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NABARD

MAHATMA PHULE KRISHI VIDYAPEETH

## SUSTAINABLE SOIL MANAGEMENT PRACTICES



# Training Module

**Soil Protection & Rehabilitation for Food Security in India (ProSoil)**

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We thank all those who have directly or indirectly contributed to this document.

# ABBREVIATIONS

| | |
|---|---|
| BAIF | Bharatiya Agro Industries Foundation |
| BBF | Broad Bed Furrow |
| BIOPROM | Bio Phosphorus Rich Organic Manure |
| ETL | Economic Threshold Level |
| FES | Foundation for Ecological Security |
| FICCI | Federation of Indian Chambers of Commerce and Industry |
| FPO | Farmer Producer Organization |
| GIZ | Deutsche Gesellschaft für Internationale Zusammenarbeit |
| HANPV | Helicoverpa Armigera Nuclear Polyhedrosis Virus |
| ICAR | Indian Council for Agricultural Research |
| ICT | Information and Communication Technology |
| IPM | Integrated Pest Management |
| MPKV | Mahatma Phule Krishi Vidyapeeth |
| NABARD | National Bank for Agriculture and Rural Development |
| NGO | Non-Government Organization |
| RWH | Rainwater Harvesting |
| SFI | Syngenta Foundation India |
| SHG | Self Help Group |
| SINPV | S. littoralis nuclear polyhedrosis virus |
| SSM | Sustainable Soil Management |
| STBFM | Soil Test Based Fertilizers Management |
| VAM | Vesicular-arbuscular Mycorrhiza |
| WOTR | Watershed Organization Trust |



**Dr. Prashantkumar G. Patil**
**Vice-Chancellor,**
**MPKV, Rahuri**

# MESSAGE

Indian agriculture is facing the threats posed by changing climate, increasing population, urbanization of rural areas and degrading soils. Hence it is necessary to adopt climate smart agriculture for understanding and achieving sustainable soil management to prevent hunger and ensure food security.

Mahatma Phule Krishi Vidyapeeth (MPKV), Rahuri is the premier Agricultural University in Maharashtra which caters to the needs of farmers through Education, Research and Extension Education as its primary mandates. University co-ordinates these mandates for augmentation of agricultural production and provide integrated agricultural education to generate trained human resource at all levels for maximum effectiveness and at a minimum cost.

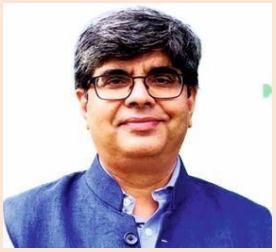
MPKV Rahuri has also established Agricultural Technology and Information Centres (ATICs) mainly to serve as a single window for propagating the technologies/products developed by the university. The other important key element of the National Agriculture Research system (NARS) is the Krishi Vigyan Kendras (KVKs). KVKs have been functioning as Knowledge and Resource Centres for transferring the recommended technologies among the farming community.

We need a forward-looking sustainable model in agriculture that talks about farming practices centuries ago, which would align with agro ecology.

The short-term training modules developed by GIZ and Mahatma Phule Krishi Vidyapeeth, Rahuri would help to develop the capacities of multi-disciplinary team of SAUs and KVKs and strengthen their role in sustainable soil management for larger interest of farming community.

I am thankful to the entire GIZ team for continuous support and appreciate the efforts of scientists from MPKV Rahuri for bringing out the short-term training modules in the form of this publication. I am hopeful that this publication will be useful to all stakeholders involved in sustainable soil management.

**(Dr. P G Patil)**



**Rajeev Ahal**
**Director, Natural Resource Management and Agroecology**
**GIZ India**

# FOREWORD

The Special Initiative “One World No Hunger” (SEWOH) is a global initiative of the Ministry of Economic Cooperation and Development (BMZ), Federal Government of Germany, launched in 2014.

It addresses a wide variety of topics in the field of agriculture, food and nutrition security and rural development. The global development cooperation programme “Soil Protection and Rehabilitation for Food Security” has been commissioned under the SEWOH initiative by the BMZ and receives co-funding by the European Union through its DeSIRA initiative as well as by the Bill and Melinda Gates Foundation. The programme is implemented by Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH together with partner agencies since 2015 in seven countries, namely Benin, Burkina Faso, Ethiopia, Kenya, India, Madagascar, and Tunisia. The programme’s strategy aims at achieving the broadest possible impact by implementing tried-and-tested approaches in soil protection and rehabilitation (SPR) of degraded soils and adapting them to new contexts as well as promoting innovations and lessons learnt.

The bilateral Indo-German development cooperation project “Soil protection and rehabilitation of degraded soil for food security in India” (ProSoil) is implemented by GIZ on behalf of BMZ in partnership with National Bank for Agriculture and Rural Development (NABARD)”. ProSoil aims to implement and promote inclusive and sustainable approaches of soil protection and rehabilitation of degraded soils amongst affected smallholder farmers, including measures to enhance soil fertility and agro-ecological practices. These practices help in building up organic matter (humus), as well as in enhancing soil health and the soil’s capacity to absorb water. The immediate advantage is rising yields. This improves the food situation of smallholders and opens new sources of income.
There are certain SPR approaches (processes, innovations) that are being implemented and tested for sustainable soil protection and rehabilitation on a broad scale through project implementing partners and stakeholders in selected target areas of India.

These continuing training courses further suport the SPR approach through sustainable soil management (SSM) for soil fertility improvement. They will help to integrate knowledge generated at the field level into continuing training courses for extension service providers. Through this initiative certain innovations generated at farmers level can be scaled with farmers, the farming community and practitioners in other regions.

I hope that these short-term training modules on SSM will be used to develop the capacities of individuals and institutions to strengthen their role as actors for the agroecological transformation by managing soils fertility in a way that can contribute to the restoration and enhancement of soil health through tested approaches.

Best regards,

**(Rajeev Ahal)**

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# 1. Introduction to Sustainable Soil Management (SSM) Training Module

This training module on Sustainable Soil Management (SSM) Technologies is being designed and developed for capacity building of farmers, field practitioners and farming community as target group with the following objectives:

- Bring awareness within community of available local resources for SSM measures
- Develop an understanding on SSM measures and their benefits
- Improve skills in adoption of SSM measures to improve soil health
- Strengthening efforts towards soil protection and rehabilitation

## 1.1 Training Module Design

The 10 numbers of specific training modules have been developed to discuss key issues and challenges on SSM and to describe relevant practices and technologies as per the details given in Table-1. Through these Training modules, participants are given a contextualized approach on the SSM practices and technologies, which they can implement to achieve improvement in soil health and crop productivity.

The training programs are categorized as Bio-Organic/Physical/Farming Practices and other methods based on the types of SSM practices covered in the program. The training programs are modular. They allow the trainers to select specific sessions from training program based on the interests and need of the target audience. The training program sessions and number of days can be customized by the trainers.

The list of various SSM training methods and techniques are given in module wise training schedule in section 2 and indicated in **Annexure 6.**

**Table 1 – List of SSM Training Modules**

| S. No. | Training Module Category | Training Module Topic | No. of training days |
|---|---|---|---|
| ***Training Module – 1*** | Bio-Organic methods | Organic Fertilizers | 2 |
| **Training Module – 2** | Bio-Organic methods | Biofertilizers | 2 |
| **Training Module – 3** | Bio-Organic methods | Biopesticides | 2 |
| **Training Module - 4** | Bio-Organic methods | Composting and Manuring | 1 |
| **Training Module - 5** | Farming Practices | Conservation Agriculture and Crop Diversification | 2 |
| **Training Module - 6** | Physical methods | Micro -Irrigation and Solar Water Pumping | 2 |
| **Training Module - 7** | Physical methods | Soil & Water Conservation and Rainwater Harvesting | 3 |
| **Training Module - 8** | Physical methods | Soil Erosion Prevention Measures | 2 |
| **Training Module - 9** | Other methods | Soil Health | 2 |
| **Training Module - 10** | Other methods | Agri-Extension and convergence | 2 |

## 1.2 Focus Group and Performance Objectives

The focus group or the target audience of the training module are - Farmers, Farm Practitioners, SHGs, Village institutions and NGOs. The training group size is suggested as 20-30 nos. After Completion of the training program/s, the participants will be able to:

- Prepare and use studied SSM measures to improve crop productivity and soil fertility
- Motivate people to use studied SSM measures and restrict use of chemical fertilizers and pesticides
- Apply for relevant government scheme available for promotion of studied SSM measures

## 1.3 Practical Contextualized Learning

The training modules contains practical training sessions and stimulate active involvement through interactive sessions, case studies, demonstrations, site visits, Group exercises, feedback session and encourage the participants to reflect on their own context and experiences.

## 1.4 Contents of the Training Module

The training module contains practical guidelines on how to organize, conduct and evaluate a SSM training program. The following guiding tools have been included in the training module:

- day wise training agenda,
- a tool for analysis of learning needs,
- checklist for the trainer,
- a set of power-point presentations and reference material that support the different learning activities,
- a set of training evaluation tool.

