



Faculty of Social Sciences and Humanities

**Socioeconomic and Cultural Influences on Food Security Among the
Bidayuh in Padawan, Sarawak**

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**Master of Social Science
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**Socioeconomic and Cultural Influences on Food Security Among the
Bidayuh in Padawan, Sarawak.**

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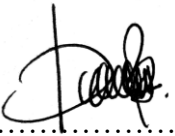
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DECLARATION

I declare that the work in this thesis was carried out in accordance with the regulations of Universiti Malaysia Sarawak. Except where due acknowledgements have been made, the work is that of the author alone. The thesis has not been accepted for any degree and is not concurrently submitted in candidature of any other degree.



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ABSTRACT

This thesis explores the concept of food security among the Bidayuh community in Padawan, Sarawak. Food security, a critical global issue, to ensure that all people have access to sufficient, safe, and nutritious food. The study aims to understand the Bidayuh's perceptions of food security, identify the factors affecting their food security, and examine the medium- and long-term strategies they employ to ensure household food security. Utilizing an exploratory study, data were collected through interviews and surveys with members of the Bidayuh community. The findings reveal that food security in this context is influenced by socioeconomic factors, cultural practices, and access to resources. The study also highlights the community's resilience and adaptive strategies in the face of food insecurity challenges. These insights contribute to the broader discussion on food security by providing a localized understanding of how indigenous communities guide and sustain their food systems.

Keywords: Food security, access, socioeconomic factors, cultural practices, resilience

***Pengaruh Sosioekonomi dan Budaya Terhadap Keselamatan Makanan Dalam
Kalangan Bidayuh di Padawan, Sarawak***

ABSTRAK

Kajian ini meneroka konsep keselamatan makanan dalam kalangan komuniti Bidayuh di Padawan, Sarawak. Keselamatan makanan merupakan isu global yang kritikal, untuk memastikan semua orang mempunyai akses kepada makanan yang mencukupi, selamat, dan berkhasiat. Kajian ini bertujuan untuk memahami persepsi komuniti Bidayuh terhadap keselamatan makanan, mengenal pasti faktor-faktor yang mempengaruhi keselamatan makanan mereka, dan meneliti strategi jangka masa pendek dan panjang yang mereka gunakan untuk memastikan keselamatan makanan isi rumah. Dengan menggunakan kajian eksploratori, data dikumpulkan melalui temu bual dan soal selidik dengan ahli komuniti Bidayuh. Penemuan menunjukkan bahawa keselamatan makanan dalam konteks ini dipengaruhi oleh faktor sosioekonomi, amalan budaya, dan akses kepada sumber. Kajian ini juga memfokuskan kepada ketahanan dan strategi adaptif komuniti dalam menghadapi cabaran ketidakamanan makanan. Penemuan ini menyumbang kepada perbincangan yang lebih luas mengenai keselamatan makanan dengan menyediakan pemahaman setempat tentang bagaimana komuniti asli memandukan dan mengekalkan sistem makanan mereka.

Kata kunci: *Keselamatan makanan, akses, faktor sosioekonomi, amalan budaya, ketahanan*

TABLE OF CONTENTS

	Page
DECLARATION	i
ACKNOWLEDGEMENT	ii
ABSTRACT	iii
<i>ABSTRAK</i>	iv
TABLE OF CONTENTS	v
LIST OF TABLES	x
LIST OF FIGURES	xi
LIST OF ABBREVIATIONS	xii
CHAPTER 1 INTRODUCTION	1
1.1 Background of the Study	1
1.2 Problem Statement	3
1.3 Research Questions	8
1.4 Research Objectives	8
1.5 Significance of Study	9
1.6 Organization of the Thesis	10
CHAPTER 2 LITERATURE REVIEW	122
2.1 Overview	12

2.2	Understanding Food Security	14
2.2.1	Historical Context	155
2.2.2	Dimensions of Food Security	18
2.2.3	Concept of Food Environment	20
2.2.4	Drivers of Food Security	23
2.2.5	Measuring Food Security	266
2.3	Cultural Dimensions of Food Security	27
2.3.1	Traditional Food System	29
2.3.2	Cultural Influences on Food Choices	30
2.3.3	Cultural Resilience and Adaptation	31
2.3.4	Nutritional Health	355
2.4	Sustainable Development Goals (SDGs) and Food Security	366
2.5	Emerging Issues and Debates on Food Security	38
2.5.1	Impacts of Covid-19	39
2.5.2	Rise of Food Insecurity	40
2.5.3	Role of Technology and Innovation	42
2.5.4	Food Security and Other Global Challenges	43
2.6	Urban vs Rural Food Security Approaches	44
2.7	Unique Food Security Challenges Among the Bidayuh	44
2.8	Gaps and Limitations in Previous Studies	45

2.9	Chapter Summary	46
CHAPTER 3 METHODOLOGY		48
3.1	Overview	48
3.2	Research Design	49
3.3	Conceptual Framework	50
3.3.1	Dimensions of Food Security	51
3.3.2	Concept of Food Security	52
3.3.3	Cultural and Local Context	53
3.3.4	Conceptual Framework Diagram	54
3.4	Data Collection	56
3.4.1	Sampling Technique	57
3.4.2	Unit of Analysis	60
3.4.3	Types and Sources of Data	61
3.4.4	Data Collection Methods	65
3.5	Data Analysis	67
3.6	Ethical Considerations	68
3.7	Chapter Summary	69
CHAPTER 4 FINDINGS AND DISCUSSION		72
4.1	Overview	72
4.2	Case Study Profile	73

4.2.1	Gender Distribution	76
4.2.2	Household Role	77
4.2.3	Occupational Distribution	78
4.3	Respondents' Perception of Food Security	80
4.4	The Influence of the Food Environment	88
4.5	Factors Affecting Food Security	91
4.5.1	Distance to food Sources	93
4.5.2	High Cost of Nutritious Food	95
4.5.3	Reduce Food Intake for Savings	97
4.5.4	Limited Gardening Space	98
4.5.5	Financial Dependence	99
4.6	Barriers to Food Security	101
4.6.1	Land scarcity	102
4.6.2	Traditional Practices	103
4.7	Cultural Resilience and Adaptation	105
4.7.1	Gardening	106
4.7.2	Online	110
4.8	Household Coping Strategies	112
4.9	Chapter Summary	115

CHAPTER 5 CONCLUSION AND RECOMMENDATIONS	116
5.1 Conclusion	116
5.2 Recommendations	119
5.3 Limitations of study	121
REFERENCES	123

LIST OF TABLES

	Page
Table 3.1 Food security framework	54
Table 4.1 Profiles of the respondent	74
Table 4.2 Occupational distribution of the respondents	79
Table 4.3 Respondent's perceptions of food security grouped according to their economic status	84

LIST OF FIGURES

	Page
Figure 2.1 Dimensions of food security	18
Figure 2.2 Levels of severity of food insecurity	26
Figure 3.1 Conceptual framework of the study	50
Figure 4.1 Respondent's role in household	77
Figure 4.2 Respondents' perception on food security	81
Figure 4.3 Factors that are affecting respondent's food security	93
Figure 4.4 Experience of land scarcity among the Bidayuh Community in Padawan, Sarawak	102
Figure 4.5 Gardening as a means of resilience and adaptation for the Bidayuh community	106
Figure 4.6 Comparison for online food shopping before pandemic and post-pandemic	110
Figure 4.7 Coping strategies of the Bidayuh household in Padawan, Sarawak	113

LIST OF ABBREVIATIONS

FAO	Food and Agriculture Organization
SDG	Sustainable Development Goal
SLF	Sustainable Livelihood Framework
FIES	Food Insecurity Experience Scale
VoH	Voices of Hungry Project
GWP	Gallop World Poll
FGD	Focus Group Discussion

CHAPTER 1

INTRODUCTION

1.1 Background of the Study

Food security has been acknowledged as one of the significant global concerns for decades. The Food and Agriculture Organization (FAO), for instance, held the World Food Conference in 1974 and highlighted the need to eradicate hunger and malnutrition which has become the global concern at the time (United Nations, 1975). This conference was held to react to the first warning of world food crisis (Shaw, 2007) and had contended that a programme, which should involve international cooperation globally, should be established to overcome the food shortage and ensure price stability. The key strategies in addressing food security in 1970s were focused on food availability, through food supply and reserves of food. Meanwhile, Acharya (1983) states that the World Food Conference has not only proclaimed the food security as the responsibility of the world community but also to draw the attention that no child, women and men should be stunted by malnutrition. In other words, the focus at that time was very much on poverty and malnutrition.

However, the focus and the concept of food security has changed and evolved since then (Heidhues, et al., 2004). They argued that the concept has changed in the last thirty years in which it reflects changes in official policy thinking. The focus of food security in the 1970s was on the availability of food, before shifting to the concept of access in the 1980s and the concept of multi-dimensional value of food security in the 1990s (FAO, 2006). This shift in focus and interpretation of food security can be seen in how the definition of food security changes over time. In the mid-1970s, the World Food Conference 1974 defines food security as the *“availability at all times of adequate world food supplies of basic*

foodstuffs to sustain a steady expansion of food consumption and to offset fluctuations in production and prices” (FAO, 2006).

In the 1980s, food security was defined by FAO (1983) as *“ensuring that all people at all times have both physical and economic access to the basic food that they need”* (Bastian & Coveney, 2013: 162). As for the World Food Summit (1996), the definition of food security supports the multidimensional nature of food security which includes the concept of food access, food availability, food utilization and stability. Later, food security is defined as *(1) availability of food in terms of its physical presence in a given country or region; (2) access to food as reflected by the ability to obtain food from own-production or through purchases, gifts or borrowing; (3) utilisation, or the ability to derive full biological benefits from food, based on food safety and personal health; and (4) stability of access, independent of shocks or cyclical patterns* (Carletto et al., 2013).

The issue of food security remains significant today, especially with the adoption of the 2030 Agenda for Sustainable Development by all United Nations member states in 2015. The Sustainable Development Goals (SDGs), which acts as a blueprint to achieve the 2030 Agenda has seventeen goals all together. The second goal of the SDGs is focusing on zero hunger. In other words, SDG2 aims to eliminate world hunger, achieve food security and to improve nutrition. This SDG2 goal is very much related to the issue of food security as it aims to achieve food security and to eliminate hunger, in line with its overall theme of inclusive development and leaving no one behind. Past studies have highlighted how socioeconomic factors (e.g. income and employment, overcrowding, food cost, cultural food values, education, knowledge and skills) are among the significant elements in ensuring food security (Boon, 2007; Brimblecombe et al., 2015; Galhena, Freed & Maredia, 2013; Keenan et al., 2001).

The recent Covid-19 pandemic has also shown the precarious nature of global food security and how it can be compromised by unexpected chains of event. Studies by Galanakis (2020), and Glauber et al., (2020), show how the Covid-19 pandemic has resulted in food insecurity globally through, among other things, logistics related issues, locational issues and access and affordability issues. Without a doubt, food security is a global concern and, at the same time, very much a local issue that need to be understood in local context.

1.2 Problem Statement

Food security is a complex, subjective and multidimensional concept. This can be seen from the definition of food security as stated by the World Food Summit (1996): “*food security exists when all people at all times, have physical and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life*” (Bondad-Reantaso, Subasinghe, Josupeit, Cai & Zhou, 2012: 159). This definition implies its link with social, economic and nutrition aspects. Other scholars like Hesselberg and Yaro (2006), emphasize the concept of food accessibility and availability. They believe that food security means “*a secure access by households and individuals to nutritionally adequate food at all times and procured in conformity to human aspirations and dignity*” (Hesselberg and Yaro, 2006: 41). It should be noted that there are various definitions of food security. In fact, Smith et al. (1993) argue that there are up to two hundred definitions of food security being used since the 1970s. This attests to the complex and subjective nature of the concept of food security. Similarly, Lakra and Kumar (2017), state that food security is multi-dimensional in the sense that it can be diversified in many groups such as poverty, unemployment, famine, gender discrimination, food and nutritional practices.

As stated earlier, the concept of food security has evolved, developed and diversified over the decades (FAO, 2006). Further explained, the shift in focus of food security was being revised from being a global and national issue to focus more on the notion of food security at household and individual levels. From the emphasis on food availability to the notion of food accessibility and then to the idea of multi-dimensional nature of food security, the concept of food security was further redefined. Based on these, the FAO identified four dimensions of food security, which are food availability, food access, food utilization and stability. This will be further elaborated in Chapter 2: Literature Review.

Meanwhile, new dimensions on ethics and human rights have recently been added into the discourse on food security (FAO, 2006). Food security has also been explored from the point of view of food environment (Capone et al., 2014; Reyes-Puente et al., 2022; Swinburn et al., 2013; Turner et al., 2018). For examples, other than the four pillars mentioned above, food security is also associated with aspects of affordability, preference, and locational factors. This is also elaborated in details in Chapter 2.

However, in examining food security, it is critical to consider specific challenges or aspects relevant to the target group. In this study, food security among the Bidayuh community in Padawan, Sarawak will be explored with a focus on socioeconomic and cultural dimensions, particularly in terms of access to food resources, reliance on traditional food systems, and adaptive strategies in response to changing economic or environmental conditions. The influence of rural infrastructure, land ownership patterns, and shifting agricultural practices will also be considered.

The Bidayuh community in Padawan faces several challenges that affect their food security, especially in terms of socioeconomic and culture. Many families still rely on traditional ways to get food, like planting hill rice, small-scale gardening, or collecting food

from the forest. But today, they are losing access to land because of development and unclear land rights, which makes it hard to grow enough food (Sayok & Teucher, 2018). Many Bidayuh communities also depend on low-paying jobs or money sent by family members, which means they don't always have enough money to buy healthy and balanced food from markets (Onn, 2018). Food prices are also high, and since some villages are far from towns, it's difficult for them to buy fresh and affordable food regularly. On top of that, traditional food knowledge is slowly being lost, especially among younger people who are less interested in farming or traditional food practices (Bennett, 2002; Sayok & Teucher, 2018). These problems show why it is important to study food security in this community, considering both their economic struggles and cultural changes.

Every community has different view on what constitute food security. For instance, in Africa, urban food production is perceived as not significant among the urban communities as many of them are dependent on supermarket and informal sector to access food (Crush, Hovorka & Tevera, 2011). However, the rural African communities are still using indigenous methods to preserve their harvest food as their survival strategy (Okoye et. al, 2017). Meanwhile in China, in Chinese literature food is perceived as the people's God (Zhou, 2010). According to Zhou (2010), recently China is food secured as food availability in China has greatly improved in the recent years. Zhou further explained, however, they do experience serious problems in terms of food safety and quality, environmental sustainability and social stability.

When it comes to research and debates on food security, the issue of culture is often neglected. Most studies focus on food security in relation to nutritional values (Manditsera et. al, 2018; Leisner, 2020), coping strategies (Chagomoka et. al, 2016; Chen et. al, 2020; Ibok, et. al, 2019) and certain target group groups such as women, low income group, and

children. Similarly, studies in Malaysia also focus on the above issue. There has not been much research done on food security from the perspective of the various indigenous group in Malaysia, except for the Orang Asli.

Past studies on food security tend to focus on the homogeneous community that is found in Malaysia. For example, past studies tend to focus on the Orang Asli community (Pei, Appannah & Norhasmah, 2019; Law et al., 2018; Zalilah & Tham, 2002) and the Malay community (Cooper, 2013). In the context of indigenous group in Sarawak, not much study has been carried out on the subject of food security. There may be a few studies available, but it only addressed the issue of food security in passing. For example, there are a few studies that focus on the Bidayuh community but on subject other than food security. For example, a study by Bennett (2002) addresses the link between wild meat and food security among the Bidayuh community, while a study by Sayok and Teucher (2018) examines the loss of traditional indigenous (Bidayuh) knowledge on local food plant. Another study on the Bidayuh community is that by Onn (2018) that focuses on the role of women and food security among the Bidayuh. These studies only refer to food security in passing and not in a detailed manner.

Recent studies have highlighted that rural and indigenous communities across Southeast Asia often face multiple barriers to food security, such as land scarcity, climate change, limited market access, and loss of traditional knowledge. For example, Law et al. (2018) reported that indigenous communities in Malaysia experience high rates of food insecurity due to poor infrastructure, low incomes, and lack of access to nutritious foods. Similarly, a study by Sani et al. (2022) and Wong (2022) found that rural households in Sabah and Sarawak struggle with rising food prices and transportation costs, which limit their ability to purchase fresh and healthy food. Globally, Skinner et al. (2013) emphasized

that many indigenous populations face food insecurity not just because of poverty, but also because of environmental degradation and reduced access to traditional food sources. These findings are relevant to the Bidayuh community in Padawan, where similar challenges are present. Including these recent studies helps to show that the food security issues faced by the Bidayuh are part of a wider pattern seen in other rural and indigenous areas.

The Bidayuh community in Padawan faces many challenges that make food security a serious issue. Since most of them live in rural areas and are indigenous, many families still depend on traditional ways to get food, such as farming for their own use, collecting food from the forest, and raising small animals. But these methods are becoming harder to continue. There is less land available for farming because of development projects, and some families have lost their rights to use the land passed down by their ancestors. It's also difficult for them to get tools and supplies needed for farming.

Many Bidayuh villages are far from towns, and the roads are not very good. This makes it hard for them to buy food from the markets, especially fresh and healthy food. Also, more people are leaving farming jobs and working for wages instead. This change has affected the traditional food system and made some families more dependent on money to buy food. These problems show why it is important to study food security among the Bidayuh in Padawan and understand how their culture, economy, and way of life affect their ability to get enough food.

