PROJECT IMPLEMENTATION PLAN

PIP Issue Date	17 July 2019
Project Code	19-AG-17-GE-DLN-A-06
Title	Self-learning e-Course on Innovations in Agroforestry Systems
Reference	Project Notification 19-AG-17-GE-DLN-A dated 27 November 2018
Timing and Duration	23 December 2019–22 December 2020 (12 months)
Implementing Organization(s)	APO Secretariat and National Productivity Organizations (NPOs)
Number of Participants	Minimum 400 participants
Self-registration	Self-registration opens from 10:00 AM Japan Standard Time on 23 December 2019 on the eAPO web portal: http://eAPO-tokyo.org Note: Participants can register directly from this portal on the APO website. Those who are already registered can access the course by using the assigned username and password. If you have forgotten your username and password, please refer to the help page on the home page of the portal.

1. Objectives

This course aims to show how agroforestry can be used to increase the productivity of degraded land. The specific objectives are to:

a. Enrich participants' knowledge of agroforestry;

b. Demonstrate how agroforestry can increase land productivity at the watershed level; and

c. Build the capacity of practitioners to adopt agroforestry in their land management practices.

2. Background

Land degradation results in the reduced capacity of ecosystems to provide diverse social and environmental goods and services. This includes the loss of habitat for biodiversity, reduced soil and watershed productivity, altered microclimates, and diminished livelihood potential including food, nutritional, and financial insecurity. Recent estimates suggest that 25% of the global land area is degraded or vulnerable to degradation.

One way to rehabilitate land and sustain production is through agroforestry. Agroforestry is the collective term for land-use systems and technologies in which woody perennials (trees, shrubs, palms and bamboo, etc.) are used deliberately on the same land-management units as agricultural crops with animals in some form of spatial arrangement or temporal sequence.

Agroforestry enhances agricultural productivity, among other economic, social, and environmental benefits. Trees and shrubs enable greater production of biomass, and the presence of nitrogen-fixing plants and crops, mycorrhizal activity, and a dense network of roots increases soil fertility. The deposition of leaf litter increases organic matter in soil which contributes to its loamy texture. It also provides mulch on soil to reduce water runoff and lower soil evaporation. Water infiltration rates and retention capacity are increased, resulting in greater water availability for plant growth. Tree roots hold soil and reduce erosion while taking up pollutants for phytoremediation. Trees provide habitats for pollinators and store sequestered atmospheric carbon above and below the ground. All of these effects enable greater production and consequently higher food, nutritional, and financial security.

This course will first describe land degradation and its consequences. Agroforestry and its applications will be explained as a means to reverse land degradation. The challenges involved and potential social, biophysical, and financial benefits will be presented in the context of sustainability. Finally, a land rehabilitation model will be presented in the context of a degraded watershed in Sri Lanka. This rehabilitation model successfully combined diverse applications of agroforestry to reverse land degradation and is an example of the innovative use of agroforestry.

3. Scope and Methodology

The tentative course structure and content are as follows:

Module 1. Land degradation

- 1.1 Types of degradation
  - Forest loss
  - Soil degradation
  - Human impacts on water sources
- 1.2 Consequences of degradation
  - Habitat loss
  - Increasing infertility, loss of productivity, food and nutritional insecurity, and livelihood instability
  - Health issues due to poor water quality

Module 2. Introduction to tropical agroforestry and its applications

- 2.1 History
- 2.2 Classifying agroforestry practices using criteria such as:
  - Structure
  - Ecological function

Productivity
Management

Module 3. Agroforestry systems and choosing the right model

3.1 Agrisilvicultural systems
3.2 Silvipastoral systems
3.3 Agrisilvipastoral systems

Quiz 1 (for self-assessment based on questions from Modules 1–3)

Module 4. Challenges in agroforestry adoption

4.1 Land and climatic characteristics
4.2 Government policy
4.3 Land tenure
4.4 Legal framework
4.5 Support for value chains of agroforestry products
4.6 Cooperation of communities
4.7 Availability of resources
4.8 Slow evidence of benefits

Module 5. Agroforestry systems and biophysical sustainability

5.1 Ecosystem services
5.2 Soil
5.3 Water
5.4 Carbon
5.5 Biodiversity

Module 6. Agroforestry systems and social sustainability

6.1 Utility values (food, fuel wood, medicinals, and timber)
6.2 Environmental values (shade, cool environment, aesthetics)
6.3 Intrinsic values (contentment, tranquil environment)
6.4 Bequest values (future generations)

Quiz 2 (for self-assessment based on questions from Modules 4–6)

Module 7. Agroforestry systems and financial sustainability

7.1 Short-term profitability of agroforestry
7.2 Long-term profitability of agroforestry
7.3 Other financial benefits including REDD+, carbon credits, and certification

Module 8. Applying agroforestry for watershed rehabilitation: Case study

This module focuses on a case study of watershed rehabilitation in Sri Lanka.

8.1 Why: Background (description of the watershed and issues)
8.2 How: Planning a solution using agroforestry that is modelled on indigenous ecosystems, participatory, and implemented with all stakeholders in the watershed
8.3 Goals: Eliminate destruction of forest cover, increase soil fertility and agricultural productivity, and improve watershed productivity (water quantity and quality)
8.4 Outcomes: Conversion of degraded land to productive landscapes using agroforestry and regenerative agriculture, enhancing livelihood benefits and sustainability.

Module 9: What needs to be done in implementation

9.1 Identify needs of stakeholders
9.2 Inventory flora and fauna
9.3 Conduct baseline studies on land use, topography, and hydrology
9.4 Draft a landscape design with participatory planning
9.5 Implement landscape design
9.6 Set a management plan including maintenance
9.7 Perform monitoring and evaluation

Quiz 3 (for self-assessment based on questions from Modules 7–9)

Module 7: Final written examination

Methodology

Self-learning e-modules, additional study materials for participants, intermittent quizzes for self-assessment, assignments, and a final examination to qualify for the APO e-certificate.

4. Qualifications of Candidates

The target participants are government officers, agricultural producers, agribusiness entrepreneurs, agricultural extension workers, academics, and other individuals with particular interest in adopting tree-dominant agriculture, watershed or land rehabilitation, diversifying farming portfolios, or promoting agroforestry.

5. Eligibility for e-Certificate

A minimum score of 70% on the final examination is required to qualify for the APO e-certificate.

Note: Participants from nonmember countries are welcome to take the course for self-development, although APO e-certificates will not be provided.

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