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15 January 2018
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Southeast Asian Fisheries Development Center

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SEAFDEC Seminar 2017
“Fisheries and Marine Environment”

15 January 2018

At SEAFDEC-NACA Meeting room, SEAFDEC Secretariat, Bangkok

Timetable

- 0830-0900 Registration
- 0900-0930 Opening Ceremony by *Secretary General, Dr.Kom Silapajarn*
- 0930-1030 บรรยายพิเศษ (Special Lecture) “แนวทางการทำวิจัยและดำเนินงาน ด้านประมงและสิ่งแวดล้อมทางทะเลเพื่ออนาคต” โดย ดร.วีระวัฒน์ หงส์สกุล

1030-1100 Refreshment

- 1100-1130 บรรยายพิเศษ (Special Lecture) “มาตรฐานสากลของ QR Code เพื่อการตรวจสอบย้อนกลับสินค้าสัตว์น้ำ” โดย สถาบันรหัสสากล

Session I: Research Activities

Moderator by Ms.Thanyalak Suasi

Timekeeper by Ms.Rattana Tiaye

- 1130-1145 Density and Distribution of Marine Benthos in the Cambodia water (*Mr. Rakkiet Punsri*)
- 1145-1200 Yield per Recruit Analysis of Brownbanded Bambooshark from Songkhla, Thailand (*Mr. Supapong Pattarapongpan*)
- 1200-1215 Gender role in coastal community : case study at Mairoot sub-district, Klong Yai district Trat Province, Thailand (*Ms.Jariya Sornkliang*)
- 1215-1230 Questions and answers

1230-1315 Lunch

Session I: Research Activities (cont’)

Moderator by Dr.Taweekiet Amornpiyakrit

Timekeeper by Ms.Kanokwan Thobphuk

- 1315-1330 Study on octopus pot fishing around Klong-yai coastal, Trat province (*Saruttaya Jaroonpongsawat , Nammon Sukhumalchan*)
- 1330-1345 Study on collapsible trap fishing targeting blue swimming crab around Pranburi coastal, Prachuap Khiri Khan province (*Sireemad Gomolwit, Hataigan Dechjorn*)

1345-1400 Study on bottom gillnet targeting blue swimming crab around Tha Chat Chai coastal, Phuket province (*Thanakorn Sa-ngeamwong, Thanyaporn Chueasawat*)

1400-1415 Questions and answers

Session II: Implementation Activities

Moderator by Ms.Panitnard Taladon

Timekeeper by Mr.Tanapat Sorragittayamate

1415-1430 Development of TD website and repository (*Ms.Namfon Imsamrarn*)

1430-1445 Introduction of SEAFDEC Database fisheries statistics of Southeast Asia (*Ms. Woraluk Meesomwat*)

1445-1500 Survey of Fish Enhancing Devices (FEDs) in the Gulf of Thailand (*Mr.Nakaret Yasook*)

1500-1515 Refreshment

1515-1530 Capacity Building on Essential Ecosystem Approach to Fisheries Management (E-EAFM) (*Mr.Krit Phusirimongkol*)

1530-1545 Improvement of Hygienic Fish handling at Fish Landing Sites (*Mr. Khunthawat Manomayithikan*)

1545-1600 Improvement of M.V. Plalung 1 Compliance to ILO Conventional Standard (C188) and Working Condition (*Mr. Thaweesak Thimkrap*)

1600-1615 The Resolution on the Future of SEAFDEC: Review of works and countries' directives in relation to marine capture fisheries (*Ms.Suwanee Sayan*)

1615-1630 Questions and answers

1630-1640 Awards Presentations for Outstanding Presenters and Papers

1640-1700 Closing Ceremony by Deputy-Secretary General, Mr.Tetsuya Kawashima

MC: Mr. Kongpathai Saraphaivanich

Density and Distribution of Marine Benthos in the Cambodian Water

Rakkiet PUNSRI¹ and Tadashi KAMANO²

¹Training Department, SEAFDEC Thailand.

²Japan Fisheries Research and Education Agency National Fisheries University

Abstract

The density and distribution of marine benthos were examined between 7-18 November 2016 from 24 Stations with the aimed of studying the benthos community in terms of abundance and species diversity. There are 18,953 individual samples collected by Smith Mc-Intyre grab with dimension of 0.1089 m². A total of 5 groups were identified. Total marine benthos abundance was recorded 3,783 ind./m², 3,673 ind./m² and 2,094 ind./m² respectively in station 8, station 24 and station 15. The Crustacea (10,395 ind./m²) was dominant all the study station (except in station 4, 12 and 23) in the Cambodian Water. The overall composition of marine benthos are Crustacea (54.7 %), Polychate (33.3 %), Mollusca (4.3 %), Echinidermata (2.0%) and Other groups. The present study reveals that the marine benthos and their abundance are variable among the Cambodia Water. The obtained information can be use for the further study of seasonal change of marine benthos and conserve biodiversity of the Cambodia Water.

Key Words: Density, Distribution, Marine benthos, Smith Mc-Intyre grab, Cambodian water

Introduction

Cambodia Water is one of the large marine ecosystems, which coast of Cambodia is along the Gulf of Thailand from Thai border in the northwest to the Vietnamese border to southeast. The coastal area includes several large bays and extends across the provinces of Kon Kong and Kampot and the municipalities of Sihanoukville and Kep. The offshore marine area contains numerous islands. The coast covers a length of some 435 km along Gulf of Thailand, and the EEZ of approximately 55,600 km² (Chamchang,2008) and relatively shallow with an average depth of about 50 meters.

The collaborative research project between SEAFDEC's Training department (TD) in Thailand, Fisheries Administration (FiA), National Fisheries University (NFU) have initiated a research programmed survey on biological oceanography in Cambodian Water aim at providing a necessary information for management of the environment and fishery resources which the study marine benthos is part of the biological oceanographic in Cambodian Water. Here to fore, on attempt has been made to collect marine benthos in the Cambodia Water. Therefore this study should be the baseline about information of benthos on Cambodia area. Despite the importance of marine benthos in the marine environment, particularly in the Cambodia Water, information on the species composition and abundance of marine benthos in Cambodia Water is still lacking.

Material and Method

Study area

The survey was carried out during 7-18 November 2016 in the Eastern gulf of Thailand under jurisdiction of Cambodian Water.

Sampling method

The sample was collected by Smith McIntyre grab (area coverage 0.1 arge) at 24 stations. The sediment is wash through a set of sieves, which mesh sieve of 1 mm. and 0.5 mm. The large benthos were removed during the washing process and placed directly in plastic preservation containers. The sediment sample remaining on the sieve was sorted out and fixed in 10% formaldehyde solution and mixed with "rose Bengal" in sea water on board and were subsequently sorted and preserved in 70% ethyl alcohol in laboratory. The sorted marine benthos was identified and counted separately for each group. The number of individuals of five (5) taxonomic groups.

Biological index

Shannon-weiner (H')

$$H' = \sum \left(\frac{N_i}{N} \right) \log_2 \left(\frac{N_i}{N} \right)$$

Result

The density and distribution of marine benthos

The overall density of marine benthos in Cambodian water was 18,953 ind./m². The Five (5) groups of marine benthos found in Cambodian water are Crustacea, Polychate, Mollusca, Echinodermata and Other groups. Crustacea (10,211 ind./m²) dominated group in

the benthic communities, followed by Polychaete (6,208 ind./m²), Mollusca (808 ind./m²), Echinodermata (367 ind./m²) and Other groups (1,065 ind./m²) were observed consistently throughout the station in the investigated area. The total average density of marine benthos varied from 0 to 3,783 ind/m². High density areas of the total marine benthos occurred at station 8 and low density in station 18 and 23.

Distribution of the four dominant marine benthos

Crustacean

The crustacea dominated and occurred at 21 out of 24 sampling station, most of them situated in high oxygen near shore.

Polychaeta

□ The polychaete was the second most density group of marine benthos. They were observed at 21 out of 24 sampling station. The highest density occurred at station 8 and the lowest in station 6, 11 and 23. The distribution of polychaete mostly discovered along the coastal zone where the oxygen is higher than other area.

Mollusca

The molluscs were observed at 9 out of 24 sampling station. It was mostly of small size and not economically significant. The highest density at station 8 and the lowest in station 2, 7 and 10. They were more distributed near shore with high oxygen.

Echinodermata

The echinoderm was found at 16 out of 24 sampling station. The amount of echinoderm which was found from each station is approximate.

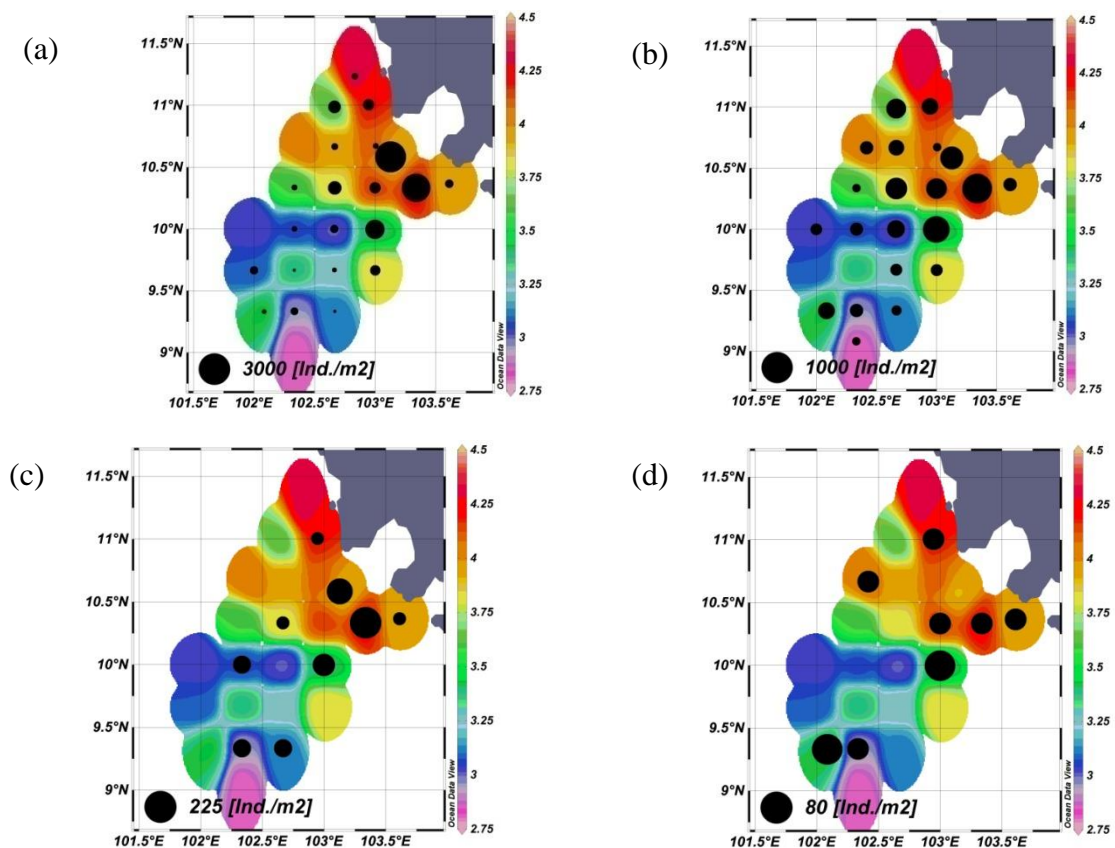


Fig.5 Distribution of four (4) marine benthos a) Crustacean b) Polychaeta c) Mollusca