# Training Modules – Learning Objectives, Curriculum and Training Agenda

# 2. Training Modules – Learning Objectives, Curriculum and Training Agenda

## A. Training Module 1 - Organic Fertilizers

- **Training Objectives, Outcome and Methodology**

| **Course Title** | **Training Programme on Promotion of Organic Fertilizers** |
|---|---|
| **Course Period** | 2 days |
| **Course Coordinator** | GIZ |
| **Focus Group** | Farmers, Farm Practitioners, SHGs, Village institutions and NGOs |
| **Target group size** | 20-30 nos. |
| **General Objectives** | • To develop an understanding on Organic Fertilizers and their benefits<br>• To improve skills in Preparation and Application of Organic fertilizers |
| **Performance Objectives** | After Completion of training program, the participants will be able to:<br>• Prepare and use organic fertilizers to improve crop productivity and soil fertility<br>• Motivate people to use organic fertilizers and restrict use of chemical fertilizers<br>• Apply for relevant government scheme available on organic fertilizers |
| **Course Contents** | • Introduction to Organic Fertilizers<br>• Benefits and Ecological impact of Organic fertilizers<br>• Preparation, Application and cost of Organic Fertilizers – Jeevamrut, Amratpani, Beejamrut, Bio-char, BIOPROM etc.<br>• Government schemes to promote Organic Fertilizers<br>• Case Studies and Practical Demonstrations<br>• Farmers sharing their experience |
| **Training Method** | • Participatory Lecture, Group Discussion, Group exercise, experience sharing, practical demonstrations/site visit, Q&A session, evaluation and feedback. |

- **Training Program Schedule - 'Promotion of Organic Fertilizers'**

| **DAY 1 (Date: ……..; Day:…….)** | |
|---|---|
| **09:00 am – 9:30 am** | **Registration** (Note Name and contact details of participants) |
| **TIME** | **TRAINING SESSIONS** |
| **9:30 am – 10:00 am** | **1. WELCOME SESSION**<br>*(Welcome and short Introduction of the participants)* |
| **10:00 am – 11:00 am** | **2. Introduction to Organic Fertilizers**<br>*(What are organic fertilizers, types, benefits, Organic fertilizers Vs Chemical fertilizers, crop specific use, Role of Decomposing organism, check with participants which organic fertilizers they use and related issues, Q&A)* |
| **11:00 am - 11:20 am** | **Refreshment & Networking** |
| **11:20 am – 01.00 pm** | **3. Preparation and Application of Jeevamrut and Amratpani**<br>*(Raw material use, method of preparation, method of application, do's and don'ts, cost of organic fertilizers, limitations, benefits, Q&A)* |
| 01:00 pm – 02:00 pm | **Lunch** |
| 02:00 pm – 03:30 pm | **4. Preparation and Application of Beejaamrut**<br>*(Raw material use, method of preparation, method of application, do's and don'ts, cost of organic fertilizers, limitations, benefits, Q&A)* |
| 03:30 pm –03:50 pm | **Tea Break** |
| 03:50 pm-04:30 pm | **5. Demonstration Activity – Application of Jeevamrut**<br>*(Keep ready all the raw material used to prepare Jeevamtut and sample of Jeevamrut to demonstrate the method of application of Jeevamrut, discuss Precautions required during application on organic fertilizers Q&A)* |
| 04:30 pm – 05:30 pm | **6. Case Studies** (ppt. or video)<br>(Present case studies showing the productivity and soil fertility improvement by use of Organic Fertilizers, *Q&A*) |

| DAY 2 (Date: ……..; Day:…….) | |
|---|---|
| 09:30 am – 10:00 am | **Recap of Day 1 (10-15 MCQ based on the topics covered can be discussed)** |
| 10:00 am – 11:30 am | **7. Preparation and Application of BIOPROM**<br>*(Local resource requirement, technology use, method of preparation, method of application, do's and don'ts, cost of Bioprom, benefits, limitations, Q&A)* |
| **11:30 am –11:50 pm** | **Tea Break** |
| 11:50 am – 01.00 pm | **8. Introduction to Biochar**<br>*(What is Bio-char, benefits, local resource requirement, method of preparation, biochar vs conventional method, cost of preparation, application of bio-char, benefits, case studies, Q&A)* |
| 01:00 pm – 02:00 pm | **Lunch** |
| 02:00 pm – 03:30 pm | **9. Group Activity – Problem Solving Exercise**<br>*(A group activity will be given to participants based on the learnings from the program with a 'problem solving exercise'; the participants will be divided into groups (each group with about 4-5 nos. of participants); the participants will work in groups and each group will present/discuss the case, Q&A)* |
| **03:30 pm –03:50 pm** | **Tea Break** |
| 03:50 pm-04:30 pm | **10. Government schemes to promote Organic Fertilizers**<br>*(Session would cover the various government schemes on promotion of Organic Fertilizers, scheme key features, subsidies available, eligibility criteria (if any), how to connect/apply for schemes etc. Q&A*)- preferably a speaker/expert related to concern government department should take this session. |
| 04:30 pm – 05:00 pm | **11. Feedback Session**<br>(Take feedback from participants on the training program, their learnings, experiences, areas of improvement in training etc.) |

## B. Training Module 2 – Biofertilizers

- **Training Objectives, Outcome and Methodology**

| | |
|---|---|
| **Course Title** | **Training Programme on Promotion of Biofertilizers** |
| **Course Period** | 2 days |
| **Course Coordinator** | GIZ |
| **Focus Group** | Farmers, Farm Practitioners, SHGs, Village institutions and NGOs |
| **Target group size** | 20 – 30 nos. |
| **General Objectives** | • To develop an understanding on Biofertilizers and their benefits<br>• To improve skills in Preparation and Application of Biofertilizers |
| **Performance Objectives** | After Completion of training program, the participants will be able to:<br>• Select and use Biofertilizers to improve crop productivity and soil fertility<br>• Motivate people to use Biofertilizers and restrict use of chemical fertilizers<br>• Apply for relevant government scheme available on Biofertilizers |
| **Course Contents** | • Introduction to Biofertilizers<br>• Benefits and Ecological impact of Biofertilizers<br>• Selection, Application and cost of Biofertilizers – Nitrogen fixing biofertilizers, Phosphorous, Zinc and Silicon Solubilizing bacteria and Potassium Mobilizing bacteria, VAM (Vesicular-arbuscular Mycorrhiza) etc.<br>• Government schemes to promote Biofertilizers<br>• Case Studies and Practical Demonstrations<br>• Farmers sharing their experience |
| **Training Method** | • Participatory Lecture, Group Discussion, Group exercise, experience sharing, practical, demonstrations/site visit, Q&A session, evaluation and feedback. |

- **Training Program Schedule on 'Promotion of Biofertilizers'**

| **DAY 1 (Date: ……..; Day:……)** | |
|---|---|
| **09:00 am – 9:30 am** | **Registration** (Note Name and contact details of participants) |
| **TIME** | **TRAINING SESSIONS** |
| **9:30 am – 10:00 am** | **1. WELCOME SESSION** (Welcome and short Introduction of the participants) |
| **10:00 am – 11:00 am** | **2. Introduction to Bio-Fertilizers**<br>*(What are Biofertilizers, types, benefits, Biofertilizers Vs Chemical fertilizers, crop specific use of biofertilizers, check with participants which biofertilizers they use, soil fertility related issues, Q&A)* |
| **11:00 am - 11:20 am** | **Refreshment & Networking** |
| **11:20 am – 01.00 pm** | **3. Use of Nitrogen fixing Biofertilizers - Bacteria (Rhizobium, Azotobacter, Acetobacter, Azospirillum)**<br>*(Selection of biofertilizer, method of application, Precautions required during application, Quality control parameters, do's and don'ts, limitations, cost of biofertilizers, benefits, Q&A)* |
| **01:00 pm – 02:00 pm** | **Lunch** |
| **02:00 pm – 03:30 pm** | **4. Use of Biofertilizers – Phosphorous, Zinc and Silicon Solubilizing bacteria and Potassium Mobilizing bacteria**<br>*(Selection of biofertilizer, method of application, Precautions required during application, Quality control parameters, dos and don'ts, limitations, cost of biofertilizers, benefits, Q&A)* |
| **03:30 pm –03:50 pm** | **Tea Break** |
| **03:50 pm-04:30 pm** | **5. Demonstration Activity – Practical Application of Biofertilizers**<br>(*Keep ready any sample of Biofertilizer and demonstrate the method of application of biofertilizers and Precautions required during application on Biofertilizers, Q&A)* |
| **04:30 pm – 05:30 pm** | **6. Case Studies** (ppt. or video)<br>(Present case studies showing the productivity and soil fertility improvement by use of Biofertilizers, *Q&A*) |

| DAY 2 (Date: ……..; Day:…….) | |
|---|---|
| **09:30 am – 10:00** | **Recap of Day 1 (10-15 MCQ based on the topics covered can be discussed)** |
| **10:00 am – 11:30 am** | **7. Application of Ferrous, Sulphur Bacteria, VAM (Vesicular-arbuscular Mycorrhiza)**<br>*(Selection of biofertilizer, method of application, Precautions required during application, Quality control parameters, dos and don'ts, limitations, cost of biofertilizers, benefits, Q&A)* |
| **11:30 am –11:50 pm** | **Tea Break** |
| **11:50 am – 01.00 pm** | **8. Introduction to Laboratory Equipment's**<br>*(List of instruments, Machines, Quality Testing, License etc.)* |
| **01:00 pm – 02:00** | **Lunch** |
| **02:00 pm – 03:30 pm** | **9. Group Activity – Problem Solving Exercise**<br>*(A group activity will be given to participants based on the learnings from the program with a 'problem solving exercise'; the participants will be divided into groups (each group with about 4-5 nos. of participants); the participants will work in groups and each group will present/discuss the case, Q&A)* |
| **03:30 pm –03:50 pm** | **Tea Break** |
| **03:50 pm-04:30 pm** | **10. Government schemes to promote Biofertilizers**<br>*(Session would cover the various government schemes on promotion of Biofertilizers, scheme key features, subsidies available, eligibility criteria (if any), how to connect/apply for schemes etc. Q&A)- preferably a speaker/expert related to concern government department should take this session.* |
| **04:30 pm – 05:00 pm** | **11. Feedback Session**<br>*(Take feedback from participants on the training program, their learnings, experiences, areas of improvement in training etc.)* |

