



**The International RIHN Final Seminar  
on  
Coastal Area Capability Enhancement in  
Southeast Asia**

*15 and 17 March 2017*

*Bangkok and Rayong, Thailand*



# Information Note

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For the convenience of the participant who will attend The International RIHN Final Seminar on Coastal Area Capability Enhancement in Southeast Asia, the following information is provided:

## **DATE and Venue**

The International RIHN Final Seminar on Coastal Area Capability Enhancement in Southeast Asia will be organized at the Kasetsart University, Bangkok and the Star Convention Hotel, Rayong Province, Thailand on 15<sup>th</sup> and 17<sup>th</sup> March 2017, respectively. Participants are requested to register before attending the opening of the seminar on Wednesday 15<sup>th</sup>, March 2017 at the Registration Desk in front of Meeting room 303, 3<sup>rd</sup> floor of the Boon Indrambarya Building, Faculty of Fisheries and on Friday 17<sup>th</sup>, March 2017 at the Srisoonthon 2 meeting room of the Star Convention Hotel.

## **TRANSPORTATION ARRANGEMENTS**

Upon the arrival to Suvarnabhumi International Airport, SEAFDEC staff will wait for you at the EXIT Door C Gate 10. In case you cannot find our staff, please wait at GATE 10, or contact Dr. Nopporn Manajit, please call Mobile phone +668 3846 4567

## **ACCOMMODATION ARRANGEMENTS**

Participants are requested to take accommodation at the the Maruay Garden Hotel (<http://www.maruaygardenhotel.com>), Bangkok and the Star Convention Hotel (<http://www.starconventionhotel.com>), Rayong province. For sponsored participants, the room charge would be responsible by SEAFDEC. However, the charge excludes the expense

for mini bar, telephone, as well as other personal items, of which the participants have to take responsibility.

## **CONTACT PERSONS**

Administrative arrangements:

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# AGENDA

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## **The International RIHN Final Seminar on Coastal Area Capability Enhancement in Southeast Asia**

*15 and 17 March 2017*

*Bangkok and Rayong, Thailand*

- Wrap-up summary of 5-years “Area Capability Project”: Area capability approach for coastal community and fisheries development *(by Dr. Satoshi Ishikawa)*
- Community-based Stock enhancement of Black Tiger in Batan Bay, Philippines *(by Dr. Hisashi Kurokura)*
- **Socio-economics in Rayong** *(by Miyata)*
  - Management and Operation of Small-scale Fishing in the Gulf of Thailand *(by Thanyalak Suasi)*
  - Actual situation of livelihood of small-scale fishing household in Thailand –The case study in Eastern, and Center of Gulf of Thailand *(by Jariya Sornkliang)*
  - The Important role of Middle Person in Small-scale Marine Capture Fisheries Product Distribution: Case study in Rayong Province, Thailand *(by Rattana Tiaye)*
- **Fishing gear & Fishing boat**
  - Importance of small-scale fisheries to coastal communities in Rayong, Thailand *(by Dr. Anukorn Boutson)*
  - Seasonal variations in small-scale fisheries in Rayong, Thailand *(by Dr. Keigo Ebata)*
  - Dimension measurement of coastal fishing boat in Rayong *(by Dr. Seiichi Takeda)*
- **Biology and Environment**
  - Fish collection of Rayong beach by set-net *(by Veera Vilasri)*  
Environmental condition in cultured area at Bandon Bay, Surat

- Thani Province, Thailand (*by Jintana Salaenoi*)
- Environmental assessment of the set-net operation in Rayong, Thailand (*by Sukchai Arnupapboon*)
  - Trophic level study with stable isotope analysis of set-net catch species in Rayong, Thailand (*by Udom Khrueniam*)
- **Set-net**
    - Area capability enhancement through introduction of community-based set-net (*by Aussanee Munprasit*)
    - Catch trend analysis of Japanese-type set-net introduced in Rayong Province, Thailand (*by Dr. Takafumi Arimoto*)
    - Impact of technology transfer of Japanese-type set-net for small-scale fisheries in Rayong coast, Thailand (*by Dr. Akashi Watanabe*)
    - Marketing and distribution channel of set-net catch in Rayong (*by Dr. Osamu Baba*)/ *Jariya Sornkliang*)
  - **Acoustics**
    - Educational study of acoustic surveys in coastal shallow area at Southeast Asia (*by Dr. Yoshinori Miyamoto*)

# TIMETABLE

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*The International RIHN Final Seminar on Coastal Area Capability  
Enhancement in Southeast Asia*

