The Vulnerability Factor Analysis of B40 Household Income Group in Southern Region of Kelantan using Confirmatory Factor Analysis

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ABSTRACT

Various factors have contributed to the vulnerability of low-income household groups. Households with the bottom 40 percent income (B40) in the Southern Region of Kelantan are faced with multi-dimensional of vulnerability that cause them to be exposed to uncertain risks and jeopardize their lives. The vulnerability factors of B40 household income group in the Southern Region of Kelantan is determined through three factors, namely economics' vulnerability, social/physical's vulnerability, and environment's vulnerability. The purpose of this study is to determine the vulnerability factors that contribute to the B40 household's income group in Southern Region of Kelantan. Respondents of this study were 385 people. Survey method using questionnaire instrument was conducted for this study. The data analyzed using IBM-SPSS-AMOS through confirmatory factor analysis (CFA) in combination (pooled). The findings show that all the vulnerability in Southern Region of Kelantan verified through the aspects of vulnerability economic, social/physical and environmental except three items are EK10 (from economic construct), SF1 (from the social/physical construct) and AS1 (from the environmental construct) are eliminated due to lower factor loading values. Main factor vulnerability of economic is loss of main sources of income. Reliance on one source of income makes B40 households vulnerable to shocks and stresses that could potentially affect their lives and difficulties in surviving of life. Natural disaster such as floods also can affect household income and activities especially households are doing agriculture activities as a main job. Vulnerability also linked to poverty. The government's efforts to help lower income households or B40 group before they become poor can reduce the problems of poverty. Government efforts should focused on group either in rural or urban area. In addition, the paradigm shift from understanding poverty after it happens to identify the possibility for the poor should be initiated by the government.

Keywords: *Vulnerability, B40 household income group (B40), Pooled-CFA, Structural Equation Model*

INTRODUCTION

Various factors have contributed to the vulnerability of low income household groups. The bottom 40 percent household income (B40) in the Southern Region of Kelantan are faced with multi-dimensional of vulnerability that affects their lives. Households with 40 percent bottom income or better known as B40 or bottom 40% are defined as bottom 40% of households with monthly income below than RM 4,360 in the year 2016 (MEA, 2019).

This research focused on the Southern Region of Kelantan because B40 household income in Kelantan was lowest income compared to B40 household income in Malaysia which is RM 2,570. Majority of household's in the Southern Region of Kelantan are involved in agriculture sector and facing a risk and vulnerable. Every year, Kelantan affected with an environments vulnerable such as flood which can damage the agriculture sector and effect of household's income. When the production of agriculture decreasing, so income for household was declining. Furthermore, these effects burden households who reliance on one sources of income. All the daily activities also affected because of difficulties in expenses to their needs and wants.

Based on these problems, the purpose of this study is to determine the vulnerability factors that contribute to the B40 household's income group in Southern Region of Kelantan. This study focuses on three aspects of vulnerability which is consists of economics' vulnerability, social/physical's vulnerability and environment's vulnerability.

LITERATURE REVIEW

Vulnerability is defined as being vulnerable to damage or ill effects of social and environmental changes and the inability to adapt the changes (Adger, 2006). Vulnerability also means less sense of safety due to external environmental pressures and uncertain risks of households and communities.

Serrat (2008), describes the vulnerability effects of two situations which is external factors (shocks, seasonal, critical situations) and internal factors (inability to achieve wellbeing in life). Henninger (1998), states that there are five major risks of vulnerable faced by individuals such as political risks, economic risks, social risks, disease risks and environmental risks. Whereas according to DFID (1999), spatial hazards are discussed in three forms: (i) shocks, such as sudden death, drought, natural disasters, conflicts and wars, accidents, price increases and currency devaluations; (ii) trends in the form of trends include decreased yields, decreased agricultural product prices, population changes, illnesses and increased production costs and (iii) seasonal such as rising prices for goods, production, health and employment opportunities.

A report published by the South Kelantan Development Authority (KESEDAR) (2013) stated that households in Southern Region of Kelantan were facing vulnerable such as low income, lack of skills and experience in doing jobs, lack of motivation and focus on employment and felt comfortable with current life. In addition, Wan Nik (2015) states that the location and geographic of Kelantan as well as the weather factors in which the Northeast Monsoon transitions have caused floods in Kelantan almost every year. The floods, which was called 'Bah Kuning' in December 2014, turned out to have jeopardized the well-being and community life and caused psychological and emotional disturbance to flood victims. Impact of that threats, causing them to lose their homes, lost their source of income and social supports.

According to Nurul Ashikin (2018), floods experienced by local communities in Temerloh district have caused the community to face financial problems. Furthermore, they are involved in the agricultural sector. Noremy (2017), found six problems faced by flood affected victims which namely destruction of homes and properties, financial problems and lost source of income, psychological problems, health problems, problems with resident representatives or community leaders as well as personal problems with family members or neighbors.

In addition, the reliance on income from the main sources only, also causes the household to be easily trapped into an easily-hazardous situation. Rospidah (2017), said that estimates account about 64.7 percent of households B40 dependent on single income sources and this makes them susceptible to threats of shock and stress that could potentially affect their livelihoods.

METHOD AND ANALYSIS

This study was conducted at Southern Region of Kelantan, which covers three quarters of Kelantan's area with a total area of 1.234 million hectares involving the Gua Musang (797,977 hectares), Kuala Krai (235,689 hectares), Jeli (128,304 hectares) and a part of Tanah Merah (72,273 hectares) (KESEDAR, 2013). Respondents of this study consist of the head of household (KIR) with the lowest 40 percent income (B40) in the Southern Region of Kelantan

Population and Sampling

The respondents determine based on stratified random sampling method which is the process of dividing elements or members in a population into non-overlapping substrate (strata) and has uniform characteristics such as interest, age, purpose and specific ethnic group (Fauzi et al, 2014). Household characteristics in the Southern Region of Kelantan are mostly Malays, Muslims and working in agriculture field (KESEDAR, 2013).

