



Fisheries Administration
Cambodia



Southeast Asian Fisheries
Development Center



United Nations
Environment



Global Environment
Facility

**Establishment and Operation of a Regional System of Fisheries *Refugia*
in the South China Sea and Gulf of Thailand**

REPORT

Second Meeting of the Regional Scientific and Technical Committee

Thansur Sokha Hotel, Kampot Province Cambodia

21th – 23th May 2019

SEAFDEC/UNEP/GEF

Bangkok, June 2019

Adopted Report of the Meeting

1. OPENING OF THE MEETING

1.1 Welcome Speech from the Chairperson of RSTC for 2018

1.1.1 Mr. Leng Sy Vann, Chairperson of the Regional Scientific and Technical Committee for 2018, welcomed all participants to Kampot, Cambodia as one of the fisheries refugia site. He mentioned that Fisheries Administration of Cambodia (FiA) originally planned to hold the meeting at Koh Kong, unfortunately, there was a problem of electricity shortage, therefore the meeting venue was moved to Kampot Province.

1.1.2 He informed the meeting that Viet Nam signed the Letter of Intent for implementing the national fisheries refugia. In addition, Indonesia will sign the Letter of Agreement within this week in Bangkok, Thailand. These are good news that all relevant 6 countries are on board for implementation of all 14 Fisheries Refugia Sites. Then he expressed his wish that all participants had a pleasant stay on the beautifully landscaped hill on the Bokor Mountain in Kampot. His welcome speech appears as **Appendix-1**.

1.2 Opening Speech by Guest of Honor from Fisheries Administration/Cambodia

1.2.1 Mr. Ouk Vibol, Director Department of Fisheries Conservation, Fisheries Administration (FiA) and concurrently the National Focal Point of the Fisheries Refugia Project greeted and expressed his warmest welcome to all participants from 6 members countries, regional experts from Thailand and Philippines, partners to Fisheries Refugia, representatives from SEAFDEC Training Department and PCU members for attending the 2nd Meeting of the Regional Scientific and Committee Meeting. He reiterated the difficulty faced by FiA to co-organize the RSTC2 during the dry seasons due to shortage of electricity in many provinces. Finally, FiA decided to hold the meeting in Kampot.

1.2.2 He informed the meeting that Cambodia is facing a problem on the Red card from EU regarding to IUU fishing. He congratulated Thailand who had got the yellow card during the past and could achieve effective fisheries management resulting to the lifting of the yellow card.

In addition, he referred to the Strategic Planning Framework for Fisheries: 2010 – 2019 that was adopted by the Royal Government of Cambodia and the updated Strategic Planning Framework for Fisheries: 2015-2024 which provides guidance to contribute to the Royal Government's vision for the future, where the Cambodian people continue to get benefits from abundant fisheries resources.

1.2.3 He also expressed his deepest appreciation for UNEP, SEAFDEC, member countries, and sincere wish for successful meeting. He then declared the meeting open at 08.42 am. His opening speech appears as **Appendix-2**.

1.3 Introduction of Members

1.3.1 Mr. Leng Sy Vann, the chairperson, noted that there were a number of new members following the election of officers for the regional working groups and invited the participants to introduce themselves to the meeting. The list of participants is attached as **ANNEX 1** to this report.

1.3.2 Mr. Somboon Siriraksophon expressed his gratitude to Mr. Ouk Vibol for his warm welcome and kind support making this meeting possible in Kampot, Cambodia. He also thanked on behalf of the committee to Mr. Ouk Vibol for providing a reception dinner when all participants arrived in Kampot province on 20th May.

2. ORGANISATION OF THE MEETING

2.1 Designation of Officers for 2019

2.1.1 Dr. Somboon Siriraksophon, Project Director informed members that the Rules of Procedure state that, the Regional Scientific and Technical Committee shall elect, from amongst the members, a Chairperson, a Vice-Chairperson and a Rapporteur to serve for one year as mentioned in the TORs for RSTC adopted at the first meeting of the Project Steering Committee held in December 2018. The rules state further that officers shall be eligible for re-election no more than once in the same year. Mr. Leng Sy Vann from Cambodia, Mr. Valeriano M. Borja from Philippines and Mr. Nguyen Thanh Binh from Viet Nam who have served as a Chairperson, a Vice-Chairperson and a official Rapporteur respectively, during 2018, are therefore, all eligible for re-election in 2019.

2.1.2 The current chairperson, Mr. Leng Sy Vann invited the participants to nominate the new Chairperson, Vice-Chairperson and Rapporteur for the RSTC 2. The results are 1) Mr. Valerino M. Borja, 2) Dr. Ngurah N. Wiadnyana, and 3) Mr. Richard Rumpet will serve as the Chairperson, the Vice-Chairperson and the Rapporteur respectively, during the 2019.

