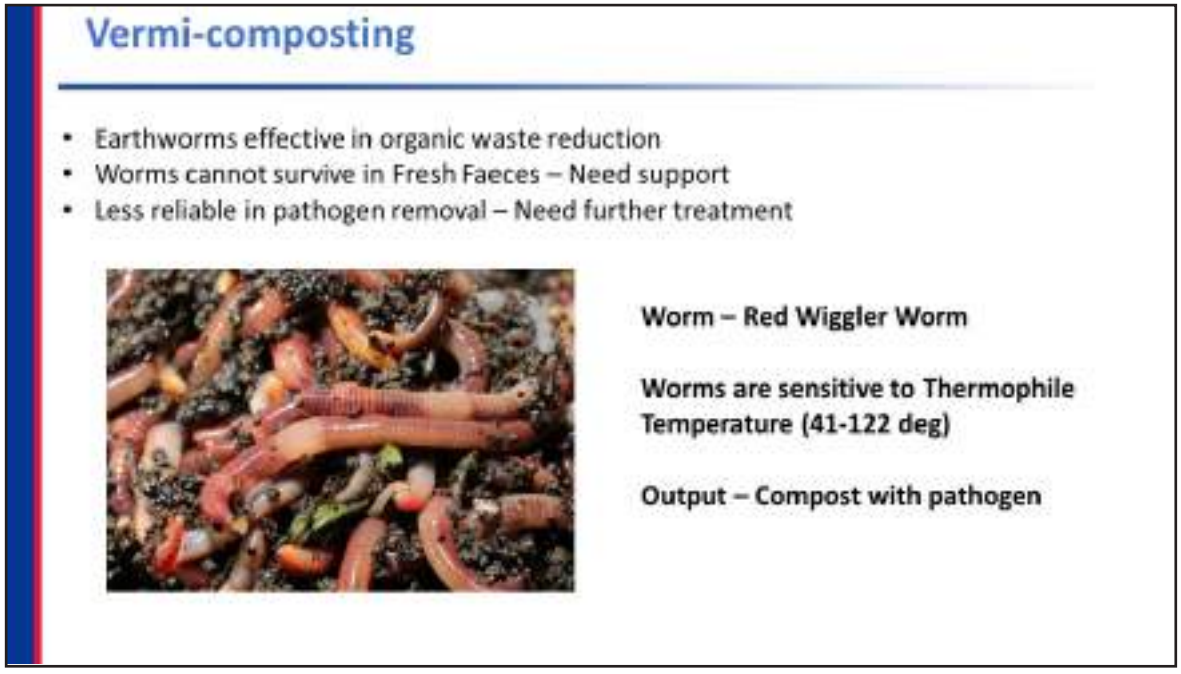
- Regmi, S. 2013. Wastewater treatment in Kathmandu: Management, treatment and alternative. Bachelor's thesis in Environmental Engineering, Mikkeli University of Applied Sciences, Finland.
- https://www.youtube.com/watch?v=qzYSryXk2FE
- https://www.youtube.com/watch?v=1UXlZpRHo08

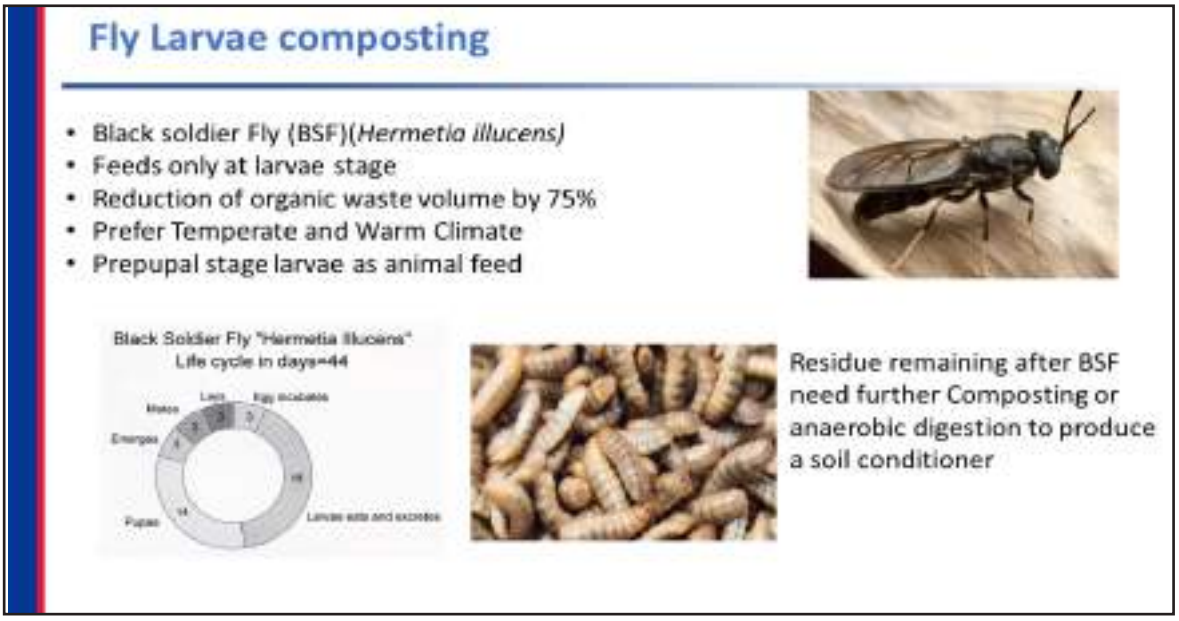
Slide 56

Slide 57



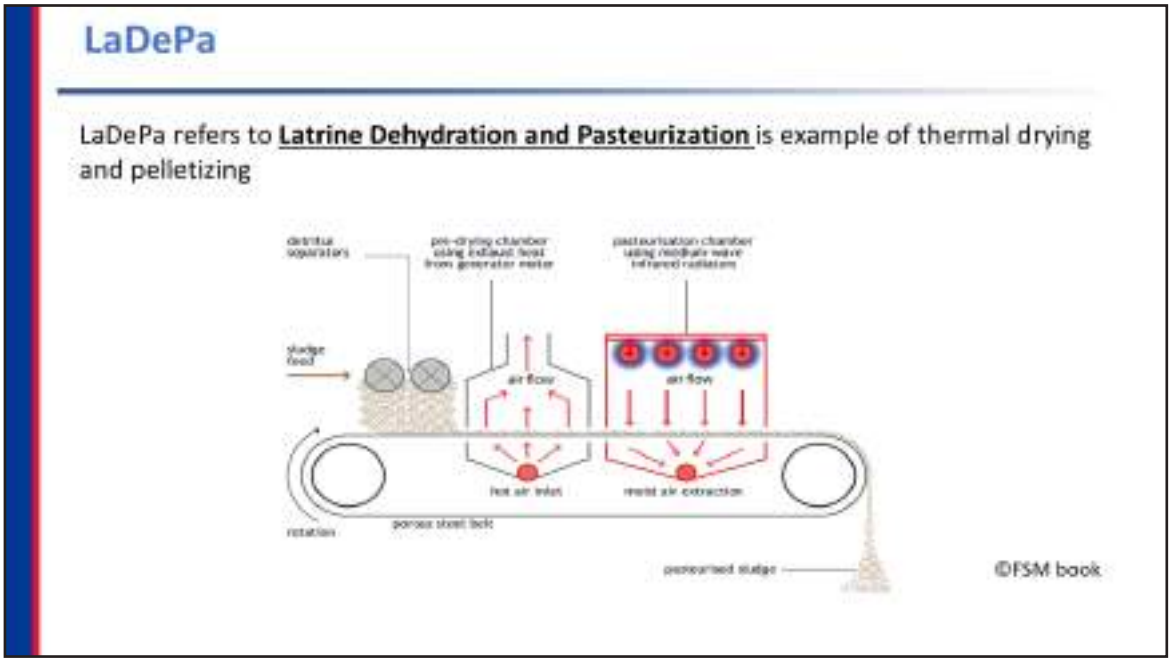
Vermi-composting treats diluted domestic wastewater sludge in a system inoculated with earthworms (Zhao et al., 2010).
Worms cannot survive in fresh faeces and need some kind of support in the form of layers of soil and vermi-compost.
Vermicomposting is not a reliable method to ensure adequate pathogen removal. However, when carried out under proper conditions the technology of vermicomposting can lead to a complete removal of coliforms. Rodriguez-Canche et al. (2010) found helminth egg removal in experiments with vermicomposting on septic tank FS. Permissible levels for reuse in agriculture were achieved after 60 days, starting from the initial earthworm inoculation, faecal coliforms, Salmonella spp., and helminth ova were reduced to <1000 MPN/g, <3 MPN/g, and <1 viable ova/g on a dry weight basis, respectively.

Slide 58



The Black Soldier fly (Hermetia illucens) originated in America, but is commonly found in temperate and warm climates.

