



UNIVERSITI PUTRA MALAYSIA

***PREDICTORS OF VULNERABILITY TYPE AMONG POOR FISHERIES
COMMUNITY MEMBERS USING GENDER ANALYSIS IN NORTHERN
STATES IN MALAYSIA***

NOREHAN BINTI SAIDI

FEM 2022 10



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By

NOREHAN BINTI SAIDI

**Thesis Submission to the School of Graduate Studies, Universiti Putra
Malaysia, in Fulfilment of the Requirements for the Degree of
Master of Science**

March 2021

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Abstract of thesis presented to the Senate of Universiti Putra Malaysia in
fulfilment of the requirement for the degree of Master of Science

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March 2021

Chairman : Associate Professor Zumilah binti Zainalaludin, PhD
Faculty : Human Ecology

This study aims to profile the backgrounds of the vulnerable respondents, to identify the distributions of the vulnerable respondents by the vulnerability type, to measure the relationship between two levels of household income and two types of water system community, and to predict the best vulnerability type to explain the likelihood of the vulnerable respondents in the poor category household income by two types of water system community involve in fisheries and aquaculture economic sector (FAES). All the research objectives were sex disaggregated. In this study two data sets were used, which were Data 01 (brackish water community) and Data 02 (freshwater community), which covered the backgrounds of the vulnerable respondents and the household income used in this study from the respective questionnaires. In both data sets, the respondents were vulnerable, which were sampled through multiple level random sampling with assistance from government agencies and the community leaders in the sampled villages at Padang Terap, Kedah; Hulu Perak, Perak; Pulau Langkawi, Kedah; and Kota Setar, Kedah; all in Northern Peninsular Malaysia. The vulnerable respondents suffer at least one vulnerability type as deduced from the Sustainable Livelihood Approach. A total of 415 vulnerable respondents reported in this study who were mainly females in brackish water (58.84%) and males (58.14%) in freshwater communities. According to the mean age, the respondents in this study were older people (mean age > 60 years old), with low academic background, mostly married males (79.07 %), single females (64.61%), and many males had house ownership (81.40%). The male vulnerable respondents mainly suffered from the Handicapped Vulnerability Type and the female suffered the Single Parent Vulnerability Type. Among the females the mean household income=RM960.74 and they were poorer than the male vulnerable respondents with a mean household income=RM1481.28. There was a significant ($p < 0.05$) relationship between two levels of household income (PLI=RM980 as a cut-off point) and two types of water system community among

the male and female vulnerable respondents. Thus, HO₁ and HO₂ were rejected. Male and female vulnerable respondents were poorer in brackish water than in freshwater communities. One Binary Logistic Regression Model for the four null hypotheses was tested in order to identify the vulnerability type to predict the vulnerable respondents in the poor category of household income in two types of water system community. All model fits were significant ($p < 0.05$), thus all four null hypotheses were rejected. The Single Parent Vulnerability Type significantly ($p < 0.05$) and negatively predicted single father and positively predicted single mothers in the poor category of household income in the brackish water and freshwater communities. In addition to the Single Parent Vulnerability Type among females in the freshwater community, the Living Alone Vulnerability Type also significantly predicted ($p < 0.05$) them as being in the poor category of household income. In conclusion, poverty is related to single mothers and females living alone, and, in the brackish water community, it is mainly related to old women. A relationship between gender, poverty, and vulnerability in masculine FAES is found in this study. Single mothers and the old women staying alone should be given high attention in terms of policies and programmes in fisheries communities, especially to achieve SDG1, SDG2, SDG 5, and SDG10.

