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Dear Dr.,

## APPOINTMENT AS A REVIEWER - JOURNAL OF SUSTAINABLE SCIENCE AND MANAGEMENT (JSSM)

I take this opportunity to express our sincerest appreciation for your assistance in reviewing our article for Journal of Sustainable Science and Management (JSSM).

Title : **Socio-Economic Profile Comparison of Fishermen Community in Kuala Marang and Seberang Takir, Terengganu, Malaysia**

We look forward to working with you again. Thank you.

**"MENJANA KHAZANAH ILMUWAN"  
"OCEAN OF DISCOVERIES FOR GLOBAL SUSTAINABILITIES"**

Yours sincerely,

**(PROF. DR. MHD IKHWANUDDIN BIN ABDULLAH)**  
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**SOCIO-ECONOMIC PROFILE COMPARISON OF FISHERMEN  
COMMUNITY IN KUALA MARANG AND SEBERANG TAKIR,  
TERENGGANU, MALAYSIA**

Journal:	<i>Journal of Sustainability Science and Management</i>
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Keywords:	fishermen, socio-economic, fishermen household

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**SOCIO-ECONOMIC PROFILE COMPARISON OF FISHERMEN COMMUNITY IN KUALA MARANG AND SEBERANG TAKIR, TERENGGANU, MALAYSIA**

**Comment [L1]:** are these smallscale/ traditional or large-scale/modern fishermen?

**Comment [L2]:** use the comparative word in the article title

**Abstract:** In Terengganu itself, as many as 10,497 of total fishermen have been recorded in the year 2015 with 1,326 and 971 of coastal fishermen in Kuala Marang and Seberang Takir district, respectively. Among the problems faced by the local fishermen includes poverty and minimal fishing activity due to the environmental and climate issues, in which these both issues lead to a decline in the fishery production and income. This study is conducted to describe the social and economic indicators of the fishermen and their family in both areas. A total of 162 fishermen were interviewed in both areas and were randomly selected by using Slovin's formula. By using descriptive analysis, the relevance between economic activities and social processes of fishermen and their household is studied. In this study, the results revealed that 100% of male fishermen were recorded in both study areas with 37.1% fishermen being above 50 years old and 27.4% fishermen between 31 to 40 years old in Kuala Marang and Seberang Takir district, respectively. Fishermen in both areas have an average of 4 to 6 numbers of children while 44.9% of fishermen in Kuala Marang have 4 to 6 household members and 32.9% of fishermen in Seberang Takir have from 7 to 9 household members. With an average of USD 626 and USD 755 of household income in Kuala Marang and Seberang Takir, this study revealed that fishermen household income in both areas did not pass the National median household income which was USD 1,307 in 2016. Therefore, occupational opportunities for fishermen household should be offered so that fishermen's wife and children can contribute in increasing their household income besides the introduction of modern fishing utility to reduce fishermen's energy during fishing activities to enhance catches and production of the fishes.

**Keywords:** Socio-economic, descriptive analysis, fisherman, fishermen household

**Introduction**

Malaysia is a country which consists of Peninsular Malaysia and Borneo, bounded by sea at most of its sides with 4,810 km length of coastlines (FAO, 2003). In Malaysia, the fishing waters extend from the shoreline to Exclusive Economic Zone (EEZ) demarcation line area to 200 nautical miles which cover about 450,000 km<sup>2</sup> (FAO, 2009). Due to that, the establishment of several villages or areas has occurred by the local people for the fishing activities with fishermen communities built in each area. Until the year 2015, the number of fishermen's districts by the state are 42 in Peninsular Malaysia and a total of 32 in both Sabah and Sarawak states (DoF, 2015). Obstacles that often haunt and harass the Malaysian local fishermen includes environmental-climate as well as poverty issue. In the issue of uncertainty in climate changes, *Islam et al.*, (2014) reported that the fishery activities in Terengganu are minimal in the monsoon season due