***15 March 2017 (Kasetsart University, Bangkok)***

- 0800-0830      Registration
- 0830-0900      Opening ceremony
- Welcome by Faculty of Fishery, Kasetsart University (*by Assist. Prof. Dr. Pongthep Wilaipun, Associate Dean*)
  - Remarks by SEAFDEC (*by Dr. Kom Silapajarn, the Secretary General*)
  - Opening Remarks by RIHN (*by Dr. Satoshi Ishikawa, The Leader of the Project on “Coastal Area Capability Enhancement in Southeast Asia”*)
- 0900-0920      Wrap-up Summary of 5-years “Area Capability Project”: Area capability approach for coastal community and fisheries development (*by Dr. Satoshi Ishikawa*)
- 0920-0940      Community-based Stock Enhancement of Black Tiger in Batan Bay, Philippines (*by Dr. Hisashi Kurokura*)
- Socio-economics in Rayong** (*Moderator by Dr. Tsutomu Miyata*)
- 0940-1000      • Management and Operation of Small-scale Fishing in the Gulf of Thailand (*by Thanyalak Suasi*)

1000-1020      • Actual Situation of Livelihood of Small-scale Fishing Household in Thailand –The case study in Eastern, and Center of Gulf of Thailand  
*(by Jariya Sornkliang)*

1020-1040      • The Important Role of Middle Person in Small-scale Marine Capture Fisheries Product Distribution: Case study in Rayong Province, Thailand  
*(by Rattana Tiaye)*

1040-1110      *Refreshment*

**Fishing gear and Fishing boat** *(Moderator by Dr. Takafumi Arimoto)*

1110-1130      • Importance of Small-scale Fisheries to Coastal Communities in Rayong, Thailand  
*(by Dr. Anukorn Boutson)*

1130-1150      • Seasonal Variations in Small-scale Fisheries in Rayong, Thailand  
*(by Dr. Keigo Ebata)*

1150-1210      • Dimension Measurement of Coastal Fishing Boat in Rayong  
*(by Dr. Seiichi Takeda)*

1210-1300      *Lunch*

**Biology and Environment** *(Mr.Aussanee Munprasit)*

1300-1320      • Fish Collection of Rayong Beach by Set-net  
*(by Veera Vilasri)*

1320-1340      • Environmental Condition in Cultured Area at Bandon Bay, Surat Thani Province, Thailand  
*(by Dr.Jintana Salaenoi)*

1340-1400      • Environmental Assessment of the Set-net Operation in Rayong, Thailand  
*(by Sukchai Arnupapboon)*



- 1400-1420
- Trophic Level Study with Stable Isotope Analysis of Set-net Catch Species in Rayong, Thailand  
(by Udom Khrueniam)

**Set-net** (Moderator by Dr. Yuttana Theparunrat)

- 1420-1440
- Area Capability Enhancement through Introduction of Community-based Set-net  
(by Aussanee Munprasit)

- 1440-1500
- Catch Trend Analysis of Japanese-type Set-net Introduced in Rayong Province, Thailand  
(by Dr. Takafumi Arimoto)

1500-1530 Refreshment

- 1530-1550
- Impact of Technology Transfer of Japanese-type Set-net for Small-scale Fisheries in Rayong Coast, Thailand (by Dr. Akashi Watanabe)

- 1550-1610
- Marketing and Distribution Channel of Set-net Catch in Rayong (by Dr. Osamu Baba)

**Acoustics** (Moderator by Dr. Monton Anongpornyoskun)

- 1610-1630
- Educational Study of Acoustic Surveys in Coastal Shallow Area at Southeast Asia (by Dr. Yoshinori Miyamoto)

1630-1640 Closing Ceremony (by, Dr. Kaoru Ishii, DSG of SEAFDEC)

**Remark:**

- 1) Master of Ceremonies by Dr. Methee Kaewnern
- 2) Each presenter should present 15 min. and Q&A 5 min.