Slide 59

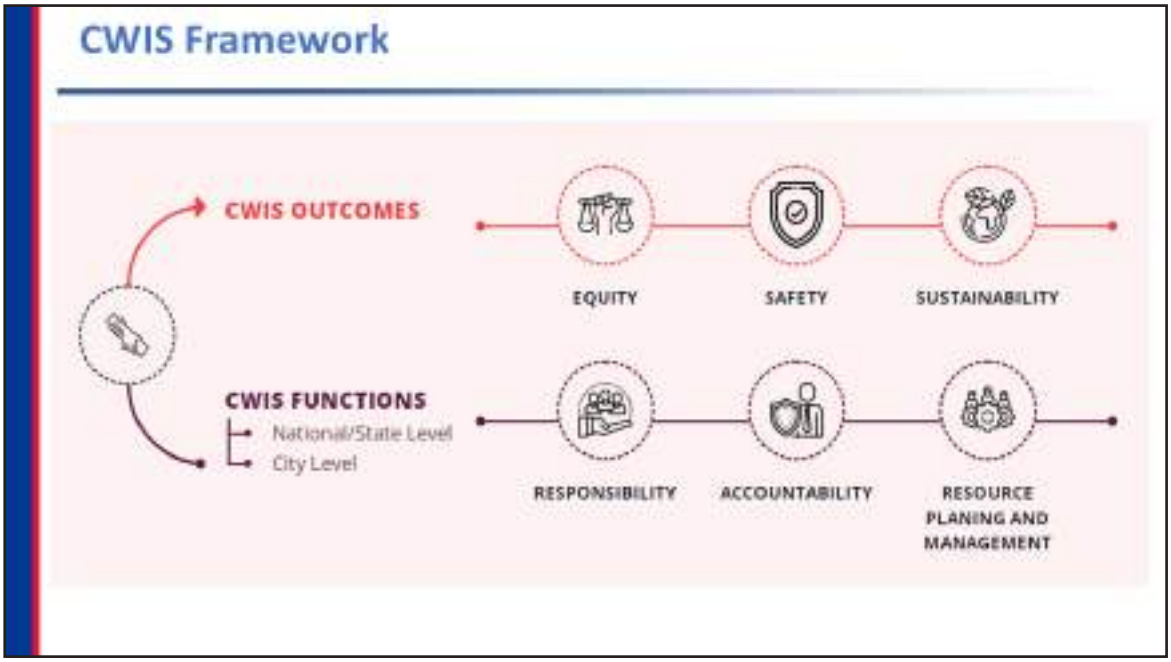


SESSION 15

Field Visit Preparation

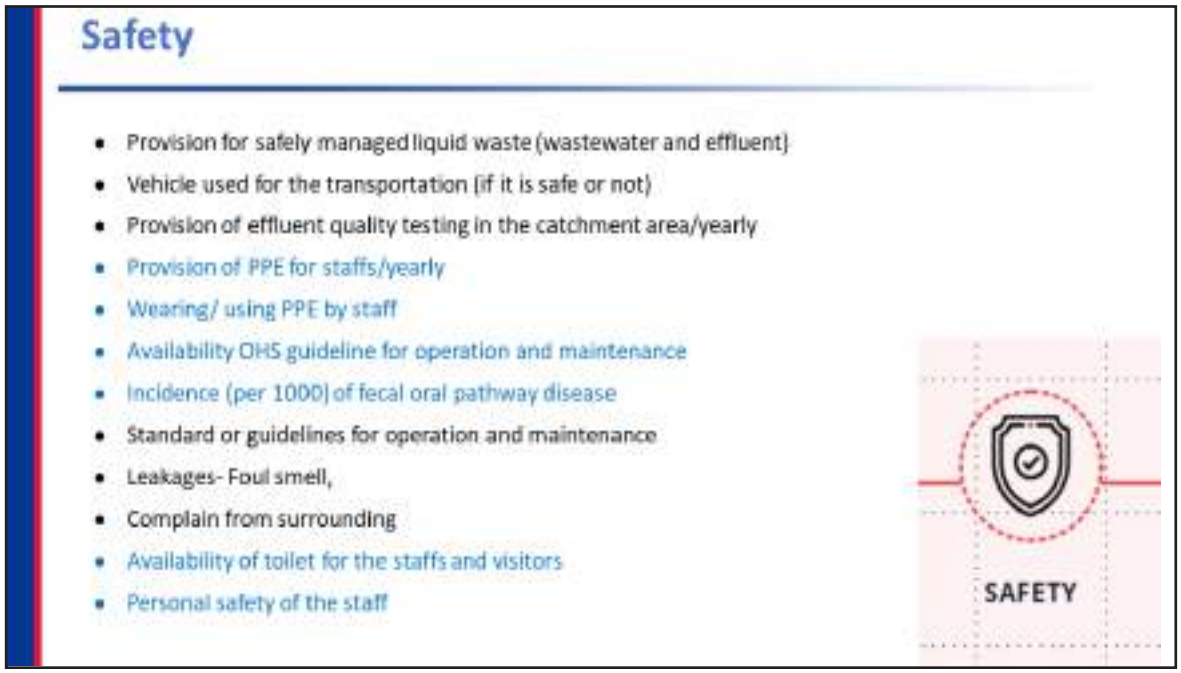
Slide 1

Slide 2



Slide 3

Slide 4



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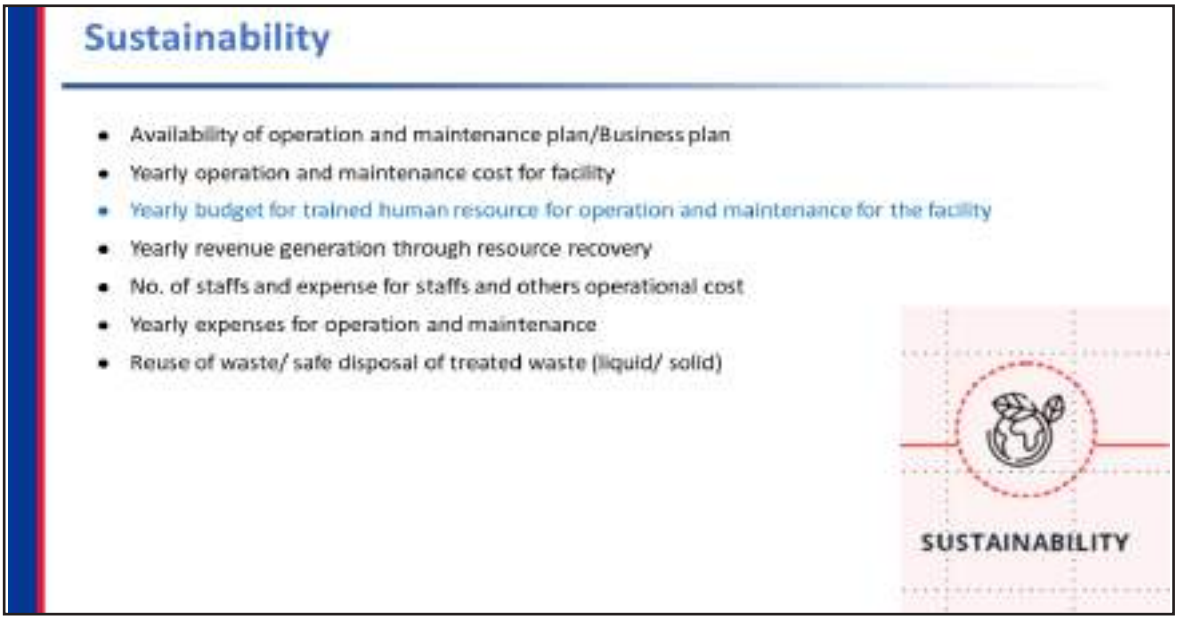
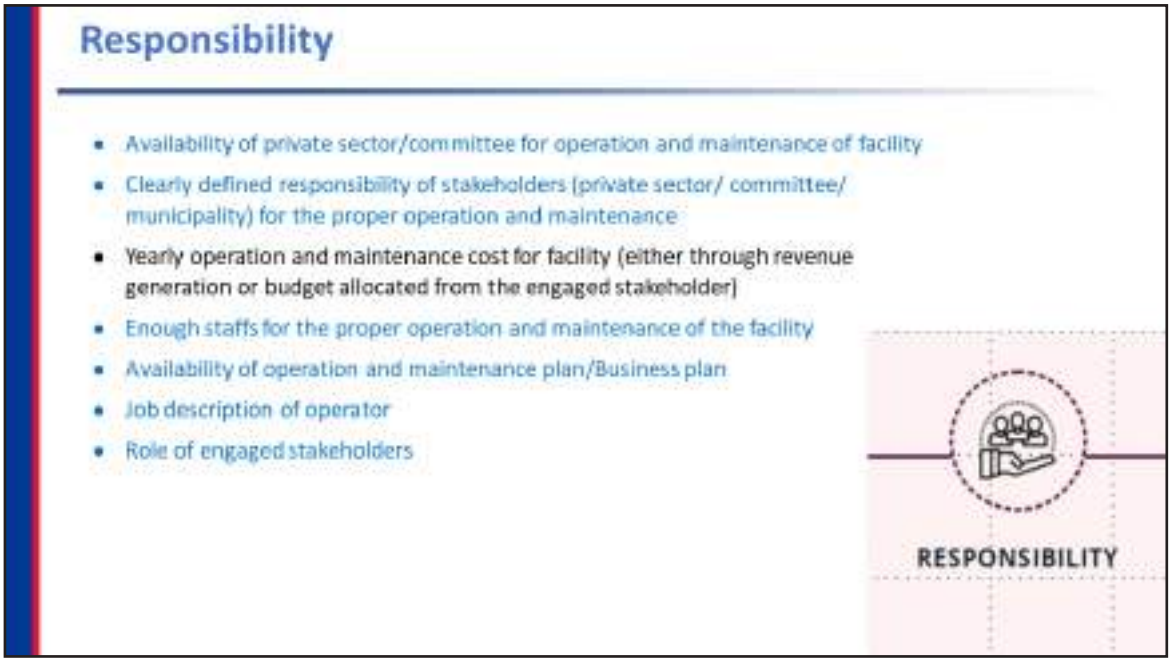


