



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

**REPORT**

**EXECUTIVE SUMMARY OF THE PRE-EFFECT ANALYSIS REPORT  
OF MUD SPINY LOBSTER REFUGIA PROJECT  
OF TOWARDS THE SOCIO-ECONOMY  
OF FISHERS ALONG SOUTH PAHANG TO EAST JOHOR**

**JOHOR, MALAYSIA  
6 SEPTEMBER 2018**

Prepared by  
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SOUTHEAST ASIAN FISHERIES DEVELOPMENT CENTER  
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## Introduction

Under the project entitled “Establishment and Operation of a Regional System of Fisheries Refugia in the South China Sea and Gulf of Thailand”, a baseline socioeconomic survey of fishers covering eight fishing areas was undertaken during March to August 2018. The main aim of the study were (i) to obtain fishing and socio-economic profile of lobster fishers in the East Coast of Peninsular Malaysia from South Pahang to East Johor; (ii) to determine the lobster exploitation such as the number of fishers, catching equipment, vessels, catch rates, etc.; and (iii) to confirm fishers acceptance of the proposed lobster refugia in Tanjung Leman, Johor.

### Basic Profile of Fishers

A total of 138 respondents were surveyed, covering the areas of Kuala Rompin (10.1%), Rompin Lama (3.6%) and Endau (3.6%) at Pahang; Tanjung Leman (14.5%), Tanjung Sedili (11.6%), Sedili Besar (13.8%), Sedili Kecil (15.2%) and Sungai Musoh (27.6%) at Johor. The respondents were consisted of 94.9% of artisanal fishers, compared to only 5.1% trawlers (Plate 01).

Percentage respondents below 20 years old, 20 – 29 years old, 40 – 59 years old and above 60 years old were 1.0%, 23.0%, 50.0% and 26.0% respectively.

The literacy rate among the respondents was high at 93.4%. 79.7% respondents were locals (Pahangites and Johorean), while the rest came from other states.

92.0% respondents have their own residence. Percentage distribution of households dwelling i.e. brick house, wooden house and semi-wooden house were 72.3%, 5.1% and 22.6% respectively.

The percentage of respondents with the number of household members between 1 – 4 pax, 5 – 8 pax, 9 – 12 pax and more 13 people per family were 43.0%, 50.4%, 5.9% and 0.7% respectively.

78.8% of the respondents interviewed were members of Fisheries Associations at their respective areas.

100% of the respondents interviewed indicated that their households were equipped with clean tap water and electricity from energy provider (TNB).

98.6% of respondents' household were using in-house toilets.

The percentages of respondents who owned vehicles and electrical appliances were motorcycles (84.8%), cars (68.8%), refrigerators (96.4%), washing machines (94.2%), televisions (92.8%) and mobile phones (92.0%).

### Employment and Respondents' Income

Percentage distribution of respondents by major tool groups were 66.1% (Drift nets / Pukat Hanyut), 19.1% (Traps / 'Bubu'), 4.3% (Longlines / 'Pancing'), 1.7% (Trawls) and 8.8% (other locally made fishing tools).

The average earnings per month of weighted fishing only for respondents was RM2,161.95; and the overall weighted average monthly income for respondents was RM2,586.32 which inclusive of main occupation, side incomes, fishery subsistence allowances and other income sources (Table 01).

### Household Expenditure of Respondents

The average expenditure per month of respondents' households as a whole was RM1,176.99. These expenses comprised of food and groceries, home and vehicle financing, home rentals, children's education, utilities and cigarettes.

### General Information on Artisanal Fisheries

The length of the boat and the engine power used by respondents on average was 20.91 feet and 40.94 horsepower.

The average weight of fish catches as a whole was 19.578 kg trip<sup>-1</sup> with a fuel consumption cost at RM60.06 (Table 02).

The cost of capital invested by respondents for the purchase of boats, engines, fishing gears and supporting equipment on average was RM15,691.63 (Table 03)

### **General Information on Lobster Fisheries by Artisanal Gears**

93.2% of respondents caught lobster simultaneously in fishing operations along the Waters of South Pahang to East Johor. On average, lobster composition comprised of 32.65% of the overall total weight of catch per trip (Table 02).

