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Impact of Livelihood Assets on the Food Security Status among Low-Income Households in Rural Area, Kedah, Malaysia

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Abstract:

Livelihood assets are an important factor in livelihood sustainability, especially in the context of food security. Without sufficient livelihood assets, food security status is compromised, especially for low-income people. This situation leads to food insecurity and has implications for the health and well-being of this group. Therefore, this study aims to determine the impact of livelihood assets on the food security status of low-income households in rural Malaysia. The study was conducted among 200 low-income households in the rural areas of Kedah, Malaysia. The Partial Lease Square Structural Equation Model (PLS-SEM) was used and it was found that human and social assets had a significant and positive relationship with total livelihood assets. Partial Lease Square Structural Equation Model (PLS-SEM) was used and revealed that the human and social assets have a significant and positive relationship with overall livelihood assets ($p<0.05$) as well as the livelihood asset has a significant positive relationship with food security ($p<0.01$). However, physical assets, financial assets and natural assets were identified as insignificant among rural low-income households in Kedah. The findings suggest that the livelihood status of rural communities and food security should be improved, especially for low-income households in Malaysia and similar countries.

Keywords: Livelihood assets, Food security, Low-income Households, Rural area, Malaysia

Introduction

Food security exists when all people at all times have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and preferences for an active and healthy life (FAO (2001). Poverty has an impact on food security. Poverty means that a family does not have enough to eat (United Nations, 1998). This situation contributes to food insecurity in households. In Malaysia, a study among low-income households found that people with low incomes or below the poverty line have difficulty achieving food security. Studies by Susanti et al. (2019), Roselawati et al. (2017), Yong & Norhasmah (2016), Zalilah et al. (2014), Ihab et al. (2013), Nik Aida Adibah et al. (2013) and Siti Marhana et al. (2012) show that low-income households in Malaysia struggle with the problem of food insecurity.

The problem of food insecurity is related to the status of livelihood resources in households as a result of poverty. Low income, higher number of families, fewer means of livelihood, low level of education and lack of skills and training are all socio-economic variables that contribute to the inability of low-income households to obtain adequate food. In other words, this element provides a source of income for this group. In addition, some respondents were required to pay for furniture and electrical appliances they consumed in their homes through a monthly payment plan. Some people commit to repaying debts for house purchase, motor vehicles, personal debts and investment debts, spending an average of RM3,612 per month (Department of Statistics, 2020). This makes it difficult for low-income families to achieve food security.

At the same time, vulnerabilities such as natural disasters (floods, droughts and climate change) and shocks (increased cost of living) pose a threat to the livelihoods of low-income people. According to Chambers (1989), vulnerability means being exposed to imponderables and stress and having difficulty coping with them. Vulnerability comprises two aspects: an external side of hazards, shocks and stress to which a person or a family is exposed, and an internal side of diminished defences, which implies a lack of resources to cope without causing harm. Physically weakened, monetarily poor, socially dependent, humiliated or mentally damaged are all examples of loss. According to Chambers (1989), people are most vulnerable to food insecurity when they are exposed to external hazards and shocks and/or when their ability to adapt without experiencing negative consequences is severely limited. Moser (1998) explains that vulnerability is strongly related to asset ownership to reduce the impact of vulnerability on the livelihoods of low-income households. The more assets individuals own, the less vulnerable they are, and the more assets they lose, the more insecure they become. To achieve the Sustainable Development Goals, it is necessary to understand the impact of livelihood assets on food security

(Yazdanpanah et al. 2021). Therefore, this study aims to determine the relationship between livelihood assets and food security among low-income households in rural area Kedah, Malaysia.

2. Literature review

2.1 Food security among low-income households

Food security means that every person has access to nutritious and sufficient food in a socially acceptable manner to lead a healthy life (Zhou et al., 2019). Food insecurity, on the other hand, is defined as limited or dangerous access to adequate and nutritionally safe food or limited ability, if not inability, to obtain acceptable meals in a socially acceptable manner (Farzana et al., 2017). Food insecurity can be a precursor to health and nutrition problems as it is an indication of family and individual health. Food insecurity can be chronic, seasonal or transitory, and can range from household concerns about access to food to acute starvation among children (Behzadifar et al., 2016).

Over the past 30 years, this concept has evolved in the context of food security, reflecting developments in government policy thinking (Clay, 2002). Food security refers to the ability to maintain a state food balance and ensure adequate food supply and availability to meet the needs of people at the national level (Chen & Kates, 1994). At the same time, food security refers to a family's rights to food production resources, income, food expenditure and food consumption at the household level (Chen & Kates, 1994). The Food and Agriculture Organisation (FOA) (2001) has identified four essential characteristics or pillars of food security, listed in Figure 1, and each pillar must be met to ensure food security, whether at the national or household level. In contrast to food security, food insecurity occurs when the availability of nutritionally adequate and safe food and the ability to feed oneself in a socially acceptable manner is limited or unpredictable (Life Sciences Research Office 1990).