# PRESENTATION SESSION

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1. Management and Operation of Small-scale Fishing in the Gulf of Thailand (*by Thanyalak Suasi*)
2. Actual Situation of Livelihood of Small-scale Fishing Household in Thailand –The case study in Eastern, and Center of Gulf of Thailand (*by Jariya Sornkliang*)
3. The Important Role of Middle Person in Small-scale Marine Capture Fisheries Product Distribution: Case study in Rayong Province, Thailand (*by Rattana Tiaye*)
4. Importance of Small-scale Fisheries to Coastal Communities in Rayong, Thailand (*by Dr. Anukorn Boutson*)
5. Seasonal Variations in Small-scale Fisheries in Rayong, Thailand (*by Dr. Keigo Ebata*)
6. Dimension Measurement of Coastal Fishing Boat in Rayong (*by Dr. Seiichi Takeda*)
7. Fish Collection of Rayong Beach by Set-net (*by Veera Vilasri*)
8. Environmental Condition in Cultured Area at Bandon Bay, Surat Thani Province, Thailand (*by Dr. Jintana Salaenoi*)
9. Environmental Assessment of the Set-net Operation in Rayong, Thailand (*by Sukchai Arnupapboon*)
10. Trophic Level Study with Stable Isotope Analysis of Set-net Catch Species in Rayong, Thailand (*by Udom Khrueniam*)
11. Area Capability Enhancement through Introduction of Community-based Set-net (*by Aussanee Munprasit*)
12. Catch Trend Analysis of Japanese-type Set-net Introduced in Rayong Province, Thailand (*by Dr. Takafumi Arimoto*)
13. Impact of Technology Transfer of Japanese-type Set-net for Small-scale Fisheries in Rayong Coast, Thailand (*by Dr. Akashi Watanabe*)
14. Marketing and Distribution Channel of Set-net Catch in Rayong (*by Dr. Osamu Baba*)
15. Educational Study of Acoustic Surveys in Coastal Shallow Area at Southeast Asia (*by Dr. Yoshinori Miyamoto*)

# Management and Operation of Small-scale Fishing in the Gulf of Thailand

*Thanyalak Suasi<sup>1</sup>, Miyata Tsutom<sup>2</sup>, Mina Hori<sup>3</sup>, Methee Kaewnern<sup>4</sup> Sumitra Ruangsivakul<sup>1</sup>, Jariya Sornkliang<sup>1</sup>, and Rattana Tiaye<sup>1</sup>*

*<sup>1</sup>Southeast Asian Development Center/Training Department*

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*<sup>3</sup>Kochi University, <sup>4</sup>Kasetsart University*

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## ABSTARCT

This study aim to provide the baseline data on the characteristics of small-scale fisheries in the Gulf of Thailand by select three study area as the representative of east, center and southern region of the Gulf of Thailand namely: Rayong, Prachuap Kirikhan-Chumphon and Suratthani province. The data collection conducted by face to face interview the fishers from three study area using the questionnaire, the actual number of sample size is 297, 286 and 316 samples respectively, the data analysis were using descriptive statistic. The result of this study show that the small-scale fishers operate fishing in the coastal area using powered fishing boat with length 6-10 meters and spend one trip per day for fishing, the fishers have more than one type of fishing gear and decide to use each fishing gear follow the fishing season of target species. Crab gillnet is the main type of fishing gear operating in the study area, therefore, Blue swimming crab is the main target species economically in three study area which the fisher can catch high volume in the peak season during rainy period even though it has a strong wind and big wave. The economics of fishing operation illustrates that the fisher interviewed receive significant net incomes using each fishing gear, however, most small-scale fishers engage in fisheries combine with agriculture, aquaculture and labor that would be the other sources of income for fishers.

**Keywords:** Small-scale fishing, Fishing gear

# **Actual Situation of Livelihood of Small-scale Fishing Household in Thailand –The case study in Eastern, and Center of Gulf of Thailand**

*Ms. Jariya SORNKLIANG<sup>1</sup>, Dr. Miyata TSUTOM<sup>2</sup>, Dr. Methee KAEWNERN<sup>3</sup>, Dr. Mina HORI<sup>4</sup>, Ms. Sumitra RUANGSIVAKUL<sup>1</sup>, Ms. Thanyalak SUIST<sup>1</sup>, and Ms. Rattana TIAYE<sup>1</sup>*

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## **ABSTARCT**

The study on actual situation of livelihood of small-scale fishing household in Thailand aimed to express current status and compare situation of fishing household of three areas in gulf of Thailand are located in eastern part at Rayong province(Ban Chang, Mouang and Klang district), Center part at Prachuab Kirikhan province(Bangsapan Noi and Bangsapan district) and Chumphon province(Pathew district), and Suratthani province(Kanchanadit, Thanchang, Chaiya,Donsak, and Muang district). The data were collected through semi structure questionnaire interview for 297 at Rayong, 286 at Prachaub Kirikanand Chumphon and 316 at Suratthani. The result focus on General information, Livelihood, Regarding business and Personal information of respondent. In part of general information in three areas were found that there is same information are following age of fishermen highest in during 41-50 years old, and respondent's education are primary school, there are member in family mode in 4 and 3 people, and main religion is Buddhism. For livelihood and regarding business part found that fisheries are main occupation for three area and fishermen have fishing experiences around 26 years old. And income form fishing of three area are 383,730, 520,483, and 521,458 respectively it was no significant