2.1.3 A new Chairperson, Mr. Valerino M. Borja was invited to give his first speech. He expressed his gratitude for all members who had traveled a long way to attend this meeting. He gave thanks to regional experts for their cooperation and the FIA of Cambodia for having held this meeting.

2.2 Documentation Available to the Meeting

2.2.1 Mr. Valerino M. Borja introduced the documentation available to the meeting by referring to document SEAFDEC/UNEP/GEF/FR-RSTC.2 INF.4. He informed the meeting that most of the documents had been circulated in advance of the meeting and had been lodged on the project web site. (<https://fisheries-refugia.org/2nd-rstc-meeting>) as **ANNEX 2**

2.2.2 Mr. Somboon Siriraksophon informed the meeting that most of the documents had been circulated in advance of the meeting and had been lodged on the project web site. There were some papers waited to be the inputs from the meeting and will be uploaded later such as the recommendations for the future work for short mackerel and frigate tunas, database system, and awareness building programs and promotional media for enhancing the fisheries refugia concept at all level of stakeholders.

2.3 Organization of Work

2.3.1 Mr. Somboon Siriraksophon briefed participants on the administrative arrangements for the conduct of the meeting (SEAFDEC/UNEP/GEF/FR-RSTC.2_INF.1), and the propose of the organization of work (SEAFDEC/UNEP/GEF/FR-RSTC.2 INF.2a-c). He noted that the meeting would be conducted in English, and in plenary as far as possible.

3. ADOPTION OF THE MEETING AGENDA

3.1 The Chairperson, Mr. Valerino M. Borja invited Mr. Somboon Siriraksophon to introduce the Provisional Agenda prepared by the Project Coordinating Unit (PCU) in consultation with the out-going Chairperson for 2018 for the meeting as SEAFDEC/UNEP/GEF/FR-RSTC.2 INF.2b and invited members to propose any amendments or additional items for consideration by the committee.

3.2 There was no other proposals or amendments, the meeting adopted the agenda and timetable, as **ANNEX 3**.

4. REPORT OF THE PROJECT DIRECTOR ON PROGRESS WORKS

4.1 Mr. Somboon Siriraksophon, the Project Director presented Report of the Progress on Activities for Establishment and Operation of Regional System of Fisheries Refugia in the South China Sea and Gulf of Thailand during a period of 2016 – May 2019 as **ANNEX 4**.

4.2 Mr. Somboon Siriraksophon informed the meeting that 5 out of 6 countries signed the Letter of Agreement as of May 2019. Also, Indonesia had finalized the LOA last week. The MMAF of Indonesian asked the PCU to join the MMAF meeting on revising the national project documents held during 2nd week of June 2019 and expected that the signing will be held as soon as possible.

4.3 He also informed the meeting on countries' decisions for 10 of 14 refugia sites in Cambodia (3), Malaysia (2), Philippines (3), and Thailand (2). Then he summarized all activities and achievements since the project started including improvement of the management of critical habitats for fish stocks of transboundary significance.

4.4 Mr. Noel Barut, a regional expert from Philippines pointed out that the habitat component of the 1st Phase of this project has identified fisheries as one of the key threats to the marine habitats such as coral reefs, mangrove, seagrass and wetland, it is therefore needed to integrate the management of fisheries together with habitats. In response to this, the Project Director informed the meeting that the 2nd phase of the SAP implementation for the South China Sea was already endorsed, it is expected that the inception workshop will be organized soon and the relevant authorities for marine environment and fisheries refugia focal points shall be invited to participate.

4.5 Mr. Nguyen Thanh Binh, the Representative for Viet Nam pointed out on the improvement of the management of critical habitats that the Government of Viet Nam had endorsed 3 refugia sites as mentioned in the national project document. Regarding to this, the Project Director responded that the budget arrangements for Viet Nam is ready to implement all 3 sites. He would show the budget table during his visit to Viet Nam.

5. PRESENTATIONS BY THE NATIONAL SCIENTIFIC AND TECHNICAL COMMITTEE ON THE PROGRESS WORK OF THE PROJECT ACTIVITIES AT THE NATIONAL LEVEL DURING JUNE 2018 – MAY 2019

5.1 Cambodia

5.1.1 Mr. Leng Sy Vann, the Scientific and Technical focal point for Cambodia presented the progress works and achievement from implementation of the national activities during the 2nd Quarter of 2018 to the 2nd Quarter of 2019. He referred to many meetings at provincial level in three refugia sites at Kep, Kampot, and Koh Kong. He added that Blue Swimming Crab Fisheries Refugia in Kep has been promulgated by Minister of Ministry of Agriculture, Forestry, and Fisheries. At this time, there are two management committee in Kep which has created including Provincial management committee and Technical working group. Moreover, the mapping and demarcating the boundary of Mackerel Fishery Refugia has been approved by Provincial Authority. He conducted the public awareness for local authority, FiA committee, and fishermen. He also presented the future costed workplan for the 2019/Q3 and Q4 which included cost for hiring a consultant for development of extension media to support public-awareness building.

