Trainers' Manual on Sanitation Technology

Supporting Sustainable Sanitation Improvements (3SI)
in Bihar through Supply Side Strengthening

Supported by
Population Services International (PSI) India

Developed by
WATER, Sanitation and Hygiene (WASH) Institute
Kodaikanal, India.
About the Manual

The manual has been developed to facilitate capacity building of stakeholders to scale up marketing of Sanitation Technology and related products in 3SI: Supporting Sustainable Sanitation Improvements in Bihar. It also contributes to achieving an open-defecation free India by building human resources who understand sanitation. The manual aims to provide appropriate sanitation technological solutions to scale up social marketing of sanitation program and products.

Capacity Development Objectives

The overall objective of the training is to build the capacity of trainers and stakeholders viz., sanitation products marketing personnel, masons etc., of the program to facilitate Sustainable Sanitation Improvements in Bihar through Supply-side Strengthening.

The specific objectives of the training program are to enable stakeholders to

- Acquire skills to provide quality products and services with knowledge on sanitation technology and the right attitude to promote rural sanitation through the implementation of Sustainable Sanitation Improvements in Bihar.

Agenda for Training

This manual is divided into Three Parts.

Part A Facilitators Guide – For any person who wants to act as Resource Person / Trainer in the 3Si Project

Part B Sanitation Technology - For all stakeholders of 3Si project

Part C Sanitation Products and Production Centre Technology – For Production Centre Managers, Master Masons and Masons

Part D Frequently Asked Question

Session Plan

Each unit is divided into sessions that may include activity/exercises.

Instructions on how to facilitate sessions are provided under the following headings:

- Objective, Time, Method, Materials, Process, Learning, Outcome, Trainers’ Notes and References.

The manual can be used for:

- Training of Trainers (TOT)
- Training/Capacity Development activities to all stakeholders of 3Si including:
  - Production Centre Managers
  - Master Masons and Masons

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Abbreviations

3Si  
Supporting Sustainable Sanitation Improvements

cms  
Centimetres (1 cm = 10 mm)

CR   
Cement Ring

cu ft   
Cubic Feet (1 cu ft = 28.32 lts)

dia   
diameter (d=2r, r=radius)

E.S  
Effective Size

HE   
Human Excreta

HHL   
House Hold Level

In   
inch (1 inch = 2.54 cm)

lts   
Litres

MFI   
Micro Finance Institution

mts   
Metres (1 m = 100 cm)

NBA   
Nirmal Bharat Abhiyan

PC   
Production Centre

PSI   
Population Services International

RCC   
Reinforced Concrete Cement

RSM   
Rural Sanitary Mart

SBM-G   
Swachh Bharat Mission-Gramin

SC   
Sales Centre

SL   
Sanitary Latrine

SM   
Sanitary Mart

SWG   
Standard Wire Gauge

ToT   
Training of Trainers

TSC   
Total Sanitation Campaign

WASHi   
Water, Sanitation and Hygiene Institute

Part A

Facilitator's Guide
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Introduction

The Government of India and the State Government of Bihar have made a number of efforts to improve sanitation through a demand-driven approach that has involved communities and facilitated through provision of subsidies for toilet construction. Products are marketed through Rural Sanitary Marts and Production Centres to encourage the Sustained Supply chain that ensures continued access to affordable and appropriate sanitation hardware and services, but there has been limited progress in Bihar because of several barriers.

Barriers to the on-going Program

- Weak sanitation supply chains.
- Poor choice in latrine products and services.
- Poor access to credit.
- Entrepreneurs do not have the capital to launch/expand sanitation businesses.
- Lack of consumer focus on campaigns for improved sanitation.

The alternate strategy encourages that one of the sustainable ways of improving access to sanitation is to work in partnership with the private sector and apply commercial marketing approaches to create demand for sanitation. The case for sanitation marketing has been fully justified by Population Services International, India (PSI) in a Sanitation Landscape Study conducted in Bihar in 2012. The study had identified several barriers to overcome and sustain sanitation promotion.

Box.1 Sanitation Landscape in Bihar

- Executors of sanitation solutions may not have sufficient training (such as informally educated masons) to construct high-quality toilets.
- The Government subsidy program (TSC) instead of TSC it should be SBM-G provides financing for toilet construction primarily through CSOs, while some MFIs are providing private sanitation financing to the end consumer. Service providers for waste collection, such as manual and mechanized pit cleaners, face a lack of proper waste treatment and disposal sites.

Sanitation Landscape-PSI, Dec, 2012

Sanitation as a Business

Sanitation marketing could help to close the gap in access to sanitation facilities. To develop the sanitation market, suppliers need to make reasonable profits and consumers need to feel satisfied with the products and services that they are getting. Sanitation therefore needs to be treated like a consumer product: attractively packaged to suit various wealth categories and marketed.

Box 2
Customers are used to purchasing input materials from a variety of suppliers: sanitary hardware retailer (pan, pipes), brick kiln (bricks), cement retailer (cement bags), and/or cement ring manufacturer (cement rings).

After assessing and analysing key issues referred in the boxes 1 and 2, PSI proposed a private sector approach that will meet the sanitation needs of consumers: The 3Si also proposes capacity development of stakeholders to implement 3Si-Supporting sustainable Sanitation Improvements in Bihar through Supply-Side Strengthening.

1. About the Manual

1.1 Introduction

The Manual has been developed to facilitate capacity building of stakeholders viz., Masons, Rural Sanitary Mart Production centre Managers, Sales and Marketing personnel etc., to scale up marketing of Sanitation Technology and related products in 3Si: Supporting Sustainable Sanitation Improvements in Bihar. It also contributes to achieving an open-defecation free India by building human resources who understand sanitation.

Box 3  Common Misconceptions About Household Sanitation Programs

Misconception 1: Without Subsidies Most People Will Not Adopt Improved Sanitation

REALITY: People are buying latrines and most latrines have been installed by homeowners with no subsidy. An extremely poor minority (instead of minority, household word can be used) may lack the ability to buy a latrine by themselves, but most, with the right choices, knowledge, and perhaps community support mechanisms, will pay for their own latrine.

Misconception 2: Low Cost Is the Most Important Latrine Attribute

REALITY: There are always trade-offs in decision making, and it is increasingly clear that a cheap latrine of poor quality and that doesn’t meet the needs of the consumer will not sell. While favoured features will vary across cultures, several attributes appear to be particularly important and, to many, worth paying more for—minimal sight and smell of faeces, durability, ease of cleaning, operating performance, and safety for children.

Misconception 3: Capacity Exists for the Provision of Affordable Sanitation Options

REALITY: Supply-side service providers, such as masons and finance organizations, may exist in any given region, but they may not have the required skills to support appropriate sanitation solutions. Masons may be familiar with housing construction and drainage based on piped solutions, but not with improved latrine Technologies. Similarly, finance organizations may provide loans for home improvements but may not allow for latrine construction. These capacities need to be developed.

The Training Program aims to bridge the Misconception gaps by providing a step-by-step guide to scaling up social marketing of sanitation program and products.
1.2 Capacity Development Objectives

The overall objective of the training is to build the capacity of trainers and stakeholders of the program to facilitate the implementation of the Sustainable Sanitation Improvements in Bihar through Supply-side Strengthening.

The specific objectives of the training program are to enable stakeholders to:

- **Understand and apply** the principles and practices of social marketing of sanitation and products.
- **Acquire skills** to provide quality products and services with knowledge on sanitation technology and right attitude to promote rural sanitation through the implementation of the Sustainable Sanitation Improvements in Bihar.

1.3 Expected Outcomes

The training program is expected to lead to the following outcomes:

- Participants are able to distinguish between a traditional sanitation program and the marketing of a sanitation program.
- A pool of resource persons is created at strategic locations within a district, equipped with the skills and capacity in marketing and delivering sanitation products and services.
- A market for sanitation is developed and the supply chain strengthened.

1.4 Developing an Agenda for Training

This module is divided into units with activity sessions spread over 4-6 days (approximately). The approximate time required is given in the schedule in respective units. (Please refer annexe)

1.5 Session Plan

Each unit is divided into sessions that may include activity/exercises. Instructions on how to facilitate sessions are provided under the following headings:

- **Objective**- Time-**Method**- Materials- **Process** – **Learning**- Outcome-**Trainers’ Notes**- Reference Hand out in the form of Manual for each activity.

These instructions are intended as **guidance only**. Facilitators are encouraged to be flexible and modify the approach in line with energy levels and the enthusiasm of participants - without diluting the objectives of course!

1.6 How to use this manual

- Read through all the units and sessions. Follow the Guidance Notes and the reference chapter in the manual carefully to plan and conduct the sessions.
- Familiarize yourself with the objective and expected outcome of each session.
- Visualize and practice the activities until you feel comfortable.
- Use Reference Materials to fill knowledge gaps and deepen your understanding.
- Ensure materials, logistics are in place.

1.7 Training Process

- **Inputs** - trainers, participants, training materials, funding, and location.
- **Process** - training methods, facilitation skills, participation, etc.
- **Outputs** - trained participants, objectives met, products like visual aids, etc.
- **Impact** - the final result: changed behaviours, knowledge gained, improved quality of services by those trained, etc.

1.8 Evaluating the training program

Evaluation is an important component of any training program. You need to know whether the participants gained knowledge, acquired skills and changed their attitude (KSA) in relation to the organizational goal/performance. Tools of evaluation can be developed by the trainer, and different tools help evaluate different changes:

- **Knowledge** - Question and answer – Multiple choices Question – Choosing write answer
- **Skills** - Practical Observation- Doing – check list – structured activity observation
- **Attitude** - Rating scale – Question and answer – Observation in the field

1.8.1 Methods of Evaluation

- Pre and post evaluation – check participants KSA at the beginning of the training and again at the end to see how much impact you have had
- Daily feedback from participants – small checks everyday can help ensure you tailor the rest of the sessions as effectively as possible
- On-site observations using checklists – this is a simple and objective way to measure understanding and attitudes and skills
- Informal conversations – a lot can be learnt by asking people informally as some people are shy of writing down critical reviews

2. Need for Capacity Development in Sanitation Technology

2.1 Introduction

Sanitation is a ‘way of life’, which is expressed in clean home, clean village, clean food, clean business/institutions and clean environment for better health. Safe sanitary practice is a crucial indicator for quality of life of individuals and communities. Inadequate sanitation, open defecation coupled with open/damaged latrines and indicators that often reflect our poor quality of life.

2.2 Status

One third of rural households in Bihar have access to toilet, which is very much below the national average of 66%. The Nirmal Bharat Abhiyan (NBA)- The program has now changed to Swachh Bharat Mission - Grameen
Needs for Capacity Development in Sanitation Technology

2.3 Marketing of Sanitation Products and Services

Social Marketing is different from regular marketing because the purpose of social marketing is social benefit rather than commercial profit. Social marketing aims to bring about positive health and social change.

### Box 5: A Capacity Development Plan for Social Marketing of Sanitation Products

This includes:
- A summary of the training needs and identification of the people to be trained at all levels
- The overall objectives of the training program(s)
- A description of the training courses, including their sequence
- A description of the training materials that need to be adapted or developed from scratch for each training course
- A monitoring and evaluation plan
- An implementation plan that details what it will take to put the capacity-building plan into action.

Successful marketing recognizes that households seeking to solve their own sanitation problems are consumers, like any others, who make their own decisions and choices. Sanitation demand is defined as the aggregated choice of individual households to pay for and install home sanitation facilities. More important benefits are increased convenience, comfort, cleanliness, privacy, safety, and prestige offered by home sanitation.

To promote sanitation through social marketing, the strategy relies heavily on the "Four Ps"—Product, Place, Price, Promotion—and capacity to do marketing based on these.

- **Product**: Various toilet options with quality
- **Price**: Clear costing and pricing of various components.
- **Place**: Toilet Information/Sales Centre – accessibility for products and product installation - Information/Sales Centre
- **Promotion**: Creative development, Product launching - installation

### Box 4: Why Market Sanitation?

- Marketing ensures that people can get what they want at a price they are willing to pay.
- Marketing is financially sustainable, subsidy programs are not.
- Marketing is cost-effective and can be taken to scale.
- Direct provision of hardware is not enough; through a market purchase, sanitation goes to those who are more likely to understand its purpose and will value, use, and maintain it.
- The market already exists but may need targeted support to better serve the sanitation demand.

### Box 6

<table>
<thead>
<tr>
<th>Stakeholders</th>
<th>What</th>
</tr>
</thead>
<tbody>
<tr>
<td>Masons</td>
<td>Production, Installation, Advising and Motivation, Procuring materials</td>
</tr>
<tr>
<td>Rural Sanitary Marts/ Production Centres/ Retails Outlets/One stop Shops</td>
<td>Design, Production of Quality Products, Sales and Marketing products</td>
</tr>
</tbody>
</table>

Therefore, Capacity Development of the key stakeholders is important: Masons, Production centre managers, sales representatives, managers of the program. There should be enough qualified personnel to address the professional requirements. This means that the Training of Trainers (TOT)—followed by a training program for key stakeholders in sanitation marketing—becomes a part of the Social Marketing Strategy.

### 2.4 Supporting Sustainable Sanitation Improvements

This training module is part of the Capacity Development Plan and has been developed as part of a broader effort to stimulate local markets to provide affordable latrine technologies that respond to and incorporate important latrine ‘attributes’ in the project piloted by PSI in their 3SI - Supporting Sustainable Sanitation Improvements through Supply-side Strengthening Sanitation Marketing Program in 18 Districts in Bihar namely Patna,
Samastipur, Begusarai, Arariya, Bhagalpur, Darbhanga, Jahanabad, East Champaran, Khagariya, Lakhisarai, Madhubani, Munger, Muzaffarpur, Saharsa, Saran, Sitamarhi, West Champaran and Vaishali.

**This Module is on Sanitation Technology** focuses on the construction of quality toilets and will be useful for trainers and training institutions. It tries to impart the most relevant and appropriate skills to masons and other stakeholders to enable them to respond to consumer demand for latrine technologies and Products developed in the project area.

The module is organized in units that logically proceed through the construction process:
- Understanding designs
- Assembling and preparing materials
- Preparing moulds and mixing and pouring concrete
- Making products
- Placing the slabs
- Completing the latrine
- After-sales maintenance

Much information will be passed on through learning by doing in a practical situation.
3. Facilitating the Facilitator

This chapter explains the role, skills and techniques that the trainer/facilitator ought to consider before starting the capacity development/training program.

There are ten steps in planning a training/capacity development program. Each step can be cleared or moved forward by ensuring/answering the following questions.