This fact shows that people who are food insecure regularly do not get enough to eat or do not have enough to eat, depending on the cultural standard (Habicht, 2004). Food insecurity is a global problem, as the number of undernourished people is growing. It now stands at 842 million people, or about 12% of the world's population (Zhou et al.) (2019). A household's level of food security is determined by a person's basic nutritional needs in a given period and assumes that all families have the same right to food, disregarding non-economic risks (Manap, 2019).

The food security of families would be affected by this fact. Ensuring food security for all requires not only ensuring that there is always enough food, but also that everyone has access to safe, nutritious food. The interactions between food security and local knowledge, negotiated along multiple axes of power, affect household nutrition (McNamara & Wood, 2019). Poor people spend three-quarters of their income on staple foods, exposing them to the risk of rising food costs, while many poor people derive a significant portion of their income from agriculture, exposing them to the risk of declining agricultural production. Poor people spend three-quarters of their income on staple foods, making them vulnerable to high food prices. Poverty reduction is a critical component of a food security strategy, as poor people spend three-quarters of their income on staple foods and are thus vulnerable to high food prices.

A study conducted by Tarasuk et al. (2019) in Canada found that low-income households are more likely to experience food insecurity than higher-income households. The study also found that food insecurity was associated with a higher risk of chronic diseases and mental health problems. The study by Loopstra et al. (2019) found that low-income households were more likely to experience food insecurity than higher-income households and that this was associated with poor physical and mental health. The study also found that food banks and other charitable food assistance programmes are often used as a last resort by low-income households experiencing food insecurity. Souza et al. (2021) also found that low-income households in urban areas were more likely to experience food insecurity than households in rural areas, and that this was associated with poor health outcomes. The study also found that access to healthy food is a major barrier for low-income households in urban areas.

Food insecurity among low-income Malaysian households is at an all-time high. According to a study by Zalilah et al (2014), 78.4 per cent of people in Selangor, Negeri Sembilan and Kelantan are food insecure. 26.7 percent of households are food insecure, 25.3 percent of individuals are food insecure and 26.4 percent of children are hungry. According to a study by Ihab et al. (2013), in Bachok district, Kelantan State, 83.9 per cent of low-

income people are food insecure, while 29.6 per cent of families and 19.3 per cent of individuals are food insecure (35.0 per cent children are hungry). A survey conducted by Roselawati et al. (2017) among Malay families in Kuantan district, Pahang state, found that 77.0 per cent of low-income households are food insecure. 52.0 percent of households are food insecure, 9.0 percent are individually food insecure and 16.0 percent of children are hungry. Surprisingly, a study by Siti Marhana and Norhasmah (2012) found that 100.0 per cent of zakat recipients in Bukit Mertajam, Pulau Pinang are food insecure. 5.0 per cent of families are food insecure, 30.0 per cent of individuals and 65.0 per cent of children are hungry. The findings of this survey show that low-income households in Malaysia face food security problems.