difference at the 95% level confidence. They also have supplementary income by in Rayong area from agriculture same as in Prachuab Kirikhan & Chumphon area, however Suratthani area, supplementary income from aquaculture. Most of business will sale they product through middleman. In personal information part shown that fishermen 's household income of each area are following; 20,928, 17,859, and 31,026 respectively, it is being no significant difference at the 95% level confidence for Rayong and Prachaub Kirikhan & Chumphon while Rayong with Suratthani, and Prachuab Kirikhan & Chumphon with Suratthani, there is significant difference at the 95% level confidence. Fishermen in three area have fundamental facility for they living e.g. television, washing machine, refrigerator, fan mobile phone and motorcycle and facilities show that It is related with monthly income when monthly income are high fishermen will have more facilities for comfortable day life. The situation of livelihood in fishing household show that fisheries are main occupation for three areas and three area have similar situation on socioeconomic in fishing household.

***Keywords:*** *Fishing household, Livelihood, Rayong area, Prachuab Kirikhan & Chumphon area, Surathani area,*

# **The Important Role of Middle Persons in Small-scale Marine Capture Fisheries Product Distribution: case study in Rayong province, Thailand**

*Rattana Tiaye<sup>1</sup>, Miyata Tsutom<sup>2</sup>, Sumitra Ruangsivakul<sup>1</sup>,  
Jariya Sornklian<sup>1</sup>, and Thanyalak Suasi<sup>1</sup>*

<sup>1</sup> *Coastal and Small-scale Fisheries Management Division, SEAFDEC-Training  
Department*

<sup>2</sup> *Japan Fisheries Research and Education Agency*

## **ABSTARCT**

The main objective of this study is to describe the small-scale marine capture fisheries products distribution in Rayong Province, Thailand, which particularly focus on the relationship between small-scale fishers and middle persons who are play important role for buying fish from the small-scale fishers. The data were collected by interviewing 297 small-scale fishers who fish along the 3 districts of adjacent sea in Rayong province and 39 middle persons. The results found that more than 60% of fishers sell their catch to the middle persons. The middle persons buy the aquatic products from the same fishers and the fishers also sell their catch to the same middle persons. 60% of middle persons provide loan or fishing gear to fishers when they lose one's capital from fishing. The relationship between fishers and middle persons in small-scale fisheries is like a mutual assistance system. However, the co-management for small-scale marine fisheries products among the fishers themselves or between the fishers and middle persons with supporting by local government can sustain the fisher livelihood and benefit in the selling and buying system.

**Keywords:** *middle person, small-scale fisheries, fisheries products distribution, role, relationship*

# **Environmental condition in cultured area at Bandon Bay, Surat Thani Province**

*Jintana Salaenoi, Yuki Okamoto, Kazuya Watanabe,  
Takashi Yoshikawa and Satoshi Ishikawa*

## **ABSTARCT**

The environmental condition in cultured area at Bandon Bay, Surat Thani Province during 2012-2014 was investigated. Physical data, water quality, sediment and phytoplankton from expected areas both in summer and rainy season were kept and determined. It was found that ammonia, nitrite, nitrate, orthophosphate, and silicate were higher in rainy season compared to summer, except for dissolved oxygen. Higher organic matter contents and acid volatile sulfide in sediment were expressed in the east coast (muddy and loamy soil) than the west coast (sandy soil) with variation content in layers. The different contents of protein, carbohydrates and uronic acids in the sediment in both seasons and depth were appeared. pH of the sediment was suitable for aquaculture and no differences at the levels of sediment depth. Ash and lignin contents were higher in the west coast than the east coast and the mouth of Tapi river, and the high contents were expressed in rainy season. For phytoplankton, 98 species were found in cultured area and diatom was the dominant group both in type and content in two seasons. High productivity was found in rainy season than summer. Comparing to the size, the content of chlorophyll a from micro-plankton was shown higher than that from nano-plankton, while chlorophyll b and c mainly found in nano-plankton than micro-plankton. Chitinolytic and cellulolytic bacteria were majority in sediment, while sulphate reducing, proteolytic, lipolytic, and acidic bacteria were minority. East coast (Kanchanadit district) has shown the higher yield of cockle production than the West Coast (Chaiya district).