5.1.2 He also introduced the baseline survey of short mackerel in Koh Kong with the technical support from the Project Co-ordinating Unit. He indicated that the purpose is to provide scientific data to support the establishment and management of mackerel fisheries refugia in Koh Kong province.

5.1.3 He showed that the project benefited into national fisheries framework and policy such as Fisheries Law, National Action Plan on Combating IUU Fishing, the 10-year Strategic Planning

Framework for fisheries. The overall detailed presentation is as **ANNEX 5a**. After his presentation, Chairperson opened for clarification and discussions.

5.1.4 Mr. Somboon Siriraksophon comments on the results from baseline survey and larval fish data collection for the short mackerel that the proposed management areas in Koh Kong sometimes does not cover the area that has high abundance of short mackerel larval fish. Therefore, it would be excellent that the proposed fisheries management areas could be expanded in the future. In addition, the similar results on the maturity stage in Trat Province and Koh Kong Province support each other. Taking into consideration of these findings, both countries need to work together for effective management of short mackerel spawning grounds.

5.1.5 Mr. Barut also suggested that Cambodia use length at first maturity as one of the indicators in managing the fisheries in the refugia sites. He also reminded the participants to always bear in mind that the concept of fisheries refugia comprised the integration of fisheries and habitat management together in order the site could be called fisheries refugia. If this two are separately manage then the sites could either be called marine protected area or fish sanctuary which is not the essence of fisheries refugia.

5.1.6 Dr. Kornrawee Aiemsomboon commented on larval fish identification should be in genus rather than at family level. She found the correlation between short mackerel and phytoplankton. In this connection, the PCU was requested to support the work study made by Cambodia.

5.1.7 Mr. Isara Chanrakhij acknowledges Cambodia data collection program, he also refers to the activities under the Collaborative Research Program in the Gulf of Thailand led by SEAFDEC Training Department. It would be useful results to support Cambodia fisheries refugia. In addition, the SEAFDEC Training Department could also technically support the larvae fish identification by biological network of the program at genus and or species levels.

5.2 Malaysia

5.2.1 Mr. Richard Rumpet, the Scientific and Technical Committee focal point for Malaysia presented the Progress Work of the Project Activities in Malaysia (June 2018-May 2019). The contents of his presentation focused on two selected fisheries refugia in Kuala Baram, Sarawak, and Tanjung Leman, Johor, work progress and financial report. He mentioned that there are 5 main activities for lobster refugia: 1) collection of lobster landing data from several sites (Sedili, Tanjung Leman, Endau); 2) Lobster Resource Survey and Documentary Filming – Oct 2018; 3) Lobster Phyllosoma Study (2017 & 2018); 4) Socio-economic survey and 5) stakeholder consultations.

5.2.2 For tiger prawn refugia study in Kuala Baram, the CPUE and Catch Composition from cast net fishing gear were conducted at three sites (Lutong River, Pasu River, and Sibuti River). The overall detailed presentation is appeared as **ANNEX 5b**.

5.2.3 Mr. Somboon Siriraksophon acknowledges the supports from the Department of Fisheries Malaysia for establishment of national fisheries refugia and the production of documentary film for tiger prawn and lobsters.

5.3 Philippines

5.3.1 Mr. Valerianno M. Borja, the Scientific and Technical focal point for Philippines presented the overall progress works during the 2nd Quarter of 2018 to the 2nd Quarter of 2019. He updates the current situation of Fisheries Refugia project such as fisheries data collection in 3 refugia sites Ichthyoplankton survey and stakeholder consultation. The preliminary results is appeared as **ANNEX 5c**.

5.3.2 Mr. Somboon Siriraksophon suggested that Fisheries refugia activities have national activities supporting the activity rather than working individually which will take longer period for baseline

survey. In addition, the results from establishment of fisheries refugia in Philippines need to get endorsement from relevant institutions such as BFAR as a policy making.

5.4 Thailand

5.4.1 Mr. Kumpon Loychuen the Scientific and Technical focal point for Thailand presented the overall progress works during the 2nd Quarter of 2018 to the 2nd Quarter of 2019. The overall detailed presentation is appeared as **ANNEX 5d**.

5.5 Indonesia

5.5.1 Dr. Ngurah N. Wiadnyana, Representative from Ministry of Marine Affairs and Fisheries of Republic of Indonesia, informed the meeting that MMAF Indonesia had finalized the Letter of Agreement and sent to SEAFDEC for consideration and comments. In this regard, MMAF will organize the internal meeting to revise and finalize the national project document and workplan in Jakarta on 27-29 May 2019. SEAFDEC PCU would be invited to participate in the discussion. It is expected that the LOA with the revised national project documents will be approved before signing ceremony at SEAFDEC Secretariat on the second week of June 2019.

