Training Module for SLMTs on LSDGs

VOL I/II/III

Theme 5: Clean and Green Village

(Creating a village for the future of our children, which is lush and green with nature's bounty, using renewable energy, clean, protecting environment and climate resilient)

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Centre for Panchayati Raj, Decentralized Planning & Social Service Delivery (CPRDP&SSD)

National Institute of Panchayati Raj & Rural Development

Rajendranagar (NIRDPR) - Hyderabad

Foreword

In our pursuit of sustainable development and the realization of the United Nations' Sustainable Development Goals (SDGs), the localization process plays a pivotal role. It involves careful consideration of thematic targets and indicators at the local level, integrating them into our local planning efforts. The significance of localized SDG targets cannot be overstated, as they serve as guiding beacons for Panchayats in formulating and executing their Gram Panchayat Development Plans (GPDP). The successful implementation of these plans is crucial for achieving the SDGs by the year 2030.

One of the key focus areas under Localized SDGs is Theme 5 – Clean and Green Village. The foundation of every village's progress lies in having essential infrastructure to cater to its basic needs, paving the way for sustainable growth. To ensure effective service delivery, infrastructure pertaining to water, sanitation, housing, health, education, clean energy, agriculture, and allied services are imperative for attaining the envisioned SDG targets.

As an esteemed apex training institution, the National Institute of Rural Development and Panchayati Raj (NIRDPR) is taking a proactive role in empowering State-level Master Trainers (SLMT) through Training of Trainers (ToT) sessions. These SLMTs, in turn, will impart knowledge and skills to District and Block-level Master Trainers, following a cascading approach. The primary objective of these training sessions is to equip Panchayati Raj Institutions (PRIs) with the expertise to meaningfully align GPDPs with SDG targets, fostering effective and impactful local development.

In pursuit of standardizing learning material, we are pleased to present the comprehensive module on Clean and Green Village, developed Dr.R.Chinnadurai Associate Professor of the Centre for Panchayati Raj, Decentralized Planning, and Social Service Delivery (CPRDP&SSD) at NIRDPR. This module is divided into five parts, encompassing the Training design, Session-wise FAQs, Session-wise learning material, MCQs for pre and post-training evaluation, and links to videos related to Theme 5.

We are confident that this module will prove to be an invaluable resource for the Faculty of NIRDPR and the SIRDPR during the training of Master Resource Persons on Theme 5 of Localization of SDGs. Together, let us march forward on the path of progress, leaving no village behind, and realizing the vision of a better, inclusive, and sustainable world.

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Part - I: Objectives, Targets and Indicators for CLEAN and Green GPs

1.1 Training approach in LSDG on Clean and Green for State Level Master Trainers (SLMTS)

Sustainable Development is a shared responsibility. It is the overall responsibility of the community to act equally in achieving the goals. The concept of Clean and Green Villages should spread at the grassroot level so that the threats and after effects of various natural disasters should not affect the local community.

1.2 Objectives of the Clean and Green Village

1. Local Government should take necessary actions to make the community aware on how to respond to various natural disasters and thereby creating a sustainable world. In this context awareness related to sustainable development goals and its local indicators should be made understood.
2. The main objective of the training approach should be empowering the local governments to realize their roles and responsibilities in achieving Clean and Green Village.
3. Training should also make the local government understand that these are already included in the constitutional framework.
4. There are already so many activities and programmes undertaken by the local governments related to Clean and Green within their limitations. In order to scale up these activities and programmes both in quantity and quality, the existing schemes of both Central and State Government can be used to attain a clean and green village.
5. The conceptual and operational understanding will enable them to develop a long term and short-term activities linking to the GPDP planning cycle.
6. In order to achieve the long-term goals, the short term goals should be monitored by quantity and quality measures on a continuous basis under the local government through which it will make the community capable of achieving the goal.

1.3 Targets and Local Indicator Framework for Clean and Green Village

As detailed in the module, there can be a minimum of 17 targets for GPs to achieve Clean and Green village status.

	Targets	Local Indicator Framework (LIF)
1	Provide access to Sanitation in the villages	1. Percentage of functional IHHL Toilets 2. Percentage of population that does not have space for construction of toilets covered by community toilets 3. Percentage Availability of toilets separately for men and women at public buildings, Schools, markets, Anganwadis (child friendly toilets)
2	Achieve ODF Sustainability	4. Percentage of community and institutional toilets having a toilet designed for Divyang (Disabled) 5. Percentage of community and institutional Toilets having water facility & soap for hand washing. 6. Whether the public and institutional toilets are kept clean
3	Solid Waste Management	7. Percentage of HHs segregating the dry and wet waste 8. Percentage of Institutions and businesses segregating the dry and wet garbage 9. Whether the Scientific disposal / recovery of non-biodegradable wastes (plastic, glass, metal, etc.) 10. Whether the Scientific treatment of biodegradable Waste 11.Whether the Safety measures followed for the sanitation workers in GP
4	Liquid waste management	12. Percentage of households having access to safe toilets 13. Percentage of households having no litter around them 14. percentage of houses having no stagnant waste water around them 15. Percentage of public places having no litter around them.

5	Use clean energy in the panchayat	16. Percentage of Renewable Energy used for: a. streetlights b. Pump sets 17. Proportion of lighting systems using LED lights including street lights
6	Achieve the environmentally sound management of chemicals and all wastes throughout their life cycle	18. Percentage of net area under organic Farming 19. Percentage use of nitrogenous fertilizer to total fertilizer (N, P & K)
7	Substantially reduce waste generation through prevention, reduction, recycling and reuse	20. Percentage of households connected to some form of sewage treatment system 21. Whether waste water treated 22. Whether Solid waste regularly collected, segregated and recycled 23. Proportion of HH using waste water as grey water 24. Has the panchayat banned single use plastic?
8	Effectively regulate harvesting and end overfishing, illegal, unreported and unregulated fishing and destructive fishing practices	25. Whether GP has taken steps for Sustainable fishing? 26. Whether Community ponds used for fisheries
9	Increase scientific knowledge, develop research capacity and transfer marine technology	27. Allocation of budget resources for fisheries sector 28. Number of Training on adaptation of scientific technology to preserve marine life for the Elected Representatives & other Stakeholders
10	Provide access for small-scale artisanal fishers to marine resources and markets	29.Whether there is adequate infrastructure facilities for fishing 30. Percentage of Fishers in Fish Farmer Producers organization (FFPOs) 31.Percentage of Fishers having received any assistance from Govt for improvement in Fisheries
11	Ensure protection of water bodies, wet lands, forests from pollution,	32. Proportion of tree cover to total geographical area

	encroachment and Indiscriminate usage.	33. Number of standing committee / working committee constituted for restoration of natural conservation 34. Is the People Bio-diversity Register is updated? 35. Are steps taken by the GP to prevent soil erosion? 36. Percentage of restoration of water bodies in the hilly areas
12	Ensure conservation of forest, barren lands, public lands	
13	Promote Community based management of natural resources	
14	Promote the implementation of sustainable management of all types of forests	37. Number of plant nurseries created in the panchayat 38. Number of Trees Planted under Social Forestry Program in the Village 39. Proportion of Area in high slope areas, barren lands and other common lands covered by trees. 40. Percentage survival of Trees planted under social forestry program in the village 41. Whether the nurseries created in the school in the GP
15	Combat desertification, restore degraded land and soil	42. Percentage of fallow area restored. 43. Percentage increase in net sown area
16	Take urgent action to end poaching and trafficking of protected species of flora and fauna	44. Number of cases registered under the Wildlife Protection Act, 1972
17	Mobilize significant resources from all sources and at all levels to finance sustainable forest management	45. Percentage of local government spending on environmental protection

Part - II: Training Approaches and Session Topics

2.1 Approaches for the current training

There are three approaches for training of Master trainers in imparting selected theme of LSDG.

- Introducing the SDG theme 'Clean and Green village' and identify relevant targets for GPs and enable them to prepare plans.
- Placing of targets for GPs in a right based frame and prepare plans
- Identification of relevant targets for GPs related to the SDG theme 'Clean and Green' and prepare plans.

In the present module, these three ways are combined. 'Clean and Green village' is an inter-sectoral theme. This theme has several sub themes as well. These sub-themes are referred here as targets for GPs. Rather than straight dealing with SDG targets for GPs related to 'Clean and Green', panchayats are first given basic introduction to clean and green, role of GPs in Clean and Green realization and relevance of SDGs.

2.2 Training Objectives

Promotion of Clean and Green environment is the overall training objective.

The specific training objectives are given below:

1. To orient the trainees on the subjects, strategies and need for creating "Clean and Green" and Enable them to assist the GPs to plan and implement strategies.
2. To make the participant to understand the issues and problems related to Natural resources management, solid and liquid waste management, controlling of various pollution, deforestation and over exploitation of natural resources.
3. To orient the trainees on the goals and targets related to "Clean and Green GP"
4. To Familiarize the trainees with the LIF related to "Clean and Green GP"
5. To enable the trainees to plan for a Clean and Green Village

2.3 Training Sessions and other particulars

1. Concept and Importance of Clean and Green Village
2. Problems of Rural Sanitation and Drive Towards access to Sanitation for all
3. Sources of clean energy and Effective Utilisation in the panchayat
4. Attempt for Clean and Green Village – Problem Tree and Activity Mapping
5. Protection of Land, Water and forest from Pollution, encroachment and indiscriminate usage.
6. Management of Solid and Liquid Wastes from Households and reduction & reuse
7. Orientation and Mentoring on Targets and LIF on Clean and Green GP

8. No Cost and Low Cost Activities under 250 Cluster related to Clean and Green Village
9. Sustainable development - Model village case presentation
10. Community based Management of Natural Resources
11. Controlling and Regulation of destructive fishing practices and Scientific management plans for restoring fish stocks
12. Mentoring on LIF Report presentation

2.3 Training Particulars

Duration of the training	**3 Days**
Target Groups	PRI functionaries and Faculties from SIRD– ERs and officials, line departments, MRPs, NGOs / Staff, CBOs
Training Venue	NIRDPR, Hyderabad / SIPRD Assam
Training methods	Interactive methods including interactive lecture, brainstorming, Group discussions and sharing of good practices, case studies, role plays, activity Mapping, Documentary Presentation
Trainers	Faculties of NIRDPR and experts from nearby Institutions
Training materials	Training module for trainers, Training handbook and study material for the participants

2.3.1 Session 1: Concept and Importance of Clean and Green Village

2.3.1.1 Session Objectives:

- To build the knowledge on the Concept and Importance of Clean and Green Village
- To build the capacity to analyse the causes and consequences of lack of cleaning and imbalance in bio-diversity
- To impart knowledge on the benefits of maintaining Clean and Green villages

2.3.1.2 Session Plan (Duration: 60 Mts):

Sl. No	Sub topics of content	Duration	Method	Tools
1	• Introduction to LSDG • Meaning, Concept of Clean and Green village	15 Mts	Interactive Lecture & Brainstorming	PPT, LCD, Chart paper, Marker, Pin board (Note: 1)
2	• Introduction to Interlinked SDGs with Theme – 5, • 29 Subjects Related to Clean and Green village approach	15 Mts	Group Activity- Activity Matrix	Chart paper Marker Pin board (Note: 2)
3	• Importance of creating Clean and green village. • Problems with unclean and climate change	15 Mts	Group Discussion & Presentation	LCD, Chart paper Marker, Pin board (Note 3)
4	• GP Roles in Clean and Green village	15 Mts	Interactive Lecture	LCD, Marker (Note:4)

Note 1: The facilitator will ask the participants what they know about "Clean and Green Village". The facilitator will group the answers and consolidate the discussion.

Note 2: Activity Matrix

- The facilitator will ask the participants about 29 subjects transferred to the local body, what are the direct linkages and the indirect linkages with regard to Clean and Green Village?
- The facilitator then divide the participants into different groups and start group work deliberations into the groups

2.3.1.3 Activity matrix

S.No	Subject	Direct linkage of Clean and Green	Impact
1	Health and sanitation		
2	Agriculture including agricultural extension		
3	Animal Husbandry, Dairying and poultry		
4	Land Improvement, implementation of land reforms, land consolidation and soil conservation.		
5	Fisheries industry		

Note Plenary: The facilitator ask the groups to come up with their presentations

Note 3: The facilitator gives an overview of 17SDGs and themes and discusses the SDG linkage in the Clean and Green theme (SDG 6, 7, 12, 13, 14 & 15).

2.3.2 Session 2: Problems of Rural Sanitation and Drive Towards access to Sanitation for all

2.3.2.1 Session Objectives:

- To identify the problems of lack of Sanitation measures.
- To sensitize the participants on the ill effects of in-sanitation and citizen's role in maintaining house hold sanitation.
- To discuss on the strategies for 100% sanitation.
- To impart knowledge on the available schemes from central and state governments for sanitation

2.3.2.2 Session Plan (60 mts):

No	Sub topics of content	Duration	Method	Tools
1	• Introduction to Sanitation • Need for achievement of ODF • Role of GP in maintaining better sanitation	15mts	Interactive Lecture	LCD, PPT Chart paper, Marker Pin board, (Note: 1)

2	• Problem Mapping on Sanitation • Identifying the problems • Identification causes and consequences of in-sanitation	20mts	Group Activity Problem Matrix	-Do- (Note: 2)
3	• Experience sharing /Good practices	15 mts	Interactive Lecture Brainstorming Group activity	-Do- (Note: 3)
5	• Discussion/Consolidation Takeaways	10 mts	Plenary (Consolidation of the group work)	-Do- (Note 4,5)

Note: 1 The Facilitator will present the subject through PPT

Note: 2 The facilitator will ask the participants to write down the issues that they face while implementing the projects and schemes on maintaining sanitation, in the cut cards. Then the facilitator sorts out the answers and will pin them on the pinboard.

●After that, the facilitator will discuss these answers with the participants with the help of PPT

2.3.2.3 Group activity: Problem Mapping

Sl.No	Sectors	Problems			
		1	**2**	**3**	**4**
1	Liquid Waste				
2	Solid Waste				
3	Open Defecation				
4	Open Drainage				

Note 3: Through interactive lecture and group discussion facilitator go for discussion with the participants and consolidates their points

Note 4: Plenary: Discussion points:

1. Need for comprehensive intervention related to sanitation for a clean and green village.
2. The Facilitator can moderate the session and the activities can write on the flash cards.

Note 5: Consolidation:

- In India we are having such kind of activities at the LSGIs level. We can see some good practices through videos.
- A brief discussion based on the videos are the takeaways in the theme of Clean and Green Village.

2.3.3 Session 3: Sources of Clean Energy and Effective Utilisation in the panchayat

2.3.3.1 Session Objectives:

- To impart knowledge on the importance of Renewal sources of energy
- To enable the trainees on finding ways and means to utilise the clean energy sources pertaining to their villages
- Identification of sources of funds for harvesting and establishing mechanism for utilisation of clean energy.

2.3.3.2 Session Plan (90 mts)

No	Sub topics of content	Duration	Method	Tools
1	• Introduction to Energy and clean energy • Sources of Renewal Energy • Cost benefit analysis on the Renewal and non-renewal energy.	30 mts	Interactive presentation	LCD, Chart paper Cut cards, Marker Pin board (Note 1)
2	Identifying the problems and possible solution related to present energy utilisation and need for alternative strategies	30 mts	Brainstorming - Group Activity	LCD, Chart paper Cut cards, Marker Pin board (Note 2)
3	Video Presentation and discussion	20 mts	Interactive session	Documentary (Note 3)
4	Consolidation and Summary	10 mts	Lecture	

Note 1: The facilitator will ask the participants - what are the major intervention areas related to clean energy.

- The major interventions areas related to clean and green will be noted down

Note 2: Group Activity: With the help of Activity matrix the various problems related to present energy utilisation and its underlying causes and alternative energy sources will be noted down.

2.3.3.3 Energy utilisation activity Mapping

Sl.No	Sectors	Problems	Alternative source
1	Street Lighting		
2	Drinking water supply		
3	Electricity for public utility and GP office		
4	Operation of Vehicles		

Note 3: Discussion Points: The problem and solutions related to clean and green will be discussed

- Facilitator will conclude the session by consolidating and summarizing the points

2.3.4 Session 4: Problem Tree and Activity Mapping

2.3.4.1 Session Objectives:

- To understand the specific interventions of the Clean and Green by LSGIs
- To understand the importance of Clean and Green

2.3.4.2 Session Plan (75 mts):

No	Sub topics of content	Duration	Method	Tools
1	Scope of existing Schemes for linking Specific interventions ● Transferred Subjects through GPDP ● FFC, SFC, other grant, OSR, Community participation	20 mts	Brainstorming Activity Matrix	LCD PPT
2	Transferred Schemes and Partnership of the Department Schemes (SSS,CSS) SBM, MGNREGS, NRLM, SRLM, NHM, Renewable energy schemes through state schemes, social forestry	30mts	Activity Matrix	LCD Chart paper Marker Pin board (Note: 1and 2)
3	Consolidation	45mts	Matrix consolidation	Chart paper Marker Formats (Note: 2)
4	Best Practices, for addressing clean and green intervention through convergence initiatives.	15 mts	Best practice sharing	LCD PPT (Note: 3)
5	Summary and conclusion	5 mts		LCD PPT

Note 1: The facilitator asks the participants to identify the intervention areas and Existing Programmes. After that, participants are asked to plot gaps between interventions and existing programs if any, and also scope and Opportunities for existing schemes (SSS and CSS) are asked to be plotted in the activity matrix

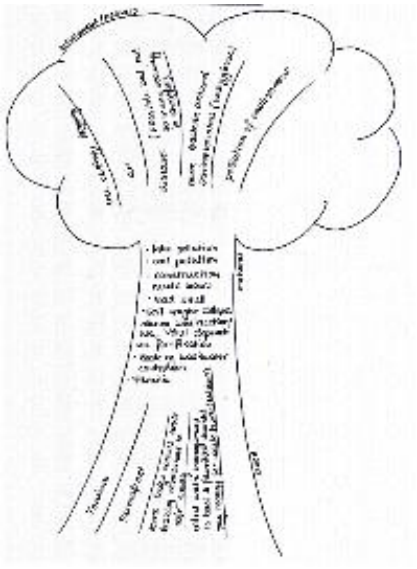
Note 2: The facilitator will consolidate the activity matrix

2.3.4.3 Activity matrix:

GPDP- FFC, SFC, OWN Fund, (SSS and CSS), Additional Resource mobilization by LSGs				
cc	**Intervention areas**	**Existing Programmes,**	**If any Gaps**	**Scope and Opportunities for existing schemes (SSS and CSS)**
1	Waste management	• Providing community composting facility ●Non bio waste collection bin at community level (Because of lack of forward backward linkages And lack of source level segregation	some of the places the system is not functioning well	SBM-2 ● Household Composting ●Doorstep Collection facility ● Community Composting ● Awareness ● Segregated Collection facility for non-bio ● Scope for forward backward linkages with SRLM- women entrepreneurs MGNREGS- ●community composting facility ● SHG workshesd construction SRLM ● Positioning women entrepreneurs as a enterprise groups ● Training for upcycling facility ● Entrepreneurs for alternate product ● Awareness through SHG network.
2	Controlling of Water pollution			
3	Clean and Green energy			

Note 3: The facilitator will ask the participants to share good practices or success stories if there is any

Later the facilitator will conclude the session by consolidating and summarizing the points discussed in the session.