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia
sebagai memenuhi keperluan untuk ijazah Master Sains

**MERAMAL JENIS KERENTANAN DALAM KALANGAN AHLI
MASYARAKAT NELAYAN MISKIN MENGGUNAKAN ANALISIS JANTINA
DI NEGERI-NEGERI UTARA DI MALAYSIA**

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Kajian ini bertujuan untuk memprofil latar belakang responden rentan, mengenal pasti taburan responden rentan mengikut jenis kerentanan, mengukur hubungan antara dua tahap pendapatan isi rumah dan dua jenis komuniti perikanan menurut sistem air, dan meramal jenis kerentanan terbaik untuk menjelaskan kebarangkalian responden rentan dalam kategori pendapatan isi rumah miskin, dan mengikut dua jenis komuniti sistem air, mereka terlibat dalam sektor ekonomi perikanan dan akuakultur (FAES). Semua objektif kajian disasarkan menurut jantina. Kajian ini menggunakan dua set data, yang mana Data-01 (komuniti air payau) dan Data-02 (komuniti air tawar), yang bahagian latar belakang responden rentan dan pendapatan isi rumah responden digunakan dalam kajian ini daripada setiap soal selidik. Dalam kedua-dua set data ini, responden adalah rentan, yang disampel melalui persampelan rawak pelbagai peringkat dengan bantuan daripada agensi kerajaan dan pemimpin komuniti di kampung-kampung yang disampel di Padang Terap, Kedah; Hulu Perak, Perak; Pulau Langkawi, Kedah; and Kota Setar; semua di Zon Utara Semenanjung Malaysia. Responden rentan merujuk kepada responden yang sekurang-kurangnya mengalami satu jenis kerentanan seperti yang disimpulkan daripada Pendekatan Penghidupan Lestari. Sejumlah 415 orang responden rentan dilaporkan dalam kajian ini yang kebanyakannya adalah wanita daripada komuniti air payau (58.84%) dan lelaki (58.14%) daripada komuniti air tawar. Berdasarkan kepada min usia, responden dalam kajian ini, umumnya adalah orang tua (min usia >60 tahun) dengan latar belakang akademik yang rendah, dan majoriti lelaki berkahwin (79.07%), majoriti wanita adalah bujang (64.61%), dan ramai lelaki mempunyai pemilikan rumah (81.40%). Dalam kalangan responden lelaki rentan kebanyakannya mereka mengalami Jenis Kerentanan Kelainan Upaya, dan kebanyakkan wanita mengalami Jenis Kerentanan Ibu Bapa Tunggal. Dalam kalangan wanita, min pendapatan isi rumah=RM960.74 dan mereka lebih miskin daripada responden lelaki rentan dengan min

pendapatan isi rumah=RM1481.28. Terdapat hubungan yang signifikan ($p<0.05$) antara dua tahap pendapatan isi rumah (PGK=RM980 sebagai titik tengah) dan dua jenis komuniti menurut sistem air dalam kalangan responden lelaki dan wanita rentan. Oleh itu, H_{O1} dan H_{O2} ditolak. Responden lelaki dan wanita rentan, umumnya lebih miskin dalam komuniti air payau berbanding dengan komuniti air tawar. Satu Model Regresi Logistik Binari untuk setiap empat hipotesis nol diuji untuk mengenal pasti jenis kerentanan bagi meramal responden yang rentan dalam kategori isi rumah miskin dalam dua jenis komuniti sistem air. Semua model adalah sesuai dan signifikan ($p<0.05$), oleh itu semua empat model hipotesis nol ditolak. Jenis Kerentanan Ibu Bapa Tunggal adalah signifikan ($p<0.05$) dan bapa tunggal meramal secara negatif sementara ibu tunggal meramal secara positif untuk responden berada dalam kategori pendapatan isi rumah miskin untuk komuniti air payau dan air tawar masing-masing. Sebagai tambahan kepada Jenis Kerentanan Ibu Bapa Tunggal di dalam kalangan wanita dalam komuniti air tawar, Jenis Kerentanan Hidup Sendiri juga signifikan ($p<0.05$) meramalkan mereka berada dalam kategori pendapatan isi rumah miskin. Kesimpulannya, kemiskinan adalah berkait dengan ibu tunggal dan wanita yang tinggal sendirian, dan dalam komuniti air payau, terutamanya berkait dengan wanita tua. Terdapat hubungan antara gender, kemiskinan dan jenis kerentanan dalam FAES yang maskulin dalam kajian ini. Ibu tunggal dan wanita tua yang tinggal sendirian harus diberi perhatian yang serius bila mana menyentuh soal dasar dan program berkaitan masyarakat nelayan, demi untuk mencapai SDG1, SDG2, SDG5, dan SDG10.