# **Environmental Assessment of the Set-net Operation in Rayong Province, Thailand**

*S. Arnupapboon<sup>1</sup>, R. Punsri<sup>1</sup>, R. Munprasit<sup>2</sup>, K. Phuttharaksa<sup>2</sup>, B. Yangponkhan<sup>2</sup>, P. Laongmanee<sup>3</sup>, A. Laksana<sup>3</sup>, T. Somlux<sup>3</sup>, T. Yoshikawa<sup>4</sup>, T. Arimoto<sup>5</sup>, S. Ishikawa<sup>6</sup>*

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*<sup>6</sup>Research Institute for Humanity and Nature, Japan*

## **ABSTARCT**

Environmental assessment of set-net operation in Mae Rumphueng Beach, Rayong Province was conducted around the set-net fishing ground during 2013-2014. Field surveys were done within the set-net A, set-net B and the reference area in the beginning (October 2013), middle (January 2014), ending (April 2014) periods of the operation and six months after the operation ending (October 2014). The results of paired t-test using the all measured data show that acid volatile sulfide (AVS) of the bottom sediments were not significantly different between any pair of the four periods ( $p>0.05$ ). Additionally, average amount of AVS over the all three areas in the beginning ( $0.0011\pm 0.0018$  mg/g dry, mean $\pm$ S.D.), middle ( $0.0026\pm 0.0029$  mg/g dry), ending ( $0.0028\pm 0.0028$  mg/g dry), and after-ending ( $0.0053\pm 0.0117$ ) were much lower than the criteria value for critical farm (2.5 mg/g dry proposed by Yokoyama, 2003). The densities of benthic macro-fauna in the set-net stations were significantly higher than those in the reference stations during the middle and ending periods; whereas those during the beginning and after-ending periods were not significantly different from each other. These results indicate that set-net operation was not relevant to the polluted substance, AVS, but induced the increment of benthic macro-fauna density during the operation season and that recovery of the initial condition took place soon after removal of gear construction.



***Keywords:*** set-net, acid volatile sulfide (AVS), benthic macro- fauna, environmental assessment

# **Trophic Level Study with Stable Isotope Analysis of Set-net Catch Species in Rayong, Thailand**

*U. Khrueniam<sup>1</sup>, K. Phuttharaksa<sup>1</sup>, T. Arimoto<sup>2</sup>, T. Yoshikawa<sup>3</sup>, K. Kon<sup>4</sup>, Y. Okamoto<sup>5</sup>, S. Ishikawa<sup>5</sup>, R. Munprasit<sup>6</sup>, S. Arnupapboon<sup>7</sup>*

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## **ABSTARCT**

For evaluating the sustainability of Japanese-type set-net introduced to Rayong province, Thailand, the mean trophic level ( $TL_m$ ) of the set-net catch was analyzed by means of the stable isotope analysis and annual catch amount of major species during the period 2003-2013.

The samples of muscle tissue and stomach content (48 species, 1030 individuals in total) were collected from the set-net and other gears in December 2012-March 2013, October-November 2013 and March 2014, in Rayong, Thailand. The environmental samples including the particulate organic matter (POM), the sedimentary organic matter (SOM), phyto/zoo-plankton and benthos were also collected. Stable isotope ratios were analyzed by Delta V advantage and Flash EA 1112 at Research Institute for Humanity and Nature, Kyoto. The  $TL_m$  were calculated with catch composition data of 2003-2013.

The stable isotope ratios of muscle tissues varied among fish species, with the range from 6.5 to 12.6‰ for  $\delta^{15}\text{N}$ , and -19.0 to -14.5‰ for  $\delta^{13}\text{C}$ . The