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41 to strong winds. Monsoon season causes turbulent with big waves and strong winds which  
42 occurs yearly between the month of December and February and may cause fishermen to lose  
43 their main source of income provided that they do not have any another income (Asli, 2012). On  
44 the other hand, for the issue of poverty, Rhoumah (2016) stated that the fishermen in Malaysia  
45 still have a high incident of poverty which includes extreme and normal poverty. According to  
46 Yahaya and Wells (1982) and Islam *et al.*, (2014), the incidence of poverty is very high  
47 especially among the artisanal fishermen's household in Terengganu. The issue of poor  
48 fishermen is still relevant until now since most of the fishermen have an individual income of  
49 below than MYR 1,500 and were included into the B40 group (bottom 40% of income group)  
50 (Khatijah *et al.*, 2017).

51 Thus, by studying socio-economic analysis of the fishermen, various types of information and  
52 data can be analyzed and reclassified, which in turn can facilitate the improvement of the  
53 fishermen's affairs. This study also enables the higher authority to identify the issues and  
54 problems regards to fishermen's socio-economy condition as well as its solutions. Stated by  
55 Farid *et al.* (2013), fisherman socio-economic studies were conducted so that initiatives can be  
56 taken in order to improve fisheries management through the improvement of fishermen involved.  
57 Supported by Zuraini *et al.* (2017), the designation of community developmental project  
58 especially for the lower-income group of community can be done by studying socio-economic  
59 profile. For example, government and NGO can play major role to improve socioeconomic  
60 conditions to reduce the poverty level by buying main instruments for fishing, arranging training  
61 programs for applying fish culture, improving sanitation facilities and starting income-generating  
62 activities to increase off-seasons income (Alam, 2005). In another hand, in study of fisherman  
63 socio-economic by Alam (2005), by measuring the fishermen income, the estimation and factor  
64 that causing poverty can be done before proper action can be taken. Analysis of fishermen socio-  
65 economic structure and their living standard were aims to examine the socio-economic status of  
66 populations such as education, income, poverty and unemployment. After all, all these elements  
67 have connections to the quality of local communities' life in aspects of housing health,  
68 telecommunications, social facilities and others (Zuraini *et al.*, 2017).

69 Specifically, 53176 tons matrix worth MYR 337.35 million of fishes landing in the coastal area in  
70 Terengganu had been recorded in 2014 (DoF, 2014). Unfortunately, Terengganu is left behind by  
71 other states such as Perak (258,464 tons matrix with MYR 1,493.42 million), Kedah (135,815 tons  
72 matrix with MYR 1,158.80 million), and Johor (79,628 tons matrix with MYR 554.09 million). From  
73 the data provided, the gap in total fish landed and total revenue from fisheries activity in Terengganu  
74 and some other states in Malaysia possess a huge difference. In the fishing area of Terengganu, the  
75 average fishermen's individual income is MYR 2,260 (Islam *et al.*, 2014) where the studies were  
76 conducted in the area of Besut, Setiu, Kuala Terengganu, Marang, Dungun and Kemaman. However,  
77 most of the fishermen in these areas are fishermen who utilized small and medium-size vessels which  
78 only operates in areas near to the coastline which makes them a small-scales fisher.  
79 In studied areas, most of the fishermen in Kuala Marang earned between USD 250 to USD 500  
80 per month and USD 500 to USD 750 per month for fishermen Seberang Takir. Other, in Lagos  
81 area of Nigeria, majority of fishermen obtained USD 91 per month (Okeowo *et al.*, 2015), USD

Comment [L3]: Add some socio-economic related research results in several other countries (other than Malaysia) as new findings from this study

