REGIONAL TRAINING ON

Smart Renewable Energy Technologies for Agricultural Supply Chains in the Mekong Region

November 21 – 25, 2022
9 am – 12 pm and 1.30 pm – 4.30 pm (GMT+7)
Zoom Online

1. Background

The agricultural sector is the backbone of, and a key contributor to, every country's economy. In the Mekong countries of Cambodia, Lao PDR, Myanmar, Thailand and Vietnam, the agriculture and food industries have been one of the fastest- growing sectors. Over 60% of the population of the Mekong region are engaged in some form of small-scale agriculture. These countries have witnessed an average annual GDP growth of 7.5% GDP since 1992[1]. They have also witnessed annual urbanization growth of 3%. High-value agricultural production, in particular horticultural crops (fruit and vegetables), have played a significant role in the growth of agricultural incomes and the improved social welfare of rural communities[2].

The transport of fresh produce from the farm to the table is subject to many obstacles such as slow transit times and high rates of perishability. Food losses and food waste have adverse impacts on the region's food security, while negatively impacting on the environment, labor, land, water and the income of farmers. The highest levels of food loss and waste occur in perishable crops such as fruits and vegetables and roots and tubers. Post-harvest losses in fruits and vegetables across Asia and the Pacific region may be as high as 50 percent, while for rice, they vary between 12 and 37 percent. On the consumer side, food waste is an emerging issue associated with growing incomes and changing food consumption habits in urban centers. These impediments to fresh food reaching urban markets encourages an increased dependence on fast foods and processed foods, elevating the levels of childhood obesity, and chronic diseases such as diabetes, high blood pressure and heart conditions. Farmers and consumers could achieve better outcomes if crop wastage were to be reduced.

Furthermore, energy is needed at every level of the agricultural supply chain, including the production of agricultural inputs, agricultural production in the field, food processing, transportation, marketing and consumption. Primary agriculture consumes only about 20% energy, while food processing including transport uses around 40%, and thereby significantly contributes to energy consumption along agricultural supply chain in Mekong countries. Transportation of fruit and vegetables to markets and to processing plants is largely dependent on diesel and gasoline inputs to fuel trucks, boats and planes in Mekong countries. The high dependency on fossil and fuels along the agricultural value chain is concerning. Further, currently energy efficiency of existing energy source has not been optimized.

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[1] Mekong Eye (2018), Pushing GMS food up the value chain, https://www.mekongeye.com/2018/01/05/pushing-gms-food-up-the-value-chain/ (Accessed: 31 may, 2021).

[2] http://www.fao.org/3/i3657e/i3657e.pdf

To reduce the postharvest loss of fruit and vegetables and development of efficient agricultural supply chains, energy inputs play a crucial role.

Leveraging technology to overcome supply chain issues will be a critical factor in mitigating the impacts of climate change on pastoral communities and ensuring farmers are financially resilient. Under the project of "Sustainable and Smart Agricultural Supply Chain Development in Mekong Countries" funded by the Mekong-Korea Cooperation Fund (MKCF), this training program is organized to optimize the energy source by applying the smart renewable energy technologies as well as improve energy efficiency along the supply chain.

2. Training Introduction

In this context, the Mekong Institute is organizing an online regional training on "Smart Renewable Energy Technologies for Agricultural Supply Chains in the Mekong Region". Training participants will progress through three phases:

- **Online Learning Phase** – consisting of 30 hours of live online learning from November 21 - 25, 2022. During this time, the participants will conceptualize, participate in training sessions and exchange practical insights. At the end, the participants will come up with the Action Plan that they are required to carry out in their respective countries.

- **Action Plan Development and Implementation** – In this phase, the participants will be required to further develop and implement their Action Plan in their home countries, backstopped by the technical assistance of MI.

- **Synthesis and Evaluation Workshop:** the participants will be invited to report the results of their Action Plan implementation as well as share the lesson learned and good practice in an online synthesis and evaluation workshop.