widespread trend of  $\delta^{15}\text{N}$  values suggested that wide range of trophic levels was included in the set-net catch species. The highest  $\delta^{15}\text{N}$  of muscle tissue was found in *Trichiurus lepturus*, and the lowest in *Aluterus monoceros*. The highest  $\delta^{13}\text{C}$  of muscle tissue was found in *Taeniura lymma*, and the lowest in *A. monoceros*. The highest  $\delta^{15}\text{N}$  (10.0‰) of diets from stomach content was found in *Tylosurus acus melanotus*, and the lowest (5.1‰) in *Himantura imbricate*, respectively. The highest  $\delta^{13}\text{C}$  (-16.8‰) of stomach content was found in *Carangoides fulvoguttatus*, and the lowest (-21.4‰) in *H. imbricate*. Through the comparison of muscle and diet  $\delta^{15}\text{N}$  for each species, the nitrogen isotopic enrichment factor was identified to be  $2.29 \pm 1.04\text{‰}$  (Mean  $\pm$  S.D.) ranging from 0.42 to 3.79‰. Which was much lower than the general value (3.4‰) in the previous studies. The trophic levels were calculated by the local  $\delta^{15}\text{N}$  enrichment factor and  $\delta^{15}\text{N}$  of primary producer (POM for the most of species but SOM for *T. lymma* and *H. imbricate* according to the Cluster Mapping). Consequently, the  $TL_m$  of set-net catch was identified to be in the range of 3.59-3.78 during the period 2003-2013, suggesting the stable trend in a higher level, which was different with the fishing down trend reported with survey trawl catch in the Gulf of Thailand. The  $TL_m$  must be good index to evaluate the sustainability of set-net in comparison with the other gears for long-term analysis, toward the establishment of the ecosystem-based fisheries management in Eastern Gulf of Thailand.

# **Educational Study of Acoustic Surveys in Coastal Shallow Area at Southeast Asia**

*Yoshinori MIYAMOTO<sup>1</sup>, Yuttana THEPAROONRAT<sup>2</sup>, Keiichi UCHIDA<sup>1</sup>, Monton ANONGPONYOSKUN<sup>3</sup>, Toyoki SASAKURA<sup>4</sup>, Yap MINLEE<sup>1</sup>, Kritsada THONGSILA<sup>5</sup>, Kohei HASEGAWA<sup>6</sup>*

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*<sup>6</sup>NRIFE, Japan*

## **ABSTRACT**

It is important to know the distribution of fisheries resources in the shallow sea area of the coast of Southeast Asia. However, adequate research equipment and methods of survey have not been established. Presently survey methods are including by trawl net and acoustic survey. Acoustic survey is an effective way to efficiently investigate a wide range of cover survey area. However, survey equipment is expensive and requires skill and know-how.

The objectives of project component 5 are 1) construction of small and inexpensive acoustic survey data collection, 2) establishment of coastal acoustic research methods for fish distribution rather than the estimated amount of resources, create distribution pattern of fish, 3) establishment of a data analysis technique and 4) educational and enlightenment of acoustic surveys.

The RIHN project achievement during 5 year program are developed the new data collection equipment and analysis systems of acoustic survey at coastal area successfully. Field test of the developed equipment and

system are conducted in Rayong and Japan. On-site-training on operation of developed new acoustic survey equipment and systems for young scientists are carried out in Thailand. Research protocol guidelines for acoustic survey in coastal area are developed and published.

Unfortunately, with time and budget constrain, the project could not completed an appropriate education and enlightenment of fishery acoustics. In the future, we will continue to promote the educational and enlighten the effectiveness of acoustic survey method by seeking cooperation with others academic societies (AFAS etc.).

## POSTER SESSION

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1. Fisher's consciousness on fisheries management at Fisheries Community in Thailand: case study in Rayong, Prachuap Kiri Khan, Chumphon and Surat Thani Province (*by Ms. Sumitra Ruangsivakul*)
2. Livelihood of fishing households that operated coastal aquaculture in Bandon bay, Surat Thani (*by Dr. Methee Kaewnern*)
3. A fisher's consciousness regarding fisheries resources and fishing ground in Gulf of Thailand (*by Dr. Tsutom Miyata*)
4. Comparison of bycatch and discards from bottom crab gillnet between artificial and non-artificial reef fishing ground in Rayong, Thailand (*by Mr. Thaweesak CHANCHIEM, et al.*)
5. The catch analysis of bigfin reef squid from the squid trap in Rayong province (*by Ms. Anpinut Witan-urawat, et al.*)
6. Effect of soak time on the catch of fish trap in Rayong, Thailand (*by Mr. Kunut Suthipongkeat, et al.*)
7. Some economic catch species from fish trap in Rayong, Thailand (*by Ms. Chadaporn Aksonpan, et al.*)
8. Survey of Pelagic Fish Distribution Around Set-Net, Rayong Province by Fish Finder (*by Dr. Monton Anongpornyoskun*)