and

d) Echinodermata

Ecological index

The average diversity index was 0.87 in the survey area. The highest value of diversity index (H') found in station 22 (1.32), follow by station 13 (1.24) and 21 (1.22), while the lowest was at station 1 (0.00052)

Discussion

The marine benthos is important for enhancing of aquatic resources and also play an important role in food chain of Marine Ecosystem (Quasin S et al, 2009). Sea floor environment probably affect the composition and abundance of marine benthos but this survey not analyze composition of sediments and not classified size of marine benthos.

This survey was the total marine benthos belonging to five (5) groups 18,953 individuals observed in Cambodian water. The results showed that the crustacean species dominated this survey, and polychaete second in density. Due to this first time study survey of marine benthos in Cambodian water, so this is compared to the data of density of marine benthos of nearby area. Ibrahim et.al. (2006) carried out survey at Karah Island, Terengganu, Malaysia found that polychaete was the most density. Piamthipmanus (1997) carried out in survey in Gulf of Thailand and Peninsular Malaysia reported that polychaete dominated the area, followed by crustacea.

This first study report for analysis diversity index in Cambodian water. Comparing to nearby area studies by Piamthipmanus (1997) it was found that the average diversity index in Gulf of Thailand was 3.03 which was higher than in Cambodian water (diversity index was 0.83). Factors that can contribute the difference of diversity index are food and availability, predator abundance, sea floor and physical condition. This information is based for study in future.

The Study of Yield per Recruit of Brownbanded Bambooshark (*Chiloscyllium punctatum*) from Songkhla, Thailand

Supapong Pattarapongpan, SEAFDEC/TD, Thailand

Abstract

The brownbanded bambooshark (*Chiloscyllium punctatum*) is dominant benthic shark in Southeast Asia, which was caught mainly as by catch. Growth parameter as Asymptotic Length (L_{∞}) and Curvature Parameter (K) for unseparated sex, male and female were 101.47 cm. and 0.78 year^{-1} , 101.47 cm. and 0.78 year^{-1} and 98.12 cm. and 0.95 year^{-1} , respectively. Result shown that female brownbanded bambooshark can grow faster than male. Result of yield per recruit show that population of brownbanded bambooshark caught from southern gulf of Thailand now still in a good condition ($B/B_{MSY} = 2.19$ and $F/F_{MSY} = 0.44$).

Introduction

The Brownbanded Bambooshark (*Chiloscyllium punctatum*) is the small benthic shark in family Hemiscyllidae distributed mainly in Southeast Asian water (Compango and Niem, 1998 and Krajangdara, 2017). In Thailand, this species was caught as bycatch. Therefore, their status and trend of these species have not been determined yet (Krajangdara, 2017). However, Dudgeon *et al.* (2016) recognized this species as “Near Threaten” since 2003.

Beverton and Holt Yield per Recruit Analysis (Gulland, 1969, cited in Sparre and Venema, 1998) is the equation explained about relation between recruitment (by number) and the possible yield can derived by weigh. The result will be shown in term of the relation between yield per recruit and other related model as biomass per recruit and the fishing mortality (F) in each level (Sparre and Venema, 1998).

This study was aimed to using the yield per recruit method to monitoring the status of *C. punctatum* in Songkhla, Thailand. The result can be used as short-term references point for further management in this area in the future.

Material and Methods

The raw data used in this study was derived from the shark and ray one year data collection project from SEAFDEC – Sweden project.

The biological and mortality parameters will be determined using FAO – ICCLAM Stock Assessment Tools version 2 (FiSAT II) (Gayanilo *et al.*, 1998) while the age – length key and t_0 using van Bertalanffy’s growth equation (Sparre and Venema, 1998). Yield per recruit using Beverton and Holt (1957) method

Result and Discussion

Growth

Length – weight study separated by sex into three (3) groups namely unseparated sex, male and female, the results for unseparated sex, male and female were $W =$

$0.000003L^{3.078}$, $W = 0.000003L^{3.0443}$ and $W = 0.000002L^{3.1152}$, respectively. Growth parameters were calculated by FiSAT II giving asymptotic length (L_{∞}) and curvature parameter (K) for unseparated sex, male and female as 101.47 cm. and 0.78 year^{-1} , 101.47 cm. and 0.78 year^{-1} and 98.12 cm. and 0.95 year^{-1} , respectively.

Age – length key provides growth curve for each data set which size at first capture from modified von Bertalanffy equation was 16.1 cm. which in the same range as reported by IUCN red list that the hatching size of *C. punctatum* was ranged between 12.0 – 18.0 cm. (Dudgeon, 2016).

Female *C. punctatum* was growing faster than male with the higher curvature parameter (0.95 year^{-1}). However, there is lack of age and growth study for this species, considering to the age and growth study of its closed species as *C. plagiosum*, *C. indicum* and *C. griseum* (Compango and Niem, 1998) show that the growth rate between male and female quite similar to each other except the result of Liu and Wang (2007) which study on the *C. plagiosum* caught from Northern Taiwan reported that the female was growing slower than male.

Mortality estimation

Mortality estimation of *C. punctatum*, using Jones and van Zalinge equation to determine total mortality and natural mortality using equation of Pauly (1980) both presented in FiSAT II.

Result from Jones and van Zalinge show that total mortality of *C. punctatum* was 3.1424 year^{-1} while the natural mortality at 30°C of surface temperature was 1.03 year^{-1} , considering to the *C. punctatum* did not involve in the species list of Pauly's research for natural mortality (Pauly, 1980). Therefore, the natural mortality for this species should using only 1 or 2 digits to avoid uncertainties. Fishing mortality was 2.1124 year^{-1} .

Size at first capture

Size at first capture (table 1) show that *C. punctatum* landed in Songkhla, was smaller than size at first maturity from the report. However, the current information of this species still limited only for male (Ali and Pek Khiok, 2012). Therefore, the further study should be arranged for more understanding on this situation.

Table 1 Size at first capture compared with size at first maturity (male)

Size (TL, cm.)	Unseparated	L_m (TL, cm.)	References
$L_{25\%}$	51		
L_c	57.78	68 – 76	Ali and Pek Khiok, 2012
$L_{75\%}$	64.46		

Yield per Recruit Analysis

The result from yield per recruit analysis show that the Y/R was increased rapidly at low value of F at present natural mortality which was shown on figure 1

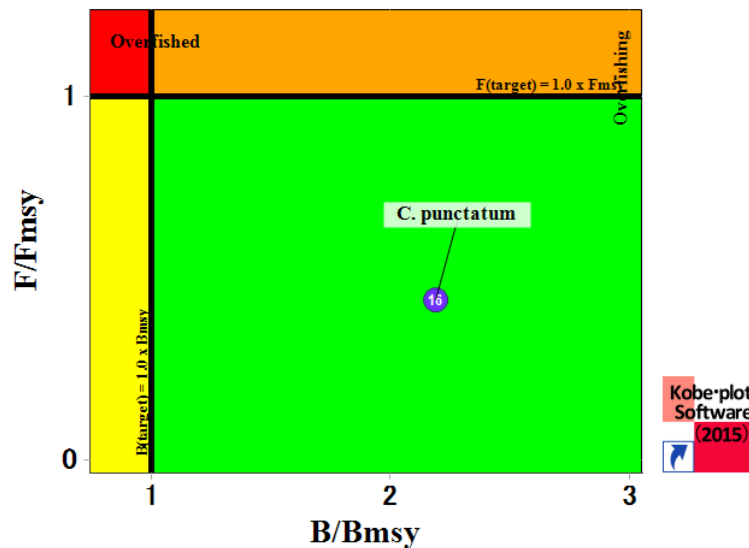


Figure 1 Result from Kobe plot show the current status of brownbanded bambooshark based on result from yield per recruit

Current situation, Y/R have highest value at 0.322708 g. per recruit at $F = 4.8 \text{ year}^{-1}$ while current situations show that Y/R was 0.311201 g. per recruit at $F = 2.114144 \text{ year}^{-1}$. Therefore, current biomass status for *C. punctatum* was 119% higher than MSY level and fishing mortality was lower than MSY level about 56% ($B/B_{MSY} = 2.19$ and $F/F_{MSY} = 0.44$, respectively). However, because this species and other ground bambooshark were caught as bycatch, the management measure should be implemented carefully considering to the status of target species as well (Krajangdara, 2017).