## C. Training Module 3 – Biopesticides

- **Training Objectives, Outcome and Methodology**

| **Course Title** | **Training Programme on Biopesticides** |
|---|---|
| **Course Period** | 2 days |
| **Course Coordinator** | GIZ |
| **Focus Group** | Farmers, Farm Practitioners, SHGs, Village institutions and NGOs |
| **Target group size** | 20-30 nos. |
| **General Objectives** | • To develop an understanding on Bio-pesticides and their use & benefits<br>• To improve skills in Preparation and Application of Bio-pesticides for Agriculture use |
| **Performance Objectives** | After Completion of training program, the participants will be able to:<br>• Select, Prepare and use of Biopesticides to intervene the life cycle of insect/pests at Economic Threshold Level (ETL) a way that crop damage is minimized.<br>• To motivate the people to use Bio-pesticides and restrict use of chemical Pesticides.<br>• Apply for relevant government scheme available to promote Biopesticides |
| **Course Contents** | • Introduction to Biopesticides and Integrated Pest Management<br>• Benefits and Ecological impact of Bio-pesticides<br>• Application of Fungal and Bacterial Pathogens<br>• Preparation, Application and cost of Biopesticides - Dashparni Ark, Cow Urine spray, Neem oil, Neemastra<br>• Introduction to Cultural Measures for eco-friendly pest and disease management<br>• Government schemes to promote Biopesticides.<br>• Case Studies and Practical Demonstrations<br>• Farmers sharing their experience |
| **Training Method** | • Participatory Lecture, Group Discussion, Group exercise, experience sharing, practical, demonstrations/site visit, Q&A session, evaluation and feedback. |

- **Training program schedule on 'Biopesticides'**

| **DAY 1 (Date: ……..; Day:…….)** | |
|---|---|
| **09:00 am – 9:30 am** | **Registration** (Note Name and contact details of participants) |
| **TIME** | **TRAINING SESSIONS** |
| **9:30 am – 10:00 am** | **1. WELCOME SESSION** (Welcome and short Introduction of the participants) |
| **10:00 am – 11:00 am** | **2. Introduction to Biopesticides and Integrated Pest Management (IPM)**<br>*(What are Biopesticides, types, benefits, Biopesticides Vs Chemical pesticides, what is Integrated Pest management (IPM), benefits, crop specific use of biopesticides, check with participants what method they use for pest control and related issues, Q&A)* |
| **11:00 am - 11:20 am** | **Refreshment & Networking** |
| **11:20 am – 01.00 pm** | **3. Application of Fungal Pathogens (Trichoderma, Verticillium, Beauveria, Metarhizium, Paeceilomyces)**<br>*(Selection of biopesticide, method of application, Precautions required during application, Quality control parameters, dos and don'ts, limitations, cost of biopesticides, benefits, Q&A)* |
| **01:00 pm – 02:00 pm** | **Lunch** |
| **02:00 pm – 03:30 pm** | **4. Application Bacterial Pathogens (Pseudomonas, Bacillus, HaNPV, SlNPV)**<br>*(Selection of biopesticide, method of application, Precautions required during application, Quality control parameters, do's and don'ts, limitations, cost of biopesticides, benefits, Q&A )* |
| **03:30 pm –03:50 pm** | **Tea Break** |
| **03:50 pm-04:30 pm** | **5. Introduction to Cultural Measures for eco-friendly pest and disease management**<br>*(Methods like trap crop, pheromone trap, light traps, resistant variety, spacing etc.)* |
| **04:30 pm – 05:30 pm** | **6. Case Studies-** (ppt. or video)<br>(Present case studies showing the productivity and soil fertility improvement by use of Biopesticides, *Q&A*) |

| DAY 2 (Date: ……..; Day:…….) | |
|---|---|
| **09:30 am – 10:00 am** | **Recap of day 1 (10-15 MCQ based on the topics covered can be discussed)** |
| **10:00 am – 11:30 am** | **7. Preparation and Application of Dashparni Ark, Cow urine spray and Neem Oil**<br>*(Raw material use, method of preparation, method of application, do's and don'ts, cost of preparation, benefits, limitations, Q&A)* |
| **11:30 am –11:50 pm** | **Tea Break** |
| **11:50 am – 01.00 pm** | **8. Demonstration Activity – Preparation and Practical Application of Neemastra**<br>*(Keep ready all the raw material and sample of Neemastra, demonstrate the method of application of above Biopesticide and Precautions required during application on Biopesticides, Q&A)* |
| **01:00 pm – 02:00 pm** | **Lunch** |
| **02:00 pm – 03:30 pm** | **9. Group Activity – Problem Solving Exercise**<br>*(A group activity will be given to participants based on the learnings from the program with a 'problem solving exercise'; the participants will be divided into groups (each group with about 4-5 nos. of participants); the participants will work in groups and each group will present/discuss the case, Q&A)* |
| **03:30 pm –03:50 pm** | **Tea Break** |
| **03:50 pm-04:30 pm** | **10. Government schemes to promote Biopesticides**<br>*(Session would cover the various government schemes on promotion of Biopesticides, scheme key features, subsidies available, eligibility criteria (if any), how to connect/apply for schemes etc. Q&A) - preferably a speaker/expert related to concern government department should take this session.* |
| **04:30 pm – 05:00 pm** | **11. Feedback Session**<br>*(Take feedback from participants on the training program, their learning's, experiences, areas of improvement in training etc.)* |

## D. Training Module 4 – Composting and Manuring

- **Training Objectives, Outcome and Methodology**

| | |
|---|---|
| **Course Title** | **Training Programme on Promotion of Composting and manuring** |
| **Course Period** | 1 day |
| **Course Coordinator** | GIZ |
| **Focus Group** | Farmers, Farm Practitioners, SHGs, Village institutions and NGOs |
| **Target group size** | 20-30 nos. |
| **General Objectives** | • To develop an understanding on Composting and Manuring and their benefits<br>• To improve skills in Preparation and Application of Composting and Manuring for Agriculture |
| **Performance Objectives** | After Completion of training program, the participants will be able to:<br>• Prepare and use Compost & manure to improve crop productivity and soil fertility<br>• Motivate people for preparation and use of compost & manure and restrict use of chemical fertilizers<br>• Apply for relevant government scheme available on Composting and manuring |
| **Course Contents** | • Introduction to composting and manuring.<br>• Benefits and Ecological impact of Composting and Manuring.<br>• Preparation, Application and cost of Composting and Manuring- Farmyard manure, Green manure, Vermi- compost, city compost, etc.<br>• Government schemes to promote Organic Fertilizers, Composting and Manuring<br>• Case Studies and Practical Demonstrations.<br>• Farmers sharing their experience |
| **Training Method** | • Participatory Lecture, Group Discussion, Group exercise, experience sharing, practical, demonstrations/site visit, Q&A session, evaluation and feedback. |

- **Training program schedule on 'Promotion of Composting and Manuring**

| **DAY 1 (Date: ……..; Day:…….)** | |
|---|---|
| **09:00 am – 9:30 am** | **Registration** (Note Name and contact details of participants) |
| **TIME** | **TRAINING SESSIONS** |
| **9:30 am – 10:00 am** | **1. WELCOME SESSION**<br>*(Welcome and short Introduction of the participants)* |
| **10:00 am – 11:00 am** | **2. Introduction to Composting and Manuring**<br>*(What is Composting and manuring, types, benefits, hazards of use of chemical fertilizers, check with participants what practice they follow for composting/ manuring and related issues, Q&A)* |
| **11:00 am - 11:20 am** | **Refreshment & Networking** |
| **11:20 am – 01.00 pm** | **3. Preparation and Application of Farmyard manure, Vermi-compost and City Compost**<br>*(Raw material use, method of preparation, method of application, role of* Decomposing organism, *do's and don'ts, cost of composting, limitations, benefits Q&A)* |
| **01:00 pm – 02:00 pm** | **Lunch** |
| **02:00 pm – 03:30 pm** | **4. Selection and Application of Green Manure**<br>*(What is Green Manure, characteristics of Green manure, types, application of Green Manure, do's and don'ts, limitations, benefits, Q&A)* |
| **03:30 pm –03:50 pm** | **Tea Break** |
| **03:50 pm-04:30 pm** | **5. Demonstration Activity –Preparation and application of Farmyard Manure with Case Studies**<br>*(Demonstrate the raw material and method of preparation of farmyard manure to the participants with the help of Case Studies, Q&A)* |
| **04:30 pm – 05:00 pm** | **6. Group Activity – Problem Solving Exercise**<br>*(A group activity will be given to participants based on the learnings from the program with a 'problem solving exercise'; the participants will be divided into groups (each group with about 4-5 nos. of* |

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| | *participants); the participants will work in groups and each group will present/discuss the case, Q&A)* |
| **05:00 pm – 05:20 pm** | **7. Government schemes to promote Composting and Manuring**<br>*(Session would cover the various government schemes on promotion of compost and manure, scheme key features, subsidies available, eligibility criteria (if any), how to connect/apply for schemes etc. Q&A)- preferably a speaker/expert related to concern government department should take this session.* |
| **05:20 pm – 05:30 pm** | **8. Feedback Session**<br>*(Take feedback from participants on the training program, their learnings, experiences, areas of improvement in training etc.)* |

