

# **Factors affecting Local Leaders' Perception on the adaptation Ability of Malaysian Small Scale Fishermen towards Climate Change**

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## **Abstract**

This study attempts to examine factors that affect local leaders' perception on the adaptation ability of small scale fishermen towards climate change. This study is quantitative in nature and via multi-stage cluster sampling, a total of 300 respondents from two fisheries districts were selected. The analysis demonstrates a significant difference between the group leaders' perception towards small scale fishermen's ability to adapt while factors such as age and income was recorded to have a significant relationship with their perception towards small scale fishermen's adaptation ability towards climate change. A number of discussions have been highlighted and hopefully it can be a good addition to the existing literature.

Keywords: Local Leaders, Small Scale Fishermen, Adaptation, Community Development

## **Introduction**

Climate change is not a new phenomenon. Globally, this issue has long been discussed by numerous scholars and organizations. Intergovernmental Panel on Climate Change (IPCC) and the International Union for Conservation of Nature (IUCN) for example, has consistently been coming out with reports that cover numerous issues on climate change. A number of climate change impacts were recorded across the world. In the South American region, for example, rising temperature was confirmed to affect fauna in the amazon while the Antarctic is suffering from the mass loss of ice shelves (Osipova and Sangermano, 2016; Goelzer et al., 2016). In Africa, the rising temperature has proven to affect water resources while rising sea level has caused a serious coastal erosion in New Zealand (Nkhonjera, 2017; Dlabola et al., 2016).

Similar to the regions mentioned previously, climate change impacts has also been proven to affect Malaysia. Previous studies by Kwan et al. (2011) and Wai et al. (2005) have shown that several areas such as Kota Bharu, Mersing and Kuantan have been experiencing rising temperature. Wan Azli (2010) on the other hand has looked into the unstable rain pattern in Peninsular Malaysia while Awang and Abdul Hamid (2013) confirmed on rising sea level in areas such as the Straits of Malacca, Mersing Waters and Tumpat Waters. Another study by Razali et

al. (2010) has confirmed the possibility of extreme winds to frequently hit the northern areas in the future. All of these impacts are known to cause damages to the community who heavily rely on climate stability for their socio-economic routine and the small scale fishermen (SSFM) community is one of them. These impacts are said to reduce the quality and the quantity of marine resources and this will eventually reduce SSFM's productivity. Moreover, the impacts of climate change are revealed to increase risks associated with SSFM fishing routine and at the same time damage their public facilities and fishing assets.

As the impacts of climate change are worsening, the ability to adapt towards it is considered an effective solution. Adaptation, according to the National Policy on Climate Change (NPCC) (Ministry of Natural Resources, 2009), can be defined as

*Actions that were taken to help communities and ecosystem cope with actual or expected impacts of climate change*

Within the scope of fishermen, adaptation strategies must be developed at the earliest stage and feedbacks from people within the field are needed. In addition to their views, a well-known group that is able to contribute ideas in the development of climate change adaptation strategies is their local leaders. SSFM's leaders can be from PNK (Local Fishermen's Association), JKKK (Village Development and Security Committee Members), Skippers, KUNITA (Fishermen's Wives Association) and KUBENA (Youth Fishermen Association). Despite their ability to contribute significant ideas, nevertheless, not much has been understood as most of the existing adaptation studies such as Shaffril et al. (2016), Shaffril et al. (2013), Senapati and Gupta (2017), Wu et al. (2017), and Arroyo Mina (2016) place a heavy focus on the perception of fishermen and not much on their leaders. The present study aims to narrow down the gap, by examining the factors that affect the perception of leaders on the adaptation ability of SSFM towards climate change.

### **The SSFM leaders**

SSFM leaders can be among the PNK, JKKK, skippers, KUNITA and KUBENA. In general, most of these groups are responsible in strengthening the socio-economic aspects of fishermen and their family members. Specifically, JKKK is an organization (usually consists of 10-15 members) established by the government, they are given the responsibility to assist the villager's development and solve problems related to poverty, health, education and attitude. PNK on the other hand is the main organization that is responsible for the development of fishermen. They are in charge of transforming small scale fishermen to commercial fishermen, assist them in matters related to the administration, provide economic and educational assistance to the fishermen and their family members. KUNITA is specifically established to assist in strengthening the socio-economic aspects of fishermen's wives while KUBENA is specifically established to assist in strengthening the socio-economic aspects of youth fishermen. Skippers as we know are the captains and are usually respected among small scale fishermen.