As aforementioned, there are not many studies that focus on the subject of food security itself as a whole among the Bidayuh households in Sarawak, especially on how they perceived household food security as well as their adapting strategies. This lack of focused research leaves a critical gap in both academic understanding and policy planning. Without a clear understanding of food security challenges faced by the Bidayuh, particularly in

Padawan, it is difficult to design effective, culturally sensitive development initiatives or interventions. Acknowledging the gap, this study aims to investigate the issue of food security among the Bidayuh community specifically in Padawan, Sarawak.

1.3 Research Questions

In order to achieve this research aim and objectives, the following questions are central to the study:

- i. What is meant by ‘food security’ from the perspective of the Bidayuh in the study area?
- ii. What are the primary factors in ensuring household food security among the sampled Bidayuh community?
- iii. How do the sampled Bidayuh households cope in the medium-term and long-term in ensuring their household food security?

1.4 Research Objectives

As stated above, the aim of this research is to investigate the issue of food security among the Bidayuh community in Padawan, Sarawak. Padawan was selected as it is an area with high Bidayuh population. This is elaborated in Chapter 3.

Specifically, the objectives of the research are:

- i. to examine how the Bidayuh community in Padawan perceive the concept of food security,

- ii. to explore the factors that are influencing the Bidayuh's food security, and
- iii. to explore how the Bidayuh in the case study area adapt in medium and long term to the challenges of food insecurity.

1.5 Significance of Study

As highlighted in the earlier sections, there is a gap in the current body of literature on food security in Sarawak and in Malaysia. Past studies on food security in Malaysia and in Sarawak tend to focus on certain area and certain groups only. For instance, most studies tend to focus on the aspects of health and nutrition (Khor & Shariff, 2019; Mohamadpour & Keysami, 2012) and on women's health and wellbeing (Khor & Zalilah, 2008; Ihab et al., 2012). Additionally, past studies on food security in Malaysia also tend to focus on certain groups, for example, the Orang Asli (Pei, Appannah & Norhasmah, 2019; Law et al., 2018; Zalilah & Tham, 2002), the Malays (Cooper, 2013) or categories such as women (Nurfahilin & Norhasmah, 2015) and the low-income households (Sharif & Ang, 2001). Other indigenous groups have rarely been included in research on food security in the past. In this context, the study will be able to address that gap. The focus of the study is the Bidayuh community, one of the indigenous groups in Sarawak, Malaysia, and there has not been a detailed study on food security among the Bidayuh community thus far.

This study is also timely as food security became a global concern especially in post-Covid-19 pandemic. Recent events have shown the vulnerabilities of various communities worldwide in ensuring food security for their households and communities. The challenges to deliver sufficient food to the whole world population shows that food security is highly important for all countries including developed countries. This is very much related to

SDG2: Zero Hunger. Consequently, it raises the question of how communities work, specifically the indigenous communities like the Bidayuh to adapt both medium- and long-term strategies to address problems associated with ensuring household food security. The findings of this study may, to a great extent be able to provide some insight on how the Bidayuh households cope and adapt in terms of becoming food secured as well as providing information needed to address SDG Goal 2.

1.6 Organization of the Thesis

The thesis is structured into five cohesive chapters, each contributing to the understanding and analysis of the research topic.

The thesis begins with Chapter 1: Introduction. This chapter starts by giving a background of the study and explain the significance of addressing the issues of food security. It also explained the problem statement as well as identifying the research gap, that the study is going to address. As stated above, this study aims to investigate the issue of food security among the Bidayuh community, specifically in Padawan, Sarawak. Research objectives and research questions were also outlined in this Chapter.

This is then followed by Chapter 2: Literature Review. This chapter offers a thorough explanation of previous research and literature related to the subject of food security. It looks into the details of food security across different levels, as well as other related concepts such as the concept of food environment and the Malthusian Principle. It also discusses past studies on food security and their related findings. Hence, this chapter provides a foundation for understanding the complexities and dynamics of the research subject (i.e. food security).

The next chapter is Chapter 3: Methodology, which describe the adopted research methodology in detailed. It explains the research design, research approach and how these are used to tackle the research inquiries and to achieve the research objectives. Chapter 3 also describes the research framework used, clarifying elements like the mixed methods approach, population and sampling methodologies, data gathering procedures, research tools utilized (e.g., surveys, interviews, or observational tools), and the ensuing data analysis strategy.

This is followed by Chapter 4: Results and Discussion. In this chapter, the findings of the study are presented and discussed. The research results are analysed, and interpreted considering the research questions and objectives. Moreover, the qualitative method such as participant interviews and observational data are supporting the quantitative findings, enriching the overall analysis. Finally, limitations of the study and opportunities for future research are also addressed to provide a comprehensive overview of the research findings.

The last chapter is Chapter 5: Conclusion and Recommendations. This chapter brings together the research findings and provides clear insights gathered from the study. It goes back to the research questions and research objectives, offering a complete view of the whole results. Furthermore, this chapter offers suggestions based on the research findings, with the aim of influencing policies, practices, or future research in the field of food security. With this thorough conclusion, the thesis highlights the importance and impact of the research conducted.

CHAPTER 2

LITERATURE REVIEW

2.1 Overview

Over the decades, food security has been a subject of extensive debate as one of the growing global challenges (Castell, Rodrigo, de la Cruz & Bartrina, 2015; Galanakis, 2020; Hesselberg & Yaro, 2006; Maxwell, 1996). Looking back, the concept of food security actually dates back to when the Malthusian Principles were introduced. Thomas Robert Malthus, in the *Essay on the Principles of Population*, argued that the rise of population will affect food security. At that time, the term food security did not exist as it was only widely used after the World Food Conference in the 1970s.

Since then, the descriptions and definitions of food security had evolved. Numerous studies have highlighted different dimensions of food security (Capone et al., 2014; Lakra & Kumar, 2017; Sraboni, Malapit, Quisumbig & Ahmed, 2014; Titus & Adetokunbo, 2007). For instance, Titus and Adetokunbo (2007) emphasized the concepts of availability, access, and utilization of food, while Sraboni et al. (2014) focused on the role of gender in ensuring food security. Additionally, Prosekov and Ivanova (2018) described how food security is tied to agricultural practices and political will, and Misselhorn's (2005) study explored the social and political aspects related to food insecurity. The latter, according to Misselhorn (2005), includes social capital related to poverty, conflicts, and diseases such as HIV/AIDS, which has become a barrier to achieving food security.

Past studies on food security also highlighted how different countries are facing different scenario of food security. Van den Broeck and Maertens (2016), for example, found that developing countries have more tendency to depend on horticultural export which has

contributed significantly in their food security through the development of rural labour markets and female wage employment companies. They further explained that providing a secure employment with stable profit remain as their challenges. Prosekov and Ivanova (2018), argued along the same line, saying that hunger occurs in most of the developing countries due to low income of the population. This meagre income then leads to difficulties or limitation in accessing food supply for a huge population (Prosekov & Ivanova, 2018). Rasul (2016), also argued the same thing: in developing countries, poverty and hunger are common phenomenon.

However, the situation differs in developed countries. According to a study by Prosekov and Ivanova (2018), the percentage of undernourished people in developed countries does not exceed 5% of the population, whereas in developing countries, it reaches up to 13%. African countries and Asian countries, in particular, indicated rates of 20% and 13%, respectively. Prosekov and Ivanova further explained that the low percentage of undernourished people in developed countries is attributed to their high level of productivity. Agricultural product in developed countries will not lead to the provision of food to the population because their food act not only as an export object but also for political trade.

Similarly, in Malaysia, a policy formulated in ensuring food security, specifically focusing on the availability, accessibility and utilization of rice to the citizen (Bala, Alias, Arshad, Noh & Hadi, 2014). It should be noted that in Malaysia, rice is a staple food. Thus, the policy shows how significant is the rice to the society. However, Bala et al. (2014) argued that Malaysian farmers are still practicing traditional farming method in their paddy farming. This, in turn, poses the challenge of determining whether rice is sufficient for the entire population (Bala et al., 2014).

Clay (2002) and Heidhues et. al (2004) had argued that, for the last thirty years, the concept of food security has evolved in order to reflect the changes made official policy thinking. More recently, the ethical and human rights dimensions of food security had been carried forward (FAO, 2006). This shows that food security is a complex issue as it links to a number of dimensions.

2.2 Understanding Food Security

Food security is a broad and subjective concept. The term may have different meanings for different people, with varying perceptions among individuals. For example, in the 1980s, food security was predominantly associated with hunger, poverty and economic vulnerabilities (Capone, Bilali, Debs, Cardone & Driouech, 2014; Cooper, 2013; FAO, 2006). This is similar to the adopted definition from the World Food Summit 1996: "Food security exists when all people, at all times, have physical and economic access to sufficient, safe, and nutritious food that meets their dietary needs and food preferences for an active and healthy life." Other scholars, such as Siamwalla and Valdes (1994), define food security as a country's or household's ability to meet a specified food level within a given year. Titus and Adetokunbo (2007) use the definition forwarded by the International Conference on Nutrition (ICN) in Rome in 1992, stating that food security is achieved when people have access to safe and nutritious food to maintain their health.

Therefore, food security remains a subject with a broad area for researchers to study, especially in the realms of human development (Burchi & De Muro, 2016). It is crucial as the increasing world population is putting mounting pressures on global food security. The world population is estimated to increase by 47 percent, with 6.1 billion in 2000 to 8.9 billion

in 2050 (Misselhorn et al., 2012: 8). Areas of growth is expected to be concentrated in Asia, Africa and other areas that are socially and environmentally vulnerable.

2.2.1 Historical Context

Debates about food security went way back Thomas Malthus' famous *Essay on the Principles of Population* in 1798, often called the Malthusian Principle. Malthus argued that population is assumed to grow exponentially, but the growth of a society's means of subsistence (i.e. food supply) is assumed to be linear (Manfredo et al, 2014). This creates a situation whereby population levels are constrained by food supply. In other words, food intake per capita shrinks as population increase at a higher (exponential) rate. As a result, Malthus assumed that, at some point, linear growth of food supply cannot meet the increasing need of the growing population. The results, according to Malthus, are hunger, malnourishment, starvation and even death. This may not have fully materialised as he envisioned but this idea started discussion on population growth, environmental sustainability and, to a large extent, food availability.

The Malthusian Principles debated about food security in terms of food sufficiency or food supply. From this original framework of sufficient world supply of food, but the term food security has then changed into the aim of national self-sufficiency in food production, and later to evolve into the current meaning focusing on access to food by individuals and households (Mallela, 2014). After the World Food Conference in 1974, which aimed to address global famine and food crises, the definition of food security tends to be centred around the notion of food sufficiency (Mallela, 2014).

Many people identify food security as food sufficiency. This concept of worldwide sufficiency was in fact the basis for the 1974 definition of food security at that time. In this context, according to Maletta (2014), a nation has food security if it produces all the food required by its population. It should be noted that, sometimes, this notion of food security is extended to other smaller units, such as community, household and individual units. This means that a community/ household/ individual has food security if it can produce all the food to cover for its needs.

However, that approach (or understanding) of food security as food sufficiency is no longer used. This is due to the fact that, since then, a number of definitions were used/introduced to describe food security. These definitions are more dynamics and reflect the evolving and multidimensional nature of the term.

There was a shift in thinking from food supply (which is related to food sufficiency) to food access. This was prevalent in 1980s. FAO (2006), defines food security as ensuring that all people at all times have both physical and economic access to the basic food that they need. Scholars started to rethink about the concept: food security is not just about the existence (supply) of food, but also the possibility of individuals or households to obtain and to consume the food. This description is very much linking food security to the economic aspects, such as income, poverty, livelihoods and the organization of the food system.

The World Food Summit (1996), for instance, redefines food security to include the aspect of 'food access'. The new revised definition of food security based on the 1996 Summit is that food security as a situation when all people at all times have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life" (Capone et. al, 2014: 13). The definition by World Food Summit (1996) support the multidimensional nature of food security as it includes

these elements: food access, availability, utilization and stability. These elements will be discussed in greater details in the following section.

Meanwhile, Sen's concept of food security focuses on the entitlements of individuals and households, rather than on the availability of food (sometimes called Sen's Entitlement Theory). In this context, Sen challenges the traditional view that food insecurity is caused solely by shortage of food (i.e. limited availability of food) but believes that access to food (entitlements) play a critical role in determining food security (Sen, 1981). He defines entitlements as the set of resources and goods that individuals can accessed based on legal, economic and social system and includes income, assets and social services that enable people to secure food.

For instance, food security is ultimately about the nutritional status if the individual has the entitlement. If the individual lacks the means to afford nutritious food, he/she would prioritise quantity over quality. Sen also noted that vulnerability to food insecurity can occur both as a chronic and transitory phenomenon (Sen, 1981). This line of debate highlighted another shift in the definition of food security. In the 1990s, for instance, the definition was further expanded to acknowledge the multi-dimensional nature of food security. This was when the definition of food security includes these four pillars: availability, accessibility, utilisation and stability (FAO, 2006).

Sen's theory highlights how access to food is influenced by economic status, social roles, and cultural practices. As noted in various literature, food security is not just about having sufficient food but also about the ability of individuals or households to obtain it through various entitlements (Carletto, Zezza, & Banerjee, 2013; Burchi & De Muro, 2016). This perspective shifted the focus of food security from just having enough food to looking

at economic ability and social fairness, which are important for tackling food insecurity in marginalized communities (Sen, 1981).

2.2.2 Dimensions of Food Security

In general, when it comes to the concept of food security, the four key dimensions are availability, accessibility, utilization, and stabilization. These four dimensions, as seen in Figure 2.1 below, have been discussed in great length in discourses on food security (e.g., Capone et al., 2014; Carletto et al., 2013; FAO, 2006; Galanakis, 2020; Titus & Adetokunbo, 2007).

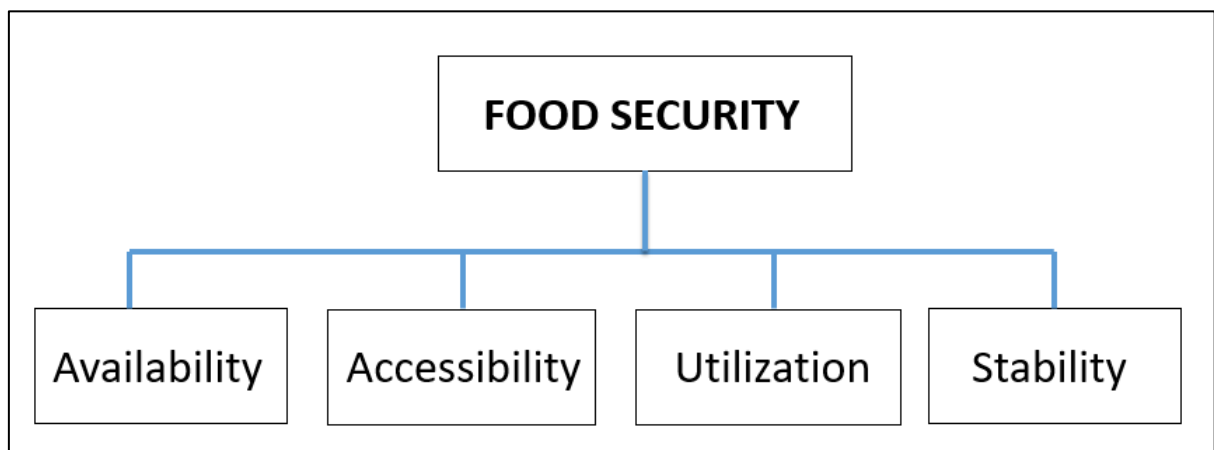


Figure 2.1: Dimensions of food security

As adopted from the World Food Summit 1996, availability refers to the presence of food of appropriate quality in sufficient quantities supplied through domestic production or imports (Carletto, Zezza, & Banerjee, 2013). Availability, in this context of food security, also refers to the sufficient quantities of food available on a consistent basis (Capone et al.,

2014). This is often associated with the overall food supply, determined by production, distribution, and trade (Paul, Paul, & Anderson, 2019: 3). Simply put, the pillar of availability is the physical availability of food.

Accessibility of food is another key dimension of food security. It describes both the economic and physical access to food, including financial ability to acquire food, and the ability to get/access the food (Carletto, Zezza, & Banerjee, 2013; Paul, Paul, & Anderson, 2019). Carletto, Zezza, and Banerjee (2013), for instance, described accessibility as having access to adequate resources to obtain appropriate foods for a nutritious diet. It is also argued that accessibility of food can usually be explained in terms of (i) affordability, (ii) allocation, and (iii) preference (Capone et al., 2014). For example, a household may be food secure if its members can afford the price of food and this is generally known as economic access of food. A household's food security is also determined by their ability to produce food directly, purchase food from markets, or receive food through non-cash transfers. Furthermore, the allocation of food is crucial, as it determines the quantity and quality of food each individual in the household (Carletto, Zezza, & Banerjee, 2013).

Meanwhile, the third dimension, i.e. food utilization, refers to the consumption of food through a sufficient diet, clean water, sanitation, and healthcare to achieve nutritional well-being (Carletto, Zezza, & Banerjee, 2013). In other words, it is associated with appropriate use of food based on knowledge of basic nutrition and care (Capone et al., 2014).

Lastly, stabilization aims to achieve stability of access to adequate food at all times, unconstrained by shocks or cyclical patterns. Similarly, when food security was first defined, food quality was disregarded. The amount of food was the main focus, as was the basic diet, which mostly consisted of cereals. Micronutrient-deficient diets were not the main cause for

concern. Definitions of food security mainly omitted concerns regarding food safety and suitability for prevalent cultural values and eating habits (Maletta, 2014).