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3 82 48 to USD 63 per month for majority of fishermen in Jhenidah Bangladesh (Farid *et al.*, 2013),  
4 83 USD 65 to USD 81 per month for majority of fishermen in Visakhapatnam Andhra Pradesh India  
5  
6 84 (Ismail, 2014) and also USD 103 to USD 213 for most of fishermen in Suriagor Del Sur of  
7 85 Philippines (Mercado *et al.*, 2016). From the data provided, the gap of fishermen income in studied  
8 86 areas and some other areas across the globe varies significantly.  
9  
10 87 In Malaysia, various forms of programs have been designed and implemented by the higher  
11 88 authorities to assist in raising the living standard of fishermen and also to facilitate the  
12 89 fishermen's working process. Among the aids provided include petrol and diesel subsidies that  
13 90 are given to reduce the fishermen's burden due to the rising fuel price, fishermen's subsistence  
14 91 allowance (Bantuan Sara Hidup Nelayan) and aid for natural disaster and fishermen's welfare  
15 92 (Skim Bantuan Bencana Alam dan Kebajikan Nelayan) to help fishermen increase their  
16 93 household income and also to improve the condition of fishermen and their families lifestyle if  
17 94 any event of disaster occur. Apart from that, other aid includes special fisherman housing project  
18 95 program (Project Khas Perumahan Nelayan) to ensure that the fishermen's houses are always  
19 96 safe to live in and to upgrade the fishermen's residency (LKIM, 2016).  
20 97 The main objective of this study is to describe the socio-economic characteristic of the  
21 98 fishermen's community in the area of Kuala Marang and Seberang Takir, Terengganu.  
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## 99 100 **Method**

### 101 ***Time and location of the study***

102 Kuala Marang is a town of Marang district located along the South China Sea coast and is the  
103 main road of highway between the area of Terengganu and Pahang state, while Seberang Takir is  
104 located at Sungai Terengganu estuary along the South China Sea coast. Specifically, 1,326 of  
105 coastal fishermen had been recorded in Marang district, while 971 of coastal fishermen had been  
106 recorded in Kuala Nerus district. For the number of fisher's vessel, 3,287 of total vessels were  
107 recorded in the whole of Terengganu state which accounts for around 17% of the total fishing  
108 vessels in Peninsular Malaysia. In Marang, out of the total 572 number of vessels, 418, 105, 18,  
109 7 and 24 fishing vessels were for IS (Inshore), Zone A, Zone B, Zone C and Zone C2,  
110 respectively, while for Kuala Nerus, the sum of total fisher's vessels are 411, 286, 96, 25 and 21  
111 vessels for IS, Zone A, Zone B, Zone C and Zone C2, respectively.

112 The survey on the study areas were conducted in March 2017 until May 2017 and the study areas  
113 covered were Kompleks Lembaga Kemajuan Ikan Malaysia Marang (LKIM) Jetty (Station 1),  
114 Recreational Park Kekabu Island (Station 2) and Tanjung area (Station 3) in Kuala Marang (5°  
115 11' 60. 00" N, 103° 13' 07. 20" E) (Marang district) as illustrated in Figure 1. On the other hand,  
116 Figure 2 shows the study areas in Seberang Takir (5° 20' 59. 99" N, 103° 07' 60. 00" E) (Northern  
117 Kuala Terengganu district) which covers Penambang Boat Jetty (Station 1), Kampung Baru  
118 (Station 2) and Kampung Batin (Station 3).



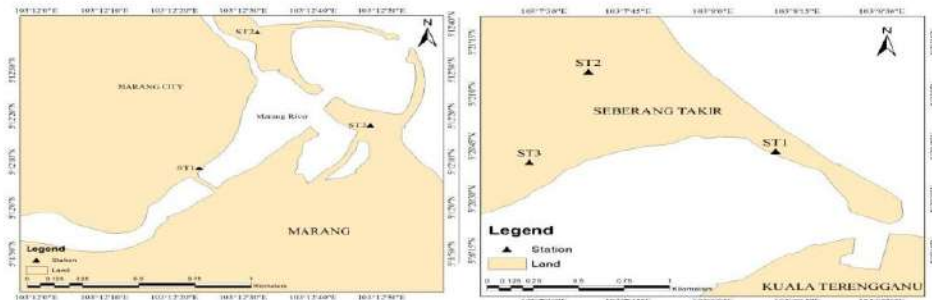


Figure 1: Study location in Kuala Marang area      Figure 2: Study location in Seberang Takir area

The study was conducted in Kuala Marang and Seberang Takir in order to highlight the differences, especially in terms of the fishermen's socio-economic development between large and small fishermen's district. According to Dof (2015), fishermen in Marang made up 15.97% of all fishermen in Terengganu while 9.42% were from Kuala Nerus. In addition, Marang is the second district with the most number of fishermen while Kuala Nerus is the sixth out of seven districts in Terengganu.