Slide 6



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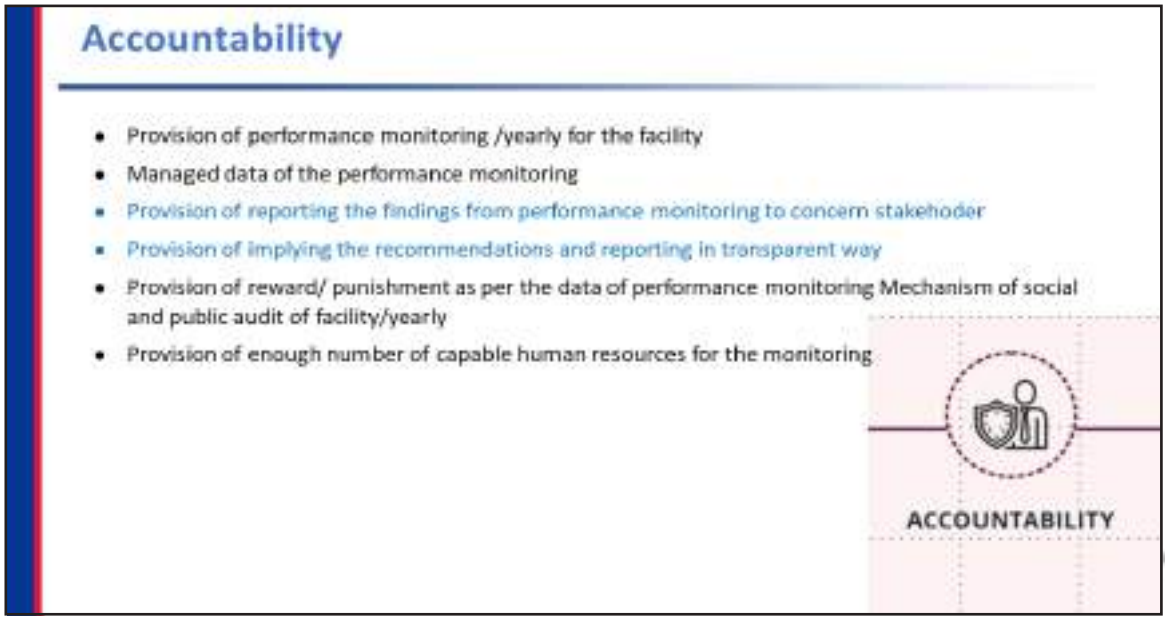
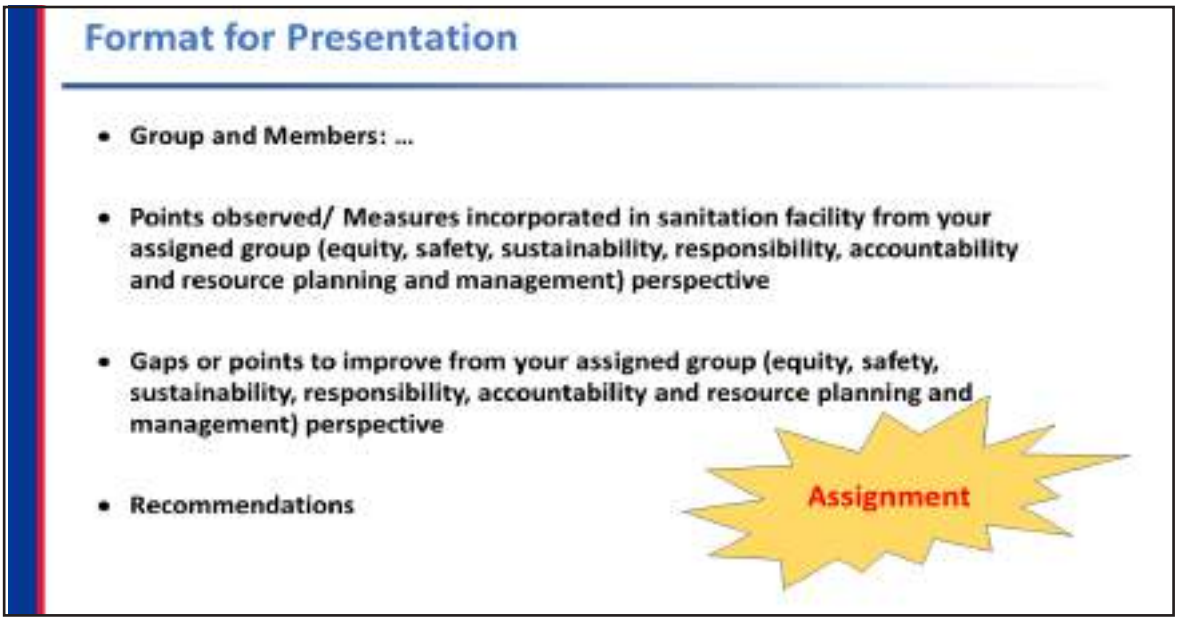


Slide 8

Slide 9



Slide 10

SESSION 15.1

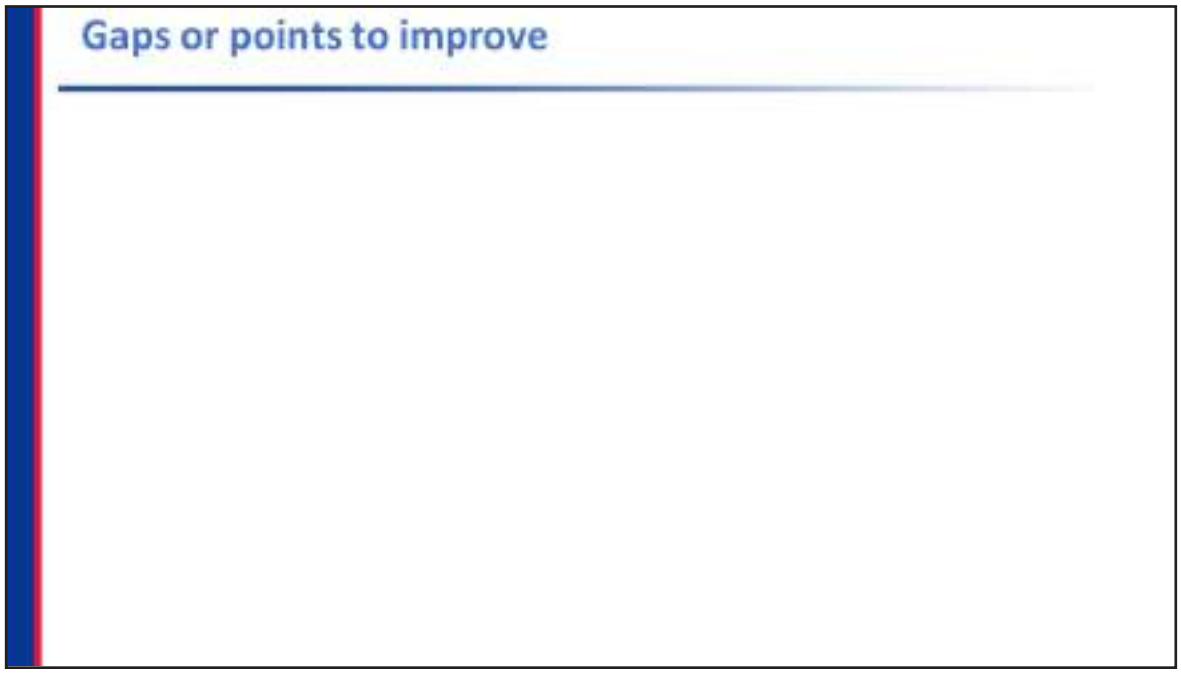
Field Visit Presentation Format

Slide 1

Slide 2

Slide 3

Slide 4



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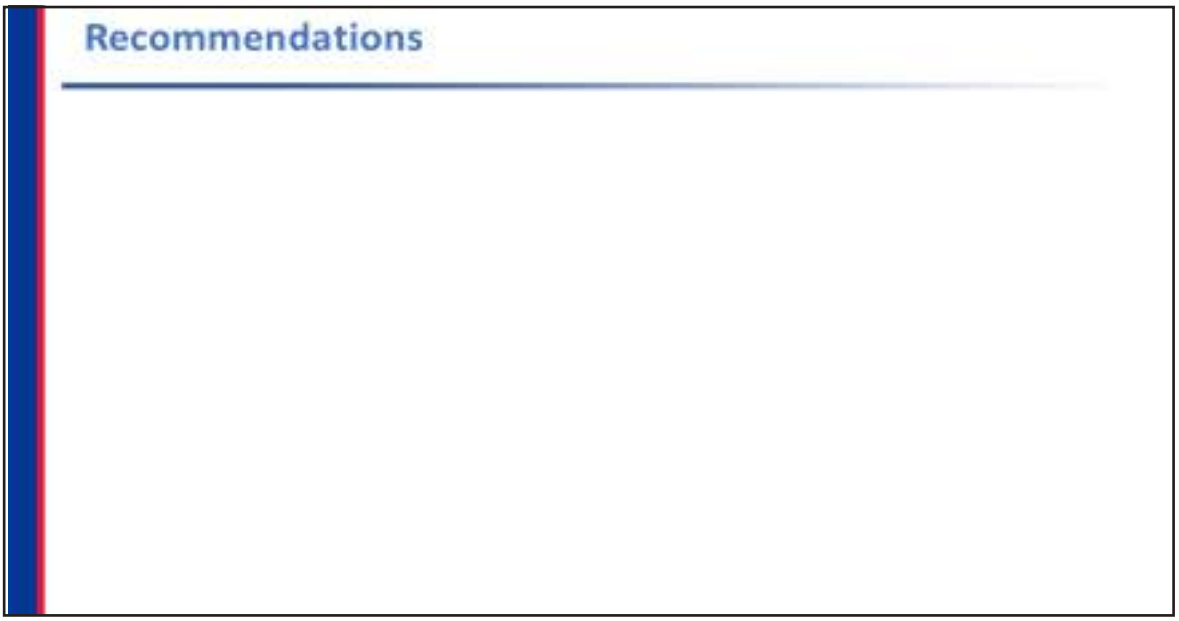