2.2.3 Concept of Food Environment

As can be seen in the above discussion, the concept of food security is complex and dynamics. The above sections discussed about the different definitions of food security, and the focus on the four dimensions of food security, namely food availability, food access, utilization and stabilization. Other than those four essential aspects of food security, scholars have argued that there are other elements in defining and measuring food security. One of them is by linking food security with the concept of food environment (Capone et al., 2014; Reyes-Puente et al., 2022; Swinburn et al., 2013; Turner et al., 2018).

The concept of food environment refers to the physical, economic, sociocultural, and political factors that influence individual's or household's food choices and consumption patterns (Reyes-Puente et al., 2022; Swinburn et al., 2013). For example, Swinburn et al. (2013: 2) define food environment as the collective physical, economic, policy and sociocultural surroundings, opportunities and conditions that influence people's food and beverage choices and nutritional status. This includes elements like availability, accessibility, affordability, and desirability of food options with a given community or society. Food environment is also determined by how people interact with the food system (Reyes-Puente et. al, 2022). They believe that this interaction will determine the way food is acquired, prepared, and consumed. In other words, it is very much related to food availability and consumer preferences (Swinburn et al., 2013). For example, ready-to-eat food influences food security in terms of its availability, cost to the people and the degree to

which it meets nutritional requirements. The prominence of ready-to-eat foods, which are often energy-dense and nutrient-poor, can exacerbate diet-related health issues and contribute to the prevalence of non-communicable diseases (Swinburn et al., 2013: 2).

Along this line of discussion, Burchi and De Muro (2016) introduce five approaches to food security: food availability, income-based, basic needs, entitlement, and sustainable livelihood. These approaches focus on studying the ability of individuals or households to secure food, considering factors such as participation in household decision-making, empowerment, and the capability and function to be secured (Burchi & De Muro, 2016).

The Sustainable Livelihood Framework (SLF) developed by the Department for International Development (DFID) in the late 1990s, provides a holistic approach to understand food security by focusing on the livelihood strategies that human use to sustain themselves in the face of economic and environmental challenges. This framework emphasizes the importance of human, social, financial, natural, and physical capital in shaping the livelihood of communities (Carney, 1998). It highlights how these assets interact within a broader socio-economic and environmental context to influence food security.

The SLF is particularly useful in analyzing how traditional knowledge, land access, agricultural practices, and social networks contribute to food security. It considers the impact of external factors like market access, infrastructure, and environmental changes, which are critical in understanding the unique challenges faced by different communities in maintaining food security.

A further problem with the early definitions of food security was their indifference towards economic behaviour and the operation of markets, preferring a framework more

akin to logistics and central planning. A shortage of food was defined as a deficit of supplies relative to usual or normative requirements, and estimated mostly in a mechanical fashion, applying past trends or fixed coefficients, with not much room for adaptive behaviour, and no major role for relative prices and their effect on producer and consumer behaviour. This may be adequate in a command economy or for prisons or barracks, where food is rationed and centrally distributed, but not for a market economy (Maletta, 2014).

To better understand food security among the Bidayuh community in Padawan, this study uses the Food Environment Theory as a guiding framework. This theory helps to explain how people's access to food is shaped not only by physical availability, but also by their economic situation, cultural practices, and social surroundings. According to Swinburn et al. (2013), the food environment includes all the physical, economic, policy, and social conditions that influence people's food choices. These include things like distance to markets, food prices, traditional beliefs about food, and the kinds of food people prefer or can afford. For example, in rural areas like Padawan, limited access to transportation or fresh food markets can make it harder for people to get nutritious food. At the same time, cultural values, such as the importance of growing one's own food or using traditional recipes, also shape what people eat.

Using this theory allows the study to look at food security in a more complete way. It helps explore not just whether food is available, but also whether it is affordable, culturally acceptable, and physically accessible to Bidayuh households. This framework is useful in understanding the complex reasons why some families may struggle with food insecurity even when food is available in nearby markets.

Understanding and addressing the complexities of the food environment are crucial for promoting healthy eating habits, reducing disparities in access to nutritious foods, and combating diet-related diseases such as obesity, diabetes, and cardiovascular diseases. Efforts to improve the food environment often involve interventions at multiple levels, including community-based initiatives, policy changes, urban planning strategies, and public health campaigns.

2.2.4 Drivers of Food Security

Food security stands as a critical global challenge, its debate evolving over centuries from the Malthusian principles to the multidimensional frameworks. As populations grow and societies evolve, understanding the complexity between food availability, accessibility, utilization and stabilization becomes increasingly vital. This review delves into the historical roots and conceptual evolution of food security, exploring how diverse socio-economic and cultural factors shape individuals' and communities' ability to secure and utilize food.

The **historical context** of food security, rooted in Thomas Malthus's ideas from the late 18th century, underscores the intrinsic link between population growth and food availability. According to Simon (2012), Malthus's theory suggested that if left unaddressed, population growth would surpass food production capacity, leading to famine and societal collapse. This perspective highlights the critical role of understanding and managing the balance between population dynamics and food production in shaping human societies.

Recognizing the **multidimensional nature of food security** is crucial for understanding the complexities involved. Scholars emphasize that food security is

influenced by economic, social, and cultural factors (Brimblecombe et al., 2015; Boon, 2007; Keenan et al., 2001; Galhena, Freed & Maredia, 2013). Economic factors such as income levels and food prices, along with social factors like community resources and cultural preferences, significantly impact individuals' and communities' ability to access and utilize nutritious food.

The dimensions of food security: availability, accessibility, utilization, and stabilization; provide a comprehensive framework for addressing the various factors influencing food security outcomes. Availability ensures a sufficient supply of food, accessibility encompasses economic and physical access, utilization focuses on consumption and nutritional impact, and stabilization aims for consistency and resilience in access over time (FAO, 2008). These four pillars are interconnected and must be addressed holistically to achieve sustainable food security.

Food availability is determined by the level of food production, stock levels, and net trade. Factors such as climate, technology, and agricultural policies influence food availability (Pinstrup-Andersen, 2009). Advancements in technology like greenhouses, irrigation, and fertilizers can help mitigate these issues, but also come with economic and environmental costs. As for accessibility, it is influenced by the income levels, food prices, and the functioning of markets and infrastructure. According to Sen (1981), poverty and lack of purchasing power are major barriers to food accessibility. When people lack the financial resources to purchase food, they become food insecure. Economic hardship is a significant contributor to food insecurity, as a large portion of the population in developing countries spends a significant portion of their income on food (Kakaei, Nourmoradi, Bakhtiyari, Jalilian, & Mirzaei, 2022).

On the other hand, utilization is affected by dietary diversity, food preparation, and intra-household distribution. According to Burchi and De Muro (2016) inadequate access to clean water, sanitation, and healthcare can compromise utilization. They pointed out that inadequate access to these basic services can undermine utilization even when sufficient food is available. Stabilization requires consistency in the other three dimensions over time, which can be disrupted by factors such as conflict, economic shocks, and climate variability (Headey & Ecker, 2013). These types of shocks and disruptions can cause transitory or cyclical food insecurity, where households may experience periods of adequate food access interspersed with periods of scarcity. According to Calloway, Carpenter, Gargano, Sharp and Yaroch (2023), chronic food insecurity can also arise when the other three pillars - availability, accessibility, and utilization - are persistently compromised over an extended period.

The **concept of food environment** helps to understand the food security by considering socio-economic, cultural, and political factors that shape food choices and consumption patterns. Manohar et al., (2023) stated that economic barriers, cultural norms, physical access to food outlets, and food quality and safety all play critical roles in determining food security outcomes and require attention in strategies aimed at promoting food security. Cultural norms and traditions around food preparation, eating habits, and food preferences also play a significant role in determining dietary patterns and nutritional outcomes. The physical accessibility of food outlets, including the proximity and availability of supermarkets, grocery stores, and local markets, can impact food access and utilization (Choi, Crimmins, & Ailshire, 2022).

2.2.5 Measuring Food Security

There are no universal methods to measure food insecurity however there are tools to measure food insecurity. One of the measurement tools is Food Insecurity Experience Scale (FIES). This measurement tool was developed by the UN under FAO through the Voices of Hungry Project (VoH) to have a standardized measurement for cross-country comparison (Cafiero et al., 2018). The development of FIES occurred as there is a myriad of food insecurity measurement tools and the tools used for the measurement of food insecurity vary from one study to another (Saint Ville et al., 2019). The FIES is a measure of food insecurity's severity at the household or individual level, based on respondents' self-reported experiences of having access to enough food, with YES or NO responses (Cafiero et al., 2018). Three established tools which were Household Food Security Survey Module (HFSSM), Household Food Insecurity Access Scale (HFIAS), and Caribbean Food Security Scale (ELSCA) had been used for the development of FIES (Ballard et al., 2013). Different levels of severity of how food insecurity can be experienced can be seen in Figure 2.2.

The Food Insecurity Experience Scale

Food insecurity is measured by the UN FAO based on household surveys that ask people eight questions on behaviors typical of someone experiencing food insecurity. This can be about poor access to a diet with sufficient quality or quantity.

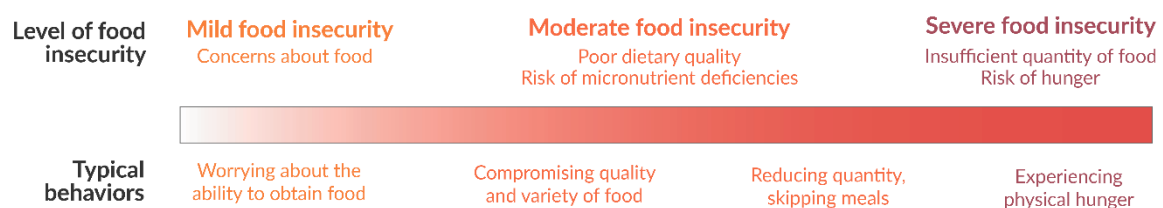


Figure 2.2: Levels of severity of food insecurity

Source: FAO (n.d.)

Besides FIES, there are other measurement tools to measure food security and insecurity. FIES is just most commonly used measurement tool as 153 countries have used this tool for national monitoring of SDGs (SDG2) through the Gallop World Poll (GWP) survey (Cafiero et al., 2018).

2.3 Cultural Dimensions of Food Security

Food security is a complex issue as it linked to a number of dimensions. The community's way of life and embedded culture is also in the context of food diversification. Past studies tend to focus on a global framework and ignore the dimension specifically local characteristics that could contribute a significant role in the nature of food security. As stated by Capone et al. (2014), consider the multicultural aspects when exploring new ideas on addressing food security.

According to Capone et al. (2014), perceptions of food security are largely shaped by socioeconomic factors such as income levels, employment status, and food affordability, alongside cultural influences. These factors determine how different communities' access and prioritize food in their daily lives. For example, in many rural or indigenous communities, food security is not only about having enough food but also about having access to culturally appropriate and nutritious food. This perspective highlights the multidimensional nature of food security, where physical availability, affordability, and cultural relevance all play crucial roles.

Galhena et al. (2013) emphasize that socioeconomic challenges such as poverty and limited access to employment opportunities directly impact food security perceptions. In

rural or economically marginalized communities, the ability to secure food is often intertwined with financial stability. Households with limited financial resources may struggle to purchase nutritious food or may resort to less desirable food choices that are more affordable but less healthy. Additionally, cultural preferences, particularly in indigenous communities, significantly shape food security perceptions. Traditional food systems and cultural food practices are often deeply rooted in community identity, meaning that access to these culturally significant foods is essential for maintaining a sense of food security. In these contexts, food security involves not just ensuring sufficient caloric intake but also preserving the community's cultural and dietary heritage.

In the Malaysian context, most of the case study among the indigenous communities tend to focus on the Orang Asli in Peninsular Malaysia. For example, studies by Law et al. (2018), Zalilah and Tham (2002), and Nurfahilin and Norhasmah (2015) have explored food security under traditional food systems for the Orang Asli. However, studies on indigenous communities in East Malaysia, such as the Iban, Melanau, or Bidayuh, remain limited. One of the studies was by Echoh et al. (2017), who investigates challenges in traditional paddy farming among Iban communities. Their study highlights issues such as declining numbers of farmers, inadequate agricultural land, and infrastructural challenges, which indirectly affect food access. This gap calls for more focused studies on the unique sociocultural and economic food environments of East Malaysian indigenous groups.

Thus, the literature reveals that food security perceptions are not uniform across different populations. Instead, they are deeply influenced by the socioeconomic realities and cultural contexts in which people live. This understanding underscores the importance of

considering local contexts when addressing food security issues, particularly in culturally diverse communities.

2.3.1 Traditional Food System

Traditional food systems are an essential part of community life, covering all aspects of food production and consumption. These systems are deeply rooted in the cultural heritage and historical practices of the community. According to Kennedy (2021), traditional agricultural practices often involve methods and crop varieties that have been passed down through generations, tailored to the specific environmental conditions of the region. These practices include sustainable farming techniques that maintain soil health and biodiversity, such as crop rotation and intercropping (Kanter, Boza, & Kennedy, 2023).

Food preservation and preparation methods are also integral parts of traditional food systems. Techniques such as fermentation, drying, and smoking not only extend the shelf life of food but also enhance its nutritional value and flavour. These methods are often unique to each culture and have been developed to maximize the utility of available resources as claimed by Kanter, Boza, & Kennedy (2023).

Community roles and knowledge transfer are critical in maintaining traditional food systems. Elders and cultural leaders play a significant role in passing down agricultural knowledge and food-related traditions. Kuhnlein, et al., (2006) for instance claim that intergenerational transmission of knowledge ensures the continuity of culturally significant practices and contributes to the resilience of the community's food system. Furthermore, traditional food systems are characterized by the use of local biodiversity. Indigenous plant and animal species form the basis of the diet, providing a diverse range of nutrients and

contributing to the ecological sustainability of the area. The conservation and use of these species are often embedded in cultural practices and beliefs, highlighting the deep connection between culture and food security.

2.3.2 Cultural Influences on Food Choices

Cultural influences and shape food choices and dietary habits within a community, reflecting in the types of food the community consumed, their meal patterns, and the symbolic meanings attached to certain foods. According to Kittler, Sucher, & Nahikian-Nelms (2016), cultural norms and traditions dictate what is considered acceptable or taboo to eat, influencing both the nutritional quality and variety of the diet.

Cultural preferences for taste, texture, and preparation methods also play a crucial role in food choices. These preferences are shaped by historical, geographical, and social factors, contributing to the diversity of culinary practices. For example, the preference for spicy foods in certain cultures can be linked to the historical availability of spices and their roles in food preservation and flavour enhancement (Ma, Song, Yan, & Zhao, 2018). Further discussed by Ma et al., case study in China where the spicy taste of Sichuan cuisine in China is attributed to cultural exchange and integration, as many residents immigrated from neighbouring regions like Hunan and Guangxi where spicy foods were already popular. Hence, the preference for spicy foods in certain cultures appears to be influenced by a complex interplay of historical, geographical, and cultural factors.

Additionally, social structures and gender roles within a community can influence food choices and distribution. For instance, Tabassum & Nayak, 2021 stated that in many cultures, women are primarily responsible for food preparation and household nutrition. This

however, can affect the dietary patterns of the entire family. Understanding these cultural dimensions is essential for developing nutrition programs and interventions that are culturally appropriate and effective (Counihan & Van Esterik, 2012).

2.3.3 Cultural Resilience and Adaptation

Cultural resilience refers to the ability of a community to maintain its cultural identity and practices when facing external influences. This resilience is crucial for the sustainability of food systems and food security. Clauss-Ehlers, (2010) claimed that communities with strong cultural resilience can adapt to environmental, economic, and social changes while preserving their traditional food practices. Clauss-Ehlers defines cultural resilience as the capacity of a culture to withstand and recover from challenges, including environmental, economic, and social disruptions, while preserving essential aspects of its identity and practices. In the context of food security, this resilience often manifests in the preservation and adaptation of traditional food production and consumption practices, which serve as critical coping mechanisms during periods of food insecurity.

One-way cultural resilience appear is through the adaptation of traditional practices to modern challenges. For instance, communities may incorporate new agricultural technologies or crop varieties while maintaining traditional cultivation methods. This blend of old and new practices can enhance productivity and food security without compromising cultural values. The integration of modern innovations with traditional knowledge helps ensure that cultural practices evolve in a manner that sustains both the community's cultural heritage and its food security (Altieri & Nicholls, 2012).

As Altieri and Nicholls (2012) note, many indigenous communities have successfully incorporated new agricultural technologies while preserving the core elements of their traditional food systems. This integration of the old with the new allows these communities to increase food production and adapt to environmental changes, such as shifting weather patterns, while maintaining the sustainability and cultural significance of their food systems. These adaptive strategies not only contribute to food security but also support the long-term resilience of the community's cultural practices.

Research on food security among indigenous groups in Malaysia, especially the Orang Asli in Peninsular Malaysia, shows that many of them face problems getting enough food. These problems include losing their land, not being able to collect traditional food, and young people no longer learning old food traditions. For example, Law et al. (2018) found that the Orang Asli from Gua Musang District (Kelantan State), Rompin District (Pahang State), and Gerik District (Perak State) had trouble getting food because they could no longer access the forest and had stopped using traditional food practices. Another study by Zalilah and Tham (2002) found that many Orang Asli families had poor diets, and some children were malnourished. These problems are similar to what is happening among the Bidayuh in Sarawak, who are also affected by modern changes and losing traditional knowledge. In other parts of the world, such as Canada, study also show that indigenous people there are trying to keep their food traditions while dealing with modern challenges (Kuhnlein et al., 2009). These examples show why it's important to understand how the Bidayuh are keeping their culture strong while also finding new ways to deal with food insecurity.

