NON-ALIGNED MOVEMENT CENTRE FOR SOUTH-SOUTH TECHNICAL COOPERATION

REPORT ON IMPLEMENTATION OF INTERNATIONAL TRAININGS

A. Activities: International Training on Fisheries for Asian and the Pacific Countries; International Training on Aquaculture for African Countries

B. Participating Countries: Algeria; Angola; Bangladesh; Comoros; Democratic Republic of Congo; Guinea; Kenya; Kiribati; Lesotho; Libya; Madagascar; Morocco; Mauritania; Nauru; Papua New Guinea (PNG); Seychelles; Solomon Islands; South Africa; Sudan; Thailand; Tunisia; Tuvalu; Uganda; Zambia

C. Funding: Non-Aligned Movement Centre for South-South Technical Cooperation (NAM CSSTC); Ministry of Foreign Affairs Republic of Indonesia *c.q.* Directorate of Technical Cooperation (DTC); Ministry of Marine Affairs and Fisheries Republic of Indonesia *c.q.* Research and Human Resource Agency (RHRA)

D. Summary

*"*International Training on Fisheries for Asian and the Pacific Countries*"* & "International Training on Aquaculture for African Countries" in Banyuwangi Fisheries Training Centre (BFTC) have been implemented from 15 to 21 July 2018. The trainings were organised as a result of Memorandum of Understanding (MoU) signing between the NAM CSSTC and the Indian Ocean Rim Association (IORA), and 16th Ministerial Meeting of NAM in 2011 in Bali. Throughout the trainings, participants from Asian and the Pacific regions were studying analyses of eco-friendly fishing gears and design, creation and operation of fishing pots. Moreover, the trainings also allowed participants from African countries to study aquaculture in cage, management of fry, feed, water quality and fish health. Exchange of ideas and experiences was conducted between participants and implementing agencies, therefore these trainings bring benefit to implementing agencies and created people-to-people connectivity.

E. Introduction

In order to implement MoU signing between the NAM CSSTC and the IORA and 16th Ministerial Meeting of NAM in 2011 in Bali, the NAM CSSTC, the DTC and the RHRA offered fisheries training programmes to developing countries in Asian, the Pacific and African regions. Training participants gained knowledge and skills on analysis of eco-friendly fishing gears, fishing pot, aquaculture in cage, and management of fry, feed, water quality and fish health.

Participants from Asian and the Pacific countries used mackerel as training material. Mackerel is one of fish commodities utilised by numerous countries for its high commercial value. The highest number of catch is found in Asia-Pacific countries. On the other hand, participants from African countries used *nile tilapia* as their training material, a fish species with highest aquaculture level. In African countries, tilapia has sustained community welfare and contributed to food security.

F. Venue and Date

These trainings were organised in BFTC, East Java (Figure 1. Training location) from 15 July 2018 to 21 July 2018. Training activities included discussion with trainers/speakers, practice in workshop and field work.

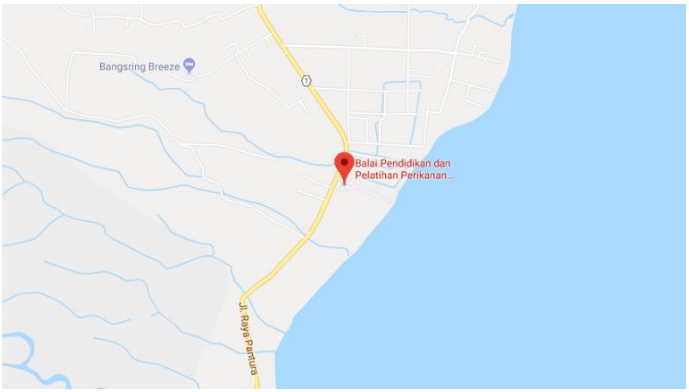

Figure 1. Training location

G. Result and Discussion

1. International Training on Fisheries for Asian and the Pacific Countries

Learning materials of “International Training on Fisheries for Asian and the Pacific Countries” were analysis of eco-friendly fishing gears, fishing pot and mackerel processing. Fisheries is recognised as natural resource which can contribute to food security and nutrition, and ensure sustainable development in economic, social and environmental fields. Fisheries activities are very popular in West and Northwest Pacific, while in Asia, 84 percent of world population working in fisheries sector.