2.3.5 Session 5: Protection of Land, Water and forest from Pollution, encroachment and indiscriminate usage.

2.3.5.1 Session Objectives:

- To set the long term and short term goals for clean and green villages
- To link SDG framework

2.3.5.2 Session Plan (75 mts):

No	Sub topics of content	Duration	Method	Tools
1	Introduction to Pollution, Types, Causes and Implications	30 mts	Group activity	LCD, PPT, (Note: 1)
2	Identification of Pollution Land, Water, Soil, Air	30 mts	Group activity Activity Matrix	Charts, Marker, Pin board (Note 2)
4	What are the Schemes to be related to the intervention areas	10 mts	Group activity	LCD, PPT
5	Summary and conclusion	5 mts	Discussion	LCD, PPT

Note: 1 The facilitator will discuss about the long Term and short term goals effects of various pollution.

Note: 2 Group activity: activity matrix

2.3.5.2 **Group Activity** Format

	Pollution – Types, Effects and Suggestive Alternatives with schemes				
	Pollution	**Type of pollution**	**Causes**	**Effects**	**Suggestive Alternatives with schemes**
	Land				
	Water				
	Air				
	Others				

With the help of activity matrix the main causes and activities along with long term and short term, its suggestive measures, and related schemes will be noted down.

2.3.6 Session 6: Management of Solid and Liquid Wastes from Households and reduction, Recycle & reuse

2.3.6.1 Session Objectives:

- To set the long term and short term goals for clean and green villages related to Disposal of Wastes
- To familiarise with the innovative strategies of management of solid and liquid wastes from the households and public places
- To link SDG, Schemes framework

4.3.6.2 Session Plan (60 Mts)

No	Sub topics of content	Duration	Method	Tools
1	• Introduction to Waste Generation • Types and sources of Wastes • Handling of Different types • Strategies for wastes reduction and reuse	30Mts	Interactive Presentation	LCD, PPT, (Note: 1)
2	Identification of sources, schemes, treatment and disposal and preparation of long and short term interventions	20 Mts	Group Activity	Charts, Marker, Pin board (Note 2)
3	Consolidation of strategies	10 Mts		

2.3.6.3 Activity matrix: To Achieve ODF

Sl. No	Intervention Areas	Goals			
		Long Term	Suggestive measures	Short Term	Schemes
1	Waste	Zero waste village	**ODF** Organic waste source level facility at all households and institutions (Behavioral change education programme)	Latrine for all Community latrine Source level composting facility ensuring 50%	SBM SBM, MGNREGA
			Community Composting facility for outflow waste (Behavioral change education programme)	Market based composting	
			Door to Door collection of segregated Non bio waste (primary segregation), Collection system and storage facility (Behavioral change education programme)	50% door to door collection for first year	
			Promotion of alternate product for reduction of waste	Promotion of alternative product and upcycling materials from rejects	
			Promotion of up cycling enterprises		
			Behavioral change intervention	Students Campaign for behavioral change education	
2	Waste management-Liquid and solid	Clean water bodies			

Note: 3 Discussion points: various related to intervention areas of clean and green, its long term and short term goals, suggestive measures and various schemes will be discussed Compressed biogas scheme- SWACHH Bharath

Later the facilitator will conclude the session by consolidating and summarizing the points discussed in the session

2.3.7 Session: 7 Orientation and Mentoring on Targets and LIF on Clean and Green GP

2.3.7.1 Session Objectives:

- To Orient the trainees on the targets, LSDGs and LIF
- To Orient on how to fill the LIF Framework for planning at the GP level

2.3.7.2 Session Plan (60 mts):

No	Subtopics of content	Duration	Method	Tools
1	Introduction LSDGs Targets LIFs	60mts	Interactive Lecture	LCD PPT
2	Summing up the discussion by the facilitator	5mts	Discussion	Chart paper

2.3.8 Session 8: No Cost and Low Cost Activities under 250 Cluster related to Clean and Green Village

2.3.8.1 Session Objectives:

- To give exposure to participants on the experiences gained from the field on Clean and Green drive
- To share the strategies on augmenting resources and undertaking of no cost or low cost activities for Clean and Green village.

2.3.8.2 Session Plan (90 mts):

No	Subtopics of content	Duration	Method	Tools
1	Introduction to 250 cluster programme on capacity building for comprehensive GPDP.	20mts	Interactive Lecture	LCD PPT
2	Best Practices under 250 Cluster from different states	30mts	Presentation of PPT, Documentary, Pictures display, Discussion	LCD (Note: 1)

3	Incorporate the priority actions into GPDP cycle • Priority setting • Situation analysis • Discussion in gram sabha • Activities • Resources • Timeline	30 mts	Brainstorming Interactive lecture	LCD Chart paper Marker Pinboard Plan format (Note: 1)
4	Summing up the discussion by the facilitator	10mts	Discussion	

Note 1:

- The participants will be divided into GP wise subgroups and are requested to choose 17 targets given in session 6 for 5 years, based on the given format.
- The current situation related to the target has to be identified first based on existing data.
- List out five concrete action points for each target. These action points are to be incorporated in GPDP as projects on a priority basis.
- These proposals need to be discussed in the Gram Sabha, Special Gram Sabhas, standing committee and other forums including tribal Gram Sabha.
- The Panchayat Committee has to allocate an adequate budget for the Clean and Green Village on a priority basis and finalize the plan for a Clean and Green Village.

2.3.9 Session 9: Community based Management of Natural Resources for better use and production

2.3.9.1 Session Objectives:

- To understand on the need for proper maintenance of Natural Resources
- To develop local suitable strategies for community involvement for better protection of Natural Resources
- To prepare a plan for progress monitoring

2.3.9.2 Session Plan (75 mts):

No	Subtopics of content	Duration	Method	Tools
1	Current status of the theme in our villages Different data needs and source related to Clean and Green	30mts	Interactive Lecture Group activity	LCD PPT (Note: 1)

2	Monitoring progress ● What ● Who ● How ● When	15mts	Brainstorming Interactive lecture	LCD Chart paper Marker Pinboard Plan format (Note: 2)
3	Strengthening monitoring systems i. Systems for monitoring ● Standing committees ● Working groups ● Monitoring committees ii. Official level ● ERs and Officials iii. Community level ● Gram sabha ● Special gram sabha	30mts	Brainstorming Interactive lecture Group work	LCD Chart paper Marker Pinboard Plan format (Note: 3)

Note: The basic objective of the session is to make them realize the importance of data and how the GP has to work more on collecting and collating it from different sources and analyzes to prioritize interventions.

Note 1:

- The facilitator will introduce the data needs specific to this SDG theme and the targets proposed for the GPs as per the previous discussions.
- GP wise groups will be formed to discuss the data gaps as well as the available data on the theme and how to collect or collate them. They will also discuss how to fill the data gaps.
- One GP can share their plan in the plenary session.

Note 2:

- Explain monitoring (what to monitor, who to monitor, how to monitor and when to monitor) with relevant examples.
- The facilitator will ask the GPs "who monitors at present, how and when?"

Note 3: The facilitator will explain the available monitoring mechanism to the GPs at the official and community level. The facilitator should tell the GPs, how important is the social audit of each institution of the villages and special Gram Sabha as monitoring mechanisms.
The participants will be divided into GP wise subgroups and are requested to monitor the progress of targets and proposed activities based on the given format.

3. Monitoring format

Monitoring Sectors (Targets for GPs)	Data source	Who will monitor?	How to monitor?	When to monitor?

3.1 Role of Panchayat in Thematic Area: Clean and Green

In order to achieve the targets given under the thematic area on Clean and Green the Gram Panchayat has to make following actions.

- Building awareness for people in the GP on various issues pertaining to importance of maintaining clean and green village and need for reducing waste and proper disposal of non-biodegradable waste. Impart knowledge on avoiding actions on adverse effect of natural resources.
- Actions on controlling pollution and banning use of plastics.
- Educate the elected representatives, officials and various committees of the GP and impart scientific knowledge on protection of Bio-diversity, Climate Change Adaptive strategies, etc for planning for better strategies to protect the environment.
- Organise adequate Gram Sabha Meetings and convene other meetings for different groups like SHG, Farmers Producers Groups, students of schools and Colleges and sensitize on change, pollution of various nature, causes of natural resources degradation and role of citizens to contribute for better environment.
- Selection of volunteers and formation of working group among various categories of people and train them for climate change action
- Inclusion of local institutions in microclimatic monitoring on parameters like rain fall, wind speed, ambient temperature, humidity, water level in streams, river
- Wall writings, display boards, handouts to disseminate information to general population on mitigation and adaptation to the affected groups on a daily, weekly, monthly, quarterly basis for alert.
- Organizing PRA with progressive farmers and elders to understand the traditional methods adopted in agriculture during extreme events like flood, drought in the past.
- Identification of vulnerable groups like pregnant women, lactating women, children, elderly, differently abled, chronically ill, etc. and develop appropriate adaptation strategies for them during extreme events.
- Discuss and sensitize Gram Sabha about the climate change mitigation factors like reducing energy consumption, usage of fossil fuels, plastics, non-renewable building materials and promote measures like planting of trees, conserving forests, usage of good agricultural practices for water conservation.

- Mapping of land use, water bodies, forest, slopes, wet lands, degraded forest within the Gram Panchayat and Continue updating the plans and norms for eco restoration and ecological management
- Develop appropriate norms for Common Property Resources and minor forest produces
- Assess the water needs, sources, schemes, solid and liquid waste being generated through participatory surveys and make plan for adequate supply.
- Ensuring maintenance of toilets of public places including those in markets and Gram
- Panchayat premises
- Identify appropriate schemes, state/national/international agencies, their programmes and schemes, non-Governmental agencies and companies which can support to proper maintenance of water bodies for sustainability and protect from contamination.
- Assess the various needs of energy – for cooking, heating, lighting, irrigation, household food processing, industries, commercial establishments like shops and hotels. Develop a comprehensive energy programme based on need assessment.
- Initiate campaign to include all households and establishments in to the energy programmes and educate them to adopt renewable sources like LED lamps, biogas tanks.

APPENDIX – 1

Draft Format for preparation of GPDP towards saturation mode adopting thematic approach of Localisation of Sustainable Development Goals (LSDGs)

Name of the Theme: Clean and Green Panchayat
Name of the Department:

S. N.	Local Indicator Framework (LIF)	Role of GP as per devolution Planning (P)/ Implementation (I)/ Monitoring (M)			LIF Data				Three years perspective plan for saturation			Annual Plan (GPDP)	
		P	I	M	Baseline data	Source of data	Targets to reach at saturation	Identified Gaps for saturation in 3 years	Proposed activities to saturate the identified gaps in LIF (each activity to be put in separate row)	Schemes/ CFC/ SFC/ OSR to be utilised/ converged to saturate the identified gap	Proposed /Estimated Expenditure of the activities	Proposed activities (each activity to be put in separate row)	Schemes/ CFC/ SFC/ OSR to be utilised/ converged to saturate the identified gap	Proposed /Estimated Expenditure
1.	Proportion of Tree Cover to total	✓	✓	✓	2%	GP (Forest)	30%	Lack of Climate Consciousness	To establish new orchards/	MGNREGA, ATMA, DDU-GKY, RKVY, MGNREGA,	(10 lakh INR for 5 Ha)	Agro-Forestry on 25 Ha	MGNREGA	50 lakh

	geographical area								horticulture plantation (Agro-Forestry)	Agriculture Infrastructure Fund, Mission for Integrated Development for Horticulture (MIDH), NMSA			Mission for Integrated Development for Horticulture (MIDH)	
2.	Number of Tree planted under Social Forestry Program in the village	✓	✓	✓	500	GP (Forest)	4000	Exploitation Mass-Deforestation	Social Forestry in Community Lands (Grazing Lands)	CAMPA (Forest), MGNREGS, MIDH, NMSA, JJM, PMKSY (WDC)	**(1 lakh INR for 1 Ha)**	Social Forestry in 30 Ha Forest Land	MGNREGA CAMPA	30 lakh
3.	Proportion of Area in high slope areas, barren lands and other common lands covered by trees	✓	✓	✓	15%	GP (Forest)	50%	Overgrazing						
4.	Percentage of Renewable Energy used for: • Pumpsets			✓	5%	GP (Horticulture)	80%	Lack of Awareness Heavy Promoter's Share	Solar Pump	PMKSY (per drop more crop), RKVY-RAFTAAR, NMSA, MGNREGA	**(4.1 lakh INR for 7.5 Hp)**	Solar Pumpsets for 20 households	PMKSY MGNREGA RKVY-RAFTAAR PMKSY RKVY	80 lakh
5.	Whether Community ponds used for fisheries	✓	✓	✓	No	MA	Yes	Lack of O&M	Farm Ponds & Aquaculture (Nursery	PMKSY (per drop more crop), RKVY-RAFTAAR,	**(~1.25 lakh INR for farm pond in 1**	Rejuvenation of 1 Community Ponds and	JJM PMKSY MGNREGA	70 lakh

6.	Whether GP has taken steps for Sustainable fishing?	✓	✓	✓	No	GP (Fisheries)	Yes	Depleting Rains – Runoff	Pond and Stocking Pond)	NMSA, MGNREGA	**Ha farm land)**	Building 50 Farm Ponds	Atal Bhujal Yojana	
7.	Percentage increase in net sown area	✓	✓	✓	2%	GP (Agriculture)	30%							
8.	Whether waste water is treated ?	✓	✓	✓	No	GP (PHED)	Yes	Lack of Awareness on possible solutions and supportins schemes	Soak Pits (Individual & Community)	PMKSY, Jal-Jeevan Mission (JJM), MGNREGS, SFC, FFC	**(10000 INR per Soak Pit)**	Building 50 SoakPIts and 1 Community Pit	JJM PMKSY MGNREGA	6 lakh
9.	Percentage of Households having no stagnant waste water around them	✓	✓	✓	40%	GP (PHED)	90%							
10.	Percentage of net area under organic farming	✓	✓	✓	20%	GP (Agri)	85%	Lack of Handholding and Mentorship	GP-level & Community-based Biogas-Biofertiliser-BioPesticide Combo Production Plant	GobarDhan, New National Biogas and Organic Manure Programme, Rashtriya Krishi Vikas Yojana, Mission on Integrated Development of Horticulture (MIDH), Prime Minister's Employment Generation	**(78 lakh INR for 5000 kh/day capacity)**	Set up of a 5000 kilo/day capacity dung &agri-waste biogas plant	GoBardhan NBOMP RKVY MIDH	78 lakh INR
11.	Percentage of Renewable Energy used for: • Cooking			✓	2%	GP	80%							
12.	Whether the Scientific Treatment of biodegradable waste			✓	No	GP	Yes							

										Programme, Credit Guarantee Scheme for Micro & Small Enterprises (CGTMSE), SRLM, FFC, SFC, Stand Up India, ASPIRE				
13.	Percentage of Renewable Energy used for: • Lighting		✓	✓	5%	GP (MNRE)	80%	Lack of Awareness O&M Issues	Solar Plant Roof-Top Solar Panel	Development of Solar Parks and Ultra Mega Solar Power Projects, PM-KUSUM Grid Connected Solar Rooftop Programme	**(70 lakh INR per kW)** **(50000 INR per kW)**	Set up of 50 roof-top solar power plants	Grid-Connected Roof-top Solar Power Program	25 lakh
14.	Are steps taken by Panchayats to stop soil erosion ?	✓	✓	✓	No	GP	Yes	Lack of sensetization, Technical Support and knowledge of Schemes	Field Bunding with Tree-Grass Plantation	JJM, MGNREGS, PMKSY (WDC), SFC, FFC, RKVY, MIDH	**(30000 INR per Ha)**	Field Bunding of 100 Ha	PMKSY JJM MGNREGA	30 lakh

VOL-1I: Learning Material
Theme 5: Clean and Green Village

CHAPTER - 1: Introduction to Clean and Green Environment

The Earth has provided with numerous gifts including sunlight, air, water, soil, minerals, plants, wildlife, etc. It is important to keep the environment and nature clean. The clean and green ecosystem provides fresh air and pollution free environment. Environmental pollution in the form of air, water and land are contaminated, resulting in Diseases, as well as toxic viruses and germs. A clean environment is critical for keeping us healthy.

The planet can be protected by conserving trees, natural vegetation, water, natural resources, electricity, and other resources. To control environmental pollution and global warming, we must strictly adhere to all available measures.

It is the duty of people and government to take care of the environment and keep it clean. With the increase of environmental hazards like water contamination, air pollution, and climate change, it is important to look for ways to reverse the damage that is being done to the planet. It is vital to protect and care for the environment by engaging the community in leading an environmentally conscious lifestyle. There is an urgent need to educate communities especially in the rural areas about climate change mitigation and adaptation for sustainable development.

There is a great need for each local government to come together in unity in order to devise the means of ensuring a cleaner and healthier environment which will help to guarantee a sustainable future. This calls for the responsibility to ensure sustainability of each local body by doing our very best to keep our environment clean and green.

1.1 Vision

- To create a village for the future of our children which is lush and green with nature's bounty, using renewable energy, clean, protecting environment and climate resilient.
- "Green"" refers to a pollutant free environment including soil, air and water in which natural resources such as ocean, land, and forests are sustainably managed and conserved to improve livelihoods and ensure food security. This will lead to build a healthy safe ecosystem and ensure employment security.
- "Clean" refers to access to safe & adequate drinking water and sanitation services, low-pollution, and low-emission world in which cleaner air, water, and ocean enable people to lead healthy, productive lives.

On the basis of the available statistics the main agenda is to ensure everyone has access to a

clean and green environment by the year 2030. For that, Local Action and People Action is fundamentally a grassroots process of the domain of the PRIs. This is why attempt to secure clean and green villages is essential for life and it can be directly linked to the panchayat system. Therefore, the theme Clean and Green approach to the SDG agenda is highly relevant.

1.2 Why Gram Panchayat is responsible for creating Clean and Green?

According to recent initiatives in decentralisation of PRIs and 73rd amendment of the constitution, local bodies are responsible for carrying actions such as Natural resource conservation, epidemic prevention, and environmental protection. The 73rd and 74th Constitutional Amendments in the country transferred 29 subjects to local self-governing bodies for management of functions given to them.

The twin objectives of the Panchayati Raj system as envisaged by the Constitution of India are to ensure local economic development and social justice. The Eleventh schedule of the Constitution expects the Panchayats to play key roles in various thematic domains enlisted as 29 functions, though the specific mandates and capacities of these local governments vary from State to State. Many of the SDG targets are within the purview of these functions listed in the Eleventh Schedule. Especially there are subjects under these which are highly relevant for Clean and Green Village.

The GP functionaries are responsible for design and implementation strategies, operation and maintenance of Solid and Liquid Waste Management (SLWM) systems with support from respective state governments departments. Mechanisms for involving third parties in construction and management activities under GP and community supervision can be explored. In such cases, absolute clarity in the roles and responsibilities of various stakeholders in managing SLWM systems is a must. Community contribution and appropriate user charges for sustainable SLWM initiatives are also desirable.

1.3 Clean and Green related subjects as per the Eleventh schedule of the Constitution

There are 9 subjects out of 29 functions allocated for PRIs are having direct relevance in creating clean and green villages. The GPDP of the gram panchayats are already have been engaged in such activities under 15th Finance Commission fund provided by the government of India. Only concentrated efforts and actions are required with designated timeline to fulfil

the targets given under LSDG for creation of Clean and Green villages. The linked subjects are given under for better clarity and plan for action.

- Agriculture including agricultural expansion
- Land Improvement, implementation of land reforms, land consolidation and soil conservation.
- Animal Husbandry, Dairying and poultry
- Fisheries
- Minor irrigation, water management and
- Social forestry and farm forestry
- Fuel and fodder
- Non-conventional sources of energy
- Health and sanitation including hospitals primary health centers and dispensaries

As per 73rd Amendment act and rules each local government needs to do actions at the local level. Therefore, the Local level interventions lead to the activities into local, hence the convergence between local and regional governments and their associations are essential. Localizing SDGs needs support from local leaders and collaboration with local formal and non-formal institutions.