The preservation of cultural festivals, rituals, and cuisines also contributes to cultural resilience. These cultural expressions provide a sense of identity and continuity, reinforcing

the community's connection to its food system. Moreover, they can foster community cohesion and collective action, which are essential for responding to food security challenges (Kuhnlein et al., 2013). Festivals and rituals not only celebrate tradition but also play a crucial part in maintaining the social structures that support food security. Studies done by Okoye et al., (2017) and Zhou, (2010), indicate that indigenous communities employ distinct adaptive strategies to ensure food security, which are deeply rooted in their cultural heritage and traditional practices.

Traditional food systems are deeply embedded in the cultural fabric of indigenous communities, offering both a means of sustenance and a connection to heritage. Kuhnlein et al. (2013) argue that cultural resilience is essential for maintaining these systems, as they provide a framework for sustainable food practices, such as gardening, foraging, and local food preservation techniques. These practices not only ensure food availability but also align with the community's cultural values, thus fostering a sense of identity and continuity. For instance, gardening is often employed as a method of resilience, allowing communities to grow culturally significant foods and maintain a direct relationship with their land, even in the face of modern economic pressures or limited access to market food sources. Such strategies enable communities to adapt to food insecurity without sacrificing their cultural integrity.

Migration and urbanization present significant challenges to cultural resilience, as they can lead to the erosion of traditional practices and knowledge. However, many communities find ways to adapt by integrating their cultural food practices into new environments. This adaptation process often involves the modification of traditional recipes and the use of locally available ingredients, demonstrating the dynamic nature of culture in

the context of food security. The ability of migrant communities to maintain their culinary traditions in new settings underscores the importance of cultural flexibility and innovation in sustaining food security (Sobal, Khan, & Bisogni, 1998).

However, challenges such as migration and urbanization can pose threats to the preservation of traditional food practices. According to Sobal, Khan, and Bisogni (1998), the process of migration often leads to the erosion of traditional food systems, as people adapt to new environments and lose access to culturally significant foods. Despite these challenges, many communities exhibit cultural flexibility by modifying their traditional practices to suit new environments while retaining the core values of their food culture. This dynamic process highlights the importance of cultural resilience in ensuring food security across different contexts.

In conclusion, cultural resilience and adaptation are vital for the sustainability of food systems. By blending traditional practices with modern innovations and maintaining cultural expressions, communities can enhance their food security while preserving their cultural identity. The ability to adapt to new environments and challenges further highlights the dynamic and resilient nature of cultural practices in ensuring food security. By preserving traditional food systems and adapting them to modern challenges, these communities demonstrate an ability to maintain both their cultural identity and food security. The literature supports the idea that food security is not just about food availability but also about maintaining cultural continuity, which is critical for the long-term well-being of these communities.

2.3.4 Nutritional Health

The cultural dimensions of food security have direct implications for nutritional health. Traditional diets, often rich in diverse plant and animal sources, tend to provide a balanced distribution of nutrients that contribute to overall health and well-being. For example, traditional diets commonly incorporate a variety of fruits, vegetables, grains, nuts, seeds, and wild game, which collectively offer essential nutrients and foster health. Research by Comerford et al., (2021) support by claiming that these diets can be nutrient-dense and environmentally sustainable, providing a complementary balance of plant and animal foods.

However, cultural changes and the influence of globalization can lead to shifts in dietary patterns, sometimes resulting in nutritional deficiencies or the rise of non-communicable diseases. The introduction of processed foods and Western dietary habits into traditional societies often leads to increased consumption of sugar, fat, and salt, contributing to health issues such as obesity, diabetes, and heart disease. As mentioned earlier by Kuhnlein et al., (2013), this shift is particularly noticeable in marginalised communities where traditional foodways have been disrupted, leading to reliance on less nutritious, processed foods.

Furthermore, the loss of traditional food knowledge and practices can worsen these nutritional issues. When younger generations are not taught the importance of traditional diets and food preparation methods, there is a risk of losing valuable nutritional wisdom that has been passed down through generations. Studies have shown that involving community members in the preservation and promotion of their food heritage can empower them to make healthier food choices and resist the negative impacts of globalization on their diets (Bharucha & Pretty, 2010). These initiatives can help communities reclaim their nutritional heritage and improve their overall health outcomes.

2.4 Sustainable Development Goals (SDGs) and Food Security

With the establishment of the 2030 Agenda, the issue of food security has once again become a significant global concern. One of the Sustainable Development Goals (SDGs) i.e. SDg2, places a great emphasis on eliminating World hunger. This SDG seeks to eliminate hunger by achieving food security, improved nutrition and to promote a sustainable agriculture. Mugambiwa and Tirivangasi (2017), for instance, argue that the increasing rate in hunger and poverty continues to be among the most life-threatening issue that the world population has to face. They further argue that hunger should be eliminated and actions to be taken to ensure the access to safe, nutritious and sufficient food every year by all people including the poor, people who are at risk and infants by 2030.

Prosekov and Ivanova (2018), support this argument and state that natural crisis, armed conflicts, population growth and poverty are the main causes of hunger and malnutrition. In addition, food insecurity leads to compromised human health, hunger and malnutrition, create serious problems for government and non-governmental institutions, policy and decision makers (Misselhorn, 2005).

Individuals and households tend to adopt various measures as their coping mechanism whenever they face challenges to ensure food security. A study on students at the University of Alberta in Edmonton, Alberta, Canada, found that the student tends to apply for loan or bursary, involve in part time job and purchase their food using credit card in order to cope with food insecurity (Farahbakhsh, Ball, Farmer, Maximova, Hanbazaza & Willows, 2015). Another example of coping strategy is related to food insecurity involves changing habits. For instance, a study in urban slums of Delhi, India, found that when facing food insecurity, the residents tend to rely on less expensive food including seasonal and local

vegetables, reduce the portion of the meals and reducing the number of meals taken per day (Gupta, Singh, Seth, Agarwal & Mathur, 2015).

However, as the world population is still growing, the world will be facing a challenge of feeding the population. The recent Covid-19 pandemic also exposes the vulnerabilities of certain communities or countries in relation to securing food security (Galanakis, 2020). This results in a need of new coping strategies and new multicultural and multisectoral approaches to address the problem of food security in various angles (Capone et al, 2014). The world is consisting of different communities that comes from different backgrounds, different beliefs, values and tradition. This will lead to different communities might have different coping strategies concerning their cultural background.

He argued that such way is especially needed as the world is facing a problem to feed the growing world population. According to Molnar (1999), culture provides a matrix and a range of responses which make it an important factor as it may include cooperation, self-denial, self-exploitation and risk-taking mechanism in dealing with difficulty. Molnar (1999) further explained that how culture can influence food security has not been widely discussed in the current literature.

In Malaysia, study on food security likely to focus on homogenous community. For example, study by Law, Norhasmah, Gan, Siti Nur'Asyura and Mohd Nasir (2018) is focusing on the identification of the factors related to household food insecurity among indigenous people (Orang Asli) in peninsular Malaysia under traditional food systems. There are other scholars that doing the similar focus which is on the Orang Asli in Malaysia, for example Zalilah and Tham (2002); and Nurfahilin and Norhasmah (2015). Apart from Orang Asli, the study on food security in Malaysia also tend to focus on gender (women) and also children, for instance, a study by Shariff and Lin (2004) where the targeted respondents

among the rural Malaysia women. Meanwhile, Zalilah and Tham (2002) were doing a study on food security and child nutritional status among Orang Asli (Temuan) households in Hulu Langat, Selangor.

In Sarawak, several studies have focused on the Bidayuh community, examining specific subjects rather than addressing food security as a whole. For instance, Bennett (2002) explored the link between wild meat and food security among the Bidayuh community, while another study by Sayok and Teucher (2018) investigated the loss of traditional indigenous (Bidayuh) knowledge on local food plants. Additionally, Onn (2018) conducted a study on the role of women and food security among the Bidayuh. These studies highlight the diverse cultural backgrounds of communities, which contribute to varying beliefs, values, traditions, and perspectives on food security. As Molnar (1999) asserts, communities may adopt different approaches or coping strategies in obtaining food based on their unique values and traditions.

2.5 Emerging Issues and Debates on Food Security

Food security is a complex and multifaceted issue that continues to evolve, with new challenges and debates emerging as the global population grows. As the world aim to strive in ensuring that all people have access to sufficient, safe, and nutritious food, it is important to fully aware about the latest developments and discussions in this dynamic field. This section will explore some of the key emerging issues and debates surrounding food security.

2.5.1 Impacts of Covid-19

The Covid-19 pandemic has significantly impacted global food security, leading to disruptions in food supply chains, logistical challenges, and increased food insecurity worldwide (Galanakis, 2020; Glauber et al., 2020). These disruptions have highlighted vulnerabilities in the food system and the need for resilience in the face of unexpected events.

The pandemic has caused disruptions to food production, processing, transportation, and marketing, leading to price increases for fresh foods like meat, fish, fruits, and vegetables. These disruptions have exacerbated existing malnutrition, with an estimated 149 million children globally experiencing stunted growth due to Covid-19 and other factors as claimed by Galanakis.

According to a study by Subramaniam et al. (2022), declining household incomes, rising unemployment, and reduced foreign remittances in developing countries can have severe impacts on food security. The study, titled "Remittances and food security", found that higher flows of remittances are associated with greater food supply in 51 developing countries from 2011-2016. Another study by Mora-Rivera and van Gameren (2021) on the impact of remittances on food insecurity in Mexico also supports this finding. They concluded that income obtained through remittances reduces food insecurity in rural households by increasing household income and food production. Additionally, low income household had to reduce their food intake in order to secure their food during the Covid-19 period. According to Glauber et al., (2020) rural households in developing countries have experienced decreased food security and diversity due to rising prices, falling incomes, and reduced market access (Glauber et al., 2020).

The COVID-19 pandemic had serious effects on food systems worldwide, especially for rural and indigenous communities. In Sarawak, a study by Teoh et al. (2024) found that

the indigenous communities experienced worse food insecurity during the pandemic due to movement restrictions, loss of income, and reduced access to traditional food sources like forests and rivers. Many households had to cut back on meals or rely more on food aid. Similarly, in Indonesia, reported that food insecurity among the Dayak Benawan indigenous community worsened during the COVID-19 pandemic (Niko, 2020). This was caused by poverty, loss of income due to seasonal work limitations, rising food prices, and limited access to markets and government aid. According to Niko (2020), any households were excluded from social assistance programs because they were not officially registered, and the remote location further restricted their access to health services and critical information. The study found that households with low education, high illiteracy, and poor infrastructure were especially vulnerable.

These disruptions not only affected food availability but also weakened cultural food systems that many indigenous groups depend on. Such findings highlight how the pandemic made existing inequalities worse and show the need to study how communities like the Bidayuh in Padawan coped with these sudden challenges. This perspective helps to show why this study is timely and the important in understanding the post-pandemic food security situation. The Covid-19 pandemic has highlighted the need to strengthen food systems to be more resilient to future shocks.

2.5.2 Rise of Food Insecurity

The rise in food insecurity underscores the importance of addressing structural weaknesses in the food system to ensure food access for all, especially during crises. Food insecurity when there is limited or uncertain availability of adequate and safe food, persists as a pressing global challenge, necessitating a concerted effort to address underlying

structural deficiencies within the food system to ensure equitable access to nutrition, particularly during periods of crisis.

Climate change represents a significant threat to food security, with its adverse impacts on agricultural productivity and food availability. Research done by Wheeler & von Braun (2013), highlights that climate change-induced shifts in temperature and precipitation patterns are projected to reduce crop yields, exacerbating food insecurity in vulnerable regions.

Political instability and armed conflict also play a pivotal role in exacerbating food insecurity, particularly in conflict-affected regions where access to food is often disrupted and humanitarian assistance impeded. According to Brück et al. (2018), the detrimental impact of conflict on food security, revealing that conflict-exposed households are more likely to experience food shortages and resort to coping strategies such as reducing meal sizes and skipping meals.

Economic instability further compounds the challenge of food insecurity, with economic shocks and fluctuations in commodity prices disproportionately affecting vulnerable populations. The role of economic factors in driving food insecurity, highlighting the importance of income support programs and social safety nets in mitigating the adverse effects of economic crises on food access (Asadi-Lari et al., 2019). Addressing these structural weaknesses in the food system requires a comprehensive approach encompassing policy interventions, investments in sustainable agriculture, and social protection measures.

2.5.3 Role of Technology and Innovation

Technology and innovation play a crucial role in enhancing food security by improving agricultural practices, increasing food production efficiency, and ensuring food safety (FAO, 2006). Innovations such as precision agriculture, digital platforms for food distribution, and sustainable farming practices can contribute to long-term food security goals.

Precision agriculture involves the use of advanced technologies such as GPS, drones, and satellite imaging to optimize crop yields and reduce waste. This approach has been shown to increase agricultural productivity and efficiency while minimizing environmental impact (FAO, 2006). For instance, precision farming can help farmers optimize irrigation and fertilizer application, reducing the environmental impact of agriculture and increasing crop yields (Khanna & Kaur, 2019).

Digital platforms on the other hand is for food distribution which can help the supply chain to be efficient, reduce food waste, and increase access to fresh produce. These platforms can include mobile apps for farmers to sell their produce directly to consumers, online marketplaces for food delivery, and digital inventory management systems for food storage and transportation (Gouvea et al., 2022).

Sustainable farming practices, such as organic farming and regenerative agriculture, can help reduce the environmental impact of agriculture while increasing food security. These practices focus on soil health, biodiversity, and ecosystem services, which can lead to more resilient and productive agricultural systems (Terra Branca et al., 2022).

Despite the potential benefits of technology and innovation in food security, there are several challenges and debates surrounding their adoption. For instance, the high cost of

precision agriculture technology can be a barrier for small-scale farmers, and the lack of digital infrastructure in rural areas can limit the effectiveness of digital platforms for food distribution (Khanna & Kaur, 2019). Additionally, the environmental impact of some sustainable farming practices, such as the use of synthetic fertilizers, can be debated (Terra Branca et al., 2022).

2.5.4 Food Security and Other Global Challenges

Food security intersects with various global challenges, including climate change, population growth, and economic disparities (Prosekov and Ivanova, 2018). Addressing these challenges requires a holistic approach that considers the interconnected nature of food security with environmental sustainability, social equity, and economic development.

According to Gregory, Ingram and Brklacich (2005), climate change poses a significant threat to food security by altering agricultural productivity, water availability, and food distribution patterns. Population growth triggering the food demand, necessitating sustainable agricultural practices to meet the needs of a growing population without depleting natural resources. Economic disparities impact access to food, with marginalized communities facing higher levels of food insecurity.

Addressing these challenges requires integrated strategies that promote sustainable food production, equitable food distribution systems, and inclusive economic policies. A more resilient and secure food system can be achieved for all through the adoption of methods that promote economic development, social fairness, and environmental sustainability.

2.6 Urban vs Rural Food Security Approaches

Urban and rural communities often face very different food security issues. In cities, people usually rely on markets or supermarkets to buy food, so problems like high food prices, transport costs, and unstable income are major concerns. Urban households may be more vulnerable to food price increases or supply disruptions, especially during times of crisis such as the COVID-19 pandemic. For example, Crush, Hovorka, and Tevera (2011) explain that urban food systems depend heavily on formal and informal market networks, and this makes city dwellers more sensitive to price changes and market access.

In contrast, rural communities like the Bidayuh often rely more on local farming, natural resources, and traditional food practices. Their challenges are less about food prices and more about access to land, decreasing biodiversity, and loss of traditional knowledge. Okoye et al. (2017) note that rural African communities use indigenous methods such as preserving harvests or foraging as survival strategies. This pattern also can be seen among the Bidayuh. Therefore, the way food security is experienced in rural areas is different, and any solutions must consider these local practices and environmental factors.

2.7 Unique Food Security Challenges Among the Bidayuh

While some research exists on food security among indigenous peoples in Malaysia, most of it focuses on the Orang Asli in Peninsular Malaysia. These studies explore nutrition, traditional food systems, and poverty issues (Zalilah & Tham, 2002; Law et al., 2018), but they do not fully reflect the experiences of indigenous groups in Sarawak, such as the Bidayuh. The Bidayuh have their own land practices, food beliefs, and cultural traditions

that affect how they grow, collect, and consume food. Their food environment is also shaped by geographic isolation and limited access to modern agricultural support.

A few researchers have studied the Bidayuh, but their work only touches briefly on food security. For example, Sayok and Teucher (2018) looked at the loss of traditional food knowledge, while Onn (2018) studied the role of women in food preparation. These are important contributions, but there is still very little in-depth research that directly focuses on how the Bidayuh understand and manage food security. This study addresses this gap by giving special attention to the local experiences, challenges, and strategies used by the Bidayuh in Padawan, Sarawak.

2.8 Gaps and Limitations in Previous Studies

Many earlier studies on food security are based on general surveys or national-level data. While helpful for getting an overview, these methods often miss important cultural and local details. For example, they may not explore how cultural beliefs affect food preferences or how traditional knowledge helps communities deal with food shortages. Studies also tend to focus on short-term issues like food prices or availability, without looking at the longer-term strategies people use to cope with change. As a result, there is still limited understanding of how indigenous households maintain food security over time.

In addition, most food security studies in Malaysia do not consider the unique social and cultural context of smaller indigenous groups. They rarely include deep interviews, community voices, or analysis of traditional systems. This research aims to fill that gap by using a mixed-methods approach, combining surveys with in-depth interviews to have a better understanding on the food security situation of the Bidayuh community. By doing this,

the study hopes to provide a more complete picture and highlight how local knowledge and cultural values influence food security in ways that are often overlooked in broader studies.