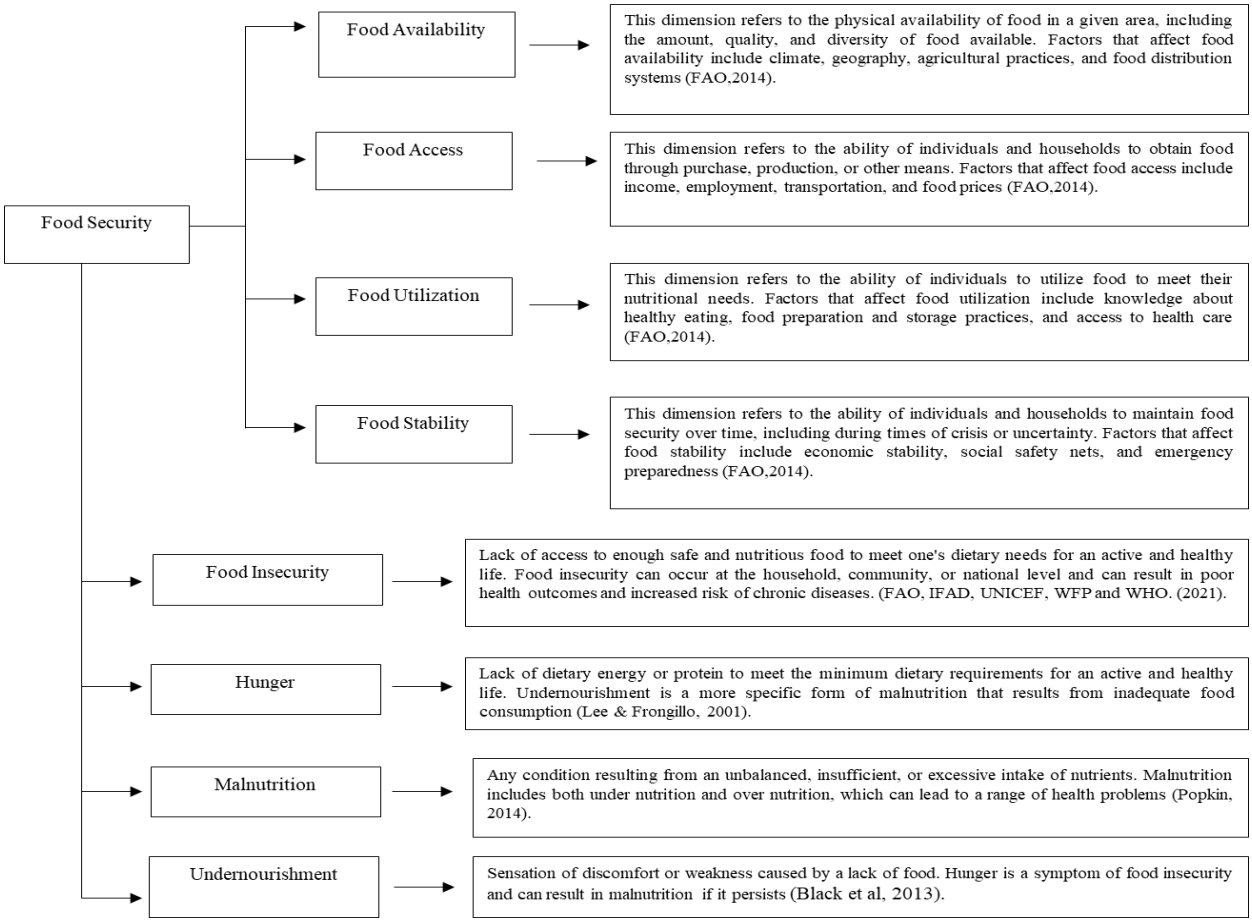

Figure 1: Terminology in food security

2.3 Impacts of Livelihood Assets on Food Security

Livelihood assets refer to the various resources and capacities that people possess and use to support their livelihoods as a Figure 2. According to Masud et al. (2016), livelihood benefits include increased income, sustainable use of environmental resources, improved well-being, reduced vulnerability, and improved food security. Ibrahim et al. (2018) discovered that livelihood assets are associated with livelihood outcomes such as food security. To determine the subsistence level, Ellis (2000) clarifies that the essential building blocks that families use to produce, engage in the labor market, and trade with other households are the subsistence assets that households possess. Household members' talents and experiences (human capital), their relationships within larger communities (social capital), their natural environment (natural capital), and physical and financial resources are all examples of this (Gebrehiwot & Fekadu, 2012).

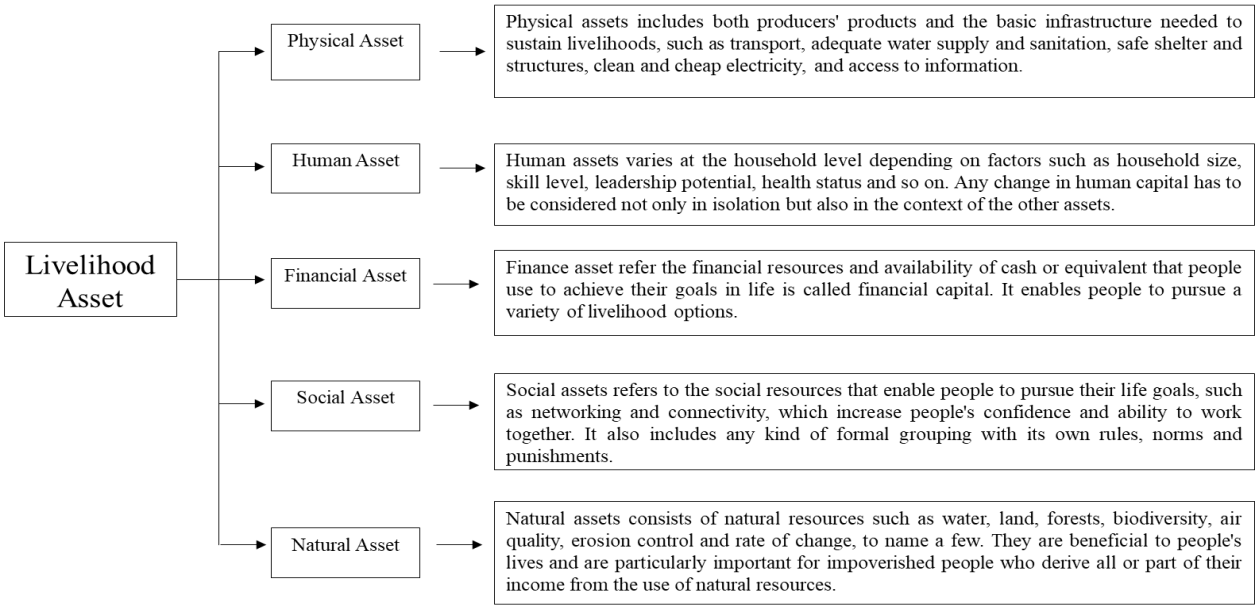

Figure 2: Type of Livelihood Asset
Source: Kollmair & Juli, 2002

Based on the above definition, it is important to measure the degree of livelihood sustainability. For example, a study conducted by Nesar et al. (2010) showed that the activities of fishing communities in Bangladesh were affected by the lack of medical facilities and other infrastructure, which led to a reduction in their income. In another case in Kampung Bahagia, Mersing, Johor, Anna, Selvaratnam & A.Bakar (2011) found that the physical infrastructure provided by the authorities in Mersing also affected the improvement of livelihoods while improving the well-being of the people. Lawal et al (2011) also found that land ownership and machinery use in rural communities in Nigeria have a negative relationship and a positive correlation in poverty reduction. According to the above studies, the comprehensive indicator in this study on physical assets includes adequate water supply, low-cost electricity, means of transport and ownership of household appliances.