**Box 7: What is the purpose of the training?**

- Who are the trainees/participants?
- What skills, knowledge and attitudes are we trying to develop among trainees?
- Who will conduct the training?
- When and how long will the training be conducted?
- Where will the training be held?
- How will the training be held?
- What resources are required to successfully conduct the training?
- What are the steps to evaluate the impact and how will you monitor the training?

The Facilitator must be very clear about the objectives of the training program. Objectives are very useful to evaluate the impact of the training in the organization. Read this manual carefully and check if you understand the objectives.

3.1 Knowing the Participants

No training program should proceed without knowing the participants. Understand their current knowledge and their responsibilities. The trainers must know about:

- Why are they attending the training program?
- What are their expectations?
- What is the expected outcome of the program? What are their concerns?

The answers to the above questions will assist the facilitator to choose the right kind of training methods and mid-course correction. Materials to help gather this information are included below - e.g. Activity A1.

3.2 Adult Learning Principles

Participatory learning always helps. Learning must come through experience: by seeing, by doing, by feeling and by evaluating. In other words, it comes from all five senses. In this training program, trainees are adults having experience of learning through their senses.

This training program uses 4 adult learning principles:

- By involving participants fully, openly without bias through participatory exercises
- By allowing their reflections through feedback
- By creating real-life situations to learn better – field observation, exercise
- By understanding the real problems in the field and solving through field exercise

3.3 Participatory Learning techniques

**I hear...I forget** - This applies to teaching somebody something. It means that if you simply tell (or talk) about something to a person/people, it is very likely that they will forget what was said.

**I see...I remember** - If you tell them “and” show them, they will more likely remember what was taught.

**I do...I understand** - If you involve them in a ‘hands-on’ activity/manner (where they ‘do’ what you are trying to teach them), they will fully understand – which means they will have totally “learned” whatever was being taught. (Ancient Chinese saying).

Some of the participatory learning techniques and tools used in this training program are listed here. The list is intended as a guide only. Trainers should be creative when using methods. Try to use drawings rather than words as much as possible. Use pictures, drawings, on board and so on.

3.3.1 Activity Profile

Illustrations/Example: Ask masons about their daily activities. Example - Where, when and how they constructed a latrine in a village? How they fabricated a cement ring for a circular pit? Facilitate them to list out their activities/write notes step by step.

3.3.2 Practical

Ask participants (e.g. masons) to list out requirements for constructing a toilet – Squatting platform, circular pit, fixing a door, precasting a slab etc.

3.3.3 Case studies

Discuss an imaginary or real situation from the village (e.g. a Production Centre having successful marketing) to encourage discussion on marketing strategies.

3.3.4 Community Surveys

a. Facilitate a rapid survey to assess the demand, condition of the toilets etc in the village.

b. Use problem situations to analyze advantages and disadvantages and possible solutions to a given situation. This can be done in a village survey, for example: Good toilets and toilets with defects/Single pit Vs double pit, Circular ring Vs brick lining. Hold a discussion on the issue.

3.3.5 Field visits

This can be combined with observation, learning by doing and hands on experience for skill development. Arrange a visit to a place of relevance to the group – e.g. to start a production centre activity; arrange a trip to a production centre and for constructing a toilet in a house.

3.3.6 Classroom

Combining all these methods with formal class room lectures using Audio Visual Aids reinforces the learning process. Pictures, posters, practical demonstrations – Dos and Don’ts – with demonstration all help people absorb new concepts.

_A picture is worth a thousand words. An observation is worth a million words!_
3.4 Checklist for field visits

*Preparing for Field-level Training

Selection of villages

- Are the selected villages located not very far from the training venue?
- Are the selected villages of average size so that maximum number of community members can be involved?
- Will the village-level functionaries be available to participate in discussions on the proposed dates of the field-level training?

The host community

- Does the community know you are coming and why?
- Are the field-level training dates and timing convenient for the host community?

3.4.1 Get a short village profile for each village selected for field study

This should include information on population, socioeconomic status, sanitation status (including usage of toilets), local customs and cultural practices, issues unique to the area (e.g., water scarcity, soil status or high groundwater table).

3.4.2 Logistics

a. Food and beverages

- Will trainees be eating at the workshop venue or carrying a packed lunch?
- Have arrangements been made for drinking water for trainees during the field-level training?

b. Transport

- How will trainees get to the selected villages?

c. Materials

- Have you prepared a field kit for each team with adequate supply of charts, markers, colour powders and construction materials?
- Do you have notebooks and pens for each participant?

d. Essential

Flip charts – Power point/film for discussion – Markers (different colours) – Stationery – writing pad, pen-folder – As per no. of participants – Masking tape – Scissors – Colour powders – Paper cards in different colours

3.4.3 Training Venue

Checklist: Training Venue

- Are there any potential sources of distraction?
- Are there enough power points to set up your electrical equipment?
- Will other people pass through the training venue?
- Are there adequate sanitation facilities for the participants?

3.5 Conclusion

The training aims to

- Enhance the knowledge and skills of the stakeholders on marketing sanitation products.
- Increase the awareness of stakeholders about new sanitation products and their quality.
- Enhance community participation in the overall programme.
Activity A.1: Introducing the Participants

1.1 Objectives

Break the ice at the start of the training program.

1.2 Time

30 minutes

1.3 Method

Paired Interviewing

1.4 Materials

Paper, pens

1.5 Process

- Explain that what we will be playing an introductions game to get to know each other better. Say that to play the game the participants need to form pairs.
- Pairs can be formed in many ways—e.g., one way is to give participants a chit with a colour/number/place and ask them to find their pair in the group (example: one person gets a picture of a toilet and has to find the other person in the room with a picture of a toilet—this exercise helps people overcome shyness and get everybody moving about).
- Once pairs are formed, ask participants to get to know their partner a little better by asking questions like:
  - What is your name?
  - Where are you from?
  - In the place that you live, what are the main issues of sanitation that affect you as far as the living conditions are concerned? (Awareness, Knowledge and Exposure to Household Latrines)
  - What types of latrines do you know of? Please mention.
  - How did you come to know about these latrines?

- After five minutes of interviewing each other, each pair should take turns to tell the rest of the group, summarizing the main information.

1.6 Learning Outcome

- Relaxes the participants and begins the process of them getting to know each other better and the facilitators—as well as to start thinking about their own experience of sanitation.

1.7 Trainers’ Notes

- Try to keep the tone of the session informal so participants can speak freely.
- This should be appropriate to the participants and fit with the time available.

Activity A.2: Learning about the Expectations of Participants

2.1 Objective

At the end of the session, the trainer must know the expectations of the participants.

2.2 Methodology

- Asking: writing and consolidating the expectations on a wall chart. The consolidated points are linked to the purpose of the training program through display and discussion. If the participants especially the Masons are not comfortable in writing, facilitate them to spell out their expectation and write them for consolidation. Modify the activity according to the field situation.

2.3 Time/Duration

20 minutes—after the introduction exercise

2.4 Material Required

- Writing materials, charts, flash cards (see annexure IV)

2.5 Procedure

- Give each participant a few blank cards and request them to write their expectations from the training.
- Tell participants that each card can contain only one expectation and it should be written in a short sentence of six to seven words in large size. A participant can use as many cards as desired and each participant should contribute at least one expectation.
- After participants have filled in their cards, bring all the cards with expectations to the centre of the room and request participants to stand in a circle, so that they can all see the cards.
- Tell participants that the expectations will be categorized by dominant themes (Knowledge, skill, attitude).
- Go through the cards one by one with the participants, reading out each expectation to the group, analyze the meaning, sort by dominant theme, discuss if it is possible to meet it.
- At this stage, share the training program objectives and schedule with participants, and discuss how this addresses their expectations.

2.6 Expected Outcome

The trainer and trainees will have a clear idea about the purpose of the training.

2.7 Facilitator’s Notes

- Trainer must be able to conceptualize the whole exercise before the start of the training. This session is vital and links to the other sessions. The facilitator can often refer to the list of expectations so as not to deviate from the purpose of the training.
Activity A.3: Program Introduction

3.1 Objective
At the end of the session, the participants must know:
The objectives of the project and the stakeholders’ roles and responsibilities regarding Masons and Production centre.

3.2 Methodology
Asking - writing and consolidating the responsibilities and tasks on a wall chart. The consolidated points are linked to the project through display and discussion.

3.3 Time/Duration
30 minutes

3.4 Material Required
Writing materials, chart paper, flash cards (20 cm x 10 cm size) and slides for presentation. (see Annexure V)

3.5 Procedure
After a presentation about the project, the participants are asked to form into 3 groups and to work as a group to match the colour flash cards:
- Blue cards (printed key points about the Project-Social marketing of Sanitation)
- Red card (printed stakeholders) and
- Yellow cards (printed with roles and task/responsibilities).
The Facilitator should help participants to ensure the flashcards are matched correctly and should clarify any points raised by the participants after placing the cards. These cards should remain in the venue till the training program isover.

3.6 Expected Outcome
The participants understand the programme/project and their roles and responsibilities within the programme.

3.7 Notes for Facilitator
At this point, many different ideas and insights have been generated about:
- what target households know, currently do, feel, and want regarding existing sanitation practices, products and services
- The strengths and weaknesses of the existing sanitation supply chain and its ability to effectively deliver what households want, need, and can afford.

It is now time to make sense of all of this new information: drawing it together to develop strategic insights that the team will use to identify possible opportunities and plan directions.

Hand out

Some of What We Need to Know About Demand for Sanitation
- Who makes decisions in the home about improving home sanitation?
- What defecation places and practices are people using now - including elderly, children, and ill people; including types and styles of latrines and methods of pit emptying and faecal disposal? Are there any potentially risky practices?
- Who are the households with unsafe sanitation facilities and practices, how many are they? How do they differ from those with safe and hygienic facilities and practices?
- What factors constrain investment in household latrines, e.g., financial, competing household demands and priorities (barriers and constraints)?
- How does the target audience communicate and/or find out about new ideas?
- What do consumers know and like/dislike about currently available options for improving sanitation (and if relevant, for pit emptying and sludge disposal services)?
- What are the most common health complaints in the area that relate back to sanitation?

Information about Supply of Products and Services
- What sanitation-related products and services are available, what are the sanitation products, identifying them? Where do they come from, and what do they cost? Who buys them?
- Who provides these products and services now (importers, manufacturers, wholesalers, distributors, retailers, service providers)? How are these products and services marketed?
- What skills do the current providers have or lack?
- What barriers would these businesses face in expanding to serve the new low-income markets of interest for sanitation marketing?
- What opportunities do these businesses see in expanding to serve new low-income markets of interest? Do they have the capacity to expand?
- What are the supply chains and prices for construction materials, components, and pit emptying services and how are these prices determined and set?
- What payment and credit systems exist for the payment of products and services?
- What formal and informal savings and loan systems are available for households to use for sanitation construction or for small-scale local businesses and independent service providers to expand/improve?
Annexure-I

The following "do's and don'ts" should ALWAYS be kept in mind by the trainer during any learning session.

DO'S
- Do maintain good eye contact
- Do prepare in advance
- Do involve participants
- Do use visual aids
- Do speak clearly
- Do speak loud enough
- Do encourage questions
- Do recap at the end of each session
- Do bridge one topic to the next
- Do encourage participation
- Do write clearly and boldly
- Do summarize
- Do use logical sequencing of topics
- Do use good time management
- Do keep it simple
- Do give feedback
- Do position visuals so everyone can see them
- Do avoid distracting mannerisms and distractions in the room
- Do be aware of the participants' body language
- Do keep the group focused on the task
- Do check to see if your instructions are understood
- Do evaluate as you go
- Do be patient

DON'TS
- Don't talk to the flip chart
- Don't block the visual aids
- Don't stand in one spot--move around the room
- Don't ignore the participants' comments and feedback (verbal and non-verbal)
- Don't read from curriculum
- Don't shout at participants

Annexure-II

Sample Pre and Post Training Evaluation Sheet
Please tick one of the choices given under each Question

Time 15 minutes

1. A toilet has to be constructed in higher elevation from the water source
   a. True  b. False

2. A toilet has water seal/P trap to prevent
   a. Bad odour  b. Fly breeding  c. Cockroaches  d. Don’t know

3. The pit of the latrine is easily lined with
   a. Bricks  b. RCC Rings  c. Stones  d. None of the items mentioned here

4. Open air defecation in your villages causes
   a. Cholera  b. Typhoid  c. Social problems like lack of privacy.  d. All the above

5. People like latrines when latrine materials are made available at their doorstep
   a. True  b. False

6. Marketing sanitary product needs Promotion
   a. True  b. False

7. Masons influence households about which toilet technology to choose
   a. True  b. False

8. The key to generating demand for sanitation lies in
   a. Increased  b. Improved  c. Behaviour change  d. None of the above,
      subsidy  technology

9. Women want to use toilet for
   a. Privacy  b. Health  c. Keeping village clean  d. None of the above

10. The squatting hole of the pan must be 9" ie 23 cms from the wall
    a. True  b. False

11. The depth of a leach pit is
    a. 1 mt.  b. 1.2 mts.  c. 2 mts.  d. 3 mts.

12. The minimum distance between two leach pits is
    a. Equal to the diameter of the Pit  b. Twice the diameter of the pit
       c. Twice the depth of the pit  d. None of the above
13. The cover slab of the pit requires 6mm rods for reinforcing the concrete
   a. True   b. False

14. Curing of the slabs requires
   a. 5 days  b. 10 days  c. 6 days  d. 2 days

15. Antiseptic solutions should not be used to clean toilets
   a. True   b. False

16. Aseptic tank construction requires secondary disposal of liquid coming out of the toilet
   a. True   b. False

17. The critical time for hand washing is/are
   a. Before eating  b. After using toilet  c. After handling  d. All the above

   a. Before eating   b. After using toilet   c. After handling   d. None of the above

18. The junction chamber of the latrine is to
   a. Divert the faecal matter after filling of the first pit
   b. Divert the faecal matter to the drain
   c. Use both the pits simultaneously
   d. None of the above

19. The colour of the pan influences household usage
   a. True   b. False

20. PSI/3i is a Government sanitation program
   a. True   b. False

---

**Annexure-III**

**A Model 5 Point Evaluation Sheet**

Name of the Participant  ___________________________  (Optional)

Rate each of the following statements as to whether or not you agree with them, using the following key
5 - Strongly agree, 4 - Somewhat agree, 3 - Neither agree nor disagree, 2 - Somewhat disagree, 1 - Strongly disagree

<table>
<thead>
<tr>
<th>What aspect</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Objective of the course is clearly defined</td>
<td></td>
</tr>
<tr>
<td>2. Objective of the unit is clearly defined</td>
<td></td>
</tr>
<tr>
<td>3. Course Materials are clear</td>
<td></td>
</tr>
<tr>
<td>4. Training methods are participatory</td>
<td></td>
</tr>
<tr>
<td>5. Training methods facilitated learning</td>
<td></td>
</tr>
<tr>
<td>6. I acquired practical skills</td>
<td></td>
</tr>
<tr>
<td>7. I can apply what I learned</td>
<td></td>
</tr>
<tr>
<td>8. The training site &amp; schedule were convenient</td>
<td></td>
</tr>
<tr>
<td>9. Please give one suggestion for improving the training Program (in one sentence)</td>
<td></td>
</tr>
<tr>
<td>10. What was the least useful part of this training (in one sentence)</td>
<td></td>
</tr>
</tbody>
</table>

Candidate’s Signature  
Optional
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Activity B.1: Brain Storming 59
1.1 What is Sanitation?