The total number of population in the Southern Region of Kelantan is 208053 and only 385 respondents of the household can have used as the sample of the study. Determination of the number of samples for this study is based on the number of samples proposed by Krejie & Morgan (1970). In addition, Hair et al., (2010), suggests that the minimum sample size depends on the complexity of the model and the characteristics of the construction model of the construct. Samples are recommended by Hair et al., (2010) between 100 and 500 depending on the number of constructs and the measurement items. The sample of this study involved with four regions under the management of KESEDAR namely Gua Musang, Kuala Krai, Jeli and a part of Tanah Merah.

Table 1 shows the majority number of questionnaires are responded by respondents from the district of Kuala Krai was 42.9 percent (165 persons), followed by 23.9 percent (92 persons) respondents in Jeli, 22.3 percent (86 persons) respondents from Gua Musang and lastly only 10.9 per cent (42 people) respondents from Tanah Merah.

Table 1 Population and Sampling

		Population and sampling		
		Total Population	**Percent (%)**	**Total sampling**
Region	Jeli	50868	23.9 %	92
	Tanah Merah	23663	10.9 %	42
	Kuala Krai	89215	42.9 %	165
	Gua Musang	44307	22.3 %	86
	Total	208053	100.0%	385

Source: Data of study, 2017

Instrument of Study

The data for this study was using questionnaire instrument. The questionnaire used Likert scale questions from 1 to 5, namely: (1) strongly disagree and (5) strongly agree. Three aspects of the vulnerability of the study, namely the economics vulnerability, social/physicals vulnerability and environmental vulnerability factors consist of 20 items. The list of variables shown in Table 2.

The variables for the vulnerability factors were obtained from previous studies, pilot test as well as interviews conducted on field work against respondents in the Southern Region of Kelantan, as well as some of the variables were derived from the results of discussions with stakeholders in the Southern Region of Kelantan, namely South Kelantan Development Authority or better known as KESEDAR.

Table 2 List of Variables of Vulnerability of Economic, Social / Physical and Environmental in the Southern Region of Kelantan

Variable	Sub factor	Code	Indicators/ Threats (Modified from previous studies)	Literature
Economic (10 items)	Loss of employment and income sources	EK1	Loss of job (main/side).	Rospidah, 2017; Mustaffa Omar et al, 2012; Serrat, 2008; DFID, 1999
		EK2	Loss of main sources income.	Rospidah, 2017; Mustaffa Omar et al, 2012; Serrat, 2008; DFID, 1999
	Increase in prices and cost of production	EK3	Rising prices for basic necessities / food.	Rospidah, 2017; R. B. Radin Firdaus et al,2014; Mustaffa Omar et al, 2012; DFID, 1999
		EK4	Increase cost input	Yasar, 2016; R. B. Radin Firdaus et al,2014; Mustaffa Omar et al, 2012
		EK5	Implementation of the GST	Pilot test, 2017
	Capital Shortage and Marketing	EK6	Lack of capital to extend production	Yasar, 2016; Mustaffa Omar et al, 2012
		EK7	Frequent breakdown of equipment (main / side).	Mustaffa Omar et al, 2012
		EK8	Threat of marketing	Yasar, 2016; KESEDAR, 2013; Mustaffa Omar et al, 2012
		EK9	Competition in occupation / business.	Mustaffa Omar et al, 2012
		EK10	Repayment of loans (financial / non-financial).	Rospidah, 2017; Yasar, 2016; Mustaffa Omar et al, 2012; Anna 2011

Social/Physical (6 items)	SF1	Lower self-esteem and self-motivation to do the work.	Noremy et al, 2017
	SF2	Emotional threat caused by family problems	Anna et al, 2011
	SF3	Neighborhood / community problem.	Yasar, 2016; Mustaffa Omar et al, 2012
	SF4	Health threats that affect work (main / side).	Rospidah, 2017; Yasar, 2016; Mustaffa Omar, 2016; Mustaffa Omar et al, 2012; Anna et al, 2011; DFID, 1999
	SF5	Social problems (such as theft, drug addiction)	Muyambo, F, 2017; Mustaffa Omar et al, 2012; Anna, 2011
	SF6	Lack basic facilities	Mustaffa Omar et al, 2012; Anna et al, 2011
Environment (4 items)	AS1	Weather threats (storm, drought, monsoon) that affect household income.	Muyambo, F, 2017; Noremy et al,2017; Ahmad Zubir, 2017; Yasar, 2016; Mustaffa Omar, 2016; R. B. Radin Firdaus et al, 2014; Mustaffa Omar et al, 2012; Serrat, 2008; DFID, 1999
	AS2	Floods threats in placement household area	Yasar, 2016; KESEDAR, 2013; Serrat, 2008
	AS3	Agricultural / livestock diseases	Muyambo, F, 2017; Yasar, 2016; KESEDAR, 2013, Mustaffa Omar et al, 2012; Serrat, 2008; DFID, 1999,
	AS4	Environmental threats that interfere with daily activities (R) and families.	Mustaffa Omar et al, 2012

Analysis Method

Data analyzed using IBM-SPSS-AMOS through Confirmatory Factor Analysis (CFA). CFA analysis was conducted after implementation of Exploratory Factor Analysis (EFA). The objective of the EFA is to reduce the dimensions of the original data to some smaller components and can be interpreted more easily and meaningfully (An Gie Yong & Sean Pearce, 2013). The EFA results found that vulnerability of economic can be explained into three components: (i) loss of employment and income sources, (ii) increase in prices and cost of production and (iii) capital shortage and marketing. While vulnerability social / physical and environmental is explained by a single component (factor) that is social / physical and environmental. After the EFA is conducted, this study proceeds with the CFA.