CHAPTER - 2: Natural Resource Management

What are natural resources? Soil, water and vegetation are three basic natural resources. The survival of creation depends upon them and nature has provided them as assets to human beings. In a wider view, land, water, biodiversity and genetic resources, biomass resources, forests, livestock, fisheries, wild flora and fauna are considered as natural resources. Now the question is are we aware of these resources? Or the question may be reframed as do we regard those as resources? If we really regard those as our resources then we have to think about managing those efficiently.

Natural Resource Management is the protection and Conservation of land, water, soil, plants and animals with a particular focus on how management affects the quality of life for both present and future generations. Well-being of human beings is dependent on quality of natural resources. Living creatures difficult to survive without clean air to breathe, plants to eat or water to drink. The various pollutants such as air, water and soil directly lead to degradation of natural resources. Deterioration of natural resources due to depletion of resources will seriously influence in the quality of air, water and soil therefore, serious and conscious intervention is required in protecting natural resources through appropriate management practices.

Pollution of Air: Air pollution refers to any physical, chemical or biological change in the air. It is the contamination of air by harmful gasses, dust and smoke which affects plants, animals and humans drastically. There are two types of air pollution which are primary and secondary. The main causes of air pollution are burning of Fossil Fuels such which emits large amount of sulphur dioxide and also carbon monoxide results in pollution. Automobiles also lays major impact and factories, Industries, mining Activities, agricultural Activities, domestic Sources are also produces large chunk of pollutants to the air.

2.1 Water and Watershed Management

Watershed is the geographical region that allows water drains into a stream; the watershed for a major river can encompass smaller watersheds that ultimately combine at a common point. A watershed includes all surface water and groundwater, soils, vegetation and animals, and human activities contained within its area. The broad intervention of watershed management includes rain water harvesting, groundwater recharge, maintenance of water balance and also preventing pollution. The objectives of watershed management include controlling damage runoff and degradation and thereby conservation of soil and water. Watershed protects, conserves and improves the watershed areas and enhances water resource, ground water recharge for more efficient and sustained production. It prevents soil erosion and reduce the effect of sediment yield on the watershed.

2.2 Soil conservation

Soil conservation is a "combination" of practices used to protect the soil from degradation. Soil conservation involves treating the soil as a living ecosystem, and recognizing that all the organisms that make the soil their home, play important roles in producing a fertile healthy environment. Soil conservation is key to environmental sustainability, it helps to protect natural resources and watersheds, restores habitats for plants and wildlife, improves water quality, and makes soil healthier.

2.3 Social forestry and Farm forestry

Social forestry refers to the management of forests for the benefits of local communities. It includes aspects such as forest management, forest protection, and afforestation of deforested lands with the objective of improving the rural, environmental, and social development. Unlike other forestry projects, in the setting of social forestry, the needs of local communities come first. Farm forestry can be commercial or non-commercial. Individual farmers are encouraged to plant trees on their own farmland to meet the domestic needs of the family. In many areas this tradition of growing trees on the farmland already exists.

2.4 Natural Resource Management: Natural Resources Management (NRM) refers to the sustainable utilization of major natural resources, such as land, water, air, minerals, forests, fisheries, and wild flora and fauna. Together, these resources provide the ecosystem services that underpin human life. Concern for natural resources management Over-exploitation of natural resources by growing population resulted in various severe problems. Destruction of

vegetation has resulted in land degradation, denudation, soil erosion, landslides, floods, drought and unbalanced ecosystems. A balanced ecosystem is an urgent need.

Natural resources (land, water, biodiversity and genetic resources, biomass resources, forests, livestock and fisheries) – the very foundation of human survival, progress and prosperity, have been degrading fast, and the unprecedented pace of their erosion is one of the root causes of the agrarian crisis that the country is facing. The demographic and socio-economic pressures notwithstanding, the unmindful agricultural intensification, over use of marginal lands, imbalanced use of fertilizers, organic matter depletion and deteriorating soil health, extensive diversion of prime agricultural lands to non-agricultural uses, misuse and inefficient use of irrigation water, depleting aquifers, salination of fertile lands and water logging, deforestation, biodiversity loss and genetic erosion, and climate change are the main underlying causes.

For example, during the ancient period Garhwal Himalaya was full of dense forest and lush green vegetation. The Himalaya is the perennial source of water for rivers, streams and reservoirs. Undoubtedly, nature takes care of its resources through natural process over a period of time and maintains them. But ever-increasing population, developmental activities and technological modernisation have over-exploited available resources without taking into consideration the damage and consequences for coming generations. Vegetation plays an important role in protecting land and water. These resources are being depleted at an alarming rate because of human intervention. Degradation and destruction of forest cover in the Himalaya is directly responsible for the denudation of watersheds. In the absence of vegetative ground cover, during the monsoon rainwater comes down to the plains unchecked. Sudden swelling of streams, flash floods in the hills and severe floods in the plains and drought in upstream areas are the consequences. The downward rush of water has tremendous erosive force and moves millions of tonnes of fertile soil during the rainy season. It causes all types of erosion as well as devastating landslides in the Himalaya. Developmental activities, construction of roads, extraction of building material and mining, etc., are a constant threat.

During Orissa Super cyclone in the year 2000, sea water entered into 150 K.m. inland as the mangrove forests were destroyed for shrimp cultivation. Mangrove forests act as natural barrier to hold a natural hazard from becoming a disaster. Moreover, due to impacts of climate change like global warming, many adverse changes are taking place in the nature as well as in the natural resources. Now the concern is the stipulated overall GDP growth rate of 9% and agricultural growth rate of 4.1 per cent during the XI Plan cannot be achieved with the ongoing shrinking and degradation of the country's natural resources. Interlinked as producers and service providers, the resources must be judiciously conserved, developed and harnessed.

2.5 Natural Resources Management for poverty alleviation: After 'Nargis Cyclone 'Aila' 4 Poverty and Environmental Degradation has a Cause-and-Effect Relationship. The thin layer of soil that covers most of the earth's land surface is the key to human well-being and survival.

Without it, there would be no plants, no crops, no animals, no forests and no people. However, about 40% of the earth's land surface and more than one billion people are affected by land degradation. Degraded lands are home to the poorest segments of the rural population. Natural resources (NR) provide fundamental life support, in the form of both consumptive and public-good services. Ecological processes maintain soil productivity, nutrient recycling, the cleansing of air and water, and climatic cycles. Soils are the foundation of agriculture, which in turn is the basic building block in the livelihoods of all people. At the genetic level, diversity found in natural life-forms supports the breeding programs necessary to protect and improve cultivated plants and domesticated animals. Wild flora and fauna form the basis of traditional medicine and a significant part of the modern pharmacological industry. In ecologically fragile, marginal environments the poor are often locked into patterns of natural resource degradation by their lack of access to productive resources, institutional services, credit and technology. Without these resources, they are compelled to overstrain already eroding lands in order to survive. The increased pressure on the land – through deforestation, overgrazing and over cultivation – causes a decline in soil fertility and production, and thus aggravates poverty. This circular, cause-and-effect relationship between rural poverty and environmental degradation is clear. Unless degradation is to be addressed directly, the sustainability of rural development projects will be undermined and attempts to alleviate rural poverty will be jeopardized.

2.6 History of Natural Resources Management in India

Traditional knowledge is vital for sustainability of natural resources including forests, water, and agro ecosystems across landscape continuum spanning from households through farms, village, commons and wilderness. The management of natural resources to meet people's requirements has been practised since the pre-Vedic era. Farmers were ranked high in the social system and village management was in their hands. In order to manage land, water and vegetation, technical knowledge suitable to the specific conditions of a region was required. They gained this knowledge and developed skill through experience and learning by doing. Farmers' traditional knowledge of agriculture includes tested technologies in the field. In a study in the hills of Garhwal Himalayas, the traditional ways of managing natural resources have been noticed, some of those are as follows:

2.6.1 Irrigation

Farmers used to carry water to their fields through small irrigation channels known as gulas. These go from the source of water along the slopes to the fields. In order to avoid seepage losses farmers use pipes. By means of gravitational force they transport irrigation water from its source. In hills it is difficult to construct gulas for all the terraces, and pipes are convenient in transporting water to every field. In order to make judicious use of water, they use a sprinkler system through gravitational force and economical utilisation of water. In the Garhwal Himalaya farmers use tree trunks as rainwater irrigation channels by taking care of undulating topography and checking seepage losses (Sharma and Sinha 1993).

2.6.2 Water Harvesting

The region of Garhwal comes in the high rainfall area and in the lack of proper management system most of the rainwater goes waste as runoff. Farmers of the hill region have their traditional technology for making small dug-out ponds to harvest rainwater. They construct such ponds at several places and use the water for survival or for supplemental irrigation. Improvements over the traditional practices are that at the bottom LDPE sheets are placed to check seepage losses. Lined tanks are cost-intensive and beyond the reach of the farmers.

2.6.3 Management of Drinking Water

Streams are the source of water in the Himalaya. Farmers pay regard to these water resources. They use the water for drinking and make efforts to keep streams clean and unpolluted. They maintain vegetation on the banks to have a clean flow without sediment for human consumption. They do not permit their cattle at the places from which they collect drinking water. They have their own traditional system for the management of drinking water. They do not allow anyone to throw garbage in its current to avoid pollution and infection.

2.6.4 Water-Based Industry

In the hills flour mills are not available. Farmers have their indigenous technology to run flour mill by means of water fall. They use home-made wooden wheels as turbines to run the mills. These mills are locally known as gharat or panchaki. It is a local response to needs of the people without electric or any other complex machine systems.

2.6.5 Agriculture

- They use a special type of traditional plough. Other types of 'improved' ploughs do not work in the hills as the soil is gravelly and not deep.
- Under rain fed conditions farmers in hill regions plough their land several times before the onset of rain to conserve water and increase water retention capacity. • Farmers plough their land straight instead of in circles and open parallel furrows for rainwater harvesting and retaining moisture. However, there is a recommendation to plough the land across the slope to check erosion.
- Farmers of hill regions prefer mixed cropping for minimising risks under rainfed conditions and creating ground cover for checking runoff and soil loss. They grow legumes with maize and ginger or turmeric with maize.
- After sowing ginger, colocasia and turmeric, farmers use paddy straw, wheat straw or leaf litters as mulch to ensure proper germination.
- Farmers do not practise weeding and inter-culturing in the maize crop because of soil conditions and the requirement of fodder in the rainy season.
- Farmers of the Garhwal hills store seeds by selection for different plots with special identification and use them in those particular plots

CHAPTER - 3: Waste Management

3.1 Solid and Liquid Waste Management

Waste management refers to the collection, transportation, handling and disposal waste. Management of waste refers to careful disposal of unwanted or unusable material that is produced through the activity of humans. Waste can be classified in to liquid, solid, or gas which are having specific disposal method and way of managing. Previously, the majority of waste created was biodegradable or organic waste, which was transformed into compost for farming activities but at present, the influx of non-biodegradable wastes and the lack of segregation and management of the same has resulted in various severe economic problems, including pollution of land and water. A direct consequence of dumping wastes onto cultivable lands and in water bodies adversely affects agriculture and other farming activities. Dumping of wastes in water bodies like rivers and streams has resulted in restriction of water flow and damage to the water ecosystem. Burning the wastes resulted in the emission of carcinogenic gasses and other hazardous gasses in addition to other problems caused by the burning of wastes are one of the biggest concerns.

Water, Sanitation and Hygiene (WASH) directly impacts human health and have far reaching consequences when it is ignored. India is one of the fastest developing economies, but when it comes to WASH indicators, it continues to lag behind. With a population of over 1.3 billion, there is a mounting and urgent need to address sanitation. Solid and Liquid Waste Management SLWM) is one of the key components of Swach Bharat Mission (SBM) (G), launched with the objective of bringing improvement in cleanliness, hygiene and the general quality of life in rural areas. SLWM is the collection, transportation, processing, recycling, treatment, and disposal of waste material in a scientific manner.

The following guidelines presents a basic, quick introduction to Solid Liquid Waste Management (SLWM) in rural areas. It is geared, particularly for district administrators to help focus on SLWM along with Open Defecation Free (ODF) activities.

3.2 What is Waste?

Waste is any item beyond use in its current form and discarded as unwanted. It can be solid or liquid with respective management methods.

3.3 Solid Waste

In rural areas, examples of solid waste include wastes from kitchens, gardens, cattle sheds, agriculture, and materials such as metal, paper, plastic, cloth, and so on. They are organic and inorganic materials with no remaining economic value to the owner produced by homes, commercial and industrial establishments. Most household waste in rural areas is organic, with little inorganic material, and is non-toxic. Because of its environment - friendliness, composting is a highly suitable method of waste management in rural areas.

3.4 Liquid Waste

When water is used once and is no longer fit for human consumption or any other use, it is considered to be liquid waste. Wastewater can be sub categorised as industrial and domestic.

- Industrial wastewater is generated by manufacturing processes and is difficult to treat.
- Domestic wastewater includes water discharged from homes, commercial complexes, hotels, and educational institutions.

3.5 Solid and Liquid Waste Management under SBM Guidelines

All GPs are to be targeted for coverage with an SLWM project. SLWM projects for each GP should be part of Annual Implementation Plan (AIP) of a district. The AIP should be approved by State Level Scheme Sanctioning Committee. Each individual SLWM project may be approved at the District Water and Sanitation Committee (DWSC) level according to the technical and financial rules of the individual states. Every state should have at least one SLWM consultant at the state level and one SLWM consultant in each District Water and Sanitation Mission (DWSM) / DWSC to guide preparations for SLWM projects.

3.6 Criteria for Selection of Technology

1. Availability of space near houses and housing pattern.
2. Geophysical condition of the village including topography, soil structure and ground water conditions.
3. Sources and pattern of water supply (individual / public).
4. Availability of common space in and around the village.
5. Economic status and human resources available with the GP.

3.7 Waste Management Technologies

3.7.1 Solid waste management: Composting Methods

Technology	Description	Advantages	Disadvantages	Conditions for use
NADEP method	Composting takes place in a rectangular brick tank with aeration holes. Organic material is added in layers and compost is ready in almost 3 months	Composting can be done on a larger scale than using piles. All nutrients are retained in the tank so resulting compost is more nutrient rich.	Tanks work in 3 month rotations so at least 2 are needed which increases the cost. Large quantities of soil and water are needed which can be difficult to transport in some areas. The entire tank should be filled within a maximum 48 hour period (24hrs is better).	Tanks can be built in all conditions. The thatch roof protects the tank from moisture. Tank should be monitored to check for cracking of seal which would allow moisture to escape. Tanks require space and a lot of initial material so a community approach is better, using a communal space for the tank and agreeing the date for bringing material/ filling the tank.
Bangalore method	Waste is composted an aerobically in a pit. Compost is ready in 6 - 8 months	Can accept municipal waste and night soil. Good for dry areas and no O+M is needed	Cannot be used in wet areas as the pit may become waterlogged. Gases produced can smell and the pit requires quite a large space. Composting process is slow	Useful in areas where the use of piles is limited by severe weather conditions e.g. strong winds and sun. Can be done at the household level where space permits as no O+M is required. Very cheap compared to tank methods as no infrastructure is required
Indore method	Waste is cut into small pieces and spread 10 -	No infrastructure is needed and process is	Nutrients are lost to the soil. Regular turning is needed	Pit/heap is unprotected so may need some protection from

	15cm thick above ground or in a pit. Compost is ready in 4 months	relatively quick	(every 5 days). Cannot be used in wet areas or areas with heavy rainfall due to water logging	animals/children etc. A windbreaker can be used to reduce effects of drying out. Very cheap compared to tank methods as no infrastructure is required.
Vermicomposting	Composting using a specific species of worms to break down waste Compost is ready in 3 - 4 months but compost must be removed in stages as the worms process it	More efficient than normal composting and produces richer compost.	Needs a vermi tank or vermin bed and worms need to be bought or grown which increases cost. Needs more O+M than normal	Worms' optimal temperature range is 15 - 35 degrees Celsius. Lower temperatures hamper reproduction and higher temperatures kill the worms or make them leave. Worms are very sensitive to drought so use in very dry areas is not recommended unless a reliable water source is available.
Bio gas from organic solid waste	Bio gas is created by the decomposition of organic waste in anaerobic conditions. The resulting gas can be let off into the atmosphere or it can be tapped for burning as a fuel. As well as the biogas, the process also produces a slurry which		Gas accumulation rates are slower than rates of use but for areas reliant on wood as a fuel for cooking biogas provides an excellent alternative.	The biogas plant can be linked to the family or community toilet or it can be a standalone system to which wastes are added. There are many different designs available. The choice of design will be influenced primarily by the desired capacity, the space available to install the plant, the type of feed material (cattle

	can be used as a nutrient rich fertilizer.			dung has higher gas producing capacities than human waste) and the finances available for construction. Waste should be added daily to ensure continuous gas production. Stoves, cookers or lamps must be converted to accept biogas but the gas itself burns without odour.

3.7.2 Liquid waste management: Wastewater Treatment Technologies

Technology	Whether Natural or Built	Aerobic/ Anaerobic/ Mixed	Expected effluent quality (low, medium, high)	Area Requirement (m^2 /person)	Power requirement kWh/person/year	Prevalence in India
Waste Stabilisation Pond System	Natural	Mixed	Medium to High	2.0 – 3.0	Nil	All over India
Duckweed Pond System	Natural	Aerobic	Medium to High	2.5 – 6.0	Nil	Greater number in the state of Punjab
Constructed Wetland	Natural	Aerobic	Medium	1.5 – 2.5	Nil	Less Implementation experience in India
Upflow Anaerobic Sludge Blanket	Built	Anaerobic	Low	0.1 – 0.2	Only for pumping	All over India in urban areas, but very less experience in rural areas
Anaerobic Baffled Filter	Built	Anaerobic	Low	0.2 – 0.4	Nil	All over India
Package Aeration System	Built	Mixed	High	0.1 – 0.15	20 – 30	All over India

Extended Aeration System	Built	Aerobic	High	0.1 – 0.2	15 – 25	All over India
Sequencing Batch Reactor System	Built	Aerobic	Very High	0.05 – 0.1	10 – 20	All over India
Soil Bio Technology	Natural	Aerobic	Very High	0.021	40 – 50 kWh/MLD to pump wastewater for distribution across the reactor bed	All over India

Source: Ministry of Drinking Water and Sanitation.

3.8 Water and Sanitation

Safe drinking-water, sanitation and hygiene are crucial to human health and well-being. Safe WASH is not only a prerequisite to health, but contributes to livelihoods, school attendance and dignity and helps to create resilient communities living in healthy environments. Protecting and restoring water-related ecosystems such as forests, mountains, wetlands and rivers is crucial to mitigate water scarcity. Increase quality of water for drinking and household use by eliminating release of hazardous substances into water sources and reducing pollution. When clean water is guaranteed, communities are healthier and more resilient. Without clean water, illnesses like diarrhea, intestinal parasites, and chronic inflammation of the intestines are common and can prevent children from absorbing key nutrients and make them more susceptible to other health issues.

Access to safe drinking water and sanitation are internationally recognized human rights, derived from the right to an adequate standard of living under Article 11(1) of the International Covenant on Economic, Social and Cultural Rights.

On 28 July 2010, the United Nations General Assembly adopted a historical resolution recognizing “the right to safe and clean drinking water and sanitation as a human right that is essential for the full enjoyment of life and all human rights”. Furthermore, since 2015, the General Assembly and the Human Rights Council have recognized both the right to safe drinking water and the right to sanitation as closely related but distinct human rights.