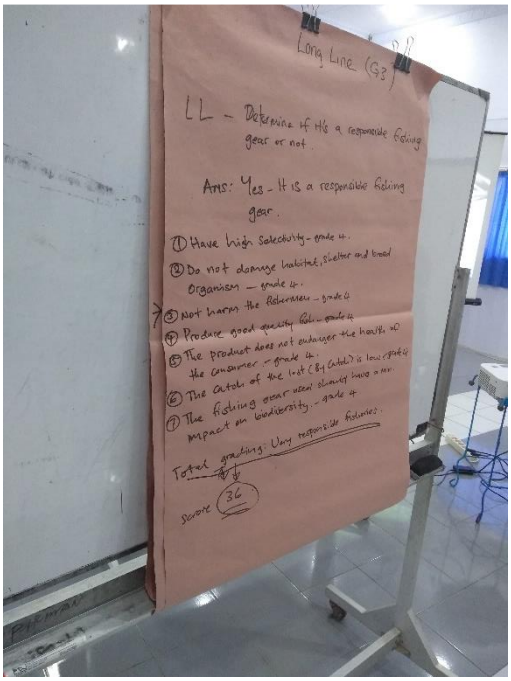

Figure 2. Result of analysis of eco-friendly fishing gear by Group 3

However, fisheries activities should be conducted in proper manner to maintain sustainability of marine resources for the future generation. In order to achieve the objective, fishermen should be able to determine and apply fishing gears that have lowest negative impact to marine environment and biodiversity. Fisheries training centres in Indonesia regularly organise trainings related to fishing gears. Various types of fishing gears are introduced to community, based on its operational method, fishing ground, Food and Agricultural Organisation (FAO) classification and Code of Conduct for Responsible Fisheries (CCRF).

Topics presented during training on fisheries were as follows:

a. Analysis of Eco-Friendly Fishing Gears

Application of eco-friendly fishing gears is necessary to protect marine resources. It is means of responsible fisheries activity to realise sustainable capture fisheries.

There are 9 (nine) criteria for eco-friendly fishing gears, namely:

1) High selectivity
2) Not disturbing fish's habitat and breeding
3) Producing high-quality catch fishes
4) Not harming fishermen
5) Products are safe for consumers
6) Low by-catch
7) Low negative impact against biodiversity
8) Not capturing or harming protected fishes
9) Socially acceptable.

Each point is broken down and scored from the scale of 1 to 4. If the total score reaches 28 to 36, then the fishing gear could be considered eco-friendly.

During the training, participants were divided into three groups to analyse Long Line, Trawl and Purse Seine. Based on discussion among participants, Long Line was considered to be the eco-friendliest fishing gear.

Figure 3. Trainer from BFTC demonstrated sample of fishing pot

b. Fishing Pot

Fishing pot is very popular among fishermen and categorised as passive fishing gear. It has cage-shaped trap to prevent fishes from getting out. Fishing pot has one or two entrances (*also known as trusses*) and it could be carried to several catching areas, with or without a boat.

General pot has rectangular shape with 80 cm x 60 cm x 40 cm size. The truss is made of iron with 0.5 cm diameter. Pot's construction is covered with 0.75-inch polyethylene (PE) webbing nets. To attach the web, Pot's builder uses PE or nylon with yarn number 18.

During the training, participants were divided into three groups, in which each group created their fishing pots. In the afternoon, the fishing pots were applied to conservation area of Bangsring Beach to verify its effectivity in catching fishes. Each pot was proven effective to catch four fishes within one day.

c. Mackerel Processing

Mackerel is one of marine fisheries commodities which should be utilised for its potentials. Mackerel processing could increase added-value and consumption rate.

Throughout the training session, participants learned following key points:

1) Mackerel is commonly processed into fillet, meatball, dumpling and samosa.
2) Processed mackerel should be in a good hygiene, has bright eyes, red gill and gummy texture, and smells like the sea.
3) Preparation is part of fish handling after harvesting, which aims at simplifying processing activity by maintaining quality and improving its appearance. Handling is a method to maintain its freshness by putting fishes into freezer or cold salt water.
4) Mackerel-based cuisines have soft texture. Mackerel-based raw material is suitable for product diversification, since it could be processed into various types of cuisines.

Figure 4. Participants made mackerel fillet

2. International Training on Aquaculture for African Countries

Figure 5. Participants from South Africa and Tunisia prepared cage aquaculture

Participants to the “International Training on Aquaculture for African Countries” learned preparation of cage aquaculture, management of fry, feed, water quality and fish health, as well as tilapia processing. Training’s objectives were increasing income of fish farmers, enhancing human resource quality of fish farmers and providing conducive infrastructure in aquaculture field.

Aquaculture has become featured programme in several developing countries, due to its resiliency against weather anomaly.

Topics presented during training on aquaculture were as follows:

a. Preparation of Cage Aquaculture

Cage aquaculture is one of aquaculture production system. It uses floating construction, web and rope. Location, size, fish species and feed are determining factors for its successful application.

Cage aquaculture requires modern technology and should meet particular technical requirements, namely adequate depth and tide and resiliency against wave. It is expected application of cage aquaculture will expand business and employment opportunities. Two advantages of cage aquaculture are: 1) Fish farmers can produce fish in an existing pond without destroying its sport fishing; and 2) Fish farmers do not have to invest large amounts of capital for construction or equipment.

