Report of the Third Meeting of the Scientific Working Group on Neritic Tuna Stock Assessment in the Southeast Asian Waters

27-29 June 2016
Chonburi Province, Thailand

I. Opening of the Meeting

1. The 3rd Meeting of the Scientific Working Group (SWG) on Stock Assessment of Neritic Tunas in Southeast Asian Waters was convened by SEAFDEC Secretariat in collaboration with the Marine Fishery Resources Development and Management Department (MFRDMD) with support from the Government of Sweden throuth the SEAFDEC-Sweden Project on 27-29 June 2016 at Pattaya City in Chonburi Province, Thailand. The Meeting was attended by scientific working group from the ASEAN-SEAFDEC Member Countries, Experts and Resource Persons on Stock Assessment, SEAFDEC's collaborating partners, and Senior officers and researchers of the SEAFDEC Secretariat, Training Department (TD), and Marine Fishery Resources Development and Management Department (MFRDMD). The list of participants appears as **Annex 1**.

2. The Deputy Secretary-General of SEAFDEC, *Dr. Kaoru Ishii,* on behalf of Secretary-General, welcomed the participants and highlighted on the importance of the Meeting as the initial results of the stock assessment of two neritic tuna species, the longtail tuna or LOT and kawakawa or KAW in the ASEAN Member States would be discussed. He added that the stock assessment of LOT and KAW in the Southeast Asian region was made possible because of the efforts exerted by the AMSs in enhancing their data collection on neritic tunas. He recalled that the Regional Plan of Action for Sustainable Utilization of Neritic Tunas in the ASEAN Region or RPOA-Neritic Tunas, which has been promoted in the Southeast Asian region aims to improve sustainable management of neritic tunas based on results of the stock assessment. In order to attain such objective, TD organized two Basic Stock Assessment Training Courses for 5 Member Countries namely Cambodia, Lao PDR, Myanmar, Thailand and Vietnam in early of 2016 in Thailand. In addition, the MFRDMD organized the Advance Stock Assessment Training Course for neritic tunas in mid of April of2016 for the some ASEAN Member States namely Brunei Darussalam, Indonesia, Malaysia, Philippines, Thailand and Vietnam at the MFRDMD premises. Such Training Courses were supported by the SEAFDEC-Sweden Project. Nevertheless, he explained that requirements for capacity building in stock assessment of neritic tunas at the country level would also be discussed during the Meeting to ensure that stock assessment is pursued by the countries as the results could serve as basis for the sustainable utilization of neritic tunas. His Opening Remarks appears in **Annex 2.**

II. Introduction and Adoption of the Agenda

3. The background of the Meeting was introduced by *Dr. Taweekiet Amornpiyakrit*, Senior Policy and Program Officer of SEAFDEC. While briefing on the neritic tunas milestones since 2014 **(Annex 3)**, he highlighted on the recognition that tuna fisheries are considered important for livelihood and food security of peoples in the Southeast Asian region. For such reason, it has also become necessary to strengthen regional and sub-regional cooperation to promote the sustainable utilization of neritic tuna resources. In this connection, the Scientific Working Group on Stock Assessment of Neritic Tunas in Southeast Asia Waters or SWG-Neritic Tunas was established by SEAFDEC in 2014 based on the recommendations of the SEAFDEC Council of Directors as well as through several SEAFDEC meetings and Regional Technical Consultations.

4. Thus, the 1st Meeting of SWG on Neritic Tunas Stock Assessment in Southeast Asian Waters was organized in cooperation with the Department of Fisheries (DoF) of Malaysia in November 2014 where the status and trend of neritic tunas in the region, especially the LOT were reviewed. This led to the development in early 2015 of the Regional Plan of Action on Sustainable Utilization of Neritic Tunas in the ASEAN Region (RPOA-Neritic Tunas) by the AMSs which was discussed and endorsed by the 47thMeeting of the SEAFDEC Council in April 2015,and subsequently by the 23rd Meeting of ASWGFi and supported by the Special Senior Officials at 36th SOM-AMAF in late 2015. The RPOA-Neritic Tunasis intended to serve as a tool to develop and enhance regional and sub-regional cooperation for the development of action plans for neritic tuna fisheries and to support assessment of the status and trend of neritic tunas at sub-regional level.

5. In June 2015, the 2nd Meeting of SWG on Neritic Tunas Stock Assessment in Southeast Asian Water was organized in cooperation with the Directorate of Fisheries of Viet Nam in Hai-Phong, Viet Nam. The Meeting discussed the ways and means of promoting the RPOA-Neritic Tunas as well as the Terms of Reference (TOR) for the SWG-Neritic Tunas. After reviewing the countries' status of neritic tunas based on existing statistical data, the Meeting discussed the priorities for capacity building, particularly on stock assessment to support the objectives of neritic tuna fisheries management in line with the implementation of the RPOA-Neritic Tunas. Thus, the Meeting agreed on the work plan for genetic study and stock assessment which would initially focus on LOT and KAW.

6. Responding to the aforementioned recommendations, the SEAFDEC Secretariat in collaboration with SEAFDEC/TD organized the basic and advance Stock Assessment Training Courses in January and March 2016 with funding support from the Government of Sweden through the SEAFDEC-Sweden Project. The training courses focused on general stock assessment for some AMSs, namely: Cambodia, Lao PDR, Myanmar, Thailand, and Viet Nam. Furthermore, in April 2016, SEAFDEC Secretariat in collaboration with SEAFDEC/MFRDMD also conducted the Special Training Workshop on Stock Assessment of longtail tuna (LOT) and kawakawa (KAW) using specific softwares such as CPUE standardization, stock product model or ASPIC, Kobe Plot, and other relevant softwares.

7. However, the genetic study for LOT and KAW proposed for 2015was postponed because of some revisionsin the work plan and the process for the data collection since good quality data would be needed for the stock assessment and good samples for the genetic analysis. Therefore, in order to follow up the work plan and discuss the stock assessment of LOT and KAW based on the countries' compiled data and "massaging of data" by the invited Resource Person, the SEAFDEC Secretariat in collaboration with MFRDMD organized the 3rd Meeting of the SWG on Stock Assessment of Neritic Tunas in Southeast Asian Waters in Chonburi Province, Thailand from 27 to 29 June 2016. The Meeting was aimed at updating the activities based on recommendations of the 2nd Meeting of SWG on Neritic Tunas Stock Assessment in Southeast Asian Waters, reviewing the biological and ecological characteristics of neritic tunas, discussing and finalizing the results of stock assessment of LOT and KAW, and updating on the proposed genetic study of these two (2) species. The Meeting was also designed to provide avenue for discussing the technical and policy recommendations from the these two (2) species, the capacity building required in stock assessment at the country level, as well as other matters related to neritic tunas including Standard Operating Procedure (SOP) for data collection, website, database, and so on.

8. On the agenda and as suggested by the Resource Person *Dr. Tsutomu Nishida,*results of the stock assessment of LOT and KAW would be discussed together and that risk assessment for these two species would be carried out later and would not be reported at this Meeting. After discussion, the Agenda of the Meeting which appears as **Annex 4** was adopted.

III. Updated Status and Trends of Neritic Tunas and Seer fish

a) Country Reports

- *Brunei Darussalam*

9. The representative from Brunei Darussalam, *Mr. Matzaini Haji Juna* presented the updated status of Neritic Tunas of Brunei Darussalam **(Annex 5),** including the fishing areas used, trend of purse seine fisheries, statistical data, CPUE by purse seine, preliminary results of special training/workshop on LOT and KAW stock assessment, ASPIC analysis for LOT and KAW, results of KOBE plot of LOT and KAW, and issues and problems. He highlighted that most of neritic tunas in the country are caught by purse seine including species of Indo-Pacific king mackerel, KAW, LOT, and narrow-barred Spanish mackerel. He also presented the CPUE analysis from these four (4) species in 2011, 2012, 2013 and 2014 (caught by purse seine). While the stock assessment analysis of LOT and KAW focused on MSY, this was done with Kobe Plot and ASPIC using data from 2011 to 2015 for LOT and KAW. However, the country still faced some problems on neritic tuna fisheries such as over fishing and over capacity. He also raised some issues concerning the inadequacy of fish stock assessment and the need for capacity building on the neritic tunas stock assessment at national level.