## **Literature Review**

There are several studies who looked into the influence of community leaders' perception on community development. Abu Samah et al. (2010) focused on 400 village leaders or locally known as JKKK. Their study involved three states in Peninsular Malaysia. This quantitative study concluded that village leaders' are reliable sources for getting any information in relation to how to develop local community. Understandably, their good relationship with the locals make them know best what the actual needs of the locals are and this eventually assists the concerned parties in constructing development strategies that are in line with the locals' need and interest.

In a study done by Shaffril et al. (2016), focused on 240 small scale fishermen in Peninsular Malaysia. Their quantitative study concluded a moderate adaptation towards climate change impacts among their respondents. One of their recommendations is to offer alternative skills especially one related to vocational and entrepreneurship. To realize this, they urged on the important roles of related agencies such as Malaysia Fishery Development Authority (LKIM), Fishermen Wives Group (KUNITA) SME CORPS and Majlis Amanah Rakyat (MARA) to provide periodical workshops and seminars to the small scale fishermen.

A review study by Shaffril et al. (2017) analysed 92 articles related to fishermen development. Their analysis confirmed an important role of leaders when it comes to developing the fishermen community. This study concluded involvement by leaders and the fishermen community would gear towards a decision making process that is democratically just with the precise aim of innovation for adaptation strategies. Having this is important as it saves money, time and energy. The community leaders in the villages and at the jetties, boat captains and crews as well can offer their opinions, experience and thoughts by involving in a range of formal events, from annual meetings to round-table discussions.

## **Methodology**

The present study is quantitative in nature whereby a questionnaire was used as the main tool for collecting the data. The questionnaire was developed based on the International Union Conversation on Nature communities' framework (2010). In total, the questionnaire consisted of nine sections, namely: 1) Demographic; 2) The capacity to experiment and learn; 3) The capacity to reorganize; 4) Community assets; 5) Flexibility; 6) Gender relation; 7) Environmental institution and social norms; 8) Organization responsibility; and 9) Market. The organization's responsibility is a new variable and it is included in the framework to replace an original factor, which is the culture of corruption, as previous studies by Shaffril et al. (2016) and Shaffril et al. (2013) accentuated on the crucial role of related organizations in strengthening the adaptation capacity among fishermen. The instrument was pre-tested at Malacca and the reliability analysis indicated that the instrument required some modifications. The expert views from two (2) entities were gained to further improve the modified instrument. The main sampling technique used was the multi-stage cluster sampling whereby in the first phase, a list of climate change affected areas were gained from previous studies and meteorological records. First of

all, two areas were randomly selected, namely Batu Pahat (due to the sea level rise) and Pengkalan Chepa (due to the rising temperature). Second of all, a total of 300 respondents among JKKK, PNK, skippers, KUNITA and KUBENA were randomly selected. The data collection process was conducted from October 2016 till December 2016 and it was assisted by several trained and experienced enumerators. During the data collection, 20 to 30 minutes were allocated for each survey session. The collected data were then analysed using descriptive and inferential statistics (frequency, percentage, mean score, ANOVA, Pearson Product Moment Correlation).

## Results and Discussion

### *Respondents' Demographic Factors*

Table 2 demonstrates the respondent's demographic factors. The majority of fishermen are male (93.3%). The mean score recorded for respondents' age was 50.5 and a majority of them (28.7%) were within the age group of 51 to 60 years old while 24.7% of them were included in the age group of 41 to 50 years old. Most of the respondents possessed a lower education level as 46.7% of them have completed primary school while 24.7% possessed a PMR/LCE certificate. A majority of the respondents were single (48.7%), a total of 8.7% were married and 2.0% were divorcees.

The mean score recorded for income per month was RM918.7. Most of them (48.7%) earned between RM701-RM1000 per month while another 38.0% generated income less than RM700 per month. Most of the respondents surveyed were tekong (skippers) (59.3%), 22.7% were PNK members, 12.7% from JKKK members and only 5.4% were KUNITA/KUBENA members. Furthermore, the mean score recorded for position duration in an organization was 7 years. Specifically, 31.5% of the small scale fishermen had 6-10 years of experience in the position they hold within an organization while another 37.0% had a less 2 years' experience.