International human rights law obliges States to work towards achieving universal access to water and sanitation for all, without any discrimination, while prioritizing those most in need. In guiding the implementation by States, key elements of the rights to water and sanitation are elaborated by the Committee on Economic, Social and Cultural Rights in its General Comment No. 15 and in the work of the Special Reporter on human right to safe drinking water:

i. Availability: The water supply for each person must be sufficient and continuous to cover personal and domestic uses, which comprise water for drinking, washing clothes, food preparation and personal and household hygiene. There must be a sufficient number of sanitation facilities within or in the immediate vicinity of each household, and all health or educational institutions, workplaces and other public places to ensure that all the needs of each person are met.
ii. Accessibility: Water and sanitation facilities must be physically accessible and within safe reach for all sections of the population, taking into account the needs of particular groups, including persons with disabilities, women, children and older persons.
iii. Affordability: Water services must be affordable to all. No individual or group should be denied access to safe drinking water because they cannot afford to pay.
iv. Quality and safety: Water for personal and domestic use must be safe and free from micro-organisms, chemical substances and radiological hazards that constitute a threat to a person's health. Sanitation facilities must be hygienically safe to use and prevent human, animal and insect contact with human excreta.
v. Acceptability: All water and sanitation facilities must be culturally acceptable and appropriate, and sensitive to gender, life-cycle and privacy requirements.

3.8.1 Jal Jeevan Mission (JJM)

Jal Jeevan Mission, is envisioned to provide safe and adequate drinking water through individual household tap connections by 2024 to all households in rural India. The programme will also implement source sustainability measures as mandatory elements, such as recharge and reuse through grey water management, water conservation, rain water harvesting. The scheme will be based on a community approach to water and will include extensive Information, Education and communication as a key component of the mission. It aims to create a Jan Andolan for water, thereby making it everyone's priority.

3.9 Health Consequences related to Water Contamination and in-sanitation

Contaminated water and lack of sanitation lead to the transmission of pathogens through faeces and, to a lesser extent, urine. The basic understanding of pathways by which pathogens from faeces are ingested through transmission by fingers, flies, fluids, fields (soil), and food:

- Diseases transmitted by the faecal pathway include diarrheal disease, enteric infection, hepatitis A and E, poliomyelitis, helminths, trachoma, and adenoviruses (conjunctivitis). Most of these diseases are transmitted through the faecal-oral pathway, but some are transmitted through the faecal-skin pathway (for example,

schistosomiasis) and the faecal-eye pathway (for example, trachoma). These transmissions occur between humans, as well as between animals and humans.

- Pathogens carried through urine (for example leptospirosis) mainly result from animal-to-human transmission.
- Poor personal hygiene causes fungal skin infections, such as ringworm (tinea) and scabies.
- Lack of handwashing is associated with respiratory infections; inadequate hand hygiene during childbirth is linked to infection and neonatal mortality

Helminth Infections: Such infections are transmitted in water by faecal matter (schistosomiasis) and in soil by soil-transmitted helminths (STH). Although routine monitoring of infection rates is limited, the large number of prevalence surveys permits global estimates to be made.

3.10 Sanitation:

The first challenge for most countries is to define what sanitation really means. The second challenge is to decide what aspects are most important. Sanitation as a whole is a "big idea" covering everything from safe collection, and disposal of human excreta (faeces and urine); to the management of solid wastes (trash or rubbish.) Each community, region or country must understand the most sensible and cost-effective way of thinking about sanitation, both in the short and long term, then establish appropriate national plans and priorities, and last but not least – implement.

It is important to understand that sanitation can act at different levels, protecting the household, the community and society. In the case of latrines it is easy to see that this sanitation system acts at a household level. However, poor design or inappropriate location may lead to migration of waste matter and contamination of local water supplies putting the community at risk. Further down affects of waterborne sewage contamination affect the entire society by ill health and environmental damage.

For countries with very low access to basic sanitation, the effective management of excreta at the household level may have the greatest health implications and benefits but may also be the biggest challenge. In other cases, for example, in a particularly congested urban community, some form of off-site (sewerage) sanitation may be the only viable choice. Yet, in other countries or communities a more complete solution might include a focus on protecting the environment.

3.10.1 Hygiene promotion

Hygiene promotion encourages all the hygienic conditions and behaviours that can contribute to good health. It aims to stimulate and facilitate the right behaviour changes. Usually, it starts with systematic data collection to find out and understand what different groups of people know

about hygiene, what they do, what they want, and why this is so. The results are used to set objectives and to identify and implement activities that enable the different groups to measurably reduce risky conditions and practices and strengthen positive situations and behaviours.

3.10.2 The Difference between hygiene promotion and health promotion

Hygiene promotion is more specific and more targeted than health promotion. It focuses on the reduction - and ultimately the elimination - of diseases and deaths that originate from poor hygiene conditions and practices. For example, good hygiene conditions and practices are enhanced when people can consume water that is safe, use sufficient amounts of water for personal and domestic cleanliness, and dispose of their solid and liquid wastes safely.

A person may have good hygiene behaviour, but not be healthy for other reasons. Good or bad health is influenced by many factors, such as the environment (physical, social and economic). For example, in social environments where people are marginalized because of their gender, economic status or religious affiliation, and have no influence whatsoever on decisions that affect their daily lives, they are likely to be prone to anxiety or depression, which can lead to mental problems.

3.10.3 Importance of hygiene promotion

Most of the health benefits of water supply projects stem from changes in hygiene behaviour. While access to the hardware itself can sometimes induce changes (such as increased water consumption), it is cost-effective to devote some resources to promoting the better hygiene and behaviours that the new facilities make possible, that have greater health impact than the hardware alone.

3.10.4 Meaning of hygiene behaviour

Positive hygiene behaviours include a wide range of practices that promote health, and prevent catching and spreading water and sanitation-related diseases. Our health related behaviour is partly determined by a complex mix of our knowledge, beliefs, attitudes, norms, and customs. Socio-economic determinants and even political factors also play important roles. Without the resources to construct and maintain water supply and sanitation facilities, it is difficult to attain levels of personal, domestic, and environmental hygiene conducive to health. Resources relate not only to money, but also to the availability of land, time, materials, and technical and management skills for achieving improved facilities.

3.10.5 Harmful Effects of open defecation

Some of the harmful impacts of open defecation are as follows:

Spread of diarrheal diseases: Preventable diseases such as diarrhea linked to open defecation are among the highest causes of illness and death, especially of children, in developing countries. Feces defecated in the open come back to us in many ways.

Loss of human dignity: Open defecation results in loss of privacy and dignity, especially for women and girls. Safe and sustainable school latrines have been proven to be linked with continued education enrolment of teenage girls and young women, particularly at puberty.

Environmental pollution: Improperly disposed mostly is a major polluter of soil and water Intestinal worms affect nearly 30 percent of the bodies. This contributes to the spread of disease and the population in developing countries depletes waters of oxygen that is needed to sustain aquatic life.

3.10.6 Diseases associated with poor sanitation

Human excreta have been implicated in the transmission of many infectious diseases including cholera, typhoid, infectious hepatitis, polio, cryptosporidiosis, and ascariasis. Under nutrition, pneumonia, worm infestations, are also associated with unsafe water, poor sanitation and hygiene resulting in reduced physical growth, weakened physical fitness and impaired cognitive function, particularly for children under the age of five.

Infectious agents are not the only health concerns associated with wastewater and excreta. Heavy metals, toxic organic and inorganic substances also can pose serious threats to human health and the environment – particularly when industrial wastes are added to the waste stream.

3.10.7 Economic benefits of investing in sanitation

Financing sustainable sanitation is an investment in human development that yields high economic returns. Improved sanitation in developing countries yields an average of about US$9 for every one dollar spent. Increases in female literacy (due to increased school attendance where proper sanitation facilities exist) contribute to economic growth.

Inadequate sanitation leads to a number of financial and economic costs including, increased medical costs as well as lost income through reduced or lost productivity. Sanitation also leads to time and effort lost due to distant or inadequate sanitation facilities, reduced income from tourism (due to high risk of contamination and disease) and increased resilience to withstand extreme weather conditions.

3.10.8 Total Sanitation Campaign

Total Sanitation Campaign (TSC) was launched in 1999 advocating a shift from high subsidy to a low subsidy regime, greater household involvement, demand responsiveness, and providing for the promotion of a range of toilet options to promote increased affordability. It also gives strong emphasis on Information, Education and Communication (IEC) and social marketing for demand generation for sanitation facilities, to set up a delivery system through Rural Sanitary Marts (RSMs) and Production Centers (PC) and a thrust on school sanitation. TSC is implemented in a campaign mode-taking district as a unit so that 100 percent saturation

in terms of households, Anganwadi and school toilets can be attained which would result in significant health benefits.

As per the 73 Constitution Amendment Act, 1992, sanitation is included in the 11th Schedule and is the responsibility of the Panchayats. At the district level, Zilla Panchayat implements the project. Similarly, at the block and village levels, Panchayat Samiti and respective Gram Panchayats are involved in the implementation of TSC. Gram Panchayats have the pivotal role in the implementation of the Total Sanitation Campaign with Voluntary Organisations/ NGOs/ to mobilize for the construction of toilets and also maintain the clean environment by way of safe disposal of wastes. They have the main responsibility in the O&M of the common facilities constructed. Panchayats can also contribute from their own resources for School and Anganwadi Sanitation. Panchayats may also open and operate the Production Centres/Rural Sanitary Marts.

CHAPTER - 4: Clean Energy

Clean and renewable energy is defined as energy that comes from resources which are naturally replenished on human timescale such as sunlight, wind, rain, tides, waves, and geothermal heat. Renewable energy replaces conventional fuels. Using with fuels with less CO_2 emission, using high efficiency chulha that consumes less amount of log and decreases combustion, using LPG, using biogas and solar energy.

4.1 What is renewable energy?

Renewable energy is energy derived from natural sources that are replenished at a higher rate than they are consumed. Sunlight and wind, for example, are such sources that are constantly being replenished. Renewable energy sources are plentiful and all around us. Fossil fuels - coal, oil and gas - on the other hand, are non-renewable resources that take hundreds of millions of years to form. Fossil fuels, when burned to produce energy, cause harmful greenhouse gas emissions, such as carbon dioxide. Generating renewable energy creates far lower emissions than burning fossil fuels. Transitioning from fossil fuels, which currently account for the lion's share of emissions, to renewable energy is key to addressing the climate crisis. Renewable are now cheaper in most countries, and generate three times more jobs than fossil fuels.

4.2 Common Sources of Renewable Energy:

4.2.1 Solar Energy

Solar energy is the most abundant of all energy resources and can even be harnessed in cloudy weather. The rate at which solar energy is intercepted by the Earth is about 10,000 times greater than the rate at which humankind consumes energy. Solar technologies can deliver heat, cooling, natural lighting, electricity, and fuels for a host of applications. Solar technologies convert sunlight into electrical energy either through photovoltaic panels or through mirrors that concentrate solar radiation. Although not all countries are equally endowed with solar energy, a significant contribution to the energy mix from direct solar energy is possible for

every country. The cost of manufacturing solar panels has plummeted dramatically in the last decade, making them not only affordable but often the cheapest form of electricity. Solar panels have a lifespan of roughly 30 years, and come in variety of shades depending on the type of material used in manufacturing.

4.2.2 Wind energy

Wind energy harnesses the kinetic energy of moving air by using large wind turbines located on land (onshore) or in sea- or freshwater (offshore). Wind energy has been used for millennia, but onshore and offshore wind energy technologies have evolved over the last few years to maximize the electricity produced - with taller turbines and larger rotor diameters.

Though average wind speeds vary considerably by location, the world's technical potential for wind energy exceeds global electricity production, and ample potential exists in most regions of the world to enable significant wind energy deployment.

Many parts of the world have strong wind speeds, but the best locations for generating wind power are sometimes remote ones. Offshore wind power offers tremendous potential.

4.2.3 Geothermal energy

Geothermal energy utilizes the accessible thermal energy from the Earth's interior. Heat is extracted from geothermal reservoirs using wells or other means.

Reservoirs that are naturally sufficiently hot and permeable are called hydrothermal reservoirs, whereas reservoirs that are sufficiently hot but that are improved with hydraulic stimulation are called enhanced geothermal systems.

Once at the surface, fluids of various temperatures can be used to generate electricity. The technology for electricity generation from hydrothermal reservoirs is mature and reliable, and has been operating for more than 100 years.

4.2.4 Hydropower

Hydropower harnesses the energy of water moving from higher to lower elevations. It can be generated from reservoirs and rivers. Reservoir hydropower plants rely on stored water in a reservoir, while run-of-river hydropower plants harness energy from the available flow of the river. Hydropower reservoirs often have multiple uses - providing drinking water, water for irrigation, flood and drought control, navigation services, as well as energy supply.

Hydropower currently is the largest source of renewable energy in the electricity sector. It relies on generally stable rainfall patterns, and can be negatively impacted by climate-induced droughts or changes to ecosystems which impact rainfall patterns. The infrastructure needed to create hydropower can also impact on ecosystems in adverse ways. For this reason, many consider small-scale hydro a more environmentally-friendly option, and especially suitable for communities in remote locations.

4.2.5 Ocean Energy

Ocean energy derives from technologies that use the kinetic and thermal energy of seawater - waves or currents for instance - to produce electricity or heat.

Ocean energy systems are still at an early stage of development, with a number of prototype wave and tidal current devices being explored. The theoretical potential for ocean energy easily exceeds present human energy requirements.

4.2.6 Bio-energy

Bio energy is produced from a variety of organic materials, called biomass, such as wood, charcoal, dung and other manures for heat and power production, and agricultural crops for liquid bio fuels. Most biomass is used in rural areas for cooking, lighting and space heating, generally by poorer populations in developing countries. Modern biomass systems include dedicated crops or trees, residues from agriculture and forestry, and various organic waste streams.

Energy created by burning biomass creates greenhouse gas emissions, but at lower levels than burning fossil fuels like coal, oil or gas. However, bioenergy should only be used in limited applications, given potential negative environmental impacts related to large-scale increases in forest and bioenergy plantations, and resulting deforestation and land-use change.

4.3 Means of use of renewable energy?

The following are some top green alternative energy tips that will help you get an idea of how you as an individual can incorporate more renewable energy into your life:

i. **Switch to green power.** An increasing number of electricity providers offer renewable alternatives, such as wind and solar power.
ii. **Use solar power.** Active solar power is captured through solar cells and can be stored for later or used immediately to provide heat or electricity. You could also use solar power to heat the water for your showers, dishwasher, and laundry by installing a solar hot water system.
iii. **Use geothermal energy.** Ground source heat pumps are a way to reduce electricity use for heating and cooling, so its easier to go 100% renewable.
iv. **Replace fossil fuels with biomass/biofuels.** You can heat your home using biofuels. You can also use a woodstove or pellet stove.

v. **Use wind power.** It is more expensive up front, but a wind turbine is a 20-year investment that will save you money in the long run.
vi. **Use small-scale hydropower.** Micro hydropower can be used, like pumping water to power a generator.
vii. **Start smart.** When buying a home, make sure it is well insulated and energy-efficient so you use less electricity.

4.4 Barriers in Renewable Energy Technologies

At this stage, rural renewable energy production has also experienced various challenges and roadblocks. Renewable energy is highly reliant on the natural climate, has an insecure supply, and is heavily reliant on infrastructure development. The development of renewable energy technologies has been delayed by economic poverty in rural areas, low levels of public services, fragile natural habitats, and poor technological levels. In addition, obstacles such as infrastructure development, energy costs, geographic issues, and household size all impede the promotion of renewable energy in rural India. The imbalanced development of different types of Renewable Energy, which results in distributed Renewable Energy, does not considerably benefit the public amount and monetary growth of rural areas in the long term. As a result, biomass energy sources like as coal, straw, and firewood continue to be heavily used in modern agricultural production and rural living. The failure of the Renewable Energy push can be attributed to immature technology. Residents' discontent with the existing renewable energy promotion process stems mostly from a lack of technical expertise, which leads to equipment breakdowns and excessive servicing expenses [19]. Simultaneously, hydropower facility building will consume farmland and irrigation water, and hydropower operation may have a negative impact on agricultural production due to excessive dam construction regulation and inadequate hydropower station management. Dams built for hydropower could, however, also be utilized to provide irrigation water.

4.5 Eco-Friendly Construction

Eco Friendly construction involves the use of materials and processes that are resource efficient and environmentally responsible throughout the life cycle of building. It should also be cost-effective, for example through green construction including both building and roads. Locally available materials should be used. Usage of cost-effective technologies by replacing material intensive construction inputs such as cement, iron rods, and other concrete materials. Proper and natural ventilation should be provided which will reduce the use of energy sources and general consumption. Use of renewable and reusable materials such as wood, old construction materials, and environmentally friendly materials are also contribute to the clean environment.

CHAPTER - 6 Role of Panchayat in Thematic Area: Clean and Green

The thematic area on Clean and Green (SDG –6,7,12, 13.14 and 15) and the relation with respect to 29 subjects transferred to the Panchayats shows that there are areas in which Panchayats have a role and the potential in addressing environmental issues. Those subjects with respect to goals 6,7,12,13,14,15 are:

1. Water and watershed management,
2. Soil conservation
3. Social forestry and farm forestry,
4. Minor forest production,
5. Land improvement,
6. Implementation of land reforms, land consolidation and soil conservation,
7. Minor irrigation
8. Fisheries
9. Drinking water
10. Health and sanitation
11. Rural electrification, including distribution of electricity and non-conventional energy sources
12. Agriculture including agricultural extension
13. Minor irrigation, water management and watershed development
14. Social forestry and farm forestry
15. Minor Forest produces
16. Land improvement, implementation of land reforms

6.1 Gram Panchayat – Action Points:

- Awareness generation amongst the citizens on the importance of reducing wastage, ensuring sustainable production and consumption, reducing the adverse impact on environment.
- Promotion of measures within the Gram Panchayat that would reduce environmental pollution, such as reducing the use of plastics within the Gram Panchayat area
- Promote sustainable tourism within the Gram Panchayat, which creates jobs, local culture and local produce
- Take steps to create an in depth understanding of the term climate change and its impacts among the Panchayat committee and other community volunteers
- Sensitize people through Gram Sabha, Students/ Farmers /SHG meetings on the implications of climate change
- Identify progressive farmers, interested students and teachers, SHG members so that a working group can be formed for climate change action
- Train these working group members with the support of Department of Agriculture, Agriculture universities, Krishi Vigyan Kendras, Department of Disaster Management, Revenue authorities, Educational institutions and NGOs
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- Initiate microclimatic monitoring with the help of local educational institutions, students and teachers on parameters like rain fall, wind speed, ambient temperature, humidity, water level in streams, river
- Wall writings, display boards, hand outs to disseminate information to general population on mitigation and adaptation.
- Establish display boards, wall writings to disseminate current season's weather pattern
- Create a system to disseminate this information to the affected groups on a daily, weekly, monthly, quarterly basis depending on gravity.
- Organizing participatory rural appraisal (PRA) with progressive farmers and elders to understand the traditional methods adopted in agriculture during extreme events like flood, drought in the past.
- Building awareness of Gram Sabhas to the extreme events like cloud bursting, flood, drought, land slide, extreme cold.
- Identification of vulnerable groups like pregnant women, lactating women, children, elderly, differently abled, chronically ill, etc.
- Develop appropriate adaptation strategies for them during extreme events.
- Discuss and sensitize Gram Sabha about the climate change mitigation factors like reducing energy consumption, usage of fossil fuels, plastics, non-renewable building materials and also to promote measures like planting of trees, conserving forests, usage of good agricultural practices like drip irrigation, water conservation measures and conservation of wet lands.
- Mapping of land use, water bodies, forest, slopes, wet lands, degraded forest within the Gram Panchayat
- Forming and empowering the people's committees by giving adequate information on schemes, agencies, Government departments, on each theme
- Develop action/conservation plans through participatory processes like logical frame work analysis for each natural unit
- Seek and identify appropriate agencies for vetting the plans as well as for funding and technical inputs
- Continue updating of the plans and norms for eco restoration and ecological management through Gram Sabha and participatory methods
- Develop appropriate norms for sustainable utilization of resources from common lands, water bodies and forests on materials like non-timber forest produce, sand, fish and water
- Assess the water needs, sources, schemes, solid and liquid waste being generated – (biodegradable and non-biodegradable) through participatory surveys so that the need for water supply, sanitation, environmental sanitation and waste management facilities can be ascertained.
- Set the water and sanitation goals and targets for the Gram Panchayat Select appropriate technology choice for water supply and sanitation in the Gram Panchayat based on participatory assessment

- Ensuring maintenance of toilets of public places including those in markets and Gram Panchayat premises
- Identify appropriate schemes, state/national/international agencies, their programmes and schemes, non-Governmental agencies and companies which can support availability of water supply, source sustainability, reduction for source contamination, sanitation and waste management programmes.
- Liaise with respective agencies for ensuring adequate water supply, cleanliness and drinking water and sanitation facilities
- Monitor and problem solve during programme implementation and after.
- Assess the various needs of energy – for cooking, heating, lighting, irrigation, household food processing, industries, commercial establishments like shops and hotels.
- Which are the appropriate sources for these – electricity from the lines, solar, biogas, LPG.
- Set the goals and targets for your Gram Panchayat.
- Develop a comprehensive energy programme based on need assessment.
- Initiate a campaign to include all households and establishments in to the energy programmes - like electrification of all households, popularization of LED lamps, biogas tanks and many others.
- Identify appropriate schemes, state/national/international agencies, their programmes and schemes, non- Governmental agencies and companies which can support the Gram Panchayat energy programme.
- Liaison with these agencies and facilitate the process.
- Monitoring and problem-solving during programme implementation and after.