CFA is used to evaluate unidimensionality, validity and reliability of a construct. Construct validation needs to be done by the investigator before modeling the causal relationship between constructs in a Structural Equation Model (SEM). CFA for each construct can be run separately or in combination (Pooled-CFA). According to Zainuddin (2018), the Pooled-CFA method is faster and more efficient. Eugenie (2014), explains Pooled-CFA is easier and better than a separate CFA. Therefore, this study uses Pooled Confirmatory Factor Analysis (Pooled-CFA) in order to identify B40 household's income group in the Southern Region of Kelantan.

In the CFA procedure, the compatibility of the measurement model with the observed data is very important and is indicated by the fitness indexes. Zainuddin (2013) notes that there is currently no agreement among researchers on the corresponding fitness index that needs to be reported. To evaluate the model fitness, a few fitness indexes need to be examined. There are three categories of model fit involved as follows: absolute fit, incremental fit, and parsimonious fit (Holmes-Smith (2006); Hair et al. (2014). In

order to achieve the acceptable model fitness, the redundant items existed in a model must be either removed or constrained (Nazim, 2013). Table 3 and 4 below show the fitness indexes, validity, and reliability.

Table 3 Fitness Indexes

Name of Category	Name of Index	Level of acceptance	Literature
1. Absolute fit	Root Mean Square of Error Approximation (RMSEA)	RMSEA< 0.08	Zainudin,2018 Hair et al, 2014 (RMSEA<0.07 accepted with CFI > 0.9)
	Goodness of Fit Index (GFI)	GFI > 0.90	Zainudin, 2018 Hair et al, 2014
2. Incremental Fit	Comparative Fit Index (CFI)	CFI > 0.90	Zainudin, 2018 Hair et al, 2014
	Tucker-Lewis Index (TLI)	TLI > 0.90	Zainudin, 2018 Hair et al, 2014
	Normed Fit Index (NFI)	NFI > 0.90	Zainudin, 2018 Hair et al, 2014 (Value between 0.0 to 1.0)
3. Parsimonious Fit	Chi Square/ Degree of Freedom (ChiSq/df)	ChiSq/df < 5.0	Zainudin, 2018

Table 4 Validity and Reliability

Name of Category	Name of Index	Level of acceptance	Literature
Convergent Validity	Average Variance Extracted	AVE ≥ 0.5	Zainudin (2018)
Internal Reliability	Cronbach Alpha	α ≥ 0.6	Zainudin (2018)
Construct Reliability	Composite Reliability	CR ≥ 0.6	Zainudin (2018)

FINDINGS AND DISCUSSION

Confirmatory Factor Analysis (CFA)

There are three factors of vulnerability namely economics vulnerability, social/physicals vulnerability and environmental vulnerability. The economic vulnerability factor consists of 10 items and three components: (i) loss of employment and income sources (EK1, EK2), (ii) increase in prices and cost of production (EK3, EK4, EK5) and (iii) capital shortage and marketing (EK6, EK7, EK8, EK9, EK 10). While for social / physical vulnerability, there are six items: SF1, SF2, SF3, SF4, SF5, SF6 and environmental vulnerability have four items: AS1, AS2, AS3, and AS4. The vulnerability for this study can be shown in Figure 1.

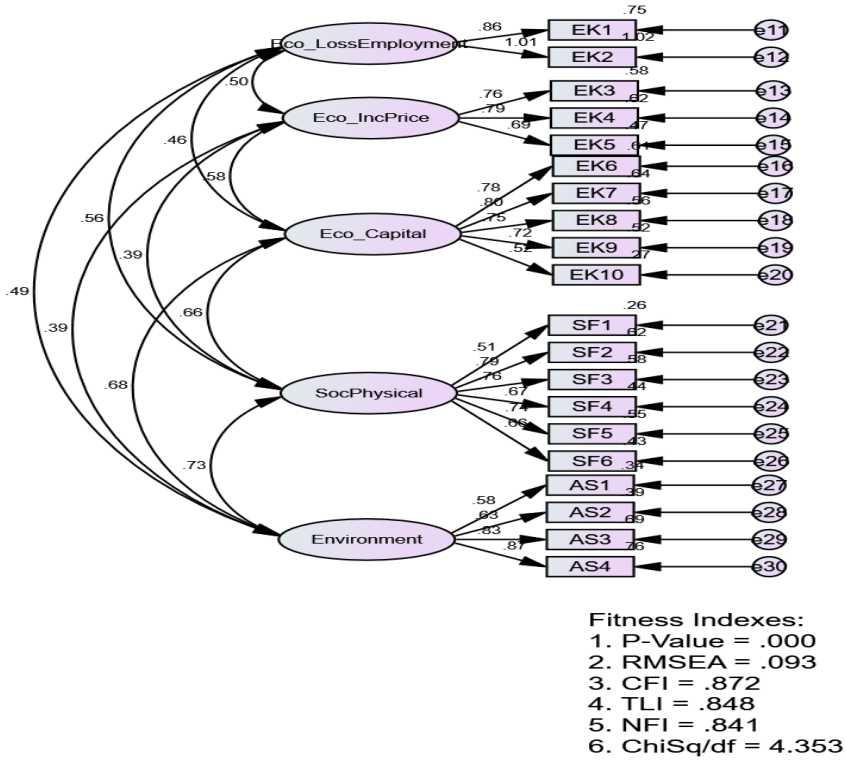

Fig 1 Pooled-CFA Model of Vulnerability of Economic, Social / Physical and Environmental

Based on the figure 1, certain interpretations can be made to verify the validity of the construct measurement model. The most important value that needs to be investigated is the value of the fitness index.