2.9 Chapter Summary

Chapter 2 of the thesis focuses on the literature review related to food security. The chapter begins by providing an overview of the emergence of the concept in the 1980s and its evolution, highlighting various definitions and dimensions proposed by different scholars. The World Food Summit's (1996) definition, emphasizing physical and economic access to sufficient, safe, and nutritious food. Along with Amartya Sen's perspective, which focuses on individual and household entitlements rather than just food availability. The chapter explore into different interpretations of food security, considering diverse viewpoints such as Cooper's link between food security, hunger, poverty, and unemployment. Various scholars, including Siamwalla and Valdes (1994) and Titus and Adetokunbo (2007), present their definitions, incorporating aspects like the ability of a country or household to meet specific food levels or access safe and nutritious food.

The literature review also encompasses past studies on food security, recognizing the differences between developing and developed countries. It explores how developing countries heavily rely on horticultural exports for food security, whereas developed nations have lower percentages of undernourished people due to higher productivity. The Malaysian context is discussed, specifically addressing policies related to rice availability, accessibility, and utilization. The chapter emphasizes the global significance of food security, particularly in the context of the 2030 Agenda and Sustainable Development Goal 2 (SDG2), which aims to eliminate world hunger. Prosekov and Ivanova (2018) argue that natural crises, armed conflicts, population growth, and poverty are major causes of hunger and malnutrition,

emphasizing the need for actions to ensure access to safe, nutritious, and sufficient food for all.

Lastly, the chapter addresses coping mechanisms adopted by individuals and households facing food insecurity, such as seeking loans, part-time jobs, or changing eating habits. It concludes by highlighting the complexity of food security, calling for a multicultural approach that considers local characteristics and cultural backgrounds. The need to explore how culture influences food security is emphasized, pointing out the gap in the current literature regarding this aspect, especially in the Malaysian context where studies tend to focus on homogenous communities, such as the Orang Asli and gender-specific studies. The chapter encourages a broader exploration of cultural dimensions in understanding and addressing food security challenges.

CHAPTER 3

METHODOLOGY

3.1 Overview

This chapter explains both the research methodology and the research methods used in this study. Research methodology is a systematic way of problem solving by which it involved the process of gaining of knowledge. It is a science of studying on how research is being conducted including the procedures of describing, explaining and predicting phenomena (Goundar, 2012). Meanwhile, research method helps to collect samples, data and find a solution to a problem (Goundar, 2012). Research method and research methodology are two different things that are often being misunderstood as a term that brings the same meaning. The main difference between research method and research methodology is that research methods are the methods you used when you conduct research into a topic (Goundar, 2012).

While research methodology helps to explain the methods that is going to be used to carry out the research, research method involves the process of conducting experiments, tests, and surveys. In other words, research methodology is the process of learning various techniques that can be used in conducting research.

In the context of this study, the research used a mixed method approach. It means that both qualitative and quantitative methods were used and that can be seen from the different methods used in data collection. For instance, data collection was done using questionnaires via google form and in-depth interview through face to face and through phone calls.

3.2 Research Design

Based on the aim and objectives of this study, the most appropriate research design for the study is an exploratory study. Exploratory study is defined as research used to investigate a problem which is not clearly define and it is conducted to have a better understanding on the existing problem but does not intend to provide conclusive results (Swedberg, 2020). According to Stebbins (2001), exploratory study is very useful when you have little or no scientific knowledge on your research area. It helps to determine the nature of the research problem and to provide a better understanding on the matter.

Exploratory study relies on reviewing the past literature, data, and information to learn about the importance of subject group, activity process or situation and to produce hypothesis generalisation (Stebbins, 2001). The main advantage of using exploratory study is that it can provide the researcher flexibility and open-mindedness in collecting data and information (Stebbins, 2001). In this context, exploratory design helps the researcher to have a better and deeper understanding on the existing issues of food security especially among the Bidayuh community. This exploratory study will enable the researcher to achieve the objectives of how the Bidayuh community perceive food security, what are the factors affecting their food security and to have insights on their medium term and long-term strategy in order to overcome their food security crisis.

As previously mentioned, in this study, mixed method approach was adopted. In other words, both qualitative and quantitative approaches were used. Qualitative method is said to be suitable in order to understand the complexity of the phenomena emerging in a person's daily life (Plunket et al. 2013; Rania, Migliorini, Rebora & Cardinali 2015) this happen because individuals will be sharing their stories that represent their involvement in

the social world. In this context, questions on the respondent's perception on food security and the challenges associated with maintaining food security were asked.

3.3 Conceptual Framework

A conceptual framework is very important in a study as it provides a comprehensive guide for achieving the aim and objectives of the study. Essentially, a conceptual framework helps to ensure a systematic approach for addressing and exploring the broad and subjective nature of the issue, in this case the issues of food security. Figure 3.1 below summarises the conceptual framework used in this study.

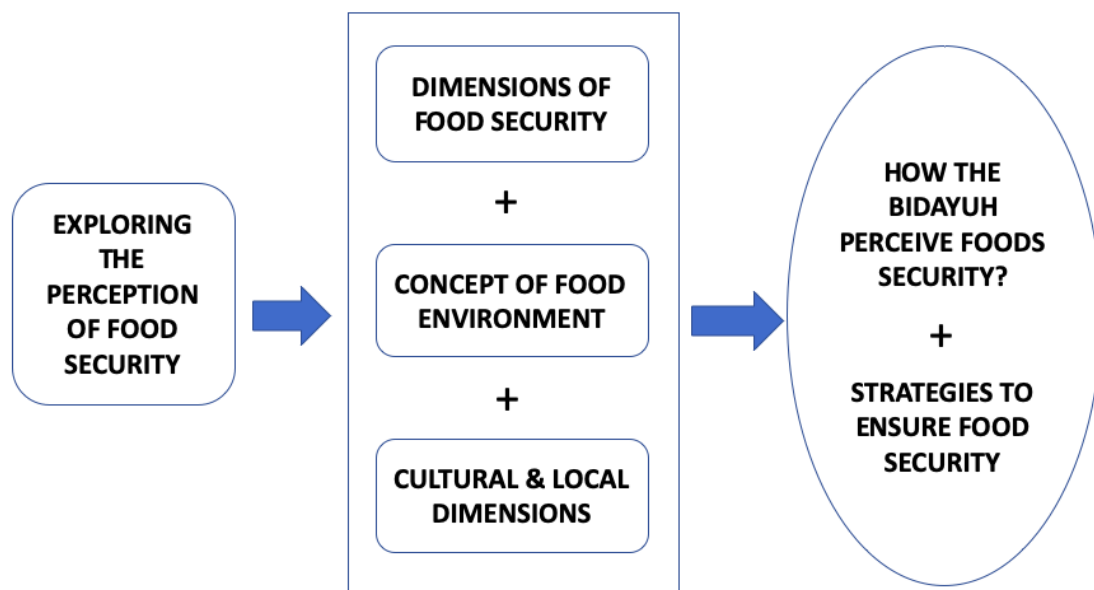


Figure 3.1: Conceptual framework of the study

The conceptual framework diagram above was used in this study and is believed to be able to give insights on food security among the Bidayuh community in Padawan,

Sarawak. Three key dimensions were explored and they are the four key dimensions of food security: availability, accessibility, utilization, and stability, the concepts of food environment, and the cultural and local dimensions of food security among the Bidayuh in the case study area. Each dimension plays a crucial role and is linked to the community's overall food security, thus emphasizing the comprehensive and interconnected nature of these factors to be explored.

3.3.1 Dimensions of Food Security

The concept of food security is central to the aim and objectives of this study. It was stated earlier that food security remains a critical global issue, evolving significantly from its initial focus on food availability in the 1970s to incorporating multidimensional aspects (Heidhues et al., 2004). The World Food Summit (1996) provided a comprehensive definition of food security, stating it exists "when all people, at all times, have physical and economic access to sufficient, safe, and nutritious food to meet their dietary needs and food preferences for an active and healthy life" (Bondad-Reantaso et al., 2012, p. 159).

Food security is traditionally analysed through four key dimensions: availability, access, utilization, and stability. Availability is a dimension refers to the physical presence of sufficient quantities of food of appropriate quality, supplied through domestic production or imports (FAO, 2006). Access involves the economic and physical capacity of individuals to obtain appropriate foods for a nutritious diet. According to Bastian and Coveney (2013), this dimension is influenced by factors such as income levels, food prices, and market infrastructure. Utilization refers to the proper biological use of food, requiring a diet providing sufficient energy and essential nutrients, potable water, and adequate sanitation (Carletto et al., 2013). Stability denotes the consistent presence of adequate food and the

ability to access it at all times, without the risk of losing access to food due to economic or climatic shocks (FAO, 2006). Stability is critical in ensuring the other dimensions of food security over time and can be influenced by political stability, environmental conditions, and economic policies.

These four dimensions will be explored in the study, particularly when investigating how the Bidayuh in the case study area perceive food security. This will be linked with the other two concepts, i.e. the concept of food environment, and the cultural and local context of food security from the Bidayuh lenses.

3.3.2 Concept of Food Security

Another key concept that will be used in this study is the concept of food environment. As mentioned in Chapter 2, food environment refers to the environment or setting where individuals or communities interact with the food system to obtain and consume food. This interaction, in turn, plays a critical role in shaping individual's or community's dietary behaviours (Kahn, 2023). The food environment includes a number of aspects, including built, cultivated and wild environments – which then influence elements of availability, convenience, preference, affordability, sustainability, proximity, and quality. All these elements ultimately influence food security through consumption patterns and dietary behaviours.

This concept will be examined in relation to how the respondents' perceived food security and investigating the challenges associated with ensuring food security.

3.3.3 Cultural and Local Context

Understanding food security within the Bidayuh community requires recognizing the cultural and local context. As stated in Chapter 1, past research often overlooks the cultural dimensions of food security, focusing primarily on nutritional values, coping strategies, and specific vulnerable groups (Manditsera et al., 2018; Leisner, 2020). That is why this dimension is included as part of the conceptual framework of this study. It is believed that in understanding the Bidayuh community's food security perceptions and practices, there is a need to understand their unique cultural values, traditional knowledge, and local environmental conditions. This dimension allows the study to examine if there are links between their local and cultural aspects with their food security practices and behaviours. For instance, studies done by Okoye et al., (2017) and Zhou, (2010), indicate that indigenous communities employ distinct adaptive strategies to ensure food security, which are deeply rooted in their cultural heritage and traditional practices.

The Bidayuh community's traditional knowledge, cultural practices, and social structures play a crucial role in shaping food security. Integrating cultural aspects into the food security framework is vital to understand the unique challenges and opportunities within this community.

The conceptual framework for this study situates food security within the broader dimensions of availability, access, utilization, and stability, while emphasizing the cultural and local context of the Bidayuh community. This approach provides a comprehensive understanding of the multifaceted nature of food security and highlights the importance of incorporating indigenous perspectives and practices into food security.

3.3.4 Conceptual Framework Diagram

The conceptual framework can be visualized as an interconnected system where each dimension influences and is influenced by cultural factors and socio-economic conditions. The Table 3.1 shown above is organized to illustrate the multifaceted nature of food security by categorizing key components under specific dimensions: Availability, Accessibility, Utilization, and Stability. This structured presentation highlights the interconnectedness and comprehensive approach needed to address food security effectively.

Table 3.1: Food security framework

Food Security Framework		
Availability	Accessibility	Utilization
Traditional	Economic access	Nutritional knowledge
Agriculture	Infrastructure	Health Services
Environmental	Social Policies	Dietary Diversity
Sustainability	Market system	Clean Water
Cultural Practices	Income from crafts	Health awareness
Community support	Market access	Traditional diet
Stability		
Political stability	Economic conditions	Environmental
		Sustainability

Availability includes factors such as traditional agriculture, environmental considerations, and sustainability, indicating the importance of consistent food production and resource management (Heidhues et al., 2004). Accessibility on the other hand, covers economic access, infrastructure, social policies, and market systems, emphasizing the need for robust systems to ensure that food reaches all populations (Bastian & Coveney, 2013). Utilization encompasses nutritional knowledge, health services, dietary diversity, clean water, cultural practices, income from crafts, and health awareness, which are crucial for making the best use of available food (Carletto et al., 2013). Stability encompasses elements that are cross-cutting and fundamental to ensuring the other three dimensions can be sustained over time. This structural choice likely reflects the role of stability as a foundation that impacts and integrates with all other aspects of food security rather than being in a separate or standalone category.

As shown above, stability is detailed through components like political stability, economic conditions, and environmental factors. These elements ensure that the conditions necessary for availability, accessibility, and utilization are maintained consistently (Okoye et al., 2017). By not placing "Stability" in the column of Table 3.1, it highlights its role as an underlying requirement for the sustainable achievement of food security, supporting the other dimensions collectively. The table's layout effectively categorizes and presents these diverse elements, demonstrating the complexity and holistic approach required to address food security challenges comprehensively. This table underscores the interconnectedness of various factors influencing food security.

3.4 Data Collection

This section describes the data collection process involved in this study, as well as the study population and the sampling techniques. Data collection is an important process in any study. In fact, it is the basis on which findings and conclusions are built on. Data collection is essentially a systematic information gathering from different sources whereby the data gathered are in line with achieving the aim and objectives of the study. In this context, the data gathered in this study are related to the aims of investigating how the Bidayuh in the case study area perceive food security, the challenges they face in ensuring food security and their adaptive strategies to maintain their household food security.

Data collection can be conducted using various methods, depending on the aim and objectives of the study. That is the reason why effective data collection method ensures that the data obtained are relevant, accurate and reliable. In order to achieve this, the targeted respondents have to be selected according to the requirement of the study.

In this case, the targeted respondents are individuals selected to provide valuable information, contributing to the comprehensive exploration of research questions, objectives, and the overall aim of the study. The population under consideration is carefully defined to ensure relevance and representation, and the sampling technique chosen aligns with the research design to draw meaningful insights. The rationale behind the selection process and the characteristics of the chosen population will be discussed to establish the validity and reliability of the study's findings.

For the purpose of this study, data collection was conducted from January, 2022 until May, 2023. Data was collected using questionnaire via Google form. Initially, it was planned as a face-to-face data collection using questionnaire. However, due to the COVID-19 pandemic and the subsequent movement control orders implemented to stop the spread of

the virus, the initial plan had to be adjusted. As a result, Google Forms is used to give out the questionnaire, which let the progress continue despite the difficult situation. This change helped keep the research going and to ensure the safety of both the respondents and the researcher.

Similar switch in data collection method (i.e. from face-to-face interview to online data collection) was common during the Covid-19 pandemic and post-pandemic times. For example, livelihood studies by Kamaruddin et al. (2021) in Malaysia, Bhan et al. (2020) in India, Rahman et al. (2021) in Bangladesh, Nguyen et al. (2021) in Vietnam, and Witoonchart et al. (2020) in Thailand had adopted similar changes in methodologies. The shift to online data collection allowed the researchers to still gather critical information in a time sensitive manner (Bhan et al., 2020). Kamaruddin et al. (2021), for instance, conducted their study (about livelihoods and coping strategies of low-income households) switched to online to comply with the Movement Control Order (MCO) regulations. Such control limits face-to-face interaction.

3.4.1 Sampling Technique

The sample size for this study was 211 respondents. The size was selected to capture a diverse representation of the Bidayuh community in Padawan. This number was determined based on the estimated population size, resource availability, and the study's exploratory nature, which aimed to provide initial insights into the food security challenges and adaptive strategies of the Bidayuh community.

Participants were chosen based on the following criteria:

- i. Bidayuh individuals aged 18 and above, reflecting the legal age for providing informed consent in Malaysia;
- ii. Residents of Padawan, Sarawak, with a strong cultural connection to the Bidayuh way of life; and
- iii. Individuals who are either head of household, primary food providers, or those responsible for household food preparation.

By focusing on these specific criteria, the study aims to capture a holistic picture of food security issues within the Bidayuh community, including economic, social, and cultural dimensions.

The participant recruitment process focused on accessibility and cultural sensitivity, considering the unique social dynamics and traditions of the Bidayuh community. In order to reach potential participants, the respondents were selected using convenience sampling, provided that they meet the aforementioned criteria. Convenience sampling is a non-probability sampling technique where participants are selected based on their accessibility and proximity to the researcher (Etikan, Musa & Alkassim, 2016). This method is often used in exploratory research or when time and resources are limited. Researchers choose participants who are readily available and willing to participate in the study. Further explained by Etikan et al., (2016), while convenience sampling is easy to implement and cost-effective, it may not be representative of the target population, and the results may not be generalizable. Researchers should be cautious when using convenience sampling and acknowledge its limitations in their research.

This approach was chosen due to its practicality. It should be noted that the data collection process was scheduled in 2020 during the Covid-19 pandemic. The movement restrictions during the COVID-19 pandemic made face-to-face data collection challenging.

Therefore, instead of face-to-face data collection, the study utilized online questionnaires distributed via Google Forms. This method allowed for safer data collection while respecting the need for social distancing, aligning with the ethical responsibility to protect both the researcher and participants and in line with the imposed movement restrictions by the authority (Kamaruddin et al., 2021; Bhan et al., 2020). Participation in the study was voluntary, and informed consent was obtained before data collection. A clear explanation of the study's purpose, potential risks, and participant rights was included in the questionnaire introduction, ensuring that respondents understood their role and could provide informed consent. Given the cultural context, the language used in the consent form was simple and culturally appropriate, reflecting the values and communication styles of the Bidayuh community.

It should be noted that Bidayuh is one of the indigenous groups that are found in Sarawak. Padawan was chosen as the case study area because of its high concentration of Bidayuh population. The rich cultural heritage and unique social dynamics of the Bidayuh community in this region provide a valuable context for the study. By focusing on Padawan, the study aims to gain in-depth insights into the Bidayuh way of life, traditions, and responses to contemporary challenges. This focus will contribute to a better understanding of the issues among the Bidayuh community in Sarawak.