6.2 People to support Panchayat

Department of Agriculture, Krishi Vigyan Kendras, Department of Revenue, NGOs, Educational institutions, technical and academic institutions like ITI, polytechnics and research institutions, Pollution Control Board, Tourism department, Health and sanitation workers, Water supply scheme operators, Swachhta dhoots, Environmentalists, Registrants of MGNREGS, masons, Traditional farmers and labourers, Government department officials, (departments like electricity, renewable energy, rural development, Civil supplies).

APPENDIX - I

CASE STUDIES ON CLEAN AND GREEN VILLAGE

Case Study 1: Seechewal Model of Waste Management in Punjab

Sant Balbir Singh, known for his tremendous efforts to safeguard the environment in Punjab, has been honoured by Parliament of Canada, Copenhagen Calendar in Denmark, Time Magazine, Hero of the Environment, SAARC Environment 2010, etc.

A. Liquid Waste Management Kali Bein, a 160 km long tributary of the Beas River, which is the life-line of the Doaba region, got polluted due to population explosion and excessive urbanisation. Sant Seechewal started work for the revival and renovation of the river on 29 July 2000. During Kar Sewa, a thick layer of silt was removed from the river as a result of which the underground water levels in Sultanpur Lodhi area rose by a metre. Treated water from Sultanpur Lodhi is used in agriculture which has augmented production. The river banks have been fixed with stones and boulders, old trees have been preserved while new ones have been planted on the sides of the roads.

B. Solid Waste Management: Solid waste from the water treatment plant in Jalandhar city is being reused in preparation of plant nurseries. Plants from this nursery are distributed at no cost to nearby towns and villages. Through these efforts, the surroundings of Sultanpur Lodhi have turned into green belt area.

C. Eco-Friendly Sewerage System: Seechewal also introduced a low-cost, an easy to install efficient sewerage system in many villages and towns of Punjab. Through the system, the dirty sewage water of a village or town is collected in one or more ponds. The collected municipal water, which is polluted but not toxic is treated by simple methods of screening, filtration, sedimentation, rotation, etc. and made environmentally acceptable and reusable for different purposes. A low-cost water treatment plant has been constructed at Dasuya town in Hoshiarpur district. In Chakar village, Seechewal with the help of funding from Non Resident Indians installed a sewerage system. The treated water supplied via underground pipelines is used for crop irrigation. This has given relief to farmers by reducing the cost of agriculture production and enhancing crop yield besides paving the way for the adoption of organic farming. These efforts have turned the dirty ponds in the village into beautiful lakes.

D. Awareness Campaigns: There have been initiatives undertaken to generate awareness amongst people like organizing an Awareness March against toxic effluents polluting natural water resources in 2009, enlightening people on the fatal effects of toxic waters, leading a people's movement against water polluting industrial units of central Punjab, use of mass and social media to create public awareness, etc.

Case Study 2: Solid Waste Management in Sikkim

After attaining Nirmal Rajya in 2008, the focus shifted to SLWM in the state of Sikkim. A pool of resource persons on waste management was created by conducting trainings in all the four districts. Zero waste concept has been adopted for waste management across the state. There have been various initiatives undertaken in the state related to SLWM, specifically on usage of disposable items and bringing about behaviour change among people.

Some measures are: • Ban on usage of plastic carry bags throughout the state. • Throwing garbage into streams has been made punishable. • Ban on use of disposables in departmental meetings and during religious functions. • Promoting school sanitation and hygiene education. • Installation of vending machines and disposers for sanitary napkins. • The CLEANATHON, Which is the regular cleanliness drive of offices, schools, and public places, is changing the face of dirty areas. • A monthly cleanliness drive is observed in offices on every second Saturday of a month. • Generating money from activities surrounding waste such as selfie with garbage, walkathon, etc. In Mellidara, South Sikkim, with financial assistance from Nirmal Gram Puraskar (NGP), the gram panchayat constructed the Resource Recovery Centre (RRC) and also purchased a resource recovery vehicle (RRV) from its own resources. The project is sustained by collecting fees from the users, involves segregating waste at community level, composting of bio-degradable waste using Effective Micro-organisms (EM) with non-biodegradable waste being segregated component-wise and then sold in the market.

Case Study 3: Zero Waste Management in Vellore, Tamil Nadu

In year 2000, Exnora Green Cross (supported by UNICEF) initiated a pilot Zero Waste Management (ZWM) project in a ward of Vellore municipality. The project was piloted in rural areas of Kaniyampadi block under the TSC in 2002 and DRDA provided funds for construction of sheds, purchase of tricycles and tools and ensured the support of local bodies. A project team comprising a coordinator, supervisors and street beautifiers was formed for each village Panchayat. Village residents were explained the concept of ZWM and each household was provided with a set of red and green dust bins for organic and inorganic waste collection. Teams with two trained street beautifiers each were formed for every 300 households and were provided a tricycle with coloured bins and a set of hand tools. The waste collected was brought to the zero waste centre from where the inorganic waste was packed and sold to local waste collectors and recyclers every month and mixed waste (10-15 percent) which could not be recycled, was sent to landfills. The organic waste collected from the households was composted and treated through Vermi-composting and the resulting rich compost was then packed for agricultural purposes and afforestation activities.

The Vellore solid waste management project is now managed by village panchayats supported by Residential Welfare Associations and SHGs. Every family pays Rs 20 and each shop Rs 50 as waste collection charge. The user charges collected are used for paying the street beautifiers and supervisors. Gandhi Nagar village Panchayat generated an income of Rs 10,646 during the

financial year 2005-06 by selling organic waste and Rs 1,62,289 from inorganic waste. There were several factors which made the implementation of ZWM successful. Some of the critical ones being informed communities willing to pay for a clean environment along with microenterprise opportunities for rural youth. Local youth took pride in beautifying their streets and got paid for it with full support and involvement of local bodies.

Case - 4 Success Story: Anathasagar of Chinnakodur Mandal of Medak District of Andhra Pradesh is the proud recipient of NGP. It was like any other village prior to TSC program, a place where all use to defecate in open, water born disease were very prominent. The Gram Panchyat took a stand that if they find anybody henceforth going in open defecation would be charged penalty. In order to change the mindsets of the community members IEC activity were taken up. Traditional folk media Kalajathara and door to door campaign, wall paintings, parents meeting in school, rallies and other programs for generating awareness were carried out. In order to sustain the program school sanitation committee for toilet complex in schools, wash committee, environment and health committees were also formed.

Case - 5 Success story of Bachoda village of District Indore in Madhya Pradesh: An example of Fly changes life of people at Bachoda Village

Village Bachoda where agriculture is the only source of economy is in limelight in entire Madhya Pradesh for receiving Nirmal Gram Pursakar for TSC. Not far behind just one year before village Bachoda was like any other village in rural India, where due to open defecation in entire village one would find dirt everywhere. Mr. Manish Bharadwaj took the initiative to solve the problem of drinking water and sanitation. He faced lot of resistance by the community members to construct toilets. Information was disseminated amongst community members through medium of meetings; pamphlets were also distributed to create awareness. But it was a long way to convince the entire village for the same. But suddenly transformation could be seen, and that was because of a small example, which was sited to community members during meetings. The example was of a small fly how it goes and sits on excreta, and again it fly and come and sits on what we eat. People were asked to think as to what do they consume now while they eat, the food?

The answer was simple one also consumes excreta along with the food which is transferred by the fly, when she sit on food items. The example was an eye opener people realized and agreed to construct toilets so that system of open defecation can be totally abolished in Bachoda Village. Few individuals were given the responsibility to become policeman for the cause of cleanliness; their duty was to not allow a single individual to go for lavatory in open defecation. In order to achieve cent percent sanitation target, individuals not constructing toilets were penalized, for some time even they were not given grains from the ration shop and pensions of few pensioners was also stopped for this reason. After construction of toilets was over, the next target was health and hygiene of community members. The woman were explained the importance of hygiene. Individuals, who use to keep them self-dirty, were punished by giving

them bath in cold water. In order to keep village clean, the roads were broaden, dustbins were kept on roadside.

Case - 6. Success story of Juvvalapalem of West Godavari District in Andhra Pradesh Juvvalapalem, a small village in West Godavari District of Andhra Pradesh having population of 3700, situated near coast of Bay of Bengal Over decades, the villagers health has been highly affected due to lack of drinking water facility, poor hygiene due to open defecation and lack of waste disposal system. The initiatives taken by the selected representatives of Panchyat has not only begged Juvvalapalem "Nirmal Gram Puraskar" but has turned a healthy place to stay. Initially the Panchyat faced lot of resistance and non co-operation from different corners of society, but gradually they convinced the masses through sanitary awareness campaigns, and over here children played major role. The villagers were asked to take oath to keep village free from open defecation and also formed human chain to show the unity amongst village to fight against open defecation system. Along with achieving 100% sanitation target the village noticed various other changes like rate of communicable and water borne diseases reduced, in order to improve children's health, eggs were distributed periodically in mid-day meals in schools. A unique waste disposable system was developed, wherein every day from household through medium of cycle rickshaw or bullock cart waste used to be collected and was taken to a common place. Over there it was further classified into recyclable and bio degradable and was properly dispose to safeguard the public health. The villager are also provided with mineral water of International standards at a highly subsidized cost i.e. 12 paisa per liter to the public and free to schools and hospitals, in addition to well maintained protected water supply system.

Case - 7. Success Story of Kavateh Piran village of Sangali District in Maharashtra: A Story of modern Walmiki Kavathe Piran, a southern Gram Panchayat of the block Miraj in Sangli district in Maharashtra located about 13 kms from the district headquarters has a unique feature of having elected the Gram Panchayat body unopposed since its formation and is lead by the Hind Kesari Shri Maroti Mane (recipient of the Dhyan Chand Award conferred by the Government of India). Besides, this all the women members in the Gram Panchayat body are elected unopposed.

The Gram Panchayat has bagged several awards at its possession including the State level award of Rs. 25 lakhs given by the State Government, under the Saint Gadge Baba Village Sanitation Campaign (SGBVSC). A decade ago, the Panchayat was characterized by its notorious & criminal activities, in fact Kavthe Piran is a story of turning of criminal land into a peaceful land. A simple question raised in Gram Sabha of 2001 by woman to the then young and energetic Sarpanch Bhimrao Mane changed the whole scenario in the village.

She simply asked "If the leader of the village and his associates are addicted to innumerable bad habits, what is the future ahead for the generation to come?" – the question led to silence in Gram Sabha, but the silence broke and next 2 years gave answer to her question and witnessed a change. The modern Walmiki Bhimrao Mane was in action and nothing could come in way of the development of Kavthe Piran. Initially the Gram Panchayat faced problems

in convincing people for constructing toilets. So the Gram Panchayat adopted policy of mandatory construction of toilets and its use. It also announced that a person found for lavatory in open defecation would be charged Rs. 100/- and the reporter will be rewarded with Rs. 20/- per case. A fake appeal was also made in the Panchayat that families constructing and using a toilet would be given a grant of Rs.7000/- per household. After construction many villagers turned to Panchayat to claim the amount. A special Gram Sabha was then called to resolve the issue of giving grant. Mr. Bhimrao Mane counseled the villagers and explained them that many of us have luxurious facilitates at our place but we don't opt for toilets, it is shameful for us to see our females go in open defecation. The appeal made impact and community members got convinced that they owe a toilet for their females, and almost all of them rejected the grant and returned home with a smile for doing something for their families and also getting the Nirmal Gram Puraskar for the joint efforts made by entire community.

Case - 8. Success story of Mala Grama Panchayath of Thrissur District in Kerala: Mala Grama Panchyath is situated 40 kms away from the District Head Quarters. The village is equally represented by Hindu, Christian and Muslim community, having its main source of livelihood as agriculture. Since past 15 years Panchayat is working towards attaining "Open defecation" free status. The efforts have started way back in 1990's by Kerala Water Authority for construction of two pit latrines, also as part of decentralized planning with the introduction of the Panchyathi Raj System between (1996 to 2003). On the launch of TSC programme in the district in 2003, people from various walks of life came together including ward level representatives formed Health Promotion Team (HPT) to motivate people for construction of sanitary latrines. In order to sensitize general public about the necessity of sanitation, health and hygiene sound amplifier mounded vehicles were used to spread the message. Through medium of traditional folk media called as "Kalajatha" a form of street play were also performed to create awareness amongst general public on sanitation issue. Also since launch of the program participation of community based organizations such as SHG's, area based development societies and community development societies were ensured. Attractive dustbins are kept on roadsides for collection of garbage. At school level unique program, which targeted the adolescent girls, were undertaken. Active involvement of Parent Teachers Association (PTA), for implementing school sanitation programme. To ensure the smooth functioning of the project, a committee at Panchyat level was formed and which monitored the progress at regular interval. Targets were also assigned to block level officers and District level officers for monitoring the construction activities. Besides the individual toilets, 15 schools and 27 anganwadis were provided with sanitation facilities. Three sanitary complexes were constructed under TSC. The authorities of Mala Grama strongly believes that change which they have come across is not overnight, it has come a long way after efforts of committed individuals and in order to sustain hygiene behavior change they formed SHG and school health clubs. Sighting one example the Sapanch proudly shares that construction of toilets has changed life of villagers. He gave e.g. of Mr. Swamy Kuttan, who was earning his livelihood as coconut climber, he got disabled after falling from coconut tree. He even needed assistance for responding to natures call. Since they had no toilets, family had to face many hardships. To

look after her ailing husband his wife Suma cold not go for work and the family had landed in trouble. After constructing a sanitary latrine adjacent to their house, Mr. Swamy Kuttan could manage his personal needs himself and his wife could regularly go to work and earn a decent living.

Case - 9. Nallambal Samuthiraam Panchayat of Pudukkottai District has achieved remarkable heights in TSC. Their achievement in respect of providing sanitary facilities themselves, up keeping of public places like roads, drainages, drinking water sources, Women Sanitary complexes, ponds are remarkable. For every kind of social action they gather together to take decisions in Grama Sabha and carry out activities without any flaw. In order to achieve 100% sanitation awareness programmes were conducted with children, meetings with SHG members, and the issue was also discussed in Gram Sabha, cultural programmes, and door to door contact. Early morning watchers use to go round the village to keep watch on people so that they don't go in open for defecation. In the entire process the GP machinery played active role. In a very effective way they not only carried the base line survey, but other IEC activities like door to door campaign, wall paintings, street play were also carried out in proper systematic manner. In order to cultivate habit amongst children to use toilets, a unique system was developed wherein daily during the assembly message by school teacher was read out. Another unique achievement of Nallambal Sanuthiram is 100% village is covered with rain water harvesting system. Besides this health programme on AIDS, eye check up camps, are also organized for community members. In Economic aspect also this village is noteworthy and is having land mark achievement in "Azhola" cultivation. In a short span the united efforts of people have changed Nallambal Sanuthiram to an ideal village among other Gram Panchayats.

Case - 10. Success Story: Topugonda Gram Panchyat winner of NGP Today the villagers of Topugonda are celebrating the success of NGP. The same village a year ago had a different look wherein the entire pathways were dirty with human excreta, various water borne diseases prevailed. Old age people and pregnant women faced lot of problems to go for toilet particularly in nights. But the desire for change and, giving a life of dignity especially to women has changed the entire scenario of Topugonda. After covering the village by 100% sanitation, everyone is feeling comfort and streets are free from unsanitary conditions that prevailed earlier. Adolescent girls and women have no threat of wicked eyes anymore when they used to go for defecation in open. Not only has this community ownership been improved. Women leadership developed. This all was possible through the IEC campaigns carried out to make the village open defecation free. The people and the authorities of Topugonda village say that the achievement is possible through the joint efforts. Their experience says that building toilets is easy but bringing behavioral change is a tough job which they have achieved now and are proud for the same.

Case - 11. Transformation of Vedireswaram Village: A Success Story Vedireswaram village is situated in Ravulapalam Mandal in East Godavari District with a population of 6393. It is a complete transformation for Vedireswaram village in just two years. Majority of the roads are

cc roads. It can boast of a beautiful park and an efficient garbage collection system. This small village is at the Gateway of the Konaseema. The village has bidden good bay to open defecation as all houses have individual sanitary lavatory and all the institutions including schools, anganwadi centers. Vedireswaram village, with under ground drainage system and no open defecation? Sounds unbelievable? But Vedireswaram village achieved what several municipalities in the state are still struggling to envision. The Chairman PRI Sri. Sayyapuraju Ramakrishnam Raju of Vedireswaram village introduced two dust bin garbage collection method in the village and distributed two plastic bins to all the BPL families to control garbage problem. Major support was given by District Water and Sanitation Committee resource team in Mobilization and Communication they conducted many awareness campaigns, door to door communication on TSC using IEC tool like Kalajathas, Wall Paintings, FGDs. The success of the village can be seen through the participation of self-help groups and DWSC. According to Smt Katha Lakshmi Animator, (Dwacra) " The past is past, but at least from today we want to see our village open defecation free and have good sanitation facilities for our children, a healthy environment for our families and financial stability so we can live a better life. This will be possible through a cooperative effort between our self help groups and DWSC".