3. Training Objectives

The general objective is to raise the awareness on smart renewable energy technologies/innovations for agricultural supply chains. At the end of the training program, each participant shall be able to:
- Better understand the importance of smart renewable energy technologies/innovations for agricultural supply chains;
- Be able to select and adopt the appropriate technologies for their countries;
- Establish a network that will foster cross-border cooperation and collaboration in application of the smart renewable energy technologies and improving the energy efficiency in the region.

4. Duration and Location

The training will be spread over five days from November 8-12, 2022. The training will be held online, consisting of 6 hours of learning per day.

5. Training Modules

In this online course, participants will explore three interrelated modules as follows:

Module 1: Overview of Smart Renewable Energy Technologies for Agriculture Supply Chains

Topics
- An overview of the current situation and the challenges to adopt the renewable energy technologies the agricultural supply chains in the Mekong Region

Module 2: Assessment of Smart Renewable Energy Technologies for Agriculture Supply Chains

Topics
- An introduction to the technology
- Product specification - features and applications
- Operationalization, customer service and warranty
- Supplier and manufacturers
- Case study of the technologies
- Cost – benefit analysis
- Calculating the return on investment

Module 3: Action Plan

Topics
- Action plan preparation
- Action plan in practice on smart renewable energy technologies the agricultural supply chains
- Key inputs for the action plan
- Group / individual action plan template
- Action plan presentation

6. Target Participants

This regional training course is tailor-made for government officials, and those from the academia and research institutions, including representatives from the private sector of Mekong countries who are involved in optimizing the energy source by applying the smart renewable energy technologies as well as improving energy efficiency along the agricultural supply chains. The total no. of participants is 30. The participants are required to meet the criteria as below:

- Hold university degree or an equivalent educational background with minimum 3 to 5 years working experience
- Command of English (speaking, reading, and writing) at working level
- Less than 40 years old
- Familiarity with cross-cultural studying and working environment
- Equipped with a computer/ laptop with office software (Microsoft Word, Excel, PowerPoint), webcam, headset (or a microphone and speakers), reliable internet connection with at least 1.2 Mbps bandwidth
- Full attendance to the training program at a convenient and quiet place/room/area

7. Training Design and Methodology

The training is designed to foster greater understanding of the training contents and to focus on practical knowledge, to respect adult learning principles, use real case studies, adopt participative approaches, as well as stimulate sharing and networking among the participants.

All training modules will be drawn from practical experience and tailored to the needs of stakeholders

in the logistics sector of the agricultural supply chain. It will incorporate concrete actions for follow-up activities after training. Each training module is designed and delivered using the "Integrated Curriculum" approach. The salient features of this integrated curriculum are that competencies are carefully selected, integration of theoretical concepts with skills practiced, and essential knowledge directed at enhanced performance. The development of implicit skills (such as facilitation, presentation, and communication, negotiation, and leadership skills) are integrated into the course.

For each module, participants will go through three progressive stages of modular training:

Learning Phase
Each training module will start with a participatory training session where trainees are introduced to the concepts, techniques, tools and effective strategies to develop and promote smart logistics technology for the agricultural supply chain. At this formulative stage, learner-centered instruction will be applied where the trainer is the leader of a community of learners, devising ways to promote inquiry, higher order thinking, problem-solving, higher levels of literacy and engagement. This is a conceptualizing stage which requires processing and drawing on a rich knowledge base of content, methods appropriate to the content, and technology appropriate to the content.
Knowledge Application Phase
This competency-based module has been classified as a form of work-based learning. Immediately after the new skills/knowledge have been acquired, the trainees will carry out corresponding assignments. That is to say, after completing deliberation on the concept and tools, participants will be given assignments to identify and design a particular activity in groups.
Knowledge Transfer Phase or Synthesis and Evaluation Workshop
This will be a share-to-learn session where each individual / group will have the chance to present their outputs and share the learning/working experience with others. Lessons learned and practical experiences from the actual applications will be shared and innovative knowledge and skills will emerge and become institutionalized.