#### Sampling method and data collection

Socio-economic quantitative data, which is the primary data, were collected using a structured questionnaire, interviews and group discussion with the fishermen's community. The sample size of fishermen as respondents was decided using Slovin's formula. (Limi *et al.*, 2017) at 90% confidence level. A number of 89 and 73 of the total respondents were interviewed in Kuala Marang and Seberang Takir, respectively. Random and purposive sampling method (Shetima *et al.*, 2014) was also practiced during the process of collecting primary data.

The questionnaire on socio-economic status and characteristics were composed of questions on fishermen's general information and core information (Perumal *et al.*, 2016). An analysis of the fishermen's socio-economic structure and their living standard were analyzed to examine the socio-economic status of populations such as education, income, poverty and unemployment. All these elements seem to have connections with the quality of the local communities' life in the aspects of housing health, telecommunications, social facilities and others (Zuraini *et al.*, 2017).

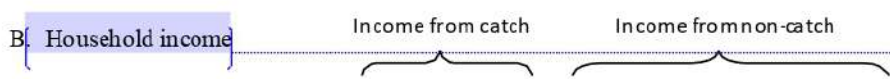
#### Quantitative descriptive analysis

Quantitative descriptive analysis was used to study the socio-economic characteristics of the fishermen's household where all the data were converted and processed into relative numbers and presented in the overall table to observe the overall situation of the fishermen's condition (Okeowo *et al.*, 2015, Das *et al.*, 2015, Sudarmo *et al.*, 2015). To analyze the fishermen's economic condition, the formulas that were used are total net income, total family income statement, and household expenses.

A. Total net income

$$\text{Total Net Income (MYR)} = \text{TR} - \text{TC}$$

Where TR= Total Revenue (MYR), TC= Total Cost (MYR)  
(Olaoye *et al.*, 2012, Okeowo *et al.*, 2015)



$$\text{Household income (MYR)} = [\text{Total Net Income}] + [\text{GI}_1 + \text{GI}_2 + \text{GI}_3 + \text{B}_1 + \text{B}_2 + \text{B}_3 + \dots]$$

Where GI<sub>1</sub>, GI<sub>2</sub> and GI<sub>3</sub> = 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> household member gross income (MYR),  
BI<sub>1</sub>, BI<sub>2</sub> and BI<sub>3</sub> = 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> household member bonuses (MYR)  
(Hendrix, 2017)

Comment [14]: household income is income from catch (Net income (MYR) = total revenue - total cost) with non-catch income (1st household member gross income and bonuses and....)

C. For household total expenses

$$\text{Household expenses (MYR)} = \text{FE}_1 + \text{HE}_1 + \text{CE} + \text{HE}_2 + \text{FE}_2 + \text{IE} + \text{ME} + \text{TE} + \text{O}$$

Where FE<sub>1</sub>= Food expenses, HE<sub>1</sub>= Housing expenses, CE=Communication expenses, HE<sub>2</sub>= Household expenses, FE= Financial expenses, IE=Insurance expenses, ME= Medical expenses, TE=Transportation expenses  
(Canada Mortgage and Housing Corporation, CMHC, 2017)

Comment [15]: household consumption expenditure is expenditure on food and non-food (Household expenses (MYR) = ...)