The financial resources and availability of cash or equivalent that people use to fulfil their life goals are referred to as financial assets. They enable people to pursue a variety of livelihood options. The main resources of financial assets are household income, savings and access to credit, as well as cash inflows such as pension money, remittances from other parties or money transfers (Department for International Development, 1999 and Thulstrup, 2015). The relationship between household income and savings is positively correlated, i.e. an increase in household income leads to an increase in savings and consequently to an improvement in financial security (Anna et al., 2011). Most studies have proven that financial asset ownership has a positive effect on the livelihood sustainability of the poor and needy. Lawal et al. (2011) found that farmers who have funds from cooperatives reduce poverty levels by 34 per cent. Lack of possession of financial resources among the elderly, women, fishermen and farmers leads to poverty (Mustaffa et al., 2012). In another study by Bashir, Schilizzi & Pandit (2012), the monthly household income of the respondents is found to be positively significant implying a positive relationship between food security and monthly income. In this study, savings, household income, access to credit (borrowing money) and help from other parties were used as indicators to measure household financial assets.

Anna et al. (2011) and Mustaffa et al. (2014) confirmed a similar definition that human wealth includes education, occupation and health status. The relationship between human assets and livelihood assets is significant. Most studies suggest that there is a negative correlation between human assets and poverty, implying that increases in these assets reduce poverty levels in rural communities. Lawal et al. (2011) show that educational attainment, farming experience and health status have a significant impact on poverty levels. Bashir et al. (2012) also found that the educational level of the household head has a positive impact on household food security. At the same time, Abdullah, Zhou, Shah, Ali, Ahmad, Uddin & Ilyas (2017) demonstrated that people with higher education are more likely to get a better-paid job and thus play a key role in household food security. In another study, it was found that the lack of education and employment opportunities among Che Wong tribes led to their vulnerability (Mustaffa et al., 2014). Based on the mentioned

studies, it can be emphasized that human capital is an important element that needs to be increased in order to continuously improve livelihood sustainability. Therefore, in this study, the level of education, occupation, and health status were used as indicators to measure human wealth.

Li, Shuai, Shuai, Cheng, Liu & Huang (2020) describe social assets as the structures of social organisation such as networks, norms, and social trust that support cooperation for mutual benefit. In addition, social assets are measured through family relationships and communities, as well as participation in social activities, and offer the benefit of improving household income (Anna et al., 2011). Social wealth is also influenced by the degree of sustainability. Gallaher, Kerr, Njenga, Karanja & WinklerPrins (2013) found that households with more social assets had higher food security than households with less social assets. This suggests that neighbours provide a basic support system that prevents households from going without at least some food in times of need. Furthermore, the lack of information due to the absence of social networks leads individuals to live insecure lives and expose themselves to vulnerable environments (Mustaffa et al., 2012). In this study, social capital was summarised as a combination of participation in community programmes and associations, and relationships in the community.

Mustaffa et al. (2012) found that infertility of agricultural soils leads to low productivity of agricultural activities while reducing farmers' income. In addition, pollution can also affect human assets and the health capacity of individuals to go to work (Tacoli, 1999). According to Tacolli (1999), good natural resource management can increase the income of impoverished people, which means that poor natural resource management can affect their income levels. Therefore, in this study, natural resources are measured in terms of land ownership and use of crops for food by the respondents, because to ensure food security

As mentioned earlier, financial assets are the most adaptable of the five asset categories listed above, as they can be easily converted into other types of capital or used directly to achieve life goals (e.g. to buy food to reduce food insecurity, to finance education, etc.). However, as financial capital is the asset to which the poor have least access, other assets are important as they can serve as substitutes (Kollmair & Juli, 2002).

In summary, household food security is related to the ownership of livelihood assets. As shown in Figure 3. Based on the above, we hypothesize the following

H1: Physical asset has a significant positive effect on livelihood assets.
H2: Financial assets have a significant positive effect on livelihood assets.
H3: Human assets have a significant positive effect on livelihood assets
H4: Social assets have a significant positive effect on subsistence assets
H5: Natural wealth has a significantly positive effect on the subsistence minimum
H6: Livelihood asset has a significant positive effect on food security

Based on the above discussion this study draws the research framework (Figure 3), which shows the relationship between household livelihood assets and food security. It is expected that household livelihood assets will have a positive impact on household food security.