The main fishing gear used by respondent for lobster fishery was drift nets (64.3%), followed by lobster traps (33.7%) and others (2.0%). The other equipment was locally known as 'Bento' and 'Pukat Cerut', used by respondents of Sedili Besar Johor.

The lobster catching season runs actively from March to November. According to respondents, the lobster distribution along the waters off Pahang to Johor was influenced by Southeast Wind ('Angin Tenggara').

The lobster capture areas were between 1.91 to 7.75 nautical miles from the coastline. The depth of the lobster habitat was estimated between 6.00 to 50.0 meters.

The comparison of lobster catches from 2016 to 2018 indicated that 69.66% of respondents reported significant declines. Among the contributing factors were (i) pollution due to reclamation works, (ii) oil spill contaminations, (iii) current and weather changes, (iv) port constructions, (v) the sea was getting shallower; and (vi) the over-whelming number of fishers.

On the other hand, 14.61% of respondents informed that lobster fishery was increasing due to factors such as (i) fishers were more experienced, (ii) improved seasons and weather conditions, (iii) more efficient fishing equipment, (iv) bigger engine horsepower; (v) operating areas were near to the artificial reef.

There is a difference in price and size for lobster market for both states. In South Pahang, lobster reaches a market price of RM80.00 (USD19.29) per kilogram with marketable size of 400g per piece. In East Johor, the ex-vessel price of lobster can reach up to RM140.00 (USD33.75) per kilogram with desirable size of 200g per piece.

### **Level of Awareness**

52.9% of respondents were well aware of the proposed establishment of lobster refugia at Tanjung Leman, Johor.

Although the percentage of respondents who knew about the proposal was not much different from those who did not know, nevertheless, 88.19% of respondents agreed with the establishment of refugia as proposed by DoF.

85.29% of respondents agreed not to conduct fishing operation of lobster during its breeding season after the establishment of refugia.

75.27% of respondents agreed to be responsible for maintaining the refugia after its establishment.

83.70% of respondents agreed that the area of lobster refugia should be gazette as a fishing restriction zone.

97.06% of respondents agreed that the Department of Fisheries should discuss with the fishers and fishers 'community regarding the proposal of the establishment of lobster refugia in the beginning.

### **The Benefits of Refugia**

94.68% of respondent agreed that lobster refugia could potentially increase fishers 'incomes.

94.32% of respondents agreed that lobster refugia could potentially increase artisanal or small-scale fishers.

97.10% of respondents agreed that fishers will gain useful knowledge from the establishment of lobster refugia.

95.74% of respondents agreed that the number of lobsters will increase significantly from the establishment of refugia.

97.59% of respondents agreed that the quality (size) of lobster would be greatly improved from the establishment of refugia.

90.24% of respondents agreed that more refugia's should be established in the Malaysian Waters.

### Social and Environmental Protection

70.00% of respondents agreed that the refugia establishment will definitely change the utilization of land, sea and fishery resources.

72.22% of respondents agreed that the modification of land use due to refugia's establishment would cause changes in social and economic activities.

Only 22.22% of respondent agreed that the refugia's establishment would cause displacement of residents to other areas.

83.72% of respondents agreed that the establishment of refugia would not reduce the number of fishers.

55.81% of respondents disagreed that refugia establishment will affect human rights such as dignity, culture and uniqueness of fishers and fish communities.

54.55% of respondents disagreed that the refugia establishment will cause problems and conflicts land rights holders and fishers' access to fishery resources.

79.49% of respondent disagreed that the establishment of refugia would upset the eco-tourism activities and recreational fisheries in the respective areas.

87.18% of respondents disagreed that the establishment of refugia would cause fishers' living standards and local community to decline.

91.43% of respondents disagreed that the establishment of refugia would have a disproportionate impact on women, the elderly, the disabled and the poor.

79.17% of respondents disagreed that the establishment of refugia would affects the cultural heritage of the local community.