10. In the discussion, *Mr. Matzaini* explained that the ASPIC analysis made use of five (5) years data from 2001 to 2015 for the CPUE analysis. The Resource Person, *Dr. Nishida* welcomed the available updated data of Brunei Darussalam but commented that such stock assessment of neritic tunas might be valid only in the Brunei Darussalam waters and only include the neritic tuna species. Since neritic tunas are highly migratory species and the stock units extend outside Brunei Darussalam waters, the analysis could be partial only. Thus, it would be important to also consider and understand the stock units of the species in neighboring waters, more particularly that as reported by IOTC, there are two stock units of LOT and KAW in the region, these are the Indian Ocean and Pacific Ocean stocks. Nevertheless, it was a good attempt by Brunei Darussalam to carry out activities and practice stock assessment analysis after its representative completed the training course on stock assessment organized by SEAFDEC. In this connection, the representative from Malaysia, *Mr. Samsudin bin Basir* suggested that for the next step, data from other countries on this two species should also be examined in order that the stock assessment of these two species in the region would be complete.

- *Cambodia*

11. The representative from Cambodia and Chief of SWG-Neritic Tunas for Cambodia, *Mr. Suy Sereywath* who was not present during the previous SWG meetings in Malaysia and Viet Nam, provided data on neritic tuna species and reported on the difficulties in compiling the required specific information. He mentioned that the Marine Fisheries Resources in Cambodia **(Annex 6)** covers general information, some marine resources and some fishing gears used, marine fisheries statistics related to tuna species/fishing gear, challenges relating to scientific information/data on marine fisheries, and conclusion/recommendations. He therefore cited the the difficulties and the issues on national stock assessment and data collection of the two species (LOT and KAW).

12. Nevertheless, the representative from Cambodia then stated reported on the status of Cambodian marine fisheries, the estimated statistics on total fish production including the estimated five-year production of *Scomberomorus lineolatus*, difficulties faced by scientists including the uncertainty of availability of LOT or KAW, and the most difficult concern on collecting specific fish production by species and by gear since Cambodia's statistical records on catch are reported in terms of total production and most of the scientists rely on results of research studies. Since it would be difficult for Cambodia to do any data analysis for stock assessment, he therefore called upon development partners and SEAFDEC to check the data available on these species as well as the scientific information on neritic tunas in Cambodia since the country lacks human and financial resources to undertake such activity. He added that data on the catch of *Scomberomorus lineolatus* was taken from the list of commercial fishes in Cambodia and caught mainly by gillnets, long line

and hook during the peak season in June, July and August; and that purse seines had also been used in the past 10 or 15 years. Most of the marine catch, however, are sold to middlemen at sea.

13. During the discussion, the SEAFDEC Policy and Program Coordinator, *Dr. Somboon Siriraksophon* sought clarification on the data on *Scomberomorus lineolatus* as reported in Cambodian Commercial Marine Fisheries, especially the species identification, considering that the species which might not be available in the Southeast Asian region like in the Gulf of Thailand as these are only available in the Indian Ocean. In response, *Mr. Sereywath* explained that 36 species are included in the said book and in Cambodia, this particular species is called Trey Beka (Beka fish), and that the scientific name of such species in the List of Marine Fishes in the Kingdom of Cambodia indicates *Scomberomorus lineolatus*. As a result, it was suggested that there is a need to do a verification check for neritic tunas and seerfishes in Cambodia, especially the *Scomberomorus* species, LOT and KAW. Although there are commercial neritic tunas in Cambodia, the problem is its system of data collection and species identification that need to be enhanced with clear policy intention from the Government of Cambodia to ensure the sustainability of the stock assessment activities. Considering that government policy is already in place, what the country needs is capacity building to enhance its system of data collection and species identification.

14. Recognizing the difficult situation that Cambodia is facing, *Dr. Somboon* pointed out the importance of including capacity building during the development of policy frameworks at the country level so that stock assessment activities could be started. Specifically for Cambodia, capacity building could include the conduct of basic baseline survey in order to determine the status of neritic tunas in Cambodia after which the country should come up with a good policy framework to support the stock assessment of neritic tunas.

- *Indonesia*

15. The representative from Indonesia, *Mr. Thomas Hidayat* reported on the updated status and trends of neritic tunas in 11 Fisheries Management Areas in Indonesia **(Annex 7)**, particularly in the South China Sea and Natuna Sea, since both areas are the most productive fishing grounds for neritic tunas and are shallow compared with the other fisheries management areas. These two (2) fisheries management areas also have considerable statistical data to be analyzed. Most of the targeted neritic tuna species in South China Sea and Natuna Sea are caught by small-scale fishermen operating drift gill net and landed in Pemangkat Port and only small number are caught by purse seine. Another fishing ports with good data on neritic tuna species are in West Kalimantan, Tanjung Pandan, Belitung, Bangka, Moro, and Riau. Records have shown that neritic tunas production in the South China Sea and Natuna Sea had fluctuated year by year with the highest production in 2005. The South China Sea itself provides 14% of Indonesia's national neritic tunas production (KAW, LOT and Spanish mackerel). Gill net used to catch the neritic tunas is approximately 4,000-10,000 m in total length and 17 m in depth with 4-5 inches mesh size, while purse seine is 250-300 m long andnet which is 75 m deep, with 1 inch mesh size of the bag. He added that purse seines in Java Sea are not provided with FADs.

16. Comparing by fishing ground and fishing gear, *Mr. Hidayat* cited that more gill nets are used in Pemangkat, Bangka, and Moro, while hand lines are used in Tanjung Pinang areas. In Pemangkat, the main target neritic tunas are caught by small-scale fishermen using drift gill net vessels (84%) while the rest is caught using purse seine vessels (26%). Based on catch composition using gill nets, KAW accounted for 40%, LOT 27%, and Spanish mackerel 18%. The annual CPUE of neritic tunas caught by gill nets in Pemangkat has fluctuated, dramatically increasing from 2010 to 2011, but with slight decreases from 2012 to 2014. The increasing number during 2010-2011 is possibly caused by wrong identification of species leading to some mistakes in the data analysis.

17. In the discussion, *Dr. Nishida* suggested that Indonesia should continue to collect and analyze the catch and effort data for all fishing gears and by species. The Deputy Chief SEAFDEC/MFRDMD, *Dr. Osamu Abe* added that while the analysis of Indonesia covers the stock

status in South China Sea and Natuna Sea, it would be more informative and important if Indonesia could also continue collecting data and provide the status of neritic tunas in deeper areas such as in the Arafura Sea near Australia. As for the country's regulation on maximum lengths of gill net, *Mr. Hidayat* explained that until now Indonesian simply categorized fisherman by gross tonnage of the vessels used and gill net used which is about 1,500-2,000 m in length. He also indicated the need to standardize the fishing gears used for effective stock assessment.

- *Malaysia*

18. The representative from Malaysia, *Mr. Samsudin bin Basir* presented the updated trend and status of Neritic Tunas in Malaysia (**Annex 8**) that had been increasing from 2005 to 2015. He informed the Meeting that there are three (3) major landing areas for neritic tunas in Malaysia, *i.e.* in the West Coast (Malacca Straits), East Coast (South China Sea), and East Malaysia (Sabah, Sarawak, Labuan). Comparing the neritic tuna species landings in different areas, East Malaysia showed declining trend for LOT, while KAW and frigate tuna (FRI) remained stable. In the West Coast, neritic tunas caught by species consisted of KAW (45%), LOT (49%), FRI (6%), while in the East Coast KAW accounted for 64%, LOT contributed 35%, and FRI the remaining 1%.