8. Tentative Schedule

Date and Time	Session	Topic
November 21, 2022		
9 am- 12 pm	Opening Ceremony	▪ Welcome and opening remarks ▪ Video presentation of Mekong Institute ▪ Introductory presentation: the training modules and sessions, e-learning, rules and norms of the online training, monitoring & evaluation tools, and online group photo ▪ Online "Getting to Know Each Other" session ▪ Pre assessment
	Module 1: Overview of Smart Renewable Energy Technologies for Agriculture Supply Chains	▪ An overview of the current situation and the challenges to adopt the renewable energy technologies the agricultural supply chains in the Mekong Region
1.30 pm-4.30 pm	Module 2: Assessment of Smart Renewable Energy Technologies for Agriculture Supply Chains ▪ Smart Solar Roof Technology	▪ An introduction to the technology ▪ Product specification - features and applications ▪ Operationalization, customer service and warranty ▪ Supplier and manufacturers ▪ Case study of the technologies ▪ Cost – benefit analysis ▪ Calculating the return on investment ▪ Discussion
November 22, 2022		
9 am-12 pm	Module 2: Assessment of Smart Renewable Energy Technologies for Agriculture Supply Chains (Cont.) ▪ Wind Power Technology	▪ An introduction to the technology ▪ Product specification - features and applications ▪ Operationalization, customer service and warranty ▪ Supplier and manufacturers ▪ Case study of the technologies ▪ Cost – benefit analysis ▪ Calculating the return on investment ▪ Discussion
1.30 pm-4.30 pm	▪ Tidal Hydrokinetic Energy	

November 23, 2022		
9 am-12 pm	Module 2: Assessment of Smart Renewable Energy Technologies for Agriculture Supply Chains (Cont.) • Biomass Energy	• An introduction to the technology • Product specification - features and applications • Operationalization, customer service and warranty • Supplier and manufacturers • Case study of the technologies • Cost – benefit analysis • Calculating the return on investment • Discussion
1.30 pm-4.30 pm	• Drone in Agriculture	
November 24, 2022		
9 am-12 pm	Module 2: Assessment of Smart Renewable Energy Technologies for Agriculture Supply Chains (Cont.) • Electric Forklift for Agricultural Warehouse	• An introduction to the technology • Product specification - features and applications • Operationalization, customer service and warranty • Supplier and manufacturers • Case study of the technologies • Cost – benefit analysis • Calculating the return on investment • Discussion
1.30 pm-4.30 pm	Module 3: Action Plan	• Action Plan preparation • Action Plan in practice on smart renewable energy technologies the agricultural supply chains • Key inputs for the Action Plan • Group / individual Action Plan Template
November 25, 2022		
9 am-12 pm	Module 3: Action Plan (Cont.)	• Action Plan presentation • Feedback

1.30 pm-4.30 pm	• Closing Session	• Post Assessment
		• Program Evaluation
		• Closing Ceremony:
		  - Speeches by selected participants
		  - Way Forward and Closing Remarks

9. Monitoring and Evaluation

An effective monitoring and evaluation (M&E) mechanism will be utilized to assess the progress and measure the results of the intervention. The M&E will be introduced in the pre, during, and post stages of the training.

Pre-event

Selection of participants: prior to the launch of the training program, relevant information on the prospective participants' knowledge level will be collected. The information will be used to assess and select the participants, monitor the progress, and assess results of the intervention.

During event

During the event, a pre- and post-training assessment will be conducted to assess their knowledge and competencies of the participants. Pre-assessment aims to gather information on the participants' level of knowledge. The result will be compared to the post assessment in order to measure the improvement in knowledge and experience. The online after-event evaluation of the training will be conducted at the end of the training. Also, the participants will prepare action plan to transfer knowledge back at their work places, provinces, and countries.

Post event

This is the knowledge transfer stage during which the participants will be required to implement individual action plans at their work place and / or in the provinces, and countries to transfer the knowledge and skill leaned during the training. This could be in the form of knowledge sharing sessions with their colleagues. The on-line follow-up evaluation of the training will be conducted in three-six months after the completion of the training.

10. Contacts

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