### Charts and tables

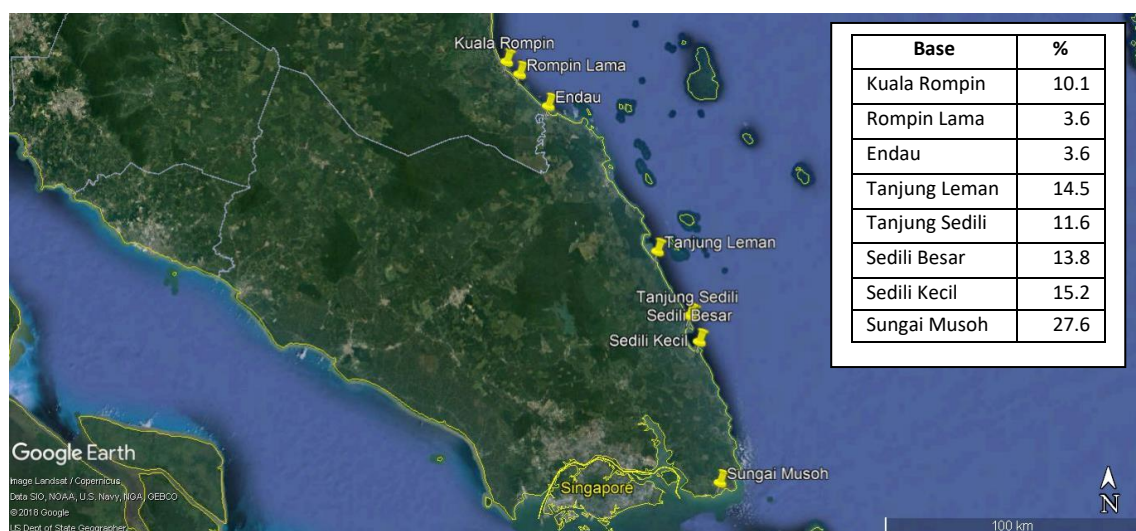


Plate 1: The number of respondents and the designated areas

Table 1: Average respondents' income and household expenditures based on fishing gears

Fishing Gears	Income from fishing operations	Total income	Household Expenditures
Drift nets	2,133.96	2,569.65	1,227.21
Traps	2,964.76	3,328.00	1,164.95
Longlines	633.33	933.33	806.67
Others <sup>1</sup> Pukat Tangsi*	750.00	1,300.00	907.25
Others <sup>2</sup> Rawai*	2,000.00	2,150.00	1,275.00
Others <sup>3</sup> Tagan*	500.00	800.00	928.00
Others <sup>4</sup> Jaring Tahan*	1,500.00	2,300.00	1,110.00
Others <sup>5</sup> Pukat Cerut*	200.00	700.00	213.00
<b>Overall Average</b>	<b>2,161.95</b>	<b>2,586.32</b>	<b>1,176.88</b>
			Unit : RM month <sup>-1</sup>

Table 2: The catch of fishers of South Pahang – East Johor

Fishing Base	Weight of catch (kg trip <sup>-1</sup> )	% of lobster (weight)	Fuel consumption (RM trip <sup>-1</sup> )	No. of operational days in a month
Kuala Rompin	25.000	4.63	56.58	17.00
Rompin Lama	18.000		78.23	20.00
Endau	47.500	30.00	71.33	12.00
Tanjung Sedili	57.042		63.85	22.20
Tanjung Leman	21.441	40.00	56.25	23.50
Sedili Besar	15.000	17.00	55.33	17.00
Sedili Kecil	9.056	23.00	59.10	22.86
Sungai Musoh	5.130	58.65	59.54	24.43
<b>Overall Average</b>	<b>19.578</b>	<b>32.65</b>	<b>60.06</b>	<b>21.10</b>

Table 3: Capital investment by respondents of major fishing gears

Respondents of major fishing gear	Boat (RM)	Engine (RM)	Major fishing gear (RM)	Secondary fishing gear (RM)	Mean Capital (RM)
Drift nets	6,159.09	8,389.86	1,990.67	1,509.00	15,420.54
Traps	6,968.42	8,433.33	2,936.67	1,585.71	16,967.50
Longlines	6,500.00	9,666.67	1,753.33	800.00	15,265.00
Others <sup>1</sup> Pukat Tangsi*	5,333.33	6,666.67	1,100.00	1,500.00	13,233.33
Others <sup>2</sup> Rawai*	6,500.00	5,850.00	5,000.00		14,850.00
Others <sup>3</sup> Jaring Tahan*	9,000.00	12,000.00			21,000.00
<b>Overall Average</b>	<b>6,346.32</b>	<b>8,368.75</b>	<b>2,179.21</b>	<b>1,504.11</b>	<b>15,691.63</b>