PROJECT IMPLEMENTATION PLAN

PIP Issue Date	28 November 2019
PIP Revision 1 Issue Date	17 April 2020
Project Code	19-AG-17-GE-DLN-A-01
Title	Self-learning e-Course on Smart Transformation of Agriculture
Reference	Project Notification 19-AG-17-GE-DLN-A dated 27 November 2018 and Project Implementation Plan 19-AG-17-GE-DLN-A dated 28 November 2019
Timing and Duration	11 May 2020–10 May 2021 (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 11 May 2020 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.

Change History of Project Notificaion: 19-AG-17-GE-DLN-A-01

Revision	Date of Issue	Clause	Modifications
Revision 1	17April 2020	Timing and Duration	Timing has been changed from 2 March 2020–1 March 2021 (12 months) to 11 May 2020–10 May 2021 (12 months).
		Self-registration	Self-registration opens from 10:00 AM Japan Standard Time on 11 May 2020 on the eAPO web portal: http://eAPO-tokyo.org.
		e-Certificate	As well as participants from member countries, participants from nonmember countries are eligible for the APO e-certificate.

1. **Objectives**

a. To offer participants practical guidance on the smart transformation of agriculture;

b. To promote the smart transformation of agriculture in member countries; and

c. To promote agriculture and food production while contributing to achieving the UN Sustainable Development Goals (SDGs), particularly SDG 1 (ending poverty in all its forms everywhere) and SDG 2 (ending hunger, achieving food security, improving nutrition, and promoting sustainable agriculture).

2. **Background**

Transformation is necessary to improve agricultural productivity significantly. The world has experienced several previous agricultural transformations. Around 3000 BC, the introduction of irrigation expanded agricultural boundaries. Crop rotation systems developed in the 18th century contributed to higher production levels. The 1940s to 1960s saw the development of pesticides and chemical fertilizers, and the 1960s to 1980s saw the use of agricultural machinery become widespread, both of which raised productivity. Currently, smart technologies such as ICT and the Internet of Things (IoT) are transforming agriculture and improving its productivity levels.

Smart technology in agriculture involves automation and robots, sensor-based environmental control systems, remote sensing for the pinpoint distribution of inputs via drones, the use of power assist suits by elderly farmers and others with physical constraints, and crop damage prediction by artificial intelligence. The use of these tools requires knowledge and training as well as equipment. This e-learning course will introduce the necessary information to utilize smart agricultural technologies effectively.

At the same time, if farmers cannot make a profit, they cannot continue to operate. Smart agriculture is generally more costly than traditional models of production. Higher-quality farm produce therefore must be sold at higher prices, which requires acceptance by consumers. Before introducing smart technology, farmers should conduct cost–benefit analyses to ensure sustainability.

The APO Agricultural Transformation Program is aimed at enhancing food security and meeting future food needs in the Asia-Pacific region through increased productivity, quality, and innovation in agricultural and food systems leading to improved rural livelihoods. In January 2019, APO prepared the Agricultural Transformation Framework as an initiative to propel growth through a holistic approach to building the capacity of member countries to adopt modern technologies and best practices for farm-level transformation.

This e-learning course will also cover methods to conduct management planning and analyses for the adoption of smart agriculture.

3. **Scope and Methodology**

Scope
The tentative course structure and contents are as follows:

Module 1. Concept of Agricultural Transformation
      1.1   Trade-offs in agriculture: environment, water, production, and consumption
      1.2   Changes in agriculture to meet the SDGs
      1.3   How digital technology changes farm work
      1.4   Future players in transformed agricultural systems
      1.5   Policy changes to encourage agricultural transformation

Module 2. The IoT for Agriculture
      2.1   Sensing technology for soil monitoring and crop growth
      2.2   Sensor networks
      2.3   Machine automation and communication
      2.4   System of systems

2.5   Data management strategies

Quiz 1 (for self-assessment based on questions from Modules 1 and 2)

Module 3. Smart Agriculture
3.1   Definition of precision/smart agriculture: management strategy
3.2   Main innovations in technology
3.3   Factors in farming systems
3.4   Case studies

Module 4. Controlled-environment Agriculture
4.1   Protected horticulture: definition, advantages, and disadvantages
4.2   Greenhouse control systems
4.3   Controlled-environment agriculture practices: case studies of plant factories
4.4   Advanced technology in controlled-environment agriculture

Quiz 2 (for self-assessment based on questions from Modules 3 and 4)

Module 5. Preconditions for the introduction of smart agriculture
5.1   Public policies on and strategies for education for the sustainable development in agriculture
5.2   People: Involvement of local communities, leadership and organization, and government-sponsored initiatives for smart agriculture
5.3   Institutions: involvement of universities, industries, and research institutes
5.4   Opportunity: financial resources, skill and knowledge exchanges, and market access
5.5   Sharing of experience worldwide

Module 6. Initial Costs and Operational Costs
6.1   Initial costs
6.2   Operational costs
6.3   Social costs

Module 7. Expected Income
7.1   Farmers' income
7.2   Benefit for society

Module 8. Other Requirements for the Introduction of Smart Agriculture
8.1   Education
8.2   Infrastructure
8.3   Public regulation

Quiz 3 (for self-assessment based on questions from Modules 5–8)

Module 9: Final 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 smart technology in agriculture.

5. Eligibility for e-Certificate

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

Dr. AKP Mochtan
Secretary-General