Results and discussions

Fishermen demographic profile

For the descriptive analysis of the fishermen's demographics profile, both studied areas were dominated by 100% male fishermen. This implies that male are more fit for fishing activities in both areas since it requires sufficient energy due to the fishing area's geographical features besides the technical skills in handling vessels and fishing gears. According to The World Fish Center (2018), the fisheries sector has long been considered a male domain, signifying a sense of adventure and risk valued by men. This finding is also in line with Shettima *et al.*, (2014) and Sudarmo *et al.*, (2015) who conducted their study in Lake Alau Borno of Nigeria and Tegal City of Indonesia, respectively, which discovered that fishery sector is dominated by fishermen compare to fisherwomen. According to Biswal (2015), women's presence in fisheries is perceived differently in different cultures. Women's roles are restricted since some culture consider women going for fishing as superstitious, compare to men. In both studied area, 15.3% and 18.9% of the wives in Kuala Marang and Seberang Takir, respectively, were recorded working and contributing to household income. Majority of the fishermen's wives in Kuala Marang and Seberang Takir (66.7% and 71.4%, respectively) worked with others and become an employee while only 33.3% and 28.6% of the wives work on their own by running small scale businesses. On another hand, 84.7% and 81.1% of wives of the fishermen in Kuala Marang and Seberang Takir were housewives.

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3 190 Age is an important criterion for socio-economy structure since it affects the fishermen's  
4 191 productivity and production in terms of fisheries and household livelihood besides innovation  
5 192 acceptance. The younger fishermen do have more energy to work and are more welcoming to  
6 193 accept any innovation included in fishing unit or fishing management compared to the old  
7 194 fishermen who are comfortable with their old-fashion way of working. Table 1 shows that in the  
8 195 study area of Kuala Marang, a majority of 37.1% fishermen are above 50 years old, with 77  
9 196 years old being the oldest and the youngest is 19 years old. On the other hand, 27.4% majority of  
10 197 the fishermen in Seberang Takir are in the group age of 31 to 40 years old with the 71 years old  
11 198 being the oldest and 19 years old being the youngest. By comparing the data obtained, Seberang  
12 199 Takir recorded the majority of productive and economic age respondent who are able to take  
13 200 strenuous task associated to fishing and increases their income along with fish catch (Olaoye *et*  
14 201 *al.*, 2012). In relation to this, fishermen's fishing experience define one's fishing skills since the  
15 202 more experience possessed by the fishermen, more abilities have been learned and experienced  
16 203 (Shettima *et al.*, 2014). Besides skills, fishing experience also did reflect the fishermen's age,  
17 204 where older fishermen had more fishing experience. In this study, fishermen's experience shows  
18 205 a negative statistically significant on fishermen's household income in both studied areas. With  
19 206 the coefficients of 0.007 and 0.006, a unit increase in fishermen's experience, fishermen's  
20 207 household income will decrease by 0.7% and 0.6% in Kuala Marang and Seberang Takir,  
21 208 respectively. By the same token of Jeyrajah & Santhirasegram (2015), as the number of fishing  
22 209 experience increases, income per fishermen will decrease by USD 1.7 due to increment in age  
23 210 that leads to the deduction in fishing operation.  
24 211 A high percentage of married fishermen were recorded which were 66.3% and 50.7% for Kuala  
25 212 Marang and Seberang Takir, respectively. It implies that occupational mobility might be reduced  
26 213 in both studied areas since each has economic responsibilities in supporting their dependent.  
27 214 Same situations were recorded in Tegal City Indonesia (Sudarmo *et al.*, 2015) and Bagan Lalang  
28 215 Sepang (Perumal *et al.*, 2016) in which 100% of 76.5% of married fishermen were recorded.  
29 216 Besides, 24.7% and 49.3% of unmarried respondents in both areas might be one of the  
30 217 breadwinners in their family to receive economic responsibility.  
31 218 Fishermen in both areas were left behind in terms of educational status which lacks higher  
32 219 education with specific training. In Kuala Marang, a majority of 36% fishermen possess  
33 220 education until their lower secondary level (Form 1 until Form 3), while in Seberang Takir, a  
34 221 majority of 35.6% went until upper secondary level (Form 4 until Form 5). On the other hand,  
35 222 15.6% and 35.2% of fishermen dropped-out of school in both study areas of Kuala Marang and  
36 223 Seberang Takir, respectively. This situation implies that fishermen in both areas, especially  
37 224 Seberang Takir, might come from families that were not concern and solicitude about education,  
38 225 at their time. This is because, in the past, children focused more on having job skills in order to  
39 226 help families to find sustenance. Worst situations were recorded in South West Region  
40 227 Bangladesh (Das *et al.*, 2015) where 75% of fishermen were illiterate while more than 60% of  
41 228 illiterate fishermen were recorded in Ogin State Nigeria (Olaoye *et al.*, 2012). As explained by  
42 229 Ahmed *et al.*, (2013), some fishermen community did not believe in benefits of having good