5.6 Viet Nam

5.6.1 Mr. Nguyen Thanh Binh, Representative from Directorate of Fisheries (D-Fish) of Viet Nam, informed the meeting on submission of the LOI between SEAFDEC and D-Fish in May 2019, and he expected the support from PCU during the initial project implementation. In addition, he invited the concerned partners, e.g. SEAFDEC Sweden project to join in Phu Quoc to support Viet Nam activity as well.

6. PROJECT EVALUATION OF THE NATIONAL ACTIVITY FROM 2017 TO MAY 2019 IN RESPONSE TO THE QUESTIONNAIRES

6.1 Mr. Somboon Siriraksophon referred to the ANNEX 2: Country Inputs on Rating Project Performance and Risk of the Report of the Progress on Activities for Establishment and Operation of Regional System of Fisheries Refugia in the South China Sea and Gulf of Thailand during a period between July 2018 and May 2019 as **ANNEX 4**. Then he informed the meeting that the country inputs on rating project performance has to be evaluated in June annually. He highly appreciated all participating countries for their inputs and will further analyze for submission to the UNEP/GEF during the 2nd week of June 2019.

7. DATA AND INFORMATION NEEDS TO SUPPORT ACTIVITIES

7.1 Management of Transboundary Species: Short Mackerel, Frigate Tuna, Etc.

7.1.1 Mr. Somboon Siriraksophon introduced the needs for management of Transboundary Species by referring to the Straddling Fish Stocks Agreement (formally, the Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks). He also mentioned the levels of cooperation in resource management and conservation of transboundary species for highest benefit to concerned country and for sustainable utilization of fish stock which final results affect the social wellbeing of fishing community. His presentation is appeared as **ANNEX 6**.

7.2 Indo-Pacific Mackerel/Short Mackerel

- **Results from the SEAFDEC-SWEDEN Project on Indo-Pacific / Short Mackerel**

7.2.1 Ms. Saisunee Chaksuin, the Gulf of Thailand Sub-region Coordinator for the SEAFDEC-SWEDEN Project presented the Results from the SEAFDEC-Sweden Project on Indo-Pacific Mackerel (*Rastrelliger brachysoma*) focusing management of transboundary fish stocks of Indo-pacific mackerel in the Gulf of Thailand. She referred a series of meetings and consultations had been convened since 2016 or even earlier which aims to develop a joint management plan for small pelagic species including the Indo-Pacific /short mackerel.

7.2.2 She also pointed out that the results from latest research on the short mackerel data collection and genetic studies significantly shows that the short mackerel distribution in the Gulf of Thailand is from all coastal countries. In addition, she emphasized that the next step for the Gulf of Thailand Countries to have a discussion to develop the sub-regional transboundary species management plan or action of Indo-Pacific mackerel. Her presentation is appeared as **ANNEX 7**.

7.2.3 She also pointed out the results from recently study on genetic of short mackerel in Gulf of Thailand that Mackerels in Trat are not related to the Cambodian ones. But the Pattani's is related to Cambodian and Viet Nam. The DNA study indicates that there's a difference in short mackerel's DNA.

7.2.4 Mr. Noel Barut asked that when the 4 sites share the same genetics. The genetics are genetically difference in categorization. The information from the Department of Fisheries, the database is compared to Cambodia's sites. The information shows that the 4 sites share same species but different stocks.

7.2.5 In addition, Ms. Saisunee Chaksuin said we still needed the whole year data to see the migratory pattern and current movement within the Gulf of Thailand which may affect the larvae movement.

- **Biological Study of Short Mackerel in Trat Province, Thailand**

7.2.7 Mr. Kumpon Loychuen presented on Biological Study of Indo-pacific mackerel in Trat Province, Thailand which is a part of the National program entitled "Monitoring of the Life Cycle of Indo-Pacific Mackerel in the Gulf of Thailand" conducted by Fisheries Research Centers, Department of Fisheries of Thailand. His presentation is appeared as **ANNEX 8**.

7.2.8 He showed some results on spawning ground of the short mackerel with the size of greater than 17 cm distributed off Trat Province. In addition, more than 60% of short mackerel found in January-March were at the maturity stage, after that, the larval fishes were appeared.

7.2.9 Mr. Somboon Siriraksophon required further clarification on the term maturity stage. In response to this, Dr. Kornrawee Aiemsomboon clarified that maturity stage refers to maturity stage 3 to 4.

7.2.10 Mr. Richard Rumpet pointed out that two islands (Koh Chang and Koh Kut) act as Fish aggregating device (FADs). These fish only move around these two islands because the larvae is found around there. In response to this, Ms. Saisunee Chaksuin mentioned that Koh Chang is a national park and many natural habitats are around there. In addition, she also mentioned that there is a no-take zone area between Koh Chang and the mainland (Chang Strait).