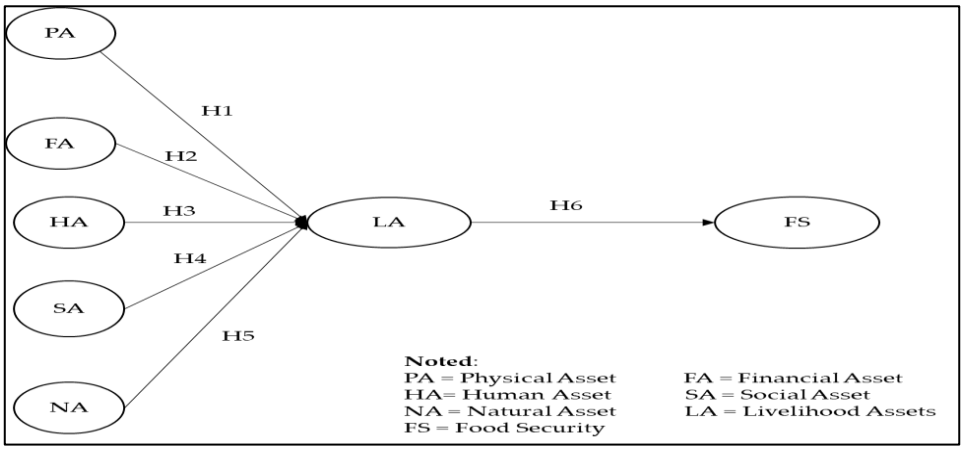

Figure 3: Study Framework

3. Methodology

3.1 Sampling, Data Collection and Analysis

This study focuses on four rural villages in Baling, Alor Setar, Pendang, and Padang Terap districts in Kedah, Malaysia (Figure 4). A total of 200 low-income households were interviewed for the study. The questionnaire was divided into three sections A, B, and C. Section A contains information on the demographic characteristics of the respondents, such as gender, age, marital status, occupation, household size, etc. Section B contains information on the ownership of livelihood assets by low-income households. Finally, Section C contains data on ownership of livelihood assets and assistance in achieving food security. The questionnaire contained different types of questions, including continuous data, a five-point Likert scale and open-ended questions. To test the hypotheses examining the relationship between livelihood assets and food security (Figure 2), this study uses the Partial Least Square Structural Equation Model (PLS-SEM) and SPSS.26. In summary, the sampling and data collection process is shown in Figure 4.

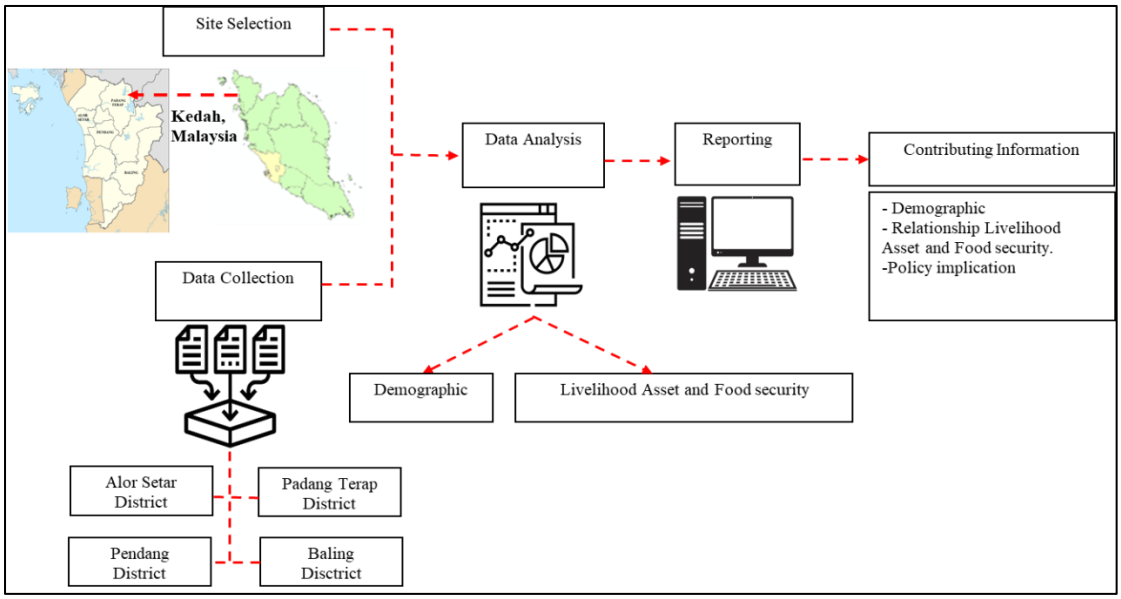

Figure 4: Sampling and data collection process

4. Results and Analysis

4.1 Demographic Characteristics

The majority of people in these districts still live in villages and engage in a variety of economic activities, including fishing, farming, and paddy farmer. Heads of households were selected as respondents because they have control over the household. With a total response of 193 usable questionnaires, all 200 questionnaires were effectively distributed to zakat recipients in Kedah State. This figure represents a response rate of 96.5 per cent. Socio-demographic and household characteristics are shown in Table 1. 42 percent of the respondents were male and 58 percent were female. The age group between 61 and 80 years had the highest number of respondents (48 percent). The majority of respondents are in their eighties or nineties. The second largest group of respondents (37 percent) was between 41 and 60 years old. In terms of education, 18 percent of the respondents have no formal education, 11.9 percent have no formal education (religious school) and 42 percent have only received some information from primary school. The distribution of respondents by marital status is also shown in Table 1. The term "single" in this survey refers to people who were not yet married at the time of the survey. "Widowed" refers to people who have lost a spouse, while "divorced" refers to people who have divorced a previous spouse. 60 percent of respondents are married, 7 percent are single and 33 percent are widowed.