Table 5 shows the fitness index for the Pooled-CFA Model of Vulnerability of Economic, Social/Physical and Environment. The value of RMSEA is greater than 0.08, while value of CFI,TLI,NFI are lower than 0.9 (between 0.841 to 0.872). Only the results for ChiSq/df are acceptable because the value less than 5.0. So, this fitness index value does not accepted to reach the required level. If the value of the fitness index does not reach the required level, it should be noted that the lower factor loading of each item involved will be remove.

Table 5 Fitness Indexes for Vulnerability of Economic, Social/Physical and Environmental

Name of Category	Name of Index	Result of Study	Comment
1. Absolute Fit	RMSEA< 0.08	0.093	No acceptable
2. Incremental Fit	CFI > 0.90	0.872	No acceptable
	TLI > 0.90	0.848	No acceptable
	NFI > 0.90	0.841	No acceptable
3. Parsimonious Fit	ChiSq/df < 5.0	4.353	Acceptable

Therefore, the factor loading for each item is reviewed through table 6. This item is reviewed through the lowest factor loading. The lowest factor loading is item SF1 which is 0.509. After remove this item, CFA-POOLED will be run again and the results for RMSEA is equal to 0.093 which is greater than 0.08, CFI, TLI, NFI less than 0.9 (between 0.854 to 0.883), and chisq/df is 4.319. This results are not acceptable because did not achieve the requirement of fitness index (Figure 2).

Table 6 Factor loading for Vulnerability of Economic, Social/Physical and Environmental

Item	Factor loading
E1 ← EK	0.865
E2 ← EK	1.012
E3 ← EK	0.764
E4 ← EK	0.785
E5 ← EK	0.686
E6← EK	0.781
E7 ← EK	0.801
E8 ← EK	0.749
E9 ← EK	0.723
E10 ← EK	0.517
SF1 ← SF	**0.509**
SF2 ← SF	0.787
SF3 ← SF	0.761
SF4 ← SF	0.666
SF5 ← SF	0.739
SF6← SF	0.658
AS1 ← AS	0.585
AS2 ← AS	0.628
AS3 ← AS	0.828
AS4 ← AS	0.871

Process of removing lower factor loading occurs repeatedly until fitness indexes value achieved. If the fitness index still not achieved even if the items have been removed, it is possible that redundant items occur in the model (Zainuddin, 2018). Figure 3 shows items EK10, SF1 and AS1 have been removed. However, the compatibility index has not been reached yet (RMSEA = 0.84, CFI = 0.918, TLI = 0.898, NFA = 0.892). Therefore, the items in constructs may have redundant items. These repeatable items can be identified through the Modification Index (MI) with values greater than 15 (MI> 15).

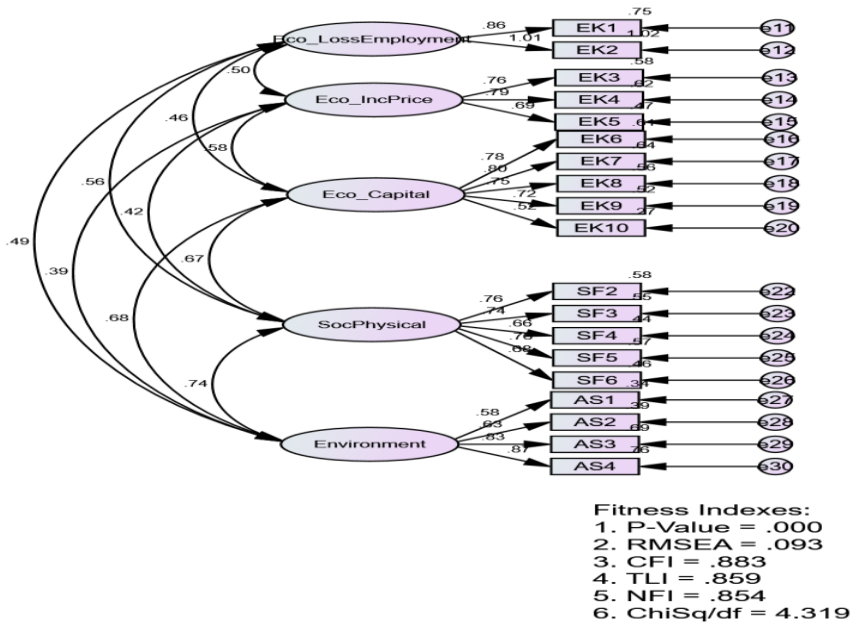

Fig 2 Pooled-CFA Model of Vulnerability of Economic, Social / Physical and Environmental (After remove SF1)