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LIST OF ABBREVIATIONS

AFS	Asian Fisheries Society
DOF	Department of Fisheries
DOSM	Department of Statistic Malaysia
FAES	Fisheries and Aquaculture Economic Sector
FAO	Food and Agriculture Organization
GAF	Gender in Aquaculture and Fisheries
GoF	Good of Fit
GTP	Gender, Technology and Development
ILO	International Labour Organization
JKKK	Village Security and Development Committee
PLI	Poverty Line Income
SDG	Sustainable Development Goals
SSF	Small Scale Fisheries Guidelines
WHO	World Health Organization
WWF	World Wildlife Fund

CHAPTER 1

INTRODUCTION

1.1 Introduction

Gender analysis has been conducted to understand and explain differences in vulnerability type, level of vulnerability, socio-demographic background, incidence of poverty, and involvement in the fisheries and aquaculture economic sector (FAES) between households, communities, or countries (Siles, Siles, Prebble, Wen, Hart & Schuttenberg, 2019; USAID, 2018). This analysis can provide an understanding of the causes of these inequalities in the FAES in order to bring about positive change, particularly for the poor and vulnerable community members who are most disadvantaged in this sector. However, according to Tamothran, Hussin & Cook (2019), the analysis of gender relations in the fishing community is still very immature and most likely limited to the different occupational roles according to gender.

Thus, there are three reasons why gender analysis is necessary for this study: first, this study focuses on fisheries community; second, they are always associated with poverty (McWilliam, Wianti & Taufik, 2021; Siles et al., 2019; Bennett, 2005); and third, they may have one of the characteristics of vulnerability, such as single mothers, caretakers; older women, handicapped individuals and people suffering from many serious diseases (Zainalaludin, Jamaluddin, Abd Syukor & Saidi, 2017).

In the context of food security and community, the need and relevance of gender analysis in FAES has been discussed (Kleiber, Harris & Vincent 2014; Harper, Zeller, Hauzer, Pauly & Sumaila, 2013). Globally, FAES is an important economic sector for many countries because FAES contributes to healthy protein for national food security (FAO, 2018; Hawkes & Ruel, 2012). The FAES may help a nation achieve Sustainable Development Goal (SDG) 1 and SDG-2 (United Nations, 2015a) to alleviate poverty and free the community from hunger (FAO, 2018), especially for poor and community member who experience vulnerability. Vulnerability in this study can be categorized as psychological, physical, social and economic or financial vulnerability (Kuran, Morsut, Kruke, Kruger, Segnestam, Orru & Torpan, 2020; Allison & Horeman, 2006). The same elements are used to identify vulnerable community members such as women, older persons, child labor, individuals with serious diseases, handicapped, poor, youth, refugees and immigrants (Government of Malaysia Official Survey, 2020; Kuran et al., 2020; Shahar, Vanoh, Ludin, Singh & Hamid, 2019; Masud & Zainalaludin, 2018; Ismail, Masud & Zainalaludin, 2015; Zainalaludin, Masud, Abdul Hamid & Mohamed Din, 2013; Idris & Selvaratnam, 2012; Flanagan, Gregory, Hallisey, Heitgerd & Lewis, 2011). In the absence of gender analysis, this gender division among vulnerable community members is overlooked.

