



PROJECT NOTIFICATION

Ref. No.:19-AG-30-GE/SPP-OSM-A-PN2100029-002

Date of Issue	26 May 2021
Project Code	19-AG-30-GE/SPP-OSM-A
Title	Multicountry Observational Study Mission on Emerging Models of Controlled-environment Agriculture in Japan
Timing and Duration	27–29 July 2021 (three days)
Hosting Country(ies)	APO Secretariat
Modality	Digital Multicountry
Implementing Organization(s)	APO Secretariat
Participating Country(ies)	All Member Countries
Overseas Participants	38
Local Participants	Not Applicable
Qualifications of Participants	Policymakers, government officials, members of farmers'/agribusiness associations, academics, consultants, and extension officers in charge of controlled-environment agriculture
Nomination of Participants	All nominations must be submitted through National Productivity Organizations of member countries
Closing Date for Nominations	20 June 2021: The closing date is for the replacement of selected candidates, when applicable. Participants were selected before the project was rescheduled and changed into a virtual session. This new selection allows changes in the participants' list if necessary.

Notes: This PN supersedes the PN issued on 18 October 2019 due to a change in implementation modality from face-to-face to virtual sessions.

1. Objectives

- a. Introduce emerging controlled-environment agriculture models in Japan, including advanced greenhouses and plant factories.
- b. Observe monitoring and controlling technologies to facilitate crop growth in a controlled agriculture environment.
- c. Learn new approaches to enhance the productivity of agriculture and stable food supply in APO member countries.

2. Background

The prices of perishable farm produce such as vegetables and fruit fluctuate depending on their seasonal supply. It is therefore important to ensure a stable supply of perishables to meet consumers' needs, while maintaining producers' incomes.

Controlled-environment farming allows crop cultivation regardless of weather conditions and season, thus extending growing and harvesting periods. Greenhouse farming is the major method of controlled-environment agriculture. According to a 2017 survey by the Ministry of Agriculture, Forestry and Fisheries, Japan, farmers' income per area of land in greenhouses is three times that under natural cultivation. Therefore, greenhouse farming increases labor productivity, enabling farmers to make profits from small land areas.

The typical models of controlled-environment agriculture are next-generation greenhouses, also known as plant factories. In next-generation greenhouses, the crop growth environment such as temperature, air and soil moisture, soil nutrition, and CO₂ levels are monitored and precisely controlled at optimum levels. Some next-generation greenhouses use artificial light. Data regarding the crop growth environment are automatically stored and analyzed to increase quality and yields. The ideal growth environment is then maintained artificially. To enable precise environmental control, smart technologies such as sensors and the Internet of things (IoT) are important.

Controlled-environment farmers must also have entrepreneurial skills. Compared with natural cultivation, controlled-environment agriculture is costly. Sound financial planning taking into account costs and benefits is crucial for success. The production of high-quality produce must therefore be accompanied by the necessary marketing skills.

This study mission will introduce various smart technologies such as sensors and the IoT currently used in controlled-environment agriculture in Japan. It is expected to promote smart transformation in the agriculture sector, which is one of the key result areas in the APO Vision 2025. In addition, the introduction of controlled-environment agriculture will contribute to raising the labor productivity of farmers and stabilizing food supplies regardless of climatic conditions, thereby benefiting consumers as well as producers in member countries.

3. Scope, Methodology, and Certificate of Attendance

The duration of each day's sessions will be around three hours comprising presentations by experts, group discussions, and other relevant learning methods. The indicative topics of the presentations are:

Day 1:

- Plant Factory Complexes (Sunlight/Artificial Light)

Day 2:

- Next-generation Greenhouse Horticulture Projects (Energy-saving Projects/Marketing Projects)

Day 3:

- Business Models for Controlled-environmental Agriculture

The detailed program and list of speakers will be provided two weeks prior to the sessions with announcement of the names of the selected participants.

The participants are required to attend all sessions. This full participation is a prerequisite for receiving the APO certificate of attendance.

4. Financial Arrangements

The APO will meet the assignment costs for overseas and local resource persons, and for a virtual site visit(s), either broadcast live or recorded as applicable.

5. Implementation Procedures

Please refer to the implementation procedures for APO digital multicountry projects circulated with this document.

A handwritten signature in black ink, appearing to read 'AKP Mochtan', with a long, sweeping flourish extending upwards and to the right.

Dr. AKP Mochtan
Secretary-General