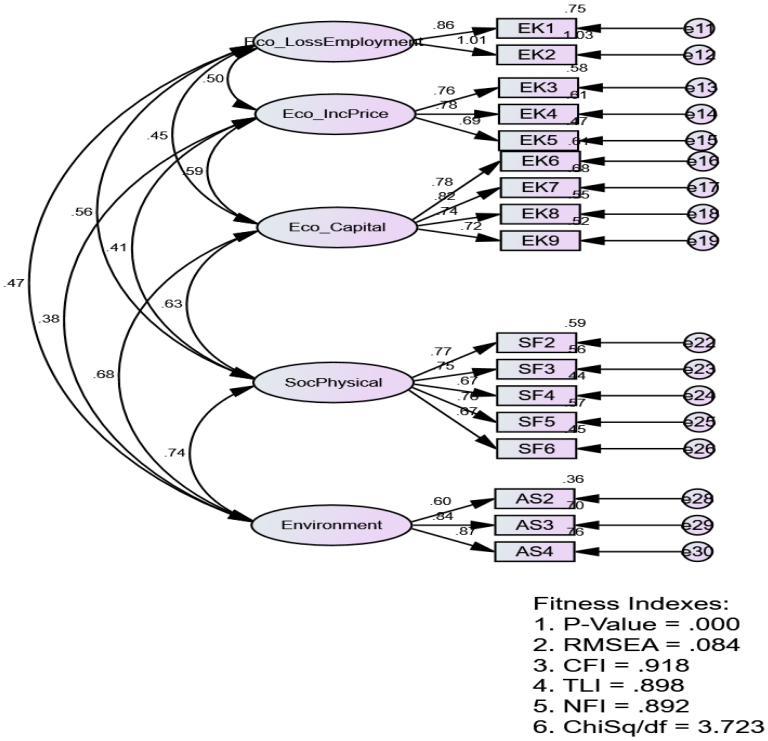

Fig 3 Pooled-CFA Model of Vulnerability of Economic, Social / Physical and Environmental (After remove item EK10, SF1, AS1)

Table 7, shows all the modifications index (MI) values greater than 15 (MI> 15). After examining the value of MI and doing the correlation between the items, then the results of the study are shown in Figure 4.

Table 7 Modification Index

	M.I.	Par Change	Comment
e25<--> e26	26.979	.132	MI > 15 show e25 and e26 are redundant
e22<--> e26	25.443	-.125	MI > 15 show e22 and e26 are redundant
e22<--> e23	45.322	.149	MI > 15 show e22 and e23 are redundant
e18<--> e19	17.004	.115	MI > 15 show e18 and e19 are redundant

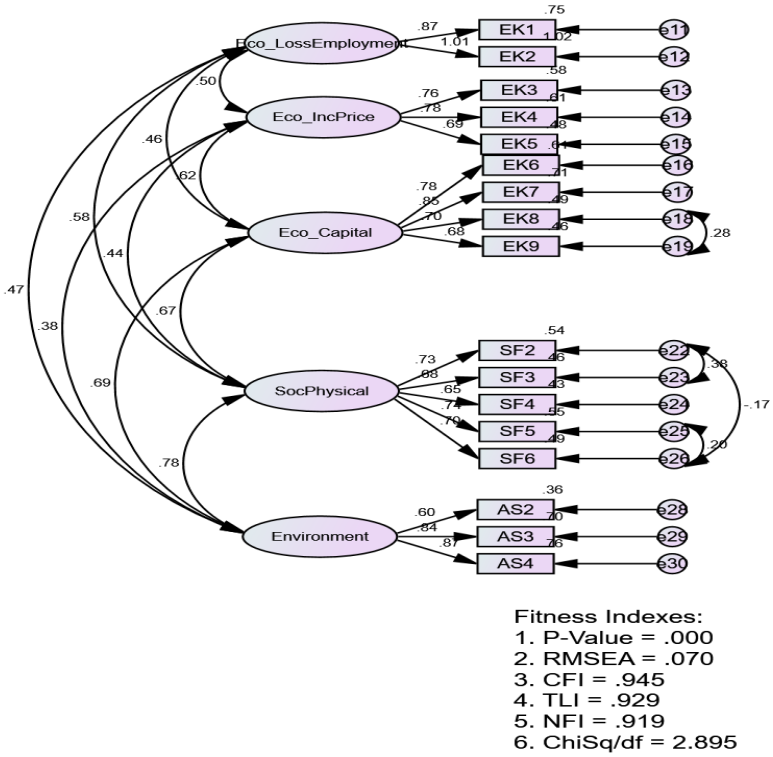

Fig 4: Final-run Pooled-CFA Model of Vulnerability of Economic, Social / Physical and Environmental (After MI)

Based on the figure 4, fitness indexes were achieved (Table 8). Only 17 items were accepted as a vulnerability item for B40 households in the Southern Region of Kelantan. The three items (EK1, SF1, AS1) are eliminated which does not give much impression to the vulnerability of Economic, Social/Physical and Environment for the B40 household in Southern Region of Kelantan.

Table 8 Fittness Indexes After MI

Name of Category	Name of Index	Result of Study	Comment
1. Absolute Fit	RMSEA< 0.08	0.070	Acceptable
2. Incremental Fit	CFI > 0.90	0.945	Acceptable
	TLI > 0.90	0.929	Acceptable
	NFI > 0.90	0.919	Acceptable
3. Parsimonious Fit	ChiSq/df < 5.0	2.895	Acceptable

Vulnerability of Economic

Value factor loading for the vulnerability of economic between 0.678 to 1.00. In component 1, the higher factor loading refer to EK 2, which is the threats of loss of main sources of income. According to Rospidah (2017), household dependence on a source of income makes households vulnerable to shock and stress that could potentially affect their lives. Workers who lost their jobs especially those who have a family are facing difficulties in surviving the effects of income loss. Their situation is more stressful if they have monthly financial commitments such as car hire, home and other expenses. To overcome and mitigate

these threats, B40 households need to diversify their income portfolios and not depend on one sources of income only.