Sanitation denotes a ‘way of life’, which is expressed in

- Clean home,
- Clean village,
- Clean food,
- Clean business/institutions and
- Clean environment for better health.

The word “Sanitation” is used to define a package of health related preventive measures and the major preventive measures are:

- Safe human excreta disposal
- Personal hygiene
- Domestic hygiene
- Food hygiene
- Water hygiene
- Safe wastewater disposal and drainage

1.2 Health, Water Supply and Sanitation – Relationship

The relationship between health and sanitation has been acknowledged from the time of Vedas. In a tropical country like ours, one can see a large scale of sickness and death due to infectious diseases related to poor sanitation. If we compare the likely fate of 1000 infants born alive in India and a rich industrial one, of the one thousand infants, more than a quarter may fail to reach their fifth birth day in India. Approximately, one hundred of these infants die in the first year itself.
1.3 Why Safe disposal of Human Excreta

Inadequate sanitation, open defecation coupled with damaged latrines, are important causes for disease in rural Bihar. Less than 35% of households in Bihar have a toilet, compared with the 46.9% national average (Census 2011). Improving the situation calls for sustained commitment and a comprehensive and effective program to address the issues of sanitation. The Nirmal Bharat Abhiyan (NBA) and now the SBM-Gis a reflection of this commitment and seeks to improve the quality of life in rural areas through (the used data should be updated)

- Accelerated rural sanitation coverage,
- Awareness and health education

1.4 Why Household Sanitation?

Inadequate and insanitary disposal of infected human excreta leads to the contamination of water sources and drinking water supplies. It provides shelter to breeding flies and carries infection from one human's faeces to other human beings. All such diseases are controllable or preventable through good sanitary barriers i.e. through safe disposal of human excreta.

1.5 “F” Diagram

Causative organisms of the diseases may be virus, protozoa or worms, which can easily spread from person to person through faeces. From the F diagram, we can trace the various ways by which faeces reach the mouth i.e. from faeces to fluids, fingers, flies, food and fields reaching the mouth or a new host.

Faeces to fingers

Not cleaning hands after anal cleaning- then contact with children’s faeces, touching cooking vessels, drinking water and food with contaminated hands.

Faeces to flies

Open defecation, especially near kitchen areas, and the chance for flies to travel from dirt to food.

Open defecation near fields

Contaminating vegetables and fruits that are not washed before eating.

 Faeces to fluids

(water and other fluids)- Dirty hands at home and open defecation, or badly kept water sources.

Interventions may be brought in to interrupt this transmission. These opportunities to interrupt are classified into two major types, primary and secondary barriers.

Primary Barrier – Sanitary Latrines. Secondary Barrier – Hygiene practices, personal hygiene, water quality, food sanitation, vector control chlorination of drinking water

The technical objective of sanitary disposal of human excreta is therefore to isolate or segregate human faeces so that the disease-producing organisms in faeces cannot get into a new host through the common modes of transmission. The figure above shows the places at which the technology is applied to break the chain of transmission from human excreta. This technology is called sanitary barrier or sanitation technology for safe human excreta disposal. Feco-oral disease cycle can be broken by

- Segregating faeces and
- Providing protected drinking water supply and
- Keeping foods clean and
Controlling files and disposing waste water safely

Of these, the most effective method is the segregation of faeces and its proper disposal. The method is called "Sanitary Barrier". This barrier can be provided by a "Sanitary Latrine" and disposing the faeces into a pit.

Sanitary latrines are made to contain the entire waste material (excreta, urine and ablution water), which efficiently prevents contact, by human beings, flies or any other animals or insects.

1.6 What is a Sanitary Latrine?

Several models of sanitary latrines are now available. The models and types vary from place to place and people to people. One should not forget to choose a model that fulfills the criteria of a 'Sanitary Latrine':

- The surface soil is not to be contaminated.
- There is no contamination of ground water that may enter springs or wells.
- There is no contamination of surface water i.e. village pond, river, lack etc.
- Excreta is not accessible to flies or animals.
- There is no handling of fresh excreta; or when this is indispensable, it should be kept to a strict minimum.
- There is freedom from odours or unsightly conditions.
- The method used is simple and inexpensive in construction and operation.

Since, the households are the source of human excreta; therefore, household sanitation becomes important part of any sanitation drive to prevent open defecation.

1.7 Sanitation Services to households?

Household sanitation is of prime importance in checking the practice of open defecation and ensuring access to sanitary toilets for all people. The wide range of technological choices available make toilets affordable to households of almost any income level, and the range takes into account customer preferences, construction materials and capacities.

This is why developing supply chain services such as production centre (PCs), rural sanitary marts (RSMs), and trained masons is so important. The individual householder is then free to select the best technological options suitable to their local and economic conditions.

In addition to the specific supply-side interventions, additional activities will focus on demand creation to directly support suppliers (who will not remain in business without a return on their investment), including mass-media campaigns and branding.

Components of Toilets

2.1 Introduction

This section discusses the technologies for excreta disposal at household level. The World Health Organisation (1958) mentioned seven points for hygienic toilets. The points are still the same today:

- The surface soil should not be contaminated.
- There should be no contamination of ground water that may enter springs or wells.
- There should be no contamination of surface water.
- Excreta should not be accessible to flies or animals.
- There should be no handling of fresh excreta; or when this is indispensable, it should be kept to a strict minimum.
- There should be freedom from odours or unsightly conditions.
- The method used should be simple, inexpensive in construction and operation.

Therefore, we need a sanitary barrier and segregation of faeces to prevent contact between the 5Fs (see Unit 1, section 1.5). This segregation is done in a pit. Hence toilets are called the primary barrier to faecal borne diseases.

2.2 Components of a Sanitary Latrine

The toilet system consists of components like

- A squatting pan to receive excreta (faecal matter and urine)
- A trap with water to flush excreta smoothly in to connecting pipes and then to pit and prevent odour
- Connecting pipes - connects junction chamber or directly to the pit
- Junction chamber for diverting to leach pit for alternate use (optional for longer use and one time investment)
- Leach pit for holding faecal matter and for decomposition
2.3 Squatting Pan and trap

The Pan forms a very important item in toilet construction. There are various designs of pans available in the market. Pans with higher gradients need less water for flushing and so are very useful for two reasons:

1. Less water requirement
2. Increases the life of the pit

If rural pans are not available, the user can choose from what is available in the market.

2.4 Pits

The function of the pit is to isolate and store human excreta in such a way that no harmful bacteria are carried to new host.

2.5 Leach Pit

With leach pit technology, the faecal matter is aerobically digested and faeces are converted into water and gas and get absorbed/leached through the pores of the pit and the solids get decomposed into manure. This technology maintains the system under hygienic conditions that are free from odour and insect nuisance.

Pits may be circular, square, rectangular, raised above the ground level.

The pits are preferably lined as it holds the soil and prevents the pit from collapsing.

Lining may be done with honey-combed brickwall or perforated concretewalls.

Leach pits are generally provided at the back of the squatting pan. For circular pits, the minimum distance between the two pits should not be less than the depth pit.

In rare conditions like limited space and semi rocky areas, long rectangular pits may be constructed; or both pits can be clubbed together with a partition wall plastered on both the sides leaving the wall at the sloped side with honey comb bricks. The areas for percolation needs to be adequate and the dimensions have to be slightly increased as per the soil conditions.

2.6 Selection of pit Size

An amount of 1kg of wet weight per person per day is taken into account for calculating the pit design. This means that for building wet latrines a provision of 37 litres (1.3 cu.ft) per person per year should be sufficient.

Aerobic Digestion

Any decomposition/digestion of organic matter that occurs in the presence of oxygen, facilitated by aerobic microorganisms is called aerobic decomposition or aerobic digestion.

2.7 What happens in the pit?

- Bacteria present in the soil play a major role in decomposing the excreta
- Anaerobic digestion – in the absence of Oxygen takes place in a pit
- If the pit is directly/indirectly connected to the atmospheric air, aerobic digestion takes place in the presence of Oxygen
- In the leach pit no atmospheric air is present, hence anaerobic digestion takes place.
- The final product is Nitrogen, Ammonia, Nitrites and Nitrates
- Gases and salts leaches into the soil, Pathogens and ova are destroyed,
- The final product is rich in plant Nutrients which is small in quantity
- The amount of sludge (wet) after one year digestion period per person would be 36.5 litres
- The Effective Capacity of a wet pit latrines per person per year is therefore 37 litres or 1.4 cu.ft

For a porous soil, a pit for a family with 5 members needs to be 1.2 meters diameter with a depth of 1.2 meters. The pit may be directly or indirectly connected with pipes.

Box. 8 Key points

- Remember a dry pit latrine/compost latrine fills more quickly than a wet pit like leach pit.
- A minimum of 3 feet effective depth is a must for all leach pits
- The Pit should be located below and away from the water point
- Pit size and location varies from soil to soil.
2.8 Types of pits

2.8.1 Shallow Pit Latrines

People working on farms may dig a small hole and each time they defecate they then cover the faeces with soil. This is sometimes known as the “cat” method.

- Excavated soil is heaped beside the pit and some is put over the faeces after each use.
- Decomposition in shallow pits is rapid because of the large bacterial population in the top soil, but flies breed in large numbers and hookworm larvae spread around the holes.
- Hookworm larvae can migrate upwards from excreta buried less than 1 m deep, to penetrate the soles of the feet of subsequent users.
- The bacteria and viruses – pathogens can pollute ground water/surface water.

2.8.2 Single Pit Pour-flush Latrines

A latrine may be fitted with a trap – a water seal, which is cleared of faeces by pouring in sufficient quantities of water to wash the solids into the pit. A water seal prevents flies, mosquitoes and odours reaching the latrine from the pit. The pit may be offset from the latrine by providing a short length of connecting pipe from the pan to the pit. The pan of an offset pour flush latrine is supported by the ground and the latrine may be within or attached to a house.

Advantages
- Odour free
- Private
- Good health and hygiene practice
- Appropriate where water is available
- Long lifetime
- Low water requirements for flushing (1.5 - 2 litres)
- Construction and maintenance are cheap and easy
- Offset types can be adjusted in any type of dwelling without causing any smell nuisance
- Suitable for less populated areas where space is available
- Possible to upgrade it into a twin pit pour flush system (for offset type)

Disadvantages
- Water necessary for flushing
- Risk of groundwater and surface water contamination

2.8.3 Two Pits Pour Flush Toilets

The two pit pour-flush water-seal toilet system is technically appropriate, economically affordable and socio-culturally acceptable where people use water for anal cleaning. It is a technology where the toilet can easily be constructed by local labour and materials. It provides all the health benefits by safe disposal of human excreta on-site.

It requires only 1.5 to 2 litres of water for flushing, thus conserves water. There are two pits; size and capacity of pits vary according to the number of users. Both the pits are alternately used. When one pit is full, excreta is diverted to the second pit. In about two years rest period, the sludge gets digested and is almost dry and pathogen free, thus, safe for handling as manure.

Digested sludge is odourless and good manure and soil conditioner. It can be dug out easily by the owner and used for agricultural purposes. It can be upgraded and can be easily connected to sewers when introduced in an area.

2.8.4 Ecological sanitation

Eco Sanitation works on the principle that urine and faeces are not simply waste products of the human digestion process, but also an asset that if properly managed can contribute to better health and food production and reduce pollution.

Eco-sanitation latrines
- Store and prepare faeces for use in agriculture by encouraging the formation of humus by the addition of wood ash and/or soil;
- Allow urine to become fertilizer for agriculture - if the urine is separated off;
- Remove faeces and urine from the immediate environment thereby contributing to better health; and
- Are dry systems that make contamination of groundwater extremely unlikely

Various parts (components) of a Twin Chamber Ecosan Toilet

- Parts Cement Roof Slab
- Vent Pipe
- Ventilator
- Squatting Slab
- Squatting Slab 6'0" 3'0" 0'9"
- Foot Rest
- 0'9" 3'0" 4'8"
- Door
- Ventilator
- Squatting Slab
- Wooden Door
- Vent Pipe
- Squatting Slab 6'0" 3'0" 0'9"
- Foot Rest
- 0'9" 3'0" 4'8"
2.8.5 Septic Tank

Septic tanks provide an excreta treatment system in locations where a sewerage system is not available. For rural areas, the septic tanks offer a limited use, especially for locations with a high water table. However, for institutions like schools and dispensaries or families who can afford the cost and manage the quantity of water required, a septic tank system for excreta disposal could be considered.

The system consists of a water-tight settling tank with one or two chambers/compartments, into which waste is carried by water flushing down a pipe connected to the toilet which usually has a U/P-trap.

Construction Details of Septic Tank

Some of the solids float on the surface, where they are known as scum, while others sink to the bottom where they are broken down by the bacteria to form a deposit called sludge. The liquid effluent flowing out of the tank is, from a health point of view, as dangerous as raw sewage and remains to be disposed off, normally by soaking into the ground through a soak-pit or with a connection to small bore sewers.

On the surface of the septic tank, the aerobic digestion takes place. At the bottom of the septic tank, anaerobic digestion takes place.

The effluent from the tank is disposed off with a soak away pit as shown in the diagram.

2.9 The difference between a Leach pit and a Septic tank

<table>
<thead>
<tr>
<th>Leach Pit</th>
<th>Leach Pit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low cost, less space</td>
<td>High in cost</td>
</tr>
<tr>
<td>Needs little water</td>
<td>More space</td>
</tr>
<tr>
<td>Sludge handling easy- manure</td>
<td>Sludge handling difficult</td>
</tr>
<tr>
<td>No recurring cost</td>
<td>Recurrent costs for emptying</td>
</tr>
<tr>
<td>Pit emptying easy</td>
<td>Safe disposal of effluents- pollution</td>
</tr>
<tr>
<td>No mosquitoes</td>
<td>Mosquito menace</td>
</tr>
</tbody>
</table>
Sanitation Technology Site selection for a toilet

3.1 Constructional Features

The following are internationally accepted recommendations for placing household latrines. They take into account the physical site conditions like:

- Topography,
- Geology,
- Location of water sources, and
- Location of neighboring houses.