19. Regarding the catch of neritic tuna species using different fishing gear, *Mr. Samsudin* explained that purse seine dominated both the East Coast (91%) and West Coast (86%). Data on marine fisheries export and import in Malaysia showed that the quantity and value of both export and import is significantly increasing in 2013 and 2014. Specifically, tuna trade in Malaysia in 2014 reached RM 15.6 million (export) and RM 62.7 million (import). Tuna Export from Malaysia to other countries include prepared fish for Japan, Singapore, Hong Kong, Iran; frozen fish to Vietnam, USA, Thailand, Mauritius; fillet to Vietnam, USA, Singapore, Qatar; fresh to Philippines; and live fish to Mauritius, whereas Tuna Import in Malaysia from other countries include prepared fish from Thailand, Indonesia, China, Philippines; frozen from China, Japan, Taiwan, Vietnam; fillet from China, Vietnam, Indonesia, Japan; fresh from Japan, Indonesia, Maldives, Philippines; and live fish from Korea.

20. On the current statistical framework, *Mr. Samsudin* informed the Meeting that Malaysia has been conducting activities on Fisheries Management Information for Neritic Tunas (LOT, KAW, FRI), and fishing effort, *i.e.* number of vessels, number of trips, number of days at sea, number of fishing days, number of hauls, and number of hours. However, he also highlighted that leaking and encroachment (e.g. illegal landing of fish catch) and IUU fishing remain the main issues that should be addressed, while improving statistical data framework, improving staff and budget allocation, and integrating recording systems are the constraints that require actions to be taken. He also noted that compliance to the IOTC Conservation and Management Measures (CMMs) is also important.

21. During the discussion, it was clarified that leaking and encroachment happen when the fishermen land their catch illegally in other countries, although this is illegal in Malaysian laws. In order to address the issues on IUU fishing including leaking/encroachment and landing across borders, bilateral dialogues among neighboring countries should be promoted for better management of the fishing areas. *Mr. Samsudin* also added that starting 2016, Malaysia would embark on its observers' program onboard and planned to jointly conduct training for local observers with Thailand and the Philippines, and welcomed the participation of SEAFDEC in this program. Nevertheless, *Mr. Hidayat* explained that in some cases data collected from observation (data from observers) should be analyzed separately from the compiled statistical data, in which case training for data management and statistics validation is also important.

- *Myanmar*

22. The representative from Myanmar, *Dr. Htun Thein* presented the results of the marine ecosystem surveys in Myanmar **(Annex 9)** from 2013 to 2015, showing big drop of catch from both

demersal and pelagic species due to inadequate marine ecosystem services. As for the catch data on tunas in Myanmar, the species caught by gill net and purse seine include LOT and KAW. He mentioned that surveys had been conducted during pre-monsoon and post-monsoon seasons, in order to get the current status of the resources in Myanmar's waters and reduce the fishing pressure. He added that the implementation of national natural resources management for five years is on-going.

23. During the discussion, it was explained that the increasing jellyfish populations in Myanmar could be due to the increasing temperature, especially in the southern part of Myanmar. As for the percentage of neritic tuna landings in Myanmar, *Dr. Thein* explained that the country has no detailed data so far, as available past data might not be reliable and could not be used as baseline data. In this regard, the Meeting suggested that it would be necessary to improve the system of collecting statistical data in Myanmar which could be worked out through the conduct of surveys for the stock assessment of different species of tunas and other fish species.

- *Philippines*

24. The representative from the Philippines, *Ms. Grace V. Lopez,* presented the general information on marine fisheries in the Philippines and the updated status and trends of neritic tunas and seerfishes in the country **(Annex 10)**. She also mentioned the country's data collection initiatives and the responsible agencies for collecting data, such as the Bureau of Fisheries and Aquatic Resources (BFAR)which implements the National Stock Assessment Program (NSAP), a regular activity in the 16 political regions of the countrystarting1997 to the present and in 1 political region (CAR), which is exclusive only for freshwater assessment since 2012. Specifically, NSAP collects landed catch, effort, and length data as well as reproductive biology data. Likewise, BFAR also trains fisheries observers, under the Philippines' Observer Program, who will go on-board fishing vessels (purse seine and ringnet) especially during the FAD closure period and in all fishing operations in Celebes Sea, Sulu Sea, South China Sea and the Eastern Pacific Seaboard. Another is the West Pacific East Asia Oceanic Fisheries Management Project (WPEA-OFMP), which justincreased their port sampling coverage for tunas in 2010. The other government agencies that also collect fishery information based on their mandates are the Philippine Fisheries Development Authority (PFDA), Philippine Statistics Authority (PSA), and the National Statistics Office (NSO).

25. *Ms. Lopez* also presented the types of boats and gears in the Philippines and the status and trends of neritic tunas, which included KAW and LOT. She explained the relative abundance distribution in the country, the annual production by sector (commercial/municipal), the types of gears with corresponding size ranges of the catch, and the nominal CPUE. Information on the distribution and market of tunas in the country were also presented.

26. During the discussion, *Dr. Nishida* mentioned that he began collecting data last August 2015 and commended the Philippines for having one of the best data collection system, and a good example for the other countries. The Tuna Project Focal Person for the Philippines, *Mr. Noel Barut* cited that for the country's data gathering efforts, enumerators are employed in almost all major and minor coastal landing sites in the regions of the Philippines. However, *Dr. Nishida* added that for a country to follow the Philippine model, it would need a lot of budget for fisheries data compilation.

- *Thailand*

27. The representative from Thailand, *Mr. Chalit Sa Nga Ngam* presented the status and management of Neritic Tunas in Thailand **(Annex 11)** by providing brief information about the important role and development of fisheries in Thailand. He also explained the types of fishing gears used in tuna fishing, the fishing grounds, and tuna production (LOT and KAW) by comparing the fishing gears used in two main zones, *i.e.* the Gulf of Thailand and Andaman Sea. Currently, a national regulation for the management of neritic tuna species in Thailand does not exist, however,

the Ministry of Agriculture and Cooperatives (MOAC) Thailand has conducted some measures to protect the country's fishery resources including neritic tunas.

28. With regard to the Marine Fisheries Management Plan (FMP) of Thailand which has been implemented since October 2015, *Mr. Chalit* mentioned that the FMP has enhanced the management of tuna stocks through improved data collection system from the *e-logbook* and *e-licensing* along with technical studies conducted on neritic tunas. He also explained that collecting data on marine species is very challenging in Thailand, but since the working group for neritic tuna management has already been approved, this working group could facilitate the conduct of LOT and KAW stock assessment. He informed the Meeting that DoF Thailand has already submitted the long-term data of LOT and KAW to SEAFDEC to be compiled in the database.

29. As for the sharp decrease of tuna catch production in Thailand, *Mr. Chalit* explained that in the past, catch data of Thailand was collected from the catch production of Thai vessels (including Thai fishing vessels landing at foreign fishing ports). Since 2008, the country's fisheries catch data only include catch data from Thai waters. However, it was also suggested that the only the data from fish caught in Thai waters for the period 2003-2013 should be used to avoid misleading information on the status of tuna stocks in Thailand and regional areas. He also added that the role of the SWG-Neritic Tunas could include providing solutions to problems and determining the status of neritic tuna stocks in the region.