Component 2 refers to EK3, EK4 and EK5. The highest value for this component is EK4 which is 0.780, followed by EK3 of 0.764 and EK of 0.693. Component 2 can be classified into price increases and production costs. The price increase factor was due to seasonal external factors (Serrat, 2008; DFID, 1999). The increase in prices of goods caused the B40's household in the Southern Region of Kelantan to be affected and easily threatened. This is because most households in Southern Region of Kelantan are involved with agricultural activities. If production input costs increase, this will reduce production and ultimately impact on revenue reduction. Lower income makes difficult for households to get basic needs. The implementation of the Goods and Services Tax (GST) on production costs and rising prices of basic necessities such as food have a large impact on households and cause them to be easily threatened.

Component 3 refers to EK6, EK7, EK8, and EK9. The highest value is EK 7 which is 0.846. This followed the EK6 of 0.778, EK8 of 0.700, and EK9 of 0.678. These components are classified into capital and marketing shortages. The lack of capital in expanding employment will cause B40 households in the Southern Region of Kelantan affected. This affects the marketing activities of goods and services. Frequent equipment damage also reduces the production of goods and services. Yasar (2016), expressing easy access to capital can increase the interest of farmers in rice cultivation..

Vulnerability of Social/Physical

The vulnerability factor of social/physical for the B40 household in Southern Region of Kelantan comprises with five items such as SF2, SF3, SF4, SF5 and SF6. The value of SF5 is the highest value of 0.744. Whereas followed by SF2 value of 0.734, SF6 of 0.702, SF3 of 0.676, SF4 of 0.654 and SF1 is deleted because lower factor loading value which is less than 0.6. The higher impact of vulnerability because of critical threats in the placement or occupation area. Critical threats such as theft or crime effect can because households exposed to hazard risks and at the same time cause them to live in fear. Anna (2011), crime effects gave affect to generating activities of household income. Besides that, social/physical affect that is caused by family problems. Family problems can influence of emotional of household and effect their activities to do their work. Household also facing with the health problems. Ahmad Zubir (2018) found that a vulnerable group was faced with 30 percent health problems. They are dealing with health problems such as diabetes, hypertension and heart problems. Those who face health problems have never attended a talk on healthcare interests.

Vulnerability of Environmental

The environmental vulnerability factor for B40 households in Southern Region of Kelantan consists of AS2 (0.602), AS3 (0.838) and AS4 (0.874). The highest impact of vulnerability of environment is AS4. The environmental threats interfere with daily household and family activities. Ahmad Zubir (2017), lower income groups and vulnerable groups facing with natural disasters. The effects of the natural disasters can affect their income. Yasar (2016), the effects of climate change and frequent flooding in the rainy season have caused heat to rise, the occurrence of disease attacks and growing crop pests. Noremy (2017) found that there were six problems faced by the respondents after the floods namely the destruction of homes and property; financial problems and loss of income sources; psychological problems; respondents' health problems or family members; problems with resident representatives or community leaders; as well as the last problem is personal issues with family members or neighbors. All the problems recognized by the respondents are the root cause of the adverse effects of natural disasters such as floods.

Validity and Realibility

Once the Pooled-CFA procedure is complete, the model needs to be tested using specific steps to demonstrate the validity and reliability of the constructs and summarized in the form of tables. Procedures for assessing the validity and reliability of each construct are compiled in Table 9. The average value of the Average Variance Extracted (AVE), exceeds the value of 0.5 and above (AVE $\geq$ 0.5) for economic, social/physical and environmental sustainability. This shows the convergence validity is achieved. While Composite Reliability (CR) 0.6 and above (CR $\geq$ 0.6) for all three vulnerability.

Table 9 Validity and Realibility

Variable		Items	Factor Loading	Cronbach's Alpha (Minimum 0.6)	CR (Minimum 0.6)	AVE (Minimum 0.5)
Economic	Loss of employment and income sources	EK1	0.865	0.933	0.939	0.886
		EK2	1.012			
	Increase in prices and cost of production	EK3	0.764	0.785	0.790	0.557
		EK4	0.780			
		EK5	0.693			
	Capital Shortage and Marketing	EK6	0.778	0.854	0.839	0.568
		EK7	0.846			
		EK8	0.700			
		EK9	0.678			
		EK10	Item is deleted due to low factor loading			
Social / Physical		SF1	Item is deleted due to low factor loading	0.840	0.830	0.494
		SF2	0.734			
		SF3	0.676			
		SF4	0.654			
		SF5	0.744			
		SF6	0.702			
Environment		AS1	Item is deleted due to low factor loading	0.811	0.820	0.610
		AS2	0.602			
		AS3	0.838			
		AS4	0.874			

Discriminant Validity

The Discriminant Validity Index Summary is set out in Table 10 below to prove that all the constructs in the study are discriminating against each other. The values in the diagonal are the value of the AVE square root for the constructs, while other values are the correlation between the constructs in the row and the column (the value in the two-way arrow Figure 4).

Table 10 Discriminant Validity Index Summary

	Eco Loss Employment	Eco Capital	SocPhysical	Environment	Eco_IncPrice
Eco_LossEmployment	**0.941**				
Eco_Capital	0.463	**0.753**			
SocPhysical	0.582	0.671	**0.703**		
Environment	0.473	0.687	0.775	**0.781**	
Eco_IncPrice	0.502	0.619	0.438	0.382	**0.747**

The discriminant validity for all constructs is achieved when diagonal values are higher than the values in the row and columns. The conclusion is that the discriminant validity of the three vulnerability, namely economic, social / physical and environmental has been achieved. The findings confirm that the economic, social / physical and environmental items are the vulnerability factors that affect the lives of B40 households in the Southern Region of Kelantan.