In general, a latrine should be:

- Located within the house to provide easy and secure access at night and in inclement weather conditions – the nearer the house the more usage.
- Easily accessed by a path;
- Located in a culturally appropriate part of the household plot—depending on the preference of household;
- Located so as not to cause problems with neighboring houses;
- Located in a spot that is not subject to surface run-off flows or ponding during rains;
- Situated at least 10 meters away from any well or surface water source and downhill site from the water source.
- Located in a spot that facilitates easy excavation of the most stable and deepest pit; and
- Constructed so that the pit is at least two meters above the highest seasonal water table.

However, the latrine construction starts with a dialogue amongst the household members and following points must be taken into account before finalizing the site:

**Box.9 Key considerations**

- Convenience and safety to the users
- Privacy of the users
- Protection of surface and ground water sources from potential pollution especially dug wells, bore wells
- Environmental considerations

3.2 Pour-flush latrine

The pour-flush water-seal latrine consists of:

- A squatting pan with a steep bottom slope (25° to 30°) / commercial pan
- A trap of 20mm water-seal set in a cement concrete floor. After use it is flushed by hand using a small container holding about 1 ½ to 2 litres of water. The excreta is carried through:
  - Two honeycomb pits lined by RCC rings or Leach pits

The liquid in the pits percolates and gases are absorbed by the soil, leaving the solids behind. The pits are used alternately; each designed to last for about 3 years (before it gets filled): when one is filled, it is put out of use and excreta are then diverted to the second pit. After about a year of not being used the contents of the filled pit become rich organic humus which is safe for handling. When convenient, it is emptied and the contents are used as manure. It is then, again ready to be put back into use – by which time the second pit is full and excreta needs to be diverted back to pit one to allow the decomposition cycle to continue.
3.3 Design and materials for squatting pan, trap and foot rests

3.3.1 Squatting pan
The squatting pan should conform to Indian Standard Specification (ISS) where the horizontal length of the pan should be at least 425 mm. The pan must be smooth, require less water for flushing and be more aesthetic.

3.3.2 Trap
The trap should be of a 70 mm dia with a 20 mm water-seal. The ceramic should be smooth. This needs less water for flushing.

3.3.3 Foot rests
Foot rests can be part of the pan or available separately. The size of foot rests should be 250 mm x 125 mm with 15 to 20 mm height.

3.3.3.1 Junction chamber and connecting pipe to pits
Should be connected to the pits either by a pipe or a covered drain. If a pipe is used, a junction chamber with a minimum internal size of 250 mm x 250 mm should be provided at the junction point.

Non-pressure AC pipe /earthen pipes of at least 75 mm. The slope provided should be 1 in 5 "to 1 in 15".

Bends and curves should be avoided in the drain. The inlet pipe or drain into the pits should project a minimum of 100 mm into the pits.

3.4 Leach pits - Size of Pits
Pits should be taken out of use when the solids reach about 0.50 m below ground level. The "life" of a pit is the time it takes for solids to fill up to that level.

The rate of solids accumulation in a pit depends on

- The nature of the surrounding soil
- The level of ground water
- The pit lining
- The texture of the pit, wet or dry

Assumed average accumulation rate of solids per /person/per /year are:

- 0.04 m³ (1.4 cu ft) in wet pits where water is used for flushing and anal cleaning
- 0.05 m³ (1.75 cu ft) in wet pits where water is used for anal cleaning.
- 0.06 m³ (2.1 cu ft) in dry pits (Latrines with separate wash area)

However it is likely that over several years, natural consolidation will occur. Pits are usually designed for use over periods of 10 years at an average.

Alternatively twin pits can be designed for periods averaging 2 – 5 years.

A pit design has to take into consideration all the factors mentioned above and be designed best suited to the local situation.

The size of a pit directly determines the period of time it can be used until it is filled up. The larger the pit volume, the longer it lasts. The volume of a pit depends on the cross section and the depth. Therefore, we can say by adhering to the specified cross-sectional dimensions mentioned above, the required volume of a pit can be achieved by changing the depth - the deeper the pit, more voluminous it is!

3.5 Pits in Different Soil Conditions

3.5.1 Types of Soil – Leaching capacity
Effluent infiltration through the walls of a pit depends on the type of soil and the level of groundwater. For pits above the groundwater table the absorption rates per square meter of the wall per day for different types of soils are as follows:

- 50 litres in sandy soils
- 30 litres in salty and loamy soils
- 10 litres or less in clay soils

3.5.2 Pit Capacity
The pit capacities (effective volume) for 5, 10 and 15 users with 3 years pit service, under dry and wet conditions are as follows:

<table>
<thead>
<tr>
<th>Number of Users</th>
<th>Effective volume in Cu.Metre for 3 years</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pit under dry condition</td>
</tr>
<tr>
<td>5</td>
<td>0.68</td>
</tr>
<tr>
<td>6</td>
<td>0.81</td>
</tr>
<tr>
<td>10</td>
<td>1.36</td>
</tr>
<tr>
<td>15</td>
<td>2.04</td>
</tr>
</tbody>
</table>
All the pathogens will be killed within about two years and thereafter cleaning can be organized - depending on the weather conditions and manure requirement. A minimum storage capacity of 3 years has been suggested for the leach pits to facilitate cleaning operations.

The household strengths of 5 or 6, 10 and 15 cover practically all Indian households. Based on three years cleaning interval, the recommended effective depth (distance between the invert level of pipe or drain and bottom of the pit) is 1.2 m and the diameter 0.9 m for 5 users.

The shape of pit can be circular, rectangular or a combination of the two. However, circular pits should be constructed wherever feasible as these are more stable and cost less. In places with space constraints, deeper pits with a smaller diameter (never less than 0.8 m dia.) or oval pits as shown above may be adopted. More than one latrine seat can be connected to a pair of pits provided the total number of users is not more than the capacity of the pits.

3.6 Location of Pits

The ideal location of the pits is symmetrically at the back of the latrine pan as shown in drawing above in section 3.5.2. However, where site conditions do not permit this layout, the pits can be placed on the side or even in front of the pans as shown in the drawings below.

The leaching pits should be located within the premises of the houses. Efforts should be made to construct them in open spaces or in the courtyard of the house, but if this is not possible, the pits can be located under the veranda or even under the squatting room where there is no space. (Seat over the Pit).

However, where it is not feasible to locate them within the premises, these may be constructed under a foot-path, or narrow lane and in extreme cases even under a road. For allowing the construction of pits under a foot-path, lane or road, the local authority should inspect the site and give approval for any such construction after being satisfied that it is not technically possible to locate the pits within the premises. No construction should be done before getting this approval.

3.6.1 Distance between two pits

The minimum space between the two pits should be equivalent to at least the effective depth of the pit.

3.6.2 Distance of leaching pits from existing structure

In many cases, the space available for constructing leaching pits may be small and placement of pits near existing structures may be unavoidable. The digging of pits and subsequent seepage may disturb the soil around the pits. The distance of the leach pits from foundations of existing buildings and the depth as well as the type of foundations of the building and the depth of the leaching pits planned.

<table>
<thead>
<tr>
<th>Types of soil</th>
<th>Total depth of pit</th>
<th>Distance of pit from the existing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clayey sand</td>
<td>1.30</td>
<td>0.22</td>
</tr>
<tr>
<td>(Sand &gt;50%)</td>
<td>1.73</td>
<td>0.43</td>
</tr>
<tr>
<td></td>
<td>2.05</td>
<td>0.60</td>
</tr>
</tbody>
</table>

3.7 In waterlogged areas

The pits should not be located in low areas where wastewater or rainwater is likely to collect around the pits. The top of the pits should be raised by 0.6 to 0.8 m above the ground level and earth filling done all around the pits up to a distance of 1.5 metres right up to the top. The raising of the pit top may require a raising of the latrine floor also. The pits should not be located in the drainage line.

RCC rings can be used instead of Bricks. But the procedure is the same.
3.7.1 Water pollution aspects

Before implementing the programme, it is essential to get proper information and complete investigations of the hydro geological conditions of the sites where the leaching pits are to be located. This will reduce the pollution risk to ground water and water distribution pipes.

3.8 Safe distance from drinking water sources

In dry pits or unsaturated soil conditions i.e. where the distance between the bottom of the pit and the maximum ground water level throughout the year is 2 meters and more:

- The pits can be located at a minimum distance of 3m from the drinking water sources such as tube wells and dug wells if the effective size (E.S) of the soil is 0.2mm or less; and
- For coarser soils (with E.S Greater than 0.2mm), the same safe distance can be maintained if the bottom of the pit is sealed off by an impervious material such as puddle clay or a plastic sheet and a 500mm thick envelope of fine sand of an effective size of 0.2mm is provided all round the pit.

In wet pit or saturated soil conditions i.e. where the distance between the bottom of the pit and the maximum ground water level during any part of the year is less than 2 meters:

- The pits can be located at a minimum distance of 9 meters from drinking water sources such as tube wells and dug wells in E.S of the soil is 0.2mm or less; and
- The sand envelope should be taken at least up to 2m above the possible highest maximum water level and the edges should be chamfered to see that no water stagnates on the top of the sand filling.
- In mound type latrines, 1m high earth filling should be provided for at least 0.25m beyond the sand envelope with the edges chamfered (cut off at the edges/bevelled) to lead away the rain or surface water; and
- Honeycomb brick work for the pit lining should be substituted by brickwork in cement mortar 1:6 with open vertical joints i.e. without mortar.

3.9 Lining of leaching pits

Leaching pits shall be lined with either brick work or RCC rings – or locally available materials.

3.10 Brick work

Pits within premises may be constructed with a honey-comb brick work lining. For the foundation, a layer of brick in 225 mm width should be laid, jointed with cement mortar 1:6. Over this, 75mm thick honeycomb brick work should be provided up to the bottom of the drain or pipe in cement mortar 1:6. The openings in the brick lining should be 115mm x 75mm when using 9"x 4½" x 3" sized bricks and 125 mm x 75mm when using bricks that are 10"x5'x3''.

- Where the leaching pits are very close to the foundation of the existing building, the width of the opening should be reduced to 12 to 15mm.
- In areas with sandy soil, the width of the openings should also be reduced.
- The thickness of the brick lining for the pits under the road or footpath should be 115mm. Solid brick work 75mm and 115 mm thick should be provided over the inverted level of the pipe or drain in pits within premises and outside.
- The thickness of the solid brick work in the shaft under the road should be 115 mm in 1:4 cement mortar.

Table 3

<table>
<thead>
<tr>
<th>Description of Material / Labour / Item</th>
<th>Quantity</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Sand</td>
<td>0.02</td>
<td>Cum</td>
</tr>
<tr>
<td>2. Stone Chips</td>
<td>0.04</td>
<td>Cum</td>
</tr>
<tr>
<td>3. Cement</td>
<td>0.25</td>
<td>Bag</td>
</tr>
<tr>
<td>4. Steel</td>
<td>2.5</td>
<td>Kg</td>
</tr>
<tr>
<td>5. Skilled labour</td>
<td>0.5</td>
<td>k-day</td>
</tr>
<tr>
<td>6. Contingency</td>
<td>1S</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Diameter & height of an RCC ring: 1000 mm x 250 mm

3.11 Use of rings for lining

The concrete ring is simple to make using prefabricated moulds. Rings are cost effective and are strong enough to be transported long distances without cracking and can immediately line leach pits easily without too much labour. The liquid from the pit will percolate and gases will get absorbed into the soil through the open joints and perforations in the rings.

3.12 Key Constructional Features

Before starting actual construction, mark the land where you want to construct a toilet using white rangoli powder. You need to mark out:

- Squatting Platform
- Junction chamber
- Outer circles of Leach pits
- Distance between two leach pits
- Stick indicating the depth of the pit for the family

Masons should keep adequate numbers of all materials at this disposal - squatting pans, traps, pipes, foot rests if required, cement and pre-cast slabs for covering the leaching pits and junction chambers - so that the progress of work does not get held up or interrupted.

- Standard drawings showing the various components are given in this manual. The depth of the foundation for squatting platform varies to suit the soil characteristics and other local conditions. For example, the top of the platform should be raised in areas prone to flooding.
The level of various units (squatting platform, junction chamber and pits) is determined keeping in view the slope.

3.13 Steps (Demonstration at Actual site)

Demonstration is critical to help the participants process this detailed technical information. Below are the works that participants need to see demonstrated first-hand:

- Foundation trenches are made and masonry construction carried out.
- The P-trap is placed in position and a spirit level is used to ensure it is water tight.
- The pan is fixed with the P-trap and tested for proper levelling and ensuring the water seal is correct by pouring water into the pan.
- The empty gap between the pan and the platform wall is packed firmly with soil. The water seal is tested by pouring water into the pan.
- The construction of platform is completed with masonry work as shown in the drawings.
- The outer sides of the platform are plastered with 20 mm thick cement mortar.
- The Y-shaped brick drain (75 mm wide) is laid at a slope of 1:10 to ensure easy flow of excreta.
- A 75 mm dia pipe maintaining the slope can also be used. This Y-junction should have a provision of flow diversion by blocking either of the outlets which could be altered when a pit is filled up due to prolonged use.
- Foot rests are constructed on the platform to facilitate use.
- Two leach pits are dug.
- 75 mm or 110 mm, brick lining is constructed.
- Alternative RCC rings can also be used for lining.
- The pit cover is made of a 50 mm thick RCC slab (with 6 mm diameter steel rods as reinforcement).

3.14 Squatting Platform - Fixing of pan, trap footrests

A squatting Platform 900 mm x 800 mm is sufficient.

- Mark the line using lime powder for 900 mm x 800 mm where you want to construct the platform.
- Make the foundation for 1 to 2 brick thickness.
- Fill the foundation with broken burned bricks/stone and add cement and sand in a ratio of 1:6 for the platform base.
- Height may be up to 400 mm.
- For water logged areas, you may need to raise the base.
- Fix the pan and trap using a levelling instrument on the platform.
- Fill the gap between the pan, trap and wall with a mixture of cement, sand and broken burned bricks.
- The squatting pan should be horizontal and flush with the floor and the rear side of the pan should be at least 200 mm away from the wall.
- The trap should be placed over a brick. The pan and trap should be joined with spun yarn soaked in neat cement and then caulked with 1:1 cement mortar. The joint should be made perfectly water tight.
- The squatting pan should be fixed on well consolidated earth with a 50 mm thick brick ballast padding and with a 20 mm thick layer of sand underneath the pan.
- Foot rests should be fixed while laying the floor and the tops should be about 20 mm above floor level.
- The floor should be smooth, impervious to water and durable with a 3% slope towards the pan all round to allow for easy cleaning.
- Plaster the platform with 1:6 cement and sand mixture.