Application of cage aquaculture involves several stages as follows:

1) Selecting site
2) Determining cage size
3) Preparing cage frames and nets
4) Selecting species based on its biological criteria
5) Stocking
6) Determining feeds and conducting feed management (e.g. *fresh or frozen trash fish, moist pellet, floating dry pellet*)
7) Harvesting
8) Managing cage efficiently
9) Fouling cage net.

During the training, participants learned techniques on measuring wave speed and water salinity.

b. Management of Fry, Feed, Water Quality and Fish Health

Figure 6. Participants measured water temperature after applying oxygen and nitrogen

During the training, participants figured out ways to get organised tilapia fry. Based on discussion between participants and trainers / speakers, several steps to get quality tilapia's fry were as follows:

1) Buying tilapia's fry from trusted wholesaler or seller, for example, a brood stock centre, since fries from that area are more guaranteed.
2) Checking before buying, to make sure that no fry is infected.
3) Transporting the fry using oxygen-filled plastic bag, and every few hours, the bag needs to be opened and added with oxygen.
4) Avoiding excessive shaking when carrying fry.

5) Fries that are purchased from distant place should be quarantined in a plastic tub before being moved to the cage.

Another important sub-topic in the training session is management of fish health. It was intended to build capacity of trainees that have the capability to control and recover marine and fisheries resources.

During the class activity, trainers disseminated information on medication for fish, fish disease and water quality testing. Several key points in the session were as follows:

1) Infectious disease of fishes is usually caused by protozoa living in the ponds / cage aquaculture.
2) Viral diseases that are caused by bacteria are harder to be cured and needed special treatments.
3) Signs of fish diseases consists of changing forms of eyes and wounds.
4) When the signs occur, fish farmer should check water containment, create daily report and conduct diagnostic laboratory.
5) Diseases caused by fungus could be cured by applying formalin.

c. Fish Processing

Tilapia is one of important commodities in freshwater aquaculture in African countries. Tilapia culture is preferred by fish farmers due to its manageability, rapid growth and fast reproduction, as well as its immunity against diseases.

Figure 7. Participants boiled fish batter on stove

Throughout the training session, participants learned following key points:

1) Quality requirement of consumed fish product is frozen fillet with SNI 01-2696-1992 (high score of organoleptic and low microbial contamination and chemical contamination. The product should be frozen under 18 Celsius degrees).
2) Application of glazing during packaging is important to protect the product from dehydration during storage in freezer / cold storage.
3) Fish nugget is a popular processed product at a party and usually served with sambal and mayonnaise, has great taste, golden colour and crunchy texture.

H. NAM CSSTC's Assessment on the Trainings

1. In principle, the trainings were designed to enhance human resource capacity in fisheries field.

2. Training implementations received positive feedback from participants and proven effective. Trainings were conducted by module presentation, discussion between participants and trainers / speakers, field and laboratory practice and field work, as well as interaction with local fishermen.
3. Participant from Sudan conveyed that the training brought important benefit for the growth of fisheries in his country. For that purpose, he expressed interest to attend similar event in the future.
4. Participant from the Republic of Congo was interested in supplement product created by the Training centre.
5. Participant from South Africa suggested follow-up action to the activity for project sustainability.
6. Participant from Solomon Islands expected that the next programme will be focused on economic and environmental aspects of corals.
7. Participant from Bangladesh suggested that the next programme could be focused on culture of oyster and seaweed.

I. Conclusion

1. It is necessary for fishermen and researchers to develop sustainable aquaculture, which underscored the importance of cage aquaculture. Participants to the training appeared to indicate their willingness to apply the cage in their countries.
2. Participating countries will further expand their observation parameters on types of fishing gears based on knowledge they gained during analysis of eco-friendly fishing gear.
3. It is important to increase the capacity for future fingerling production. In this light, international cooperation to develop fingerling production techniques for critically endangered species is imperative.

J. Photos

Figure 8. Class activity of Asia-Pacific countries

Figure 9. Participant from Nauru attached web to pot's construction

Figure 10. Participants were getting ready to hop on boat picking up fishing pot which had been applied one day earlier

Figure 11. Preparation of fishing pot by trainers in the coastal area of Bangsring Beach

Figure 12. Participants finished making fillet, meatball, dumpling and samosa

Figure 13. Participants learned about fish diseases and their cures

Figure 14. Cage culture in the Bangsring Beach

Figure 15. Key material to maintain water quality

Figure 16. Making of cage aquaculture by participants from African countries

Figure 17. Participants created nugget batter

Figure 18. Photo group session before coral transplantation

Figure 19. Participants released turtle babies to the sea

Figure 20. Visit to lounge of Banyuwangi Regent

Figure 21. Visit to one-stop service office