Slide 6

SESSION 16

Effective Learning

Slide 1

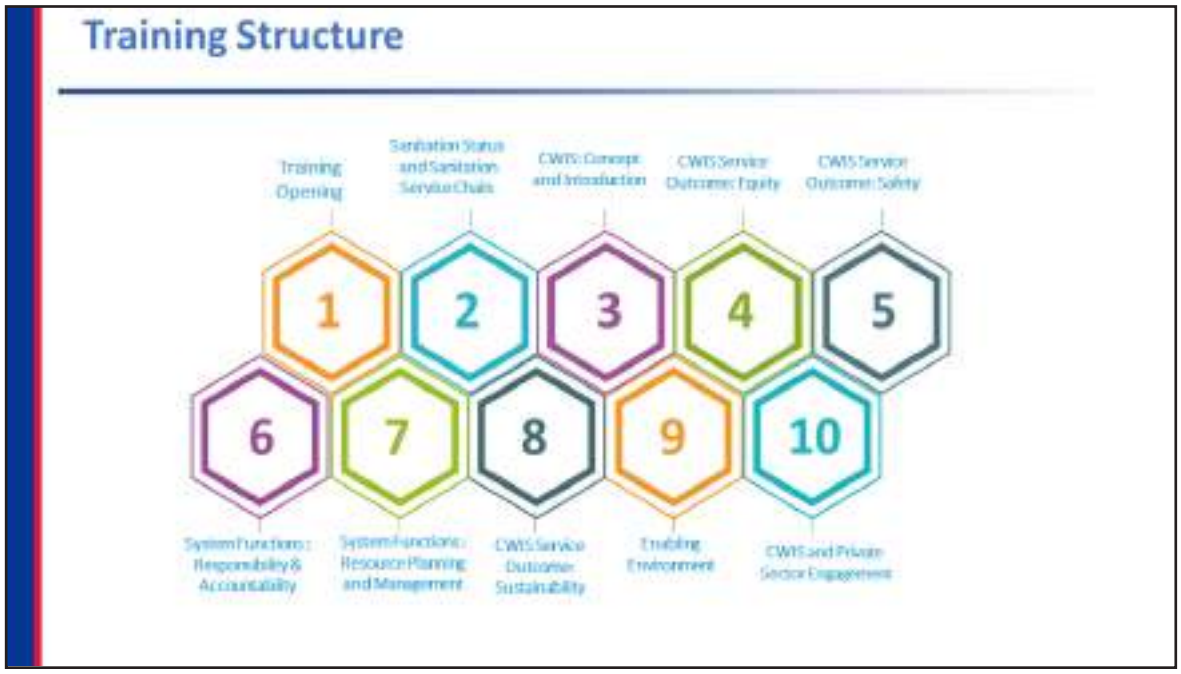
Slide 2

The student/ boy shown in the video was not able to get the information provided to him. Similar to it, a trainer should not focus on passing information as is not the goal of a trainer/ training rather should focus on if the participants are being able to grab the information being provided to them or not.

Effective training and learning are such that the information being passed is being grabbed by the participants as well hence will be discussing on making the learning more effective in the session.

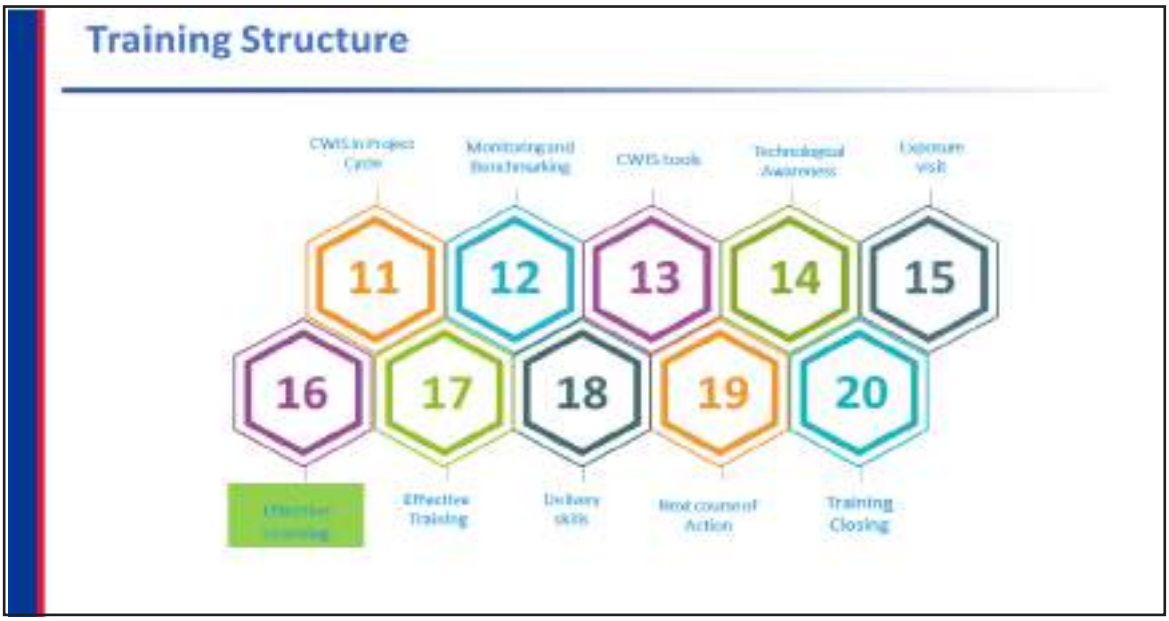
Slide 3

Slide 4



This training includes 20 main technical sessions, and are currently on session 16: Effective learning

Slide 5



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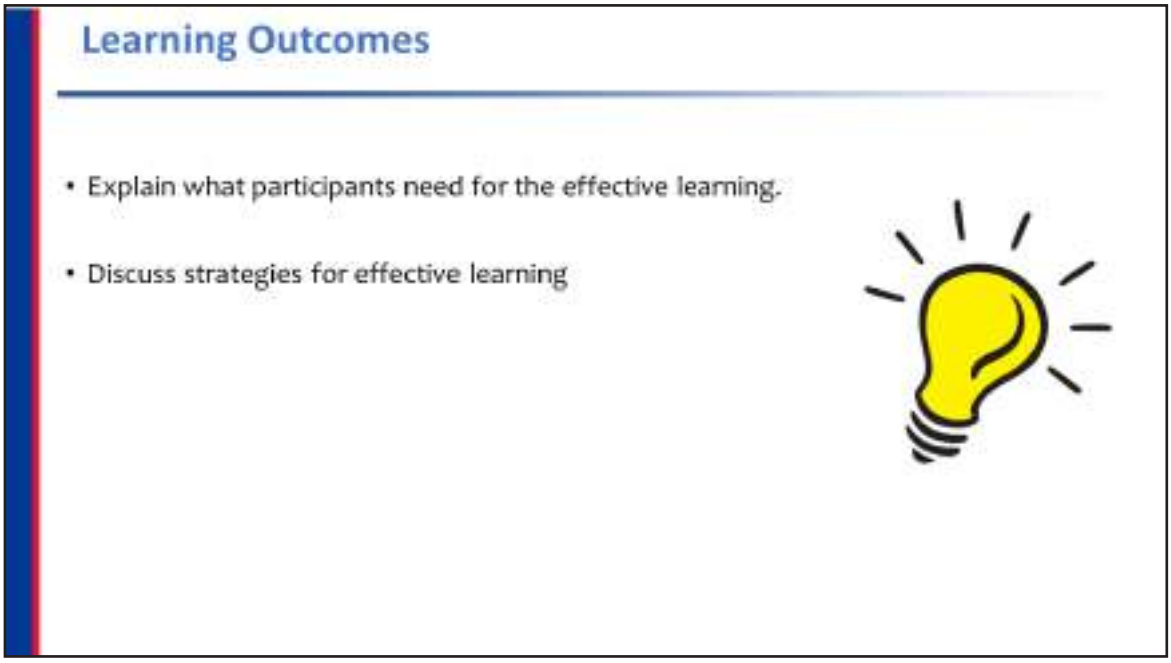
Slide 6