7.2.11 Mr. Isara Chanrakhij pointed out that spawning ground and season of short mackerel around Koh Chang and Koh Kut may impact by seasonal upwelling during northeast monsoon. These phenomena should be further studied on oceanography or remote sensing.

7.2.12 Mr. Richard Rumpet also suggested that as the result of the biological study is complete in the paper. There should be presented in a diagrammatic form in the presentation.

- **Biological Study of Short Mackerel in Koh Kong Province, Cambodia**

7.2.13 Asst.Prof. Dr. Kornrawee Aiemsomboon, a Regional Expert on Fish Biology and Ecology from Chulalongkorn University, Thailand presented Biological Study of Short Mackerel in Koh Kong

Province, Cambodia based on her preliminary study to support Cambodia on finding of science-based information and results. She pointed out the importance of required science-based information for fisheries management purposes. The overall results in her studies revealed the relationship between sea surface temperature, chlorophyll-a and planktons which fishes including Short mackerel's feed (confirmed by stomach content study). In addition, the marine environmental changes especially a rising in sea surface temperature might be a reason for the period of peak gonad development in Short mackerel had a bit shift from normal. Her presentation is appeared as **ANNEX 9**.

7.2.14 Mr. Somboon Siriraksophon stated that the result on maturity state of short mackerel in Koh Kong and Trat province supports each other, however the genetic study from Thailand indicates that they are different populations. He also suggested Dr. Kornrawee Aiemsomboon that Thai data collection and analysis should collaborate with the Cambodia's. Two areas should work together on sub-regional analysis. He said that Dr. Kornrawee emphasized the high density of larvae found outside the proposed management area.

7.2.15 Mr. Isara Chanrachkij suggested to identify the minimum requirements for data collection between two areas and better focus on the geographic area.

- **Comments and Recommendations for Future Works**

7.2.16 Mr. Somboon Siriraksophon facilitated the discussion on future works of the Transboundary species to support the establishment of fisheries refugia in transboundary areas and possibility for development of Action Plan at Sub-regional Gulf of Thailand. He opened the discussion.

7.2.17 Referring to the recommendation for study on distribution and abundance of the Zooplankton off Koh Kong areas as one of the key indicators, Mr. Leng Sy Vann stated that Cambodia doesn't have the equipment to collect data, he therefore seeks for support from the SEAFDEC PCU.

7.2.18 In conclusion, the recommendations for future works on Transboundary species is as **ANNEX 10**.

7.3 Frigate Tuna

- **Frigate Tuna of Western Luzon (In the SCS)**

7.3.1 Mr. Noel Barut, a Regional Expert on Fisheries *Refugia* from Philippines presented on Frigate tuna data trends in the West Philippine sea. His presentation is appeared as **ANNEX 11**. In his presentation there are two Regions: namely Region 1 or Ilocos Region, and Region 3 or Central Luzon are the main fishing ground and catch trends for the Frigate tuna in west Philippines.

- **Regional Study by SEAFDEC**

7.3.2 Mr. Somboon Siriraksophon shared the general information on biology and ecology of the Frigate tuna, and the regional studies on tunas including the Frigate Tuna compiled at the SEAFDEC Seminar on Fishery Resources in the South China Sea, Area IV : Vietnamese Waters. Based on studies, he indicated that Frigate tuna behavior has correlation with temperature and other environmental changes, the spawning season varies with areas, but in some place it may even extend throughout the year. He also states that Philippines study of Frigate tuna needs to identify the migratory pattern or life cycle movement is still lacking. Establishment of the Frigate Tuna Refugia in Masinloc for protection of the juvenile Frigate tuna is needed as proposed in the national program, if resources available, the migratory route of frigate tuna needed to be identified too. His presentation is appeared as **ANNEX 12**.

7.3.3 Mr. Barut mentioned that the Philippines has conducted a study on frigate tuna under the South China Sea Fisheries Development and Coordinating Program funded by Food and Agriculture

Organization (FAO) in the early to mid 80's. He further mentioned that this could be a good reference to conduct further study on frigate tuna.

7.3.4 In response, Mr. Somboon Siriraksophon referred to the concept of the fisheries refugia. If we know the migratory route, then we can come up with more proper conservation and management of that species. He suggested that it might be possible that the Philippines can compile or even hold sub-regional meeting of frigate tuna study to identify the migratory route of frigate tuna based on the existing data in each country. Mr. Noel agrees with the suggestion of Dr. Somboon Siriraksophon.

- **Comments and Recommendations for Future Works**

7.3.5 Mr. Somboon Siriraksophon facilitated the discussion on future works of Frigate tuna if their migration patterns were connected to the other areas or country. The Committee are requested to provide a view, recommendations for consideration by implementing country.