Table 1: Sociodemographic characteristics of the respondent

Socio-Demographics	Percentage (%)
Age	
Below 20 years	9.0
41 years- 60 years	37.0
61 years-80 years	48.0
Above 80 years	6.0
Sex	
Male	42.0
Women	58.0
Family status	
Non- marital cohabitation	7.0
Married	60.0
Widow	33.0
Family size	
0	18.6
1-3	42.0
4-6	28.0
7-9	9.3
Above 10	2.1
Education	
No studies	18.7
In-formal education *(sekolah pondok)*	11.9
Primary School	42.0
Secondary School	27.4
Asset Ownership	
Motorcycle	62.8
Car	22.3
Bicycle	12.95
Television	86.01
Radio	35.75
Gas stove	95.34
Washing Machine	83.94
Refrigerator	64.77
Mobile phone	65.80

The age distribution of the survey participants is shown. In this sample, respondents aged 61 to 80 had the highest percentage of responses (48 per cent), followed by respondents aged 41 to 60 (37 per cent) and respondents aged 21 to 40 (9 per cent). In comparison, 6 per cent of respondents were over 80 years old, while 9 per cent were between 21 and 30 years old. The study also shows that about 42 per cent of the respondents completed primary school and 27.4 per cent completed primary school. 18.9 percent of the respondents did not attend school and only 11.9 percent have informal education (religious school).

In terms of transportation, motorbikes are the most popular among respondents. 62.8 percent of the respondents own motorbikes. This is followed by 22.3 per cent of respondents who own a car. While 12.9 per cent of the respondents said they ride bicycles. In the electrical/household appliances category, 86.01 per cent of the respondents owned a television, 35.75 per cent a radio, 83.94 per cent a washing machine and 64.77 per cent a refrigerator. The communication devices in this study are a mobile phone and a mobile phone with internet access. Table 5 shows that 65.80 of the socio-demographic respondents owned a mobile phone.

Table 2 shows that the average monthly income of the respondents was RM 803.24 (USD 193.67) per month. This puts zakat recipients below the poverty line income (PLI). In 2020, the PLI in Malaysia was amended to increase the household income from MYR 980 (USD 238.56) to MYR 2499 (USD 608.33). According to the latest PLI, the poverty rate in Malaysia would increase to 5.6 per cent in 2019, with the number of poor rising to 405,441 in 2019 from 24,700 in 2016. The objective of this classification is to enable more targeted planning, monitoring and programme implementation to close the household income gap (Department of Statistics,

Malaysia, 2020).

Table 2: Mean Households Income (RM/month)

Income item	Mean (RM)	Percentage (%)
Main Sources of Income	317.28	39.5
Spouse's net income	173.50	21.6
Children's donations	63.46	7.9
Pension	140.57	17.5
Social welfare	56.23	7.0
Zakat aid	52.21	6.5
Total	803.25 (USD 193.67)	100

Table 3: Mean Households expenditure (RM/month)

Income expenditure item	Mean (RM)	Percentage (%)
Food/beverage	166.05	24.7
Clothes	51.76	7.7
Medicine/health	80.00	11.9
Transportation (petrol fare)	56.47	8.4
Installment (vehicle/furniture)	80.67	12
Children's education (school expenses/ tuition/ fees)	128.40	19.1
Residential rental	72.60	10.8
Utility bill (electricity bill, water bill, telephone bill)	36.30	5.4
Total	672.25 (USD 162.09)	100

Table 3 shows that the monthly income of this group is made up of main income RM317.28, spouse's net income RM173.50, children's donations RM 63.46, pension RM 140.57, social assistance RM56.23 and zakat assistance RM52.21. Indirectly, zakat assistance contributed to the income of the respondents, albeit a small percentage. Overall, the zakat recipients in the study spend an average of RM672.25 per month for household purposes Table 7. Food and beverage expenditure accounted for 24.7 per cent (RM166.05) of the total expenditure. These individuals spent 19.1 per cent (RM128.40 per month) on education. This situation shows that despite their hardship, this group values their children's education and hopes that their future generations will not inherit the poverty they are experiencing.

4.2 Estimation of Measurement Model

4.2.1 Reliability of Item

In the context of PLS-SEM, reliability refers to the extent to which the measurement instruments (i.e., scales or questionnaires) used to collect data are consistent and stable. Reliability is usually assessed using measures such as Cronbach's alpha and composite reliability, which indicate the internal consistency of the measurement items. High levels of reliability indicate that the measurement instruments are consistent and stable, which increases confidence in the validity of the results. Value reliability items ranging from 0.5 and above are accepted (Hair et al, 2011) as Table 4.

4.2.2 Convergent Validity

Convergent validity refers to the extent to which multiple measures of the same construct (i.e., variable) are consistent and converge on a common factor. In PLS-SEM, convergent validity is usually assessed using measures such as average variance extracted (AVE) and factor loadings, which indicate the degree to which the measurement items load on a common factor. High levels of convergent validity indicate that the measurement items are measuring the same underlying construct, which increases confidence in the accuracy of the results (Fornell & Larcker (1981). AVE value of 0.50 or above indicates that a construct achieved (Chin, 1998; Hair et al., 2011. Table 4 demonstrated the AVEs of the constructs of the study.