30. On the use of the fishing ports in Thailand that implement the Port State Measures (PSM) for neritic tunas data collection, *Mr. Chalit* explained that the catch quotas of LOT would be implemented in 2018. In the meantime therefore,data collection would depend on the on-going measures on status of tuna stocks as well as on available information on regional stocks of tuna. Moreover, results from the many forums that discussed improvement of the effectiveness of fisheries management (including combating IUU fishing) could be referred to in developing the measures that avert illegal trading of neritic tunas and other species. Output of the SWG-Neritic Tunas on stock assessment could also be used to establish the quota system based on the results of the regional analysis. In addition, it was also suggested that catch documents provided by port inspectors and adequate capacity for port inspection are important to concerns that need to be addressed to strengthen data collection.

31. During the discussion, *Dr. Nishida* suggested that since the quota system of one country could affect another country, the quota system of any country should therefore consider the regional stock assessment and MSY level. From the results of the stock assessment, SEAFDEC could recommend quotas for the ASEAN Member States (AMSs)for which the countries could decide on the catch quota based on such recommendations. In case overfishing occurs, SEAFDEC could facilitate the development of a mechanism for AMSs to discuss and cooperate in addressing this concern. Moreover, the conduct of a regional stock assessment would be necessary as the result could be used as reference points for SEAFDEC to develop the guidelines for the catch quota scheme.

32. Regarding the establishment of closed season in coastal areas in Gulf of Thailand and Andaman Sea, *Mr. Chalit* explained that closed season was defined by using the data from abundant period of juveniles of a fish species. During such time, only some fishing vessels are allowed to catch the commercial fish species, except the small-scale vessels. Although management of neritic tunas has not yet ben promoted in Thailand, measures have been established to protect the general fishery resources of the country.

33. While lessons could be learned from the experience of the Philippines in managing the fishery resources, the Meeting suggested that a mechanism should be established through a working group or permanent body in management, to provide technical advice to SEAFDEC for the long term. Moreover, the establishment of an alternative body to share information in the region (technical body for policy advice) or a working group could be proposed for development into an ASEAN working group in the future.

- *Viet Nam*

34. The representative from Viet Nam, *Mr. Vu Viet Ha* presented the tuna status of Viet Nam including information on fishing zones and fishing gears, as well as the production of main species of tunas in Viet Nam collected through surveys and sampling activities by species and gears **(Annex 12)**. Through the results of the survey, the overall status and trend of tunas in Viet Nam focusing on KAW and LOT could be established including the fishing ground for the neritic tunas, catch production and areas for catching tunas. However, some difficulties were encountered in Viet Nam, especially the lack of annual data for stock assessment.

35. In the discussion, *Dr. Nishida* suggested that Viet Nam should consider estimating the tuna production by species and establish the total catch, and that catch data collection should be continued focusing on the catch effort by species. Sincethe country's uncertain catch production data on tuna could affect the regional stock assessment in the future, improvement of the data collection systems would be necessary not only for Viet Nam but also for Cambodia, and Myanmar. *Mr. Ha* also clarified that the possible cause of the sharp increase of neritic tunas production in Viet Nam could be due to the shortened period of the survey from two (2) times per year to only once per year due to limited budget. Nevertheless, since the surveys were conducted at different times, the resulting data may not be appropriate for stock assessment.

b) SEAFDEC Meeting sand Results from Capacity Building on Stock Assessment

36. The Policy and Program Coordinator of SEAFDEC, *Dr. Somboon Siriraksophon* presented the brief timeline of the Scientific Working Group on Neritic Tunas starting from the 2014 Workshop on Neritic Tuna Fisheries until the Training on Stock Assessment in 2016 **(Annex 13)**. The capacity building activities funded through the SEAFDEC-Sweden Project included two basic training courses and an advance training course on stock assessment which focused on CPUE Standardization. Through the process, SEAFDEC developed the software on "CPUE (Catch-Per-Unit Effort) Standardization by GLM (Generlized Linear Model) to support the Stock Assessment. This software is updated time to time and uploaded to the SEAFDEC Neritic Tuna Website where all AMSs can download and use it for their research work. He also mentioned that based on the recommendation of the 18thFCG/ASSP, any scientific result should be submitted to the NC for consideration before address to the SEAFDEC Council for final decision. He also repleted the main functions of MFRDMD and SEC as a Secretariat of the Scientific Working Group meeting for the long term management of neritic tunas in the region.

IV. Reviews on Biology and Ecology of Neritic Tunas: Longtail tuna and Kawakawa

37. The Deputy Chief of SEAFDEC/MFRDMD, *Dr. Osamu Abe* presented the "Biology and Ecology of Longtail Tuna, *Thunnus tonggol* (Bleeker, 1851)" **(Annex 14)** by describing the diagnostic features of the longtail tuna (LOT). He highlighted on the two (2) key features for LOT identification, namely; i) the number of gill rakers, and ii) morphology of its liver. He also pointed out its geographical distribution before delving into the length-weight relationship. He stressed that age estimation is essential for stock assessment as age-length relationship is being used as the starting point of stock assessment. However, he also cautioned that it might be difficult to estimate age-length relationship by length frequency due to selectivity of the fishing gears and frequency of sample collection. He also explained the length-at-first-maturity for LOT in Southeast Asian waters and their spawning seasons and areas. As for its life history, he admitted that little is known about the larvae, migratory patterns and the sub-populations. He described LOT as opportunistic feeders and their main choice of prey are the pelagic fishes. He also cited that during non-spawning season, LOT tends to feed less.

38. The subsequent presentation of *Dr. Abe* on the "Biology and Ecology of Kawakawa, *Euthynnus affinis* (Cantor, 1849)" highlighted on the diagnostic features of kawakawa (KAW) such as its color, length and gill rakers, and then the geographical distribution of KAW which is far wider than LOT. He also explained the length-weight relationship and age-length relationship of KAW and mentioned that KAW could reach maturity from age one (1). KAW is also known to spawn frequently during the spawning season and just like the LOT, it is an opportunistic feeder. He stated that the diet composition of KAW is wide range, depending on the seasonal change with bigger fish consuming bigger prey. He then asked the AMSs to provide local information of neritic tunas in the form of reports or documents. During the discussion, the Meeting commended *Dr. Abe* for his presentation which could assist researchers from the AMSs in increasing their understanding of the biology and ecology of neritic tunas, and in searching for local information on neritic tunas in their respective countries.

V. Results on Stock Assessment for Longtail Tuna in Southeast Asian Waters and Proposed Management Measures

39. Results of the Stock Assessment for Longtail Tuna in the Southeast Asian Waters and Proposed Management Measures **(Annex 15)** were reported by the Resource Person *Dr. Tsutomu Nishida*. However, he explained that such draft document on Stock Assessment of Longtail Tuna in the Southeast Asian Waters has not yet been officially published by the SEAFDEC, and hence could not be used for citations. He continued by expressing his acknowledgments and gratitude to the experts and agencies in the implementation of training/workshop funded by the SEAFDEC-Sweden Project, which had so far trained eight core participants from Kasetsart University, Indonesia, Malaysia, Philippines, Brunei Darussalam, SEAFDEC/MFRDMD, and Thailand who could lead the Training of Trainers (ToT) for stock assessment in the future.

40. For the stock assessment of longtail tuna, *i.e.* the Pacific Ocean and Indian Ocean stocks, *Dr. Nishida* commended the countries for providing the historical nominal catch, and other relevant country data prepared as scientific catch data set based on the published catch data from the Indian Ocean Tuna Commission (IOTC), FAO, and SEAFDEC. From such data, the Catch Per Unit Effort (CPUE) continuous data for more than 10 years was used for the CPUE standardization software. He also suggested that it is imperative for the SWG-Neritic Tunas to understand the 'R' functions for fisheries stock assessment which are included in CPUE software and Kobe Plot.