7.3.6 In conclusion, the recommendations for future works on Frigate tuna is as **ANNEX 13**.

7.4 Best Practice Fishing Gears and Methods

7.4.1 Mr. Weerasak Yingyuad, on behalf of Mr. Isara Chanrachkij, Head of Research and Development Division, SEAFDEC/Training Department, introduced the needs of best practice fishing gears and methods to solve problems and challenges on inshore fishing pressures caused by the use of destructive fishing gear and practices, such as the operation of demersal trawls and push nets in seagrass areas, and the detonation of explosives in coral reef areas. He compiled all threats, immediate cause, root cause affects to some economically important species while suggested for management action from the quarterly reports submitted by respective country. In addition, he referred to the FAO technical guidelines for responsible fisheries where the options to manage fishing are summarized under the EAFM frameworks. His presentation is appeared as **ANNEX 14**.

7.4.2 He also proposed to work on fishing gear modification and fishing practice improvement to support an Establishment of fisheries refugia at country level which reflected to the regional program requirement. The workplans and selected country were discussed.

7.4.3 Mr. Somboon Siriraksophon added that the reason why PCU needs to support the modification and promotion of the use of fishing technology in the refugia sites is because the regional program has certain amount of budget which can be used to organize the consultations to more practical works on gear modification to see the further activities to reduce the impact to habitat from fishing gear.

7.4.4 Ms. Chin Leakhena from Cambodia requested the PCU to conduct the scientific study to prove the fact on pros and cons of specific fishing gear such as elongated and collapsible trap for further policy's maker consideration the management measures. In responsible to this, the Project Director suggested to add this issue into the workplan on fishing gear modification and fishing practice improvement led by SEAFDEC/TD in collaboration and funded by PCU Regional program.

7.4.5 Mr. Nguyen Thanh Binh Representative from Viet Nam also stated the same problem with Cambodia on the use of Elongated and Collapsible traps net and electricity. These fishing gears have been prohibited in Viet Nam since January 1st, 2019 even though there has been insufficient scientific evidence on their negative impacts on the resources. He also suggested the precautionary approaches as specified in the Fisheries Law.

7.4.6 Dr. Ngurah N. Wiadnyana Representative from Indonesia informed the meeting that the MMAF of Indonesia prohibited the use of all trawl gears through Minister of Marine Affairs and Fisheries Regulation no.2 2015. Indonesia promoted alternative gears such as bottom longline fishing

for demersal fishes, Trammel net fishing for prawns. In addition, the trawlers were modified to other boat type of gears as mentioned above and others.

7.5 GIS Mapping and Existing Ocean Modelling

7.5.1 Ms. Nuttida Chanthasiri, a researcher from Thailand-China Joint Laboratory for Climate and Marine Ecosystem, Representative from Department of Marine and Coastal Resources (DMCR) Thailand presented the progress in Ocean Forecasting System in Thailand. Her presentation is appeared as **ANNEX 15**.

7.5.2 She informed the meeting a series of works for development and official launching of the Ocean Forecasting System (OFS) in Thailand in 2015. Meanwhile, DMCR linked the OFS website, [http://ofs.dmcr.go.th/thai land/result.jsp](http://ofs.dmcr.go.th/thai%20land/result.jsp), to the Central Database System and Data Standard for Marine and Coastal Resources webpage, <https://marinegiscenter.dmcr.go.th>, to distribute the forecast product to the public. Furthermore, the OFS Thailand provides outputs in five parameters; *i.e.*, wind, wave height, sea level, current and temperature, the last two of which are in 21 layers.

7.5.3 Mr. Somboon Siriraksophon informed the meeting of the importance of ocean modeling which is one of the target output of fisheries refugia project. Taking it into consideration, the project proposal was developed almost more than 5 years ago which aims to come up with ocean simulation under the regional activities. However, to-date, many institutions expertise on oceanic data management and modeling system have developed many platforms for ocean modelling for predicting the ocean changes such as movement direction of current could help marine recuse works, predicting the habitats changes for example algal bloom, coral reef bleaching, predicting sea temperature increase, larval dispersal, predicting the oil spill, etc. He therefore consulted with the RSTC that the PCU will not spend money for development of the Ocean simulation, but rather use money to integrate the work between countries and institutions responsible for development of the ocean modelling under the framework of IOC/Westpac. He also emphasized that the system should cover all SCS and GoT areas. This issue will be further consulted to the Project Steering Committee in November 2019

7.5.4 Also, he asked Ms. Nutthida Chanthasiri whether it only covers the Gulf of Thailand or the whole SCS. She informed that in the next phase, the present version will further function and intended to establish the higher resolution model by the end of 2019. However, it needs more cost for the development in the whole SEA domain. Therefore, it has to be operated by separating areas which cover the Andaman Sea and the Gulf of Thailand to make it more easily function and accessible.

7.5.5 Mr. Somboon Siriraksophon also questioned on how often the OFS need to validate the data with the observation data from cruise survey. Because the relevant countries of fisheries refugia have conducted the baseline survey both on land and at sea. It is possible to get cooperation on sharing of country data to the OFS for validation of the system and further improve the accuracy of the system for predicting or forecasting.