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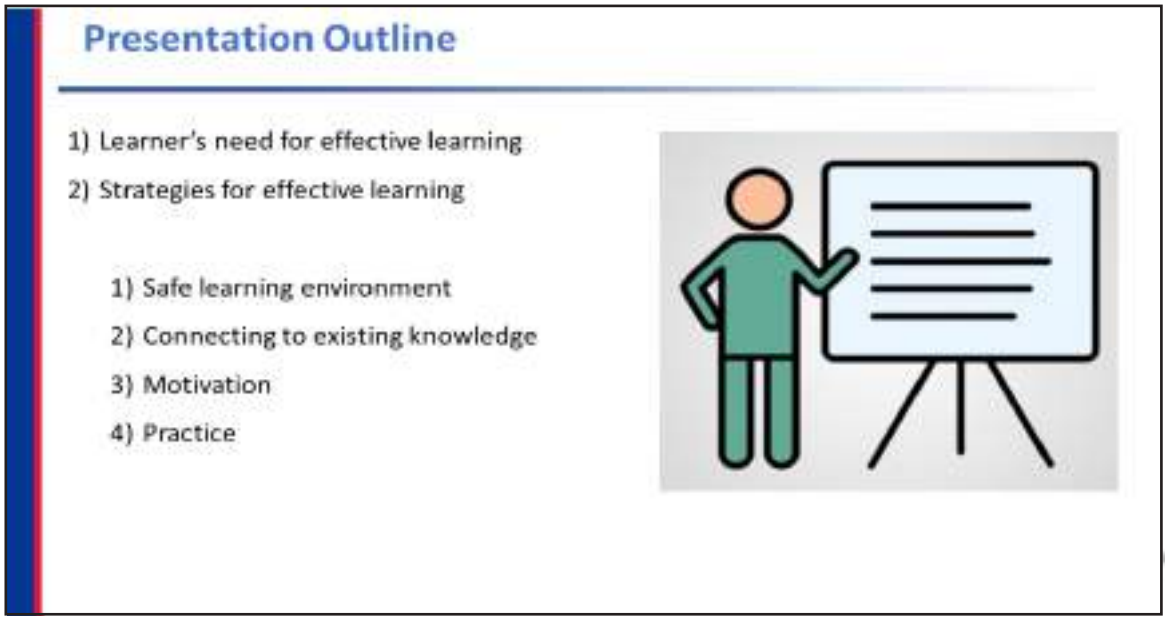
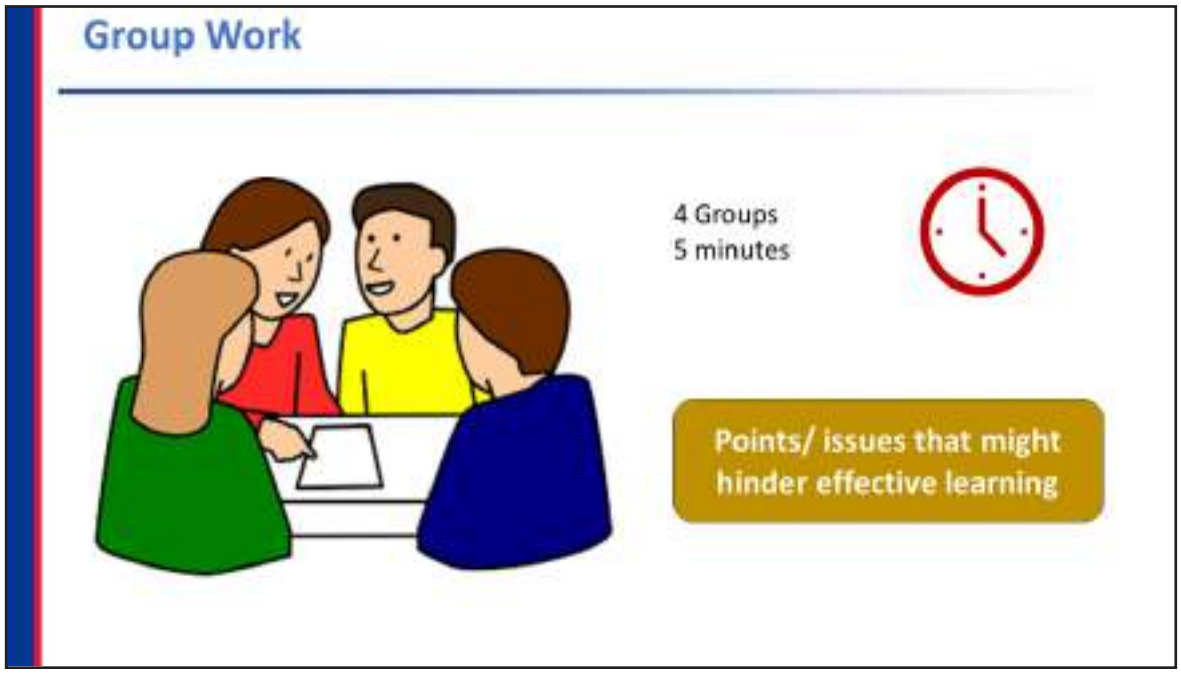


Slide 8



In their groups, note the points that might hinder effective learning, one point in a meta-card.

Slide 9

In their groups, ask to discuss the strategies to overcome the given issues

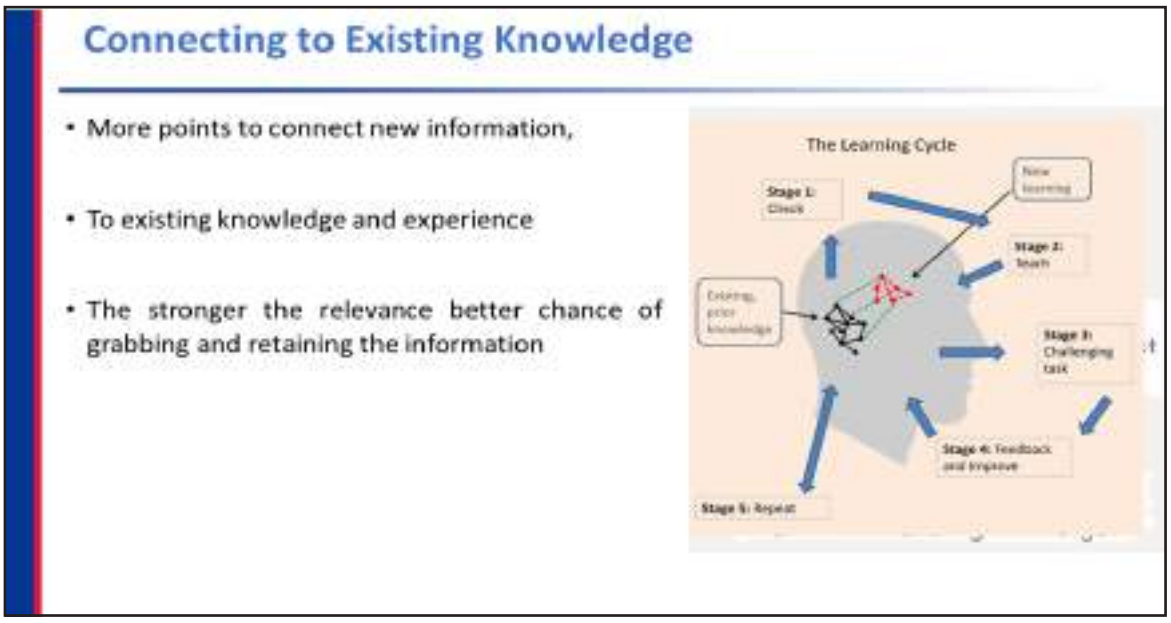
Slide 10

Slide 11

After presenting the information, ask participants to relate some of the points being done in the training for the physical needs of participants.

Slide 12

Slide 13



Science has proven that adult learn by connecting to existing knowledge, example: 'water' in Newari language in Bhaktapur is called 'Na:' and in other parts of Nepal it is called 'La:'
If we are to give this information to participants, participants may recall it by linking it to something they already know.
Trainer's note: You may ask if they are to remember it, how/ what would they do. Collect 2 to 3 responses from participants.

Present information from slide.

Discuss on how the information is retrieved in the mind, more the connection more is the chance of learning/ remembering.

Slide 14

One of the other thing that helps to learn is the motivation. The motivation for different participants may be different.