Table 4: Item Reliability Composite Reliability and Convergent Validity

Model Construct	Measurement Item	Loading	Average Variance Extracted (AVE)	Composite reliability (CR)
Physical Asset (PA)	AF1- Transportation AF3- Water and electric supply	0.726 0.742	0.539	0.700
Financial Asset (FA)	AK1- Zakat aid AK2- Borrow money	0.610 0.992	0.678	0.799
Human Asset (HA)	AM2- Age AM3- Health status AM4- Knowledge	0.790 0.803 0.869	0.675	0.861
Social Assets (SA)	AS1- Involve in a community program AS3 -Involve in association AS5- Relationship in the community	0.912 0.934 0.852	0.810	0.927
Natural Asset (NA)	ASJ1-Land ownership ASJ2- Using plants as a food	0.611 0.991	0.678	0.799
Food Security (FS)	HP1- Food Availbility HP2- Food Access HP4- Food Utilization	0.820 0.898 0.902	0.764	0.907

4.2.3 Discriminant Validity

Discriminant validity refers to the extent to which measures of different constructs (i.e., variables) are distinct and not overlapping. In PLS-SEM, discriminant validity is usually assessed using measures such as cross-loadings and the Fornell-Larcker criterion, which compare the correlation between constructs to the square root of the AVE for each construct. High levels of discriminant validity indicate that the measurement items are measuring different underlying constructs, which increases confidence in the ability to differentiate between them (Chin, 1998). Table 5 indicates the discriminant validity.

Table 5 Discriminant Validity (Fornell-Lacker Criterion)

	FA	FS	HA	LA	NA	PA	SA
FA	0.823						
FS	0.153	0.874					
HA	0.420	0.374	0.822				
LA	0.186	0.329	0.250	1.000			
NA	0.146	0.109	0.306	0.104	0.823		
PA	0.059	0.115	0.190	0.141	0.082	0.734	
SA	0.208	0.244	0.211	0.238	0.104	0.306	0.900

4.3 Estimation of Structural Model

The estimation of a structural model in PLS-SEM involves analyzing the relationships between the latent constructs (i.e., unobserved variables) and the observed indicators (i.e., observed variables). The goal of the structural model is to test hypotheses about the causal relationships between the latent constructs, as well as to estimate the strength and significance of these relationships. This is typically done using path coefficients and t-values, which indicate the direction and magnitude of the relationships, as well as the level of statistical significance (Hair et al, 2014). Accordingly, the aim of this study is to; (a) empirically assess the relationship

between exogenous latent constructs (human asset, social asset, physical asset, finance asset, natural asset, and the endogenous latent construct (food security) as a Figure 5.

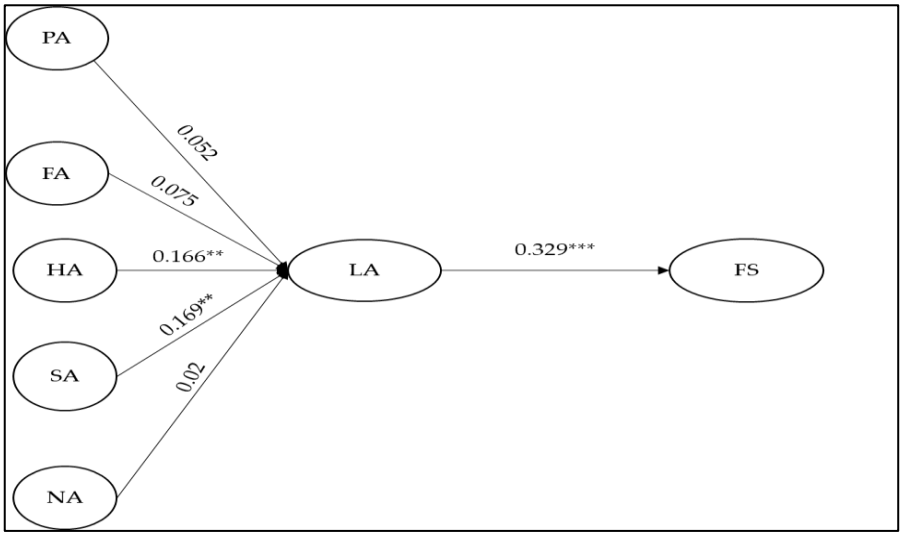

Figure 5: Structural Model

Table 10 below presents the result of the structural model of this study that is the predicted hypothesized relationships between the latent exogenous and latent endogenous constructs. The results were determined through path coefficient values (β), the standard error (SE), T-statistics as well as P-value. Significance was interpreted using asterisk signs to show the significance level, for instance (***) for 0.01 %; and (**) for 0.5 %.