While the online data collection approach is cost-effective and practical, it may not fully capture the diversity of the target population, potentially limiting the relevance of the findings (Etikan, Musa & Alkassim, 2016). Despite this limitation, the sample was considered adequate for an exploratory study focused on understanding the unique perspectives and experiences of the Bidayuh community.

3.4.2 Unit of Analysis

The unit of analysis in this study encompasses two distinct categories: (i) the food provider, typically the head of the household, regardless of gender, and (ii) the individual primarily responsible for food preparation within the household. This dual focus methodology is employed to comprehensively capture the perspectives and experiences of both the individuals who acquire food resources for the household and those who oversee the intricate processes of food preparation and organization.

By incorporating these two categories into the unit of analysis, the study aims to achieve a nuanced understanding of the dynamics shaping food security within the Bidayuh community. Vasantha Raju and Harinarayana (2016), stated that this approach recognizes the multifaceted nature of food provisioning and preparation roles within households, acknowledging that responsibilities and decision-making processes regarding food acquisition and management may vary based on cultural norms, gender dynamics, and socioeconomic factors.

Furthermore, this dual-focus unit of analysis facilitates the exploration of potential disparities or inequalities in access to and control over food resources within households. By examining the perspectives of both the food provider and the individual responsible for food preparation, the study seeks to identify any differential experiences, challenges, or priorities related to food security that may exist within the household context.

Additionally, this approach allows for a more comprehensive examination of the interplay between food procurement strategies and food utilization practices within Bidayuh households. By analysing the perspectives of individuals involved in both acquiring and preparing food, the study can elucidate how household food security strategies are

developed, enacted, and adapted over time in response to various socio-cultural, economic, and environmental factors.

3.4.3 Types and Sources of Data

The data for this study is gathered through primary and secondary sources. Primary data is original, raw data collected directly from targeted respondents. It includes surveys, observations, interviews, and questionnaires. Ajayi (2017) describes primary data as first-time collected data that remains unprocessed and original. The collection methods for primary data in this study involve online survey, in-depth interviews and observation.

i. Online Survey via Google Form

As aforementioned, an online survey was conducted to gather data from a broader range of respondents within the Bidayuh community. The decision to use the online survey was made due to the limitations arising from the Covid-19 pandemic. It should be noted that the data collection period for this study was during the pandemic. Numerous movement restrictions that were imposed at the time had made it difficult for the researcher to conduct the planned face-to-face data collection. The researcher had to resort to online survey, after much deliberation. Furthermore, online surveys offer several advantages, including ease of distribution, cost-effectiveness, and the ability to reach participants across different geographical locations (Vasanth Raju & Harinarayana, 2016). The survey was designed to collect data on various aspects of food security, such as access to food resources, dietary habits, food-related coping strategies, and perceptions of food insecurity.

Participants were invited to complete the online survey through social media platforms. The survey was administered using Google Forms allowing participants to respond to questions at their convenience. The survey questionnaire will include a mix of closed-ended and Likert scale questions to capture standardized data, as well as open-ended questions to allow participants to provide detailed insights and comments.

By conducting an online survey, the aim is to gather a large volume of data efficiently and analyse it quantitatively to identify patterns, trends, and correlations related to food security within the Bidayuh community. This method complements the qualitative insights obtained through in-depth interviews and observations, providing a comprehensive understanding of food security issues from multiple perspectives.

ii. In-Depth Interview

The researcher also conducted interview session with the targeted respondents among the Bidayuh community. This is because, according to Silverman (2000), in-depth interview could help to collect and gain a rich information on the subject studied by the researcher. Using this method, the researcher was able to obtain rich information on food security issues that the Bidayuh community faced in their daily life. This, in turn, had enabled the researcher to understand the issues according to the community perceptions and point of view as well. According to Milena, Dainora and Alin (2008), in order to let the respondents, talk about their personal thoughts, opinions, feelings and experiences, in-depth interview is the most effective ways to achieve that.

In-depth interview is a way to extract a clear picture of the respondent's perspective on the research topic (Milena et al., 2008). During this technique, the person being

interviewed is considered as the expert because they know the answer to the questions asked while the interviewer is considered as the student with lack of knowledge. DiCicco-Bloom and Crabtree (2006) states that, in-depth interview allows the interviewer to dig deeper into social and personal matters of the participants. Also, in-depth interview will enable the researcher to ask a wide range of research questions from the participants without have to worry about the time, the other member of participant as this one is happened individually.

The in-depth interviews were conducted when the pandemic was slowing down, and vaccinations were actively being administered within the community. However, there were limitations due to the availability of the targeted interviewees. During weekdays, those most likely to be available included housewives, small home business owners, students attending online classes, individuals working from home, and elderly. To address this limitation, the researcher took the initiative to conduct interviews at night after working hours by scheduling appointments with a few individuals.

The individuals selected for the interviews were those who were easily accessible during the interview period. The research also considered practical aspects such as participants' availability, location, and willingness to participate. Logistical arrangements, including interview scheduling and mode (in-person or phone), were made to ensure feasibility for both the researcher and the participants. The individuals selected for the interviews were chosen to ensure diversity across gender, age, and roles within the household. This approach aimed to capture a wide range of perspectives and experiences related to food security within the community. By including individuals from different demographic groups and household roles, the research sought to gather insights that reflected the varied circumstances and challenges faced by different segments of the population.

Initially, the researcher intended to conduct several focus group discussions among different age groups to gain diverse understandings and views on food security. However, to adhere to social distancing orders, in-depth interviews were conducted individually instead. The questions asked focused on Bidayuh culture related to food, the issues they face, their strategies for dealing with these issues, and their perceptions of food security.

iii. Observation

Observation is an act of watching the respondent's actions which include their body language and the verbal language during their behaviour observations (Musante, 2015). Observation techniques tend to be used when respondent is feeling reluctant to share their thoughts or opinions verbally. There are two types of observation, the first one is structured and the other one is unstructured. Given (2008), mentioned that structured observation refers to the technique in which the researcher observes an event using a guide or plan. On the other hand, unstructured observation is to observe and record the behaviour of the respondents without using any pre-determined guide or plan. In this study, non-participant observation was used where the researcher will observe the surrounding and the environment without participating in it.

By doing this observation, the researcher could evaluate the food security among the Bidayuh community by looking at their behaviour and actions in their daily life. By watching and experience it ourselves, the researcher will be able to understand more on the issues itself, to gain knowledge on the Bidayuh culture and also to easily identify Bidayuh community strategies that is practiced when facing food security issue.

iv. Secondary Data

Secondary data is the data that already exists and already been collected through primary sources. It is made readily available for researchers to use for their own research in the future. In other words, it is a type of data that has already been collected in the past by researchers for any particular project, then make the data or information available for other researcher (Johnston, 2017). Secondary data can be obtained from websites, article, journal, books and also government publications.

In this study, secondary data was also used to support the primary data and also to act as a guideline or reference. This helps the researcher to have a basic idea on the related issue of food security by looking at the data from the past research. By using this secondary data, the researcher could also make a comparison and to evaluate the changes or the similarity of the primary data that has been collected. From there, the researcher will be able to see the uniqueness of the different data collected at a different time. In this study, secondary data such as published sources and academic research were utilized.

3.4.4 Data Collection Methods

In-depth interviews were conducted with targeted respondents among the Bidayuh community to gather comprehensive information on food security issues from their perspective. In-depth interviews provide an opportunity for participants to express their views, experiences, and concerns in detail, allowing for a rich understanding of the complexities surrounding food security within the community. Case study done by Yusriadi, and Cahaya (2022), this study uses in-depth interviews and a Focus Group Discussion (FGD) to explore the dimensions of food security experienced by rural communities in Indonesia.

In-depth interviews explored their experiences with food, food insecurity, and the mechanisms that compound the difficulty in getting access to food. Through open-ended questions and probing, interviewers can delve deeply into topics such as access to food resources, dietary preferences, coping mechanisms during periods of scarcity, and perceptions of food security interventions.

Next is non-participant observations serve as a valuable complement to interview data by providing direct insights into the daily behaviours and practices related to food security within the Bidayuh community. By immersing themselves in the community setting, researchers can observe first-hand how households procure, prepare, and distribute food, as well as any cultural or social dynamics that may influence food-related decision-making processes. Observations enable researchers to capture nuances that may not be evident through self-reporting alone, offering a more holistic perspective on food security issues.

Questionnaire via Google Form (online tool) is a structured questionnaire was administered to members of the Bidayuh community in Padawan, Sarawak. This method facilitates the collection of quantitative data on various aspects of food security, including food access, affordability, dietary diversity, and perceptions of food insecurity. The questionnaire is designed to capture standardized information from a large sample of respondents, allowing for statistical analysis and generalization of findings. As claim by Vasantha Raju and Harinarayana, (2016), Google Forms offers several advantages for data collection, including ease of use, accessibility across devices, and automatic data storage and analysis capabilities.

Secondary data analysis is an addition to the primary data collection methods. Secondary data analysis involves reviewing existing literature and data from various sources to supplement and contextualize the primary data collected. This includes scholarly articles,

government reports, and community-based studies related to food security, as well as demographic and socioeconomic data from relevant sources. Secondary data analysis allows researchers to identify trends, patterns, and gaps in knowledge, as well as to situate their findings within the broader scholarly discourse on food security.

By employing a combination of qualitative and quantitative data collection methods, this study adopts a mixed-methods approach to comprehensively explore food security issues within the Bidayuh community. This approach enables researchers to triangulate findings, validate results, and generate a more nuanced understanding of the complex factors shaping food security outcomes.

3.5 Data Analysis

Data analysis is a process that involves the systematic investigation of data to extract meaningful patterns, trends, and relationships. It involves various techniques, such as statistical tests, data visualization, and modeling, to identify insights from the data and draw conclusions about the research questions or hypotheses (Guadagno, 2010). According to Thorne (2000), data analysis is the most complex and confusing compare to the all phases of a qualitative project, it is the least thoughtful discussion in the literature. However, data analysis is one of the important keys in research method in order to interpret the collected data correctly so that it will be easier to understand the research aim.

Thematic data analysis, was employed in this study, offers a systematic approach to identifying, analysing, and reporting patterns inherent in the data (Braun & Clark, 2006). By discerning recurring themes and motifs, researchers can unveil the underlying issues, problems, and commonalities, thereby gaining a holistic understanding of the research

context. According to Marks and Yardley (2004), thematic analysis serves as a powerful tool for exploring the complexities of qualitative data, enabling researchers to extract nuanced insights and explore multifaceted perspectives.

Moreover, thematic analysis facilitates the synthesis of diverse concepts and opinions, allowing for a comprehensive examination of the subject matter (Alhojailan, 2012). By discerning patterns and relationships within the data, researchers can contextualize their findings, drawing connections between emerging themes and existing literature. This iterative process of analysis enhances the depth and intricacy of the research, fostering a nuanced understanding of the phenomenon under investigation.

Thematic analysis enables researchers to relate the frequency of themes to the overarching research content, thereby enhancing the accuracy and rigor of the study (Alhojailan, 2012). By systematically organizing and interpreting the data, researchers can navigate the complexities of qualitative inquiry, illuminating key insights and generating actionable recommendations for future research and practice.

3.6 Ethical Considerations

Ethical considerations play a key role in the research process, ensuring the protection of participants' rights, confidentiality, and overall well-being. As such, this study adheres to ethical principles outlined by relevant institutional review boards and professional guidelines.

First and foremost, informed consent is obtained from all participants prior to their involvement in the study. Participants are provided with detailed information regarding the

research objectives, procedures, and benefits, and are given the chance to ask questions and pull out from the study at any time without repercussion.

Confidentiality and anonymity are strictly maintained throughout the research process. All personal identifiers are removed from data transcripts, and participants are assigned pseudonyms to safeguard their privacy. Additionally, data storage and handling procedures adhere to data protection regulations to prevent unauthorized access or disclosure.

Furthermore, this study upholds the principles of respect, dignity, and cultural sensitivity in all interactions with participants. Efforts are made to ensure that participants from diverse backgrounds feel valued and respected, and their perspectives are treated with the utmost respect.

Special care is taken to minimize any potential harm or discomfort to participants. Sensitivity to the cultural and social context of the Bidayuh community is paramount, and steps are taken to avoid causing distress or offense during data collection and analysis.

Lastly, any conflicts of interest or biases are disclosed transparently, and steps are taken to mitigate their impact on the research process. Open communication and ethical reflection are encouraged within the research team to ensure the integrity and validity of the study findings.

3.7 Chapter Summary

Chapter 3 focuses on the materials and methods employed in the study. The study adopts a mixed-method approach, utilizing both questionnaires via Google Forms and in-

depth interviews conducted face-to-face and through phone calls. The research design chosen is an exploratory study, aimed at investigating undefined problems to gain a better understanding. Exploratory studies are particularly useful when there is limited scientific knowledge in the research area. The mixed-method approach involves both qualitative and quantitative methodologies. Qualitative methods are chosen to comprehend the complexity of phenomena in individuals' daily lives, as participants share their stories representing their social world involvement. The exploratory study allows flexibility in data collection, aiding a deeper understanding of food security issues, especially among the Bidayuh community.

The section further explained into population and sampling, focusing in the area of Padawan, Sarawak, where the majority of the Bidayuh population resides. In-depth interviews are conducted with key figures, including the head of the household and food preparers. The selection of Padawan is justified due to its unique Bidayuh resettlement maintaining its traditional villages. The sampling method chosen is non-probability purposive sampling, using predefined criteria to select participants.

Data collection methods include online survey, in-depth interviews and observations, mainly for primary data collection. Online survey allows for rich information on food security issues from the Bidayuh community, while in-depth interviews allow interactions between researcher and respondents from different age groups and different gender. Observation, as a non-participant, aids in evaluating food security by observing daily behaviours. Additionally, secondary data is utilized from existing sources such as websites, articles, journals, books, and government publications to complement primary data and provide context.

The research instrument selected is the semi-structured interview, offering flexibility in posing open-ended questions and allowing for discussion. Thematic data analysis is

chosen for data analysis, a method focusing on identifying, analysing, and reporting patterns in the collected data. Thematic analysis provides a systematic approach to uncover issues, problems, and similarities, aiding a comprehensive understanding of the research context.

CHAPTER 4

FINDINGS AND DISCUSSION

4.1 Overview

This chapter presents the results of the exploratory study on food security among the Bidayuh community in Padawan, Sarawak. The findings and discussion in this chapter are based on the data collected from 211 respondents. As previously mentioned, the study, through a comprehensive analysis of the issue, aims to gain insights on the issue of food security among the Bidayuh community in Padawan, Sarawak.

This chapter is structured around the two key dimensions of food security as they apply to the Bidayuh community. Firstly, the focus is on the aspect of availability. This focuses on examining the issues of food security in the context of sufficiency of food supply in the community. It also explores the role of traditional knowledge and practices in ensuring food availability by the sampled respondents. Secondly, the focus is on food accessibility. It is centred around the issue of access, where it investigates the economic and physical access to food. This includes an analysis of household income levels, their occupation, market access, and transportation infrastructure. By integrating these dimensions, the chapter provides a holistic view of food security within the sampled Bidayuh community.

The analysis in this chapter is guided by the following research objectives, which frame the discussion of findings:

1. To examine how the Bidayuh community in Padawan perceive the concept of food security. This objective is addressed in the sections discussing respondents'

understanding of food security, including their views on food safety, quality, and sufficiency (Figure 4.2 and Table 4.3).

2. To explore the factors that are influencing the Bidayuh's food security. This is reflected in the sections covering economic challenges, physical access to food, and the impact of cultural practices (e.g., distance to food sources, high cost of nutritious food, and financial dependence).
3. To explore how the Bidayuh in the case study area adapt in medium and long term to the challenges of food insecurity. This objective is covered in the discussions on traditional practices, cultural resilience and adaptation, gardening, online and household coping strategies.

4.2 Case Study Profile

In this section, a detailed case study profiles of the participants are presented. A total of 211 respondents was involved in this study. Table 4.1 below shows a comprehensive overview of the respondents' profiles. It categorizes the respondents based on their gender, their role within the household and their occupation. Table 4.1 further breaks down those categories by frequency and percentage, offering a detailed insight into the demographic composition and occupational distribution of the respondents.

Categories		Frequency	Percentage
Gender	<i>Male</i>	97	46.0
	<i>Female</i>	114	54.0
Role	<i>Head of household</i>	50	23.7
	<i>Wife</i>	60	28.4
	<i>Dependent</i>	101	47.9
Occupation	<i>Government</i>	75	35.5
	<i>Private sector</i>	43	20.4
	<i>Self-employed</i>	55	26.1
	<i>Retiree</i>	7	3.3
	<i>Student</i>	17	8.1
	<i>Housewife</i>	12	5.7
	<i>Unemployed</i>	2	0.9

Table 4.1: Profiles of the respondent

As can be seen from Table 4.1, the respondents were categorised in terms of their role in the household: head of household, spouse of the head of household (usually the wife of the head of household) and the dependent. Dependent refers to the son or daughter of the head of household. It should be noted here that the minimum age for the respondents to participate in this study is 18 years old. Individuals aged 18 and above are considered as capable of providing informed consent, as they are legally recognized as adults and able to make decision regarding their participation in research (Babbie, 2020).

The table also shows that females respondents comprise a slight majority at 54%, with children being the most common household role, accounting for 47.9% of the total participants. In terms of occupation, the largest group is employed in the government sector (i.e. civil servants), making up 35.5% of the total respondents.

The demographic profiles outlined in Table 4.1 can be better understood using Sen's Entitlement Theory, which emphasizes that food security is not just about having enough food but also about the ability to access it through legal, economic, and social means (Sen, 1981). For instance, the majority of government servant (35.5%) among the respondents indicates a stable form of exchange entitlement, as these individuals receive regular income and social benefits, which improve their ability to secure food. In contrast, the high percentage of dependents (47.9%) represents a group with limited entitlements since their access to food depends on the earning power of the head of household (Sen, 1981).