Slide 15

Slide 16

SESSION 17

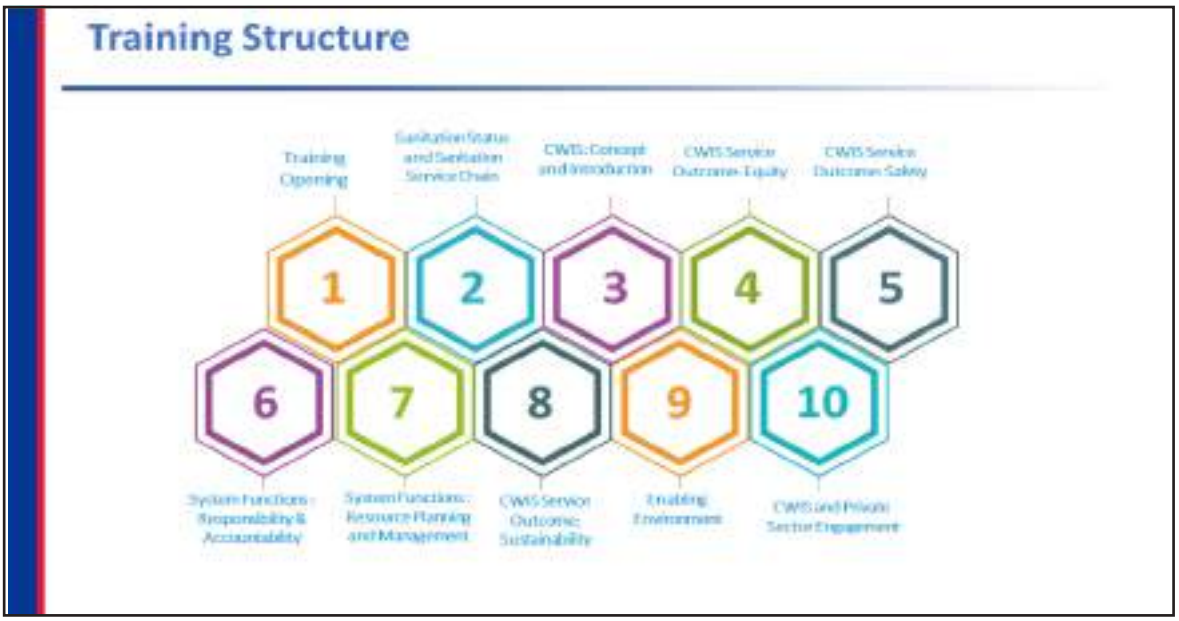
Effective Training

Slide 1

Slide 2

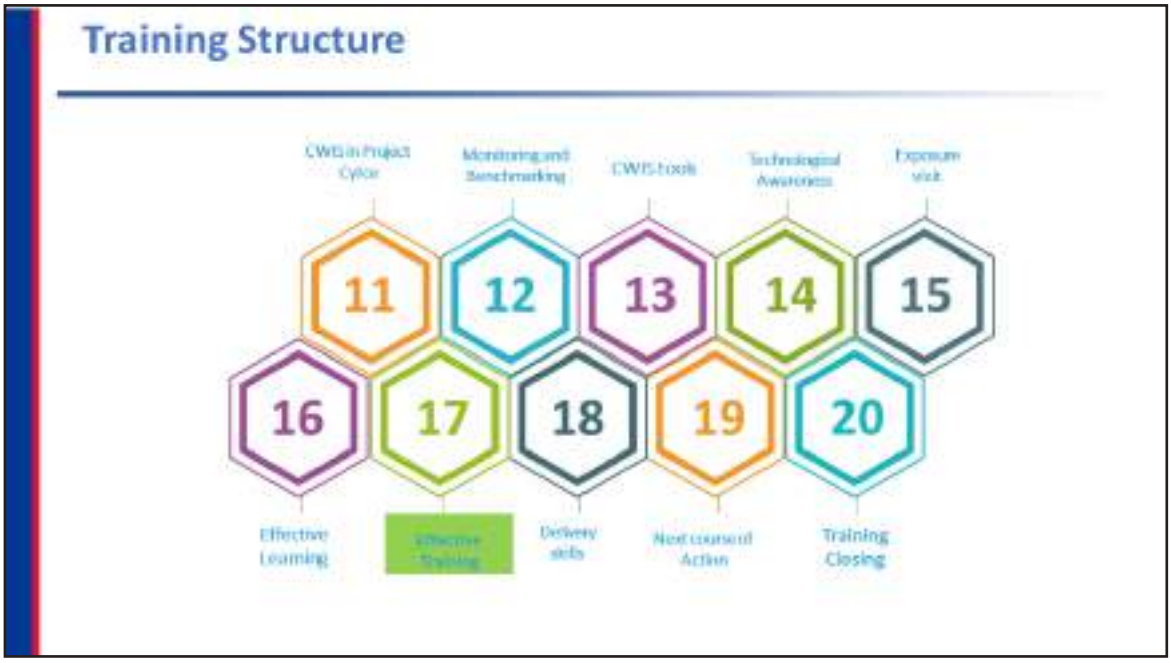
Refer to lesson plan for details on activity
Participants understand things differently based on their experiences and if you as a trainer do not clearly communicate the desired outcome, people may end up doing things differently form how you anticipated. So, as a trainer, one should always focus on giving clear instructions and making sure all participants are on the same page.
Link: similar to giving clear instructions there are other points that a trainer should focus on for effective training and are going to discuss them in the session.

Slide 3



This training includes 20 main technical sessions, and are currently on session 17: Effective Training

Slide 4



This training includes 20 main technical sessions, and are currently on session 17: Effective Training

Slide 5

Learning Outcomes

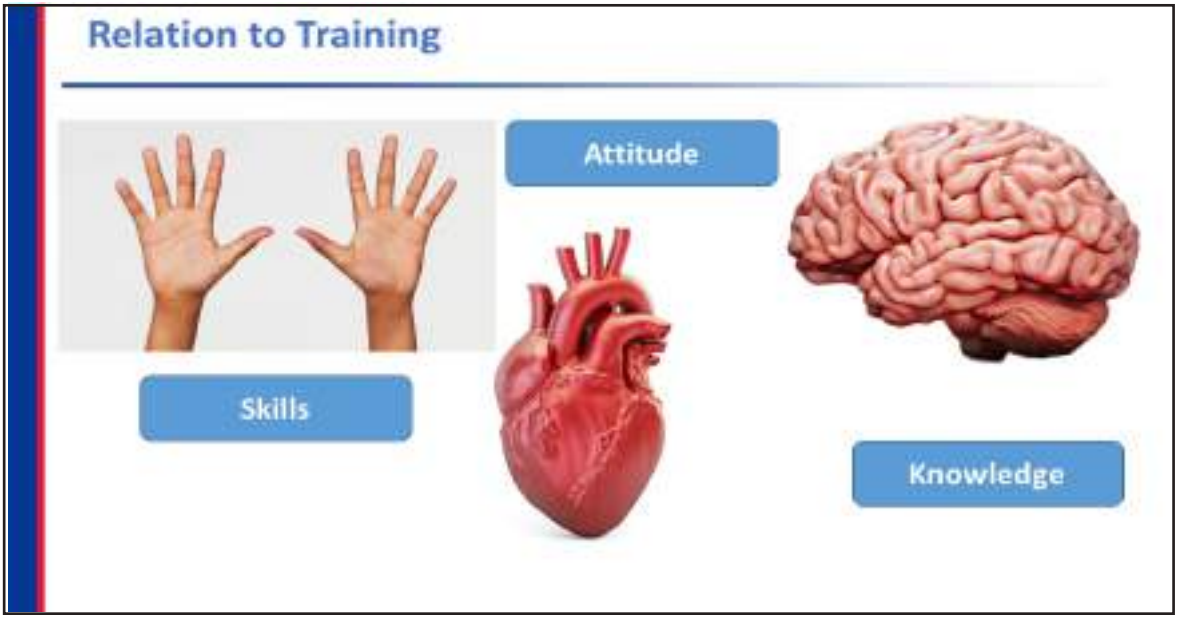
- Describe the qualities of trainers for an effective training delivery
- List the tips for the effective presentation

Slide 6

Presentation Outline

- Qualities of effective trainers
  - Knowledge
  - Skills and
  - Attitude
- Tips for effective presentation
- ARCS model for effective training

Slide 7



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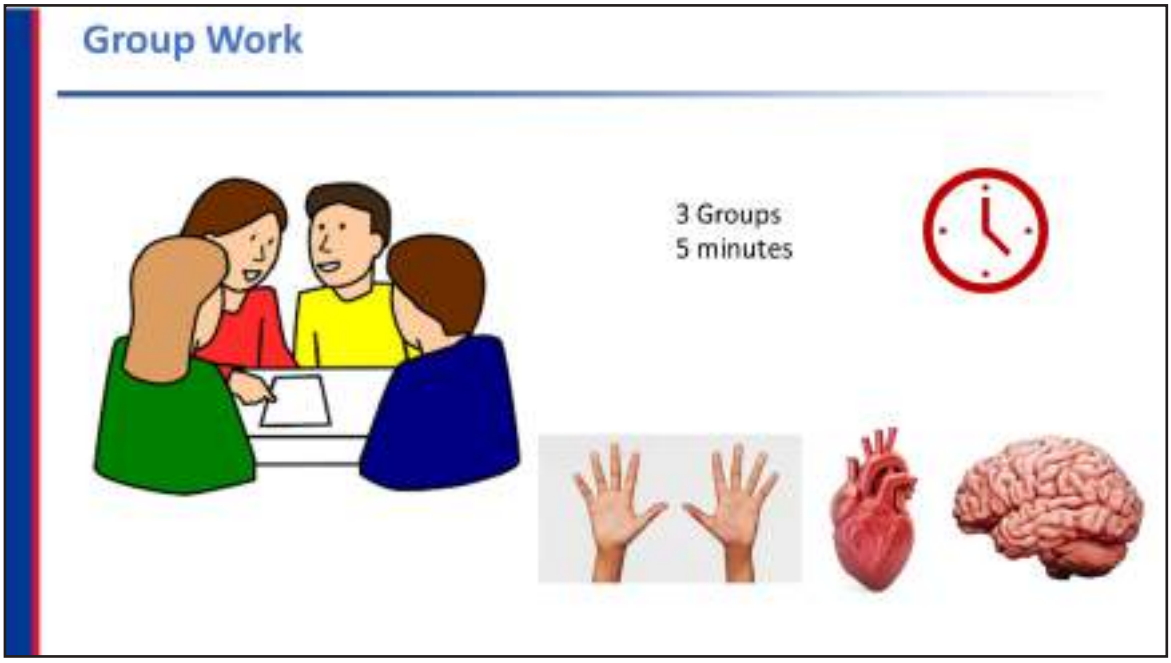


In their groups, participants are to discuss what are the qualities that a trainer should have relating to the pictures that they got in groups. Ex. what knowledge he/she should have or what kind of attitudes that he/she should have or what skills that he/she should have.