7.5.6 Mr. Somboon Siriraksophon suggested the cooperation between Fisheries Refugia project and Ocean Modelling Institutions needed to be created, and the data requirement to support the OFS needed to be identified too. In response to this, Ms. Nutthida Chanthasiri suggested that the online data from mooring buoy system is useful for the model validation since they can be accessible by everyone everywhere. However, the Cruise survey data is also important such as the local net current and CTD data. In addition, she also mentioned the seabed platform data since she deployed it in Samui Island, one month later, the fishermen destroyed the equipment.

7.5.7 Mr. Richard Rumpet stated that he agrees that the project needs to use this modelling to locate the larvae. He encouraged the networking to local experts in ASEAN and collect local data as well. He also asked if the OFS is applicable to the river since Malaysia has some big rivers which have tiger prawns too. But, unfortunately, the system is applicable to ocean data only.

7.5.8 In response to Mr. Richard Rumpet, Mr. Isara Chanrachkij informed the meeting that the SEAFDEC Japanese trust fund and Japan ASEAN Integration Funds works under the SEAFDEC Training Department to apply the remote sensing to help inland fisheries resource management. He will provide the name of project coordinator to Malaysia's Representative.

7.5.9 Miss Nutthida Chantasiri preliminary presented the upwelling phenomena around Koh Chang and Koh Kut, Thailand, which can be investigated during northeast monsoon by the observation data for OFV validation. Her presentation consists with the information of spawning ground and spawning season of short mackerel presented by Mr. Kampon Loycheun.

7.6 Baseline Survey Data

7.6.1 Mr. Somboon Siriraksophon presented on the Baseline Survey Data which aims to emphasize the importance of baseline study and baseline data to support, monitor, and evaluate the project implementation at national levels. He also pointed out that baseline study and baseline data should be designed in alignment with the identified key deliverable and benchmarks for the project as shown in the Appendix 4 of the Project Document. Then he welcomed the committee to provide a scientific and technical recommendations on baseline data required to support country implementation. His presentation is appeared as **ANNEX 16**.

7.6.2 In addition, Mr. Somboon Siriraksophon also proposed that there are three issues are linked such as data inputs for the website, existing baseline survey data conducted by countries, and the database system within the data menu of the website. In this connection, the PCU proposes to discuss this matter at the next RSTC3. Before that meeting. The PCU will circulate the questionnaires on data requirements for consideration and inputs.

7.6.3 Mr. Richard Rumpet supports the idea and request PCU communicate via email to the member countries for inputs to be discussed at the 3rd RSTC meeting.

7.7 Information and Education Program

- **Project Web-Sites at Country and Regional Programs**

7.7.1 Mr. Somboon Siriraksophon introduced a new structure of the regional website for Fisheries Refugia project to support the Information Management and Dissemination in support of national and regional-level implementation of the fisheries refugia concept in the South China Sea and Gulf of Thailand. In addition, the websites is able to share the Knowledge generated and experiences from establishing and operating fisheries refugia nationally, regionally, and globally.

7.7.2 He also referred to the report of PSC1 held in December 2018 mentioned that "Regarding the national web portal development, the PCU with inputs from the RSTC, will create a content template, design and share among member countries for translation into their respective national languages" in this regards the PCU have developed the country web portals contents for consideration. The presentation is appeared as **ANNEX 17**.

7.7.3 Mr. Valerianno M.Borja asked if members will give approval to translate the web portal into their own native language so that it is unnecessary to create their own national web portal. Mr. Noel

Barut stated that countries have their own website so maybe country could put access onto their website to link the country webpage under the regional webpage.

7.7.4 Mr. Richard Rumpet agreed with suggestion made by Mr. Noel that country should add more local information and local languages.

7.7.5 Mr. Nguyen Thanh Binh Representative from Viet Nam supported that it is important to translate the website into local languages. Viet Nam has national Fisheries database that could be utilized to publish and disseminate information about Fisheries Refugia Sites.

7.7.6 Mr. Somboon Siriraksophon concluded that the national webpage for fisheries refugia will be developed by countries themselves. However, each country is requested to link their countries' web portals under the regional website.

- **Fisheries Refugia Center(s) at National Level: Lessons Learned from Malaysia**

7.7.7 Mr. Richard Rumpet, a Scientific and Technical focal point for Malaysia introduced the Country Fisheries Refugia Centres as a good lesson learned from Department of Fisheries Malaysia as a part of Fisheries Refugia Project in Malaysia. His presentation is appeared as **ANNEX 18**

7.7.8 Mr. Somboon Siriraksophon acknowledged a good lesson learned from the national fisheries refugia activities and he encouraged other member countries to enhance fisheries refugia centres in their selected sites.

7.7.9 Mr. Isara Charnrajik commented that this is a constructive program which is useful to the public. However, to create another information center maybe costly, he then suggested to seek cooperation with the public facilities such as aquariums and museums for promoting the project concept to the public.

