Activity 2.3
Sub activity 2.3.1/2023
(Budget USD 30,000)

Regional Training Course (Energy Optimization for Fishing Vessel and Optimal Post-Harvest Fish Handling Techniques) for the SEAFDEC Member Countries *(27 November to 1 December 2023)*

Organization Details

Project Title	Responsible Fishing Technology and Practice
Section/Division Name	Marine Engineering Section Training and Research Supporting Division SEAFDEC Training Department
Lead Technical Officer (LTO)	Mr. Nakaret Yasuk (Fishing Technology Section Head)
Activity Leader	Mr. Thaweesak Thimkrap (MESH)
Project Advisor	Mr. Suthipong Thanasansakorn (TRSDH)
Contact Person	Mr. Khunthawat Manomayitthikarn (ME)

Introduction:

Modern fishing is one of the most energy-intensive methods of food production. Motorized and mechanized fishing is dependent on fossil fuels, which are non-renewable and limited. Fossil fuels produce increased levels of carbon dioxide in the atmosphere contributing to the greenhouse effect and other pollutants which are detrimental to the environment and human health. The greenhouse effect leads to irreversible climatic and oceanographic changes. Moreover, spiraling oil prices may severely affect the economic viability of fishing as a means of fish production. Many nations around the world have undertaken large-scale programs in energy conservation in consideration of these implications.

Energy security issues assume great significance on account of the increasing demand-supply gap and escalating dependence on imports. Thus, it is obvious that fuel conservation initiatives should take center-stage in developmental efforts, considering its non-renewable nature, limited availability, and effects of its use on the environment. Various approaches to energy conservation in fish harvesting such as (i) fishing gear and methods; (ii) vessel technology; (iii) engines; (iv) reduction gear, propeller, and nozzle; (v) sail-assisted propulsion; (vi) adoption of advanced technology; (v)conservation and enhancement of resources, are discussed in the following sections. Not only Energy Optimization in Fishing. The fish handling and preservation onboard are also equally important.

Currently, fishery resources are decreasing. Including the rising cost of fishing operations, causing fishers to suffer losses of income, causing the need to extend the period of fishing for a longer time. These problems are factors that directly affect the quality of catches that come to consumers. Including the shortages of labor on the fishing vessels and the fishing fleet, because fishing is hard work while the income and living conditions are not as good as they should be and had to be at sea for several days.

The main factor that directly affects the price of important fishery products is the quality of raw materials that are fresh because fish as raw materials that are easily deteriorated. When the fish dies, there will be a rapid change in freshness quality. The problem of slowing spoilage and keeping it fresh for a long time is an important factor. The lack of knowledge and techniques of fishers or tools for maintaining the quality of fish together with the cost burden of keeping the quality of fish, especially the energy and labor costs onboard. Therefore, the care and storage of fish are insufficient to maintain freshness. Fish products cannot be exported at premium grade or served as international markets. Many fish caught cannot be consumed by humans and must be developed as food for animals. In this situation, it is not worth the extravagant use of limited resources.

SEAFDEC/TD have realized the importance of both issues. Therefore, there is a plan to organize a regional training course for SEAFDEC member countries under financial support from the Japanese Trust Fund named Regional Training Course (Energy Efficiency Measures for Fishing Vessels and Optimal Post-Harvest Fish Handling Techniques. This initiative is a response to recommendations received during the ASEAN-SEAFDEC regional meeting on Solutions and Action Plans for the ASEAN Region in 2030. The primary objective of this comprehensive training course is to enhance the knowledge and expertise of Member States in energy efficiency measures, specifically tailored to fishing vessels and postharvest fish handling techniques. The course places significant emphasis on two key aspects optimizing fuel utilization in the fishery supply chain during fishing activities and preserving fish freshness. Through targeted instruction and hands-on training, participants will acquire the necessary tools and understanding to effectively manage their upcoming energy efficiency technologies and post-harvest fishing operations.

Furthermore, the training course highlights the critical importance of promoting sustainable practices and energy-saving measures to ensure the long-term viability of fisheries while upholding environmental integrity. By providing integrated regional training courses, Member States have a valuable opportunity to strengthen their capacities in post-harvest fish management and energy management, thereby contributing to the overall sustainability and productivity of the fisheries sector. SEAFDEC Training Department remains resolute in its commitment to supporting Member States in effectively managing and developing fisheries sustainability, even in the face of challenging circumstances.