Table 6 Results of Hypothesis Testing (Relationship Determination)

Hypotheses	Path Relationship and Direction	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STERR|)	P Values
H1	PA -> LA	0.071	0.071	0.735	0.463
H2	FA -> LA	0.090	0.092	0.813	0.417
H3	HA -> LA	0.167	0.083	1.994	0.047**
H4	SA -> LA	0.171	0.070	2.416	0.016**
H5	NA -> LA	0.015	0.099	0.204	0.838
H6	LA -> FS	0.334	0.074	4.458	0.000***

Table 6 illustrates the statistical analysis supporting hypothesis H1, namely that there is a positive but non-significant relationship between access to physical assets and livelihood assets. H2 demonstrated a positive relationship between access to financial assets and livelihood assets. More specifically, H3, which predicted a positive and significant relationship between access to human assets and subsistence levelivelihood assets, was supported, as was H4, which predicted a positive and significant relationship between social assets and livelihood assets, as shown in Table 10. Thus, H4 was positively supported by the path analysis.

H5, on the other hand, suggests that there is a positive but non-significant relationship between natural assets and livelihood assets. Since the ordinary poor people do not have a legitimate asset such as land, this scenario has occurred and has implications for the natural assets of this group. Meanwhile, Hypothesis H6 revealed a positive and significant relationship between livelihood assets and food security. The above statistical path analysis shows that the study's prediction of access to livelihood assets (human, social, physical, natural and financial), zakat assistance and food security have been experimentally validated and support the study.

5. Results and discussion

The objective of this study is to examine the relationship between livelihood assets and food security in low-income households in rural Kedah, Malaysia. Most of the family income is generated from agricultural activities. The study found that the community in general lacks sufficient livelihood resources, especially

financial resources.

In this study, human assets are measured by education level, age, and health status. The majority of people have low levels of education and 42% of them have no formal education in public educational institutions. Therefore, it is not surprising that the level of education has a positive impact on food security status. The more educated a household is, the more food secure it is, and vice versa (Bashir et al., 2012, & Gebre, 2012). Similarly, 42% of the respondents have no work due to age and health reasons, while 23% work as rubber tappers and fishermen who belong to the low-income groups. Moreover, health became one of the main factors for the income crisis as respondents are not able to work to earn a higher income but need money to cover their medical expenses. This situation justifies that the ownership of human capital has reached a worrying level among the respondents in this study.

All the respondents (91.7%) have no savings because they do not have income to meet their daily household needs. It is thus evident that more than half of the respondents do not have a main income and can only rely on the help of Lembaga Zakat Negeri Kedah (LZNK) and Jabatan Kebajikan Masyarakat (JKM) as well as support from their children and relatives. Meanwhile, 20% of them have an income of less than RM500 per month. At the same time, some of the respondents were obliged to pay in monthly installments for furniture and electrical appliances that they consumed in their houses. As an obligation to repay debts that were not purchased, motor vehicles, personal debts, and investment debts. This situation leads to lower household food security.

Studies elsewhere suggest that social assets contribute to economic development and household food security (e.g. Krishna, 2002). Therefore, this study examines the relationship between social assets as an element of livelihood sustainability and food security. In this study, on the other hand, community relations show that these people have close connections in society. These people regularly participate in activities organized by the community or a third party (government, non-governmental organization).

At the same time, these people have less land ownership, with the majority of respondents having minimal land ownership. This scenario has implications for the livelihoods of their generation and for food security. In addition, the average distance between the homes and the market is 8 kilometers, which affects the food security of the people. Due to the lack of nutritious food in rural areas, people are forced to meet their basic needs, especially food, in urban areas.

6. Conclusion & recommendations

The objective of this study is to determine the impact of wealth on food security among low-income households. The results show that human and social assets are significantly and positively related to total subsistence level and that subsistence level is significantly positively related to food security. However, physical assets, financial assets and natural assets show no significant relationship for rural low-income households in Malaysia.

In general, this study shows that low-income people in northern Malaysia are still able to achieve food security through livelihood asset ownership. Nevertheless, livelihood asset ownership is low among this group, especially financial assets, which have the lowest index value compared to other assets. Consequently, any opportunity that arises in financial asset ownership will have an impact on access to food security.

To improve the living standards of low-income people in rural areas, household members should be supported through education, training, and skills development to improve their skills and abilities through a community-based approach. They will be most engaged and focused on high-value-added activities by adopting practices and technologies such as smart farming, online businesses, and outsourcing. Successful implementation of these initiatives will lead to increased income and employment opportunities.

At the same time, low-income people should be encouraged to create more income opportunities through entrepreneurial activities. In addition, opportunities will be created for low-income people to engage in online business and use local resources to create business opportunities. This approach will be promoted to engage low-income businesses in the supply chain. At the same time, access to quality education and training will be improved to enhance the skills and abilities of low-income household members. Children from low-income households will receive priority for scholarships for higher education, including financial support for skills training, including. Technical and Vocational Education and Training (TVET).

Access to quality health care and primary health care facilities in rural and remote areas will be improved to provide affordable and better health services. For example, the Health Skim initiative aims to strengthen and expand insurance coverage for low-income people. Group insurance will be used as an alternative to reduce the burden of covering health costs for low-income people. It will also provide hospice services and establish dialysis and elderly care centers. In addition, cooperatives will be encouraged to offer affordable health services to their members.

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