Women's participation in FAES is generally not considered by many stakeholders (Weeretunge, Synder & Sze, 2010; Matthews, 1993). In Malaysia, no census or documentation has been conducted on the actual number of women involved in various fishing activities (Siason, Tech, Matics, Choo, Shariff, Heruwati & Sunderarajan, 2002; Yahaya 2001). This is confirmed by many studies in which women's work in FAES is rarely statistically recorded (Kleiber, Frangoudes, Snyder, Choudhury. Cole & Soejima, 2017; Santos, 2015; Kleiber, et al., 2014; Frangoudes, 2013) and even less documented (Zhao, Tyzack, Anderson & Onoakpovike 2013; Frangoudes, 2011; Frangoudes & Keromnes, 2008). Indeed, they are mainly involved in less masculine activities, such as post-harvest activities, marketing and along FAES value chains (Barange, Bahri, Beveridge, Cochrane, Funge-Smith & Poulain, 2018; Bassey, Thobejane & Atu, 2012; Allison, 2011). They always receive small or no remuneration as women's role in FAES is only to support their husband or male family members (Lentisco & Lee, 2015; International Labour Office, 2013; Yodanis, 2000), which may jeopardize gender equality (SDG 5) in FAES (Harper et al., 2013).

For this reason, most women in the fisheries community are most vulnerable to poverty (Bene, 2003; Veeran, 2000). The proportion of poor women has been referred to as feminization of poverty by Pearce (1978) because women have always been poorer than men but ignored (Payne, 1991). Furthermore, the feminization of poverty is due to changes in the family that have revealed women's latent economic vulnerability (McLanahan & Kelly, 2006; Veeran, 2000), particularly the increase in single-parent households, older person, and those living alone (McLanahan & Kelly, 2006; Pearce, 1978). Households headed by women are more vulnerable and may fall into extreme poverty, especially in FAES, because they earn lower incomes or are not paid in cash. Instead, they receive a FAES product as an incentive, which is just enough for a household to consume (Mutia, Magistrado, Fermaran & Muyot, 2020; FOA, 2018; Yahaya, 2001) and may help them avoid hunger (SDG-2).

1.2 Problem Statement

In the field of fisheries, research on gender and vulnerability is not new, but has been discussed and reviewed for several decades. According to William (2008), FAES is viewed through the lens of gender because fisheries and aquaculture researchers and policy makers focus mainly on fish stock and fish production, which is done by men, as shown by the Second Global Symposium on Gender and Fisheries in 2007. Ahmad, Isa, Ismail & Yussof (2003) pointed out the situation in Malaysia where women are rarely recognised as fishermen. Not only are they rarely recognised, but their contribution to FAES is hardly found in the statistics (Kleiber et al., 2017; Santos, 2015; Kleiber et al., 2014; Frangoudes, 2013). According to FOA (2018), 59.6 million people were employed in the primary FAES sectors in 2016, including 19.3 million in aquaculture and 40.3 million in capture fisheries worldwide. In addition, several countries reported only men and did not indicate whether or not women were involved (Gopal, Hapke, Kusakabe, Rajaratna & William, 2020).

As indicated in SOFIA (2018), women account for 15% of total fisheries employment, while men account for 78% and 7% are unspecified. Differences in reporting of sex-disaggregated data explain a small proportion of women's involvement (Torell, Bilecki, Owusu, Crawford, Beran & Kent, 2019; FAO, 2018). This therefore explains the lack of sex-disaggregated data on fisheries in many countries. This may be due to the masculinity of FAES activities such as physical strength, but numerous studies have shown that women are also employed in a FAES (Gopal et al., 2020; Torell et al., 2019; William, 2008). Moreover, women's involvement in fisheries usually due to the fact that their husbands are fishers (Mutia et al., 2020; Olowosegun, Sanni, Sule & Bwala 2005). Therefore, their contribution to FAES is often overlooked and considered as underemployment because they are thought to play only a small role in FAES (Kawarazuka, 2015; Bennett, 2005; Kusakabe, 2003). Besides that, Women are always associated with vulnerability (Chintey & Chintey, 2014; Sultana, 2006; Carpenter, 2005; Ali & Isa, 1995), which may be due to the masculinity of the economic sector (Joint United Nations Programme on HIV/AIDS, 2012; Aolain, 2011) or gender roles (Williams, 2012) or because they suffer from many diseases (Ahmad, Mansor & Paim, 2016; WHO, 2012; Klasen, Lechtenfeld & Povel, 2011; Yin-Fah, Masud, Hamid & Paim, 2010; Barrientos, Gorman & Heslop, 2003) as women generally live longer than men (United Nation, 2019).