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Gender Role in Coastal Community: Case Study at Mairoot, Klong Yai Sub-districts Trat Province, Thailand

Ms. Jariya Sornkliang*, Ms. Rattana Tiaye*, Mr.Thana Yenpoeng**, Ms. Varantorn Kaewtankam and Ms. Jasmine Pholcharoen

* Southeast Asian Fisheries Development Center, **Department of Fisheries, ***Sustainable Development Foundation

Abstract

I. Introduction

Gender is one form of social difference (others are: class, caste, age, ethnicity, race, etc). Gender specifically refers to society's perception of appropriate roles, obligations, behaviors, activities, and status that considers appropriate for men and women, based on existing norms of femininity and masculinity. *Gender Roles, Responsibilities, Time and Lived Experiences* Information on the norms that influenced men and women's behavior, and also structures the type of activities they engage in, their social status, the importance assigned to their work, roles and responsibilities. This dimension captures information on men and women's different roles, the timing and place where their activities occur, their capacity to participate in different types of economic, political and social activities, and their decision-making. (Time, space and mobility, Household and community division of labor, Participation rates in different activities, and Roles). This domain also explores their lived experiences and emotional dimensions of their livelihoods and their reproductive lives. Working with environmental resources requires relationship with people, nature and institutions, the challenges they possess, which are sometimes uneasy, uncertain, and fraught with stress and anxiety. This is to collect information about the emotional experiences of different social groups of women and men (e.g. loss, nostalgia, insecurity, defiant in the face of threat, protective, stress, worry, shame, shock, and so on) when they recall or refer to the use of resources and the power relations around this.

II. Methodology

The study will use the gender analysis guide/toolkit for coastal resource dependent communities which included the key domains. The methodologies is Individual interview (IDI) to the fishermen in six (6) coastal fishing villages of Mairoot, Klong Yai Districts, Trat Province, Thailand.



Fig. 1 Six fishing villages in Mai Root Sub-district

III. Results

3.1 Reproductive activities

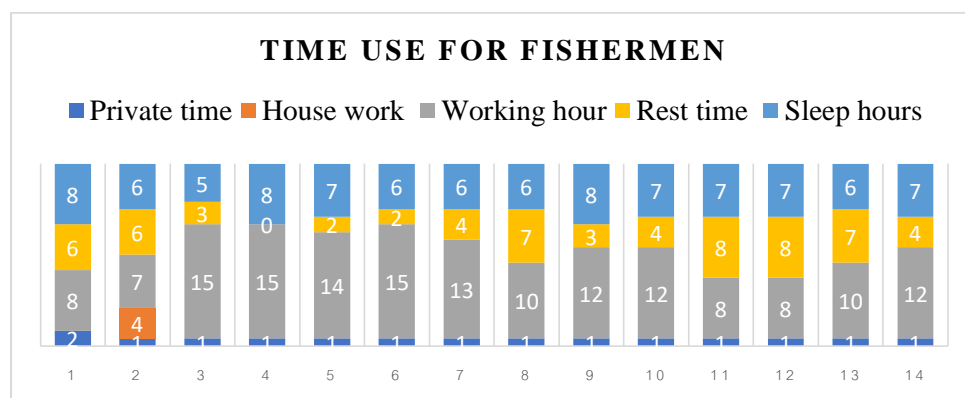
Reproductive roles	Men (%)	Women (%)	Both (%)	Boys (%)	Girls (%)	Both (%)
Child care	5.97	34.33	59.70			
Care for elderly and sick family members	11.11	47.22	41.67			
Cooking	5.19	70.13	23.38		1.30	
Cleaning	5.41	71.62	21.62		1.35	
Fuel collection or energy production	33.33	66.67				
Food security & nutrition (e.g. home gardening, livestock, and gleaning)	28.57	23.81	38.10	4.76	4.76	4.76
Grazing for animals/livestock	28.57	14.29	57.14			
Community activities	20.90	38.81	40.30			
Building a house	75.76	75.76	1.52	22.73		
Fish processing	60.00	20.00	20.00			

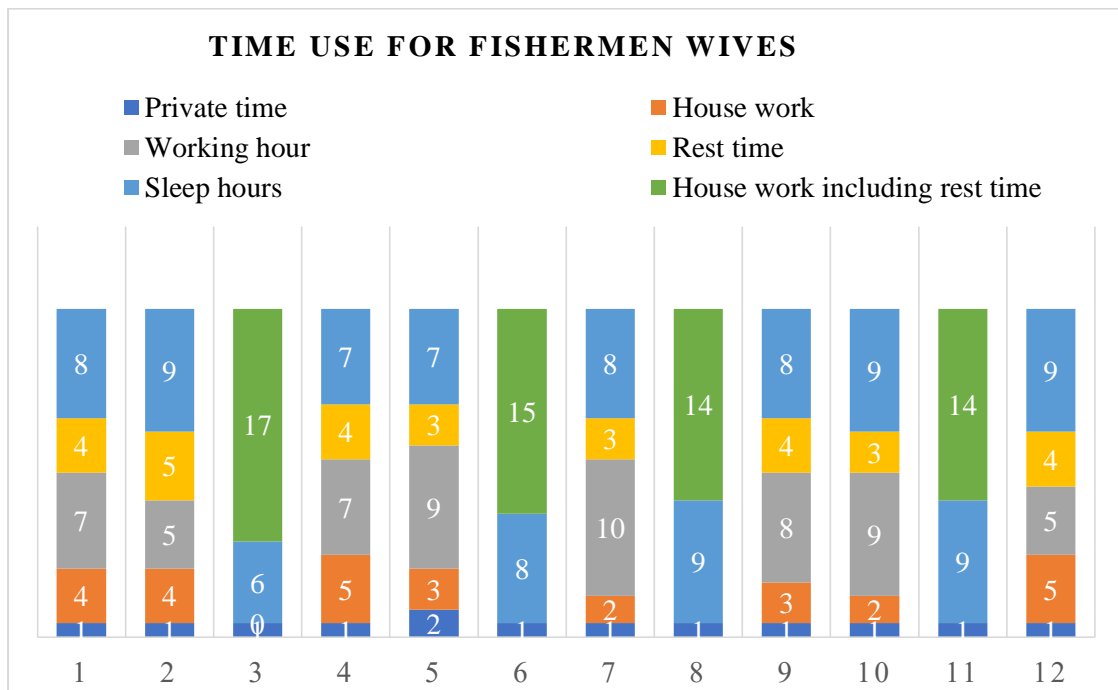
3.2 Productive activities

Livelihood activities	Men (%)	Women (%)	Both (%)	Boys (%)	Girls (%)	Both (%)
Farming (commercial crops/crop production)	31.58	21.05	36.84	5.26	5.26	
Fishing (commercial/local or external market) - Capture fisheries (caught fish,	59.38	15.63	21.88		3.13	

Livelihood activities	Men (%)	Women (%)	Both (%)	Boys (%)	Girls (%)	Both (%)
prawns, crabs, or shellfish)						
Gleaning/hand-collection from wetland areas (e.g. snails, frogs, crabs, etc)	37.50	12.50	50.00			
Fish processing / post harvest production		43.75	43.75		12.50	
Aquaculture			100.00			
Collecting Non Timber Forest Products (this can also include aquatic plants) or Forest user (e.g. gathering non-timber forest products)	33.33	11.11	55.56			
Marketing/Selling (fish, vegetables, rice, forest products, other)	35.29	35.29	29.41			
Preparing fishing gear	74.19	9.68	16.13			
Clean fishing gear/aquaculture equipment	90.32	3.23	6.45			
Fishing gear maintenance	66.67	9.09	21.21		3.03	
Livestock for sale	100.00					
Salary / wage employment	40.00	60.00				
Eco-tourism; e.g. tour guide, boat operator, cooking, cleaning	75.00 100.00 50.00 50.00	 25.00 50.00	 25.00 50.00			
Informal employment	20.00	26.67	53.33			
Remittance from relatives	6.67	53.33	40.00		13.33	

3.3 Time use





IV. Conclusion

Roles of men and women on fisheries in Mairroot Sub-district are divided physically by sex and time, it links to time to participate in community activities that more women participated than men. Hence when we need men to participate in our program must concern about time that men are available. Women have capability to engaged in conservation or livelihood promotion group because they always at home, ready to be part of the community activities.

Study on octopus pot fishing around Klong-yai coastal, Trat province.

Saruttaya Jaroonpongsawat¹, Nammon Sukhumalchan¹, Gowit Janejaem¹, Thunyakarn Sirishang¹, Wuthipong Lertchaipat¹ and Anukorn Boutson¹

¹Department of Marine science, Faculty of Fisheries, Kasetsart University, Bangkok

Abstract

In Thailand, octopus pot operations targeting *Amphioctopus aegina* were reported firstly in Trat province in 2004, conducted by Vietnamese fishers. Now, it is a popular fishing gear and widely used by Trat fishers since easy to operate, good catch amount and high value of the octopus for exporting to oversea markets. This study carried out around Klong-yai coastal, Trat province. The relative papers were reviewed and onboard survey with the fishers was conducted on 28 Oct 2017. The data revealed that the pot has been widely operated in Thai waters. The pot made by Noble volute shell (*Cymbiola nobilis*). In the study site, each pot was connected by polypropylene rope (7 m pot interval), set at the bottom (mud-sand), set parallel to the coastal, fishing depth of 10-15 m. The sock time was 1-2 days. During retrieving process, pots were hauled onboard and arranged in the buckets. The main caught octopuses were released from the pots by themselves. If the octopus still remained inside, the fresh water was used by dropping to the pot to release the octopus. Only *A. aegina* species was found in the pot and only 1 individual octopus was caught in a pot. The capture statistics in 2010–2013 showed that the octopus catch tend to increase both the catch amount and value, with the amount of 10,200 tons and the value of 651.1 million baht in 2013. Regarding Trat fishers opinions, the octopus catch have been decreasing because of the intensive fishing particularly from the commercial boats those increased the pot numbers/boat (maximum can reach 20,000 pots/boat). Even though octopus pot is a very species selectivity gear but it was reported that associated to decreasing of the octopus numbers. Beside the pot fishing also impacted to the amount decreasing of noble volute shell. The underwater observations in the real fishing ground and the position of the octopus setting at the sea bottom that relate to the catch efficiency will be discussed.