Case - 12. Ausulapally, Gram Panchayath of Medak District in Andhra Pradesh is a unique example of standing united for developmental activities. A small village of 2484 population, with agriculture and labour as its main occupation of earning livelihood has set a unique example in Andhra Pradesh, and has the honours of receiving Nirmal Gram Pursaskar for the year 2005-06. It was the challenge to the District authorities to change the mindset of individuals. The entire village surroundings and pathways were dirty with human excreta, till 2003 no of cases registered for spread of Malaria, Typhoid, GE, Diarrhea were rampant, all the pathways were with cesspools, mosquito breeding. The District authorities not only visited but reviewed coverage and usage of existing toilets and components of Sanitation but motivated the community leaders for using toilets and to adopt best practices. On massive level IEC campaign was taken up, wherein youth groups, school students and general public were shown documentary films, pamphlets, posters were distributed for generating awareness. Not only this in order to achieve open defecation-free status, the Gram Panchayath made resolution that those who go for defecation in open will not be given water supply. The Panchyat also supported those families who were not having space to construct toilet in their houses by providing them land. The task of brick making, production of RCC rings, procurement and supply of WC pans/pipes and other construction material was taken up in the village itself by the masons of the village. This had not only given employment for 3 months to them but transport cost was not there so beneficiaries got material at cheaper rates. In order to carry out the operation and maintenance of toilets various committees at village and school level have been formed, which is just a beginning for a new progressive pathway.

Case -13. Kozhuvanal Gram Panchayat Kozhuvanal Panchayat of Lalam block of Kottayam District is 22 kms away from the District Head Quarter. With an objective to improve the health and living standard of the people in Kottayam by reducing the incidence of

waterborne and communicable diseases which will in turn eliminate to a reasonable extent the morbidity rate and raise the life expectancy, the District Health Hygiene and Sanitation Mission headed by the District Panchayat, carried out certain activities like meeting of voluntary organizations, meeting with political party leaders, workshop for media persons, Lighting of "Sucithwa Deepam", proclamation rally and Kalajatha. A unique initiative was introduced to adopt the scientific solid waste management at the household level with community participation. Program on Vermi composting was arranged for all the households to generate positive enthusiasm on solid waste management among the people. One of the most unique thing of Kozhuvanal amongst the other NGP recipient is the construction of about 400 latrines on a particular day, which was connoted as the Sanitation Day "Suchithwa Dinam".

Case - 14. Success Story of Survadi village of Satara District in Maharashtra: Survadi is 65 kms from district Headquarter Satara & 245 kms away from state capital Mumbai. Initially hardly 47 household had toilets out of which majority of them were used for other purposes like shelter for hens, storage for firewood etc. In the entire village you will find water running on roads and puddles formed due to open drainage. The village payments were always surrounded with bushes and shrubs. In the year 2000 the villagers got an opportunity and the entire village was reformed under "Sant Gadgebaba Gram Swacchhata Abhiyan". Involvement of energetic Block Development Officer Mr. Rajendra Kokre not only guided villagers to construct toilets, but along with TSC program they planted some 1500 trees, internal roads were constructed, new system for drainage was introduced, soak pits were prepared, kitchen garden were developed by women wherever it was possible. This was just a beginning the villagers of Survadi had not to look back once they got united, those who could not afford to construct toilets took loans from bank and together they made the village with 100% toilet construction and its proper usage. The smile on the faces of women folk and entire houses of Suravadi painted in pink colour depicts the unity and success achieved in a short span.

Case-15. Microcredit for Sanitation: A quiet revolution leading to permanent behaviour change In 1998, MYRADA an NGO, has supported the formation of 24 federations comprising 563 groups with a total of 7568 members in the Talvadi, Andhiyur and TN Palayam blocks of Erode District, 13 of these federations take part in this UNICEF supported micro credit sanitation project. The federations use the fund as not as grant but as revolving fund-individual members borrow money for toilet construction and the repayments are again given as loans to other members. No interest is charged. In the entire cycle once this project gets complete, the original fund remains intact to be used in other sanitation programs. The unique feature of the project is that entire disbursal of funds is done by the members, nowhere UNICEF or NGO is involved, only time to time the NGO does audit of the federations. In the implementation process the federation committee first scrutinize the past payment record of the member, the space availability to construct toilet and then on those basis loan is passed. . The motto behind this project is not only to encourage construct toilets and awareness generation on community health and sanitation by discouraging open air defecation, but it is all about empower people by entrusting the implementation and management of the project to institutions run by them.

As of 2002 UNICEF released Rs. 2,00,000 ($ 6667, approx.) amongst 8 federations. The federation till date has carried out 650 toilet blocks construction successfully. The success of the project is not based mere on the no of toilet blocks constructed; it is all about the end of the plight which elderly people, women and adolescent girls used to face especially when going for open defecation. The success of the project have motivated the members to extend their idea beyond toilet construction to build bathing enclosures, rain water harvesting structures, biogas plants run on human and animal waste.

Case -16. Marching Towards the Goal of "Sanitation for All"- A Case Study of Chembarambakkam Panchayat showing women endeavor Background If water is life, sanitation is surely a 'way of life' and access to such facilities definitely has an impact on the quality of human life and health as well as the incidence and the spread of the diseases, needless to mention, the broader human development programme. The programme of sanitation has definitely evolved and moved beyond from top down to bottom approach focusing on community participation both in planning and implementation. There have been numerous efforts, which has strengthened this programme over the years. Demography Thiruvallur district was bifurcated from erstwhile Kanchipuram district in1997.It has an area of 3418 sq km distributed over 816 villages spread over 14 panchayat unions in 8 Taluks. It lies in between 12º 10' and 13º 15' north latitude and 79º 15' and 80º 2' east longitude. Thiruvallur is a coastal district, adjacent to metro of Chennai bounded on the east by Bay of Bengal and Chennai city; on the north by State Andhra Pradesh, on the south by Kanchipuram district, on the west by Vellore district. There are 6 municipalities, 19 town panchayats and 669 villages panchayats in the district. Population The district's population has grown over 4 times during the period 1951-91 and it stood at 22.38 lakhs in 1991 as compared to 5.70 lakhs in (1951). Literacy The literacy rate in the district Thiruvallur as per 1981 census was 37.9%. In the next decade the rate has increased to 56.8%. (1991 census) Similarly, the estimated figure for 1996 has also been high at 63.3%. More than half of the women in district are literates. Agriculture is the major source of sustenance for a majority of the population. Paddy is the major food crop in the district.

Case - 17. Ensuring Water and Sanitation - The SHG way: A Case Study of Keeraplayam Experience

Background: If water is life, sanitation is surely a `way of life' and access' to such facilities definitely has an impact on the quality of human life and health as well as the incidence and the spread of diseases; needless to mention, the broader human development programme. The programme of water and sanitation has definitely evolved and moved beyond from top down to bottom approach focusing on community participation both in planning and implementation. There have been numerous efforts, which have strengthened this programme over the years. Some of them quite aptly been highlighted during the Nirmal Gram Puraskar Ceremony held in February 2005 1 , by His Excellency Dr. A.P.J Abdul Kalam, President of India who shared his experiences related to sanitation in various places in India including Keerapalayam, Cuddalore district and Gandhi Nagar Town Panchayat, Vellore district of Tamil Nadu. He

desired that such cases might be examined with possibilities of replication in other parts of the country.

Keerapalayam Panchayat has witnessed many development interventions both Governmental and Non- Governmental as well as individual efforts which need to be underlined that have made this Panchayat a model. Keerapalayam has received many awards. It received the 'Best Clean Village Campaign Award'-2003-2004 by hon'ble Chief Minster of Tamil Nadu. The Panchayat further came into the limelight when His Excellency, Dr. A.P.J. Kalam, President of India visited Keerapalayam on 8th Aug 2004 and appreciated the efforts being made especially in water and sanitation through SHGs. Achievements of Keerapalayam in watsan sector Achievement has no colour but in Keerapalayam case, it is visible in facts. The practice of open defecation has been totally arrested in the village.

All the 1,160 houses have constructed their own household toilets and are in full use. One community toilet, which was constructed to cater to individual households of the village, is now being used by the persons visiting to the local market. All the schools and Anganwadis have been provided with water and sanitation facilities. Sanitation of a village did not finish with construction of toilets in the individual houses, schools and other Government buildings only. For a village to look clean its streets should be cleaned and there should be a proper disposal of drainage/sewage in order to ensure cleanliness of the village.

No death due to communicable disease in last three years Zero dropout rate in the last three years Supply of safe drinking water to all Practice of open defecation eliminated Clean and green environment even on water supply front, the Keerapalayam Panchayat has shown remarkable progress. All the Govt buildings along with religious structures have been covered with rainwater harvesting schemes. The average water supply to the villagers is 80 lpcd, which is more than the national average.

In Keerapalayam Panchayat, there are 25 Self Help Groups in which 9 are Backward Class groups, 11 are Schedule Caste groups, 1 Schedule Tribe groups and 4 are mixed groups. There are total 459 members in this groups i.e. 10% of the total population is mobilized in these groups. All the SHG groups have their bank account in the nearby bank. They are engaged in many activities like coir rope, coir and puppet making, milk society, pickles, earthworm manure, herbal medicine production, producing ploythen power, etc. These groups have been further organized in a federation called Panchayat level Federation (PLF)

SHG Model of Keerapalayam Village Community 50 member, 2 from each SHG NGOs-support in mobilization, training, work formal SHGs with bank account- 25 such groups, 12-20 members in each group. Panchayat has 7 committees. Watsan activities are coordinated by Water and Clean Committee headed by Panchayat President.

Watsan Services based SHGs

- SHG engaged waste management through plastic shredding and napkin making

- SHG engaged in providing masonry services for toilet construction and plumbing services for hand pump repair, water testing

Strengths and weakness as perceived by the Group Strengths & Weakness 1. Unity due to same village and caste 2. Strong leadership 3. Participatory environment 4. Prompt services 5. Survived without any credit assistance 1. Not skilled in constructing super-structure 2. Lack of office and communication facilities 3. Informal grouping 4. No long term saving 5.2 SHG engaged in providing plumbing services. This is small informal group of five members, which was formed in 2003. For environmentalists and ecologists, sustainability requires that an activity can be sustained (e.g. biologically) by the physical environment that nonrenewable resources are not used up. In the context of watsan programming and SHG model, the issue is sustainability of whom–the water and sanitation programme which is our focus or the sustainability of SHG.

Advantages/best practices: The SHG model adopted in the Keerapalayam Panchayat has worked well so far largely because of:

1. Strong leadership in the form of Panchayat President who has not only provided a vision for development but also managed to keep politics out from the development process.

2. Dedicated community participation in the programme which has improved the coverage and awareness

3. Presence of functional SHG in diverse activities organized under PLF which has strengthened their functioning and economic and social outputs

4. Dovetailing/convergence of different schemes has given a new dimension to the development process

5. Coordination among DRDA, NGO, GP, other Govt functionaries which have improved the implementation

6. Focus on women has ensured parity in participation, which has also improved their status in general.

7. Value addition/ innovations in programme especially in the form of waste management or Rural Bazar has taken the programme to higher level

Support mechanism for SHGs: SHGs involved in providing masonry and plumbing services and pan manufacturing Training and toolkit support Skill building in production and management under SGRY and TSC Programme and market Support Immediate programme and market support under SGRY, TSC, IAY Institutional Support Organized institutional support in the form of PLF, NGO, GP, DRDA, WDC, Bilateral support, etc.

Replication Potential: The word "replication" means a process of deliberate repeating. Since no two communities are alike and no community is the same at two different points of time, the notion of replicability becomes an ideal rather than something, which can be practiced precisely. This is even true for India who is very diverse and complex. Therefore, any efforts to replicate any model certainly invite some deviation from the original model. In case of watsan based SHG model of Keerapalayam Panchayat, various possibilities on sustainability has been discussed. The model has the potential for substantiality and if it is sustainable, certainly, it is replicable.

Case 18. Kaba is small village in Lohit District of Arunachal Pradesh located at three Km away from Namsai town. The population of the village is 118 of which 63 female and 55 male. The entire population is schedule tribe and belongs to Adi community; out of 40 household of the village 13 are above Poverty Level (APL) and 27 below Poverty Level (BPL). The village is very much scattered. Earlier the people had been collecting water for their domestic needs from the shallow dug wells, which were exposed, to the risks of bacteriological contaminations. Except few APL families no household were having any latrine and all were defecating openly. Besides health hazard, the dignity of the girls and women were seriously in stake. Only primary school of the village was neither having dependable water source nor any sanitation facilities, which was causing serious inconvenience to the small boys and girls. The trained village level motivators played key role in persuasion to village community. Realising the positive potentiality of reform approach the Gaobura, the elected members of PRI and women community of Kaba village took a lead role to enhance the quality of life in the village availing the benefit of the pilot project and the reform programme. Combining the subsidy amount of Rs. 500/unit from Govt. the substructure has been constructed with offset pit and plastic pan and trap.

Each of the beneficiary household of BPL constructed their superstructure by themselves with locally available materials like bamboo/ timber/ split bamboo with mud plaster. All the latrines are at present in use. The villagers made a radical change in their earlier habit of open defecation. In school also toilet facilities for both boys and girls are being created. The behavioural change and their change of mindsets helped them achieve better quality of life. Thus, Kaba village where all the households are having hygienic latrines against 5.7% of the state.

Kasu village with population of 120 mostly Buddhists, located in the same block (Namsi), Lohi district, realized from benefits of having individual household sanitary latrines in Kaba village. The villagers came forward and involved themselves in sanitation progrmme like village of Kaba and attained 100% sanitation along with the school maintaining separate toilets for boys and girls properly.

Case - 19. Nirmal Dhalhara GP – A Feat, which Remains Incomplete Sanitation programme was launched in Dhalhara GP, Sahid Matangini Block, East Medinipur district, West Bengal, in 1990. Hard work and determination of the local administration and the supporting NGO

succeeded in mobilising communities and generating awareness on the importance of eradicating open defecation. All households in the GP have toilets and people do use it. Government of India recognised the achievement made by the GP by awarding NGP last year. However, an interaction with Mr.Sasanka Ray, a 70 year old small time farmer in Astara village, has given a different perspective to the open defecation free status achieved by the GP. Mr.Ray has a large family of 12 members (six men, four women and two children). As the family size is big, he built two toilets in 2004. Both are onpit latrines with pits having 4ft depth and an equal diameter. All members of the family use toilets and are happy the way TSC is implemented. When he was asked about the problem of pits getting filled up, he casually remarked that it happened last year. Interestingly he removed the excreta and used it as manure in the field without getting it sanitised through composting. Further enquiries revealed that around 85 per cent of the households in the GP have on-pit latrines. This implies that in those many per cent of households in the GP safe disposal of excreta is not a reality. Reason cited for not promoting double-pit latrine is that on-pit model is positioned at the entry level. Once people are accustomed to using toilets, they would go for upgradation and start using double-pit model. This argument does not hold much water as the programme has been under implementation since 1990. It appears that the IEC programme has ended up conveying the wrong message that all that matters is using a toilet for defecation and washing hands after that. Safe handling of excreta is not given the importance it deserves. Enquiries with the water testing laboratory revealed that nine per cent of samples tested from Dhalhara GP had bacteriological contamination. So, there is a need to take proactive steps to upgrade the existing toilets and convey the message that safe handling of excreta is as important, if not more important than avoiding open defecation and hand washing.

Case - 20. WOMAN SARPANCH LEADS THE WAY: Tamil Nadu

Tamil Nadu is one of the leading states in the success specially in the role of Women leading this mass movement and initiating innovative sanitation models. Smt. Varalakshmi Vijayakumar the President of the Thirukalukundram Panchayat Union is one such dynamic woman leader of a small remote village of Tamil Nadu who has made a lifelong commitment to make her village and Panchayat Union a role model of Best Sanitation technology and practices in the country. Recognizing that women are the ones who understand both the problems and the practical solutions for providing safe sanitation in their home and village community, Varalakshmi made the women's Self Help Group the forefront of the sanitation movement in her village. In order to tap the Panchayat funds for her sanitation mission she contested and won the reserved seat for women as President and decided to transform her dirty village with almost no sanitation facilities to an 'Open defecation Free' Clean and Healthy village through the Nirmal Gram Puraskar Awards scheme under TSC. Through door-to-door meetings and intensive and sustained awareness programmes she motivated and mobilized all the women's groups, village community members, elders, Principals, teachers, youth, Health workers, Anganwadi workers and other Panchayat members to take up the construction of toilets in each and every individual household, schools and Anganwadis. The Panchayat

members and the Self help group members meet every month to discuss all development programmes and schemes for the village including pooling and maintenances of funds, skill building of SHG members in financial and administrative management. Thus within a short period of one year all the 104 households, all schools and Anganwadi in village were provided with toilets. The significant aspect was the huge amount of community contribution, a total of Rs. 49400 through individual contribution and Panchayat and SHG funds that was generated for construction of toilets - Rs. 26400/ for household construction, Rs. 2000/ for schools and Rs. 1000 for Anganwadis, Rs. 20,000 for Mini Power Pump. In addition 10 Solid and liquid waste management initiatives and 3 liquid waste management projects, rain water Harvesting systems in houses, segregation of biodegradable and nonbiodegradable in separate bins in streets have made the village clean and self sustaining in its water and sanitation needs. The village also has a Women's Sanitary Complex built with a Government grant of Rs. 2,40,000 the operation and maintenance of which is done by the Women's Self Help group. Special attention is focused on the Health and Hygiene awareness activities in schools and Anganwadis and children spread the messages on sanitation through the 10 commandments of maintaining personal hygiene. Proudly displaying the Momento Varalakshmi received from the President of India in the NGP awards function held in 2007 in Delhi she says "I dedicate this Nirmal Gram Puraskar to the Women's self help group members and all the villagers for making my village Clean and Healthy and they together will not only maintain this status but will start several new ventures like Solar Electricity, Bio gas linked toilets. Women's enterprises thus becoming a role model for all other villages in India".

Case Study 21. Green Village. Khasi Tribe and their Socio-Culture geography: A Study on Asia's Cleanest Village Mawlynnong by Dr. TAPAS PAL, Visva-Bharati University, Santiniketan

Mawlynnong village is an eco-tourism spot visited by 1000s of visitors from various parts of the country in every year. There is a violent sense of self-determination among these people and certain rules they have followed traditionally. They do not want government to borrow ideas from outside and impose it on them. The villagers who have made the place so beautiful like the cleanest in the continent. There is something special about the place. I just came to see why it has become so famous. It really is clean and you have to give them 10 out of 10 for that. The rest of country should learn from Mawlynnong's experience. According to Mawlynnong village headman there is a fine imposed by the village council for anybody found to be throwing litter around or cutting trees. If Indians want to make their country a clean, healthy place, 100% literacy, then they should learn from the aesthetic environmental education model (both formal and informal) of Khasi tribesmen of Meghalaya's Mawlynnong village. Mawlynnong village was discovered by missionaries of the Anglican Church who came in contact with the village to spread the gospel way back in 1902. They later built a church there with the help of the highly-skilled local masons. Mawlynnong, a small village located in the East Khasi Hills in Meghalaya, was awarded the prestigious tag of 'Cleanest Village in Asia' in 2003 by Discover India Magazine. Located at about 90 kms from Shillong, the village offers a sky walk for you

to take in the beauty as you explore it. According to visitors, you cannot find a single cigarette butt/plastic bag lying around there. As of 2014, there are about 95 households (around 450-500 people) in Mawlynnong. Mawlynnong Village of Meghalaya also referred as 'God's own garden'. The community has made collective effort to maintain the ambience of a clean village (Phukan, 2014). The village offers picturesque natural beauty, a trek to the living Root Bridge at a neighboring village Riwai. The village also offers a sight of natural balancing rock, a strange natural phenomenon of a boulder balancing on another rock.

The flash you enter Mawlynnong, a huge billboard welcomes you with the caption _Welcome to Mawlynnong – God's Own Garden'and at the same time you also get to read a list of do's and don'ts on how to keep the village clean. These do's and don'ts are for everyone: the locals as well as the visitors. Each and every individual residing here, including the old and the children, all are responsible to keep the village clean. It is a joint endeavor by everyone and maybe that is the reason it has become a heritage site today. Community management is very much important for Malynnong's life. The informal education for environment has come from community instructions, which is the production of community hall. After getting the cleanness village prestige, village community has given their more importance on community management.