Additionally, the high percentage of self-employed individuals (26.1%) shows a reliance on production entitlements, where access to food depends on their ability to produce or trade goods and services. This group is particularly vulnerable during economic downturns, as their income can be unstable and less predictable.

The findings on financial dependence and high food costs also support Sen's argument that food security is not just about food availability but also about economic capability. For example, the B40 group, despite being the lowest income, still prioritizes safe and healthy food (Table 4.3). This reflects that even low-income households value quality and nutrition, highlighting the role of health awareness and economic power in shaping food choices (Sen, 1981).

These details are crucial for understanding the demographic and occupational diversity among the respondents, which will later be used to explain the study's findings and implications.

4.2.1 Gender Distribution

Females make up 54% (i.e. 114 individuals) of the study population, compared to 46% (equivalent to 97 individuals) males. This gender composition is important as it may reflect societal norms, participation rates in studies, or specific interest groups within the sampled community being studied. In many cultures, women may be more likely to participate in surveys and studies, especially those conducted within households (Tabassum & Nayak, 2021). This can be due to traditional roles where women are more often at home and, thus, more accessible for surveys.

As mentioned in Chapter 3, data collection for this study was conducted online via Google Form. This method was chosen due to the restrictions arising from Covid-19 pandemic. The researcher had to change the initial data collection plan, which was supposed to be physical and face to face interview, to online data collection because of the Covid-19 pandemic. The Covid-19 pandemic and the associated (and numerous) movement restriction measures that were put in place from March 2020 till April 2022 in Malaysia to combat the spread of Covid-19 had limited the researcher's ability and opportunity to do face to face interviews. This has been explained in greater details in Chapter 3.

Online data collection, via Google Form, had shown that this survey was accessible by both male and females, as long as they have the access to the internet. According to Bullough, Guelich, Manolova and Schjoedt (2022), in terms of cultural norms, women are

more open or willing to share information, particularly in studies related to family, health, or social issues since the topics covered by the study also play a significant role. In this case, the subject matter involved is perceived to be more relevant to women, hence, they may be more inclined to participate.

4.2.2 Household Role

The role of each respondent within their household is categorized into three main groups as shown in the Figure 4.1 below.

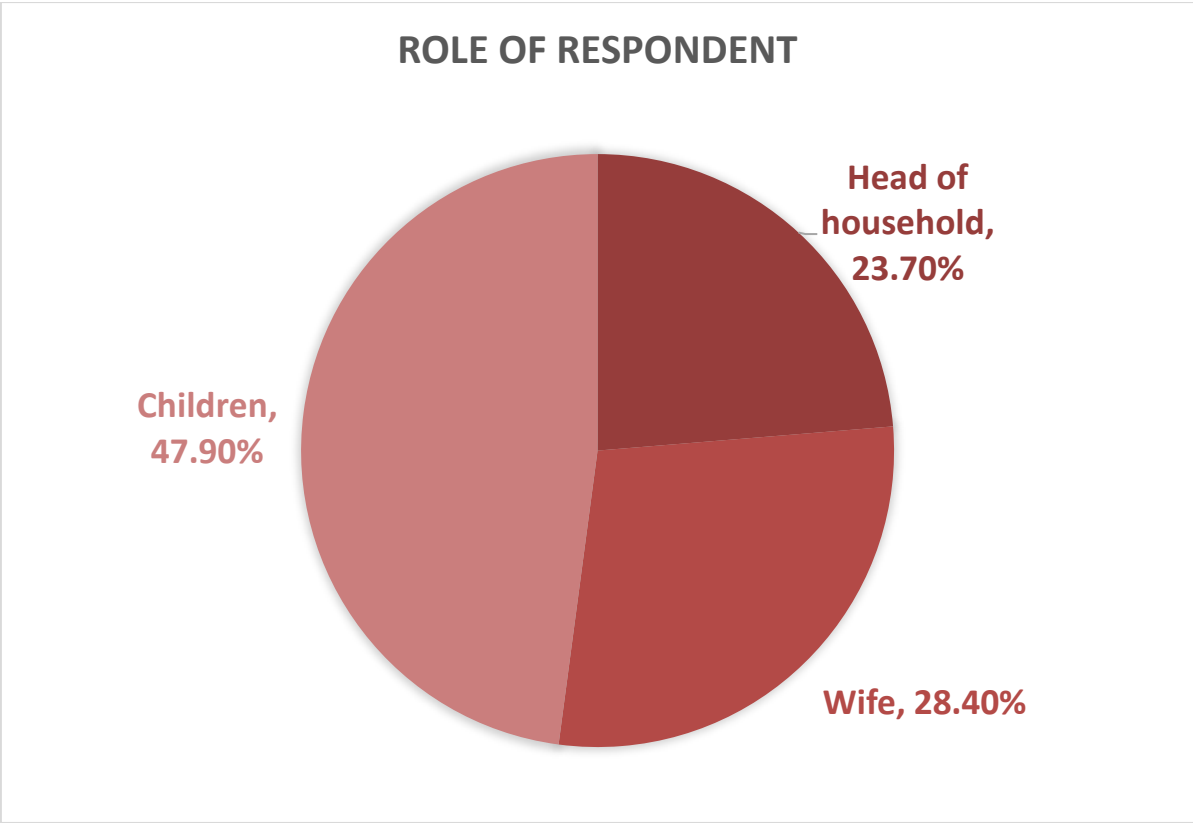


Figure 4.1: Respondent’s role in household

This distribution highlights that nearly half of the participants are dependent, suggesting a significant focus on younger perspectives within households. The presence of

spouses (wives) of the head of households at 28.4% and the head of household at 23.7% indicates a balanced representation of different adult roles within the family structure. The representations of the different categories of roles within households ensures that the study captures a comprehensive view of household dynamics, including decision-making processes, economic activities, and caregiving responsibilities. The head of household is considered the primary decision-maker and often the main economic provider. Head of household are responsible for major financial and administrative decisions. Their views are crucial for understanding issues related to household income, expenditure, and overall well-being.

The inclusion of wives/spouses (28.4%) highlights the role of women in household management and caregiving. This category often overlaps with head of household in terms of responsibilities but also provides a unique insight into gender-specific issues, such as work-life balance, domestic labour, and childcare. The perspective of wives is essential for addressing gender dynamics and promoting gender equality within households (Parpart, Connelly and Barriteau, 2000). The high percentage of dependent respondents reflects the importance of incorporating the voices of younger household members. Children's responses can shed light on educational needs, health concerns, and recreational interests.

4.2.3 Occupational Distribution

The occupation data shows a varied employment among respondents in this study. Table 4.2 below shows the breakdown of the respondents' occupation.

Table 4.2: Respondent's Occupation

Employment	Percentage (Individuals)	Frequency
Government sector	35.5%	75
Private sector	20.4%	43
Self-employed	26.1%	55
Retiree	3.3%	7
Student	8.1%	17
Housewife	5.7%	12
Unemployed	0.9%	2

Those employed in the government sector form the largest group. They comprise over a third of the total respondents. This indicates a stable employment base and having the access to government services and benefits among the respondents. A government job often come with job security, regular (and stable) income, and various forms of benefits, such as pensions, access to healthcare, and other social services. The high percentage of government employees indicates economic stability within the community. This stability can lead to increase household spending and savings, which can affect the household food security differently from those who works in different economic background. Hence, this affect their overall well-being and quality of life positively.

Secondly, the self-employed category also forms a significant portion among the total respondents (26.1%). This reflects entrepreneurial activities within the sampled community. While the presence of retirees (3.3%), reflecting individuals who have exited

the workforce. The retirees are those who tend to have more experience and knowledge. As retirees often possess valuable experience and knowledge that can benefit the community through mentorship or volunteer activities. Students acquiring 8.1% of the respondents, representing the future workforce and indicating investment in education. This group is in the process of acquiring skills and knowledge that will shape their career paths.

Housewives represent 5.7% of respondents, indicating those primarily engaged in managing household duties and caregiving. Bear in mind that housewives are doing the unpaid work that supports the household and community especially in this matter of food security that involve the whole household. The small percentage (0.9%) of unemployed respondents indicates individuals facing economic challenges and those who are seeking for employment.

4.3 Respondents' Perception of Food Security

This section addresses the first objective of the study which is to examine how the Bidayuh community in Padawan perceives the concept of food security. Understanding their perceptions is crucial, as food security is a subjective concept shaped by local culture, economic activities, and environmental conditions (Capone et al., 2014). The responses from interviews and surveys reveal that for the Bidayuh, food security means more than just having food as it includes food safety, cultural preferences and the ability to produce or obtain food through traditional and modern means.

Figure 4.2 below illustrates the respondents' perceptions on food security. It can be used to summarise the results and provide insights into the perceptions on food security among the respondents. The majority of the sampled Bidayuh respondents view food

security primarily as having safe food to consume. It can be seen from Figure 4.2 that 160 respondents (equivalent to 75.8%) choose food safety as their primary answer when asked about their view on food security. This response implied their fundamental concern for food safety. This response is similar to the findings from other studies as mentioned in Chapter 2: Mugambiwa and Tirivangasi (2017); Capone et. Al. (2014); Carletto et al. (2013); Siamwalla and Valdes (1994); and Titus and Adetokunbo (2007). This concern of food safety may exist due to increased awareness of the health risks associated with consuming contaminated of unsafe food. This is similar to the findings from Yeh et al. (2021), Gupta, & Freedman (2021), Ma et al. (2016), Maletta (2014), and Zhou (2010). For example, Yeh at al. (2021) studied the relationship between food insecurity, dietary quality, and food intake from economically disadvantaged household and found that awareness of food safety is influenced by economic conditions, with food-insecure households facing more barriers to making healthy and safe food choices.

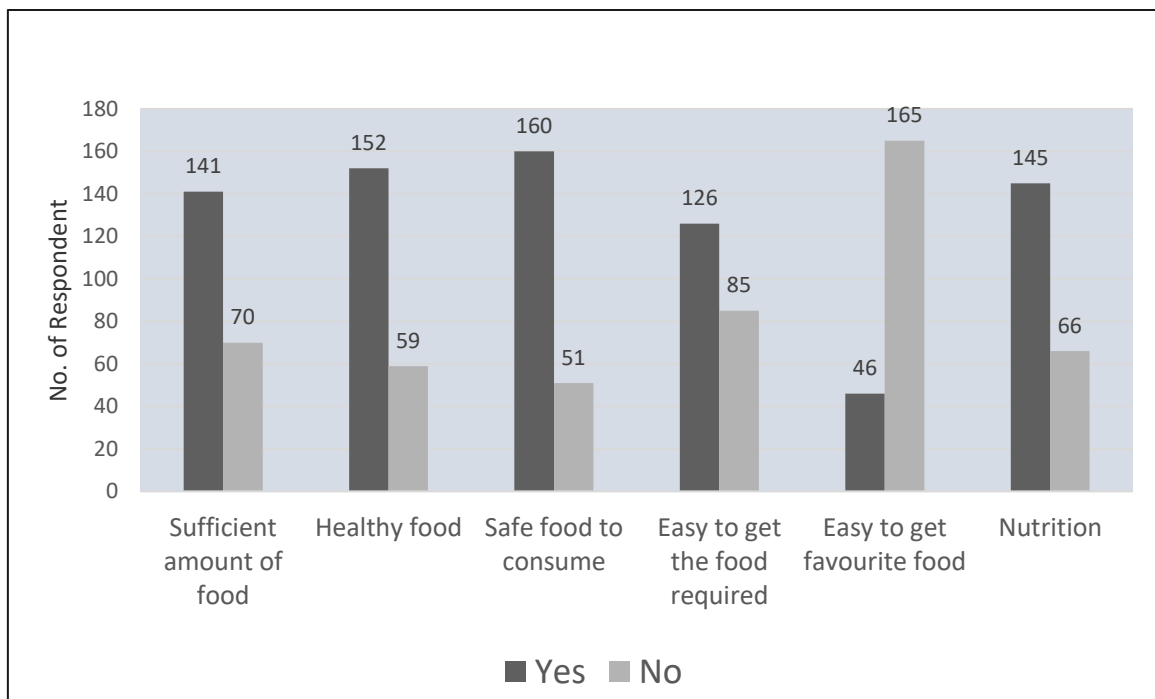


Figure 4.2: Respondents' perception on food security

At the same time, this concern aligns with global trends that emphasize the importance of food safety in achieving food security. As mentioned previously, the definition of food security that had evolved over the past decades had also been re-aligned with concerns over the safety and nutritious food consumption (refer to FAO's (2006) definition of food security).

This study also found that many respondents also prioritize healthy and nutritious food over their favourite choices. As shown in the figure above, 152 respondents (approximately 72% of the total respondents) chose healthy food as their definition of food security. This means that, to them, being food secured means having healthy food. This finding could be interpreted as them having a strong concern for health and well-being within the sampled community. Data suggests that the sampled Bidayuh respondents are not only interested in having enough food but they are also conscious of the quality and nutritional value of the food they consume. This can be related to Sen's entitlement theory that highlights how people's ability to access food goes beyond availability, but also depends on their ability to choose quality and nutritious food over just sufficient quantities (Sen, 1981).

In other words, this approach to food security encompasses more than just food availability, it also includes the need for a diet that supports overall health and prevents disease. Their perception of food security involves consuming safe food daily. This echoed Sen's (1981) view on how food security is ultimately about the nutritional status of the individual or household, and not just about having enough food for consumption due to their entitlements. Having said that, Sen also states that when low income households lack the means to afford nutritious or higher-quality food, they are more likely to prioritise food quantity over quality (Sen, 1981).

However, the findings (refer Figure 4.2 above) also shows that more than half of the respondents (i.e. 67% of the total respondents) consider having a sufficient amount of food as a key aspect of food security. This view highlights the importance of food availability and accessibility. In other words, it focuses on the aspect of food sufficiency, which is the traditional view of food security. As previously discussed in Chapter 2, food sufficiency is very much linked to the elements of availability and accessibility of food. Past studies also indicated that the notion of food security is very much linked to these two fundamental elements (Burchi & De Muro, 2016; Capone et al., 2014; Carletto et al., 2013).

It suggests that while the community values the food quality and safety, ensuring a consistent and adequate food supply remains a fundamental concern in the sampled community. This is a given fact, and has been discussed in various food security debates, that people always prioritise food sufficiency as the key element to ensure food secured household (Bondad-Reantaso, 2012; FAO, 2006; Hesselberg & Yaro, 2006). This is especially true for low income households (Abdullah et al., 2021; Mugambiwa & Tirivangasi, 2017) or marginalised communities (Law et al., 2018; Zalilah & Tham, 2002) and even during emergencies, such as the recent Covid-19 pandemic (Galanakis, 2020).

In general, results from this study highlight the dual focus on both the quantity and quality of food as important to the sampled Bidayuh respondents. They are not just talking about the “traditional” view on food sufficiency as the key component of household food security but also embrace the “contemporary” component of integrating healthy and nutritious elements in their understanding of the issue.

Table 4.3: Respondents' perceptions of food security grouped according to their economic status

Economic status/ Perception	B40 Group (Total 62 respondents)	M40 Group (Total of 52 respondents)	T20 Group (Total of 26 respondents)
Sufficient amount of food	39	39	22
Healthy food	44	35	18
Safe food to consume	49	30	19
Easy to get the food required	42	23	10
Easy to get favourite food	14	7	6
Nutrition	39	32	22

The table above provides a comparison of food security perceptions across the three economic groups: B40 (bottom), M40 (middle), and T20 (top). In this case, the respondents were categorised into one of the three categories based on their household income. It is then matched against their view on food security to get the sense of understanding of how they think food security should be. Their perceptions are assessed based on sufficiency of food, healthy food, safe food, ease of obtaining required and favourite food, and nutrition (refer Table 4.3 above).

Interestingly, the B40 group, despite being the lowest income group ($\leq$ RM4,849 per month), tend to view food security as having food that are safe for consumption (ranked

first), healthy food (ranked second) and easy to obtain (ranked third). This contrasts with common findings in other indigenous and low-income communities, where food security is often defined by quantity over quality (Abdullah et al., 2021; Mugambiwa & Tirivangasi, 2017). The difference as shown in this Bidayuh sample indicates the growing awareness of food quality due to better education, exposure to health campaigns, or growing awareness from recent events like the COVID-19 pandemic. This highlights a unique aspect of the Bidayuh context, where cultural and socioeconomic factors may be shaping a more health-conscious view of food security. In other words, findings from past studies often portrayed the poor group indicating food sufficiency as their main priority in order to become food secured, but the findings of this study tend to differ from those findings.

The M40 group's perceptions of food security are moderate. This means that their views on various aspects of food security are balanced between satisfaction and concern, reflecting a middle-ground position when compared to the B40 and T20 groups.

It highlights that while the M40 group generally feels they have enough and relatively healthy food, there are significant concerns about the safety and accessibility of food. Compared to the B40 group, which shows higher confidence in food safety and ease of access possibly due to lower expectations or different coping strategies, the M40 group exhibits more reservations.

The M40 group's moderate perceptions of food security reflect a nuanced view where basic food sufficiency and nutritional needs are generally met, but concerns about food safety and ease of access to required and preferred foods persist. This middle-ground stance underscores the complexity of food security issues among different economic groups, where financial capability and expectations play significant roles in shaping perceptions.