Study on crab trap targeting blue swimming crab around Pak Nam Pran coastal, Prachuap Khiri Khan province

Sireemas Komonwich^{1*}, Hathaikarn Dechjorn¹ *, Chuanggan Petsrichuang¹,
Widchadaporn Tablung¹, Suwadol Gogul¹, Saowarat Saibua¹ and Anukorn Boutson¹

¹Department of Marine science, Faculty of Fisheries, Kasetsart University, Bangkok

Abstract

Blue swimming crab (BSC), *Portunus pelagicus* is an economic important species and recorded as the highest catch among the crabs. Collapsible trap is the one of popular fishing gear for catching the crab. The collapsible function is useful for minimum the space onboard to carry. Hence, even small fishing boat can carry a lot of traps. The trap structure made from steel (3-6 mm diameter), size of 30x50x15 cm, wrapped by polyethylene net with the mesh size of 38 mm. The bait (cheap marine fish) attached inside at the center of trap bottom. The trap was set at the seafloor. This study was conducted around Pak Nam Pran coastal, Prachuap Khiri Khan province by interview and onboard survey with the fishers on 30 Sep-1 Oct 2017. The data were recorded such as trap deploying, retrieving, the catch, post-harvest process etc. The study found that 6 sets (100 pots/set) were deployed as a long-line, 12 m interval, 2 m of branch-line. The fishing ground was far from shore 1-10 km, 3-6 m depth. The soak time was about 12 hours. The fishing boat was 6-8 m length, long tail with the outboard engine. The average catch of BSC was about 10 kg/operation day. The fishers get the good catch in Jun-Jul. The catch results showed that not only BSC was caught but also the bycatch animals such as grouper (*Epinephelus* sp.), eeltail catfish (Plotosidae), Three-spined frogfish (*Batrachoididae* sp.), spotted Babylon (*Babylonia* sp.) and crucifix crab (*Charybdis feriata*). Some of them were non/low marketable value which the fishers did not sale. The bycatch were discarded/released at sea while some edible bycatch were brought back home for cooking. The fishers formed a group and established a project aims to utilize the BSC resources for tourism, marketing, processing and distribution together with the idea of conservation in the same time. Some income/benefit from the project would be returned to the group members while some would be used for running the project. The crab bank project aim to sustainable crab use in the study area will be discussed.

Study on bottom gill-net targeting blue swimming crab around Tha Chat Chai coastal , Phuket province.

Thanakorn Sa-ngeamwong¹, Thanyaporn Chuesawat¹, Palida Yimsri¹, Wareerin Premrit¹, Pongphop Rasikoon¹ and Anukorn Boutson¹

¹Department of Marine Science, Faculty of Fisheries, Kasetsart University, Bangkok

Abstract

Bottom gillnet targeting blue swimming crab (BSC), *Portunus pelagicus* is a common fishing gear in Thailand. It is set on the seafloor and widely operated along Thai waters. Relative papers were reviewed and interview fishers at Tha Chat Chai coastal, Phuket and filed survey were conducted on 5 Nov 2017. The gillnet in the site made from nylon monofilament (PA), clear color, 100 mm mesh size, 12 meshes depth, total length about 450 m/set. The float line consisted of two polyethylene (PE) ropes with the diameter of 3 mm, attached with the plastic floats (4.5 m interval). The sinker line consisted of 1 PE rope, diameter of 4 mm, attached the rugby-shaped lead weights of 10 g each (0.6 m interval). The stone weights were set at the start and the end points of the net set. The bamboo poles were attached with buoy and flag, connected to the net end for marking the location. The fishing depth was 12-45 m, 3-5 km from shore with the soaking time of 1-3 days. Long-tail boats with the length of 5.5-14.0 m, 5-24 HP were used for the operation. The average carapace width of the BSC catch in Phuket was 13.9 cm. The crab prices were 250 and 180 baht/kg (4-5 and 10-12 crab individuals respectively). The gillnet caught some bycatch species. Some were economic important such as Dwarf whipray (*Himantura walga*), Scaly whipray (*Himantura imbricate*), Rock crab (*Charybdis natator*), Sand Lobster (*Thenus orientalis*), Bigeyes (*Priacanthus* spp.) etc. Some bycatch were non/low marketable value such as White long-armed crab (*Parthenope longimanus*), Porter crab (*Dorippe quadridens*), Black long-armed crab (*Rhinolambrus longispinis*), Decorator crab (*Camposcia retusa*), Box crab (*Calappa clypeata*) etc. those discarded. The catch compositions (% by weight) were blue swimming crabs (75.31%), other crabs (8%), other animals (8%) and fish (7.71%). After the gillnets are dilapidated, some nets are abandoned at sea and considered continue to catch the organisms that associate to ghost fishing. The appropriate measurements from Department of Fisheries should be defined for sustainable BSC resource use.

Development of TD Website and Repository

Namfon Imsamrarn

Training Department, Southeast Asian Fisheries Development Center

I. INTRODUCTION

SEAFDEC, an Inter-Governmental Organization plays an important role in promotion of sustainable development of fisheries and aquaculture in the Southeast Asian Region for more than four decades. Cooperation with other regional and international organizations have been recognized through several important events such as Millennium Conference in 2001 and ASEAN-SEAFDEC Conference in 2011. Since 1990s, internet have been introduced worldwide, where information technology becomes important as a part of human life including education, economic, social and politics and so on. Development of high speed internet creates a new communication system and support living style including works and activities such as public relations, multi-media production, publication etc., especially information dissemination and website which are technologies for communication between internal and external organization as well as in developing management system for efficiencies. The objective of this paper is to enhance SEAFDEC visibility by developing the information and dissemination system which developed new TD website in 2017.

In this regards, TD established Southeast Asian Fisheries Development Center, Training Department Institutional Repository (STIR), which is the official digital repository of scholarly, research and technical information of the Department to download all information materials using open source software named the DSpace.

In this paper, author considers the importance of information technology for introducing SEAFDEC/TD activities and improving access to SEAFDEC/TD technical/scientific articles was expressed via the website. In this regards, the author introduced for developing of the TD website and Repository to increase public relation and increase TD's visibility as well as point out constrains of its development that requires the strengthening and cooperation within the Training Department of SEAFDEC.

II. DEVELOPMENT OF TD WEBSITE AND REPOSITORY

a) SEAFDEC/TD Website

The website of the SEAFDEC/Training Department was developed based on the structure of works/activities of the organization via the www.seafdec.or.th which is linked to the main website of SEAFDEC through www.seafdec.org.

New TD website using Joomla to develop which is an open source content management system that is being used extensively in the arena of website development due to the availability of several features that make it user-friendly, and flexible.

STRUCTURE OF TD WEBSITE

The structure of SEAFDEC/Training Department website is consisted of 6 main portions as follows (see Figure 1):

1) Top Menu

This top menu shows general information of SEAFDEC/TD including organization/TD, structure of the organization, staff directory, facilities, services,

and library. In addition, under library consists of photo and video gallery related to fisheries.

2) Highlight Activities

This portion is used to announce the highlight of present activities. The title of subject will be changed time to time depend upon the present TD's event.

3) Main Menu

This main menu is the core of TD activities including TD Programs, Training, Publications, Calendar, and News.

4) TD News, Announcement and SEAFDEC Department's Link

- TD News: This portion presents news on the TD activities. This portion will link to the TD news webpage whereas all news are listed by date.
- Announcement: This portion presents announcement of TD events and job recruitment.
- SEAFDEC Department's Link: This portion for linkage with the other SEAFDEC Departments websites.

5) Banner Menu

This portion includes the menus that link to other specific webpages for friendly connection. The menu includes Fisheries Statistic in Southeast Asia and collaborating partners project such as SEAFDEC-SWEDEN Project, the South China Sea Fisheries Refugia Initiative, USAID Oceans and Fisheries Partnership and Strategy for Trawl Fishery Bycatch Management.

6) SEAFDEC/TD Youtube Gallery

This portion for downloading the newsletters and Advance Fisheries Technology Magazines. User can also subscribe these two publications by filling their user e-mail address in the bank form.

b) SEAFDEC/TD Institutional Repository (STIR)

An institutional repository is an archive for collecting, preserving, and disseminating digital copies of the intellectual output of an institution, particularly a research institution. An institutional repository can be viewed as a set of services that a university offers to members of its community for the management and dissemination of digital materials created by the institution and its community members.

In this regards, SEAFDEC/AQD Institutional Repository or SAIR was established in 2011 to provide reliable means for SEAFDEC/AQD staff to store, preserve, and share their research outputs, thus, enabling easy access to and increasing the visibility of SEAFDEC/AQD scientific publications. During the Twelfth SEAFDEC Information Staff Exchange Program (ISEP) Meeting in Kuala Lumpur, Malaysia in 2011, the Meeting took note of the initiative of AQD in establishing the SAIR; and subsequently, a staff exchange activities was conducted for the officers of Secretariat, TD and MFRDMD to visit AQD and learn more about information-related initiatives undertaken by AQD. Nevertheless, until present the publications of SEAFDEC Secretariat and Departments have been made accessible through the Secretariat and Departmental website.

During the Seventeenth ISP Meeting in 2016, the need for improved access to SEAFDEC technical/scientific articles was expressed and encouraged each Department to establish its own information repository, and the Secretariat to consider holding the centralized repository system that could link with the departmental information repositories. In this connection, AQD was asked to share lessons learned and experiences on the establishment of the AQD Repository not only to the Secretariat but also to the Departments, and also to provide information on the process of establishing a repository system.

Subsequently, during the SEAFDEC Department Chiefs' Meeting (DCM), the Meeting supported the establishment of repositories by the Departments and Secretariat. In this connection, the Secretariat was requested to facilitate the conduct of inter-departmental Workshop on the development of SEAFDEC repositories, and sought the assistance of AQD during the said Workshop.