Case - 22 Water Governance: The practice of managing the waste water was carried out in village Baindi of District Yamunanagar, Haryana during the period April, 2016 to October, 2018. This best practice was adopted by the villagers due to the hazards arising from the filthy over flowing ponds, water logged streets and improper disposal of waste water in the village. The management of waste water in a safe and sustainable manner was the major challenge for them. The practice is about reducing the toxicity and environmental threat, and to reuse the water for agriculture, fisheries and recharging the ground water at low maintenance. The village Panchayat of Baindi is known for its efforts for the welfare of its people. The major problem of the village was waste pilling up in all the public places. The filthy site of overflowing ponds and water logged streets was usual scenario. Gram Panchayat was desperate to solve the problem; the introduction of five pond technology of treating the waste water came as a rescue to panchayat. This system has five ponds namely:-

1. Anaerobic
2. Alternate Anaerobic
3. Facultative
4. Maturation
5. 2nd maturation, this water needs to be treated before adding into the surrounding natural filter systems like swamps and it produces a disposable effluent without causing harm to the environment and it also prevents pollution. Besides providing clean environment to the villagers, the five pond system recharges the underground water as well.

6. Village Baindi has improved hygiene as it manages its own waste treated steps from the ponds which can be used as manure for agriculture as such as other benefits such as source of bio mass for electricity generation.

7. By adoption of WSP (Water Stabilization Ponds) technology the village has successfully improved social economic profile. They have been successful in their efforts towards improved infrastructure in terms of building banquet hall and panchayat shops for income generation. Seamless and dedicated efforts have been put for all pucca streets in the village. Solar Lights are also being encouraged to save energy. At present there are five big lights at the main crossings of the village and 14 small ones are installed in the streets.

SESSIONWISE FREQUENTLY ASKED QUESTIONS (FAQs) ON CLEAN AND GREEN VILLAGE

Introductory Session on Sustainable Development Goals (SDGs) and Panchayati Raj Institutions (PRIs)

1. What does the 73rd amendment to the Indian constitution mean?

The 73rd Amendment Act of 1992 gave constitutional recognition to the Panchayats (Rural local Government) by the addition of a new Part IX and a new Schedule 11 in our constitution. The 73rd Amendment was for The Gram Panchayats or the local Government of the Rural areas. The 74th Constitution Amendment Act of 1992 gave constitutional recognition to the Municipalities (The Urban Local Governments) by the addition of a New Part IX-A and a New Schedule 12 to the Constitution of India. The 74th Constitution Amendment Act was for The Municipal corporations or the local Government of the Urban areas.

2. What do you mean by Sustainable Development Goals?

The Sustainable Development Goals or Global Goals are a collection of 17 interlinked global goals designed to be a "blueprint to achieve a better and more sustainable future for all". The SDGs were set up in 2015 by the United Nations General Assembly and are intended to be achieved by 2030.

3. What do you mean by localisation of SDGs?

Localisation of the Sustainable Development Goals (SDGs) refers to the process of defining, implementing and monitoring strategies at the local level to achieve global, national and sub-national sustainable development goals and targets.

Session 1: Concept and Importance of Clean and Green Village

1. What do you mean by clean and green?

Green" refers to a pollutant free environment including soil, air and water in which natural resources such as oceans, land, and forests, are sustainably managed and conserved to improve livelihoods and ensure food security. This will lead to build a healthy safe ecosystem and ensure employment security. "Clean" refers to access to safe & adequate drinking water and sanitation services, low-pollution, and low-emission world in which cleaner air, water, and oceans enable people to lead healthy, productive lives.

2. What is the main vision of Clean and Green Village?

The main vision of clean and green village is to create a village for the future of our children, which is lush and green with nature's bounty, using renewable energy, clean, protecting environment and climate resilient.

3. How to keep the environment clean and green?

- Planting more trees and increasing the green area is a major step towards keeping the environment clean and green.
- Proper disposal of waste of every kind must be encouraged and if necessary, rewarded.
- The emission of vehicular gases should be checked and environmentally friendly fuel alternatives encouraged.
- Deforestation should be dissuaded and penalised. If found indispensable, an alternative area must be cultivated for forestation.
- All material that is non-degradable such as plastic should be removed from circulation.
- People must be educated about the importance of a clean and green environment. Awareness programs are beneficial in doing so.
- Fire crackers and burning fires in the open must be stopped.

4. What are the SDG linkages in the Clean and Green theme?

Out of the 17 Sustainable developmental goals the theme "Clean and Green villages" is interlinked to few other goals. They are SDG – 6, 7, 12, 13, 14 and 15.

- SDG 6 is successfully incorporated into SDG9 via integrated water resource management, quality, and reliable, sustainable and resilient infrastructure (6.5 & 9.1).
- Recycling and safe reuse of water, reduce release of chemicals and waste into water and reduce waste generation (12.4, 12.5) provide healthy, hygiene environment.
- SDG 7 is directly linked to SDG Clean and Green in case of increasing share of renewable energies and energy efficiency, upgrading infrastructure, increased resource use efficiency and clean technologies (7.1, 7.2, 9.4)
- Targets 7.1 & 7.2 conveys the idea of increasing share of renewable energies and energy efficiency which is a way of sustainable consumption of resources which indeed to attain SDG clean and green timely.

- Targets 12.8 & 13.3 stand for raise awareness and education on sustainable waste generation will contribute to mitigation of disasters associated with climate change.
- Target 6.6 conveys the protection and restoration of water-related ecosystems that indirectly blends with target 15.4- conservation of mountain ecosystems (water bodies/ streams).
- Target 14.7 tries to increase economic benefits to SIDs and LDCs from sustainable use of marine resources which facilitates sustainable tourism depicted on Target 8.9.
- Target 14.4 accounts to fight illegal, unreported and unregulated fishing, wrehich can have attained only through accountable and transparent institutions (target 16.6).
- The sustainable management and efficient use of natural resources converged in target 12.2 paves the way for SDG clean and green attainment.

5. What are the major problems faced in related to clean and green?

The major problems related to clean and green are;

- Numerous environmental hazards
- Various pollutions such as air, water and soil
- Acidification of water and soil
- Climate change
- Waste disposal
- Public health issues

6. What are the positive effects of clean and green?

Clean and green environment imply absence of pollution and a better quality of life. Green on the other hand has a direct link to promoting good health. Literally a green environment means abundance of trees and greenery. Trees are instrumental in purifying air by absorbing the dangerous gases and giving out Oxygen. Clean environment is the key to existence and survival of life on planet earth. Maintaining a clean environment reduces pollution, preserves our biosphere, protects endangered species, and also helps preserve the earth's natural.

Session 2: Problems of Rural Sanitation and Drive Towards access to Sanitation for all

Q. What is hygiene promotion?

Hygiene promotion encourages all the hygienic conditions and behaviours that can contribute to good health. It aims to stimulate and facilitate the right behaviour changes. Usually, it starts with systematic data collection to find out and understand what different groups of people know about hygiene, what they do, what they want, and why this is so. The results are used to set objectives and to identify and implement activities that enable the different groups to measurably reduce risky conditions and practices and strengthen positive situations and behaviours.

Q. What is the difference between hygiene promotion and health promotion?

Hygiene promotion is more specific and more targeted than health promotion. It focuses on the reduction - and ultimately the elimination - of diseases and deaths that originate from poor hygiene conditions and practices. For example, good hygiene conditions and practices are enhanced when people can consume water that is safe, use sufficient amounts of water for personal and domestic cleanliness, and dispose of their solid and liquid wastes safely.

A person may have good hygiene behaviour, but not be healthy for other reasons. Good or bad health is influenced by many factors, such as the environment (physical, social and economic). For example, in social environments where people are marginalized because of their gender, economic status or religious affiliation, and have no influence whatsoever on decisions that affect their daily lives, they are likely to be prone to anxiety or depression, which can lead to mental problems.

Q. What is Occupational Hygiene?

Occupational Hygiene is the discipline of anticipating, recognising, evaluating and controlling health hazards in the working environment with the objective of protecting worker health and well-being and safeguarding the community at large.'

Q. Is hygiene promotion the same as hygiene education?

No, it is not. Education usually means teaching people, e.g. about what makes them ill and what they must or must not do. Often it is didactic. In the case of hygiene education, for example, the educators may want to teach people the germ theory of disease in order to discourage transmission through unhygienic practices. Such information has its place, e.g. when people themselves want to know how they can avoid getting a particular disease. However, successful promotional programmes do not 'instruct' people. They promote healthy conditions and practices in other, usually more effective, ways than 'teaching', e.g., by improving access to the means for better hygiene and health, social marketing, participatory learning, and peer influence. In hygiene promotion, the individuals and communities themselves review their hygiene practices and develop ways of improving them.

Q. Why is hygiene promotion important?

Most of the health benefits of water supply projects stem from changes in hygiene behaviour. While access to the hardware itself can sometimes induce changes (such as increased water consumption), it is cost-effective to devote some resources to promoting the better hygiene and behaviours that the new facilities make possible, that have greater health impact than the hardware alone.

Q. What is the place of children in hygiene promotion?

Children are both a major target group and major actors in hygiene promotion programmes. Young children still need to build their resistance to infectious diseases. When under the age of five they are the most vulnerable to poor water supply, sanitation, and hygiene. Some 6,000 children die every day from diseases associated with lack of access to safe drinking water, inadequate sanitation, and poor hygiene - equivalent to 20 jumbo jets crashing every day.

At the same time, children are major actors when it comes to better practices. Children who acquire good habits when young will often practice these throughout their lives and pass them on to their own children. They often also have a positive influence on parents. Schools and school sanitation programmes play an important role in spreading good practices.

Q. How can the social marketing approach contribute to hygiene promotion?

Lessons from hygiene promotion and sanitation programmes have shown that social marketing is a good way to reach many people collectively in a short time and achieve the adoption of one or a few changes. Social marketing is less suitable for complex and comprehensive behaviour change and capacity building.

Q. What do we mean by hygiene behaviour?

Positive hygiene behaviours include a wide range of practices that promote health, and prevent catching and spreading water and sanitation-related diseases. Our health related behaviour is partly determined by a complex mix of our knowledge, beliefs, attitudes, norms, and customs. Socio-economic determinants and even political factors also play important roles. Without the resources to construct and maintain water supply and sanitation facilities, it is difficult to attain levels of personal, domestic, and environmental hygiene conducive to health. Resources relate not only to money, but also to the availability of land, time, materials, and technical and management skills for achieving improved facilities.

Q. What is hand hygiene?

Hand hygiene is a general term that applies to routine hand washing, antiseptic hand wash, antiseptic hand rub, or surgical hand antisepsis.

Q. What do we mean by "sanitation"?

The first challenge for most countries is to define what sanitation really means. The second challenge is to decide what aspects are most important. Sanitation as a whole is a "big idea" covering everything from safe collection, and disposal of human excreta (faeces and urine); to the management of solid wastes (trash or rubbish.) Each community, region or country must understand the most sensible and cost-effective way of thinking about sanitation, both in the short and long term, then establish appropriate national plans and priorities, and last but not least – implement.

It is important to understand that sanitation can act at different levels, protecting the household, the community and society. In the case of latrines it is easy to see that this sanitation system acts at a household level. However, poor design or inappropriate location may lead to migration of waste matter and contamination of local water supplies putting the community at risk. Further down affects of waterborne sewage contamination affect the entire society by ill health and environmental damage.

For countries with very low access to basic sanitation, the effective management of excreta at the household level may have the greatest health implications and benefits but may also be the biggest challenge. In other cases, for example, in a particularly congested urban community, some form of off-site (sewerage) sanitation may be the only viable choice. Yet, in other countries or communities a more complete solution might include a focus on protecting the environment.

Q. What do we mean by open defecation?

Open defecation is defined as defecation in fields, forests, bushes, bodies of water or other open spaces.

Q. Why is it important to stop open defecation?

Some of the harmful impacts of open defecation are as follows:

Spread of diarrheal diseases: Preventable diseases such as diarrhea linked to open defecation are among the highest causes of illness and death, especially of children, in developing countries. Feces defecated in the open come back to us in many ways.

Loss of human dignity: Open defecation results in loss of privacy and dignity, especially for women and girls. Safe and sustainable school latrines have been proven to be linked with continued education enrolment of teenage girls and young women, particularly at puberty.

Environmental pollution: Improperly disposed mostly is a major polluter of soil and water Intestinal worms affect nearly 30 percent of the bodies. This contributes to the spread of disease and the population in developing countries depletes waters of oxygen that is needed to sustain aquatic life.

Q. What do successful sanitation programmes have in common?

Community- led and driven programmes that utilize local, sustainable technologies, coupled with an enabling environment and good partnerships between public and private sectors are the key factors in achieving universal sanitation and eliminating open defecation.

Q. What do we mean by sustainable sanitation?

The main objective of a sanitation system is to protect and promote human health by providing a clean environment and breaking the cycle of disease. In order to be sustainable a sanitation system has to not only be economically viable, socially acceptable and technically and institutionally appropriate, but it should also protect the environment and natural resources.

Q. Why does sanitation matter?

Lack of improved sanitation is a global crisis directly impacting the health, education, productivity and economic status of a household and often becoming the catalyst towards propelling a family out of poverty.

Improved sanitation and hygiene education will speed the achievement of all MDG's, helping eradicate extreme poverty and hunger; achieve universal primary education; promote gender equality and empower women; reduce child-mortality; improve maternal health; combat HIV and AIDS; malaria and other diseases; as well as ensure environmental sustainability.

Q. What diseases are associated with poor sanitation?

Human excreta have been implicated in the transmission of many infectious diseases including cholera, typhoid, infectious hepatitis, polio, cryptosporidiosis, and ascariasis. Under nutrition, pneumonia, worm infestations, are also associated with unsafe water, poor sanitation and hygiene resulting in reduced physical growth, weakened physical fitness and impaired cognitive function, particularly for children under the age of five.

Infectious agents are not the only health concerns associated with wastewater and excreta. Heavy metals, toxic organic and inorganic substances also can pose serious threats to human health and the environment – particularly when industrial wastes are added to the waste stream.

Q. How does sanitation affect the environment?

Inadequate sanitation, particularly in the context of urbanization, allows for sewage or waste to flow directly into streams, rivers, lakes and wetlands, affecting coastal and marine ecosystems, fouling the environment and exposing millions of children to disease. Improved sanitation reduces environmental burdens, increases sustainability of environmental resources and allows for a healthier, more secure future for the population.

Q. What are some of the challenges developing countries and donors face in meeting the MDG targets on sanitation?

Eliminating disparities in access to sanitation are critical to achieving equitable access for all. Despite the fact that billions have gained access to improved sanitation, distribution to access is far from equitable. Ninety-nine percent of the population in the developed world use improved sanitation facilities as compared to 52 percent in the developing world. In addition, rapid population growth and climate change also hinder progress.

Q. Are both the MDG drinking-water and sanitation targets achievable?

The world has met the MDG target of halving the proportion of the population without access to safe drinking-water. However, current trends show that the MDG sanitation target will likely be missed. Regarding open defecation – the riskiest practice – there is some good news. The proportion of the world's population that practices open defecation is on the decline, although 1.1 billion people are still practising open defecation.

Q. What are the economic benefits of investing in sanitation?

Financing sustainable sanitation is an investment in human development that yields high economic returns. Improved sanitation in developing countries yields an average of about US$9 for every one dollar spent. Increases in female literacy (due to increased school attendance where proper sanitation facilities exist) contribute to economic growth.

Inadequate sanitation leads to a number of financial and economic costs including, increased medical costs as well as lost income through reduced or lost productivity. Sanitation also leads to time and effort lost due to distant or inadequate sanitation facilities, reduced income from tourism (due to high risk of contamination and disease) and increased resilience to withstand extreme weather conditions.

Q. How feasible is it to change entrenched habits, like open defecation?

Numerous examples of successful change exist. More and more communities pride themselves in achieving the Open Defecation Free (ODF) status. Community-led Total Sanitation approaches that educate households, along with the availability of local and sustainable solutions and services, are a first step towards changing entrenched habits. Additionally, teaching school children facts about health risks and safe hygiene practices helps them develop essential life skills that they share with their families. These life skills also enable them to acquire and maintain healthy lifestyles, and to take greater responsibility for their own lives, as they become adults with families of their own.

Q. Are water and sanitation equally important?

Yes. Water and sanitation are integrally related and equally important for a life of health and dignity. Lack of safe sanitation is a major cause of contamination of water sources, so without

safe sanitation, safe drinking water is impossible. Many diseases are caused by the lack of access to safe sanitation, or by poor quality water. Safe water is essential for hygiene.

Q. What is Total Sanitation Campaign?

Total Sanitation Campaign (TSC) was launched in 1999 advocating a shift from high subsidy to a low subsidy regime, greater household involvement, demand responsiveness, and providing for the promotion of a range of toilet options to promote increased affordability. It also gives strong emphasis on Information, Education and Communication (IEC) and social marketing for demand generation for sanitation facilities, to set up a delivery system through Rural Sanitary Marts (RSMs) and Production Centers (PC) and a thrust on school sanitation. TSC is implemented in a campaign mode-taking district as a unit so that 100 percent saturation in terms of households, Anganwadi and school toilets can be attained which would result in significant health benefits.

Q. What are the Rural Sanitation programmes implemented by MoRD?

Government of India had launched Central Rural Sanitation Programme (CRSP) in the year 1986 with the objective of accelerating sanitation coverage in rural areas. CRSP was restructured in the year 1999 exhibiting a paradigm shift in the approach and Total Sanitation Campaign (TSC) was introduced. At present, TSC is the only rural sanitation programme implemented by Ministry of Rural Development.

Q. What is the role of PRIs in TSC implementation?

As per the 73 Constitution Amendment Act, 1992, sanitation is included in the 11th Schedule and is the responsibility of the Panchayats. At the district level, Zilla Panchayat implements the project. Similarly, at the block and village levels, Panchayat Samiti and respective Gram Panchayats are involved in the implementation of TSC. Gram Panchayats have the pivotal role in the implementation of the Total Sanitation Campaign with Voluntary Organisations/ NGOs/ to mobilize for the construction of toilets and also maintain the clean environment by way of safe disposal of wastes. They have the main responsibility in the O&M of the common facilities constructed. Panchayats can also contribute from their own resources for School and Anganwadi Sanitation. Panchayats may also open and operate the Production Centres/Rural Sanitary Marts.

Session 3: Sources of Clean Energy and Effective Utilisation in the panchayat

1. What is renewable energy?

Renewable energy, often referred to as clean energy, comes from natural sources or processes that are constantly replenished. For example, sunlight or wind keep shining and blowing, even if their availability depends on time and weather. While renewable energy is often thought of as a new technology, harnessing nature's power has long been used for heating, transportation, lighting, and more.

Non-renewable, or "dirty," energy includes fossil fuels such as oil, gas, and coal. Non-renewable sources of energy are only available in limited amounts and take a long time to replenish. When we pump gas at the station, we're using a finite resource refined from crude oil that's been around since prehistoric times. Non-renewable energy sources are also typically found in specific parts of the world, making them more plentiful in some nations than others. By contrast, every country has access to sunshine and wind. Prioritizing non-renewable energy can also improve national security by reducing a country's reliance on exports from fossil fuel–rich nations.

2. How many different types of renewable energy are there?

The two main sources of renewable energy – or the ones you've most likely heard of before – are solar and wind power.