Table 2: Respondents' Demographic Factors

<b>Factor</b>	<b>Frequency</b>	<b>Percentage</b>	<b>Mean</b>
<b>Gender</b>			
Male	140	93.3	
Female	10	6.7	
<b>Age</b>			
<40	33	22.0	50.5
41-50	37	24.7	
51-60	43	28.7	
>60	37	24.7	
<b>Level of education</b>			
Never been to school	12	8.0	

Primary school	70	46.7	
PMR/LCE	37	24.7	
SPM/SPMV/MCE	24	16.0	
Skill Certificate/ STPM	5	3.3	
Diploma	2	1.3	
Degree/Master/PhD	-	-	
<b>Marital status</b>			
Married	13	8.7	
Single	134	89.3	
Divorced	3	2.0	
<b>Income per month</b>			
			918.7
<RM700	57	38.0	
RM701-RM1,000	73	48.7	
RM1,001 – RM1,500	13	8.7	
RM1,501	7	4.6	
<b>Organization</b>			
PNK	34	22.7	
JKKK	19	12.7	
TEKONG	89	59.3	
KUNITA/KUBENA	8	5.4	
<b>Duration of holding a position in an organization (years)</b>			
			7.2
<2	20	37.0	
3-5	8	14.8	
6-10	17	31.5	
>11	9	16.7	

*Local leaders' perception towards Small Scale Fishermen Adaptation Ability towards Climate Change*

The local leaders' perception towards small scale fishermen's adaptation ability towards climate change was measured based on the cumulative mean score of eight communities' adaptation framework by IUCN (2010). The mean score then was divided based on the range of score calculation

$$\frac{\text{Maximum mean score (5.00)} - \text{Minimum mean score (1.00)}}{\text{Number of intended levels (3)}}$$

Number of intended levels (3)

The calculation resulted in three categories, namely low (mean score between 1.00-2.33), moderate (2.34 – 3.67) and high (3.68-5.00). The analysis concluded that the overall level of local leaders’ perception on the adaptation ability of small scale fishermen towards climate change was at a moderate level. Specifically, only one of them recorded a low level of mean score while another 123 recorded a high level of mean score.

Level	Frequency	Percentage	Mean Score	SD
Low	1	0.3	3.54	0.45
Moderate	176	58.7		
High	123	41.0		

*Comparison between leaders’ perceptions on small scale fishermen adaptation towards climate change*

The analysis performed in Table 3 demonstrates a significant difference between leaders of four groups studied (M=3.95, SD=0.63, F=3.944, p=0.010). Based on the analysis, leaders of KUNITA/KUBENA recorded a high mean score while the skippers recorded the lowest mean score. KUNITA leaders would frequently interact with their husbands, thus it was no surprise if they have positive perception towards their husband’s adaptation ability towards climate change.

Table 3: Comparison test using ANOVA

Factor	Mean	SD	F	p
<b>Organization</b>			3.834	.010
PNK	3.59	.56		
JKKK	3.61	.42		
SKIPPERS	3.44	.42		
KUNITA/KUBENA	3.70	.27		

*Relationship between Perception towards Small Scale Fishermen Adaptation Ability and Selected Demographic Factors*

Table 4 demonstrates the relationship analysis between selected demographic factors and local leaders’ perception on the adaptation ability of small scale fishermen towards climate change. It was confirmed that income yielded a significant and positive relationship with the leaders’ perception. Having such results indicate that the better financial ability these leaders have, the more positive their perception on the adaptation ability of small scale fishermen towards climate change. No significant relationship was recorded between age and the duration of employment in an organization.

Table 4: Relationship between Perception towards Small Scale Fishermen Adaptation Ability and Selected Demographic Factor

<b>Factors</b>	<b>r</b>	<b>p</b>
Age	.058	.315
Income	.126	.029
Duration of holding a position in an organization	.071	.349

### **Recommendations**

Clearly, periodical meetings or workshops regarding climate change adaptation strategies should be conducted between concerned parties, as such, the fishermen community and their leaders, nevertheless views from KUNITA, older and higher income leaders shall not be overlooked as their opinions matter as well.

### **Conclusion**

Both local and international scholars have stressed on the worsening impacts of the climate change. Impacts such rising temperature, unstable rain pattern, extreme winds and waves, rising sea level along with coastal and mangrove erosion are predicted to worsen in the future and necessary adaptation strategies are required to tackle forthcoming situations. As one of the groups that rely heavily on nature stability for their socio-economic routine, small-scale fishermen are in a dire need for effective adaptation strategies. In response to this, the government has come out with several efforts and to include local fishermen's view and experience on climate change community adaptation strategies and planning is one of it. Nevertheless, it is undeniable that additional views from local leaders are equally useful in order to strengthen its effectiveness. This creates unified views of the community and their leaders on the best things can be done to face and adapt the undesirable impacts of climate change. This study fulfil its aims to examine the factors that affect local leaders' perception on the adaptation ability of small scale fishermen towards climate change by concluding factors such as organization and income affects their perception on the adaptation ability of small scale fishermen towards climate change.

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