According to SEAFDEC/TD initiative and establish institutional repository system called name SEAFDEC/TD Institutional Repository (STIR) and can be classified categories to the following activities (see Figure 2):

- 1) Journal Articles, Conference Papers and Book Chapters by SEAFDEC/TD Staff
- 2) Magazine and Newsletter Articles by SEAFDEC/TD Staff
- 3) News Articles
- 4) SEAFDEC/TD Collaborative Projects
 - 4.1 SEAFDEC-Sweden Project
 - 4.2 SEAFDEC-RIHN
 - 4.3 SEAFDEC-USAID
 - 4.4 SEAFDEC-UNEP/GEF
- 5) SEAFDEC/TD Publications
 - 5.1 Institutional and Annual Meeting Reports
 - 5.2 Press Releases
 - 5.3 Newsletters
 - 5.4 Journals/Magazines
 - 5.5 Brochures and flyers
 - 5.6 Posters
 - 5.7 Stakeholder-oriented Manuals
 - 5.8 Books
 - 5.9 Conference Proceedings
 - 5.10 Audio-Visual Materials
 - 5.11 Technical Publications and Reports on Fishery Resources
 - 5.11.1 Fish Larvae
 - 5.11.2 Demersal Fishery Resources
 - 5.11.3 Pelagic Fishery Resources
 - 5.11.4 Deep-sea Fishery Resources
 - 5.11.5 Tunas
 - 5.12 Technical Publications and Reports on Fishery Management and Enhancement
 - 5.12.1 Fisheries Management Concepts and Approaches
 - 5.12.2 Indicators and target reference for management
 - 5.12.3 Management of Fishing Capacity and Combating IUU Fishing
 - 5.12.4 Resources Enhancement
 - 5.13 Technical Publications and Reports on Fishing Technologies and Practices
 - 5.13.1 Fishing Gears and Methods
 - 5.13.2 Bycatch Reduction Devices
 - 5.13.3 Marine engineering
 - 5.14 Technical Publications and Reports on Fish Handling and Post-harvest Practices
 - 5.14.1 Fish Handling, Preservation and Utilization
 - 5.15 Cross-cutting Issues
 - 5.15.1 Labor in Fisheries
 - 5.15.2 Gender in Fisheries

5.15.3 Safety at Sea
 5.16 Policy Framework and Guidelines/ Codes
 5.16.1 Regional Guidelines
 5.16.2 Policy Recommendations
 5.16.3 RPOA
 5.16.4 International Instruments

The screenshot shows the SEAFDEC/Training Department website homepage. At the top, there is a navigation bar with the SEAFDEC logo and a menu including HOME, ABOUT SEAFDEC/TD, ORGANIZATION STRUCTURE, STAFF DIRECTORY, FACILITIES & SERVICES, and LIBRARY. Below this is a banner celebrating 50 years of SEAFDEC, listing various departments and their founding years: Secretariat (1981), Training Department (1986), Marine Fisheries Research Department (1969), Aquaculture Department (1973), Marine Fishery Resources Development and Management Department (1992), and Inland Fishery Resources Development and Management Department (2014). A secondary navigation bar features icons for PROGRAM THRUSTS, TRAINING, PUBLICATIONS, CALENDAR, and NEWS. The main content area includes a 'Latest News' section with three articles: 'CAPACITY BUILDING ON FISH HANDLING TECHNIQUES FOR MEMBER COUNTRIES', 'DATA VALIDATION OF GENDER ANALYSIS IN TRAT PROVINCE', and 'THE WORKSHOP ON VERTICAL SLOT FISH PASSAGE DESIGN TO FACILITATE MIGRATION OF INDIGENOUS FISH SPECIES IN THE SOUTHEAST ASIAN REGION'. To the right of the news is a search bar and a 'SEAFDEC Technical Seminar' announcement. Below the news is a grid of featured content: 'Fishery Statistic in Southeast Asia', 'SEAFDEC-SWEDEN Project', 'The South China Sea Fisheries Refugia Initiative', 'USAID Oceans and Fisheries Partnership', and 'Strategy for Trawl Fishery Bycatch Management'. A 'SEAFDEC/TD Youtube Gallery' section follows, showing video thumbnails for a meeting, a workshop, and a presentation on EAFM principles. The footer contains social media links, contact information, and a copyright notice for 2018.

Figure 1: SEAFDEC/TD Website Homepage

DSpace
Login

SEAFDEC/TD Institutional Repository

DSpace @ SEAFDEC/TD

Southeast Asian Fisheries Development Center, Training Department Institutional Repository (STIR) is the official digital repository of scholarly, research and technical information of the Department.

Communities in STIR

Select a community to browse its collections.


Journal Articles, Conference Papers and Book Chapters by SEAFDEC/TD Staff [0]

Magazines and Newsletter Articles by SEAFDEC/TD Staff [0]

SEAFDEC/TD Collaborative Publications [0]


SEAFDEC/TD Publications [16]

Recently Added




Report of the Technical Workshop on Regional Fishing Vessel Record (RFVR) Database Development and Management in Southeast Asia

Training Department, Southeast Asian Fisheries Development Center (Training Department, Southeast Asian Fisheries Development Center, 2014-10)




Regional Technical Consultation on the Regional Fishing Vessels Record : Use and Way Forward of RFVR Database as a Management Tool to Reduce IUU Fishing in Southeast Asian Region

Training Department, Southeast Asian Fisheries Development Center (Training Department, Southeast Asian Fisheries Development Center, 2015)




Report of the Experts Group Meeting on Port State Measures in Southeast Asia

Training Department, Southeast Asian Fisheries Development Center (Training Department, Southeast Asian Fisheries Development Center, 2012-11-22)



Report of the Experts Meeting on Regional Cooperation to Support the Implementation of Port State Fisheries in Southeast Asian Region

Training Department, Southeast Asian Fisheries Development Center (Training Department, Southeast Asian Fisheries Development Center, 2016-02-11)



Kisah seorang budak bernama Por (Story of a boy named Por) [Malay and English]

Panitnard Taladon; Krit Phusirimongkol (Training Department, Southeast Asian Fisheries Development Center, 2014-12-11)

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Communities & Collections

By Issue Date

Authors

Titles

Subjects

MY ACCOUNT

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DISCOVER

Author

SEAFDEC/TD (4)

Training Department, Southeast Asian Fisheries Development Center (4)

Arnupapboon, Sukchai (2)

Krit Phusirimongkol (2)

Panitnard Taladon (2)

Buranapratheprat, Anukul (1)

Ludnakrob, Pontipa (1)

Punsri, Rakkiet (1)

Sornklaiang, Jariya (1)

TD (1)

Subject

Responsible Fishing (4)

Fisheries (3)

Fisheries Technology (3)

Port State Measures (2)

Thai Turtle Free Devices (TTFD) (2)

vessel (2)

acid volatile sulfide (AVS) (1)

benthic macro- fauna (1)

Cambodian water (1)

environmental assessment (1)

... View More

Date Issued

2016 (6)

2009 (4)

2014 (3)

2012 (1)

2013 (1)

2015 (1)

Has File(s)

Yes (16)

RSS FEEDS

RSS 1.0

RSS 2.0

Atom

DSpace software copyright © 2002-2016 DuraSpace

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Theme by



Figure 2: SEAFDEC/TD Institutional Repository (STIR)

REFERENCE:

- 1) <https://medium.com/@iskpro1/get-a-unique-and-remarkable-website-developed-by-availing-joomla-web-development-services-f5fb910ef71b>
- 2) https://en.wikipedia.org/wiki/Institutional_repository
- 3) Workshop on Establishment of Institutional Repository of SEAFDEC Secretariat and Department, 6-9 March 2017, Samut Prakan, Thailand

Introduction of SEAFDEC Database Fisheries Statistics of Southeast Asia

Woraluk Meesomwat

Introduction

The Fishery Statistical Bulletin for Southeast Asia was established based on the Framework for Fishery Statistics of Southeast Asia, which was developed by SEAFDEC through the consultative process with ASEAN and the ASEAN-SEAFDEC Member Countries. The Fishery Statistics Framework was endorsed at the Fortieth Meeting of SEAFDEC Council and the Sixteenth Meeting of the ASEAN Sectoral Working Group on Fisheries (ASWGF) in early 2008, with the primary objective to serve as the “Minimum Requirement for Fishery Statistics of Southeast Asia”. In addition, the Fishery Statistics Framework is also anticipated to facilitate a long-term improvement of National Fishery Statistics in order to support national planning and management of fisheries, as well as to facilitate the compilation and sharing of statistics and information at regional and international levels, i.e. those currently compiled by SEAFDEC, FAO, as well as other fishery-related organizations.

The Bulletin will be published starting from the statistics of the year 2008. The statistical period, in principle, covers January to December of the reporting year. In cases where country was unable to supply the statistics of the reporting year by the timeline as indicated in *Table 1*, the latest data available may be given, provided that the year to which the data belongs indicated in the space provided.

No.	Questionnaire title
Q1	Fishery Production by Sub-Sector
Q2	STAT-SEAFDEC Capture Production by Species and SEAFDEC Sub-Areas
Q3	Producer Prices for Capture Production by Species
Q4	Marine Capture Production by Type of Fishing Gear and by Species
Q5	Inland Capture Production by Water Bodies
Q6	Number of Fishing Boats by Type and Tonnage
Q7	Number of Fishing Units by Size of Boat
Q8	AQ-NS 1 and 9 Forms for Reporting Statistics on Aquaculture of Fish, Crustacean, Molluscs, and Aquatic Plants (NS9) by Species, Production, Environment and Fishing Area
Q9	Aquaculture Production of Ornamental Fish
Q10	Seed Production from Aquaculture
Q11	FISHSTAT FM: Fishers

Table 1: List of questionnaires, and harmonized submission mechanism and timeframe

Data and information available from various sources could be used as inputs for the Bulletin. These include the data collected through statistical surveys, from government records and semi-governmental organizations. In addition, data and information derived from new statistical techniques or small-scale surveys could also be used to provide inputs to the Bulletin.

Activity

For our project process/activity after SEAFDEC publish the Fishery Statistical Bulletin of Southeast Asia in each year or data from questionnaire then we input the raw data entered into a database. After input to the data will process and show the results on the web site.

Results

"SEAFDEC Database Fisheries Statistics of Southeast Asia" was developed by using PHP language and MySQL Database on the URL <http://map.seafdec.org/NewBulletin/> for the main function of our website

Marine Fisheries

- Marine Fishery Statistics on fishing boats will be use to clarify the amount of capital invested in fishery corresponding to the size of fishing boat and cover annual data of fishing boats in marine areas.