Objective:

1. To enhance the technical knowledge of participants, particular attention will be given to fuel efficiency methods, including the monitoring of fuel consumption during fishing activities. The training will provide up-to-date information on best practices and innovative technologies for optimizing fuel usage, enabling participants to make informed decisions regarding fuel efficiency measures.
2. Increasing awareness of responsible fishing practices is a key objective of the training course. Participants will be enlightened about the significance of reducing carbon dioxide emissions from fishing vessels and encouraged to adopt enhanced energy efficiency measures. By doing so, sustainable fishing practices and environmental conservation can be promoted effectively.
3. To transfer hygienic and user-friendly fish handling tools and techniques, ensuring the quality of catches, promoting food safety, and minimizing post-harvest losses throughout the fish-catching, storing, and transportation processes.
4. To exchange perspectives and ideas among participants, focusing on practical approaches to reduce postharvest losses in local fisheries. This encompasses various aspects such as fish treatment, ice preservation, conservation, handling, and transportation.
5. The establishment of a stakeholder network is another important objective, aiming to facilitate the exchange of technical information and experiences related to energy efficiency measures of fishing vessels and post-harvest fish handling practices.

Expected Output:

Upon successful completion of the training program, participants are expected to acquire the following competencies:

1. Enhanced Technical Knowledge and Practical Skills: Participants will augment their technical knowledge and practical skills related to implementing energy efficiency measures and reducing post-harvest losses. This will strengthen their capacity to effectively carry out extension and promotional activities in their respective countries.
2. Heightened Awareness of Hygiene and Best Practices: Participants will gain increased awareness and understanding of the knowledge on energy optimization strategies for the Southeast Asian fishing fleet. Moreover, they will be equipped with knowledge of the importance of hygiene and the adoption of best practices for fish handling onboard fishing vessels.
3. Effective Dissemination of Technical Information: The training program will effectively disseminate technical information on energy efficiency measures and fish handling techniques to the Member Countries. This will ensure that the acquired knowledge and information are shared and applied effectively in relevant contexts.

Course structure:

This regional training program will be delivered in the following three (3) major modules:

1. Literature reviews 60%
2. Demonstration 20%
3. Discussion and evaluation 20%

Program Description:

Regional Training Course (Energy Optimization for Fishing Vessel and Optimal Post-Harvest Fish Handling Techniques) for the SEAFDEC Member countries comprises three (3) modules:

Module l. Literature reviews (Energy Efficiency Measures for Fishing Vessels)

1.1 Current knowledge of energy efficiency and energy-saving technology at the international level.
1.2 Utilization of fuel efficiency through the implementation of fishing gear designs, materials, construction patterns, and ways to reduce impact levels from fishing operations.
1.3 Energy efficiency measures and alternative energy solutions for fishing vessels or Future trend of decarbonization and alternative fuels for fishing vessels.
1.4 Energy Efficiency Technologies and Measures on Japan fishing vessels.
1.5 SEAFDEC and FAO fishing vessels energy audits for Thai trawl vessels.
1.6 Advancing Sustainable Fishing Practices: Innovations in Technology and Operational Strategies for Energy Optimization and Environmental Minimization.
1.7 Innovations in Technology and Operational Strategies for Energy Optimization and Environmental Minimization.
1.8 Calculating carbon emissions from fishing operations.
1.9 Practical Observation of the Enhanced MVPLALUNG Demonstrational Vessel Accompanied by a Presentation on Energy Optimization and Low Impacts of Fishing Technologies.

Module 2. Literature reviews (Optimal Post-Harvest Fish Handling Techniques)

2.1 The Importance of fish handling.
2.2 Theory of good practices and hygiene control.
2.3 Process of analyzing fish freshness.
- Theory of freshness analysis.
- Important of freshness analysis.

2.4 Cold chain management
- The importance of cold chain management
- The process to maintain the temperature to protect the fishery product losses.

2.5 Preservation techniques and method for onboard fish handling.
2.6 Factors influencing improving fish handling onboard and aquaculture products.
2.7 Enhancement of fish handling practices at the fish landing site based on hygienic standards, and energy efficiency measures Preparation for fish unloading and transportation process.
2.8 The implementation of practical preservation techniques to enhance fish handling onboard fishing vessels.
2.9 Research experience of slurry ice system for fish preservation on a demonstrated fishing vessel.
2.10 Fish handling and preservation practices on techniques to preserve fish freshness at premium grade.
2.11 Introduction to fish handling techniques using the IKE-JIME method.
2.12 Practices in fish handling techniques using the IKE-JIME method.