## E. Training Module 5 – Conservation agriculture and crop diversification

- **Training Objectives, Outcome and Methodology**

| | |
|---|---|
| **Course Title** | **Training Programme on Practicing Conservation Agriculture and Crop Diversification** |
| **Course Period** | 2 days |
| **Course Coordinator** | GIZ |
| **Focus Group** | Farmers, Farm Practitioners, SHGs, Village institutions and NGOs |
| **Target group size** | 20 -30 nos. |
| **General Objectives** | • To develop an understanding on conservation agriculture and crop diversification practices and their benefits<br>• To improve skills in practicing conservation agriculture and crop diversification for Agriculture |
| **Performance Objectives** | After Completion of training program, the participants will be able to:<br>• Use of conservation agriculture and crop diversification practices to improve crop productivity and soil fertility<br>• Motivate people to use conservation agriculture and crop diversification and restrict mono cropping and excessive tillage<br>• Apply for relevant government scheme available on conservation agriculture and crop diversification to improve soil fertility |
| **Course Contents** | • Introduction to conservation agriculture and crop diversification.<br>• Benefits and Ecological impact of conservation agriculture and crop diversification.<br>• Application of crop diversification and Conservation agriculture practices – Mixed-cropping, Intercropping, Crop rotation, Broad base furrow, Ridge and furrow, crop spacing, zero tillage etc.<br>• Preparation and Promotion of Kitchen Garden<br>• Government schemes to promote conservation agriculture and crop diversification.<br>• Case Studies and Practical Demonstrations<br>• Farmers sharing their experience |
| **Training Method** | • Participatory Lecture, Group Discussion, Group exercise, experience sharing, practical, demonstrations/site visit, Q&A session, evaluation and feedback. |

- **Training Program schedule on 'Practicing Conservation Agriculture and Crop Diversification'**

| **DAY 1 (Date: ……..; Day:……)** | |
|---|---|
| **09:00 am – 9:30 am** | **Registration** (Note Name and contact details of participants) |
| **TIME** | **TRAINING SESSIONS** |
| **9:30 am – 10:00 am** | **1. WELCOME SESSION**<br>*(Welcome and short Introduction of the participants)* |
| **10:00 am – 11:00 am** | **2. Introduction to Conservation agriculture and crop diversification**<br>*(What is Conservation agriculture and crop diversification, types of cropping pattern, benefits, check with participants which practices they use and related issues Q&A)* |
| **11:00 am - 11:20 am** | **Refreshment & Networking** |
| **11:20 am – 01.00 pm** | **3. Application of crop diversification practices – Mixed-cropping, Intercropping, Crop rotation etc.**<br>*(Types of practices, method of preparation, do's and don'ts, limitations, benefits, Q&A)* |
| **01:00 pm – 02:00 pm** | **Lunch** |
| **02:00 pm – 03:15 pm** | **4. Application of Conservation agriculture Practices– Broad base furrow, Ridge and furrow, crop spacing etc.**<br>*(Method of preparation & application, dos and don'ts, limitations, benefits, Q&A)* |
| **03:15 pm –03:30 pm** | **Tea Break** |
| **03:30 pm – 6.30 pm** | **5. Site Visit –** *Identify a site for site visit relevant to the training. Take participants to the pre-identified site to show case Practical application of Conservation agriculture and crop diversification practices in the farms (if feasible)*<br>***If site visit is not feasible then following sessions can be taken up.*** |
| **03:30 pm-04:30 pm** | • **Demonstration Activity – Practical on Intercropping and Mixed cropping**<br>*(Keep ready all the raw material and demonstrate on Intercropping and Mixed cropping with the help of participants, Q&A)* |

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| **04:30 pm – 05:30 pm** | **6. Case Studies** (ppt. or video)<br>*(Present case studies showing the productivity and soil fertility improvement by using Conservation agriculture and crop diversification methods, Q&A)* |
| **DAY 2 (Date: ……..; Day:…….)** | |
| **09:30 am – 10:00 am** | **Recap of Day 1 (10-15 MCQ based on the topics covered can be discussed)** |
| **10:00 am – 11:30 am** | **7. Preparation and Promotion of Kitchen Garden**<br>*(Site selection, method of preparation, cropping pattern, do's and don'ts, cost of seeds, limitations, benefits, Q&A)* |
| **11:30 am –11:50 pm** | **Tea Break** |
| **11:50 am – 01.00 pm** | **8. Introduction to Zero-tillage**<br>*(what is zero tillage, how does zero tillage helps, benefits, limitations, Case Study, Q&A)* |
| **01:00 pm – 02:00 pm** | **Lunch** |
| **02:00 pm – 03:30 pm** | **9. Group Activity – Problem Solving Exercise**<br>*(A group activity will be given to participants based on the learnings from the program with a 'problem solving exercise'; the participants will be divided into groups (each group with about 4-5 nos. of participants); the participants will work in groups and each group will present/discuss the case, Q&A)* |
| **03:30 pm –03:50 pm** | **Tea Break** |
| **03:50 pm-04:30 pm** | **10. Government schemes to promote Conservation agriculture and crop diversification**<br>*(Session would cover the various government schemes on promotion of Conservation agriculture and Crop Diversification, scheme key features, subsidies available, eligibility criteria (if any), how to connect/apply for schemes etc. Q&A) - preferably a speaker/expert related to concern government department should take this session.* |
| **04:30 pm – 05:00 pm** | **11. Feedback Session**<br>*(Take feedback from participants on the training program, their learnings, experiences, areas of improvement in training etc.)* |

## F. Training Module 6 – Micro-irrigation and solar pumping system

- **Training Objectives, Outcome and Methodology**

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|---|---|
| **Course Title** | **Training Programme on Promotion of Micro-irrigation and solar pumping system** |
| **Course Period** | 2 days |
| **Course Coordinator** | GIZ |
| **Focus Group** | Farmers, Farm Practitioners, SHGs, Village institutions and NGOs |
| **Target group size** | 20 -30 nos. |
| **General Objectives** | • To develop an understanding on Micro-irrigation, need of water saving and solar water pumping system and their benefits.<br>• To improve skills in application of Micro-irrigation and solar water pumping system for water conservation and soil moisture improvement. |
| **Performance Objectives** | After Completion of training program, the participants will be able to:<br>• Use Micro-irrigation and solar water pumping system to improve crop productivity, soil and water conservation.<br>• Motivate people to use Micro-irrigation and restrict use of inefficient irrigation system like flood irrigation etc.<br>• Motivate people for use of solar pumps<br>• Apply for relevant government scheme available on Micro-irrigation & solar water pumping system. |
| **Course Contents** | • Introduction to Water Budgeting, Micro-irrigation and solar water pumping systems<br>• Application, Cost and Benefits of Micro-irrigation– Drip irrigation, Mini drip kit, Sprinkler irrigation etc.<br>• Benefits of solar water pumping systems<br>• Government schemes to promote Micro-irrigation and solar water pumping<br>• Case Studies and Practical Demonstrations<br>• Farmers sharing their experience |
| **Training Method** | • Participatory Lecture, Group Discussion, Group exercise, experience sharing, practical, demonstrations/site visit, Q&A session, evaluation and feedback. |

- **Training program schedule on 'Promotion of Micro irrigation and solar Pumping system'**

| **DAY 1 (Date: ……..; Day:…….)** | |
|---|---|
| **09:00 am – 9:30 am** | **Registration** (Note Name and contact details of participants) |
| **TIME** | **TRAINING SESSIONS** |
| **9:30 am – 10:00 am** | **1. WELCOME SESSION**<br>*(Welcome and short Introduction of the participants)* |
| **10:00 am – 11:00 am** | **2. Introduction to Water Budgeting and Micro irrigation**<br>*(What is Water Budgeting, crop planning based on available water, Micro irrigation, types, benefits, Micro irrigation vs. Flood irrigation, check with participants which irrigation method they use and related issues, Q&A)* |
| **11:00 am - 11:20 am** | **Refreshment & Networking** |
| **11:20 am – 01.00 pm** | **3. Application of Micro-irrigation System – Drip Irrigation, Mini Drip Kit etc.**<br>*(Components, method of use, crop suitability, land suitability, dos and don'ts, cost of Micro-irrigation system, Drip irrigation Vs conventional irrigation methods, limitations, basic O&M, Q&A)* |
| **01:00 pm – 02:00 pm** | **Lunch** |
| **02:00 pm – 03:15 pm** | **4. Application of Sprinkler Irrigation System**<br>*(Components, method of use, crop suitability, land suitability, dos and don'ts, cost of sprinkler irrigation system, Sprinkler irrigation Vs conventional irrigation methods, limitations, basic O&M, Q&A)* |
| **03:15 pm –03:30 pm** | **Tea Break** |
| **03:30 pm - 06:30 pm** | **5. Site Visit –** *Identify a site for site visit relevant to the training. Take participants to the pre-identified site to show case Practical working of Sprinkler Irrigation /Drip irrigation/Solar Pumping system in the farms (if feasible)*<br>***If site visit is not feasible then following sessions can be taken up.*** |
| **03:30 pm-04:30 pm** | • **Demonstration Activity – Practical working of Sprinkler Irrigation and Drip irrigation system** |

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| | (Demonstrate working of sprinklers and drip irrigation to the participants, Drip irrigation Vs sprinkler irrigation, O&M, *Q&A*) |
| **04:30 pm – 05:30 pm** | **6. Case Studies** (ppt. or video)<br>(Present case studies showing the productivity improvement through soil & water conservation using drip irrigation method, *Q&A*) |
| **DAY 2 (Date: ……..; Day:…….)** | |
| **09:30 am – 10:00 am** | **Recap of Day 1 (10-15 MCQ based on the topics covered can be discussed)** |
| **10:00 am – 11:30 am** | **7. Introduction to Solar water pumps**<br>*(About solar water pumps, technology use, method of application, dos and don'ts, cost of solar water pumps, benefits, Solar Pump Vs Diesel & electric Pump, limitations, check with participants which pumping method they use and related issues, Q&A)* |
| **11:30 am –11:50 pm** | **Tea Break** |
| **11:50 am – 01.00 pm** | **8. Demonstration Activity – Practical working of Solar water Pumps**<br>*(Demonstrate components and working of solar water pumps, Benefits, local resource requirement, Solar vs. conventional water pumping, Q&A)* |
| **01:00 pm – 02:00 pm** | **Lunch** |
| **02:00 pm – 03:30 pm** | **9. Group Activity – Problem Solving Exercise**<br>*(A group activity will be given to participants based on the learnings from the program with a 'problem solving exercise'; the participants will be divided into groups (each group with about 4-5 nos. of participants); the participants will work in groups and each group will present/discuss the case, Q&A)* |
| **03:30 pm –03:50 pm** | **Tea Break** |
| **03:50 pm-04:30 pm** | **10. Government schemes to promote Micro-irrigation and solar water Pumping system.**<br>*(Session would cover the various government schemes on promotion of micro irrigation & solar pumping, scheme key features, subsidies available, eligibility criteria (if any), how to connect/apply* |