- No. Of Fishing Units is the annual data of fishing units operated in marine and coastal areas and classified by type and size of fishing boats as well as by major types of fishing gears.

- Fishery Production by Species and by Fishing Area The statistics for marine capture production represent the statistics on catches and landings of marine and brackishwater species of aquatic organisms, killed, caught, trapped or collected for all commercial, industrial, and subsistence purposes in quantity and in value.

- Fishery Production by Type Of Fishing Gear and by Species represented the production that classified under commercial and small-scale fisheries, where possible should be further classified into detailed types of fishing gear for each category.

Inland Capture Fisheries

- Inland Capture Fishery Production by species and By Fishing Area is the statistics for inland capture production present the catch of freshwater species of aquatic organisms that are killed, caught, trapped or collected for all commercial and subsistence purposes.

- Inland Capture Fishery Production by Type of Waterbodies is statistics on production by Type of Waterbodies from inland capture fishery presented in accordance with the following four types of water bodies: Lakes ,Rivers, Flood plains/rice fields,and Reservoirs.

Aquaculture

- Aquaculture production by species and By Fishing Area is the production from aquaculture could be broken down by species from all types of culture Mariculture, Brackishwater culture, Freshwater aquaculture and also Aquaculture production by species of ornamental fishes

- Seed production from aquaculture-The statistics on artificial seed production is presented in order to assess the recruitment in aquaculture and facilitate management

purpose. Production could be reported by species in terms of the number of larvae, fingerlings, juveniles, etc.

Price

-Statistics on fish price covers aquatic organisms in the form of fresh fish only, which includes marine and freshwater species.

Fisher

- No. of Fisher-Number of fisher for all Inland, Marine and Aquaculture fishery, Fishers/people involved in fishing could be classified into:a) Full-time b) Part-time c) Occasional fishing by household members.

Capacity Building on Essential Ecosystem Approach to Fisheries Management (E-EAFM)

Panitnard Taladon, **Krit Phusirimongkol**

Introduction

The Ecosystem Approach to Fisheries Management (EAFM) was advocated in the Southeast Asian region to strike a balance among the diverse societal objectives by taking into account the knowledge and uncertainties of biotic, abiotic, and human components of ecosystems and their interactions and applying an integrated approach to fisheries within ecologically meaningful boundaries (FAO, 2003). EAFM is essentially an integrated management strategy within ecologically defined boundaries, and the integrated systems approach promoted through the EAFM tie together integrated coastal management and ecosystem level perspectives, EAFM is an attempt to do fisheries management in an ecosystem context (Link, 2010) which one method is the training for stakeholder.

Training courses on the Essential Ecosystem Approach to Fisheries Management (E-EAFM) had been organized by SEAFDEC Training Department through the REBYCII CTI Project since 2014 to promote the concept and principles of EAFM in the Asian Member States (AMSs). The objective of the training is to build the understanding of the concept and need for ecosystem approach to fisheries management and acquire necessary skills and knowledge to be able to develop, implement and monitor an EAFM plan for better management of capture fisheries

Method/Activities

Training process

The EAFM training course will be conducted for five days. The process as follows:

Day 1: Understand what EAFM is and why it should be used

Day 2: Understand what moving towards EAFM entails

Day 3: Work through the EAFM planning process

Day 4: Work through implementing EAFM plans and

Day 5: Present and receive feedback on group EAFM plans.

Course content

The content are in the five steps (including start up) that shown in the figure 1.

Step 1: Definition and scope of the Fisheries Management Unit (FMU)

Step 2: Identification and prioritization of the issues and goals

Step 3: Development of the EAFM plan

Step 4: Implementation of the EAFM plan and

Step 5: Monitoring, Evaluation and Adaption.



Figure 1 Five steps of EAFM

E-EAFM and the target participants

For E-EAFM, the target participants are the mid-level managers and staff working with fisheries, environment, economic development and planning departments who are responsible for managing fisheries and the associated marine environment and suitable for fisheries extension officers, junior-level staff or students at fisheries research institutes and colleges.

Training of the Trainer on E-EAFM and the target participants

For further extend and transfer knowledge and information deep down to each country the Training for Trainer (TOT) become the most vital process for all members, learning and understanding all the content and knowing how to transfer appropriately. The target participants for the TOT must be the persons who already passed the E-EAFM training course. The TOT is very intensive and aiming to strengthen knowledge and skill for the selected participants, these to make sure that the participants will be confidence and be able to transfer and apply the concept and principle of the E-EAFM to their own countries in afterward.

Result and way forwards

Since 2015, there have been more than 155 participants from SEAFDEC's member countries were trained for the E-EAFM training courses. Most of the participants (> 90%) mentioned that their course expectation and objectives are fulfilled. For the TOT, there are totally more than 25 participants were trained, (4 persons-Thailand, 7 persons-Myanmar, 7 persons-Cambodia, 7 persons-Lao PDR). SEAFDEC/TD will continue in taking the task to build up and strengthening the fisheries officers of its' member countries on the understanding of the EAFM concept as well as to be able to apply and make use of the concept in afterward.

Reference

SEAFDEC/SEC. 2017. *The Southeast Asian State of Fisheries and Aquaculture 2017*. Southeast Asian Fisheries Development Center/ Secretariat. SEC/ST/49. 104 pages.

IMPROVEMENT OF HYGIENIC FISH HANDLING AT FISH LANDING SITES

Suthipong Thanasarnsakorn, Thaweesak Thimkrub, **Khunthawat Manomavidthikarn**

Suthipong@seafdec.org, Thaweesak@seafdec.org, khunthawat@seafdec.org

Marine Engineering Section, Training and Supporting Research Division

Southeast Asian Fisheries Development Center (Training Department), Thailand

Extended Abstracts

Hygienic issues at fish markets and fish landing sites were implemented by the Department of Fisheries. We had an opportunity to work with Department of Fisheries since 2015 to improve the issues through three main items on sorting fish on floor, untreated cleaning water, and more hygienic cleaning method of baskets and fish markets at a private voluntary fishing port in Rayong province.

During preliminary observation concerning on hygienic facilities at the fishing port, the owner provides almost suitable hygiene of size sorting table and pumped underground water for cleaning purposes. However, sorting fishes by species are still done on the floor which will be contaminated with dirty water. Not only contamination on sorting fish on floor, but also unperfected cleaning baskets is by passing water outside baskets one time without brushing inside to remove stick fish scraps. The cleaned baskets are overlay in several rows without any fly protection and drying with sun light.

With the previous described situation and to solve sorting fish by species, four (4) designed species sorting tables were provided for their sorting process. The table contributed to improve hygiene during species sorting because of without cleaning water contamination and convenient to clean under the table. But there are some negative impacts when using species sorting table, these are fatigue of sorting workers for long time standing and transferring workers for dumping fishes on the table resulting to expand working time and to refuse using the table.

In terms of hygienic cleaning water, the owner used underground water.

For unsuitable cleaning of basket that is mentioned previously, it should install medium pressure pump or agriculture water pump with handle nozzle injector. Injecting medium water pressure both inside and outside the baskets can remove almost stick fish scraps.

Due to unsuccessful contribution of hygiene in Rayong, the expand cooperative activities on improvement of hygienic fish market with fish market organization was done again at Yanawa fish market, Bangkok in year 2016. This step, planning and discussion among SEAFDEC staff and expertise of fish market organization was done at Yanawa office. Preliminary observation with recording by CCTV had been done for one month and it was found that:

At Yanawa, it has three fish markets including seawater fish/shrimp, squid, and freshwater fish. Each market has individual working activity because of difference in unloading amount and product species.

Due to limited space at the market, fish vendors use their area for multi-purpose application for unloading, storage, sorting, and selling products. With this reason, vendors used rubber, plastic, or canvas sheet to support sorted fish/shrimp for selling, and some merchants used the supporting sheet for sorting fish/shrimp on floor because of simple and low cost to manage space utilization. Even the protection of contamination is less effective by using the supporting sheet, but they attempted to keep clean on their working area by cleaning with pumped water often. The other weakness points of using supporting sheet on the floor are flood over with dirty water and walking over by workers during work.

The second is squid market, vendors dump several bulks of squid on rubber sheet covered all the concession area where customers can walk-in without cleaning their feet before making auction. This selling process spend not over half hour until squid market ended.

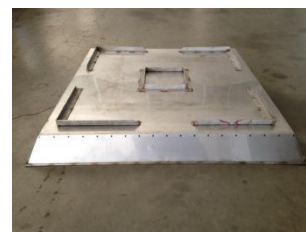
Lastly, the freshwater fish market, freshwater fishes are transported by pickup truck. These fishes were dump on the floor that lay with big plastic sheet, however, many fishes slide out the sheet area that touch on floor surface directly. With big amount of fish on floor, workers can step over fishes to sort them by size and storage in several plastic boxes which customers can enter to buy these fishes in boxes by auction. The selling freshwater fishes will end within not over two hours.

From previous description, every selling market has different owners, customers, and workers in the same area. Until dealing activity ended, working area was cleaned by using pumped river water to remove mucilage, blood, remaining trash and bacterial accumulation on surface floor occurred from marketing activities.

According to the study, there are many hygienic impacts concerns in fish market such as contaminations from cleaning water and dirty residues on working floor. At initiative stage, we had discussed with the in-charge person of fish market organization to mitigate on bacterial contamination from cleaning water and to protect walking over of workers by using stainless steel trays, especially function during sorting and show casing. In which the shape, size, and dimension designation of the tray were designed and discussed with expertise of fish market before fabrication. After these trays were distributed to four pilot volunteer merchants for demonstration use.



Upper view of the tray



Bottom side of the tray

Figure 1 Stainless steel tray

Specific dimension of tray is 1 m width 1 m length and 0.1 m height , 1 inch leg height 5 mm hole around bottom edge of tray to release water out. 1 inch height of leg is to avoid residue water on floor that contaminates fish in the tray. This shape of tray can overlay multi-layers to efficient storage space. Due to durability, light weight, and corrosion free, food grade stainless steel is a suitable choice to be applied.