Slide 9

Knowledge

Trainers need knowledge about:

- How people learn
- What learners need – connection to past experiences, motivation, safe learning environment and practice
- Group dynamics
- What resources are available for training and how to use them
- Cultural understanding of the area and participants' background
- Water, sanitation and hygiene

Slide 10

Attitude

Trainers need the following attitudes:

- Self-reflective
- Open to feedback and willing to learn
- Humble
- Respectful
- Friendly
- Patient
- Flexible
- Professional
- Honest and confident in being able to say "I don't know"
- Positive and engaged
- Energetic
- Resourceful
- Calm presence

Slide 11

Slide 12

In their groups, participants are to discuss what are the qualities that a trainer should have relating to the pictures that they got in groups. Ex. what knowledge he/she should have or what kind of attitudes that he/she should have or what skills that he/she should have.

Slide 13

Slide 14

Slide 15

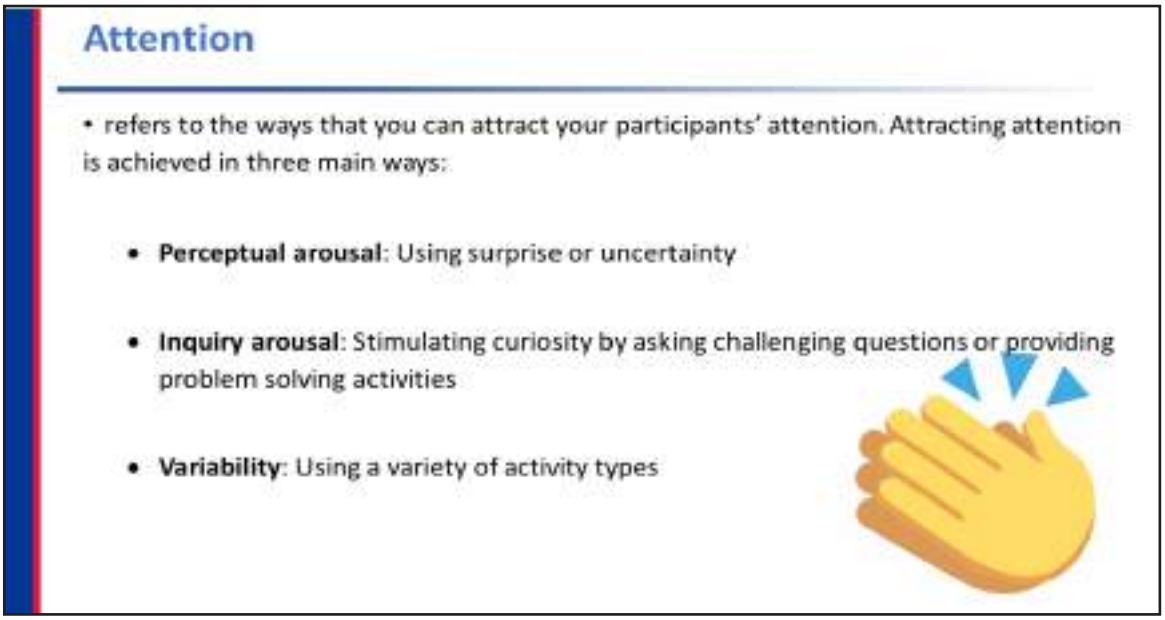
Tips for Effective Presentation

- Respect the opinions of participants
- Always practice before delivery
- Practice responding to typical questions that may occur
- Use of different learning styles: audio, visual, kinesthetic
- End with an action commitment

Slide 16

Effective Training through ARCS model

Slide 17



Clap your hands and see how participants responds to it. Explain attention as referred in the slide and inform clapping is one of the way to grab the attention. Other way might be simply keeping quiet or as following.

Slide 18

Presenting your materials differently is one of the way to grab attention.

Slide 19

Attention- Examples

- Use humour
- Present your **material in different ways**: discussions, projects, small group discussions
- Take the role of **devil's advocate** to challenge your participants understanding
- Ask your learners **to brainstorm solutions to a problem**
- Use games, role-plays or other active methods of **engaging participants** with the content

Slide 20

Relevance

- Refers to the ways that you communicate how the participants will benefit from your learning experience.

- Explain how the new learning builds on their existing skills and knowledge.
- Explain how the learning will help them today
- Explain how the learning will help them tomorrow

Slide 21

Relevance

- Tie the instruction to their motives for learning it: power, achievement, a desire to belong
- Model what you want them to learn, or ask some participants to model it for the class
- Allow your participants to choose the learning activities or the order of the activities

Slide 22

Confidence

• refers to the ways that you convey the participants' likelihood of success. Some strategies for developing confidence include

- Assuring them they can do it
- Explaining the performance requirements and evaluation criteria

Slide 23

Confidence

- Building on what they already know in small steps
- Providing consistent and constructive feedback
- Help the participants to see the relationship between their effort and their success by allowing them some personal control over the learning

Slide 24

Satisfaction

• refers to the sense of achievement your participants should feel after taking your training. People gain satisfaction from learning something meaningful. Examples of activities that encourage satisfaction are

- Opportunities to demonstrate their new knowledge and skills in meaningful ways

Slide 25

Slide 26

Train on knowledge and skills
Direct them towards goals
Lead group activity, lead an example
Listen, intently

Slide 27

Thank you!
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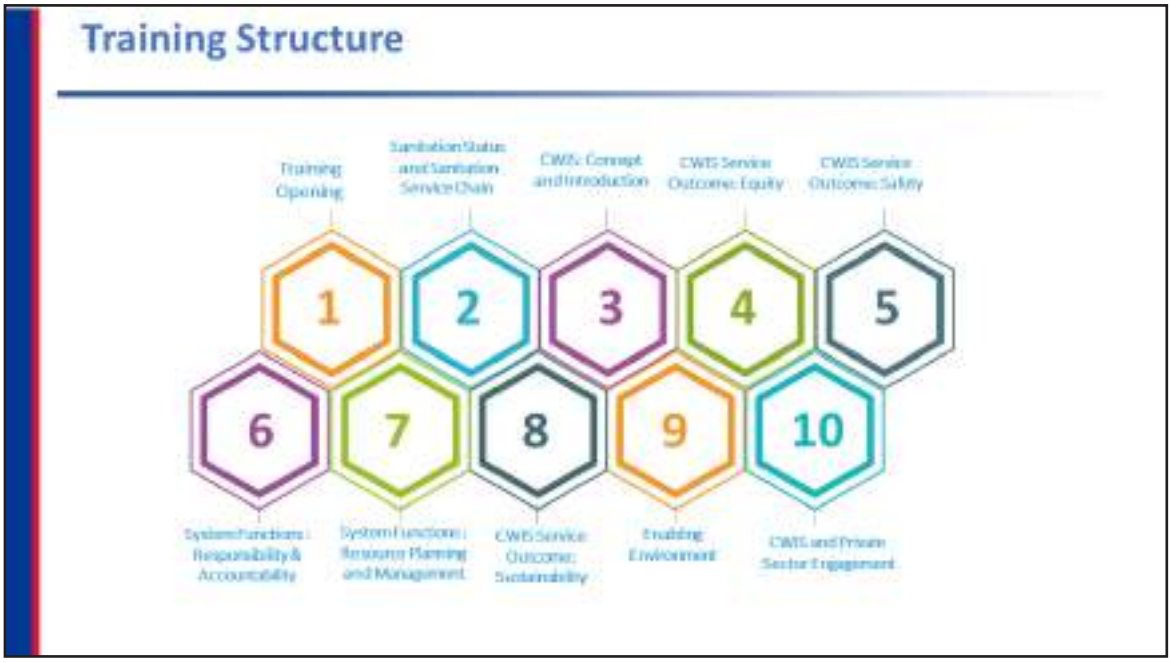
Department of Water Supply and Sewerage Management
Technical Support

SESSION 20

Training Closing

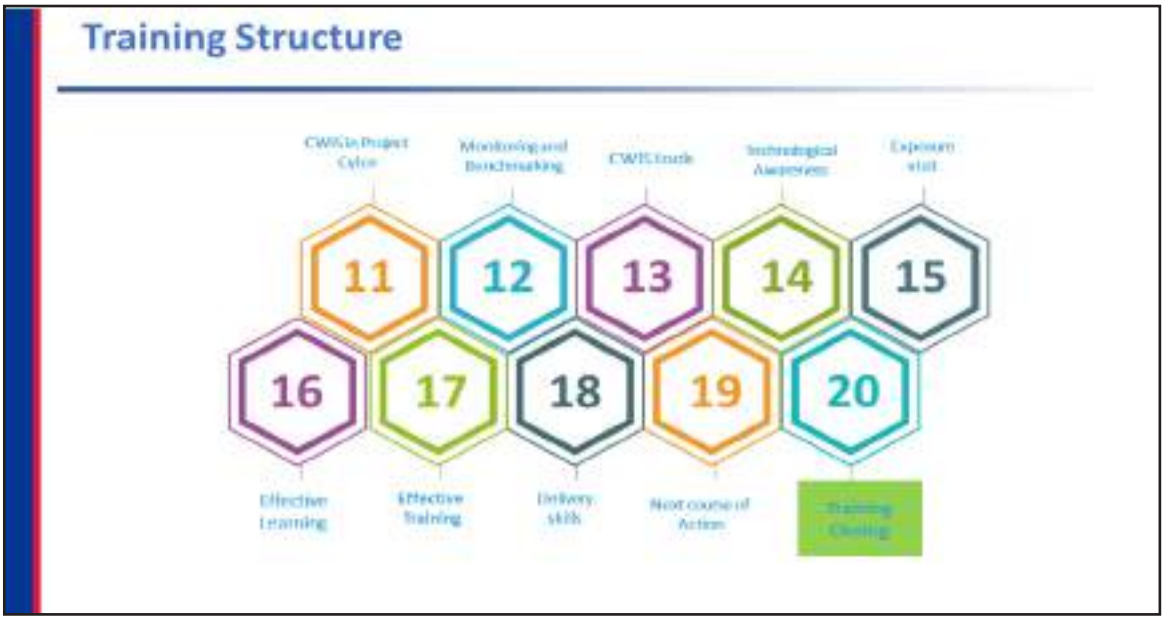
Slide 1

Slide 2



This training includes 20 main technical sessions, and are currently on session 20: Training Closing