But in FAES Malaysia, there are few statistics on women's participation and little data on the participation of vulnerable groups. Thus, it is important to first identify the background of vulnerable groups in fisheries communities to provide a basis for policy and programme development. Many previous studies focused only focused on fish, technologies, fish products, fish diseases and not on the participation of fishermen or aquaculture operators (Roslina, 2018; Budiati, Rusul, Wan- Abdullah, Mat Arip, Ahmad & Thong, 2013; Lananan, Abdul Hamid, Din, Ali, Khatoon, Jusoh & Endut, 2014).

Gender and vulnerability studies are especially important in poor households (Bene 2011; Allison & Horemanes, 2006; Bennet, 2005), including the fisheries community. It can affect the fisheries community and its economic ability to respond to the changes (Rajaratnam, Cole, Longley, Kruijssen, 2016; Shafrill et al., 2011) because of masculinity of FAES activities. According to Osman, Bakri, Bachok, Ibrahim & Mohamed (2015), many vulnerable individuals such as handicapped, children, women, older person, poor and single parents have been registered at Social Welfare Department and also in the data-based known as e-Kasih and this number is expected to increase year by year. To begin with, there is still less data on the distribution of vulnerability types by sex disaggregated in fisheries community in Malaysia. This could be due to the fact that many studies in FAES focus mainly on fish (William, 2008). The lack of sex-disaggregated data on vulnerability type in the fishing community leads them to remain in the devil's trap of poverty (Anuar, Ibrahim, Kamarudin & Hassan, 2018).

The distribution of vulnerable groups in the fishing community can help and protect the community by addressing their problem and identifying the new ability for them to re-contribute again either directly or indirectly in the economic sector and FAES. Currently, they are denied their rights, marginalized, treated unfairly or disadvantaged in the community, especially women and older people (World Bank, 2018; Osman et al., 2015; Barrientos et al., 2003) because they deserve adequate policies and programs according to their vulnerability types.

The fact that the right, marginalisation, injustice or disadvantage they suffer varies according to their vulnerability types in the fisheries community. As in Malaysia, the Department of Fisheries in FAES defines three types of water system communities, namely brackish water, freshwater and marine water communities (DOF, 2019a), and all activities related to these three types of water systems are masculine (Satapornvanit, 2018; Cliffe & Akirontimi, 2013). This study focuses on the brackish and freshwater communities because they have different types of masculine activities, vulnerability types, and poverty. A masculine activity means that the risk of working in this sector is high (Stergiou-Kita, Mansfield, Bezo, Colantonio, Garritano, Lafrance & Theberge, 2015). The FAES is classified as masculine economic sector because fishermen may face the high risk of fatal accidents or accidents that may cause them permanent disability (Niveda, 2021; Yusuff, Hussain, Latif, Rahman, rashid & Abdullah, 2015; Murray, Fitzpatrick & O'Connell, 1997). Meanwhile, their wives are usually full-time housewives and are completely dependent on their husbands for their livelihood (Bahtiar, Yusof & Kamarudin, 2021; Wahab, Ghani & Yusof; 2018; Wei & Ali 2018; Islam, 2008; Tietze, Groenwold & Marcoux, 2000). The sudden death of fishermen may leave behind poor single mothers (Zumilah et al, 2017; Oginni, Ahonsi & Ukwuije, 2013) in the community.