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| | *for schemes etc., Q&A) - preferably a speaker/expert related to concern government department should take this session.* |
| **04:30 pm – 05:00 pm** | **11. Feedback Session**<br>Take feedback from participants on the training program, their learning's, experiences, areas of improvement in training etc.) |

## G. Training Module 7 – Soil & Water Conservation and Rainwater Harvesting

- **Training Objectives, Outcome and Methodology**

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|---|---|
| **Course Title** | **Training Programme on Methods of Soil & Water Conservation and Rainwater Harvesting** |
| **Course Period** | 3 days |
| **Course Coordinator** | GIZ |
| **Focus Group** | Farmers, Farm Practitioners, SHGs, Village institutions and NGOs |
| **Target Group size** | 20 – 30 nos. |
| **General Objectives** | • To develop an understanding on methods of soil and water conservation and their benefits<br>• To understand methods and benefits of rainwater harvesting (RWH)<br>• To improve skills about soil and water conservation and RWH methods for soil fertility and productivity improvement |
| **Performance Objectives** | After Completion of training program, the participants will be able to:<br>• Prepare and use methods of soil and water conservation to avoid soil erosion and loss of soil fertility<br>• Aware the farmers about soil and water conservation methods and restrict inefficient soil and water management<br>• Plan and Implement rainwater harvesting methods<br>• Apply for relevant government scheme available to promote soil and water conservation and rainwater harvesting |
| **Course Contents** | • Introduction to Soil and water conservation<br>• Benefits and Ecological impact of soil and water conservation.<br>• Biological Soil and Water Conservation Measures – Vegetative Strips, contour farming, Broad Bed Furrow (BBF), reforestation, mulching etc.<br>• Preparation and Application of physical Soil & Water Conservation Measures - contour trenches, small check dams, Farm bunds, Bori Bunds, farm & gully pond, etc.<br>• Introduction to Rainwater Harvesting (RWH) and Groundwater recharge, case studies<br>• Government schemes to promote soil & water conservation and RWH<br>• Farmers sharing their experience |
| **Training Method** | • Participatory Lecture, Group Discussion, Group exercise, experience sharing, practical, demonstrations/site visit, Q&A session, evaluation and feedback. |

- **Training Program Schedule on 'Methods of soil & water conservation and Rainwater Harvesting'**

| DAY 1 (Date: ……..; Day:……) | |
|---|---|
| **09:00 am – 9:30 am** | **Registration** (Note Name and contact details of participants) |
| **TIME** | **TRAINING SESSIONS** |
| **9:30 am – 10:00 am** | **1. WELCOME SESSION**<br>*(Welcome and short Introduction of the participants)* |
| **10:00 am – 11:00 am** | **2. Introduction to Soil and Water conservation**<br>*(What is soil and water conservation, benefits, methods, check with participants which soil & water conservation method they use and related issues, Q&A)* |
| **11:00 am - 11:20 am** | **Refreshment & Networking** |
| **11:20 am – 01.00 pm** | **3. Biological Soil and Water Conservation Measures – Vegetative Strips, contour farming, Broad Bed Furrow (BBF), reforestation etc.**<br>*(Local resource requirement, technology use, method of preparation, method of use, do's and don'ts, benefits, limitations, Q&A)* |
| **01:00 pm – 02:00 pm** | **Lunch** |
| **02:00 pm – 03:30 pm** | **4. Soil and Water Conservation through Mulching**<br>(*Local resource requirement, method of mulching, method of use, dos and don'ts, cost of application, limitations, benefits, Q&A*) |
| **03:30 pm –03:50 pm** | **Tea Break** |
| **03:50 pm-04:30 pm** | **5. Application of contour trenches and small check dams**<br>*(Machinery use, method of preparation, method of use, dos and don'ts, cost of methods, limitations, Q&A)* |
| **04:30 pm – 05:30 pm** | **6. Preparation and Application of FARM BUND**<br>*(Local resource requirement, technology use, method of preparation, method of use, do's and don'ts, cost of preparation, benefits, limitations, Q&A)* |

| DAY 2 (Date: ……..; Day:…….) | |
|---|---|
| **09:30 am – 10:00 am** | **Recap of Day 1 (10-15 MCQ based on the topics covered can be discussed)** |
| **10:00 am – 11:30 am** | **7. Introduction to Rainwater harvesting**<br>*(What is rainwater harvesting, types, benefits, check with participants if they have installed Rainwater harvesting and its related issues, Q&A)* |
| **11:30 am –11:50 pm** | **Tea Break** |
| **11:50 am – 01.00 pm** | • **Preparation and Application of farm pond and Gully Pond (Dug out and Amendment type)**<br>*(What is farm pond and Gully pond, site selection and method of preparation, method of application, cost of preparation, limitations, benefits, Q&A)* |
| **01:00 pm – 02:pm** | **Lunch** |
| **02:00 pm – 03:00 pm** | **8. Preparation and installation of New water harvesting structures (Bori Bunds)**<br>*(Raw material use, method of preparation, method of application, dos and don'ts, cost of Water harvesting, limitations, Q&A)* |
| **03:00 pm –03:15 pm** | **Tea Break** |
| **03:15 pm-06:30 pm** | **9. Site Visit –** *Identify a site for site visit relevant to the training. Take participants to the pre-identified site to show case Practical application of Soil & water Conservation practices and rainwater harvesting structures or Watershed area in the farms (if feasible).* ***If site visit is not feasible then following sessions can be taken up.*** |
| **03:15 pm-04:30 pm** | **10. Demonstration Activity – Practical on Preparation of Bori Bunds and FARM BUND**<br>*(Demonstrate the method of preparation of Bori Bunds and FARM BUND for rainwater harvesting with the help of participants, Q&A)* |
| **04:30 pm – 05:00 pm** | • **Case Studies** (ppt. or video)<br>*(Present a case study showing the soil erosion prevention, flood hazards improvement, water conservation by use of rainwater harvesting methods, Q&A)* |

| DAY 3 (Date: ……..; Day:…….) | |
|---|---|
| **09:30 am – 10:00 am** | **Recap of Day 2 (10-15 MCQ based on the topics covered can be discussed)** |
| **10:00 am – 11:30 am** | **11. Introduction to Groundwater Recharging – Percolation ponds, recharge wells**<br>*(What is groundwater recharging, benefits, local resource requirement, methods, cost of groundwater recharge, Q&A)* |
| **11:30 am –11:50 pm** | **Tea Break** |
| **11:50 am – 01.00 pm** | **12. Case Studies** (ppt. or video)<br>*(Present case studies showing the productivity and soil fertility improvement after implementing soil & water Conservation measures, Q&A)* |
| **01:00 pm – 02:pm** | **Lunch** |
| **02:00 pm – 03:30 pm** | **13. Group Activity – Problem Solving Exercise**<br>*(A group activity will be given to participants based on the learnings from the program with a 'problem solving exercise'; the participants will be divided into groups (each group with about 4-5 nos. of participants); the participants will work in groups and each group will present/discuss the case, Q&A)* |
| **03:30 pm –03:50 pm** | **Tea Break** |
| **03:50 pm-04:30 pm** | **14. Government schemes to promote Soil and water conservation methods including rainwater harvesting**<br>*(Session would cover the various government schemes on promotion of Soil & Water Conservation and Rainwater Harvesting, scheme key features, subsidies available, eligibility criteria (if any), how to connect/apply for schemes etc. Q&A) - preferably a speaker/expert related to concern government department should take this session.* |
| **04:30 pm – 05:00 pm** | **15. Feedback Session**<br>(Take feedback from participants on the training program, their learnings, experiences, areas of improvement in training etc.) |

## H. Training Module 8 – Soil erosion prevention measures

- **Training Objectives, Outcome and Methodology**

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|---|---|
| **Course Title** | **Training Programme on Soil erosion prevention measures** |
| **Course Period** | 2 days |
| **Course Coordinator** | GIZ |
| **Focus Group** | Farmers, Farm Practitioners, SHGs, Village institutions and NGOs |
| **Target group size** | 20 30 nos. |
| **General Objectives** | • To develop an understanding on Soil erosion prevention measure and their benefits<br>• To improve skills in application of Soil erosion prevention measures for soil conservation |
| **Performance Objectives** | After Completion of training program, the participants will be able to:<br>• Implement soil erosion prevention measures for soil conservation, restoring soil fertility and soil texture.<br>• Motivate people to practice soil conservation by use of Soil erosion prevention measures.<br>• Apply for relevant government scheme available on Soil erosion prevention measures. |
| **Course Contents** | • Introduction to soil erosion prevention measures<br>• Benefits and Ecological impact of soil erosion prevention measures<br>• Preparation and Application of Soil erosion prevention measures – Agroforestry, Afforestation, Vegetation cover, mulching soil, conservation tillage, Planting shelterbelts, seeding in fellow land, stone bunds, grassland restoration, Glyricidia plantation on bunds, vetiver (Khas) etc.<br>• Government schemes to promote Soil erosion prevention measures<br>• Case Studies and Practical Demonstrations<br>• Farmers sharing their experience |
| **Training Method** | • Participatory Lecture, Group Discussion, Group exercise, experience sharing, practical, demonstrations/site visit, Q&A session, evaluation and feedback. |