230 education status and opt for their children to follow their footsteps as a fisherman. This is proven  
 231 by the high percentage of fishermen children in Seberang Takir which were school dropped-out  
 232 students with 29.1% while 19.2% had been recorded in Kuala Marang. According to Mamun  
 233 (2011), major causes of fishermen’s children to drop-out school were illiteracy, involvement in  
 234 income findings, economic and social problems as well as family member’s unconsciousness.  
 235 Besides that, in terms of lack of consciousness about education, 35.6% and 31.5% of fishermen  
 236 were illiterate. Also, high percentage of addiction problem especially smoking were recorded  
 237 with 92.1% and 82.2% as well as the importance about having secondary or any extra occupation  
 238 were taken lightly as 92.1% and 83.6% of fishermen in Kuala Marang and Seberang Takir,  
 239 respectively, have no any extra occupation.  
 240 Fishermen in both study area have a majority of 4 to 6 number of children. In Seberang Takir,  
 241 6.8% of fishermen’s household composed of more than 12 members while zero percent had been  
 242 recorded in Kuala Marang. According to Dzuhaimi *et al.* (2012), in the study of Malay Muslim  
 243 fishermen community in Selangor, a majority of them have big household size and lives together.  
 244 This study shows that the fishermen’s household number has a positive statistically significant  
 245 relationship with the fishermen’s household income. With the coefficients of 0.057 and 0.050, a  
 246 unit increase in fishermen’s household member increases the fishermen’s household income by  
 247 5.7% and 5% in Kuala Marang and Seberang Takir, respectively. As stated by Mercado *et al.*  
 248 (2016), some rural fishermen tend to apply the use of family labor and limited investment, which  
 249 is as many as 13% and 31.5% of respondents in Kuala Marang and Seberang Takir, respectively,  
 250 that uses family labor type for fishing activities. This enhances the cost reduction and increases  
 251 the profit during fishing activity since there exists full trust in several affairs such as managing  
 252 fishing unit, fishing catch and profit sharing that can be done harmoniously which facilitates the

253 working circumstances.

Table 1: Fishermen demographic profile

Characteristics	Kuala Marang		Seberang Takir	
	Frequency	Percentage (%)	Frequency	Percentage (%)
Age (Years)	31 to 40	21	20	27.4
	Above 50	33	18	24.7
Marital status	Single	22	36	49.3
	Married	59	37	50.7
Educational Level	Lower	19	26	35.6
	Upper	32	22	30.2

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### 259 *Fishermen's fishing unit profile*