# **Livelihood of Fishing Households that Operated Coastal Aquaculture in Bandon Bay, Surat Thani**

*Methee KAEWNERN<sup>1</sup>, Miyata TSUTOM<sup>2</sup>*

*<sup>1</sup>Faculty of Fisheries, Kasetsart University, Thailand*

*<sup>2</sup>Socioeconomic Development Group, Fisheries Research Agency, Japan*

## **ABSTRACT**

Bandon bay located in Surat Thani province, southern of Thailand covering approximately an area of 1,070 km<sup>2</sup>. The inner bay that extends for 80 km coast, where most mollusc culture areas are located, covers an area of 480 km<sup>2</sup>. With gradually sloping intertidal zone of the coast, it has a mean water depth of 2.9 m with respect to mean sea level. There is a large band of mudflats extends along the coast to about 2 km of off shore area. Since Bandon bay receives most of the surface freshwater runoff from Tapi-Phumduang river watershed. This geographic condition leads to nutrient enrichment in the bay and abundant of natural marine resources. Therefore, the bay is one of the most country's productive coastal areas that production come not only from capture fisheries but also aquaculture which support domestic demand with high return.

To identify coastal area capability and strengthen suitable management approach in this area, investigation of fishing household livelihood and their perspective in current career are necessary. The survey for data collection therefore was conducted during 2012-2014. A total of 316 small scale fishing households from 5 districts namely Chaiya, Thachang, Muang, Kanchanadit and Donsak were interviewed using structured questionnaire. In addition, information from local administrations in study area was also collected. Among these amount, 87 fishing households operated aquaculture as a source of their family incomes. Since aquaculture especially mollusc culture is an important activity in the bay and is recognized as a signature product of country. This paper therefore aims to point out demographic data, income sources, activities and problems on production, product distribution of

those 87 fishing households. It also provided information on their attitude on fishery management, social capital and livelihood.

The demographic data of 87 small scale fisher, who operated aquaculture indicated that most of respondents were man (66.7%) and nearly half of them had age between 41-50 years old. However, like other sector in fisheries, most of them have education level only at primary school. Family members ranged between 1-3 persons. The results showed that main sources of income of them came from aquaculture, capture fisheries and trading in village. Approximated incomes of those sources were 0.84, 0.41 and 0.37 million Bath per year respectively. Due to availability of mudflat area, main aquatic species cultured in Bandon bay were cockle (*Anadara granosa*) and oyster (*Crassostrea belcheri*). Meanwhile sea bass (*Lates calcarifer*) was also cultured both in cage and earthen pond. The information from the last crop cycle indicated that cockle, oyster and sea bass culture are about 1 year.

Labor used in aquaculture activities ranged from 1-6 persons with average of 2 persons. Although aquaculture was a good income source for respondents, however more than half of them (54.7 %) faced with some problems with high seriousness level such as increasing of operation cost (seed, cultured materials), slow growth rate, degradation of water quality. They also concerned on environmental problems such as water discharges from land based shrimp farming and industry factories and freshwater runoff. Like a common practice of small scale fisher in Thailand, most of production was sold to middle man who determined product price and rather transported it by boat than car or motorcycle.

According to view point of respondent on fishery management aspects, like other groups of respondents which have not operated aquaculture, although they agreed that fishery resources such as fish, shrimp, crab or mollusc in the sea are considered as a common property and fishery is open access activity in Thailand, do fishing under this principle may lead to over-fishing and fishery resource reduction. However, more than



half of them (60.9%) thought that fishing activities should be open access. Only 39.1% of respondents did not agree with this concept and about 79% of those indicated that only village members should have right to do fishing in their fishing area. Almost respondents (90.8%) have ever heard of fisheries management in and around their fishing ground and knew that the purposes of fishery management are to conserve enhance fishery resources for sustainable utilization. Management activities in the study area that recognized by respondents were prohibition on fishing during spawning period, mesh size control for net. Respondents agreed that fishery management is necessary for this area. In their point of view, when the catch production reduced about 50% of current volume, some fishery management measures should be implemented. If fishery management is installed to maintain fishery resources, they could bear for 30% catch reduction at beginning of implementation. However, they could bear for that situation only within 2 years. The results on social capital indicated that more than half of respondents were not member of organization in their community. Only some respondents were members of fishing group, socio-civic group. Almost respondents believed that they have ability to borrow money. Relatives and neighborhood were the one who could give helps when emergency cases happened. In general public views of life, they satisfied current financial situation of family. Almost of them (98.9) were still happy with current life. Only 48.3% of them worried about low and uncertain income, children education and health. However, they still lived with high hope. They thought that rich natural resources are very important for maintaining their career and protecting the environment should be given priority even if it causes slower economic growth and some loss of returns. The information from this study revealed Bandon bay has a good capability to generate income for local communities. Small scale fisher who operated aquaculture in Bandon bay have good livelihood, however management measured still needed for sustain their career.