CONCLUSION

As a conclusion, B40 household income group in Southern Region of Kelantan facing with multi-dimensions of vulnerability in aspects of economic, sosial/physical and environment. All items are accepted as factors of vulnerability except three items are EK10 (from economic construct), SF1 (from the social/physical construct) and AS1 (from the environmental construct) are eliminated due to lower factor loading values.

Factor vulnerability of economic is loss of main sources of income. Dependence on one source of income makes households vulnerable to shock and stress that could potentially affect their lives and difficulties in surviving of life. Beside that, higher prices of good and services also can affect the lower income group especially for the basic necessities. Capital also important for the household, lack of capital to household can affect for income and expenditure household. If households no have money so their live can be difficult and affect their emotion. Household can more stress and do some crime to get the money for buy goods and services. Besides that, family problem also can affect household income. The last is natural disaster. Vulnerability of natural disaster such as floods can affect household's income and activities especially households who do agriculture activities as a main job.

RECOMENDATION AND SUGGESTION

This study only include three factors of vulnerability namely economic, social/physical and environmental. In the future, researchers can use another factors such us political, health, market, demographic and agricultural factors as a vulnerable factors. Beside that, vulnerability also linked to poverty. Understanding the concepts and measures of vulnerability and their relationship to poverty can help policy makers and program implementers identify the lower income households or B40 group. The government's efforts to help lower income households before they become poor can reduce the problems of poverty. Government efforts will be focused on those target groups especially B40 group either in rural or urban area. In addition, the paradigm shift from understanding poverty after it happens to identify the possibility for the poor should be initiated by the government. At the same time, development allocations to raise the level of living of B40 group can be allocate with more efficient and effective.

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REFERENCES

Adger, W.N. (2006), 'Vulnerability', Global Environmental Change 16(3), 268–281.https://dx.doi.org/10.1016/j.gloenvcha.2006.02.006

Ahmad, N. (2013). Assessing the Unidimensionality, Reliability, Validity and Fitness of Influential Factors of 8th Grades Student's Mathematics Achievement in Malaysia. *International Journal of Advance Research, Vol. 1 (2).*

Ahmad Zubir Ibrahim, Chamhuri Siwar (2017). *Kelestarian Penghidupan Petani Luar Bandar*. Sintok: Universiti Utara Malaysia

Ahmad Zubir Ibrahim, Kalthum Hj Hassan, Roslina Kamaruddin &, Abd Rahim Anuar. (2018). The Level of Livelihood Assets Ownership among Vulnerability Group in East Coast of Malaysia. *European Journal of Sustainable Development (2018),* 7, 3, 157-161 ISSN: 2239-5938 Doi: 10.14207/ejsd. 2018.v7n3p157

An Gie Yong, Sean Pearce (2013). A Beginner's Guide to Factor Analysis: Focusing on Exploratory Factor Analysis. *Tutorials in Quantitative Methods for Psychology 2013*, Vol. 9 (2), p. 79-94. DOI:10.20982/tqmp.09.2p079

Anna A/P Arokia Nathen, Doris Padmini A/P Selvaratnam & Norlaila Abu Bakar. (2011). Hubungan Tingkat Pendapatan dan Kehidupan Lestari: Kerangka Konseptual. *Persidangan Kebangsaan Ekonomi Malaysia ke VI (PERKEM VI), Ekonomi Berpendapatan Tinggi: Transformasi ke Arah Peningkatan Inovasi, Produktiviti dan Kualiti Hidup*, Melaka Bandaraya Bersejarah, 5 – 7 Jun 2011. ISSN: 2231-962X

DFID. (1999). *Sustainable Livelihoods and Poverty Elimination*. UK: Department for International Development.

Egan, J. (2006). *Vulnerable populations: Don't forget about me! Public Aid Coordinator*, Citi of Winnipeg. Dicapai daripada https://www.gov.mb.ca/emo/pdfs/vulnerable.pdf

Eugenie Eugene Chong, Ahmad Nazim, Sabri B. Ahmad (2014). A Comparison between Individual Confirmatory Factor Analysis and Pooled Confirmatory Factor Analysis: An Analysis of Library Service Quality, a Case Study at a Public University in Terengganu. *International Journal of Engineering Science and Innovative Technology (IJESIT)* Volume 3, Issue 1, January 2014. ISSN: 2319-5967

Fauzi Hussin, Jamal Ali & Mohd Saifoul Zamzurinoor (2014). *Kaedah Penyelidikan & Analisis Data SPSS. Sintok*: UUM Press. ISBN 978-967-0474-67-0

Hair J.F, Black W.C, Babin B.J, Anderson R.E. (2014). *Multivariate Data Analysis*. 7th edition. Pearson New International Edition, USA.

Hair, J. F., Black, W. C., Babin, B. J., and Anderson, R. E. (2010). *Multivariate Data Analysis: A Global Perspective, 7th Edition*. New Jersey: Pearson Educational Inc.

Hair, J.F, Black, W.C., Babin, B. J., Anderson, R.E. & Tatham, R. L. (2006). *Multivariate Data Analysis*, 6th edition. Pearson, N.J: Prentice Hill.

Henninger, N. (1998). *Mapping and Geographic Analysis of Human Welfare and Poverty Review and Assessment.* World Resources Institute. Washington.

Holmes-Smith P, Coote L, Cunningham E. (2006). *Structural Equation Modelling: From the Fundamentals to Advanced Topics.* Melbourne: SREAMS.