41. Based on the data provided by the four (4) countries' data coordinators for assessment of LOT and KAW in Southeast Asian Waters mainly in the Indian Ocean, the trend of LOT nominal catch was increasing from 1970 to 2014. Nevertheless, *Dr. Nishida* found a negative correlation between catch and CPUE. The Scenario of A Stock-Production Model Incorporating Covariates (ASPIC) in the Andaman Sea, which included the data of global catch by country, CPUE by country, gear and area, using the Kobe Plot software, showed that the parameters with K=200,000 produced the most plausible results by considering the value of the correlation coefficient r, regression coefficient r^2, maximum sustainable yield (MSY), and total biomass (TB). He explained that for LOT in the Andaman Sea, TB/TBmsy was directly correlated with (fishing pressure/fishing catch) F/Fmsy.

42. For the results of LOT stock assessment in the Pacific Ocean using data from four (4) countries, *Dr. Nishida* cited that there is a negative correlation between catch and CPUE. The good Scenario of ASPIC in the Gulf of Thailand using the Kobe Plot software showed that the parameters with K=500,000 produced the most plausible results based on many things especially the r value = 1.07. Using the Kobe Plot software, the stock status was in the safe zone in 2013 since TB/TBmsy = 2.22 and F/Fmsy = 0.18.

43. In summary, *Dr. Nishida* explained that F/Fmsy and TB/TBmsy of LOT decreased in the Indian Ocean due to the percentage of overfishing which was 78 in 2014 but the LOT was safe in the Pacific Ocean by 2013. He also explained that some CPUE data provided by the countries include

zero catch which could be more than 30%, and therefore suggested that in such situation other suitable models could be used, including the negative binomial model, zero inflated model, GAM and etc., in order to prevent having strange digital qq plot. He confirmed his findings about the negative correlation between catch and CPUE by comparing with the IOTC results in 2015 and 2016. He therefore recommended that the unsafe stock status should be managed by voluntary reduction of catch and effort, although a serious stock status condition is required for the ASEAN, IOTC and others, to adopt mandatory reduction of catch and effort.

44. Regarding the results of the stock assessment of LOT in the Andaman Sea and Gulf of Thailand, the representative from Thailand suggested that other countries bordering these waters, like Malaysia and Indonesia should also provide their respective countries' data to be used to update the CPUE data (calculation of MSY) within two or three years. This is considering that the CPUE data from 1995 to 2013 in Andaman Sea and Gulf of Thailand used in the aforementioned stock assessment were for Thailand only, and therefore does not complete the stock status in the said waters.

45. In the case of the Philippine CPUE data, *Dr. Nishida* explained that the since data had lots of up and down bumps due to zero catch, it could not be used for the CPUE standardization software. He then suggested that other models could be used to improve the data and statistical treatment using less than ten (10) years of CPUE data. The composition of zero catch that reaches more than 30% makes the CPUE trend not smooth, therefore a much more careful checking of the CPUE data is necessary before it could be used for stock assessment.

46. While noting that results of stock assessment of LOT and KAW in the Pacific Ocean was safe in 2013 due to the association characteristics of these species, the representative from MFRDMD was concerned that this could affect the management measure, since one of the species was unsafe in the Pacific Ocean stock assessment. In this connection, *Dr. Nishida* explained that similar situation happened in IOTC and other areas of tuna management organizations, and suggested that adjustment of the management of stock should be made for the bad situation by reducing the operations of large fishing vessels and catch.

47. Moreover, the representative from Malaysia also suggested that the quality of data should be improved, especially for the catch effort data by focusing on daily record but not on the complicated number of fishing vessels. Furthermore, since LOT in the Indian Ocean had already been overfished (in the red zone) in 2014 as well as in the West Coast of Malaysia that showed a declining trend from 2012 to 2015, it was suggested that enough good data from Indonesia could also be used to improve the stock assessment in the Indian Ocean. In this regard, *Dr. Nishida* explained that although results of the stock assessment had some constraints, the SWG-Neritic Tunas could make full use of the recommendations to modify their efforts in stock assessment and prepare articles worth submitting to international journals. Nevertheless, *Dr. Nishida* explained that the best CPUE data for the stock assessment could be compared with the catch data stock reduction analysis which has many constraints. He also added that CPUE data could be applied for some relative situations, especially when CPUE data are lacking in some developing countries.

48. The representative from Indonesia also suggested that CPUE data from other concerned countries should be used not only from Thailand, especially using Indonesia's country data. In response, *Dr. Nishida* explained that in some cases, there was chance to compare with other countries data due to the limitation of data at that time, and recommended that AMSs should agree to use Indonesia's data. The representative from Malaysia therefore proposed to use the CPUE data from Indonesia and Malaysia for the following year's stock assessment project, and indicated that since the result was in the safe zone, it could support the SWG-Neritic Tunas in developing scientific arguments. However, there could be difficulties in using these two (2) countries' data for the subsequent year stock assessment project, since the CPUE data showed less than 10 years trend only although such data could be included in the next three-year framework.

49. The representative from Thailand stated that the ten (10) years data of Thailand collected by the country's statistics and research unit also supported the IOTC for their stock assessment this year, and requested that the ten year data provided by Thailand should be considered for CPUE standardization. In addition, she also cited that Thailand has 94 fishing vessels that catch only tunas and has already started to provide the fishing days for these vessels as a solution to overfishing in accordance with Thailand Fishery Law. As the ten-year data is reliable for the CPUE standardization, *Dr. Nishida* mentioned that the annual data from 1995 to 2013 in the Gulf of Thailand and Andaman Sea, the 2005-2011 monthly data in Andaman Sea and 2011-2015 additional monthly data would be useful to improve the analysis of the stocks. Currently, he already finished the five years CPUE data analysis, which means that it is accepted to use five years CPUE data. This could support the efforts of the Philippines, Malaysia, and Indonesia as well. He also highlighted on some difficulties in making quota system for each species related to the proportion of reduction.

50. As for the concern of Malaysia on neritic tunas fishing by purse seine, *Dr. Nishida* explained that good CPUE data could also be collected from the buyers of target species. Therefore, considering the location, reducing the catch by at least 10% should be considered by the AMSs and that voluntary guidelines should be established in order to promote such effort.

51. In conclusion, it was agreed that the AMSs should also work together for the adoption of countries' suggestions under the RPOA-Neritic Tunas and its modification in the near future.

VI. Results on Stock Assessment for Kawakawa in Southeast Asian Waters and Proposed Management Measures

52. Results of the Stock Assessment of Kawakawa (KAW) in the Southeast Asia Waters (**Annex 16)** were also reported by *Dr. Tsutomu Nishida*. Firstly, he presented and discussed the results of the stock assessment training session conducted by SEAFDEC/MFRDMD and the two stock hypotheses in the Pacific and Indian Oceans. He also explained the reason for choosing the CPUE of Thailand for the standardization. He added that even if Thailand and the Philippines developed their own CPUE, there is also the possibility that the Philippine CPUE could be used in the future. Then, he introduced the result of the stock assessment and data processing using three softwares (CPUE, Kobe Plot and ASPIC batch Job) and excel, and explained how to use the result for estimating stock of KAW in the Pacific Ocean and Indian Ocean. He also suggested that Viet Nam, Cambodia, and Myanmar should cooperate in undertaking stock assessment of KAW.

53. As for the stock status and management measures, *Dr. Nishida* discussed the summary of the results of the four stock assessments and the caveats in the stock assessment results which were considered as positive and realistic. He also suggested that SEAFDEC could advice the AMSs on the current stock status and call for voluntarily reduction of catch. For the serious case, other mechanisms like the ASEAN and IOTC should have stronger actions to assure the continuous supply of tunas. Finally, he also mentioned that additional works need to be done in the future for better stock assessment of tunas.

54. During the discussion, *Dr. Nishida* responded to the query of the representative from Thailand that the source of the CPUE data of the Indian Ocean is based on inputs from DOF Thailand from 1995 to 2013 collected from the Andaman Sea and Gulf of Thailand.

