

## **TRAWL FISHERY AT PRAN BURI, PRACHUAB KIRI KHAN PROVINCE THAILAND: A PILOT PROJECT ON THE USE OF INDICATORS AS A MANAGEMENT TOOL IN FISHERIES MANAGEMENT \***

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### **Introduction**

The Prachuap Khiri Khan Province of Thailand is located in the middle of the Malay Peninsular and its coast faces to the East on the Gulf of Thailand. The provincial population in 1998 was 473,335. The GPP (Gross Provincial Products) of this province at current market prices was 29,554 million Baht in 1996, and ranks 15<sup>th</sup> among the 76 provinces in the country. GPP per capita of the province was 57,786 Baht. The main industry is agriculture and fishery. Crops, livestock, forestry, and agricultural processing products contributed 4,650 million Baht (16% of total GPP in the Province), while the fishery sector contributed 2,811 million Baht (10%). The working population in 1998 was 242,093, among which 122,075, or almost half, work in the primary industry. An average household monthly income in the province was 10,017 Baht in 1998. Income from agriculture and farming was 7,411 Baht. Though there is no available data for fisher household income, since fisher households are classified as agricultural, these data on average incomes suggest a level of fisher income (SEAFDEC, 2000).

Prachuap Khiri Khan Province comprises 8 districts (or *amphoe*). Pran Buri is located in the northernmost area of the province. The population of Pran Buri was 72,027 in 1999.

### **Description of Fishery**

#### *Importance and Production*

In the Gulf of Thailand, the major marine capture fisheries consist of large scale and small scale fisheries. The total landings in 1998 was 2.4 million tonnes which 64 % (1.53 million tonnes) was from the Gulf of Thailand and 36 % (0.86 million tonnes) was from the Andaman Sea. Among the large scale fishing gear, fish production of about 55 % came from the otterboard trawl fisheries. Otter board trawl is one of the most widespread and the most important gear in term of production and the number of fishing boats. Otter board trawlers of over all length (OBT LOA) <14m is an important gear for catching shrimp. This type of fishing contributes greatly to local food security. Their fishing grounds are mostly within 3 km from shore and nets have a cod-end mesh size of 2.0cm. The fisheries are operated by the poorest fishers using their own family labor as well as hired labor from other regions of Thailand. Due to the decline of resource, the fishers have been forced to extend their operation hours as well as reduce their net mesh size for their survival. Without having proper management, this fishery may have destroyed the resources. Furthermore, the fishers may not profit from their fishing operations.

#### *Current Management Measures*

The Department of Fisheries of Thailand has established regulations to prohibit fishing by trawlers and push netters within a distance of 3,000m from the shoreline and within a perimeter of 400m of any stationary gear.

As an outcome of the National Seminar held by the Department of Fisheries in 1999, the fishers from trawl fisheries agreed to enlarge the cod-end mesh size of shrimp trawlers (OBT LOA <14m) from 2.0cm to 2.5cm. The Department of Fisheries has to conduct a set of experiments and show the loss and gain from the fisheries after the enlargement of the mesh sizes. The regulatory measures for the optimum mesh size used will be proposed for further consideration of the higher rank policy makers.

#### *Reasons for Selecting Fishing Site and Fishing Gear*

The otter board trawler (OBT LOA) <14m is selected within the selected site at Pran Buri district. The small sized otter board trawlers in this area are usually operated by local fishers and/or hired labor from other regions of Thailand. Fishers in this area earn the lowest income when compared to fishers of other areas. Moreover, some trawlers sometimes operate illegally within the area 3km from shore. Almost of the fishers at the project site are willing to give a good cooperation. Thus, it is more convenient and a good outcome from the pilot project can be expected that will facilitate better management of the fisheries in this area.

#### *Geographical Distribution*

Otter board trawlers of over all length <14m at Pran Buri are operated in the shallow sea between latitude 12° 25 N and latitude 12° 45 N and in a depth of water of about 20m.

#### *Fishing Gear and Methods*

A trawl net made from polyethylene 380 d/9 with mesh size 2.5cm and another with a cod-end mesh of 2.0cm and made from polyethylene 380 d/12 will be used. The head rope is 24-29m and ground rope 26-30m. The ground rope is weighted by chain. The otter board is rectangular and made from wood. Three or four fishers will take part in the fishing operations. A small shrimp trawler with LOA less than 14m will be hired for a series of experiments using enlarged cod-end mesh sizes. The fishing operations will be conducted during night time.

### **Pilot Project Implementation**

**Part I.** Survey the project area and review the basic knowledge of the selected study area.

**Part II.** Hold a Consultation Meeting with the stakeholders (fishers, processors, local authorities and local government officers) to inform them and explain the objectives and purpose of the pilot project to them as well as to discuss their problems.