Kementerian Hal Ehwal Ekonomi (MEA) (2019). Klasifikasi Pendapatan Isi Rumah Malaysia. Malaysia. Putrajaya.

KESEDAR. (2013). *Laporan Akhir Pelan Strategik KESEDAR Dalam Hala Tuju Baru Wilayah Kelantan Selatan 2030*. Akademi Aidit Sdn Bhd.

Khazanah Research Institute (KRI). (2018). *The State of Households 2018: Different Realities.* October 2018. Perpustakaan Negara Malaysia. ISBN 978-967-16335-1-9

Meikle, S, Walker, J. & Ramasut, T. (2001). *Sustainable Urban Livelihoods: Concepts and Implications for Policy*. DPU Working Paper. London. The Development Planning Unit, University College London.

Miller, J. (2003). Critical incident debriefing and social work: Expanding the frame. *Journal of Social Service Research*, 30 (2), 7-25.

Mohd Fauzi Mohd Harun, Ahmad Fauzee Abdullah. (2007). *Kemiskinan Mengikut Teori Konvensional dan Perspektif Islam*. Shah Alam: Universiti Teknologi MARA.

Muhammad Yasar, Chamhuri Siwar, Rospidah Ghazali. (2016). Analisis Kemudahterancaman Pesawah Padi di Kawasan Pembangunan Bersepadu Terengganu Utara, Malaysia. *Jurnal Ekonomi Malaysia 50(2) 2016 39 – 47*. http://dx.doi.org/10.17576/JEM-2016-5002-04

Mustafa Z, Wijaya T. (2012). Panduan Teknik Statistik SEM & PLS dengan SPSS AMOS. Yogyakarta: Cahaya Atma Pustaka.

Mustaffa Omar (2016). Perbandingan Indeks Kelestarian Hidup Dan Kemudahancaman Komuniti Minoriti Orang Asli di Semenanjung Malaysia. *Malaysian Journal of Society and Space 12 issue 8 (34 - 47)* © 2016, ISSN 2180-2491

Mustaffa Omar, Mohd Samsudin, Ishak Yussof, Sharina A. Halim. (2012). Kemudahterancaman dan Kelestarian Hidup Komuniti Luar Bandar: Satu Penelitian Dari Sudut Kerangka Kelestarian Hidup. *Journal of Tropical Marine Ecosystem* 2(2012):71-82

Muyambo, F., Jordaan, A.J. & Bahta, Y.T., (2017), 'Assessing social vulnerability to drought in South Africa: Policy implication for drought risk reduction', *Journal of Disaster Risk Studies* 9(1), a326. https://doi. org/10.4102/jamba. v9i1.326

Noremy Md Akhir, Azlinda Azman, Nazirah Hassan & Nur Hafizah Md Akhir. (2017). Kajian Penelitian Masalah Mangsa Bencana Banjir Disember 2014 di Kelantan. *Journal of Social Sciences and Humanities*. Special Issue 3 (2017): 007 ISSN:1823-884x

Nurul Ashikin Alias, Chamhuri Siwar, Mohd Khairi Ismail, Nor Diana Mohd Idris. (2018). Flood Disaster Management in Sungai Pahang Basin: Case of Temerloh. *In Improving Flood Management, Prediction and Monitoring.* Published online: 08 Nov 2018; 91-102. https://doi.org/10.1108/S2040-726220180000020017

Parmjit Singh, Puzziawati Abdul Ghani & Teoh Sian Hoon. (2009). *Quantitative Data Analysis for Novice Researchers.*Kuala Lumpur: Primera Publishing. ISBN 978-983-44857-0-2

Quarantelli, E. L. (1998). *What is a disaster? Perspectives on the question*. New York: Routledge.

R. B. Radin Firdaus, Ahmad Zubir Ibrahim, Chamhuri Siwar & Abdul Hamid Jaafar. (2014). Penghidupan Petani Padi Dalam Mendepani Cabaran Perubahan Iklim: Peranan Intervensi Kerajaan Menerusi Skim Subsidi Harga Padi (SSHP). *Kajian Malaysia, Vol. 32, No. 2, 2014, 73–92*

Robert V. Krejie, Daryle W. Morgan. (1970). *Determining Sample Size for Research Activities*. Educational and Psychological Measurement.

Rospidah Ghazali. (2017). Keterangkuman dan Masyarakat Saksama: Multidimensi Kemudahterancaman Isi Rumah B40 dalam *Buku Memperkasa Sosioekonomi Kelompok B40 Mendepani Arus Perdana*. Kuala Lumpur: Institut Tadbiran Awam Negara (INTAN). ISBN: 978-983-3109-95-1

Serrat, O, (2008). The Sustainable Livelihoods Approach. Knowledge Solution, *Asian Development Bank.* Dicapai daripada https://www.adb.org/sites/default/files/publication/27638/sustainable-livelihoods-approach.pdf

Tabachnick BG, Fidell LS. (2007) *Using Multivariate Statistics.* Boston: Pearson Education Inc

Unit Perancang Ekonomi (EPU). (2015). Jabatan Perdana Menteri, Putrajaya.

Wan Nik, W. Y. (2015, Jun 30). Banjir Kelantan 2014: Satu musibah. Pusat Kajian Strategik Kerajaan Negeri Kelantan. Di muat turun daripada pks.kelantan.gov.my/? p=82

Zainuddin. (2018). *Pendekatan Mudah Structural Equation Modelling (SEM)*. Selangor: MPWS Rich Resources Sdn. Bhd.

Zainudin Awang. (2012). *Structural Equation Model Using AMOS Graphic*. Shah Alam: UiTM Press.