Solar: We use solar energy every day, from growing crops on farms to staying warm. Photovoltaic (PV) solar panels are made of solar cells. A cell is a small disk of a semiconductor like silicon. They are attached by wire to a circuit. As light strikes the semiconductor, light is converted into electricity that flows through the circuit. As soon as the light is removed, the solar cell stops producing power.

Wind: We can also produce electricity through wind power. A wind turbine turns energy in the wind into electricity using the aerodynamic force created by the rotor blades, which work similarly to an airplane wing or helicopter rotor blade. When the wind flows across the blade, the air pressure on one side of the blade decreases. The difference in air pressure across the two sides of the blade creates both lift and drag. The force of the lift is stronger than the drag and this causes the rotor to spin. The rotor is connected to the generator, either directly (if it's a direct drive turbine) or through a shaft and a series of gears (a gearbox) that speed up the rotation and allow for a physically smaller generator. This translation of aerodynamic force to rotation of a generator creates electricity.

Hydropower, Biomass, Geothermal, and Tidal Energy: Other less 'mainstream' sources of renewable energy are hydroelectric power, biomass energy, geothermal energy, and tidal energy.

Like other forms of electricity generation, hydropower uses a turbine to help generate electricity; using the energy of falling or flowing water to turn the blades. The rotating blades spin a generator that converts the mechanical energy of the spinning turbine into electrical energy.

Biomass contains stored energy from the sun. Biomass is organic material that comes from plants and animals. When biomass is burned, the chemical energy in biomass is released as heat. It can be burned directly or converted to liquid biofuels or biogas.
According to the Geothermal Research Council, geothermal Energy is heat (thermal) derived from the earth (geo). It is the thermal energy contained in the rock and fluid that fills the fractures and pores within the rock of the earth's crust. Deep wells are drilled into underground reservoirs to tap steam and very hot water. The steam and hot water are then brought to the surface for use in a variety of applications, including electricity generation, direct use, and heating and cooling

Tidal energy is produced by the surge of ocean waters during the rise and fall of tides. For most tidal energy generators, turbines are placed in tidal streams. A tidal stream is a fast-flowing body of water created by tides. A turbine is a machine that takes energy from a flow of fluid. That fluid can be air (wind) or liquid (water). Because water is much denser than air, tidal energy is more powerful than wind energy. Unlike wind, tides are predictable and stable. Where tidal generators are used, they produce a steady, reliable stream of electricity.

3. Which renewable energy source is the best?
Although all of the different forms of renewable energy can be used, the most efficient forms of renewable energy are geothermal, solar, wind, hydroelectricity, and biomass. In the US in 2015, renewable energy accounted for a tenth of the total US energy consumption. Half of this was in the form of electricity. Biomass had the biggest contribution with 50%, followed by hydroelectricity at 26% and wind power at 18%.8 However, these statistics may show the most efficient forms as such because of the availability and popularity of certain types of renewable energy. The more mainstream renewable energy becomes, and the more it is utilized globally, these statistics will change.

4. Can renewable energy replace fossil fuels?
The transition from fossil fuels to renewable energy will not occur overnight, and it will not escape recurring setbacks. Nevertheless, renewables are likely to replace fossil fuels as the dominant source of electrical power well before mid-century as well as make giant strides in other areas such as transportation." Renewable energy can and will replace fossil fuels in the future, but it will take time for the world to adjust to reducing their reliance on fossil fuels.

5. How can renewable energy benefit the environment?

This is a fairly straight-forward answer. Unlike fossil fuels such as oil and diesel, renewable energy sources produce no greenhouse gases and do not produce any toxic substances or pollutants that could harm us or the environment. In addition, renewable energy sources are – as the name states – renewable. For example, wind power or solar power cannot be depleted. We can't run out of wind or sunshine. The same goes for hydropower.

However, there are some disadvantages to certain sources of renewable energy. Wind and solar power require large masses of land to erect wind turbines or solar panels. There are some ways to combat this issue, such as using farmland. Researchers from Oregon State University estimate that installing photovoltaic panels on just one percent of croplands worldwide would be enough to meet all of humanity's global electricity needs.

6. How does renewable energy save money?

There are a number of ways that renewable energy will save you money. For one, your electricity bill could be lower. Businesses that install solar panels, wind turbines and other forms of renewable energy on their properties and use them to power their operations can meet a significant portion or all of their energy needs. They would also be protected from fluctuations in electricity prices, and could potentially sell their energy back to the grid. When a power outage happens on the main grid, homes and businesses that have renewable energy will not be affected. Renewable energy is also becoming less expensive upfront to buy and install. In the long term, utilizing renewable energy sources either in your home or as a business will save money or reduce the risk of outages.

7. Will renewable energy create jobs?

Today, jobs in clean energy become more available and well-paid because, according to European Defence Fund (EDF), solar energy supply companies are able to offer more jobs per dollar invested. It develops 12 times faster than the whole US economy. The main reason for such growth is the economic indicators. Businesses have realised that sustainable development is key to success, long-term performance, and investment. Besides that, the prices on solar and wind products have dropped - making it more affordable. The Great Powers such as US, China, and Germany are pushing for renewables, which made them launch a plan to reduce the global gas emissions by 40%. It will include building factories generating clean energy that would require creating 430,000 additional jobs.

The increasing investments in the renewable energy sector has the potential to provide more jobs than any other fossil fuel industry. Local businesses and renewable industries will benefit from this change as their income will increase significantly. The benefits of shifting to renewable energy are clear-cut and for this reason the governments should react positively towards the transition to clean energy.

8. Will renewable energy sources stop global warming?

Many people disagree over whether or not global warming is real. We are not here to debate that fact; however, we are here to discuss the significant impacts that fossil fuel use has on the environment, and how renewable energy will reduce those harmful effects. Carbon dioxide and other greenhouse gas emissions act like a blanket, trapping heat, which results in frequent storms, drought, sea level rise, and even extinction of animal species. In the US, 29% of emissions come from the electricity sector. Replacing these fossil fuels with renewable energy sources will reduce the amount of harmful emissions in the atmosphere, and will reduce the risks associated with global warming. Renewable energy sources produce little to no emissions during the manufacturing, installation, operation, and decommission. For example, burning natural gas for electricity releases between 0.6 and 2 pounds of carbon dioxide equivalent per kilowatt-hour; coal emits between 1.4 and 3.5 pounds of CO2E/kWh. On the other hand, wind produces only 0.02 to 0.04 pounds of CO2E/kWh during a life cycle, and solar produces 0.07 to 0.2; geothermal 0.1 to 0.2; and hydroelectric between 0.1 and 0.5.

9. What happens if the sun isn't shining or the wind isn't blowing?

The answer to this question is: batteries. When the sun IS shining and the wind IS blowing, solar panels and wind turbines (as well as other renewable sources such as hydropower) produce electricity, and this electricity is stored in large batteries. When solar panels or wind turbines produce more power than we are demanding, the energy gets stored in batteries for later use.

According to GE, a battery energy storage solution offers new application flexibility and unlocks new business value across the energy value chain, from conventional power generation, transmission & distribution, and renewable power, to industrial and commercial sectors. Energy storage supports diverse applications including firming renewable production, stabilizing the electrical grid, controlling energy flow, optimizing asset operation and creating new revenue. Energy storage can help you increase the dispatch ability and predictability of renewables, helping to meet strict code and connection permits.12

10. What is green technology?

Green Technology is any technology that does not injure or impact the earth's environment through the process of supply, manufacturing, use, and disposal. Electric cars, solar panels, and LED light bulbs are a few examples of current Green Technology

11. What is clean energy?

Clean energy is an umbrella term for energy sources that don't produce large amounts of carbon emissions during their generation. While clean energy sources are also often renewable energy sources, the two are not quite the same. Renewable energy refers to sources of energy that are natural resources that will replenish after consumption, either through natural reproduction or other recurring processes.

12. What is carbon neutrality?

Carbon neutrality is a state of net-zero carbon dioxide emissions. This can be achieved by balancing emissions of carbon dioxide with its removal (often through carbon offsetting) or by eliminating emissions from society (the transition to the "post-carbon economy"). The term is used in the context of carbon dioxide-releasing processes associated with transportation, energy production, agriculture, and industry.

13. What is meant by Non-conventional sources of energy and why do we need it?

Non-conventional energy are sources that are renewed by natural processes on a continual basis. Solar energy, wind energy, bio-energy (bio-fuels cultivated sustainably), hydropower, and other sustainable energy sources are some examples. In current context when the consumption of energy grows, the population depends more and more on fossil fuels such as coal, oil and gas day by day. There is a need to secure the energy supply for future since the prices of gas and oil keep rising by each passing day. So we need to use more and more renewable sources of energy. For the effective exploitation of non-conventional sources, there has been an establishment of a separate department namely “Department of non-conventional sources of energy” by the government of India.

Session 4: Attempt for Clean and Green Village – Problem Tree and Activity Mapping

1. What do you mean by climate change?

Climate change refers to long-term shifts in temperatures and weather patterns. These shifts may be natural, such as through variations in the solar cycle. But since the 1800s, human activities have been the main driver of climate change, primarily due to burning fossil fuels like coal, oil and gas. Burning fossil fuels generates greenhouse gas emissions that act like a blanket wrapped around the Earth, trapping the sun's heat and raising temperatures. Clearing land and forests can also release carbon dioxide. Landfills for garbage are a major source of methane emissions. Energy, industry, transport, buildings, agriculture and land use are among the main emitters.

2. What are the different types of pollution?

The major kinds of pollution, usually classified by environment, are air pollution, water pollution, and land pollution. Modern society is also concerned about specific types of pollutants, such as noise pollution, thermal pollution, light pollution, and plastic pollution. Pollution of all kinds can have negative effects on the environment and wildlife and often impacts human health and well-being

3. What is global warming and what are its effects?

Global warming is the phenomenon of a gradual increase in the temperature near the earth's surface. This phenomenon has been observed over the past one or two centuries. This change has disturbed the climatic pattern of the earth. However, the concept of global warming is quite controversial but the scientists have provided relevant data in support of the fact that the temperature of the earth is rising constantly. There are several causes of global warming, which have a negative effect on humans, plants and animals. These causes may be natural or might be the outcome of human activities. In order to curb the issues, it is very important to understand the negative impacts of global warming

Effects of Global Warming

1. Rise in Temperature: Global warming has led to an incredible increase in earth's temperature. Since 1880, the earth's temperature has increased by ~1 degree. This has resulted in an increase in the melting of glaciers, which have led to an increase in the sea level. This could have devastating effects on coastal regions.

2. Threats to the Ecosystem: Global warming has affected the coral reefs that can lead to the loss of plant and animal lives. Increase in global temperatures has made the fragility of coral reefs even worse.

3. Climate Change: Global warming has led to a change in climatic conditions. There are droughts at some places and floods at some. This climatic imbalance is the result of global warming.

4. Spread of Diseases: Global warming leads to a change in the patterns of heat and humidity. This has led to the movement of mosquitoes that carry and spread diseases.

5. High Mortality Rates: Due to an increase in floods, tsunamis and other natural calamities, the average death toll usually increases. Also, such events can bring about the spread of diseases that can hamper human life.

6. Loss of Natural Habitat: A global shift in the climate leads to the loss of habitats of several plants and animals. In this case, the animals need to migrate from their natural habitat and many of them even become extinct. This is yet another major impact of global warming on biodiversity.

Session 5: Protection of Land, Water and forest from Pollution, encroachment and indiscriminate usage

1. What are Natural Resources?
Natural resources are things which are present naturally in the environment that we exploit for survival as well as commercial purpose.

2. Why do we need to manage our Natural Resources?
Natural resources management is essential for equal and stainable allocation among humans, not just for this generation but also for the upcoming ones.

3. What are the Two Major Approaches to Management of Natural Resources?
Two approaches to the sustainable management of natural resources include an adaptive management and community based natural resource management.

4. What are the problems with natural resources management?
The major challenges are erosions and degradation of land, water, and biodiversity as well as most important components like quality of air, sun light which figures important from quality food production and value added services.

5. What is the need for management of natural resources?
Managing the resources would not only ensure their rational use but also put a limit to the degradation it is causing to the environment. For example, the usage of resources in different forms generates a lot of waste which is being disposed off into the water bodies. This, in turn, is polluting the rivers and lakes.

6. What is the sustainable management of natural resources?
It deals with the management of resources such as coal, water, soil, land, animals, trees, etc., it means taking care of the biodiversity and the environment of marine life. Keeping in mind the needs of future generations so that the coming generation can also benefit from natural resources.

7. How many types of natural resources are there?
Natural resources fall into three categories: perpetual renewable resources; intermediate renewable resources and non-renewable resources.

8. How do we use natural resources in our daily lives?
Natural resources are used to make food, fuel and raw materials for the production of goods. All of the food that people eat comes from plants or animals. Natural resources such as coal, natural gas and oil provide heat, light and power

Session 6: Management of Solid and Liquid Wastes from Households and reduction, Recycle & reuse

1. How does one create awareness among people on the need for SLWM and health impacts in absence of it?

IEC campaigns can be an important way to generate awareness about proper SLWM and its positive impacts.

2. How does one overcome gaps in state level policy and programme support?

This challenge may be overcome through enhanced emphasis on SLWM in policies, and also by devising and implementing state specific policy actions.

3. What are the different ways to build SLWM capacity on ground levels?

This can be done by facilitating trainings for district and state level functionaries on latest technologies and developing institutional capacity on technical, financial, institutional and social aspects along with creating financial capacity at local grass root levels.

4. How does one select appropriate technology?

To ensure appropriate technology selection, information on SLWM technologies needs to be disseminated to grass root functionaries, and parameters in selecting technology need to be identified in assisting GPs, suitable to their living context. Also, pilot projects should be developed for implementing SLWM solutions through NGOs or private operators, and learning's should be shared.

5. What should be the SLWM implementation model?

A decentralised approach with active participation of people at all stages of waste management from the point of generation to its final disposal, treatment and reuse should be adopted.

6. How does one overcome the challenge of limited financial resources?

Efforts should be made to explore sources of finance such as SBK or Public Private Partnerships, MLA or MP funds, MGNREGS fund, cess on services, 14th Finance commission, etc. Also, there is a possibility to tap potential investments from NGOs, state advanced training institutes, technical institutions of the state, support to GPs from technical departments of the state, twining arrangements and exposure visits. Other solutions to meet project related financial needs includes leveraging private sector CSR funds for SLWM initiatives, engaging with financial intermediaries to develop appropriate financial products. To ensure project cost control, it is essential for GPs to evaluate technologies from a long term perspective and charge user fees.

7. How does one ensure proper O&M of SLWM projects?

At household levels, the criticality of O&M should be emphasised with a thrust on participatory methods to mobilise communities and charge user fees.

8. Where does my drinking water come from?

The drinking water that is supplied to our homes comes from either a surface water or ground water source. Surface water collects in streams, rivers, lakes, and reservoirs. Ground water is water located below the ground where it collects in pores and spaces within rocks and in underground aquifers. We get ground water by drilling wells and pumping it to the surface. Water travels to your tap from a surface water or ground water source through your local water utility or through an individual water system, such as a private well.

9. What type of health issues can be related to water quality?

Contaminants in our water can lead to health issues, including gastrointestinal illness, reproductive problems, and neurological disorders. Infants, young children, pregnant women, the elderly, and people with weakened immune systems may be at increased risk for becoming sick after drinking contaminated water. For example, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Federal law requires that systems reduce certain contaminants to set levels in order to protect human health

10. How do germs and chemicals get into my drinking water?

There can be many sources of contamination of our water systems. The most common sources of contaminants include:

- Naturally occurring chemicals and minerals (e.g., arsenic, radon, uranium)
- Local land use practices (e.g., fertilizers, pesticides, livestock, concentrated animal feeding operations)
- Manufacturing processes
- Sewer overflows
- Malfunctioning wastewater treatment systems

11. What are the 5 'R's of waste management?

The five 'R's of waste management are Refuse, Reduce, Reuse, Repurpose and Recycle

- **Refuse-** Refuse what you don't need. The "refuse" step involves saying "no" to waste in the forms of single-use disposables like bags, straws, cutlery, cups, as well as to junk mail, promotional freebies and other short-lived non-necessities that have a one-way ticket to the garbage bin.
- **Reduce-** reduce what you do need. Activating step 2 means getting clear about what you need and simply cutting back on that which you don't need. "Reduce" in the context of zero waste might mean letting go of household items that are no longer of use and donating, or selling these, thereby alleviating clutter and creating space.

- **Reuse-** reuse by using reusables. It simply means switching up disposable items for reusable and permanent alternatives. This means sourcing a reusable beverage container and carrying it with you when you are out and about. It means carrying reusable cutlery with you as a measure to avoid disposable cutlery. A refillable glass bottle, or stainless-steel water bottle
- **Repurpose-** For every item that can't be refused, reduced, or reused, try repurposing it. Many people in the green community refer to this method as upcycling.
- **Recycle-** recycle what you can't refuse, reduce, or reuse.

Session 7: Orientation and Mentoring on Targets and LIF on Clean and Green GP

1. What are the major schemes related to clean and green?

- **SBM-Swachh Bharat Mission**

Swachh Bharat Mission, Swachh Bharat Abhiyan, or Clean India Mission is a country-wide campaign initiated by the Government of India in 2014 to eliminate open defecation and improve solid waste management.

- **MGNREGA- Mahatma Gandhi National Rural Employment Guarantee Act**

The MGNREGA was initiated with the objective of "enhancing livelihood security in rural areas by providing at least 100 days of guaranteed wage employment in a financial year, to every household whose adult members volunteer to do unskilled manual work"

- **Galvanising Organic Bio-Agro Resources Dhan (GOBAR-DHAN)**

Galvanizing Organic Bio-Agro Resources Dhan (GOBAR-DHAN) scheme was first announced in Budget 2018.The main aim of Gobar Dhan Yojana is to make farmers self-reliant apart from converting waste to energy. This scheme will help in managing and reuse cattle dung and thus makes the nation "Open Defecation Free".

- **Jal Shakthi Abhiyan**

The Jal Shakti Abhiyan was launched by the Ministry of Jal Shakti in 2019. It is a campaign for water conservation and water security in the country through a collaborative effort of various ministries of the Government of India and State governments. The Jal Jeevan Mission is based on various water conservation efforts like point recharge, desilting of minor irrigation tanks, use of greywater (wastewater from sinks, kitchen) for agriculture and source sustainability. It will be based on a community approach to water.

- **Har Medh Par Ped**

Sub-Mission on Agroforestry (Har Medh Par Ped) Scheme was launched in 2016-17 to encourage tree plantation on farm land along with crops/ cropping system to help the farmers get additional income and make their farming systems more climate resilient and adaptive.

- **Namami Gange Programme**

Launched in 2014, Namami Gange Programme is an Integrated Conservation Mission with a budget outlay of Rs. 20,000 crores. The objective of the Programme are the abatement of pollution and conservation and rejuvenation of the National River Ganga.

- **Nagar Van Scheme**

Launched on the occasion of World Environment Day 2020, the Nagar Van Scheme aims at developing 200 Urban Forests pan India in the coming five years. It will be built either on the existing forest land or another vacant land in the cities across India offered by the local bodies.

- **Jal Jeevan Mission**

Launched in August 2019, Jal Jeevan Mission envisages a supply of 55 litres of water per person per day to every rural household through Functional Household Tap Connections (FHTC) by 2024.

- **National Clean Air Programme**

Launched in January 2019, aims to reduce air pollution by at least 20-30% in the next five years, with 2017 as its base year. The mission aims at reducing the concentration of coarse (PM10) and fine particles (PM2.5) by at least 20% by 2024. However, NGT has directed MoEFCC to reduce the aforementioned timeline and to increase the target of reduction.

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