3.15 Flooring

Concrete 1:6:12 (using graded brick ballast of 40 mm gauge) in 75 mm thicknesses should be laid for the sub-grade. It should be well compacted at a slope of 3 in 100 towards the pan. The floor over the sub-grade should be laid in two layers, the lower layer having 22 mm thick and the upper 3 mm thick.

The surface of the floor should be left for some time until moisture disappears from it. Mortar for top layer should be prepared by adding water to form a thick slurry and then should be laid and finished with a wooden or steel float. Curing should start from the next day and continue for at least 7 days. To make the toilet floor look more attractive tiles with a good grip can be fixed over the floor.

3.16 Junction Chamber

A junction chamber 250x250 mm should be constructed at the bifurcation point of pipes. The base concrete in 1:6 cement mortar. Walls should be built 115 mm thickusing bricks and cement mortar (1:6). Pipes should be embedded in the masonry. At the bottom of chamber, 250 mm thick cement concrete 1:2:4 should be laid sloping towards the pits, and the inner sides of the chamber should be plastered in cement mortar 1:4. The bottom should be rendered smooth with neat cement and the sides rounded off. Curing should be done for a week. After curing, the mouths of the two pipes joining to the pits may be blocked with a flat brick in weak cement mortar, and a precast RCC slab cover 325 mm x 325 mm x 40 mm may be placed over the chamber. Pre fabricated junction chambers can be used in place of a masonry chamber.

3.17 Connection to pits

The trap can be connected to the leaching pits through a connecting pipe for single offset pit. The leaching pits located within premises may be connected by a covered drain too. The junction chamber will be needed for double pits or when there is provision for a second pit.

A connecting drain must be constructed at a slope of 1 in 5 to 1 in 15.

The base concrete should be laid in cement concrete 1:6:12 (1 cement : 6 sand : 12 brick ballast of 40 mm gauge graded); or lime concrete 1:3:6 and over it a layer 25 mm thick of cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 stone grit 6 to 10 mm). Gauge should be laid in a channelled shape.

The drain sides should be constructed in cement mortar 1:6 (1 cement : 6 sand) The inner faces of the brick drain should be plastered with cement mortar.
1.4 (1 cement: 4 coarse sand). Curing should be done at least for a week. The drain should be covered by the bricks jointed in mud mortar after blocking the opening to one of the pits at the bifurcation point.

3.18 Pipe

Alternatively, a non-pressure AC pipe of not less than 75 mm dia / earthen pipes may be used. It should be laid at a slope of 1 in 5 to 1 in 15. The jointing of the pipes should be done in 1:1 cement mortar. The joints should be made watertight. The connecting pipe from the junction chamber from P-trap must be extended 50 mm - 75mm into the pit. The connecting pipes must be under the earth and must be well cushioned.

3.19 Curing

Curing of all cement or lime masonry work should be done at least for 10 days. However, in case of lime masonry, curing should commence after 2 days of its laying.

3.20 Superstructure for latrine cubicle

3.20.1 General

The latrine superstructure or the cabin provides the two main functions:

- Privacy to the user
- Protection to the user and the latrine from the elements.

3.20.2 Technical Requirements

The technical requirements of a latrine superstructure are relatively straightforward and may be summarized as follows (see the diagram).

3.21 Designing the superstructure

Size: The superstructure must not be too large but should fit the dimensions of the floor slab to discourage people from defecating on the floor. Provision should be made for

- An area of at least 8 square feet (0.74 sq.m) but not more than 15 square feet (1.4 sq.m)
- A roof of at least 6.5' (1.98 m) above the slab near the entrance door
- Other parts should be a minimum of 6' (1.83 m).

3.21.1 Ventilation:

Adequate cross ventilation has to be provided to dissipate odours. Openings could be left at the top of the walls. Often it is convenient to leave open spaces between the top of the door and the roof (1 inch), as well as at the bottom between the door and the floor. The ventilators can be fixed at rear and side walls.

Size = Height-1 ft, Breadth-1.5ft, Thickness – 2"

The door: The door should ideally open outwards in order to optimize the internal floor area. This choice is left to the user. Women may prefer an inward opening door for security as this can be held shut. The material chosen shall not endanger the privacy of the user. The bottom of the door needs to be sufficiently clear of the floor to prevent rot and decay but still ensure complete privacy of users. Always give choices for the door colour and shape – corrugated sheet / Ferro cement etc.

Size = 5½ ft x 3½ ft

Lighting: Natural light should be adequately available inside a latrine without compromising privacy.

The walls and roof: These must be weather proof, provide adequate privacy for the user, exclude vermin and be compatible in external appearance with the dwelling / house. The walls should ideally be lime / colour washed to give it a reasonable appearance.

3.22 Construction

A wide variety of building materials can be used to construct the superstructure. However, considering the longevity, durability and the appropriateness of these, the following can be recommended for use:

- Wall Burned bricks
- Cement blocks
- Ferro-cement
- Roof Corrugated GI
- Reinforced concrete
- Door and ventilator Timber
- Corrugated GI on a timber / Steel / Aluminium / steel frame
- Plain / Coloured GI sheet on a timber / Steel / Aluminium frame

The choice depends on the durability, cost, availability, affordability, geographic features in the area and the preferences of the customer. The important point is that the structure built should be functional, easy to maintain, last a long time and meet all the technical requirements discussed earlier.

3.23 Site clearance

Surplus materials and earth should be removed and the site cleared up immediately after completion of work – do not leave rubbish and unused materials behind.
3.24 Supervision

The technical person-in-charge should supervise the construction work in consultation with the house owner. After the construction is completed, he should inspect and check the entire work carried out by the Mason. However, special attention should be paid to the following points:

- The work has been carried out exactly as the layout agreed beforehand
- The pipes have been properly laid
- Size of leaching pits is in accordance with the standard design
- The size of openings in the lining of pits is as specified
- The house owner is satisfied
- Unused materials have been removed on completion

### Box: 10 Points to be remembered

- Where to locate the latrines.
- How to measure sizes – Size can be measured using a person’s arm, while a rope can be used to draw circles
- Start first with the squatting platform - superstructure
- Fix the pan, trap
- Join the connecting pipe
- Locate the Junction chamber
- Locate the pit, mark and dig
- Line the pit with rings/bricks as per specification
- Construct Junction chamber
- Connect the pipe to the pits
- The upper 15 cms of the lining must be plastered
- Cover the slab immediately
- Pack the sides properly
- Cure the structure wherever needed
- Construct the superstructure and accessories to the taste
- Make the walls with any material but should be made to give the necessary privacy
- One drain or pipe needs to be blocked with a seal that can be removed after some time so that the discharge from the squatting pan goes to one pit only.
- The latrine floor has been constructed and finished as specified.
- There is no blockage of the squatting pan and trap due to falling of the mortar during construction.
- The squatting pan, trap and foot rests have been fixed correctly.
- The entire work has to be in time and the house owner must be satisfied with the work.
4.1 Using the Latrine

The health of the family will not improve just by building a latrine. The members, including the children must use latrines instead of any open defecation. Very young infants should make use of potties and have their faeces disposed of in the latrine.

4.2 Maintenance of household latrines

Maintenance of a household pour-flush latrine is very simple. Day-to-day maintenance consists only of washing the latrine floor and cleaning the squatting pan.

- The squatting pan should be cleaned daily with a broom or a brush with a long handle after sprinkling a little ash/detergent powder.
- As little water as possible should be used for cleaning the floor as otherwise it will reduce the life of the leaching pits.

Inside the latrine, a container of 1.5 to 2 litres capacity should be kept filled with water. Help teach people of the household how to squat to use their new toilet best: their squatting position should be such that the excreta fall as near the centre of the trap opening as far as possible to avoid too much need for washing the pan afterwards. Before each use the surface of the squatting pan should be slightly moistened with water so that the excreta slide smoothly without sticking to the surface.

- Rain water and waste water from the bath or the kitchen etc. should not be allowed to enter the leaching pits or the squatting pan.
- Do not through any other waste like kitchen waste, sweepings, rags, sanitary napkins, cotton pieces etc. to avoid choking the squatting pan or trap.

Only one of the two pits is to be used at a time. After 1-3 years /when the first leach-pit is full (the indication being back flow when flushed), the discharge from the pan should be diverted to the second pit and the first pit should be allowed to rest and material within it decompose. Diverting discharge by changing which connection is blocked off can be undertaken by the householder or, if she wishes, make her own arrangements to have it done for her.

After the pit is filled and the latrine is connected to the second pit, the pit cover can be removed and soil to a depth of 150 mm should be filled in the first pit and the cover be placed in position again. Where earth is not available easily or the pit cover is difficult to remove then the earth could be added at the time of emptying the pit content. This makes it easier to handle.

When the first pit has been out of use for about 1 ½ to 2 years, it can be emptied by the householder. This can be done manually by shovel or auger. The contents will then be safe for handling, dry and without any foul smell. In special cases like in the flooded areas etc., the sludge that is taken out should be spread out in a bed for sun drying during the non-rainy seasons and utilized as manure.

4.3 Ensure the proper use of the latrine

Make sure all members of the household know:

- Clean the latrine at least twice a week
- Only use soft detergent for cleansing toilet not disinfectant. It prevents bacteriological action.
- Use the pan/hole provided. Do not pass excreta on the floor
- Latrine pan needs cleaning with brush made up of Nylon. Not with Antiseptic lotions
- Do not throw refuse /garbage such as grass and leaves from gardening or rubbish bin into the pit. These will fill up the pit quickly and cost money for replacing.
- Women should not throw sanitary napkins or cloths into the pan as these will block the P trap (and it may cost money to fix the blockage) plus the pads will not decompose effectively in the pit
- Pour a little water before using a dry pan in order to ensure that excreta do not stick on the surface of the pan.
- Close the door properly after use. This keeps the interior of the superstructure shaded.
- Wash hands with soap /detergent after using the latrine.
- Keep the surroundings clean.

4.4 Maintaining the latrine

A poorly maintained or malfunctioning latrine may be more dangerous to health than not using one at all. The maintenance requirements of latrines include:

- Ensuring proper drainage around the latrine at all times.
- Ensuring that the pit is completely sealed at the base; and in case of indirect pits, the pit cover must be in the proper position and must not leak.
- Check regularly:
  - for broken slabs and joints.
  - for collapsed soil around the pit.
  - that the cover of the inspection chamber / junction box is in position securely.

Always cushion the cover slabs with earth. No gap should be present between the slabs and the pit.

4.4.1 Some points for to stress again and again for householders about usage and maintenance

- The latrine is part of the house and should be adequately cared for.
- Use as little water as possible for cleansing – but make sure it is clean.
• No antiseptic/disinfectant should be used – this affects the decomposition
• No solid matters should be thrown into the pan – garbage or female hygiene products
• The water seal must always be filled with water
• The platform should be kept dry
• Adequate lighting and ventilation keeps the latrine spick and span
• Latrines provide privacy and promote health of everyone in the household
• Latrines help you save time and energy – they stop you catching lots of diseases that can be exhausting, dangerous, and cost time and money with doctors
• Family members are proud to own a latrine

Activity B1: Brain Storming

1. Objective
   - At the end of the session, the participants must be able to know the concepts and components of sanitation, its relationship to individuals' health and dignity.

2. Methodology
   - Brainstorming – power point presentation (see annexure 5) – Exercise

3. Time/Duration
   - 45 minutes

4. Material Required
   - Writing materials, chart paper, picture cards – seven components of sanitation– F diagram cards – discussion

5. Procedure
   - After brainstorming on what is sanitation, the participants are divided into three groups. First two groups are given a set of picture cards (see annexure 4) showing the source of infection, modes of spread of infection and effect of the spread of the infection. The third group is given F diagram pictures and the participants are facilitated to link the picture cards in sequence and at the end they are encouraged to explain the sequence they linked picture cards.
   - After this exercise the facilitator uses a power point presentation or simple picture cards to explain: What is sanitation? What is safe excreta disposal? Why sanitation is important?

6. Expected Outcome
   - The trainer and trainees will have clear ideas about sanitation and the importance of safe disposal of human excreta.

7. Facilitator’s Notes
   - Facilitate a discussion on
     - Fecal-oral transmission routes in a community.
     - Good and bad hygiene behaviours that are putting people at risk.
     - Primary and secondary barriers to block the transmission of disease.
   - At the end of this session, the facilitator can provide brief information on how poor sanitation impacts wellbeing: e.g., number of deaths caused by diarrhoea, the toll it takes of children’s lives. If possible, the facilitator should provide local examples of the impact on health, productivity and well-being: worm infestation.

Reference Materials: Unit 2 of the Manual
Activity B2: Sanitation Technology – Excreta disposal

1. Objective
   After completing this session, participant will be able to
   - Understand and explain the ways of safe disposal of human excreta
   - List out the sanitation technology

2. Methodology
   Exercise – presentation by participants and facilitator

3. Time/Duration
   Exercise in classroom – 30 minutes
   Field visit – 90 minutes

4. Materials Required
   Premade picture cards of sanitation technology for safe disposal of human excreta
   Field visit
   Power point presentation

5. Procedures
   Participant groups are given pictures of sanitation technology for excreta disposal.
   Pictures in Sanitary ladder and other similar pictures will be given. (Refer Annexure II in part B)
   Ask participants to get together and grade the best toilet using on sanitary latrine criteria.
   Field Visits – Organize a transect walk to observe the excreta disposal technology and the problems encountered in the transect walk. After the field visit, the facilitator should explain the concepts of safe disposal of excreta and what is sanitary latrine.

6. Expected Outcome
   The participants will understand the technology of sanitary latrine, characteristics of a sanitary latrine – whether technology adopted in the field is sanitary one or not.

7. Facilitator’s Notes
   Reference Material See Unit 2, 3 of the manual

Activity B3: Sanitation Technology – Components of Toilets

1. Objective
   After completing this session, participant will be able to
   - Understand and explain the components of a toilet system

2. Methodology
   Exercise – presentation by participants and facilitator

3. Time/Duration
   45 minutes

4. Materials Required
   Premade picture cards of sanitation technology for safe disposal of human excreta
   PSi products (Models or Actual products): Components of a toilet- Pan-Trap-Junction Chamber - squatting Platform-Leach pit- Honey comb lined pit
   Field visits
   Power point presentation

5. Procedures
   Participants are given picture of sanitation technology for excreta disposal.
   Ask the participants to identify the components of toilet and functions of various components in the picture cards /posters.
   Field Visits – Organize a visit to observe the components of a toilet in village to confirm the various components in real toilets explain how they function.