- **Training Program Schedule on 'Soil Erosion Prevention Measures'**

| **DAY 1 (Date: ……..; Day:…….)** | |
|---|---|
| **09:00 am – 9:30 am** | **Registration** (Note Name and contact details of participants) |
| **TIME** | **TRAINING SESSIONS** |
| **9:30 am – 10:00 am** | **1. WELCOME SESSION**<br>*(Welcome and short Introduction of the participants)* |
| **10:00 am – 11:00 am** | **2. Introduction to Soil erosion prevention measures**<br>*(What is soil erosion, types of soil erosion prevention measures, benefits, ask participants what practice they follow to stop soil erosion and related issues, Q&A)* |
| **11:00 am - 11:20 am** | **Refreshment & Networking** |
| **11:20 am – 01.00 pm** | **3. Preparation and Application of Soil erosion prevention measures– Agroforestry, Afforestation, vegetation cover**<br>*(Factors that influence soil erosion prevention measures, types and method of application, limitations, benefits, Q&A)* |
| **01:00 pm – 02:00 pm** | **Lunch** |
| **02:00 pm – 03:15 pm** | **4. Preparation and Application of Mulching soil and Conservation Tillage**<br>*(Method of preparation, method of application, benefits, cost of tillage, cost of Mulching, limitations, Q&A)* |
| **03:15 pm –03:30 pm** | **Tea Break** |
| **03:30 pm-06:30 pm** | **5. Site Visit –** *Identify a site for site visit relevant to the training. Take participants to the pre-identified site to show case Practical application of soil erosion prevention measures in the farms (if feasible)*<br>***If site visit is not feasible then following sessions can be taken up.*** |
| **03:50 pm-04:30 pm** | • **Demonstration Activity – Planting shelterbelts, seeding in fallow lands.**<br>*(Keep ready all the raw material and demonstrate the method of preparation of seeding in fallow land with the help of participants, Q&A)* |

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| **04:30 pm – 05:30 pm** | **6. Case Studies** (ppt. or video)<br>*(Present case studies showing the productivity and soil fertility improvement by use of Soil erosion prevention measures, Q&A)* |
| **DAY 2 (Date: ……..; Day:…….)** | |
| **09:30 am – 10:00 am** | **Recap of Day 1 (10-15 MCQ based on the topics covered can be discussed)** |
| **10:00 am – 11:30 am** | **7. Preparation and Application of Stone bunds, grassland restoration etc.**<br>*(Local resource requirement, method of preparation, method of application, cost of preparation, benefits, limitations, Q&A)* |
| **11:30 am –11:50 pm** | **Tea Break** |
| **11:50 am – 01.00 pm** | **8. Introduction to Gliricidia Plantation and vetiver (Khas)**<br>*(What is Gliricidia plantation, use of* vetiver (Khas)*, Benefits, method of application, cost of cultivation, application of Glyricidia and* vetiver (Khas)*, Q&A)* |
| **01:00 pm – 02:00 pm** | **Lunch** |
| **02:00 pm – 03:30 pm** | **9. Group Activity – Problem Solving Exercise**<br>*(A group activity will be given to participants based on the learnings from the program with a 'problem solving exercise'; the participants will be divided into groups (each group with about 4-5 nos. of participants); the participants will work in groups and each group will present/discuss the case, Q&A)* |
| **03:30 pm –03:50 pm** | **Tea Break** |
| **03:50 pm-04:30 pm** | **10. Government schemes to promote Soil erosion prevention measures**<br>*(Session would cover the various government schemes on promotion of Soil erosion Prevention measures, scheme key features, subsidies available, eligibility criteria (if any), how to connect/apply for schemes etc. Q&A) - preferably a speaker/expert related to concern government department should take this session.* |
| **04:30 pm – 05:00 pm** | **11. Feedback Session**<br>*(Take feedback from participants on the training program, their learning's, experiences, areas of improvement in training etc.)* |

## I. Training Module 9 – Soil Health Management

- **Training Objectives, Outcome and Methodology**

| **Course Title** | **Training Program on Soil Health Management** |
|---|---|
| **Course Period** | 2 days |
| **Course Coordinator** | GIZ |
| **Focus Group** | Farmers, Farm Practitioners, SHGs, Village institutions and NGOs |
| **Target group size** | 20 – 30 nos. |
| **General Objectives** | • To develop an understanding of Soil health parameters and the benefits of soil health monitoring<br>• To improve soil health monitoring skills and to create awareness among farmers about soil health management |
| **Performance Objectives** | After completion of the training program, the participants will be able to:<br>• Use soil health monitoring practices to improve crop productivity and soil fertility<br>• Motivate people to use Soil health card and limit the use of excess fertilizers<br>• Apply for relevant government schemes available to promote soil health monitoring and management |
| **Course Contents** | • Introduction to Soil Health and managements and its benefits<br>• Soil health Parameters, Sampling and Testing methods<br>• Methods of Soil testing on farms<br>• Preparation of soil health card<br>• Reclamation of problematic soils<br>• Introduction to Soil Test Based Fertilizers Management (STBFM)<br>• Government schemes to promote Soil health management<br>• Case Studies and Practical Demonstrations<br>• Farmers sharing their experience |
| **Training Method** | • Participatory Lecture, Group Discussion, Group exercise, experience sharing, practical demonstrations of soil health testing, site visit, Q&A session, evaluation, and feedback. |

- **Training Program Schedule on 'Soil health Management'**

| DAY 1 (Date: ……..; Day:…….) | |
|---|---|
| **09:00 am – 9:30 am** | **Registration** (Note Name and contact details of participants) |
| **TIME** | **TRAINING SESSIONS** |
| **9:30 am – 10:00 am** | **1. WELCOME SESSION**<br>*(Welcome and short introduction of the participants)* |
| **10:00 am – 11:00 am** | **2. Introduction to Soil Health Management**<br>*(What is soil health and soil Quality, importance of soil health, soil health problems and related issues, benefits of soil health monitoring, check with participants which method they use for soil health monitoring and related issues, Q&A)* |
| **11:00 am - 11:20 am** | **Refreshment & Networking** |
| **11:20 am – 01.00 pm** | **3. Soil health Parameters, Soil Testing and soil Sampling Methods**<br>*(Soil health indicators, method of soil sampling, testing methods, Do's & Don'ts for on farm assessment of soil health, cost of soil health monitoring, Q&A)* |
| **01:00 pm – 02:00 pm** | **Lunch** |
| **02:00 pm – 03:30 pm** | **4. Preparation and Application of soil health Card**<br>*(What is Soil Health Card, cost of preparing soil health card, Strategies for improving soil health, interpretation framework for soil health indicators under agricultural land use, Q&A)* |
| **03:30 pm –03:50 pm** | **Tea Break** |
| **03:50 pm-04:30 pm** | **5. Demonstration Activity – Practical sampling and understanding soil texture**<br>*(Demonstration of soil sampling and testing with the help of participants, Q&A)* |
| **04:30 pm – 05:30 pm** | **6. Case Studies** (PowerPoint presentation or video)<br>*(Present case studies showing the productivity and soil fertility improvement by use of Soil health management, Q&A)* |

| DAY 2 (Date: …... Day:…….) | |
|---|---|
| **09:30 am – 10:00 am** | **Recap of Day 1 (10-15 MCQ based on the topics covered can be discussed)** |
| **10:00 am – 11:30 am** | **7. Reclamation of problematic soils**<br>*(Types of Degraded land and characteristics, methods of reclamation strategies for problematic soil, dos and don'ts, cost of reclamation,* lime and Gypsum requirement for improvement of acid and sodic soils, *benefits, limitations, Q&A)* |
| **11:30 am –11:50 pm** | **Tea Break** |
| **11:50 am – 01.00 pm** | **8. Introduction to Soil Test Based Fertilizers Management (STBFM)**<br>*(What is STBFM, how to increase fertilizer use efficiency, efficient use of micronutrients, micronutrients deficiency and correction measures, Q&A)* |
| **01:00 pm – 02:00 pm** | **Lunch** |
| **02:00 pm – 03:30 pm** | **9. Group Activity – Problem Solving Exercise**<br>*(A group activity will be given to participants based on the learnings from the program with a 'problem solving exercise'; the participants will be divided into groups (each group with about 4-5 nos. of participants); the participants will work in groups and each group will present/discuss the case, Q&A)* |
| **03:30 pm –03:50 pm** | **Tea Break** |
| **03:50 pm-04:30 pm** | **10. Government schemes to promote Soil health Card**<br>*(Session would cover the various government schemes on promotion of Soil health card, scheme key features, subsidies available, eligibility criteria (if any), how to connect/apply for schemes etc. Q&A) - preferably a speaker/expert related to concern government department should take this session.* |
| **04:30 pm – 05:00 pm** | **11. Feedback Session**<br>*(Take feedback from participants on the training program, their learnings, areas of improvement in training etc.)* |