55. Responding to the query of the representative from Malaysia on the consequences if one species will fall under the unsafe zone, *Dr. Nishida* reiterated that KAW production in Malaysian waters is declining due to overfishing, and this concern was already discussed with IOTC on how to manage this species. Since this is a common problem, it could be addressed through the development of management measure such as requesting fishers to reduce the number of fishing vessels, among others.

56. On the request of the representative from the Philippines for possible several scenarios and the recommended measures to address such scenarios, *Dr. Nishida* explained that this would be the next step under the risk assessment activity, and that conducting stock assessment for 10 years continuously would result in good data for the risk assessment. He added that calculating one country's CPUE would be better for stock assessment.

57. The representative from Thailand shared the information that Thailand has provided data to IOTC for 10 years for the neritic tunas, and that the 3-year timeline for Thailand might be too short because Thailand plans to have quota system of neritic tunas in 2018. *Dr. Nishida* mentioned that since quota system should not be promoted by individual countries only, the regional analysis would be useful especially in the case of shared stocks and not single stock in the countries. He also added that every country should seriously consider to come up with good management measures.

VII. Review of Information on Other Neritic Tuna Species

a) FrigateTuna

58. A review of the frigate tuna species (**Annex 17**) was presented by *Mr. Raja Bidin Hasan* of SEAFDEC/MFRDMD. Frigate tuna *Auxis thazard* can be found in the Indian Ocean and Pacific Ocean. Based on IOTC data, production of frigate tuna (FRI) had been increasing from 2002 to 2014 (nearly 100,000 metrictons) by purse seine and gillnet. However, the major fishing gears for neritic tunasin Malaysia are purse seine and trolling, and majority of the catchcomprises *Thunnus tonggol* (about 56%) and *Auxis thazard* (about 4%). These neritic tuna species are epipelagic and have different spawning seasons,compared with the othertuna species in the Indian Ocean and Pacific Ocean.

59. On the FRI stock, *Mr. Raja Bidin* explained that currently quantitative data is lacking, so that BMSY and FMSY are important information that could be used for reference. He added that there are sub-stock of this species in Africa, Oman, Indonesia, and Thailand. He also highlighted that the pattern of FRI migration is not clear andthese species could be found mixed with *Auxis rochei*, KAW, and skipjack tuna in the schooling.

b) Seerfish

60. A review of information on species of seerfish species (**Annex 18**) was presented by *Dr. Somboon Siriraksophon* of SEAFDEC Secretariat. He explained thatbased on reports of FAO, SEAFDEC, and the countries, the main species of seerfishes found in the Indian Ocean and Pacific Ocean include *Scomberomorus commerson* and *Scomberomorus guttatus*. However, there are no available data from Cambodia and Viet Nam on these species. Statistical reports indicate that production of both species had been increasing from 1980 to 2014 (200,000-250,000 metrictons) by area and country. He also suggested that if stock assessment would be conducted for these species by 2017, it would be necessary to review the biology and ecology of such species.

61. During the discussion, the representative from Thailand suggested that it is necessary to correctly identify frigate tuna (*Auxis thazard*) and bullet tuna (*Auxis rochei*), since these two (2) species have quite similar characteristics, in fact based on experience, Thailand also finds some difficulties in identifying them. The representative from the Philippines also cited that previously production of both species of *Scomberomorus* had been combined in the Philippine statistics, but now the information had been correctly separated.

62. The representative from Indonesia informed the Meeting that in Sarawak and South China Sea, LOT and KAW are mixed, with the deep sea LOT and KAW mixed with *Auxis* sp. and bullet tuna, while in the Indian Ocean, LOT and KAW are mixed with other small size of seerfishes. In this regard, it is necessary to confirm the species classification through genetic DNA analysis for each species and Indonesia will start its genetic study for stock assessment soon. The representative from

Myanmar also mentioned that its species identification book would be published by the end of this year in Myanmar, since they already sent the genetic samples of all fishes including neritic tuna species to Tanzania, Japan and China for confirmation.

63. While noting that each country has different areas or species composition, *Dr. Nishida* agreed with the idea to separately identify the species of KAW and LOT and suggested that in the future, tuna fishing should separately report their tuna catch by species. He added that in the last two years, IOTC conducted the Training on Species Identification for local level to improve the skills of identifying tuna species. He therefore recommended that the SEAFDEC-Sweden Project could consider supporting the budget for this kind of training for the AMSs. However, it is still necessary for the countries to improve their knowledge on the different tuna species and collect as much data as possible.

64. The representative from the Philippines informed the Meeting that FAO conducted the training for identifying small tunas and published a book in 1992, following the confirmation of smaller tuna species through genetic analysis. The representative from Malaysia also mentioned that it could be challenging to collect and formulate data for seerfishes since these are caught by traditional fishermen. The representative from Indonesia expressed the concern on collecting statistical data for stock assessment of these species because of the number of islands and landing sites in the country for small-scale fisheries. In anyway, it is still necessary to start improving the systems of collecting data on these species for better stock assessment in the future.

65. The representative from Viet Nam informed the Meeting that for the *Scomberomorus* sp., the adult could reach 35 cm, has two (2) spawning seasons, and caught by purse seine and gillnet. The representative from Myanmar added that *Scomberomorus* sp. is also found in his country but the fishermen bring their catch to the fish carrier vessel at sea, instead of landing their catch in the fishing ports. However, the Government of Myanmar has already provided logbook for fishermen, but the system of data recording is still not working well. He added that the DoF of Myanmar currently established an arrangement with its Marine Science University for Stock Assessment Study and Data Collection.

66. The representative from the Philippines informed the Meeting that data for these species had already been separately recorded and the National Statistics Office has the data for three (3) neritic tuna species. The representative from Indonesia also informed the Meeting that they collect data from gill net fishers to study the landing site and spawning area, and also to study the biology and behavior of the neritic tuna species for stock assessment.

67. After the discussion, the proposed work plan for the next five (5) years was developed based on the aforementionedrecommendations, including identification and stock assessment activities for frigate tuna and seerfishes in 2017-2018. Under the work plan, it was suggested that *Mr. Supapong* from SEAFDEC/TD could serve as the core person for SEAFDEC, while *Dr. Nishida* committed to serve as voluntary supervisor to enhance and encourage the SWG in sustaining the activities, *e.g.* using CPUE, Kobe plot, ASPIC in the future.

VIII. Review/Progress of the Genetic Study and Improve Data Collection, Details of Budget and Work Plan in 2016 – 2017

68. The representative from SEAFDEC/MFRDMD, *Ms. Wahidah Mohd Arshaad* presented the proposed "Population Study of *Thunnus tonggol* (Bleeker, 1851) in the Southeast Asian Region" (**Annex 19**). She rationalized the usage of D-loop of MtDNA instead of Cytochrome b based on two (2) publications by Willete *et al*. (2016) and Kunal *et al*. (2014). She mentioned that twenty three (23) sampling sites had been identified across the Southeast Asian region and while additional sampling sites are added in Myanmar, some changes were made to the sampling sites in Indonesia and Malaysia, and reduced in some countries, such as in Viet Nam. She also suggested that the study would commence on October 2016 and run until September 2017. She informed to the Meeting that

AMSs should collect the samples of LOT and KAW but she will only conduct the genetic analysis for LOT. She commented that based on her experiences, it is difficult to obtain samples from Indonesia and Philippines, and suggested that both countries could conduct if possible, the genetic analysis on their own. She added that while it is possible for MFRDMD to assist Indonesia and Philippines, she expressed her concern about the availability of samples and the possibility of sharing data with Indonesia. She also explained the expected outputs from this study.