6. Expected Outcome
   The participants will understand the technology of sanitary latrine, characteristics of a sanitary latrine – and components and functions of each component

7. Facilitator’s Notes
   Reference Material Unit 2 and 3 of the Manual
Activity B4: Sanitation Technology

1. Objective
   After completing this session, participant will be able to
   - List out the tools and materials required for constructing various components of a toilet system

2. Methodology
   - Asking - writing down and consolidating the tools required for the construction of toilet. The consolidated points are linked to the construction details. Discussion with the facilitator

3. Time/Duration
   30 minutes

4. Materials Required
   - Writing materials, chart paper, picture cards - Actual Materials

5. Procedures
   - The participants are given flash cards (20 cms x 10 cms size). Ask participants to write down one tool and one material for constructing various components of a toilet system. Ask them to locate sources of the materials.
   - Facilitate participants to present their writings. Group them under various headings
   - Finally give the presentation showing various tools and materials. Facilitator now clarifies the points raised by the participants.

6. Expected Outcome
   The participants will list out tools and materials for actual construction of various components of a toilet.

7. Facilitator’s Notes
   Reference Unit 4 of the Manual

Activity B5: Sanitation Technology – Site selection for toilet

1. Objective
   After completing this session, participant will be able to
   - Know how to select suitable site for constructing various components of a toilet

2. Methodology
   - Observe participants and help them select a suitable site for constructing a toilet
   - Learning by doing – Field

3. Time/Duration
   30 minutes

4. Material Required
   - Measuring tape, colour powder – 1 meter sticks
   - Construction materials on the site for actual construction at village - house - school

5. Procedure
   - Ask participants to identify a house without a toilet. Facilitate the participants to discuss with the household’s members to choose a site for the toilet. Ask the participants to identify a suitable site for constructing squatting platform, placing, junction chamber, connecting pipes and site for pits. After identification, Ask them to mark out site for the various components of a toilet. Discuss the points with reference to Unit 4 Manual.
   - Finally give the presentation showing the various pros and cons of selecting a site for constructing a toilet and clarify any points raised by the participants.

6. Expected Outcome
   The participants will be able to select a suitable site for the actual construction of various components of a toilet.

7. Facilitator’s Notes
   Reference Material Unit 4 of the Manual
Activity B6: Sanitation Technology

1. Objective
   By the end of the session participants will be able to understand the best and suitable sanitation technology.

2. Time
   1 hour

3. Method
   Sanitation ladder

4. Materials
   - Sanitation ladder picture cards – Pictures of sanitation options
   - Visit to village

5. Process
   - Based on the local context, prepare a sanitation ladder indicating the type of sanitation options to choose from, ranging from 'least desirable', e.g., open defecation to 'most desirable', e.g., pour flush latrine, a sample of sanitation ladder is included in the Attachments.
   - Explain to the participants that the purpose of this visit to the village is to identify the sanitation ladder in the village.
   - Divide them into 3-4 groups.
   - Give each group an identical set of drawings/cards with different sanitation options depicted on them, with the words.
   - Ask the groups to match the existing sanitary practices and technology in the village with the ladder cards.
   - Agree with the groups on the time they will take to complete the task.
   - Now, visit each group and give them the next task.
   - Based on your experience in the field, classify where on the ladder the village you have interacted with is at present and where you would like it to be in a year from now. Discuss the opportunities and difficulties you may face in trying to move up different steps on the ladder.
   - Ask each group to explain their findings of sanitation ladder in the village.
   - Use this discussion as an entry point to discuss different technology options and the components required for rejuvenating the toilets or new construction.

6. Expected outcome
   The participants now understand the best possible technology for promoting sanitation and sanitary products. By the end of these modules, participants will be able to:
   - Identify different technological options.
   - Understand the criteria for choosing appropriate and affordable sanitation technologies.

7. Trainers’ Notes
   Refer Unit 4 of the Manual
Annexure – I

Most Preferred Latrine Type/Reasons for the Preference

Water Closet
- Most comfortable when defecating
- Water is inside for flushing and washing, you do everything from inside
- Easy to keep clean
- Long lasting

Latrine with cemented floor, brick walls, and iron sheets
- Easy to keep clean
- Long lasting / strong
- Cannot easily sink and therefore less prone to accidents
- Does not smell
- Easy to keep dry
- Prestigious and makes the home look beautiful

Characteristics of a Bad Latrine
- Bad smell
- Temporary structures susceptible to destruction by termites, heavy rains, and wind
- Lack of privacy due to absence of a lockable door and walls
- Lack of water for washing hands after a visit to the latrine
- Difficult to keep the floor clean and dry
- Poor ventilation
- Flies in the latrine
- Lack of a drop hole cover

Annexure -II

Sanitation Ladder

<table>
<thead>
<tr>
<th>Cost</th>
<th>Hygienic Sanitation</th>
<th>Improved Sanitation</th>
<th>Unimproved Sanitation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hygiene Enhancements</td>
<td>Latrines can be further enhanced with a washable cement floor, toilet house superstructure, and other desirable features</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minimum standard is a pit latrines with slab and water seal or flap</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minimum standard is a pit latrines with slab</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>For example, pit latrine without slab</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physically separates feces from the environment, but does not block transmission of pathogens</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physically separates feces from the environment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Disposal of solid waste in open spaces such as fields or bodies of water</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Open Defecation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health Benefits</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Trainers’ Manual on Sanitation Technology
Sanitation Products
and
Production Centre
Technology
5. Assembling and Preparing Materials

5.1 Introduction

5.2 Measuring Tools

5.3 Levelling tools

5.4 The Working tools

5.5 Materials Needed for construction

5.6 Qualities of Some materials

5.6.1 Bricks

5.7 Different kinds of mortar

5.8 Preparing Materials

5.8.1 Correct Sizing

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5.8.3 Handling


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6.3 Preparing the Concrete Slabs

6.3.1 Preparing the Site

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6.4 Mixing and Pouring Concrete

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6.6.1 Concrete cures in three stages

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7. Essential Components of Rural Sanitary Marts

7.1 Production Centres

7.2 Components of a Production Centre

7.3 Prerequisite for establishing a Production Centre

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7.5 Activities in a Production Centre

7.6 Various methods of pre-fabrication

7.6.1 Site preparation

7.6.2 Concrete Reinforcement (Iron Rods)

7.7 Demonstration Models in a Rural Sanitary Mart

7.8 List of tools and equipments required for a Production Centre

Activity C.1: Sanitation Technology - Making a Component for Toilet Construction

Activity C.2: Sanitation Technology - How to Prepare Moulds

Activity C.3: RSM / Production Centre

8. What is Social Marketing Sanitation?

8.1 Introduction

8.2 Social marketing is NOT

8.3 Marketing Mix

8.4 Marketing Strategy

Activity C.4: Role of Production centres in Marketing Sanitation Products

Activity C.5: Role of Masons in Sanitation Marketing

Reference

Frequently asked Questions

Suggested Schedule
5.1 Introduction
It is very important for a mason to know the tools and materials used for construction and he must be able to identify the tools and quality of the materials he uses in constructing a toilet system.

5.2 Measuring Tools
- **Tape measure**: Measuring tape of 10m/30 feet length is required
- **Pointing trowel**: A small flat blade with a wooden handle used for lifting mortar and spreading it.
- **Wooden float**: It is a smooth wooden piece attached to a handle and used for levelling, plastering, and smoothing.
- **Wooden levelling log**: A wooden log used for checking the levelling of walls.
- **Tube level**: A transparent tube which is filled with water to check the levels at different places.
- **Square**: It is required for checking that corners are creating right angles.

5.3 Levelling tools
- **Plumb rule**: A piece of wood (100mm x 15mm) with a thread passing through it for a length of 1.2m to 1.8m attached to a lead plumb weight. This is needed for checking the verticality of wall.
- **Spirit level**: It has a metal box with a glass tube containing liquid and an air bubble. It is used to check the horizontal level of the wall is straight.

5.4 The Working tools
- **Trowel**: consists of a steel blade with a wooden handle. The trowel is used for lifting mortar and spreading and rough pointing. It is also used for cutting bricks.

Trainers must obtain in advance all the tools and materials needed for building the concrete slabs, foundations and hand washing stations. This requires the trainers to familiarize themselves with the local vendors for the materials listed below.

5.5 Materials Needed for construction
- **Cement**
- **Sand**
- **Aggregate**
- **Plastic sheets**
- **Iron Bar: 8 mm or 10 mm**
- **Binding wire**
- **Bricks for foundations**
- **Waste Engine oil/Grease**
- **Nails**
- **Water**
- **Various moulds**

5.6 Qualities of Some materials
5.6.1 Bricks
1. **Appearance**: The good bricks should be perfectly cuboids. The surface should be smooth and even. The bricks should not have nodules, cracks and gaps. When broken the brick should show uniform grains without cracks.
2. Strength and hardness: the brick should not be easily scratched with finger nail. The brick should not break when dropped from a height of 1.2m.

3. Absorption: the good brick should not absorb more than 20% of water by weight.

5.7 Different kinds of mortar
- **Cement lime mortar**: Cement is mixed with lime to increase the workability. It is mixed in the proportion of: 1 cement: 2 lime: 9 sand.
- **Cement mortar**: Cement and sand are dry mixed in the required ratio and water is added to form a paste that is workable.

5.8 Preparing Materials
Several of the materials will require some sort of preparation prior to use, e.g., sorting, cleaning. Preparing the materials takes time. Plan and prepare accordingly, so that valuable time is not lost during training.

5.8.1 Correct Sizing
The aggregate will likely need to be broken down. For circular dome slabs, aggregate stones are between 6 and 10 mm. For rectangular reinforced concrete slabs, the aggregate can range from 6 to 14 mm. Use screens to sort the aggregate and ensure proper sizing.

Cut the iron reinforcing bars of 6 mm thickness to the required 99 cm lengths for ease of transport and work, as they are purchased in 12-metre lengths. It is easiest to cut them at the point of sale and the length needed for the square slab is 1m x 1m. Eight bars are required per slab. Be sure to take your own hacksaw with an extra blade to the point of sale.

Sand may need to be cleaned in advance. River sand is much cleaner than pit sand and usually does not require extra cleaning. When using pit sand, wash the sand since it typically contains silts and clays. Clean the pit sand by filling a bucket one-third full of the sand. Pour out the dirty water and repeat once. This process does use quite a bit of water, but it is important to have clean sand for strong concrete.

5.8.2 Treatment
When using wood or metal moulds for slabs, drop holes and foot pads, coat the surface that will be in contact with the concrete with either grease or used engine fuel. Grease is recommended. This will help to remove the mould more easily after the concrete has set.

5.8.3 Handling
None of these construction materials requires special handling. However, construction waste and leftover materials must be disposed of properly.

6.1 Introduction
Moulds are important for fabrication of various components of a toilet. Cover slabs, squatting slabs and cement rings are all produced using moulds.

Two types of moulds are required for the leach pits:
- A square wooden mould for the square reinforced concrete slab
- A round metal mould for the round slab

6.2 Moulds for Square/round Slab
The mould for casting a square slab is a **simple wooden frame**. Aluminium made screw type frames with internal measurements of 1m x 1m (1000 mm x 1000 mm) and a height of 40 mm. Picture shows a round and square mould for the reinforced concrete slab.

The inner piece of the mould is a round metal piece welded as shown (Picture). The outer piece of the mould is knocked down into **four equal arc shaped pieces** that can be fastened together at the joints using nuts and bolts (Pictures). This design permits the masons to disassemble the moulds after casting at one site for ease of transport to another site. Note how the inner and outer moulds are placed in perfect symmetry (Picture).
6.3 Preparing the Concrete Slabs

Steps involved in preparing a concrete slab include
- levelling the ground
- mixing the concrete
- assembling the moulds
- pouring the concrete into the moulds
- curing the concrete slabs

6.3.1 Preparing the Site

Slab construction is best done on flat ground and under natural shade. This will require cleaning and levelling the site for the slab as well as for mixing the concrete.

6.3.2 Circular Slab

Slabs are best built on plastic sheeting to help with moisture control during curing. When using the metal circular mould, leave the bolts a bit loose so that the mould lays flat.
- Place the inner mould in the exact centre of the outer mould.
- Use wet sand to form the shape to the dimensions.
- Compact the wet sand well with a small block of wood.

6.3.3 Laying the Mould for Square Slab

The mould for the square slab is made of wood/Aluminium/iron plate with inner dimensions of one square meter and fitted together by hammering nails at the corners; alternatively, screws could be used to facilitate assembly and breakdown. The mould is easy to assemble and dismantle for portability and is re-usable over a long period of time. The 8 or 10 mm iron bars are tied together using binding wire pieces according to the assembly and breakdown. The mould is easy to assemble and dismantle for portability and is re-usable over a long period of time.

6.4 Mixing and Pouring Concrete

- Mix the concrete according to the ratios 1:3:3. When mixing concrete by hand, mix the sand and cement well, and then add the aggregate.
- A hole should then be created in the middle of the pile of dry materials.
- Fill it with approximately 50% of the water. After mixing thoroughly, create another hole in the middle and add the rest of the water.
- Mix until consistency is achieved. It must be stressed that keeping the mix as dry as possible will produce the strongest concrete.
- Too much water weakens concrete mix.
- Compact the wet concrete to remove any air pockets.

6.4.1 Pouring Concrete for the Round Slab

The concrete must be thoroughly mixed as directed above—remember that aggregate must be from 6 to 10 mm for the dome slab and the mix must be kept dry. The drop hole mould must be greased and placed, and the inner face external ring mould greased as well.

Place the concrete first around the base of the outside mould and then carefully place it on the compacted sand base, moving around in rings working upward on the dome and finishing at the top. Placing the concrete in this fashion helps prevent collapse or movement of the wet sand base. Compress and tamp the concrete as it is placed to ensure there are no voids in the slab.

Slab thickness must be measured perpendicular to the face of the mould base. Maintain the 70mm thickness by placing the concrete in small amounts and working it quickly to the proper thickness, and then do not change this thickness during compaction and finishing (see Picture). After pouring the concrete, leave the mould in place for at least three days to avoid the uncured slab breaking.

6.5 Moulds of the square slab

First, fill the mould with concrete to a depth/thickness of 25 mm. Then place the reinforcement bars in the concrete. Make sure that the ends of the iron bars are completely covered by concrete, ensuring that they will not be exposed in the finished slab. Then place the final 45 mm of concrete. The concrete must be "rodded" to ensure that it completely covers the reinforcing bars.

6.6 Curing and Handling Slabs - Curing Concrete

After the first day, if a slab is kept moist for one to two weeks, the hardened concrete potentially doubles its strength.

6.6.1 Concrete cures in three stages

- Initial setting after casting, which takes between 45 minutes to eight hours;
- Final setting, for seven to 14 days; and
- Hardening, this takes up to 28 days.