## J. Training Module 10 – Agri-extension and Convergence

- **Training Objectives, Outcome and Methodology**

| | |
|---|---|
| **Course Title** | **Training Programme on Promotion of Agri-extension and Convergence** |
| **Course Period** | 2 days |
| **Course Coordinator** | GIZ |
| **Focus Group** | Farmers, Farm Practitioners, SHGs, Village institutions and NGOs |
| **Target group size** | 20 – 30 nos. |
| **General Objectives** | • To development capacity and skill of farmers in Agri-extension<br>• To provide knowledge and information on new agriculture practices and ICT tools to improve soil fertility and crop productivity in sustainable manner |
| **Performance Objectives** | After Completion of training program, the participants will be able to:<br>• Use Agri-extension methods to improve farming practices and crop productivity<br>• Form and promote SHGs and related activities<br>• Help other farmers in providing training, demonstrations, and use of new farming technologies |
| **Course Contents** | • Introduction to Agri-extension and convergence<br>• Benefits of promoting Agri-extension and convergence<br>• Application of Agri-extension, Technology assessment, role of ICT, training & capacity building, demonstrations<br>• Role of Self-Help Group (SHG) and Farmers Producer Organization (FPO)<br>• Government schemes to promote Agri-extension and convergence<br>• Case Studies and Practical Demonstrations<br>• Farmers sharing their experience |
| **Training Method** | • Participatory Lecture, Group Discussion, Group exercise, experience sharing, practical, demonstrations, site visit, Q&A session, evaluation and feedback. |

- **Training program schedule on 'Promotion of Agri-extension and Convergence'**

| **DAY 1 (Date: ……..; Day:……)** | |
|---|---|
| **09:00 am – 9:30 am** | **Registration** (Note Name and contact details of participants) |
| **TIME** | **TRAINING SESSIONS** |
| **9:30 am – 10:00 am** | **1. WELCOME SESSION**<br>*(Welcome and short Introduction of the participants)* |
| **10:00 am – 11:00 am** | **2. Introduction to Agri-extension and Convergence**<br>*(What is Agri-extension, types/ Modes, benefits, check with participants which Agri-extension services they have taken up and related issues, Q&A)* |
| **11:00 am - 11:20 am** | **Refreshment & Networking** |
| **11:20 am – 01.00 pm** | **3. Application of Agri-extension and convergence – Technology assessment and Role of ICT in Agromet advisory dissemination**<br>*(Role of ICT, technology assessment, types of services, government initiatives, Q&A)* |
| **01:00 pm – 02:00 pm** | **Lunch** |
| **02:00 pm – 03:30 pm** | **4. Agri-extension and convergence – Demonstration and capacity Building activities**<br>*(Training methods, benefits, Capacity building institutes and topics, limitations, Q&A)* |
| **03:30 pm –03:50 pm** | **Tea Break** |
| **03:50 pm-04:30 pm** | **5. Demonstration Activity – village development schemes**<br>*(Demonstrate the method of preparation of village institutional schemes with the help of participants, Q&A)* |
| **04:30 pm – 05:30 pm** | **6. Case Studies** (ppt. or video)<br>*(Present case studies showing the opportunities to learn basic agricultural skills and knowledge, occupational training, farmers growth and development leading to soil improvement Q&A)* |

| DAY 2 (Date: ……..; Day:…….) | |
|---|---|
| **09:30 am – 10:00 am** | **Recap of Day 1 (10-15 MCQ on based on the topics covered can be discussed)** |
| **10:00 am – 11:30 am** | **7. Introduction to Self Help Group (SHG)/ Farmers Producer Organization (FPO)**<br>*(What is SHG and FPOs, benefits, role of SHGs and FPOs, limitations, Q&A)* |
| **11:30 am –11:50 pm** | **Tea Break** |
| **11:50 am – 01.00 pm** | **8. Formation of SHGs**<br>*(Method of formation of SHG, cost, benefits, limitations, Q&A)* |
| **01:00 pm – 02:00 pm** | **Lunch** |
| **02:00 pm – 03:30 pm** | **9. Group Activity – Problem Solving Exercise**<br>*(A group activity will be given to participants based on the learnings from the program with a 'problem solving exercise'; the participants will be divided into groups (each group with about 4-5 nos. of participants); the participants will work in groups and each group will present/discuss the case, Q&A)* |
| **03:30 pm –03:50 pm** | **Tea Break** |
| **03:50 pm-04:30 pm** | **10. Government schemes to promote Agri-extension and convergence**<br>*(Session would cover the various government schemes on promotion of agri-extension in India, scheme key features, subsidies available, eligibility criteria (if any), how to connect/ apply for schemes etc, Q&A) - preferably a speaker/expert related to concern government department should take this session.* |
| **04:30 pm – 05:00 pm** | **11. Feedback Session**<br>(Take feedback from participants on the training program, their learning's, experiences, areas of improvement in training etc.) |

# 3. Guidelines on Use of Training Modules for Conduction of SSM Trainings

These guidelines are prepared for handling 'Training Programs' based on the Sustainable Soil Management (SSM) Training Modules given in the report. It helps trainers in selection of training module, prepare for their sessions, shows them how to structure the training, and gives informative material for achieving the participants' learning objectives.

These guidelines are aimed at experts/trainers who will train Farmers, Farm Practitioners, SHGs, Village institutions and NGOs, and involved in the conceptualization and implementation of SSM Training Modules. The guidelines equip trainers with a set of competencies and tools that allows them to:

- Analyse the learning needs of the target audience through training needs assessment
- Select or develop a training program based on given SSM Training Modules
- Share knowledge and methodologies to facilitate and conduct the training programs
- Evaluate the learning results achieved by the target audience

## 3.1 SUGGESTED GUIDELINES

1. Training needs Assessment: It is suggested to conduct a training needs assessment of the focus group through a structured questionnaire before conduction of the training program. A suggestive 'training needs assessment form' is enclosed for the reference as **Annexure 1.**

2. Selection of Training Module or training sessions from the module: The training programs are modular. The trainers can select specific module or sessions from training program based on the interests and need of the target audience. The training program sessions, training program name and number of days can be customized by the trainers. The list of training module indicating various SSM methods is enclosed as **Annexure 6.**

3. Preparation and conduction of training program:
    a. **Participants-** The participants should be selected from the following focus group - Farmers, Farm Practitioners, SHGs, Village institutions and NGOs engaged in soil management activities. A registration form for selection of participants is enclosed as **Annexure 2.**
    b. **Location and venue –** The training programs can be conducted Pan India. The training should be conducted locally within community/villages to promote participation of farmers and other focus group members. The training venue should be easily approachable by the participants and should have comfortable seating of 30-35 number of people. The training venue should have been provided with required training facilities like screen, audio visual and other training facilities as given in **Annexure 3.**
    c. **Site Visit –** Based on the selected training module identify a 'study location' for site visit. Arrange for required logistics for taking participants to the site for study tour and back.
    d. **Demonstration -** Based on the selected training module arrange for necessary material/equipment for 'Demonstration activity' for participants.
4. **Speakers/trainers** – Based on the selected training module Identify the speakers/resource persons for taking relevant sessions. The suggested list of experts is given as **Annexure 4.**

**Standards of SSM Training Module facilitation and implementation trainers**: The selected trainer must:

- Have good overall thematic knowledge of the Soil heath related issues and SSM practices
- Have experience in delivering training programs especially for farmers and other focus group audience.
- In addition, he/she should: have good facilitation skills and understand Hindi/local language of the training region,
- For trainers' reference, the training material (ppts, reference material) for each training module is being provided which will serve as background information during training. The trainers can also use their own training material which should be in-line with the training module objectives and sessions.

- The trainers should provide copy of ppts/reference material to the participants for their future reference (preferably in Hindi/local language).

a. Language – The training program should be conducted in local/regional language of the participants.

5. Training material - A set of training material (ppts. and reference material) is being provided with this training module for reference of the speakers and distribution for the participants. The training ppts and reference material should be provided in regional/local language of the participants.

6. Conduction of the training – The training should be conducted as per the selected training module/sessions. For smooth conduction of the training an important checklist for trainers is given as **Annexure 3.**
7. Feedback and evaluation – Training feedback should be taken from participants during 'feedback session' in the training to evaluate the training effectiveness. A suggestive feedback form is enclosed as **Annexure 5.**
8. Training Certificates – The trainers may give 'Certification of Participation' to the participants on successful completion of the training program.

# Annexures:

## Annexure 1: Training Needs Assessment Form

**TRAINING NEEDS ASSESSMENT FORM**

1. **Name:**

2. **Contact information:**

**Address:**
**Mobile:**
**Email:**

3. **Other Information:**

**Gender:**
**Age (years):**

4. **Please select the relevant category you belong to:**

- Farmer
- Farm Practitioners
- SHG
- Village institution
- NGO
- **Others (pl specify)**

5. **Name of the organization:**

_____

6. **Current work profile:**

_____

7. **Highest Educational Qualification:**

8. _____
9. **Challenges faced related to soil management:**

_____

**10. Have you attended any training related to Soil Management recently: Yes / No**

**11. Preferred language for training:**

_____

**12. Please tick specific areas of your interest for the training in Sustainable Soil Management or suggest new areas of your interest.**

| S.No. | Suggested Training Topics | Please Tick |
|---|---|---|
| 1 | Organic Fertilizers | |
| 2 | Biofertilizers | |
| 3 | Biopesticides | |
| 4 | Composting and Manuring | |
| 5 | Conservation agriculture and crop diversification. | |
| 6 | Micro-irrigation and solar pumping system | |
| 7 | Soil & Water Conservation and Rainwater Harvesting | |
| 8 | Soil erosion prevention measures | |
| 9 | Soil Health Management | |
| 10 | Agri-extension and Convergence | |
| 11 | Suggest other topics for training: | |

## Annexure 2: Registration Form

**SSM Training Program**

**(Topic:……., date: …….)**

**REGISTRATION FORM**

1. **Name:**

2. **Contact information:**

**Address:** _____
**Mobile:**_____ **Email:** _____

3. **Other Information:**

**Gender:** _____ **Age (years):** _____

4. **Please select the relevant category you belong to:**

- Farmer
- Farm Practitioners
- SHG
- Village institution
- NGO
- **Others (pl specify)**

5. **Name of the organization:**
_____

6. **Current work profile:**
_____

**Highest Educational Qualification:**
_____

7. **Challenges faced related to soil management:**
_____

8. **Have you attended any training related to Soil Management recently: Yes / No**

9. **Expected benefits from the training program:**

_____

## Annexure 3: Important Checklist for the trainer

**The trainer/speaker should have following information/items before the start of the training program:**

- ✓ Copy of SSM power-point presentations and Reference Material
- ✓ Program Agenda
- ✓ List of Participants
- ✓ List and Contact details of Speakers
- ✓ Copy of Feedback Forms
- ✓ Certificate for Participations
- ✓ Demonstration material
- ✓ Details of Site Visit- arrangement of logistics to go to site and back
- ✓ Laptop/Computer with Internet
- ✓ Audio visuals – screen, projector, mike, pointer
- ✓ Photocopier and Printer (access to)
- ✓ Name tags
- ✓ Stationary material – paper, pen, pencil, rubber, sharpener, scissors, string, glue, writing pads, whiteboard/flipchart, markers, hole-puncher, stapler etc.