Slide 3



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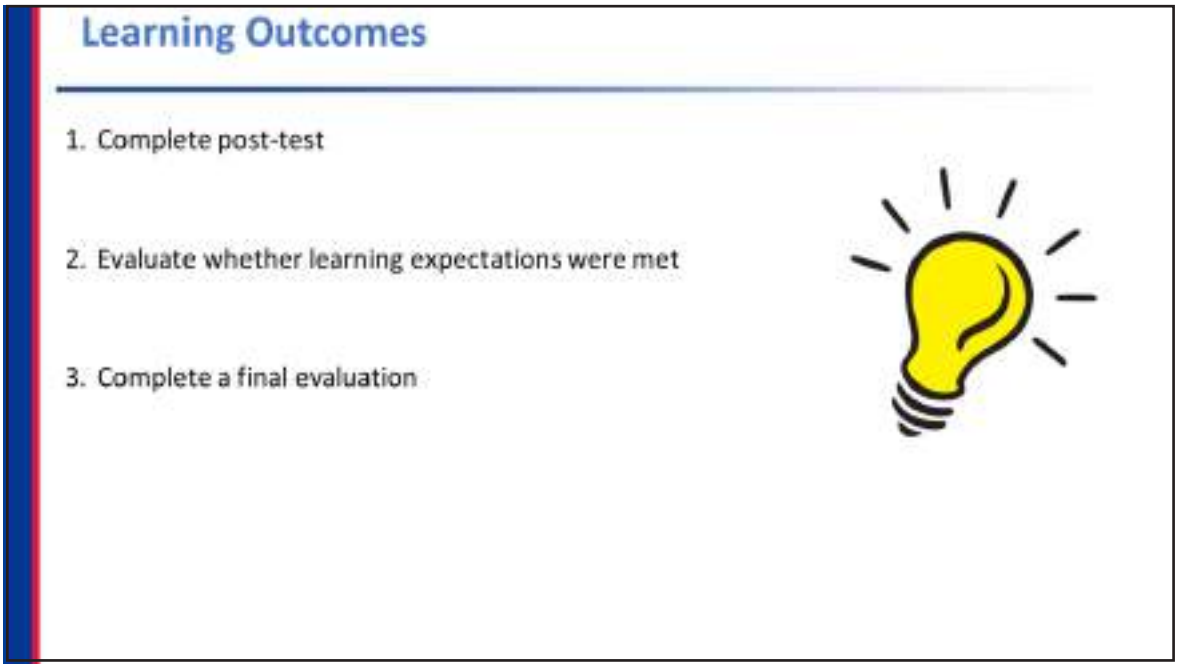
Slide 4



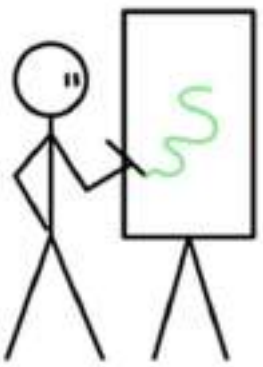
Slide 5

Presentation Outline

- Revisiting Expectations
- Post-test
- Training Evaluation
- Voices from participant
- Certificate Distribution
- Group Photo

Slide 6

Revisiting Expectations



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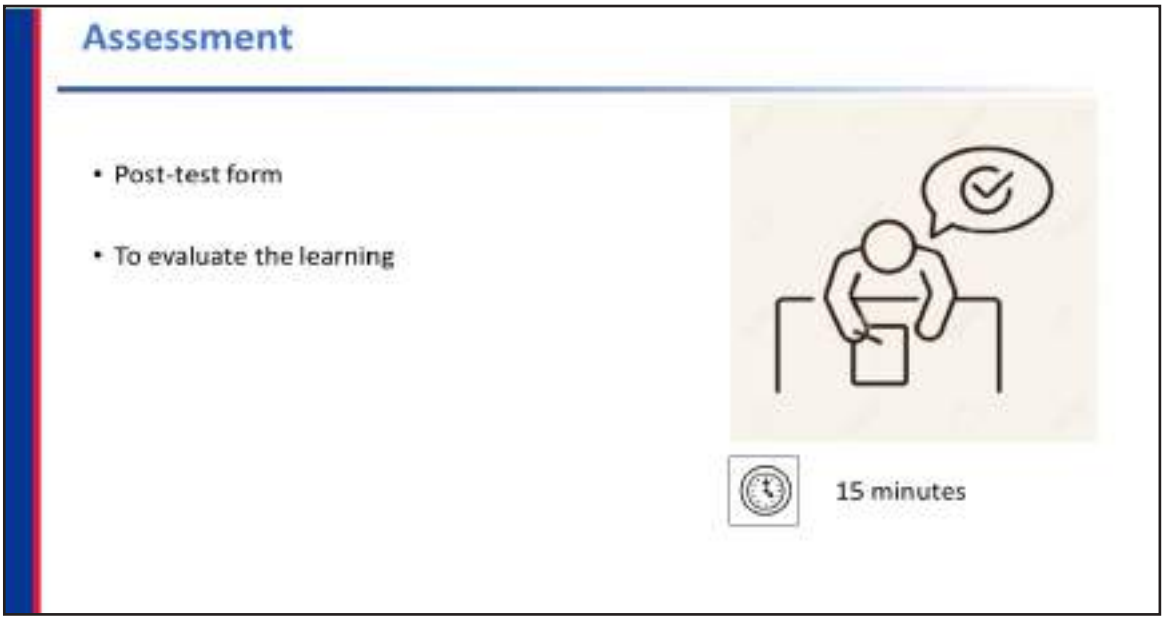
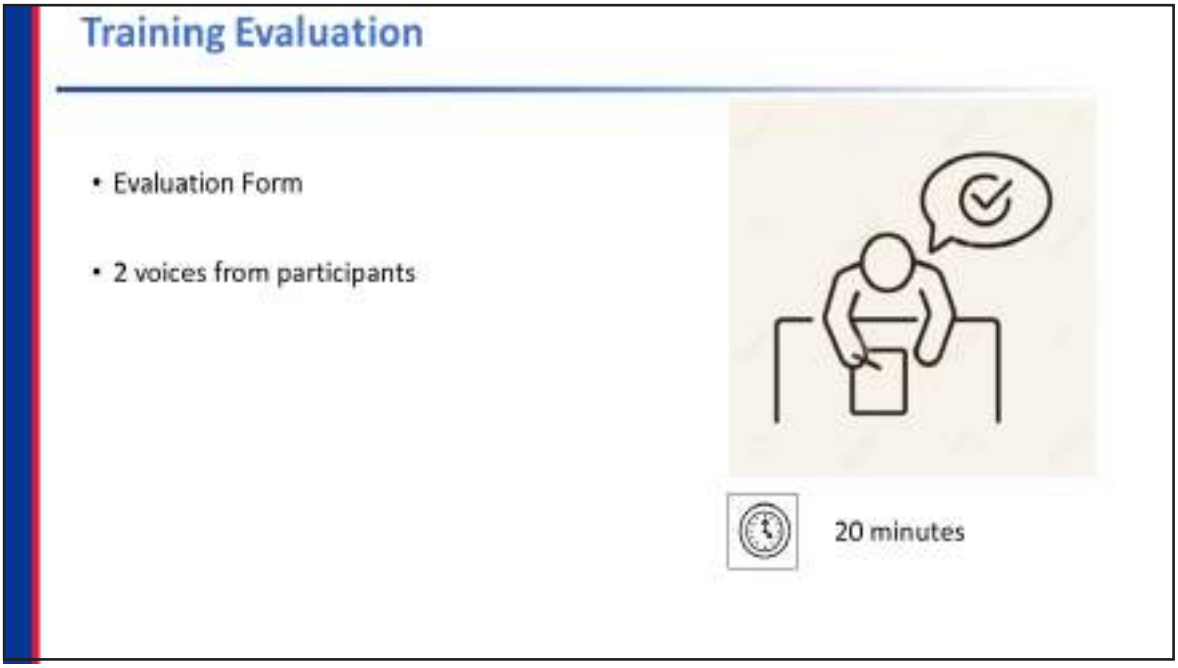


Inform participants about the pre and post test and provide the form for pre-test. Provide 15 minutes time for the activity.

Slide 8



Inform participants about the training evaluation form and provide the form. Provide 20 minutes time for the activity.

Slide 9

Certificate Distribution

- One strength of the participant
- Congratulation for the completion of the event
- Best wishes for future endeavor with the knowledge

Slide 10

Group Photo

- Request for group photo
- And close the training

Slide 11

Thank you!
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Ministry of Water Supply
Department of Water Supply and Sewerage Management
Technical Support
ENPHO

Government of Nepal
Ministry of Water Supply
Department of Water Supply and Sewerage Management
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