Other studies have often found a link between gender and poverty, poverty and vulnerability in brackish water and freshwater fisheries, but it is more difficult to make an attribution if the studies are not designed with the specific aim of accessing gender, poverty and vulnerability in brackish water and freshwater fisheries. A few examples of other studies Roslina (2018) states that fishermen in brackish water communities may earn a higher income than in freshwater communities due to the higher risk of work in brackish water than in freshwater FAES (Danielsson, Kuyateh & Ravikumar, 2010); and United Nation Development Program (2019) and Sen, (1991) stated that single mothers in fisheries communities are the poorest among the poor because they mainly live off their husbands (Bahtiar et al., 2021; Islam, 2008). Without their husbands, they have to earn a living for the family as there are not many things they can do in masculine FAES. Interestingly, both studies found that gender and vulnerability correlate with poverty in fisheries community.

In addition, vulnerable groups in brackish water communities may be more affected by poverty than the vulnerable groups in freshwater communities due to the different nature of vulnerability type and masculinity of FAES. The

masculinity of FAES has marginalised the handicapped, single mothers, older women and those suffering from serious disease in any community because they usually do not have financial security to cope with a loss of income source (Masud & Zainalaludin, 2018a; Humphrey, 2016; United Nation, 2015b; Hamid, 2015). There is a very high poverty rate among rural older women living alone (United Nations Department Economic and Social Affairs, 2015), partly because women live longer than men (United Nations, 2019), have lower academic backgrounds than men (Zainalaludin, 2012), and are unable to work directly, especially in the masculine economic sector (Mohd, 2014). While there is limited research on gender, vulnerability types and poverty in brackish water and freshwater fisheries, the studies are usually unable to bring out the correlation with poverty in fisheries community.

However, there is limited information concerning the triangulated relationship between gender, poverty and vulnerability in brackish water and freshwater fisheries communities in Malaysia. The vulnerable community members should have equal opportunities at all levels of decision-making in FAES in both brackish and freshwater communities, because vulnerable men and women have the same right to benefit from FAES as non-vulnerable people in FAES.

Thus, the details of the gender analysis in this study are based on the following research questions:

- RQ₁: What are the backgrounds of the vulnerable respondents by sex disaggregated?
- RQ₂: What are the distributions of vulnerable respondents by vulnerability type and sex disaggregated?
- RQ₃: What is the relationship between the two categories of respondents' household income by two types of water system community and by sex disaggregated?
- RQ₄: What is the best vulnerability type(s) to predict the likelihood of male and female vulnerable respondents in terms of poor category household income by two types of water system community?

1.3 Research Objectives

In general, the objective of this study is to identify the significant vulnerability type(s) to predict the likelihood of male and female vulnerable respondents in terms of poor category of household income by two types of water system community. The specific objectives of this study are as follows:

- RO₁: to profile the backgrounds of vulnerable respondents by sex disaggregated
- RO₂: to identify the distributions of vulnerable respondents by vulnerability type and sex disaggregated
- RO₃: to measure the relationship between two categories of household income and two types of water system community by sex disaggregated
- RO₄: to predict the best vulnerability type(s) to explain the likelihood of male and female vulnerable respondents in terms of poor category of household income by two types of water system community

1.4 Scope of the Study

The scope of this study covers the vulnerable respondents who suffer one or more vulnerability type as deduced from the Sustainable Livelihood Approach by Allison, Horseman and Bene (2006). The Vulnerability Types are Handicapped, Single Parent, Older Person, Serious Disease, Living Alone, Caretaker and Child Labour. They are poor and marginalised with the income for the poor households being < RM980 (PLI, 2016). This study focuses on male and female vulnerable respondents in terms of the poor category of household income. With identify the vulnerable respondents by their vulnerability in poor category in order to help them improve their socio-economic status at least they receive income more than poverty line.

The findings of this study do not represent able bodied and non-vulnerable individuals in fisheries communities or the vulnerable individuals in other economic sectors. The findings in this study only represent the vulnerable groups in the fisheries communities in Northern Peninsular Malaysia which are in Kedah and Northern Perak State. These include two types of community – freshwater and brackish water – according to the water system as defined by the Department of Fisheries Malaysia (DOF) (2019a). These communities are mainly involved in FAES in terms of economic activity. This study on vulnerability type by two water system communities, due to a lack of disaggregated data, it prevent researchers from gaining important insights for policy and practice regarding vulnerable groups in brackish and freshwater community.