Module 3. Discussion/evaluation

Touches upon current international knowledge of energy efficiency and energy-saving technology, fuel efficiency utilization in fishing gear design, and alternative energy solutions for fishing vessels by concluding with discussions on energy efficiency technologies and measures on Japanese fishing vessels, energy audits for Thai trawl vessels conducted by SEAFDEC and FAO, and innovations in technology and operational strategies for advancing sustainable fishing practices and topics related to fish handling and preservation. It includes literature reviews on the importance of fish handling and the theory of good practices and hygiene control including the process of analyzing fish freshness and emphasizes the significance of freshness analysis. Cold chain management is discussed, highlighting its importance in protecting fishery products from losses.

Target participants:

The Regional Training Course (Energy Optimization for Fishing Vessel and Optimal Post-Harvest Fish Handling Techniques) has been specifically developed to increase the human resource capacity of fisheries officers from SEAFDEC member countries including Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Thailand, and Vietnam to ensure the best participation and outcomes. Candidates should have relevant work experience in energy efficiency measures and post-harvest fish handling and be able to effectively transfer the knowledge gained from the training program. By taking advantage of this knowledge Participants can contribute to the advancement of energy efficiency measures on fishing vessels and post-harvest fish handling practices within their region to promote continuous development and excellence in these fields

Date and Venue:

The Regional Training Course (Energy Optimization for Fishing Vessel and Optimal Post-Harvest Fish Handling Techniques) for the SEAFDEC Member Countries will be held total 5 days from 27 November to 1 December 2023 at SEAFDEC/TD Thailand.

Training Syllabus:

Day	Time	Subjects	Instructor
		I. Energy Efficiency Measures for Fishing Vessels	
Day 1 27 Nov. 2023	08:30 – 09:00	Registration	SEAFDEC team
	09:00 – 09:15	Welcome and opening ceremony	SG/TDC & DSG/DTDC
		Group Photo	Audiovisual
	09:15 – 09:30	General information	Mr.Khunthawat
	09:30 – 10:00	*Refreshment break*	
	10:00 – 11:00	1.1. Current knowledge of energy efficiency and energy-saving technology at the international level.	Dr. Stephen Eayrs (Online)
	11:00 – 12:00	1.2. Utilization of fuel efficiency through the implementation of fishing gear designs, materials, construction patterns, and ways to reduce impact levels from fishing operations.	FRA Japan
	12:00 – 13:00	*Luncheon*	
	13:00 – 14:00	1.3. Energy efficiency measures and alternative energy solutions for fishing vessels or Future trends of	FRA Japan

		decarbonization and alternative fuels for fishing vessels.	
	14:00 – 14:30	*Refreshment break*	
	14:30 – 16:00	1.4. Energy Efficiency Technologies and Measures on Japan fishing vessels.	FRA Japan
Day 2 28 Nov. 2023	09:00 – 10:00	1.5. SEAFDEC and FAO fishing vessels energy audits for Thai trawl vessels.	Mr.Khunthawat
	10:00 – 10:30	*Refreshment break*	
	10:30 – 12:00	1.6. Advancing Sustainable Fishing Practices: Innovations in Technology and Operational Strategies for Energy Optimization and Environmental Minimization	FRA Japan
	12:00 – 13:00	*Luncheon*	
	13:00 – 14:00	1.7. Innovations in Technology and Operational Strategies for Energy Optimization and Environmental Minimization	Mr.Suthipong
	14:00 – 14:30	*Refreshment break*	
	14:30 – 15:30	1.8. Calculating carbon emissions from fishing operations.	FRA Japan
	15:30 – 16:30	1.9. Practical Observation of the Enhanced M.V. PLALUNG Demonstrational Vessel Accompanied by a Presentation on Energy Optimization and Low Impacts of Fishing Technologies. *(SEAFDEC pier)*	Mr.Thaweesak
		2. Optimal Post-Harvest Fish Handling Techniques	
Day 3 29 Nov. 2023	09:00 – 10:00	2.1. The Importance of fish handling.	Thai DOF
	10:00 – 10:30	*Refreshment break*	
	10:30 – 11:30	2.2. Theory of good practices and hygiene control.	Thai DOF
	11:30 – 12:00	2.3. Preservation techniques and methods for onboard fish handling.	Mr.Thaweesak
	12:00 – 13:00	*Luncheon*	
	13:00 – 14:00	2.4. Process of analyzing fish freshness.	PSU/PC
	14:00 – 14:30	*Refreshment break*	
	14:30 – 15:30	2.5. Cold chain management	KU
	15:30 – 16:00	2.6. Factors influencing improving fish handling onboard and aquaculture products.	Mr.Suthipong
Day 4 30 Nov. 2023	09:00 – 10:00	2.7. Enhancement of fish handling practices at the fish landing site based on hygienic standards, and energy efficiency measures Preparation for fish unloading and transportation process.	Mr.Khunthawat
	10:00 – 10:30	*Refreshment break*	
	10:30 – 11:30	2.8. The implementation of practical preservation techniques to enhance fish handling onboard fishing vessels.	Mr.Khunthawat