By observing the use of sorting trays distributed to the voluntary fish market, they can prevent contamination of dirty cleaning water and walking over the fishes. Since limited amount of distributed trays, some sorted fishes were still placed on rubber sheet which is able to be contaminated from floor cleaning water. In contrast, some fish market does not sort fish on rubber/plastic canvas but showcasing sorted fish on the trays waiting for customer.

Even the trays catch our objectives on avoiding bacterial contamination from cleaning water, but with limitation both size and insufficient amount of tray distributed for sorting, heavy weight 20 kgs. each, workers of fish market did not prefer to apply the tray and use their method by laying their rubber/plastic canvas on floor. Not only these several obstructions, but also limit working space in fish market results to slow down working speed and inconvenience in working because of obstacle tray when workers drag and pull insulated containers in working zone. Space application in fish market was varied often for sorting and showcasing. With these reasons, the trays was located along edge of fish market to avoid interference in working of worker in the center of working space. In other words, workers in fish market use crotchet to hook and pull the trays during movement in the working zone, however there are only two hooking points on the tray that are difficult for worker to hook the trays. These limitations and weaknesses of trays cause to refuse by fish markets.

To acquire more information on hygiene of fish market or fishing port, we had a hygiene survey trip to observed various fish landing sites along the Southern part of Thailand. Each fish landing site has individual technique in unloading and sorting fishes. Two efficient fish landing sites in Pattanee and Phuket are the base models in sorting fish species from purse seine fishing boat by using deep bottom plastic tray and sorting table with small edge high. In this case two fishing ports have enough space to support fish market activities. However, when fish landing sites having limited space such as in Ranong and Yanawa Bangkok, fish market owner/organization should prepare various sizes of plastic tray such as 1x2x0.1 m or 1x2x0.25 m and sufficient amount to supply users in fish market. In selling process, fish market owners should use small table to place fishes for showcasing products.

Lastly, marine engineering section under SEAFDEC flag have to acknowledge the Department of Fisheries, voluntary fishing ports in Rayong, fish markets in Yanawa, and Fish Market Organization in supporting the places, suggestions on suitable improvement of hygienic fishing port, and time until each activity completed.



Improvement of M.V. PLALUNG 1 Compliance to ILO Conventional Standard (C188) and Working Condition

Thaweesak Thimkrap



Thailand received its first yellow card from European Union(EU) in April 2015, because Thailand had not been doing enough to tackle Illegal Unreported and Unregulated (IUU) fishing. Thailand needs to improve its fisheries' monitoring, control, and surveillance systems to comply with international obligations, and to certify the

origin and legality of its fishery exports concerning forced labor. The yellow card warning was a wake-up call for Thailand to clean up its fishing industry to avoid EU trade bans. The imposition of trade sanctions may have a negative impact on the Thai seafood industry between \$ 200 million and \$ 500 million.

To reduce the impact of EU policies on Thai fishing industry, and participation in tacking IUU fishing both of TUF and Nestle as a company on sea food exporting business take actions by announcing to stop purchasing products and terminate contracts with all suppliers that violate human rights or the Fisheries Act 2015.

In addition to the actions of the government and other key stakeholders, both parties carried out several projects to avoid illegal and forced labor. The purpose is to raise awareness among fishing vessel owners and fishing crews about the good practices, the protection of ocean ecosystems, the promotion of human rights, safety onboard and living conditions for the crews.

At global level, about 38 million people work in capture fisheries, and 15 million are full-time fishers. Fishing which is considered as one of the world's most challenging and hazardous occupations. Thailand as a member state would by the end of 2018 ratify the ILO's Convention No.188 concerning work in the fishery sector and covering fair wages, working hours, quality of shelter for laborer, and sanitary standards. The government should clear policies to enable all migrant workers to work legally through a nationality-verification process and the memorandum-of-understanding (MoU) process, as well as to strengthen law enforcement to the enhancement of working conditions to decent the conventional standards,

SEAFDEC is an inter-governmental organization have mission “to develop and manage the fisheries potential of the region by rational utilization of the resources for providing food security and safety to the people and alleviating poverty through transfer of new technologies, research and information dissemination activities. To support the Thai fishing fleet through the Department of Fisheries on raise up the working standard of crews onboard according to the ILO Conventional no.188 SEAFDEC/TD provided M.V. PLALUNG 1 with a capacity of 35 Gross tonnage, 17.5 meters in length use as the sample vessel of the joint project between SEAFDEC/TD, Department of Fishery, Thai Union Group and Nestle Thailand were funding to renovate the vessel and develop the training program, training package and capacity building of resource persons of all project partners including the Department of Fisheries.

The sample vessel will be renovated according to the conventional standard no.188 and use as the model to demonstrate session of the training. The participants comprise of fishing vessel owners, captains and crews along the important fishing port of Thailand e.g. Rayong, Song khla and Pattani provinces. The training includes four (4) components as follows:

1. Ways of vessel renovation for the appropriate shelters, dining and leisure areas onboard the vessel is mandatory, along with a first-aid kit, toilet and facilities with proper sanitation standard.

2.The promotion and protection of human rights of crews/workers. A new Ministerial Regulation which came into force on February 2016 that sets to secure the health, safety and welfare of crews.

3.Safety at sea and the regulation requires for the vessel owner to provide appropriate safety equipment as well as adequate and clean food and drinking water for the crews.

4. Fishery machinery to support and improve working condition onboard, engine maintenance, and energy efficient used.

Outcomes of the joint project on renovation of “Sample vessel”

1. The most importantly, they have learnt on ways to renovate and visions needed to transform for their own fishing vessel into ones with decent working and living conditions.

2. Through this approach, the ‘Sample vessel’ is lesson learn that would lead to tangible improvements of fishing vessels across Thai fishing fleet, making a difference to the lives of hundreds of thousands who worked at sea.



3. This project, SEAFDEC/TD also considers through the decent of working standard and smart working by implementing of appropriate technology onboard according to the government policy named "Thailand 4.0" for reducing the numbers of man power onboard by installing a net drum and other associated to fishing operation e.g. refrigeration system and so on thus manpower can be reduce for more than 30%.
4. Hence, the government will have a clear policy and provide with appropriate actions to enable the associated fishing vessel to the enhancement of shelter area to decent the working standards onboard as well as to strengthen law enforcement including the structure flexibility, supporting program or source of loan.



The Resolution on the Future of SEAFDEC

Review of Works and Countries' Directives in Relation to Marine Capture Fisheries

Suwanee Sayan

SEAFDEC Secretariat

INTRODUCTION

Since its establishment in 1967, SEAFDEC's direction has been changed from improvement of technologies including capture fishery, aquaculture and post harvest technology for enhancing the fishery production to the promotion of responsible fisheries of the Southeast Asian region in 1990s taking into accounts to the requirements of the international fisheries-related issues continue to emerge, as well as fisheries policy issues and trade barriers, threatening the sustainability of the fisheries and aquaculture sectors in the Southeast Asian region. In 2017, as SEAFDEC was entered the threshold of its Fiftieth Anniversary and taking the opportunity of the occasion as a platform to guide SEAFDEC towards its future direction, the SEAFDEC Program Committee during its Thirty-ninth Meeting in 2016 suggested that a Special SEAFDEC Council Meeting should be organized with the objective of setting the future direction of SEAFDEC beyond its Fiftieth year. The Resolution on the Future of SEAFDEC was therefore developed taking into accounts the prioritized issues for future regional program formulation adopted during the Forty-sixth Meeting of the SEAFDEC Council in 2014, and the recommendations/suggestions by SEAFDEC Member Countries. The Resolution on the Future of SEAFDEC: Vision, Mission, and Strategies Towards 2030 was adopted (**Annex1**) during the Special SEAFDEC Council Meeting in Bangkok, Thailand on 15 November 2017 which organized in conjunction with the Fiftieth Anniversary of SEAFDEC.

REVIEW OF WORKS AND COUNTRIES' DIRECTIVES

The Resolution comprises of preamble, Vision and Missions, and six (6) strategies including 29 actions that SEAFDEC have to take into consideration when developed any programs/projects to ensure that it is alignment within 6 strategies to meet the SEAFDEC vision towards 2030. Six strategies are as follows: 1) Securing the sustainability of fisheries to contribute to food security, poverty alleviation and livelihood of people in the region; 2) Supporting the sustainable growth of aquaculture to complement fisheries and contribute to food security, poverty alleviation and livelihood of people in the region; 3) Ensuring the food safety and quality of fish and fishery products for the Southeast Asian region; 4) Enhancing trade and compliance of the region's fish and fishery products with market requirements; 5) Addressing cross-cutting issues, such as labor, gender and climate change, where related to international fisheries; and 6) Empowering SEAFDEC to strengthen its roles in the region and to improve its services to Member Countries. Considering the marine capture fisheries issues, all strategies are concerned exception to the Strategy 2 and 3 where the areas are focused on aquaculture and food safety aspects, respectively. **Table 1** shows the existing FCG/ASSP projects which are related to the marine capture fishery under the responsibility of SEAFDEC/TD, MFRDMD and Secretariat in

accordance with the new SEAFDEC Strategy toward 2030. The key action requires for marine capture fisheries can be concluded as follows:

- Assessment of important marine fish stocks in the region and development of guidelines of management measures for such fish stocks;
- Compilation of scientific data and information including local knowledge on marine fisheries to support policy formulation and management for sustainable fisheries;
- Development and promotion of regional measures and tools for combating IUU fishing;
- Development of innovative management tools and concepts that are applicable for fisheries in the region;
- Development and promotion of responsible fishing technologies, including energy optimization, carbon reduction and reduction of post-harvest losses onboard fishing vessels;
- Integration of habitat and fisheries management, and provision of support for the conservation of important fishery resources;
- Development and promotion of traceability system for fish and fishery products in the region;
- Monitoring of the possible impacts of and raising awareness on climate change to fisheries, and development of adaptation and mitigation measures in response to such impacts;
- Development regional initiatives to promote the consideration of environmental and biodiversity conservation issues in fisheries management; and
- Recognition of the importance of small-scale fisheries, welfare of labor in fisheries, safety at sea, and gender equality in the fisheries sector.