At a minimum, keep the slab in one place while curing for the final setting period and only move it after the fourteenth day. It is recommended that the slab be left for 28 days before laying on the pit, although this can be done after 14 days.

The easiest way to keep a slab moist is to pour the concrete for the slab on a heavy black plastic sheet. This will stop moisture from being absorbed into the ground. Cover the slab with sand, and keep the sand reasonably watered, with the plastic sheet folded over the top of the wet sand to retain moisture. This way water is only applied every few days.

6.6.2 Handling

It is best not to move the slabs for the first five days after curing. However, since the concrete needs up to 14 days for curing, the best practice is not to move the slab at all until during this time.
6.6.3. Retrieving Mould

For a dome slab, shaped using the metal moulds, a minimum of five days are necessary before lifting the dome slab to retrieve the inner mould. It is very important to remove the moist sand placed atop the slab to keep it moist before lifting the slab as it adds a significant amount of weight, which can also cause breakage. The above moulds and slabs are suitable for direct pit latrines/the seat over the pit model toilets. Alternatively, a squatting platform can be constructed with a pan with a water seal and connecting pipes for pits. This is commonest type of Pourflush House hold latrines in Bihar.

6.7 Rings for lining

The concrete rings is simple to make using pre fabricated moulds according to the need/requirement. Presented here is acost effective method to make rings that are strong enough to be transported to long distances without any cracks and can immediately line any number of leach pits easily without much labour or cost.

![Two different moulds for RCC Ring making](image)

The liquid from the pit will percolate and gases will get absorbed into the soil through the open joints and perforations in the rings.

6.7.1 Step by step activity

- Prepare a level surface for an area about 2 X 2 m. Cover the surface with a polyethylene (plastic) sheet
- Make the formwork ready and place it according to the sketch
- Check the right angles for rectangular slabs
- Make the reinforcement bars ready and fix them according to the drawing
- Mix stiff concrete in ratio 1:2:4 (Cement: Sand: Stone)
- Make sure the casting platform is cleared of all debris
- Before arranging formworks, spread a thin plastic sheet or a clean large sheet of paper (cement bags could be used) on the platform
- Oil or grease the internal parts of the formwork
- Place formworks properly fixed - with provision for easy dismantling - on the sheeted platform
- Place steel in position (i.e. steel already tied)
- Mix concrete, using the proportion 1:2:4 (Cement: Sand: Stone), then place in the formworks making provision for at least half inch cover for steel both at bottom and top of the slab and compact gently making sure that the steel reinforcement remains at its correct position.

![RCC Ring made from the mould](image)

6.8 Pit covers

For covering the pits, reinforced concrete slab can be used. The covers should be designed for the expected load. For pits located within premises, the load taken should be the same as for roofs of residential buildings and for pits located under footpaths or roads, covers should be designed for light and heavy traffic respectively.
6.9 Materials required for cover slab for a common circular slab

- 6 mm rod – 2 No x 0.975mt
- 4 mm rod – 1 No x 3.0mt
- 4 mm rod – 4 No x 0.45mt
- 4 mm rod – 8 No x 0.425mt
- 4 mm rod – 1 No x 2.375mt
- 4 mm rod – 1 No x 1.150mt
- Total 11.725 mt i.e. 0.10 kg/mt + 1.2kg
- 22 SWG Wire mesh
- Cement mortar 1:2:5
- Cement = 12 kg
- Sand = 0.8 cft

6.10 Step by step activity

- Prepare a level surface about 2 x 2 m. Cover the surface with a polyethylene (plastic) sheet.
- Make the formwork ready and place it according to the sketch.
- Check the right angles for rectangular slab
- Make the reinforcement bars ready and fix them according to the respective drawing
- Mix stiff concrete in ratio 1:2:4 (Cement: Sand: Stone)

6.11 Casting procedure

1. Make sure the casting platform is cleared of all debris.
2. Before arranging formworks, spread a thin plastic sheet or a clean large sheet of paper (cement bags could also be used) on the platform.
3. Oil or grease the internal parts of the formwork.
4. Place the formworks on the platform and fix properly - ensuring they are easy to dismantle later.
5. Place steel in position (i.e. steel already tied).
6. Mix concrete, using the proportion stated earlier on i.e. 1:2:4, then place in formworks making provision for at least half inch cover for steel both at bottom and top of the slab and compact gently making sure that the steel reinforcement remains at its correct position.
7. When concrete begins to set, spread a smooth 1:1 Cement: Sand mixture on the surface, using a wood float and a steel towel to ensure the surface of the concrete smooth.
8. Make sure that the formwork for squatting and vent holes in the squat and vent slabs are removed when the concrete is half set and apply a trowel to smooth the surface. For the squat slab, the surface around the hole should slope towards the hole.
9. Cover the concrete and leave it damp for twenty four hours before removing the formworks.
10. Cure the concrete slabs (properly watered every day) for at least seven days before installation.

6.12 Concrete cures in three stages

- Initial setting after casting - takes between 45 minutes to eight hours
- Final setting - for 7 to 14 days
- Hardening - this takes up to 28 days

Keep the slab in one place while curing for the final setting period. It is best to leave the slab for 28 days before laying on the pit, although this can be done after 14 days.
Essential Components of Rural Sanitary Marts

7.1 Production Centres

Production Centres will produce the items required for construction of various sanitary facilities as an outlet using the local skill and available materials as well as stock materials and products. RSMs are retail outlet like shops where sanitary materials are stocked and sold.

7.2 Components of a Production Centre

- Store Room With Veranda
- Curing Tank
- Working Platform
- Shuttering
- Cement Mould
- Tools
- Water supply
- Display
- Status Report Format

7.3 Pre requisite for establishing a Production Centre

- Work shed (10 mt x 5mt = 50 sqmt) - brickwork up to plinth level, pucca colour, concrete pillars, GI/steel sheet roofing with one small storeroom
- Moulds for rings, squares, squatting plates, round squatting plates, pit covers, pan/traps etc.
- Curing vat: 3mt x 1.5 mt brick wall with concrete flooring
- Open space for brick soiling (7mt x 8mt size)
- Show room with publicity and marketing support

7.4 Materials of Production Centre and marketing

It is recommended that a Precast Centre be used to produce the different slabs to ensure consistently good quality and to provide easy access for household to purchase slabs.

Precautions required during production and transportation of pre-fabricated items

- Fix formworks properly and place them on the sheeted platform with provision for easy dismantling.
- Make sure that the formwork for squatting and vent holes in squat and vent slabs are removed when the concrete is half set and apply trowel to smooth the surface. For squat slabs the surface around the hole should slope towards the hole.
- Leave concrete covered and damp for twenty-four hours and carefully remove the formworks.
- Cure concrete slabs (properly watered everyday) for 14 days.

7.5 Activities in a Production Centre

7.6 Various methods of pre-fabrication

7.6.1 Site preparation

Use a central and accessible site of about 10mt x 5mt (i.e. 50 square mt) which is large enough to produce about 30 large slabs or 60 small slabs per day.

- Level the site properly and treat with 2 to 3" thick concrete base with a smooth screened surface.
Formworks
Wood/steel/aluminium frames with specific dimensions are required for the formwork and neatly fabricated to the correct dimensions.

7.6.2 Concrete Reinforcement (Iron Rods)
Determine the dimensions of reinforcement required for vent, cover, squat and sitting slabs. Another important material required at the precast base is reinforcing bars and binding wire.

Good quality precast concrete slabs require clean and well graded aggregates. It is therefore necessary to ensure the quality of the cement, sand, stones and water to be used for precast works. The normal proportion for the mixture for moulded concrete is one part of cement, two parts of sand and four parts of stones (1:2:4) by volume mixed with a quantity of water enough to assist the casting process.

7.7 Demonstration Models in a Rural Sanitary Mart

7.8 List of tools and equipments required for a Production Centre

<table>
<thead>
<tr>
<th>Items</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Right angle</td>
<td>1</td>
</tr>
<tr>
<td>Hammer (2 kg)</td>
<td>2</td>
</tr>
<tr>
<td>Trowel (Big)</td>
<td>3</td>
</tr>
<tr>
<td>Trowel (Small)</td>
<td>2</td>
</tr>
<tr>
<td>Trowel (Bilayeti)</td>
<td>2</td>
</tr>
<tr>
<td>Chisel</td>
<td>2</td>
</tr>
<tr>
<td>Spirit level (10&quot; long)</td>
<td>1</td>
</tr>
<tr>
<td>Jali cutter</td>
<td>2</td>
</tr>
<tr>
<td>Wirecutter (for 4mm Q)</td>
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<tr>
<td>Spade (Kudal)</td>
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<td>Mattock (Belcha)</td>
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<tr>
<td>Rusha (Wooden)</td>
<td>2</td>
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<tr>
<td>Patta (4’ long and 2’ long)</td>
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<tr>
<td>Bucket (Steel 121hrs)</td>
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</tr>
<tr>
<td>Mugor Jug (P.V.C.)</td>
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<tr>
<td>M.S. Gamala</td>
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<tr>
<td>Measuring tape (15 mtr)</td>
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<tr>
<td>Round brush</td>
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</tr>
<tr>
<td>Flat brush (3”)</td>
<td>2</td>
</tr>
<tr>
<td>Sieve for Sand Screening</td>
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</tr>
<tr>
<td>Balance with weights (up to 2kg)</td>
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</tr>
<tr>
<td>Shuttering for circular type squatting platform</td>
<td>1 set</td>
</tr>
<tr>
<td>Shuttering for rectangular type squatting platform</td>
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</tr>
<tr>
<td>Shuttering for cover slab</td>
<td>1 set</td>
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<tr>
<td>Shuttering for walls</td>
<td>1 set</td>
</tr>
<tr>
<td>Shuttering for pan fixing</td>
<td>1 set</td>
</tr>
<tr>
<td>Shuttering for foot rest</td>
<td>1 set</td>
</tr>
<tr>
<td>Office room Almirah, table &amp; chair</td>
<td>1</td>
</tr>
</tbody>
</table>
Activity C.1: Sanitation Technology - Making a Component for Toilet Construction

Preparing Moulds

C1.1 Objective
At the end of the session, the participant must be able to
- Select suitable mould for production of suitable product
- Cast a product

C1.2 Methodology
Facilitating the participants to select suitable moulds for each component of a toilet
- Learning by doing

C1.3 Time/Duration
25 minutes

C1.4 Material Required
- Measuring tape
- Moulds
- Junction chamber slabs for covering leach pits
- P trap – pan – ring moulds - bricks
- Construction tools and construction materials on the site for actual construction

C1.5 Procedure
- Ask participants to identify moulds and the product that can be made out of the mould - its use.
- Facilitate the participants to handle a mould and assemble the mould to make a product.
- Ask the participants to collect the materials required for making a product with the selected mould.
- Ask the participants to cast a product and discuss.
  The Facilitator then clarifies the points raised by the participants.

C1.6 Expected Outcome
The participants will know how to select the right mould and cast a product for installation of a toilet.

C1.7 Facilitator’s Notes
Reference Material Unit 8 of the Manual

Activity C.2: Sanitation Technology – How to Prepare Moulds

C2.1 Objective
After completing this session, the participant will be able to
- List out the tools and materials required for a preparing a mould for a cover slab
- Know how to prepare moulds for components of a toilet system

C2.2 Methodology
Facilitating the participants to observe and list out materials required for preparing a mould.
- Learning by doing – i.e. assembling and dismantling a mould

C2.3 Time/Duration
45 minutes

C2.4 Material Required
- Moulds
- Cement
- Iron Rods
- Sand
- Tools

C2.5 Procedure
The components of moulds are placed on the floor.
- Ask participants to identify what it is?
- Ask the participants to assemble, lubricate and place the mould on floor for ready use stage.
- Ask them to dismantle them and clean them.
- Ask each participant to write down one material for preparing the components of a toilet system using the mould. Discuss.
  Finally give the presentation showing various tools and materials.
  The Facilitator now clarifies the points raised by the participants.

C2.6 Expected Outcome
The participants will list out tools and materials for moulds for construction of various components of toilet.

C2.7 Facilitator’s Notes
Reference Unit 7 of the Manual
Activity C.3: RSM/ Production Centre

C3.1 Objective
At the end of the session, the participants must able to
- List out various tools required for Production Centre.

C3.2 Methodology
Visit to a RSM/Production Centre and ask questions. List the tools in the Centre and their uses in sanitation technology. Discuss its relevance in the marketing of sanitation.

C3.3 Time/Duration
20 minutes

C3.4 Materials Required
Writing materials - chart paper - Good Production Centre.

C3.5 Procedure
The participants are asked to transect the production centre and list out tools and equipments.
Ask each group then presents their key points.
The facilitator now clarifies the points raised by the participants.

C3.6 Expected Outcome
The participants will understand the various tools and equipment for the successful running of a PC.

C3.7 Facilitator’s Notes
The trainer must able to conceptualize the PC and quality products, and must be able to clarify the points raised by the participants.

C3.8 Reference technology module

What is Social Marketing Sanitation?

8.1 Introduction
Social marketing is a systematic approach to public health problems. It goes beyond marketing. It is not motivated by profit alone but is concerned with achieving a social objective. The aim is not simply to sell latrines, for example, but to encourage their correct use and maintenance.

The key components of social marketing are:
- Making produces, services, or behaviors that fit the felt needs of the consumers/users
- Strategic approach to promoting the products, services, or behaviors
- Methods for effective distribution so that when demand is created, consumers know where and how to get the products, services, or behaviors
- Improving the adoption of products, services, or behaviors and increasing the willingness of consumers/users to contribute something in exchange; and pricing so that the product or service is affordable

Note the following key points in this definition. Social marketing
- Uses commercial marketing strategies.
- Involves influencing voluntary (not forced or coerced) behavior change (not just increased awareness or increased knowledge). Promotes an end goal of improved personal welfare and improved welfare of society.

8.2 Social marketing is NOT
- Just advertising or communication.
- A media campaign.
- Reaching everyone.
8.3 Marketing Mix

The marketing mix, also known as the “4 P’s,” is made up of four parts that, together, create the exchange offered to the target audience.

Product:
What the audience gets or what you offer; can be tangible items, intangible benefits. In social marketing of sanitation, the product usually refers to the sanitation products like toilets, desired behavior i.e., owning and use of toilets; the benefits—i.e., better health and positive hygiene behavior.

Price:
What the audience gives up getting a tangible product; also the costs or barriers to making the desired behavior change. The price is the cost or barriers to owning the product and adopting the behavior.

Place:
Where the audience is located or gathers, performs the desired behavior, accesses. Products/services, or thinking or hearing about the health issue.

The concept of “place” includes both where and when the audience accesses products or services. Placement strategies can include offering services or materials in locations that are convenient.

Promotion:
Messages, materials, channels (path used to reach the target audience), and activities to promote behavior change and describe the product, price, and place features of the program.