260 For fishermen's fishing unit profile characteristics, Table 2 shows that 42.7% of fishermen in  
261 Kuala Marang travels for 11 to 20 Nautical Miles (NM) while 37% of fishermen in Seberang  
262 Takir travels for 1 to 10 NM for their fishing activities. However, this contrasts with the fisher  
263 folks in Ogun Waterside, Nigeria, where more than half of them work for only 1 NM since most  
264 of the fishermen in Ogun Waterside only uses canoed fishing vessel (Olaoye *et al.*, 2015) while  
265 the majority of the fishermen in Kuala Marang and Seberang Takir used engine-type vessel.  
266 Types of fishing vessels play a crucial role in the fishing travelled distance in which advanced  
267 vessel with engine permits fishermen to travel further compared to the traditional canoed vessel.  
268 According to Sesabo & Tol (2005), fishing ground with more fish stocks can be accessed by  
269 going for a long-distance fishing ground which causes fishermen to travel further. As much as  
270 57.3% of fishermen in Kuala Marang works from 17 to 24 hours per trip while 42.5% of  
271 fishermen in Seberang Takir works from 9 to 16 hours per trip. Fishermen tend to work extra  
272 hours and commit to a high fishing effort either in the number of fishing hours or fishing trips  
273 due to fishing efforts do affect in increasing the fishermen's catch and income. For this, fishing  
274 effort shows positive significant relationship with fishermen household income in Kuala Marang.  
275 With the coefficient of 0.026, a unit increase in fishermen's fishing trips per month increases  
276 fishermen's household income by 2.6%. As explained by Islam *et al.*, (2016), fishing efforts  
277 which consists of fishing hours in a month is significant at 1% which implies that it highly  
278 affects the fishermen's catch along with their income. As shown in Table 2 below, more than  
279 half of the fishermen were vessel owners which consists of 57.3% and 50.7% of ownership  
280 recorded in Kuala Marang and Seberang Takir, respectively. This implies that vessel ownership  
281 has positive significant relationship with fishermen household income in Seberang Takir. With  
282 the coefficient of 0.204, a unit increase in fishermen's working position increases the  
283 fishermen's household income by 2.6%. This is due to the agreement of the 2/3 owner splits  
284 share from the fish catch between vessels owner and renter-borrower (Nieves *et al.*, 2009).  
285 According to Omwega *et al.*, (2000), the average of monthly income for vessels owner were  
286 around 3 times more than the crew since the owner owned various boats and vessels.  
287 For fishermen type of gear used for fishing activity, in Kuala Marang, 86.50% of the fishermen  
288 uses single gear which consists of 1.10% of trap, 12.40% of line and 73.0% of net, while 13.50%  
289 of them uses multi-type of gear. On the other hand, in the study area of Seberang Takir, 71.20%  
290 of the fishermen use single gear which consists of 2.70% of trap, 42.80% of line, and 24.70% of  
291 net, while 28.80% of them uses multi-type of gear. The gear types used by fishermen shows a  
292 positive significant relationship with the fishermen's household income. With the coefficient of  
293 0.313 and 0.218, a unit increase in the number of gear used increased the fishermen's household  
294 income by 31.3% and 21.8% in Kuala Marang and Seberang Takir, respectively. In comparison  
295 with Kenya South Coast, the artisanal fishermen there prefer using multiple fishing gear to target  
296 various fish species (Tuda *et al.*, 2016) and multi gears also applied in San Miegul Island for  
297 multi-fishery purposes (Nieves *et al.*, 2009). Supported by Y & Antonia (2017), a unit increase  
298 in the number of gear increased the fishermen's income by 44.7%.

Table 2: Fishermen's fishing unit profile

Characteristics	Kuala Marang		Seberang Takir	
	Frequency	Percentage (%)	Frequency	Percentage (%)
<b>Fishing trip distance</b>	1 to 10 NM	33	27	37
	11 to 20 NM	38	14	19.2
<b>Working hours per trip (Hours)</b>	9 to 16	34	31	42.5
	17 to 24	51	28	38.3
<b>Fishing trips per month (Trip)</b>	16 to 20	47	24	32.9
	Above 21	31	26	35.6
<b>Vessel ownership</b>	Owner	51	37	50.7
<b>Type of gear</b>	Single gear	77	52	71.2
	Multi gear	12	21	28.8

### Fishermen's housing condition profile

Regarding to the fishermen's housing condition profile, 84.3% and 91.7% of fishermen in Kuala Marang and Seberang Takir live in their own houses, respectively and likely, 88% and 84% of fishermen in Sepang, Selangor (Perumal *et al.*, 2016) and Kuala Besut Terengganu (Wan *et al.*, 2009) live in their own houses rather than renting a house, respectively. Fishermen prefer to live in their own house especially when the house is inherited in order to guarantee the existence of a residence as well as having an exclusion of monthly housing rent payment. According to Zaimah *et al.* (2015), house ownership reflects a better level of living. Besides that, fishermen are also able to avoid monthly house rent commitment and want to cherish the family's relics and assets (Wan *et al.*, 2009).