- **Development of Fisheries *Refugia* Database**

7.7.10 Mr. Somboon Siriraksophon referred to the development of the Regional Website as mentioned in 7.7.1 which is linked to the country database needed to develop by 2019. He informed the committee to refers to the agreed action appeared in agenda 7.6 on baseline survey data.

7.7.11 In conclusion, the database system is in principle agreed by the committee to be discussed together with compilation of baseline data collection at the next RSTC.

- **Awareness Building on Fisheries *Refugia* Concept**

7.7.12 Mr. Somboon Siriraksophon requested the committee to share their views and suggestions on the awareness building to promote the Fisheries Refugia concept either at national and /or regional levels.

7.7.13 He concluded recommendation from one and half day activities reported by the countries as well as successful establishments of the educational centers at sites in Malaysia, and many activities at national level with all stakeholders and seek more inputs from the meeting. He also added that if any countries had already developed any media for awareness building, please share the design to the PCU for References.

7.7.14 Mr. Weerasak Yingyuad from the PCU recommended the country to use the results of communication survey from the stakeholder consultation workshop which successfully conducted in Cambodia, Thailand, and the Philippines. In this regard, Mr. Leng Sy Vann replied that Cambodia

communicated via messengers which is useful to reach local people. He also planned to create posters containing information useful for local people to ensure their understanding of fisheries refugia concept.

7.7.15 Mr. Noel Barut added that it is necessary to know the target sector of the community such as: policy maker, fisherfolk, students, and other stakeholder and then make policy according to target requirements or needs.

7.7.16 Ms. Saisunee Chaksuin shared her experiences with SEAFDEC-Sweden project. She suggested to identify the targets first because we need different approaches to them. The fisherman might need translated methods from academic to easily comprehensible one to them. Also, the social media application such as LINE and Facebook do not success in communication. She encouraged the members to find out the familiar media their locals prefer.

7.7.17 Mr. Isara Chanrachkij suggested to seek a partner/cooperation with the CSR (Corporate Social Responsibility). He coordinated with the CP company which shares CSR policy that alignment with the Fisheries Project objectives on promotion of sustainable fisheries and conservation of habitats. Maybe the project can be promoted to relevant private partnership.

7.7.18 The results from discussion are as **ANNEX 19**.

8. OTHER BUSINESS

8.1 Financial Report

8.1.1 Mr. Somboon Siriraksophon informed the meeting on process for requesting the cash advance as well as the required financial report. Regarding this the PCU requests for all cooperation from Country to understand the process for requesting the Cash Advance and follow the template for financial report. The presentation is appeared as **ANNEX 20**.

8.2 Costed Workplan for 2019/Q3-Q4

8.2.1. The project Director acknowledged all relevant countries for the submission of the Costed workplan for 2019/Q3 and Q4 by mid of June 2019. It was also noted that Viet Nam and Indonesia will initiate the project implementation as soon as possible with the support from the PCU. Regarding the costed workplan for two countries will be developed and submit to the PCU in June 2019.

8.2.2 The submitted costed workplan for 4 countries appears as **ANNEX 21**.

8.3 Technical Visit to Refugia Sites on Thursday 23rd, May

8.3.1 All participants visited and observed the fisheries refugia sites and important marine habitats in Kep province such as Marine Conservation Cambodia at Koh Ach Ses, the blue swimming crab Fisheries Refugia site, crab market in city of Kep Province, and sight-seeing to the vicinity of Kampot and Kep Province. The site visit was started from 7:00 – 15:00hrs.

9. DATE AND PLACE OF THE THIRD REGIONAL SCIENTIFIC & TECHNICAL COMMITTEE MEETING

9.1 The committee from 6 countries are requested to propose for date and place of the next meeting. After deliberation, Mr. Nguyen Thanh Binh is requested to host the 3rd RSTC as agreed at the 1st RSTC. In this connection, he proposes the meeting venue at **Phu Quoc Island** – one of the selected fisheries refugia sites in Viet Nam from **26 – 28 November 2019**.

9.2 However, the PCU will further communicate with the Directorate of Fisheries of Viet Nam on the estimated accommodation and travelling cost before final decision taking into consideration the available budget. In case, it is necessary to change the venue to other place where selected refugia is located, the PCU will inform to all RSTC members 2 months in advance.

10. ADOPTION OF THE REPORT OF THE MEETING

10.1 The rapporteur, Mr. Richard Rumpet, presented the draft report prepared by the PCU, which was considered, amended, and adopted as it appears in this document.

11. CLOSURE OF THE MEETING

11.1 The Chairperson expressed his gratitude to all participants, committee, regional experts, and researchers, for all their discussions and patience dedicated to this meeting. He thanked FiA of Cambodia for hosting 2nd RSTC meeting.

11.2 There was no further business the Chairperson closed the meeting at 6.50 PM.