All the 4 P’s are interrelated. If you change one, it is likely to have implications for the rest.

8.4 Marketing Strategy

The marketing man in sanitary mart must devise the product aimed at satisfying the certain dormant need for sanitary toilets by customers. The main objective is to educate them on the indirect benefits of using the product in terms of health, convenience and privacy. Once the product reaches the customer there is revenue, surplus, and profit. The first step in Marketing Strategy is to identify the target for market. Example is identifying the people without toilets.

Quality and Easy to construct Latrine may respond to these needs and make sanitation available to the masses by offering a product that is affordable, accessible.

Surveys have shown that people perceive the important benefits from improved sanitation such as:
- Convenience
- Social status
- Modernization
- Privacy
- Security
- Increased privacy and security can be a very important impact of improving sanitation facilities, especially for women and girls. Women and girls often wait until it is dark to defecate in areas where there are few or no sanitation facilities, and open defecation is the norm.

For a typical consumer in a Bihar village, installing a latrine or toilet the first time usually begins with:
- Awareness of the personal benefit of sanitation through exposure to sanitation products and adopters, ideally in a familiar home setting. Learn about available technologies, how they work, and what they cost.
- Collect advice and opinions from trusted sources like Sanitary ware shops and masons. Consult and negotiate with family or compound members about sharing costs and use, and seating of latrine.
- Evaluate alternatives, including doing nothing or waiting. A dual-purpose block of bath cabins and latrines over a single pit.

Then, they:
- Accumulate necessary cash. Search out pit diggers, experienced builders, detailed construction and operating information, costs of materials, and any required permits.
- Decide on design features and seating. Select a mason, negotiate prices, purchase and transport materials. Oversee construction.

These require a series of decisions before latrine construction actually begins. Consumers need to progress through most, or all, of the steps as illustrated above. This ‘decision ladder’ provides a graphic illustration that installing a latrine is not a simple option and consumers can get ‘stuck’ at any of the levels. Technological innovations spread slowly at first, because few consumers know about or understand them, but demand picks up as increasing numbers of consumers become familiar with the product.
Activity C.4: Role of Production centres in Marketing Sanitation Products

C4.1 Objective
At the end of the session, the participants must able to understand what a Production Centre is?

C4.2 Methodology
Visit to a RSM/Production centre- Asking- writing and consolidating the key points observed - Presentation by participant on its relevance marketing of sanitation. Brainstorming on responsibilities and task. Writing on wall chart. Discussion and clarification

C4.3 Time/Duration
60 minutes

C4.4 Material Required
Writing materials, charts, Good Production centre.

C4.5 Procedure
The participants are divided into 4 groups.

Group 1 is asked to transect the production centre with the sketch of the Production centre and key places indicating what is there and why is there?

Group 2 is given the task of listing the items produced- raw materials required –

Group 3 is given the task of listing the moulds, what products is developed from the mould- rough sketch

Group 4 is given the task of economics of PC/RSM – Collecting information and filling (attached)

Ask each group to present their key points.

Facilitator now clarifies the points raised by the participants.

C4.6 Expected Outcome
The participants will understand about the program/project and social marketing.

C4.7 Facilitator’s Notes
Trainer must able to conceptualize the project, its goal, objectives, target, quality product, roles and responsibilities of stakeholders and able to clarify the points raised by the participants.

C4.8 Reference
Unit 8 of this Manual-1 Technology and for details refer Manual-2 Marketing

<table>
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<th>Sl.No.</th>
<th>Details of material produced</th>
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<th>Value of finished product (A)</th>
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<td>Deduction For subsidy (E)</td>
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<td></td>
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<td></td>
<td>Cost of damage/lost produced material (F)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Net rolling fund available (G)</td>
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</table>

Status Report of Production Centre
(Illustrative only – Participants can enlarge the items)

<table>
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<tr>
<th>Name of Production Centre:</th>
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<tbody>
<tr>
<td>Reporting Period: ......... to ...........</td>
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</tbody>
</table>

Abstract
Value of finished product (A) =

Value of construction material (B) =

Cash available (C) =

Deduction For subsidy (E) =

Cost of damage/lost produced material (F) =

Net rolling fund available (G) =

Trainers’ Manual on Sanitation Technology
Sanitation Products and Production Centre Technology
Activity C.5: Role of Masons in Sanitation Marketing

C5.1 Objective
After completing this session, participant will be able to understand their role in marketing sanitation products for social benefits.

C5.2 Methodology
Brain storming and discussion on a case study.

C5.3 Time/Duration
30 minutes

C5.4 Material Required
Tutor presentation - Individual presentation Writing materials, charts,

C5.5 Procedure
Case study
“My name is Ramalal. I have been constructing latrines since 2007, and running a small store stocking latrine elements. Previously, I thought the latrine business could only be a side-business and that I couldn't make much profit. I had to go to the place and spend several days to build a latrine. I had to depend on many materials which I was not familiar with. I don't know what the right depth is and how to choose the right product for right soil. Many people told me that they can afford a latrine but they cannot find a place for it. After training, my capacity has increased significantly.

“With new latrine designs and marketing methods, I no longer have to rely on people to come, I'm going to them. Now I take little profit per latrine but I sell a lot of them, and the benefit is now much higher for me and my family.

On production matters, I see the improvement of production speeds with one inside mould and two outside moulds; I can produce 10 cement rings per day, compared to 4 cement rings per day before. Prefabricated materials allow the people to build latrines quickly. I learned about design and also about promotion by sales people and my business has grown to 30-60 latrines a month. Now, I earn more in a month. I realize that understanding a good design of latrine and good site management does not alone increase the latrines I sell. I can sell not only the latrine itself but also the latrine construction.

Present a similar case study i.e before training and after training.

Ask ... Who Ramalal is? What was his capacity before training and what was the impact of training on him? Ask what happened, why did it happen, how did it happen. What was his role in promoting sanitation now?

C5.6 Expected Outcome
The participants will understand their role and responsibilities in the NBA and in sanitation marketing.

Reference
1. USAID Hygiene Improvement Project, Academy for Educational Development Washington.
2. UNDP India Project IND/81/014
3. Michael Roberts, International Development Enterprises (IDE), The WSP
7. 3Si Concept Note, PSI India
8. Sanitation Landscape, Dec 2012, PSI India
9. Business Model Building Blocks, Dec 2012, PSI India
10. Stakeholders Workshop 1 Proposed Areas of Enquiry, September 10, 2012, PSI India
Part D

Frequently Asked Questions
Frequently Asked Questions

1. What do we mean by “sanitation”?
Sanitation is any system that promotes sanitary, or healthy, living conditions. It includes systems to manage waste water, storm water, solid waste, and household refuse and it also includes ensuring that people have safe drinking water and enough water for washing. Here we focus on the safe management of human excreta.
Sanitation includes both the ‘software’ of understanding why health problems exist and what steps people can take to address these problems, and ‘hardware’ such as toilets, sewers and hand-washing facilities.

2. What do we mean by “good sanitation”?
Good sanitation refers to the appropriate behaviour and practices of the people living in a specific environment. The people know to avoid contact with human excreta and to hygienically dispose of human waste.
The people’s behaviour displays a responsible attitude towards the hygiene of their families, the community, and the environment. By being a responsible and hygienic individual you make sure that you do not spread diseases.

3. Why does good sanitation matter?
The faecal borne epidemic diseases have focused attention on the importance of good sanitation in breaking the cycle of diseases spread by human excreta.
Sanitation matters for a range of other reasons too:
- privacy, dignity, convenience and safety for individuals.
- pollution impacts, especially on water sources.
- poverty reduction, through reducing vulnerability to disease and allowing low-income people to make better use of their resources.
For all these reasons good sanitation is an essential part of community development.

4. What is needed to achieve improved sanitation?
Toilets are an important part of achieving good sanitation, but without proper public understanding about why sanitation matters, and what is necessary to achieve good sanitation, toilets are not enough to break the cycle of disease.

5. What are the advantages of good sanitation behaviour?
- increased life expectancy with reduced morbidity and child mortality.
- savings in health care costs.
- reduced sick leave and higher worker productivity.
- better learning capacities among schoolchildren - increased school attendance, especially by girls.
- national pride.

6. What is sanitation promotion?
Sanitation promotion describes a number of different activities that make up an effective approach to improving sanitation. These include:
- Creating demand for better sanitation in communities through programs which raise awareness about why sanitation is important.
- Providing consumers with information about a range of sanitation options.
- Building and upgrading existing toilets.
- Promoting health awareness and safe hygiene practice.
- Providing users with information about their toilets to ensure that they are well maintained.
- Monitoring and evaluation to assess the impact of programs and suggest changes where necessary.

7. Who is responsible for better sanitation?
Good sanitation starts at home with individual household members taking responsibility for hygienic disposal of their excreta and household waste, and for good basic health practices. The local authority is responsible for ensuring safe disposal of the excreta and the waste of the community as a whole, as well as promoting hygienic behaviour.

8. What are the alternatives to conventional water-borne sanitation?
Sanitation technologies are often reduced to just two choices: full flush toilets, or ECOSAN. In fact, there are a range of alternatives in use in India – single, double pit pour flush toilets, ECOSANSSG (drying) toilets/urine diversion and so on.
There is no one ‘best option’ – each situation has its own needs and every technical option has its place and functions best in the environment it was designed for. Decision-makers need to familiarise themselves with these options, and understand their particular operating requirements, cost implications and limitations.

9. How does water supply impact on the choice of toilet technology?
Local governments need to think carefully about the kind of water supplies people in their area have because this has a big impact on the kind of sanitation systems that will be viable. The level of water supplies provided needs to match the sanitation technology.

10. What are the different technologies that 3Si uses?
Examples of sanitation technologies include simple (single) pit latrines, dual pit latrines, pour flush latrines. Communities and families are trained in all aspects of the correct usage and maintenance of latrines.
Suggested Schedule

Draft Schedule for 5 days – This can be done 4 days for experienced Stakeholders

<table>
<thead>
<tr>
<th>Session</th>
<th>Topic</th>
<th>Minutes</th>
<th>Methodology</th>
<th>Tools</th>
<th>By Whom</th>
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<tbody>
<tr>
<td><strong>Day 1</strong></td>
<td></td>
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<tr>
<td>09.00-09.30</td>
<td>Registration</td>
<td>20</td>
<td>Filling Form or register</td>
<td>Questionnaire</td>
<td>Facilitator</td>
</tr>
<tr>
<td>09.30-09.45</td>
<td>Pre test</td>
<td>10</td>
<td>By filling format</td>
<td>Questionnaire</td>
<td>Facilitator</td>
</tr>
<tr>
<td>09.45-10.00</td>
<td>Introduction of Participants</td>
<td>30</td>
<td>Activity</td>
<td>Exercise</td>
<td>Facilitator &amp; Participants</td>
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<tr>
<td>10.00-10.15</td>
<td>Objective of the Training</td>
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<td>Presentation and Power point</td>
<td>Discussion</td>
<td>Brain storming</td>
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<td></td>
<td>Programs, Dos and Don'ts</td>
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<tr>
<td><strong>Tea Break</strong></td>
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<tr>
<td>10.30-11.00</td>
<td>Learning the expectations of the Participants</td>
<td>30</td>
<td>Activity</td>
<td>Game and Exercise</td>
<td>Facilitator &amp; Participants</td>
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<tr>
<td>11.00-11.45</td>
<td>About 3SI</td>
<td>45</td>
<td>Activity</td>
<td>Game and Exercise</td>
<td>Facilitator &amp; Participants</td>
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<tr>
<td>11.45-12.45</td>
<td>What is Sanitation? (Linkages between good sanitation and water also define in the suggested session)</td>
<td>60</td>
<td>Presentation and Discussion</td>
<td>Power point Discussions</td>
<td>Facilitator &amp; Participants</td>
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<td><strong>Day 2</strong></td>
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<tr>
<td>09.00-12.45</td>
<td>Sanitation Technology Site selection for a toilet</td>
<td>165</td>
<td>Presentation Discussion</td>
<td>Facilitator &amp; Participants</td>
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<tr>
<td><strong>Lunch</strong></td>
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<tr>
<td>02.00-03.00</td>
<td>Continue from before lunch</td>
<td>60</td>
<td>Activity</td>
<td>Game and Exercise</td>
<td>Facilitator &amp; Participants</td>
</tr>
<tr>
<td>03.00-03.45</td>
<td>Sanitation Technology - Components of Toilets</td>
<td>120</td>
<td>Presentation Discussion Activity</td>
<td>Class room Field visit and field exercise</td>
<td>Facilitator &amp; Participants</td>
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<tr>
<td>04.45-05.15</td>
<td>Tea and Reflection of the day</td>
<td>30</td>
<td>consolidation</td>
<td>Class room</td>
<td>Facilitator &amp; Participants</td>
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<td>Presentation Discussion</td>
<td>Facilitator &amp; Participants</td>
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<td>09.45-10.45</td>
<td>Activity How to construct a toilet Field based</td>
<td>120</td>
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<td>Facilitator &amp; Participants</td>
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<td><strong>Tea break</strong></td>
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<td>11.00-12.45</td>
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<td>Presentation Discussion</td>
<td>Facilitator &amp; Participants</td>
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<td>09.00-09.30</td>
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<td>Presentation Discussion</td>
<td>Facilitator &amp; Participants</td>
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<tr>
<td>09.30-09.45</td>
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<td>15</td>
<td>Consolidation by discussion</td>
<td>Class/Field</td>
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<tr>
<td>09.45-10.45</td>
<td>Sanitation Technology Making a component for toilet construction</td>
<td>160</td>
<td>Activity-11 Making components of toilet moulds</td>
<td>Field hands on experience</td>
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Note: All times are in hours and minutes.
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<thead>
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<th>Time</th>
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<td>Essential Components of production centers</td>
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<td></td>
<td>Tea Break</td>
<td></td>
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<tr>
<td>11.15-12.45</td>
<td>What is marketing Sanitation?</td>
<td>60 mts</td>
<td>Activity Role of Production Centre in Marketing Sanitation</td>
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<td>Sanitation marketing through Turnkey Solution providers</td>
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<tr>
<td></td>
<td>Lunch</td>
<td></td>
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<tr>
<td>02.00-03.00</td>
<td>Continuation from morning</td>
<td>60 mts</td>
<td>Activity Role of Masons in Marketing Sanitation</td>
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<td>03.00-03.45</td>
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<td>45 mts</td>
<td>Activity Marketing sanitation Products</td>
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<td>03.45-05.00</td>
<td>Reflection</td>
<td>15 mts</td>
<td>Consolidation by Class/Field discussion</td>
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*Trainers' Manual on Sanitation Technology*

*Suggested Schedule*