**Part III.** Collect data from otter board trawlers by sampling on a monthly basis from April to December 2003 to study the present fishery status and trend.

**Part IV.** Conduct an experimental study on the use of enlarged mesh sizes proposed as a new condition or as an alternative condition. In this study an otter board trawler will be hired and nets with cod-end mesh sizes of 2.0, 2.5 and 3.0cm will be used. The mesh size of the cover net used for these experiments will be 1.5cm.

**Part V.** Hold a Concluding Meeting with the stakeholders to report them the outcome of the study and present to them the proposed management plan. Finalize the report to submit to SEAFDEC.

#### *Expected Outcome for the Pilot Project*

The fishers will know the present fishery situation from several indicators and may help to take action for the management of fisheries in their area. The selected site will have a management plan to manage the small shrimp trawl fishery. The stakeholders in the area may help to solve the problems in that area. If the pilot project is successful, it will be used as a case study for other areas for sustainable fishery management.

*Part I and Part II Activities (Survey and Consultation Meeting)*

Following the Resolution and Plan of Action from the ASEAN-SEAFDEC Conference on Sustainable Fisheries for Food Security in the New Millennium, SEAFDEC (Southeast Asian Fisheries Development Center) has cooperated with Department of Fisheries Thailand to start a pilot project on the use of indicators as a tool in fisheries management. The otter board trawl fishery in Pran Buri, Prachuap Khiri Khan was selected for the pilot project. This project aims to enhance awareness of stakeholders and increase participation of fishers, stakeholders and communities in sustainable fisheries. Stakeholders will be encouraged to play a role and cooperate in the determination of appropriate indicators for use in management towards sustainable fisheries. Also at present, decentralization of fisheries management in particular towards responsible fisheries, is now becoming a main policy as mentioned in the constitution, 2540 (AC.1997). Therefore this pilot project places emphasis on encouraging fishers and other stakeholders to participate, criticize, raise problems and propose solutions for more efficient, effective and sustainable resource management.

*Objectives of the Meeting*

1. To brainstorm, share experiences among stakeholders (fishermen, private sector, government officer, community leader etc.)
2. To announce and show perspective view of project to fishermen and other stakeholder in details.
3. To call for cooperation between fishermen and other stakeholder in running project.

*Participants and Instructors*

<b>Participants</b>	3 July 2003	4 July 2003
Government officers from DOF	17	14
Officers from SEAFDEC	2	-
OBT fishermen at Pran Buri	33	32
Local Government Unit (LGU)	5	
Middleman	2	3
<b>Instructors</b>		
Government officers from DOF	2	-
Officers from SEAFDEC/MFRDMD	1	1
<b>Total</b>	<b>62</b>	<b>50</b>

*Meeting Venue*

1. Pattara yacht club
2. Project area

*Date*

3<sup>rd</sup> - 4<sup>th</sup> July 2003

**Conclusions and Recommendations**

At the meeting, the SEAFDEC National Coordinator for Thailand, Mr.Somsak Chullasorn, presented the background of the Indicators Project in Thailand and the SEAFDEC Regional Project Leader for the Indicators Project, Ms. Phaik-Ean Chee, presented the status of the pilot projects that are being implemented in other member countries. Dr. Mala Supongpan from SEAFDEC Secretariat presented a paper on the use of indicators for fisheries management. She

also mentioned that indicators will be very useful for fisheries management in the pilot project area. These indicators will provide a ready tool for describing the state of fishery resources and fishery activities. After that, the project team brainstormed, identified and proposed indicators that can be used as suitable management tools. The project team selected 11 indicators which could be separated into three groups. These are:

1. Resource indicator
  - Catch per unit effort (CPUE)
  - Catch composition of good and trash fish
  - Number of species caught
  - Average size of fish
  - Size of mature fish, shrimps and *Sepia* spp.
2. Fleet
  - Fishing time
  - Fishing power
3. Economic and social indicators
  - Income per unit effort
  - Cost
  - Profit of fishers
  - Price index

The panel accepted the above indicators proposed. Then the project team identified information and data required for collection and explained the method for the enlarging cod-end mesh size from 0.6 inches to one and 1.2 inches for the experimental survey. The project team started to collect the data in the project site on August 2003 and the first experiment using the enlarged cod-end mesh size was conducted in September 2003.

#### *Data Collecting Procedure*

1. Record catch data, fishing effort, size, price of fish
2. Categorize fish caught
3. Identify fish species
4. Measure of the length and weigh the fish
5. Collect specimens to study the reproductive biology of target species
6. Interview fishers to compile general information on the fishery, fishing grounds, fishing methods, marketing of fish and price of fish.