## Annexure 4: List of Speakers/Resource Persons for reference

| S.No | Name | Designation | Organization | City | Mobile | Email | Area of Expertise |
|---|---|---|---|---|---|---|---|
| 1 | Dr Sandip Landge | Scientist-I (Entomology) | MPKV, Rahuri | Ahmednagar | 8830512132 7588604043 | Landge_sandip@rediffmail.com | Entomology, Organic pesticides |
| 2 | Dr. Musmade Narayan | Senior Research Assistant- Plant Pathology and Agril. Microbiology | MPKV, Rahuri | Ahmednagar | 9420452667 | musmadenarayan@gmail.com | Biopesticides, Organic Fertilizers, Biofertilizers, composting & manuring |
| 3 | Dr Atul Atre | Professor- Dept of Soil & Water Conservation Engineering | MPKV, Rahuri | Ahmednagar | 9860593836 | atreatul@gmail.com | Soil & Water Conservation, Soil erosion prevention |
| 4 | Dr Anil Durgude | Soil Scientist, Dept of SSAC | MPKV, Rahuri | Ahmednagar | 9420007731 | durgudeag@rediffmail.com | Soil Health |
| 5 | Dr Ajit Nayak | Sr. Scientist-Land & Water Management Engineering | ICAR-IIWM, Bhubneswar | Bhubaneswar | 8989206421 | anayak62@gmail.com | Soil & Water Conservation, micro-irrigation |
| 6 | Dr Saurabh Das | Assistant Professor (Research) | University of Nebraska–Lincoln Panhandle Rsch & Ext Center, USA | Nebreska, USA | | sdas4@unl.edu ; saurav12das@gmail.com | Soil Health, Conservation Agriculture, |

| S.No | Name | Designation | Organization | City | Mobile | Email | Area of Expertise |
|---|---|---|---|---|---|---|---|
| 7 | Dr. Jaya N. Surya | Principal Scientist & Head | ICAR-NBSS&LUP | New Delhi | 9818141358 | Jaya.Surya@icar.gov.in | Soil Health, Agri-Extension and convergence, Conservation Agriculture and Crop Diversification |
| 8 | Dr Milind D. Joshi | Subject Matter Specialist (Plant Protection) | KVK, Baramati | Pune | 9975932717 | milindento15@rediffmail.com | Biopesticides, Organic Fertilizers, Biofertilizers, composting & manuring |
| 9 | Dr D Chakraborty | Scientist (Retd.) | CGWB | New Delhi | 9873125140 | durjoy.09@gmail.com | Rainwater Harvesting & Groundwater Recharge |
| 10 | Karishma Bist | Addl. Director | FICCI | New Delhi | 9818260682 | karishma.bist@ficci.com | Water Conservation and Rainwater Harvesting, Training & Capacity Building |
| 11 | M A Patil | Assistant Secretary General | FICCI | New Delhi | 9868112517 | ma.patil@ficci.com | Water Conservation and Rainwater Harvesting |
| 12 | Dr. Sumit Pal | Scientific Officer | SFI | New Delhi | | sumit.pal@aegf.in | Agri-Microbiology, Soil and Water conservation, Microirrigation, Environmental Microbiology |
| 13 | Dr. Gajanan B. Rajurkar | Irrigation Lead | AEGF | Maharashtra | | gajanan.rajurkar@aegf.in | Soil and Water conservation and Microirrgation |
| 14 | Mr. Avijit Nayak | Head Agronomy & Innovation | SFI | West Bengal | | avijit.nayak@syngenta.com | Agronomy, Soil Health and water conservation |
| 15 | Mr. Ravindra Katre | Head SURYA | SFI | Maharashtra | | ravindra.katre@syngenta.com | Agri Extension, Training |

| S.No | Name | Designation | Organization | City | Mobile | Email | Area of Expertise |
|---|---|---|---|---|---|---|---|
| 16 | Mr. Amol Deshmukh | Project Lead | AEGF | Maharashtra | | amol.deshmukh@syngenta.com | Agronomy, Soil health and water conservation |
| 17 | Mr. Yuwaraj Madeshawar | Project Lead | AEGF | Maharashtra | | yuwaraj.madeshwar@aegf.in | Agronomy, Soil health and water conservation |
| 18 | Mr. Bhushan Ahire | Project Lead | AEGF | Maharashtra | | bhushan.ahire@syngenta.com | Agronomy, Soil health and water conservation |
| 19 | Mr. Ramprasad Sana | Project Lead | AEGF | Andhra Pradesh | | ramprasad.sana@aegf.in | Agronomy, Soil health and water conservation |
| 20 | Mr. Keshav Borkar | Project Lead | AEGF | Bihar | | keshav.borkar@syngenta.com | Agronomy, Soil health and water conservation |
| 21 | Mr. Sudhir Vadodaria | Training Consultant | SFI | Maharashtra | | sudhirvadodaria@yahoo.com | Agri-Extension and Training |

## Annexure 5: Training Evaluation - Feedback Form

**FEEDBACK FORM**

**SSM Training Program**
**(Topic:……., Dated: ……)**

**1. Training Program** *(please tick the appropriate)*

| Parameters | Excellent | Very Good | Good | Average |
|---|---|---|---|---|
| **Intellectual Arrangements** | | | | |
| • Speakers / Trainers | | | | |
| • Training Material | | | | |
| Organizational Arrangements | | | | |
| • Training Venue | | | | |
| • Food & Hospitality | | | | |
| • Demonstration Activity | | | | |
| • Site Visit Experience | | | | |
| **OVERALL PROGRAM RATING** | | | | |
| Other Remarks (if any): | | | | |

**2. How has the training program benefited you?**

---

**3. Suggest Area(s) of Improvement:**

---

**4. Areas of your interest for future training programs?**

---

**Kindly provide your contact details:**

**Name :**
**Organization :**
**Address :**
**Phone no. :**
**Email :**

## Annexure 6: Training Material

The power point presentations (PPTs) and Reference Material on following 10 nos. of Training modules is being prepared and provided with this training module.

| Training Module | Use and Application of following SSM Techniques/methods covered |
|---|---|
| **1. Organic Fertilizers** | • BIOPROM, Jeevamrut, Amrutpani, Seed Germination Test Kit (Beejaamrut), Biochar , Government schemes etc. |
| **2. Biofertilizers** | • Nitrogen fixing Biofertilizers, Algal biofertilizers, Fungal biofertilizer, Phosphorous, Zinc and Silicon Solubilizing bacteria and Potassium Mobilizing bacteria, VAM (Vescicular-Arbusculer Mychorrhiza), Government schemes etc. |
| **3. Bio-Pesticides** | • Integrated Pest Management, Fungal Pathogens, Bacterial Pathogens, trap crop, pheromone trap, light traps, resistant variety, crop spacing, Dashparni Ark, Cow urine Spray, Neem Oil Neemastra, Government schemes etc., |
| **4. Composting and Manuring** | • Farmyard manure, Vermi-compost, City Compost, green manure, Government schemes etc. |
| **5. Conservation Agriculture and Crop Diversification** | • Mixed-cropping, Intercropping, Crop rotation, Broad base furrow, Ridge and furrow, crop spacing, zero tillage, Kitchen garden promotion, Government schemes etc. |
| **6. Micro -Irrigation and Solar water pumping systems** | • Drip irrigation, Mini drip kit, Sprinkler irrigation, solar water pumping systems, Government schemes etc. |
| **7. Soil & water conservation and Rainwater Harvesting** | • Vegetative Strips, contour farming, Broad Bed Furrow (BBF), reforestation, mulching, contour trenches, small check dams, Farm bunds, Bori Bunds, farm & gully pond, Rainwater Harvesting |

| Training Module | Use and Application of following SSM Techniques/methods covered |
|---|---|
| | (RWH) and Groundwater recharging, Government schemes etc. |
| **8. Soil Erosion prevention measures** | • Agroforestry, Afforestation, Vegetation cover, mulching soil, conservation tillage, Planting shelterbelts, seeding in fellow land, stone bunds, grassland restoration, Glyricidia plantation on bunds, vetiver (Khas), Government schemes etc. |
| **9. Soil Health** | • Soil health indicators, Soil Testing methods, Soil health card, Reclamation of problematic soils, Soil Test Based Fertilizers Management (STBFM), Government schemes etc. |
| **10. Agri-Extension and convergence** | • Technology assessment, role of ICT, training & capacity building, demonstrations, Self-Help Group (SHG), Farmers Producer Organization, village institutions, Government schemes etc. |

# References:


- https://www.shutterstock.com/image-photo/group-green-sprouts-growing-out-soil-363270434

- https://unece.org/DAM/trade/Publications/ECE_TRADE_419_TFIG-TrainingManual.pdf



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