1.5 Limitations and Assumptions

This study is limited to the assumption of the Feminization of Poverty (Pearce, 1978) and Gender Schema Theory (Bem, 1987) that males are associated with masculinity and the masculine economic sectors, while females are associated with femininity and are involved in the private sphere doing household chores were lead to poverty. Under this assumption FAES is a masculine economic

sector because the activities are mainly associated with men and use great physical strength. Nevertheless, vulnerable men and women are assumed to be involved in FAES to generate income.

It is assumed that the respondents answered the questionnaires in the respective study sincerely by giving correct and true answers to represent themselves. Using questionnaires that were developed and used for data collection was the main limitation in this study to obtain a representation of respondents who met the criteria from fisheries community. This study used similar parts in the respective questionnaires, which were the profile of the vulnerable respondents, profile of the vulnerability type suffered by the vulnerable respondents, and the vulnerable respondents' household income. The data were limited to these parts in those questionnaires.

1.6 Significance of the Study

The findings of this study are significant for gender and development in masculine FAES, and may help to understand the effect of change on male and female vulnerable groups in fisheries communities in the context of the economic sector, social, and environment. Although gender and development studies aim to reduce gender inequality from all angles, this study focuses on economic opportunities, which may be due to vulnerable men and women usually being in disadvantaged positions in FAES, especially as single mothers and older people. This study may help to promote gender equality (SDG-5) among the vulnerable groups in fisheries communities. Thus, they can be economically and socially empowered according to their vulnerability type.

The findings of this study offer baseline data on the profile of the vulnerable groups in fisheries communities by sex disaggregated. The baseline data may contribute to the focus and discussion in the Gender, Aquaculture and Fisheries (GAF) network, which aims to address the issues of gender equality and vulnerable group in FAES. Besides, it may help to address the issues concerning the role of vulnerable men and women in fisheries communities (Williams, Porter, Choo, Kusakabe, Veikila, Nikita & Melba, 2012).

This study may help the government agencies to develop an action plan, such as capacity building programmes for the vulnerable groups, which can focus on specific types of vulnerability. The vulnerable groups can be assisted to identify the economic sub-sectors in FAES that are within their capability, such as eco-tourism, fish-based processed food, or seafood restaurant, and many more sub-sectors in which they can be trained to work.

The vulnerable group can continuously serve in the national economy and poverty can be eradicated (SDG-1) in fisheries communities; more fish-based process food can be produced (SDG-2), such as dried salted fish, keropok lekor, marinated fish (Zainalaludin, 2010); gender equality (SDG-5) can be improved by empowering vulnerable women to increase the economic wellbeing and the health of their family (SDG-3); the inequality of the vulnerable groups can be reduced (SDG-10); consumption and production can be increased and sustained (SDG-12), and life under water can be promoted (SDG-14), at least in the localities in Malaysia. In this study context of this study mainly focus to achieve SDG-1, SDG-2, SDG-5 and SDG-10.

The findings of this study may also contribute to conceptualizing the seven vulnerability types deduced from the Sustainable Livelihood Approach by Allison, Horemans and Bene (2006), which are Handicapped, Single Parent, Older Person, Caretaker, suffering Serious Disease, Living Alone, and Child Labour. The findings may also contribute to the body of knowledge concerning vulnerability, poverty, and establishing wellbeing as well as gender and development. The most important contribution of this study concerns the triangulated relationship between gender, poverty, and vulnerability type in fisheries communities. Future studies can be conducted in other masculine economic sectors in order to examine this triangulated relationship.

1.7 Conceptual and Operational Definitions

1.7.1 Fisheries

Conceptual: Fisheries involve activities concerning the capture of wild fish or raising fish through aquaculture (Blackhart, Stanton, & Shimada, 2006).