A routine survey of the local small shrimp trawlers will be conducted monthly at Pran Buri fishing piers. Samples will be taken from fish landings and interviews with skippers will be conducted at the fishing pier.

The fish caught by the sampled shrimp trawlers and from the experimental study will be sorted out into food fish category (fish and shrimp) and trash fish category (small size commercial fish of economic importance and true trash fish). The species identification of both categories will be done and the price of fish species will also be recorded. The sizes of fish caught will be measured by species and separated by mesh sizes.

#### *Analysis of Data*

Analyses of the catches, catch composition, number of species caught, average fish size, size of mature fish will be determined.

### Existing Data in 1997 and New Data in 2003

Initial data collected are summarized in the table below.

**Table 1:** Summary of some data on indicators compiled for the pilot project

Year	1997	2003
Fishing effort (hr/day)	10	13.40
Target species	Shrimp	Shrimp
CPUE (kg/hr)	21.949	19.540
CPUE of commercial fish with economic value (kg/hr)	13.290	13.046
Commercial fish with economic value :	61:39	67:33
Trash fish (%)		
CPUE of trash fish (kg/hr)	8.659	6.493
Small size commercial fish with economic fish : True trash (%)	35 : 65	32:68
Return (Baht/day)	2,522.23	
Total Cost (Baht/day)	2,607.23	
Profit	-84.98	

### Constraints and Solutions

#### ☞ Variation of Data Year by Year

Data on indicators for analysis should be time series data. However data collected in the past years were different from the present since conditions were different. It was therefore difficult to compare data and develop them for the indicator pilot project. E.g. in 1997, fishers had not graded their group of trash fish. They sold by a flat price of 1.25 baht/kg. Since 2002, fishers have sorted their catch and sold by two groups, trash fish and miscellaneous fish with prices of 1 baht/kg and 3.5-4 baht/kg respectively.

#### ☞ No Control Over the Landing Site

Selection of the project site requires to careful consideration. After the start of the sampling program, the data collector found that parts of catches had been sorted and sold or processed by the fishers themselves before discharging at the landing site of pilot project. Complete data could not be collected and data analysis could be inaccurate.

#### ☞ Unable to Maintain the Standard Measurement and Classification

Although the national guidelines on the classification and measurement of catch had been agreed upon, in practice, it was found to be different from the guidelines in certain years. This caused difficulties to follow-up activities. E.g. in 1997, the classification was focused only at the genus level but in 2002 it was changed to the species level. The absolute comparison between catches in 1997 and 2002 was only possible at the genus level. This could not allow the recognition of endangered marine species.

#### ☞ Alteration of the National Standard for Catch Measurement and Classification

Some acceptable international standards for catch classification have not been harmonized with the national standard. Data collected in the past, following the national standard for catch classification, could not be compared with the present data collected which are based on the international standards for catch classification. In the past, the Thai national standard measurement for shrimp total length was from the rostrum to the telson. Following the introduction of a standard measurement by FAO, measurement of shrimp total length was changed to middle of eye to telson.

☞ Error in Catch Data from Sea Trial

Error in data collected from the sea trial is one of the problems that may affect the analysis. Through practical experience, there tends to be discrepancies in the data due to the massive amount of catch data. If the collector of these data is not experienced enough, errors cannot be detected and this will affect the accuracy of the analysis. Although experienced scientists are able to detect errors in the catch data, they still need to take time to carefully check data. However owing to the problem of the insufficient number of scientists, a longer time is required for data analyses resulting in delays in reporting.

*Solutions*

To enhance good and accurate data collection, collectors have to report in detail on the real time conditions together with the catch data. Any comparison of time series data should be conducted with caution.

The landing site selected for sampling should be where fishers discharge their whole catch.

It is recommended to harmonise the standard of measurement classification to the national guideline of catch measurement classification. Every detail for alteration the national guideline of catch measurement classification must be clarified the impact of usage data before the agreement.

The collector should restrictively maintain data gathering process under standard of catch measurement and classification.

Develop the skills and experience of the people related to the field. To reduce mistakes in data management (Collection and analysis) staff development programs should be established not only to increase number of staff but also to introduce the regional standardization of catch measurement and classification and to improve catch data for use internationally.

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**\* Appendix 1: Project Information**

Project Leader: Ms. Ratanawalee Phoonsawat

Project team: Ms. Jintana Jindalikit  
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**Data of project initiation:** July 2003

**Planned project duration:** from July 2003-April 2004