69. During the discussion, the representative from Myanmar suggested that the sampling site in Myanmar should be changed, from Thandwe to Gwa since LOT is more abundant in Gwa. *Dr. Somboon* cautioned that the sampling sites should be selected wisely and based on previous studies to ensure future success. He also urged the countries to think of this study as a region-wise analysis and he proposed to divide the sampling sites into two (2) stock assessment areas, namely: Indian Ocean and the Pacific Ocean.

70. In responding to the query of the Chief of MFRDMD, *Mr. Ahmad Adnan Nuruddin* on how the sampling sites were selected, *Ms. Wahidah* explained that the sampling sites had been decided during the 2nd Meeting of the SWG on Neritic Tuna Stock Assessment in 2015. *Dr. Abe* also added that the sampling sites were selected based on two (2) stock assessment areas, the Indian Ocean and the Pacific Ocean. He explained that the Indian Ocean is represented by fishing grounds in Myanmar, Indonesia, and Malaysia while for Pacific Ocean is represented by the fishing grounds in South China Sea, Sulu Sea, and Sulawesi Sea.

71. On the difficulty in obtaining genetic samples from Indonesia, *Mr. Hidayat* agreed that it is difficult to transport genetic samples from Indonesia without the agreement and proper paperwork from relevant authorities, and suggested that Indonesia will conduct the PCR analysis and submit the results to MFRDMD for the DNA sequencing process. For the samples from the Philippines, *Mr. Barut* assured that this time, the Philippines would able to send the genetic samples to MFRDMD. He mentioned that there are sixteen (16) landing sites for LOT and KAW in Philippines and it would take some time to apply for the necessary permits as the Philippines is in the midst of amending its laws. However, it is also possible for the Philippines to conduct the PCR analysis and submit the results to MFRDMD for the DNA sequencing process.

72. With regard to the selection of sampling sites for the population study of LOT and KAW, *Dr. Somboon* pointed out that the sampling sites in Trat and Sihanoukville are situated too close to each other and there is possibility that fish landings in both sites could be more or less the same. While admitting that currently there is no documentation on specific species landings in Cambodia, *Mr. Serywath* also mentioned that there is lack of information on neritic tunas in the country and and expressed keen interest on capacity building. In this regard, *Dr. Somboon* proposed that more capacity building workshops could be conducted in Cambodia, Myanmar, and Viet Nam.

73. While cautioningthe Meeting to be less rigid on selecting the sampling sites, *Mr. Adnan* also suggested that the countries should focus on the number of samples instead of sampling sites, for example, he pointed out that both sampling sites of Trat and Sihanoukville could contribute twenty five (25) samples each. If there is no LOT or KAW landing on the designated sites, samples could be obtained from nearby ports.

74. The representative from Thailand agreed that Songkhla should be added as one of the sampling sites in the southern region of Thailand. The representative from Malaysia also suggested that Kuantan, Kuala Perlis, Sandakan and Tawau could be added in the list. The representative from Brunei Darussalam agreed that Muara should be selected as LOT is landed in this port, especially in October, November and December as the peak seasons.

75. For the Philippines, *Mr. Barut* suggested that Masinloc, Puerto Princessa, General Santos City, and Albay could be added. He informed that it will take one (1) or two (2) months to collect fifty (50) samples of LOT compared to KAW. *Dr. Abe* mentioned that if possible, samples should

come from the same school of the respective sampling sites. For Indonesia, *Mr. Thomas* suggested Ambon, Cilacap, Pekalongan, Banda Aceh and Sibolga as the sampling sites. For Myanmar, *Dr. Thein* suggested that Gwa for LOT and KAW, and Yangon for KAW. For Viet Nam, *Mr. Pham* suggested Vung Tau for LOT, Da Nang and Nghe Ann for KAW.

76. After the discussion, the AMSs agreed to sample and conduct the PCR analysis on their own and submit the results to MFRDMD except Cambodia. While MFRDMD agreed to assist Cambodia in this aspect, the AMSs were reminded to collect fifty (50) samples per sampling sites.

IX. Other Matters

a) Neritic Tunas Database and Website

77. The Information Technology Officer and Webmaster of SEAFDEC/TD, *Ms. Namfon Imsamrarn* presented the Neritic Tunas Database and Website, and that the web page address is www.seafdec.or.th/neritic-tunas. In each tab, website user could access to such data as the country profile (from eight (8) countries, *i.e.*Brunei Darussalam, Cambodia, Indonesia, Malaysia, Myanmar, Philippines, Thailand, Viet Nam). Furthermore, website users could also find RPOA-Neritic Tunas and so on. Before uploading recommendations on policy or technical aspects on the RPOA-Neritic Tunas, approval from the high level of ASEAN meeting should be sought or approval from the concerned institutions first before any information is put on the website. For the database on the Neritic Tunas, this has not yet been developed in the website.

b) Role of the Scientific Working Group

78. The role of SWG-Tuna was reiterated by *Dr. Somboon*as clearly stipulated in the TOR of SWG-Tuna which had been endorsed by the SEAFDEC Council Meeting and high level meetings of the ASEAN. The TOR can be accessed via http://www.seafdec.or.th/neritic-tunas/index.php/about-project/tor). However, it is still possible to change anything on the TOR/role of SWG-Tuna, so any comments on the role of SWG could be considered. He also reminded the SWG that although the funding support from SEAFDEC-Sweden Project will end in 2017, each country would still have to participate in the next SWG meetings by providing funds to ensure the sustainability of the work on tunas. In this connection, *Mr. Samsudin* raised the issue on the possible unavailability of funds for the SWG of each country, and suggested that SEAFDEC could consider sponsoring one participant from each country to ensure the full participation of all SEAFDEC Member Countries. However, SEAFDEC might not be able to support the funding for the next phase since the approved TOR stressed the strong indication that each country has the ability to sponsor using its own budget.

79. In responding to the issues raised, SEADEC Senior Advisor *Dr. Magnus Torell* informed the Meeting that it is necessary to consider the importance of working in the direction that has been set by countries and should not be thought of in a project basis. *Dr. Nishida* also stressed on the importance of the continuity of SWG-Tuna for the stock assessment activities and management of the resources. *Dr. Samboon* also reiterated that although SEAFDEC could not sponsor the SWG after project is finished, SEAFDEC could still support the capacity building requirements for the countries by trying to seek funding from other donors.

c) Next Scientific Working Group-Neritic Tunas Meeting

80. As proposed by the representative from the Philippines, the Meeting agreed that the Fourth SWG-Neritic Tunas Meeting would be convened in June 2017 in the Philippines.

d) Others

81. The Meeting mentioned that results of the Neritic Tuna Stock Assessment by the SWG-Tuna would be very useful in the AMSs. Therefore, it was proposed that to consider promoting sustainable fisheries management in the region cooperation with the ASEAN Tuna Working Group should be strengthened.

X. Work Plan for Research, Capacity Building, and Priorities for 2017 and Onwards

82. The proposed Work Plan for Research, Capacity Building and Priorities for 2017 onwards was presented by *Dr. Taweekiet*. Specifically, stock assessment for KAW and LOT will commence by the end of July this year and risk assessment of KAW and LOT will follow by the end of September. Review and conduct of Stock Assessment of Seerfishes, the technical workshop on Seerfish data and others will be done by core experts, but *Dr.Somboon* added that inputs from AMSs would be necessary. Since the Review Workshop for Seerfishes will be conducted this year, SWG members are invited to provide input data on seerfishes. The representative from Malaysia suggested that what is needed in this case is the database. Seerfishes must be included in the same workshop of KAW and LOT, and data would be needed for the three (3) species, however *Dr. Somboon* said that it is too early to do stock assessment, the information on KAW and LOT should be discussed first this year.