	11:30 – 12:00	2.9. Research experience of slurry ice system for fish preservation on a demonstrated fishing vessel.	Mr.Thaweesak
	12:00 – 13:00	*Luncheon*	
	13:00 – 14:00	2.10. Fish handling and preservation practices on techniques to preserve fish freshness at premium grade.	FRA Japan
	14:00 – 14:30	*Refreshment break*	
	14:30 – 16:00	2.11. Introduction to fish handling techniques using the IKE-JIME method.	FRA Japan
Day 5 1 Dec. 2023	09:00 – 10:30	2.12. Practices to fish handling techniques using the IKE-JIME method.	
	10:30 – 11:00	*Refreshment break*	
	11:00 – 12:00	Discussion/evaluation	
	12:00 – 13:00	*Luncheon*	
	13:00 – 14:00	Closing ceremony	DSG/DTDC

Allowances and other benefits:

In adherence to the established guidelines, participants will receive the subsequent allocation and benefits as delineated below, ensuring that they are provided with the necessary support and advantages throughout their engagement in the program. These provisions have been carefully structured to optimize the participants' experience and enable them to fully immerse themselves in the learning and developmental opportunities provided.

a) Travel:

Participants from countries other than Thailand will receive an economic round-trip airfare, covering the cost of their travel. The air travel arrangements will be made through the shortest feasible route from the nearest international airport to Bangkok. In the event of transit, participants will be requested to take the earliest available flight from the transit airport to Bangkok. It is important to note that any rerouting, which may result in extra costs and time, is not allowed.

The responsibility for domestic travel, encompassing all associated fees and expenses, whether by air, sea, or land, from the participants' hometown to the nearest international airport in their respective countries before departure, lies with either the participants themselves or their employers.

b) Accommodation:

SEAFDEC/TD will assume responsibility for providing participants with comfortable accommodation and serving a nutritious breakfast and lunch (Dinner excludes) for the duration of their stay during the training period. We understand the importance of a supportive environment and a rewarding start to the day, which greatly contribute to the overall health and optimal learning experience of our participants. Rest assured, we are committed to ensuring your comfort and satisfaction during your stay with us.

c) Subsistence Allowance:

In accordance with the esteemed standards upheld by SEAFDEC/TD, participants will be granted a Daily Subsistence Allowance that aligns with the well-established norms and guidelines. This provision ensures that participants are appropriately supported during their involvement in the program, allowing them to focus wholeheartedly on their learning and professional development.

d) Books and training materials:
SEAFDEC/TD will graciously provide participants with all the essential books and training materials that are deemed necessary for their active participation. These resources have been thoughtfully selected to ensure a comprehensive and enriching learning experience. We are committed to equipping participants with the necessary tools and references that will contribute to their knowledge acquisition and skill development throughout the training program. Upon completion of the training course, participants will be promptly provided with a comprehensive set of training materials and accompanying activity pictures, all conveniently packaged in downloadable file formats. The URL for accessing and downloading these materials will be communicated to you at a later juncture.

e) Accident and Health Insurance:
SEAFDEC/TD will kindly take on the responsibility of procuring health and accident insurance coverage on behalf of each participant. Your well-being and safety are our top priority, and we want to ensure that you are protected throughout your participation in this regional training program.

Contact persons:

1) Mr.Khunthawat Manomayitthikarn khunthawat@seafdec.org
2) Mr.Anusorn Chanyim anusorn@seafdec.org
3) Mr.Thaweesak Thimkrap thaweesakt@seafdec.org

SEAFDEC Instructor:

1) Mr.Suthipong Thanasansakorn suthipong@seafdec.org
2) Mr.Thaweesak Thimkrap thaweesakt@seafdec.org
3) Mr.Khunthawat Manomayitthikarn khunthawat@seafdec.org

Outsource Instructor:

1) Kasetsart University (KU)
2) Prince of Songkla University Pattani Campus (PSU/PC)
3) FRA Japan (Kamisu-shi, Ibaraki)
4) Stephen Eayrs Ph.D. /Smart Fishing Consulting Director