**Keywords** : Small-scale fisheries, Aquaculture, Livelihood, Bandon Bay

# TRAVEL AND SEMINAR PROGRAM

*The International RIHN Final Seminar on Coastal Area Capability Enhancement  
in Southeast Asia*

***16-18 March 2017, Star Hotel, Rayong, Thailand***

<b>Date</b>	<b>Time</b>	<b>Activity</b>
16 Mar (Th.)	0900-1200	<b>Coaster:</b> Leave from Maruay Garden Hotel to Rayong <b>Van:</b> Leave from SEAFDEC/TD to Rayong
	1800-2100	<i>Reception dinner at EMDEC (host by SEAFDEC)</i>
17 Mar (Fr.)	1130-1200	Registration
	1200-1300	<i>Lunch at Star Hotel (providing for all participants)</i>
	1300-1700	The International RIHN Final Seminar on Coastal Area Capability Enhancement in Southeast Asia in Star Hotel  <i>(Main target is fisherman and stakeholder, present by Thai language) see detail in seminar timetable</i>
	1730-2000	<i>Farewell dinner (host by RIHN)</i>
18 Mar (Sa.)	1200-1700	<b>Coaster:</b> Leave Rayong to airport and hotel <b>Van:</b> Leave Rayong to SEAFDEC/TD

*Remark: Activity and time might be change depend on situation*

# TIMETABLE

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*The International RIHN Final Seminar on Coastal Area Capability  
Enhancement in Southeast Asia*

***17 March 2017 (Rayong Province, Thailand)***

- |   |   |
|---|---|
| 1130-1200   | Registration ( <i>at Srisoonthon 2 meeting room</i> )   |
| 1200-1300   | Lunch ( <i>providing for all participants</i> )   |
| 1300-1320   | Opening ceremony <ul style="list-style-type: none"><li>• Welcome by EMDEC (<i>by Kumpon Loychuen, Director of EMDEC</i>)</li><li>• Remark by SEAFDEC (<i>by Dr. Yuttana Theparoonrat</i>)</li><li>• Opening Remarks by RIHN</li></ul>                                   |
| 1320-1340   | Introduction of 5-years “Area Capability Project”: Area capability approach for coastal community and fisheries development ( <i>by Dr. Nopporn Manajit</i> )   |
| <b>Socio-economics in Rayong</b> ( <i>Moderator by Sumitra Ruangsivakul</i> ) |   |
| 1340-1410   | <ul style="list-style-type: none"><li>• Summary on 5-year socio-economic activities in Rayong</li><li>• Summary of results from implementation activities</li><li>• Benefit of activities for fisherman and stakeholder</li></ul> <i>Present by Socio-economic team</i> |

## **Fishing gear and Fishing boat** (*Moderator by Dr. Nopporn Manajit*)

- 1410-1430
- Importance of small-scale fisheries to coastal communities in Rayong, Thailand, with the topic on Seasonal variations in small-scale fisheries in Rayong, Thailand (*by Dr. Anukorn Boutson*)

## **Biology and Environment** (*Moderator by Kamolrat Phutraksa*)

- 1430-1450
- Fish collection of Rayong beach by set-net (*by Veera Vilasri*)
- 1450-1510
- Environmental assessment of the set-net operation in Rayong, Thailand (*by Sukchai Arnupapboon*)

## 1510-1530 *Refreshment*

### **Set-net** (*Moderator by Dr. Yuttana Theparoonrat*)

- 1530-1550
- Area capability enhancement through introduction of community-based set-net, including topic on Catch trend analysis of Japanese-type set-net introduced in Rayong Province, Thailand (*by Aussanee Munprasit*)
- 1550-1610
- Impact of technology transfer of Japanese-type set-net for small-scale fisheries in Rayong coast, Thailand (*by Dr. Nopporn Manajit*)
- 1610-1630
- Marketing and distribution channel of set-net catch in Rayong (*by Jariya Sornkliang*)

### **Acoustics** (*Moderator by Dr. Monton Anongpornyoskun*)

- 1630-1650
- Educational study of acoustic surveys in coastal shallow area at Southeast Asia: focusing in case study in Rayong area (*by Dr. Yuttana Theparoonrat*),

1650-1700      Closing ceremony (*by RIHN*)

1730-2000      *Farewell dinner at restaurant a long beach (host by RIHN)*

*Remark: Master of Ceremonies by Dr.Methee Kaewnern.*