83. Furthermore, it was also proposed that Workshops on Stock Assessment, Genetic Study for KAW and LOT would be organized to review and update information of frigate tuna data by the AMSs for future stock assessment. The timeframe of work plan for research should take into consideration the fact that it takes few months for the stock assessment and risk assessment of KAW and LOT, which also need different coordinators for data collection. As the AMSs agreed to provide the data either from surveys and catch data, bullet and frigate tuna should be included in the data collection. *Dr. Somboon* added that for the genetic study, species and season of collecting should also be included.

84. For the capacity building requirements and priorities, Training on Stock Assessment of Seerfish will be conducted in April 2017, also included in the work plan is human resources development on data collection at landing sites and application of catch documentation for neritic tunas in the AMSs. On-site training on species identification and data collection of neritic tunas would also be organized, date and place of which would be indicated later.

85. It was also suggested that catch document should be used for collecting dataespecially for Cambodia, Viet Nam and Myanmar. In this regard, the representative from Cambodia suggested that SEAFDEC should consider conducting on-site/capability training in Cambodia while sharing of data through the SWG should be sustained.

86. For the 4th SWG Neritic Tunas Meeting, it was suggested that this could be held in June-July 2017. The list of contact persons/scientific working group/core persons for data analysis would be updated periodically. Also, information of frigate tuna and bullet tuna and request data for seerfishes from countries should also be updated as these would be discussed in the Meeting. The plan and schedule for stock assessment of LOT and KAW in the region would also be deliberated on during the 4th Meeting.

87. After the discussion, the Meeting adopted the Work Plan for Research, Capacity Building and Priorities for 2017 onwards as shown in **Annex 20.**

XI. Policy Recommendations

88. The draft policy recommendations based on the outputs of the Meeting was presented by *Dr. Worawit Wachana* of the SEAFDEC Secretariat comprise three (3) parts, namely:(1) ASEAN Policy Endorsement;(2) Improvement of Fisheries Management for Neritic Tuna Resources in Southeast

Asia; and (3) Improvement of Fishery Information/Data to Understand Stocks Status of Neritic Tunas Resources in Southeast Asia.

In responding to the representative from Thailand on whether the RPOA-Neritic Tunas is considered part of Fisheries Improvement Project (FIP) since Thailand is now conducting (FIP), *Dr. Somboon* explained that FIP was developed under the USAID Maximizing Agricultural Revenue through Knowledge, Enterprise Development and Trade Project: A project funded by the U.S. Agency for International Development, and is part of Feed the Future, the U.S. Government's Global Hunger and Food Security Initiative. In 2013, the MARKET project formed the ASEAN Public-Private Taskforce for Sustainable Fisheries and Aquaculture (Taskforce) to identify and implement collaborative regional solutions to ensure the sustainable growth of the seafood industry in the region. The Taskforce identified the expansion of Fishery Improvement Projects (FIPs) as a key regional priority to address environmental sustainability, economic viability and market access issues for fisheries. FIPs are being recognized by international buyers as a positive tool for achieving improved fishery practices. With the formation of the ASEAN Economic Community in 2015, there is an opportunity for Asian fishery organizations such as SEAFDEC to define a regional FIP protocol that reflects the realities facing fisheries in the region, while simultaneously addressing and meeting key environmental concerns identified by environment non-governmental organizations, with a credible, transparent "third party" verification mechanism. Therefore, the DoF Thailand could also promote and share the resultsof Regional Stock Assessment on Neritic tunas to the FIP Protocol forum for the consideration and come up with more effective management of regional fish stock.

89. During the discussion, the Meeting agreed that Item (1): ASEAN Policy Endorsement should be changed to "Further promote and strengthen the ASEAN RPOA-Neritic Tunas" considering that the the AMSs have unanimously agreed to adopt the RPOA-Neritic Tunas. Item (2): Improvement of Fisheries Management for Neritic Tuna Resources in Southeast Asia should also include the development of regional-based management measures for neritic tunas. It was also reiterated that the establishment of the SWG Neritic Tuna in Southeast Asia focuses on the stock assessment and development of management measures for the sustainable utilization of neritic tunas. In order that the management measures for neritic tunas in the Southeast Asian region could be promoted, the AMSs should make full use of the results of the regional stock assessment. Meanwhile, the AMSs should strengthen the management measures for neritic tuna within their respective national jurisdictions.

90. On the Feasibility Study for Stock Assessment of Other Tunas, *i.e.*the frigate tuna, bullet tuna and seerfishes (*Scomberomorus guttatus* and *S. commorson*) which would be carried out during the next phase of the project for a three-year period, it was reiterated that data collection and submission should be improved. In this regard, the AMSs were encouraged to incorporate data collection into their national fisheries policies and develop mechanism for improved data collection of neritic tunas.

91. In like manner, the AMSs were also asked to also consider conducting national stock assessment based ontheir national policies and share the results with the SWG during its meetings. Considering that some countries in the region might have some difficulties in conducting stock assessment as this is not elaborated in their national policies, the Meeting suggested that the Policy Recommendations should also indicate the need for the countries to incorporate neritic tunas in their respective national fishery policies.

92. In response to the query of the representative from Indonesia about the application of the ASEAN Catch Documentation Scheme for improvement of data collection for the conduct of stock/risk assessment for target neritic tunas, *Dr. Somboon*clarified that this has reference to the RPOA-Neritic Tunas especially on the management of neritic tunas.*Mr. Barut* also suggested that the other countries could learn from the experience of the Philippines on data collection by national agencies that led to improved data. In this connection, the representative from Cambodia stressed that his country would need capacity building on this aspect.

93. For the Improvement of fishery information/data to understand stock status of neritic tunas resources in Southeast Asia, the AMSs were encouraged to compile and standardize information on CPUE for all fishing gears (purse seine, gillnet, trawl, etc.). As for the development of a common method for collecting data, because each country has different methods in data collecting, the Meeting agreed that the AMSs should compile information on CPUE for all fishing gears and make a separate set of data for CPUE standardization which also needs to be improved to make the information comparable.

94. The representative from Malaysia suggested that the inclusion of two species, LOT and KAW in the genetic studies would improve understanding of neritic tunas stock structure for management. *Mr. Barut* also suggested thatfor the participating countries' inputs into the SEAFDEC neritic tuna database/website, improved national data should be submitted in order that these would be useful for the project. Moreover, the Meeting also suggested that the SEAFDEC neritic tuna database should be linked with the web site of SEAFDEC, and that the project's core persons or SWG are knowledgeable enough to initiated capacity building program/activity on stock assessment of neritic tunas in their respective countries.

95. As added information, *Dr. Tsutomu Nishida* presented a short report on the Stock Assessment of the Spanish and King Mackerels, taking Thailand as an example to prove that there is a need to improve the statistical data of each country.

96. After the discussion, the Meeting adopted the Policy Recommendations on Stock Assessment and Management Measures for Neritic Tunas in the Southeast Asian Waters (**Annex 21**) for consideration by the AMSs.

XII. Closing of the Meeting

98. On behalf of SEAFDEC, the Chief of MFRDMD, *Mr. Ahmad Adnan Bin Nuruddin* expressed his sincere gratitude to all the participants who spent three (3) days to deliberate the issues related to stock assessment of neritic tunas in Southeast Asian waters. He was pleased that the Meeting was able to obtain valuable outputs through technical and policy recommendations on management measures and most importantly, the Meeting also identified the capacity building requirements of the ASEAN Member States on stock assessment for neritic tunas. He also reminded the AMSs to continue to cooperate beyond this Meeting to ensure that neritic tunas are exploited in a rational and sustainable manner. He thanked the Resource Person, *Dr. Nishida* for his assistance in interpreting the results of the stock assessments. With that note, he declared the 3rd Meeting of the SWG on Neritic Tuna Stock Assessment in the Southeast Asian Waters closed. His Closing Remarks appears as **Annex 22**.