CONCLUSION AND WAY FORWARD

What SEAFDEC need to support Member Countries on marine capture fisheries can be summarized into five (5) areas as follows: 1) Stock assessment including the stock structures, stock status and monitoring. SEAFDEC need to have a strategy to promote national stock assessment, fishery data collection framework, and improvement of fisheries statistics at national level. This should lead to support the Regional assessment for shared stock within the Southeast Asia; 2) Fishery profiles in each Member Countries to make sure that we understand the fishery structure, fishing effort and fisheries monitoring. One of the big challenges to support the stock assessment is the fishing efforts by type of gear. In this regards, to avoid the data poor analysis for shared stock or fish stock, SEAFDEC need to address how important of the data collection on fishing effort to member countries; 3) Governance issues on fisheries policy and management, and regulation; 4) Social-cultural aspects which are related to consumption, livelihoods, and community awareness such as on climate changes, importance of small-scale fisheries, welfare of labor in fisheries, safety at sea, and gender equality in the fisheries sector, etc.; and 5) Development of innovative management tools and concepts that are applicable for fisheries in the region

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ANNEX 1

ADOPTION

(Adopted on 15 November 2017 at the Special Meeting of SEAFDEC Council)

Resolution on the Future of SEAFDEC:

Vision, Missions, and Strategies Towards 2030

We, the Council Directors of SEAFDEC during our Meeting in Bangkok, Thailand on the occasion of the Special Meeting of the SEAFDEC Council on 15 November 2017 organized in conjunction with the 50th Anniversary of SEAFDEC,

Recognizing that provisions in various international instruments such as the United Nations Convention on the Law of the Sea (UNCLOS, 1982), the UN Sustainable Development Goals (SDG, 2015), the FAO Code of Conduct for Responsible Fisheries (CCRF, 1995), and relevant International Plans of Action are crucial for the development of programs and activities towards enhancing the practices for sustainable fisheries development in the Southeast Asian region;

Affirming the need to implement actions in line with regional fisheries policy frameworks, particularly the Resolution and Plan of Action on Sustainable Fisheries for Food Security for the ASEAN Region adopted by the ASEAN-SEAFDEC Ministers and Senior Officials responsible for fisheries during the ASEAN-SEAFDEC Conference on Sustainable Fisheries for Food Security for the ASEAN Region Towards 2020 “Fish for the People 2020: Adaptation to a Changing Environment” in June 2011;

Also affirming the need to support the Member Countries of SEAFDEC in the implementation of regional guidelines and policy recommendations developed by the SEAFDEC in collaboration with the Member Countries;

Bearing in mind the need to enhance cooperation with ASEAN under the ASEAN-SEAFDEC Strategic Partnership (ASSP) framework, support the implementation of activities under the ASEAN-SEAFDEC Fisheries Consultative Group (FCG) mechanism, and take into consideration the “Strategic Plan of Action on ASEAN Cooperation in Fisheries (2016-2020)”;

and

Recognizing the need for SEAFDEC to continue playing an active role in enhancing the collaboration among the Member Countries, as well as partnerships with prominent regional, international

organizations and donor agencies towards the sustainability of fisheries and aquaculture in the Southeast Asian region;

Being aware the fact that regional guidelines and policy recommendations and frameworks developed under different organizations, mechanism and arrangements beyond Southeast Asian region need to be taken into account; and

Resolved to adopt the Vision, Missions, and Strategies of SEAFDEC towards 2030, as follows:

I. VISION

“Sustainable management and development of fisheries and aquaculture to contribute to food security, poverty alleviation and livelihood of people in the Southeast Asian region ”

II. MISSIONS

“To promote and facilitate concerted actions among the Member Countries to ensure the sustainability of fisheries and aquaculture in Southeast Asia ” through:

- i. **Research and development** in fisheries, aquaculture, post harvest, processing, and marketing of fish and fisheries products, socio-economy and ecosystem to provide reliable scientific data and information.
- ii. **Formulation and provision of policy guidelines** based on the available scientific data and information, local knowledge, regional consultations and prevailing international measures.
- iii. **Technology transfer and capacity building** to enhance the capacity of Member Countries in the application of technologies, and implementation of fisheries policies and management tools for the sustainable utilization of fishery resources and aquaculture.
- iv. **Monitoring and evaluation** of the implementation of the regional fisheries policies and management frameworks adopted under the ASEAN-SEAFDEC collaborative mechanism, and the emerging international fisheries-related issues including their impacts on fisheries, food security and socio-economics of the region.

III. STRATEGIES

1) Securing the sustainability of fisheries to contribute to food security, poverty alleviation and livelihood of people in the region:

- a. Assessment of important marine fish stocks in the region and development of guidelines of management measures for such fish stocks;
- b. Assessment of the status of inland fisheries, and compilation of baseline information on policies and regulations related to inland fisheries in the Member Countries;

- c. Compilation of scientific data and information including local knowledge on both inland and marine fisheries to support policy formulation and management for sustainable fisheries;
 - d. Development and promotion of regional measures and tools for combating IUU fishing;
 - e. Development of innovative management tools and concepts that are applicable for fisheries in the region;
 - f. Development and promotion of responsible fishing technologies, including energy optimization, carbon reduction and reduction of post-harvest losses onboard fishing vessels; and
 - g. Integration of habitat and fisheries management, and provision of support for the conservation of important fishery resources.
- 2) Supporting the sustainable growth of aquaculture to complement fisheries and contribute to food security, poverty alleviation and livelihood of people in the region:**
- a. Development, verification and promotion of responsible and sustainable aquaculture technologies, to improve the quality of broodstocks and technologies on seeds production;
 - b. Finding alternatives to fish meal in feed formulation and promote economical use of feeds;
 - c. Development of practical fish health management strategies including the establishment of early warning system for aquatic animal diseases;
 - d. Generation of appropriate technologies for rural aquaculture to provide livelihood and alleviate poverty; and
 - e. Compilation of scientific data and information including local knowledge to support policy on sustainable aquaculture.
- 3) Ensuring the food safety and quality of fish and fishery products for the Southeast Asian region:**
- a. Development and promotion of technology to produce high quality, healthy and safe fish and fishery products to meet the international standards;
 - b. Improving endogenous processing technologies to standard or acceptable levels;
 - c. Regular monitoring of chemical and biological contaminants to ensure seafood safety; and
 - d. Promotion of seafood quality assurance systems for fish processing establishments in the region.
- 4) Enhancing trade and compliance of the region's fish and fishery products with market requirements:**
- a. Strengthening the cooperation among Member Countries to implement international standards in trade of fish and fishery products within the ASEAN region;
 - b. Development of regional standards, policies and guidelines to enhance intra-regional/international trade; and
 - c. Development and promotion of traceability system for fish and fishery products in the region.
- 5) Addressing cross-cutting issues, such as labor, gender and climate change, where related to international fisheries**
- a. Provision of platforms for monitoring and evaluating the impacts of emerging international fisheries-related issues on the fisheries and economic sectors in the region;

- b. Organizing fora to enhance the awareness of Member Countries on international fisheries-related issues and coordinating the development of the ASEAN Common Positions to address the regional concerns on the issues;
 - c. Monitoring of the possible impacts of and raising awareness on climate change to fisheries and aquaculture, and development of adaptation and mitigation measures in response to such impacts;
 - d. Development regional initiatives to promote the consideration of environmental and biodiversity conservation issues in fisheries and aquaculture management; and
 - e. Recognition of the importance of small-scale fisheries, welfare of labor in fisheries, safety at sea, and gender equality in the fisheries and aquaculture sector.
- 6) Empowering SEAFDEC to strengthen its roles in the region and to improve its services to Member Countries:**

Strengthening SEAFDEC’s capacity to support ASEAN’s efforts to adopt and implement regional policies and guidelines, as well as ASEAN’s efforts to monitor the implementation of such regional policies and guidelines;

- a. Enhancing the human resource capability of the Member Countries to support, adopt and nationalize regional policies and guidelines;
- b. Expanding the network with prominent organizations in relevant fields and engaging actively in international fisheries fora;
- c. Enhancing human resources within SEAFDEC organization and pooling expertise in the region to improve the performance of SEAFDEC; and
- d. Promoting SEAFDEC to wider international communities to gain more supports from organizations, governments and donors.

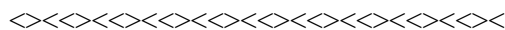


Table 1: Existing FCG/ASSP projects which are related to the marine capture fishery

No.	Program Thrust/Project Title	Lead Department	Strategy Towards 2030					
			1	2	3	4	5	6
1	Human Resource Development for Sustainable Fisheries	TD	✓					✓
2	Optimizing Energy Use/Improving Safety Onboard in Fishing Activities	TD	✓					✓
3	Promotion of Sustainable Fisheries Resources Enhancement Measures in Critical Habitats/Fishing Grounds in Southeast Asia	TD	✓					✓
4	Enhancing Coastal Community Resilience for Sustainable Livelihood and Coastal Resources Management	MFRDMD	✓					✓
5	Promotion of Counter Measures to Reduce IUU fishing activities	TD	✓					✓

No.	Program Thrust/Project Title	Lead Department	Strategy Towards 2030					
			1	2	3	4	5	6
6	Combating IUU Fishing in the Southeast Asian Region through Application of Catch Certification for Trading of Fish and Fishery Products	MFRDMD				✓		✓
7	Establishment and Operation of a Regional System of Fisheries <i>Refugia</i> in the South China Sea and Gulf of Thailand	TD	✓					✓
8	Fisheries Resource Survey and Operational Plan for M.V. SEAFDEC 2	TD	✓					✓
9	Offshore Fisheries Resources Exploration in Southeast Asia	TD	✓					✓
10	Enhancing the compilation and Utilization of Fishery Statistics and Information for Sustainable Development and Management of Fisheries in Southeast Asian Region	TD/SEC				✓		✓
11	Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region	MFRDMD						✓
12	Research for Enhancement of Sustainable Utilization and Management of Sharks and Rays in the Southeast Asian Region	MFRDMD						✓
13	Fisheries and Habitat Management, Climate Change and Social Well-being in Southeast Asia	SEC	✓				✓	✓
14	USAID-SEAFDEC “Oceans and Fisheries Partnership”	TD				✓	✓	✓



TRAINING DEPARTMENT
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