Operational: Fisheries involve activities that include capturing wild fish or through aquaculture farming in brackish water and freshwater systems

1.7.2 Aquaculture

Conceptual: Aquaculture is the farming of aquatic organisms including fish, crustaceans, and aquatic plants in freshwater or brackish water (FAO, 2018)

Operational: Aquaculture is fish farming activities in brackish water and freshwater systems through aquaculture technologies, such as cage, pond, and poly-tank.

1.7.3 Fisheries and Aquaculture Economic Sector (FAES)

Conceptual: The FAES is an economic sector that involves fisheries activities in brackish water and freshwater systems to generate income (Department of Fisheries, 2019a)

Operational: The FAES is the economic sector related to fisheries either directly or indirectly

1.7.4 Water System

Conceptual: Two types of water system are brackish water and freshwater system (Department of Fisheries, 2019a)

Operational: There are two types of water system – brackish water and freshwater

1.7.5 Brackishwater System

Conceptual: The brackish water water system comprises the less salty areas in marine water (Nthunya, Maifadi, Mamba, Verliefe & Mhlanga, 2018).

Operational: The brackish water water system comprises the less salty areas in marine water.

1.7.6 Freshwater System

Conceptual: The freshwater system includes rivers, lakes, and freshwater bodies (Iliyasu, Mohamed & Terano, 2016; Lahsen & Iddya, 2014)

Operational: The freshwater system includes rivers, lakes, and freshwater bodies

1.7.7 Fisheries Community

Conceptual: The fisheries communities are those communities that are mainly involved in FAES as an economic activity to generate income (Organisation for Economic Co-operation & Development, 2001).

Operational: The fisheries communities in this study refer to those communities in which the members are mainly involved in FAES, either directly or indirectly, to generate income

1.7.8 Vulnerability

Conceptual: Vulnerability types refers to the individual experience of psycho-social, physical, social and economic or financial vulnerability (Kuran, Morsut, Kruke, Kruger, Segnestam, Orru & Torpan, 2020; Allison & Horeman, 2006).

Operational: The vulnerability in this study are individual experience of psycho-social, physical disability and poor

1.7.9 Vulnerability Type

Conceptual: Vulnerability types refers handicapped, children, women, older person, poor and single parents (Osman et al., 2015)

Operational: The vulnerability types in this study are Handicapped, Single Parent, Older Person, Caretaker, suffering Serious Disease, Living Alone, and Child Labour but does not include mentally retarded (Zainalaludin et al., 2017)

1.7.10 Vulnerable Community Members

Conceptual: Vulnerable includes those lacking an ability or in the disadvantaged groups to do something, especially related to income generating activities (Ahmad et al., 2016; Zainalaludin et al., 2017)

Operational: The vulnerable in this study include those who suffer at least one vulnerability type.

1.7.11 Poverty

Conceptual: Poverty refers to not earning an income to meet minimal requirements and basic needs (Deonandan, 2019)

Operational: The monthly household income obtained is less than the Malaysia Poverty Line Income (PLI) = RM980

1.7.12 Sex

Conceptual: Sex is the biological aspect of being male or female (Pryzgodka & Chrisler, 2000)

Operational: Sex in this study refers to male or female

1.7.13 Gender

Conceptual: Gender refers to the social construct terminology of what males and females should do, and how they should behave and interact in the community (Ogunlela & Mukhtar, 2009; Hofstede, 2001)

Operational: Gender refers to men and women and represents males and females, respectively.

1.7.14 Gender Analysis

Conceptual: Gender analysis refers to the differences in the gender roles, occupational, activities, needs, opportunities, responsibilities and rights of men and women in fisheries communities (Gopal, Williams, Porter, Kusakabe & Choo, 2014).

Operational: Gender analysis refers to the differences in the vulnerability type, level of vulnerability, socio demographic background, poverty incidence, and involvement in FAES among men and women in fisheries communities

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