From Table 4, 44.3% and 44.4% of fishermen in both study area of Kuala Marang and Seberang Takir, respectively, live in a wooden type of house while 36.4% and 32% of fishermen live in houses built up from a mixture of both wood and bricks. This is because in Malaysia, fishermen's community is known to reside in the village area in which they prefer to have their residence to be in a village nature built from wood. According to a study by Perumal *et al.* (2016), the same situation is shown by the fishermen's community in Sepang, Selangor.

In terms of toilet facilities, 100% of the houses own bathroom or toilet facilities in both study area where similar findings were also recorded by Perumal *et al.*, (2016) in Bagan Lalang, Selangor, Malaysia. However, in contrast, 80% of fishermen houses in Andra Pradesh India do not possess any toilet and bathroom facilities (Ismail, 2014) and possess no sanitary facilities or toilet where he fishermen uses lands, fields, canals, bushy area, hidden places and latrine to answer the call of nature (Reza *et al.*, 2015). In Malaysia, toilets are built in every house as it is a basic component in a house construction nowadays (Perumal *et al.*, 2016).

All 100% of the fishermen's respondent with their household in both study areas enjoy the electrical facilities present in their residence and similarly with rural fisher in North Suriago Del Sur, Philippines (Mercado *et al.*, 2016). Otherwise, for fishermen around Chirirbandar Upazila Bangladesh, only 28% of the fishermen household-owned electrical facilities (Hossain *et al.*, 2015). The absence of electricity causes difficulty to complete daily household routines and working chores, for example, household cooking and cleaning matters will be troublesome to be conducted while for fishermen, the storage of fishing catch may not be done in a proper way. Thus, the electricity supply provided by the authorities enhances the social well-being among the community and population (Hussain *et al.*, 2011).

In Kuala Marang and Seberang Takir, 90% and 62.5% of fishermen's household, respectively, depends on the government's pipe water for drinking water sources, self-sanitation activity, household chores and other purposes while 100% of the fishermen's household in Atrai and Kankra rivers at Chirirbandar Upazila, Dinajpur, Bangladesh, still depends on tube well for drinking water facilities in their residence (Hossain *et al.*, 2015). As stated by Perumal *et al.* (2016), apart from the toilets, clean water supply also acts as an important component in house construction for household self-sanitation and house chores.

Table 4: Fishermen housing condition profile

Characteristics	Kuala Marang		Seberang Takir	
	Frequency	Percentage (%)	Frequency	Percentage (%)
<b>House ownership</b>				
Own	36	40.5	25	34.2
<b>Electricity facilities</b>				
Present	88	100	72	100
<b>Water facilities</b>				
Government pipe	80	90.0	45	62.5

#### *Fishermen's individual and household income with expenses profile*

In terms of the fishermen's individual income from the fishing activity, Table 3 shows that most (68.6%) fishermen in Kuala Marang earned between USD 250 to USD 500 while in Seberang Takir, majority (45.2%) of the fishermen earned between USD 500 to USD 750. As for the reasons, the factors that affect the fishermen's individual income includes fishermen's fishing effort along with the engine and vessel capability in which more advanced fishing vessels and aid had been utilised. In Seberang Takir, high percentage of younger fishermen had been recorded which causes most of them to possess the capability of having extra working hours and working effort since these young fishermen are in physically and economically active age group. For fishermen's household income as illustrated in Table 3, a majority of 47.2% fishermen's household in Kuala Marang earned an income between USD 250 to USD 500 while 37% in Seberang Takir earned between USD 500 to USD 750 household income, per month. According to the Department of Statistics Malaysia in 2014, the median for Malaysian household income