Meanwhile the T20 group ($\geq$ RM10,960), despite having higher income than the other two groups, a majority of the respondents perceived food security as having sufficient amount of food. In addition, they emphasize on the nutrition as the key component for being food secured. Findings indicated that the respondents in this group may have higher standards and expectations with regards to food quality, variety, and nutritional value. This would explain their lower satisfaction in some areas (e.g. food security is not about getting one's favourite food) compared to those in the B40 and M40 groups. The T20 group's focus on sufficiency and nutrition is also linked to their financial strength. Compared to the other groups, they can afford more and potentially better-quality food. However, their higher expectations might lead them to perceive greater challenges in achieving their ideal food security. Similar findings and explanation about these were highlighted in a study by Darmon & Drewnowski (2008). They explained that while financial strength enables better access to food, it also raises expectations for dietary quality.

Overall, the differences in perceptions across these economic groups highlight the complexity of food security and satisfaction. While income is a significant factor, the expectations and standards for food quality and food availability play crucial roles in shaping how each group perceives their food security. The findings indicate that financial insecurity significantly affects food choices in low-income households. These are similar to situations in other countries whereby these households often have limited resources, which constrains their ability to purchase diverse and nutritious foods. Consequently, they tend to opt for cheaper, calorie-dense options that may not necessarily be healthy (D'Alessandro, Bizzotto Molina, Dekeyser & Rampa, 2021). Hence, a low number of respondents recorded choosing sufficiency of food, getting favourite food and nutrition for B40 group as indicators of food security in this study.

The study also found that the Covid-19 pandemic has reshaped food sufficiency priorities across all income levels. Interestingly, higher-income respondents who are typically less concerned with food quantity due to their financial stability, also began to prioritize food sufficiency during the pandemic. This shift was driven by several factors including supply chain disruptions, panic buying, psychological impact and economic uncertainty (Doustmohammadian et al., 2023). They further explained that these factors illustrate how the Covid-19 pandemic acted as a great equalizer in terms of food security concerns globally. It underscored the vulnerability of food systems and highlighted the importance of having an adequate food supply, regardless of one's financial status. This shift towards prioritizing food sufficiency across different income levels emphasizes the broad impact of the pandemic on societal behaviours and attitudes towards food security. The widespread panic during the pandemic led many to secure any available food to ensure their family's survival. Panic buying, stockpiling, and increased concern over food security were common during the pandemic (Abdullah et al., 2021). The changes in attitudes toward food sufficiency were often shaped by the fear of supply chain disruptions and economic uncertainties during the pandemic.

In summary, while low-income households traditionally prioritize food quantity due to financial constraints, the Covid-19 pandemic caused even higher-income households to adopt similar priorities. The pandemic's disruptions and the resulting panic highlighted the fragility and vulnerabilities of food systems and there is a need to ensure sufficient food availability, reshaping food security perceptions globally (Galanakis, 2020).

4.4 The Influence of the Food Environment

Traditionally, the Bidayuh community engaged in agriculture, particularly large-scale paddy farming. They also cultivated pepper, vegetables, and fruits. Studies done by several scholars have shown that, over time, modern Bidayuh families have increasingly preferred employment outside agriculture to support their families (Cyril et al., 2023; Nwanesi & Samat, 2021; Sim, 2001). In order to preserve their traditions, they continue with small-scale farming for family consumption.

This study took place in a village where most Bidayuh households own land and a house. They also have the tendency to carry out small-scale gardening activities around their homes. For instance, one of the respondents had expressed concern about youth participation in agriculture. This stems from the fact that not many Bidayuh youths want to be involved in agriculture or farming as a way of life despite having access to family land. According to Sim (2001) and Nwanesi & Samat (2021) modernization and urban employment are the leading causes for declining traditional farming among indigenous youth in Malaysia. Despite this, over half of the respondents (119) indicated that they are involved in farming, though many are the sons or daughters of the head of households (i.e. the dependents). The farming activities were mainly operated by their parents.

"None of my children are involved in agriculture and all of them have jobs and one prefer to be a housewife... In this village, it's rare to see young people engaged in agricultural activities since most of them are working in other fields... My husband and I used to manage a paddy field and rubber plantation which is a part of our income. However, none of our children or relatives are interested in continuing this work..."

(Respondent No. 2; female, age 74 years old)

The Bidayuh community in Padawan area generally does not face issues with food supply due to their ability to travel for food. In other words, they have easy access to food sources. This is because Padawan area is served by a number of small townships as well as having easy access to bigger towns (e.g. Serian) and city (Kuching). However, according to the respondents, they find it to be a struggle to find good quality food in nearby townships or village shops. This is due to the types of food available in the area. This is because local shops (or village shops) may primarily stock essential or locally sourced products. In order to get what they termed as a better-quality item, which may include premium food items, or specific brands, the respondents have to travel approximately 45 minutes to the city for better options, depending on their village's location. In this context, food security is influenced, to a certain extent, by the food environment. This travel represents a trade-off between convenience and access to preferred food products. Thus, very much in line with their notion of food environment, linked to their food preference and choices, availability, affordability and convenience.

The study also found that the hunting activity, which was once a well-known activity among the Bidayuh community, is now gradually declining. Similar argument was put forward by Bennett (2002) and Sayok & Teucher (2018). For instance, loss of traditional knowledge related to the identification, use, and cultivation of native food plants could be linked to a few aspects, namely (i) modernization and urbanization; (ii) integration of indigenous communities into mainstream society, and (iii) environmental and ecological changes (Bennett, 2002; Sayok & Teucher, 2018). According to a high number of respondents, this happens in their community because the resources are declining and they could hardly be found in the forest anymore. Hunting and foraging in the forest are two

indigenous practices that are (used to be) important for ensuring food security in forest-dependent communities. According to one of the respondents;

"Our parents used to have wild meat and other traditional food daily, but now we can only have it if it is available. Since it's hard to find, we seldom do it except for special occasions like Gawai, weddings, and gatherings."

(Respondent No. 6; female, age 37 years old)

These responses can be linked to the observations made by Sayok & Teucher (2018) and by Capone et al. (2014). While Capone et al. (2021) does not specifically address the need to travel for branded or preferred foods like, they highlighted the importance of local food systems, which they believe can (i) reduce the needs to travel for food, (ii) enhancing food security, and (iii) improving sustainability. Unlike Reyes-Puente et. al. (2022), they believed that by promoting local food production, rural communities can minimize the distance they need to travel for food, which, in turn, has positive implications for health, economy and the environment.

When asked about food security concerns, more than half (i.e. approximately 67.8%) of the respondents indicated they do not worry about their household's food security. Only 32.2% of the respondents expressed concern. Because data was collected during the pandemic, it is believed that the pandemic has, to a large extent, influenced these perceptions. It should be noted that, even before the pandemic, financially stable households typically did not face food security issues. For example, one 25-year-old respondent said:

"...it is because of the Movement Control Order (MCO) I am worried about my household food security. Financially, I am not worried because both of my parents

are working; I am only worried that the stock of food in the market is not enough to cater all the people who were locked up in their houses."

(Respondent No. 1; male, age 25 years old)

The Covid-19 pandemic has significantly influenced respondents' answers, as it has brought substantial changes to human life, economy, and food systems (Galanakis, 2020). In this study, it is found that a small proportion of households reported difficulties securing food, with some worrying about their family's food supply. In addition, approximately 18% of respondents (i.e. 38 respondents) experienced running out of food, leading to serving only one dish per meal due to financial constraints. Additionally, 105 respondents had to reduce their food intake. These findings reveal that, during the study period, not all Bidayuh households in the case study area are food secured. In fact, the findings revealed a significant number of the respondents had in fact experienced food insecurity.

4.5 Factors Affecting Food Security

The second objective of the study is to explore the factors that are influencing the Bidayuh's food security among the Bidayuh community. Socioeconomic elements such as income level, land access, household role, and occupation are critical determinants of food security (Brimblecombe et al., 2015; Keenan et al., 2001). Meanwhile, traditional practices, cultural food values, and environmental limitations also play a role in shaping food access and preferences.

One of the primary challenges is the distance to food sources. This is related to the concept of food environment, where the elements in the environment influence one's food

security. In this study, many Bidayuh villages are located in remote and rural areas, and a fair distance to the nearest towns, where markets and other convenience services are located. This makes it difficult for community members to easily access markets or stores where they can purchase food. This distance not only limits their ability to buy food regularly but also increases transportation costs, further straining their already limited resources.

Additionally, the high cost of nutritious food triggers the problem. Even when food is available, the prices of healthy and nutritious options are often prohibitively expensive. As a result, many families are forced to reduce their food intake to save money, which can lead to malnutrition and other health issues. The reliance on online purchases for food supplies is another factor, but this is not always a reliable or affordable solution due to limited internet access and additional costs associated with delivery. Furthermore, the lack of space for gardening in these communities means that they cannot supplement their diets with home-grown produce, which could otherwise provide a valuable source of fresh and nutritious food. Financial dependence plays a significant role in these challenges, as many community members have limited income and are heavily dependent on fluctuating economic conditions. This financial instability makes it difficult to consistently afford food, especially more costly nutritious items. Addressing these factors requires a diverse approach, including improving access to markets, making nutritious food more affordable, and providing support for local food production to enhance the overall food security of the Bidayuh community in Padawan.

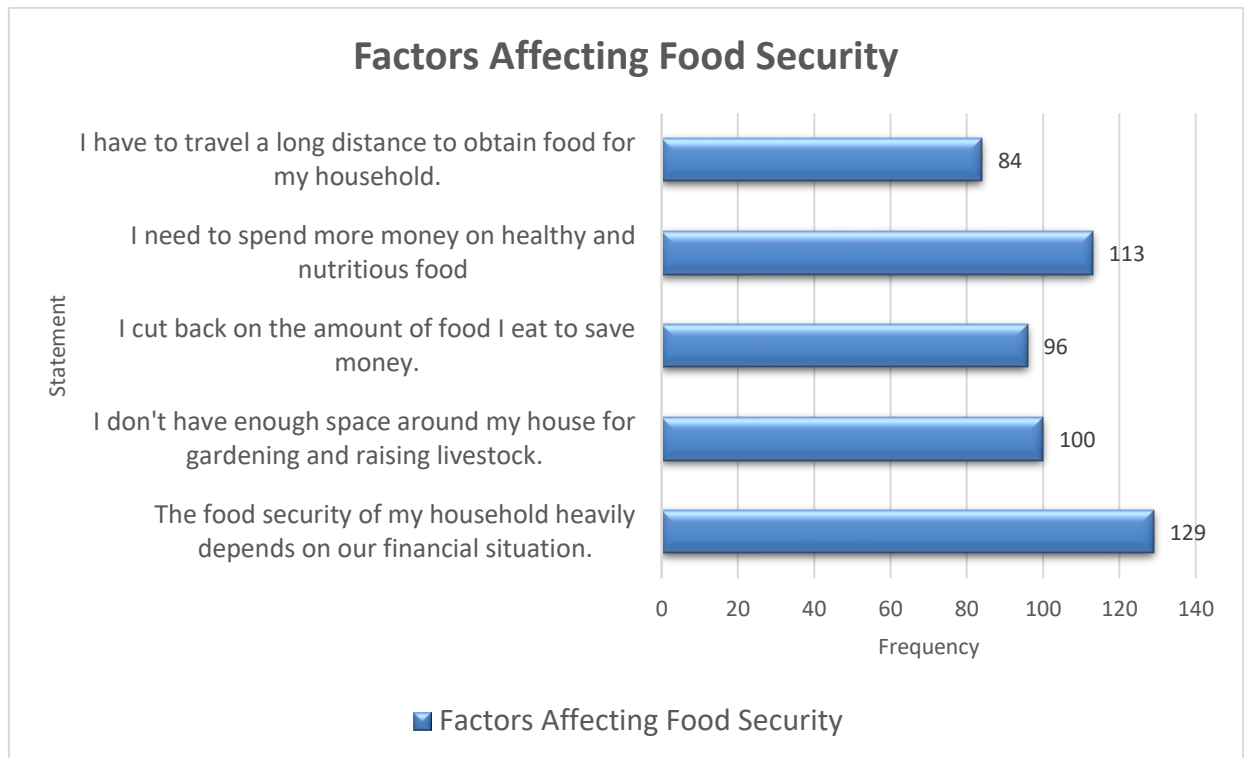


Figure 4.3: Factors that are affecting respondent’s food security

4.5.1 Distance to food Sources

The distance to food sources is a significant factor affecting food security among the Bidayuh community in Padawan, Sarawak. In this study, a total of 84 respondents agreed that they have to travel far to obtain their food supplies. As mentioned earlier, most of the Bidayuh villages are located in remote and rural areas which is far from the city. Hence, it is difficult for the community members to have easy access to the markets or stores where they can purchase food. This is similar to the points highlighted by Reyes-Puente et. al. (2022). They observed that rural and semi-rural areas often lack access to larger grocery stores or supermarkets, and have to go to urban centres to access a wider range of products, including healthier options and preferred brands.

The Sustainable Livelihoods Framework (SLF) helps explain how different types of resources affect the food security of the Bidayuh community. One of those resources is the distance to food sources as it highlights the importance of physical and financial capital. Without good roads, transportation, or sufficient income, it can be difficult for households to access the food they need (Carney, 1998).

In addition, necessity to travel long distances poses several challenges. As one of the respondents noted:

“As a single mother supporting my children and grandchildren, I rely on my late husband's pension to buy groceries. Because the market is quite far from our house, we stock up on food once a month. Although we have a car, only my daughter can drive, so we have to wait until she is off work to go shopping.”

(Respondent No. 3; female, age 56 years old)

While many community members now have access to transportation, the cost associated with using these means of transport remains a substantial burden. Fuel costs, vehicle maintenance, and transportation fees all add to the overall expense of acquiring food. For families already struggling with limited financial resources, these additional costs can be prohibitive, reducing the amount of money available for purchasing food itself. A female respondent aged 56 and is a housewife claimed:

“My husband and I prefer travel to town using motorcycle instead of using car because it is more cost effective. But if it is raining, we have no choice but to use car....”

(Respondent No. 4; female, age 56 years old)

Moreover, the long distances also require significant time investments. Traveling to and from distant markets or stores consumes valuable time that could otherwise be spent on productive activities, such as farming, working, or caring for family members. This time investment can be particularly burdensome for households with limited labour capacity or those with members who are elderly or have disabilities.

Furthermore, the reliance on distant food sources can lead to inconsistencies in food availability. For instance, if transportation options are disrupted due to vehicle breakdowns, adverse weather conditions, or financial constraints, families might face temporary shortages. This uncertainty can lead to periods of inadequate food supply, exacerbating issues of food insecurity. This, to some extent, is parallel to the research done by Reyes-Puente et al. (2022) which underscores how geographic and socioeconomic factors influence food environments, pushing rural residents to travel in order to improve their food accessibility.

4.5.2 High Cost of Nutritious Food

The high cost of nutritious food presents is another factor that are affecting the food security among the Bidayuh community in Padawan, Sarawak. In this study, a total of 113 out of 211 respondents claimed that they have to spend more money to access healthy and nutritious food options. The limited availability of nutritious foods in local markets or local stores forces the Bidayuh community in the case study area to seek out these items in larger towns or cities, where prices are higher due to increased demand and transportation costs. As a result, Bidayuh families are compelled to allocate a larger portion of their already stretched budgets to afford these essential food items especially families that come from the low-income group.

The pricing of nutritious foods compared to less healthy alternatives can be inherently higher. FAO and WHO often argued that fresh fruits, vegetables, lean proteins, and whole grains, which are crucial components of a balanced diet, tend to be more expensive than processed or unhealthy options (FAO, 2013). Along the same argument, study done by Saleem and Hassali in 2016, reports that healthy eating was perceived as 'unaffordable' in Malaysia, with an individual following a 1500 kcal menu needing RM 845.50 on average. This study sheds light on the cost implications of maintaining a healthy diet in Malaysia, indicating the challenges faced by individuals in accessing and affording nutritious food options. Saleem and Hassali (2016) also state that the growing consumption of processed and unhealthy food gained popularity because of their lower cost, convenience and widespread availability, compare to its healthier alternatives.

The pricing difference creates a barrier for many Bidayuh community, especially those with limited financial means, in accessing the necessary nutrients for maintaining good health. Furthermore, economic disparities within the community worsen the impact of the high cost of nutritious food. Families with lower incomes or those facing financial hardships are particularly vulnerable, as they may struggle to afford even basic food necessities, let alone prioritize spending on more expensive healthy options. This situation can perpetuate cycles of poverty and poor health outcomes, further exaggerate food insecurity.

The consequences of the high cost of nutritious food extend beyond financial strain. Inadequate access to these foods can lead to poor dietary habits and nutrition-related health issues, such as malnutrition, obesity, and chronic diseases. These health problems not only diminish the quality of life for individuals within the community but also place additional burdens on the healthcare system. But as for this study, it aims to focus on the accessibility and the availability of food security among the Bidayuh community.

4.5.3 Reduce Food Intake for Savings

The practice of reducing food intake for the purpose of savings presents a distressing reality within the Bidayuh community in Padawan, Sarawak. The study found that a majority of the respondents (n=96) admitted the necessity of cutting back on the quantity of food they consume in order to save money. This phenomenon arises from economic pressures and financial constraints faced by many families within the community. With limited incomes and rising costs of living, particularly in terms of food prices, Bidayuh households often find themselves forced to make difficult decisions regarding their food consumption. In an effort to stretch their limited resources, they resorted to reducing the amount of food they eat, sacrificing quantity for the sake of financial savings.

Another important reasons behind this shift in behaviour is the impact of the Covid-19 pandemic, which has led to movement restrictions and economic challenges. The implementation of movement restrictions, such as lockdowns and stay-at-home orders, has disrupted livelihoods and economic activities within the community. Many Bidayuh families rely on daily wage labour or small-scale businesses for income, which have been severely affected by the pandemic-related restrictions. With reduced or uncertain income streams, community members have been forced to reassess their spending priorities, including their food consumption patterns. Such move may lead to reduced nutritional quality and increase reliance of cheaper, less healthy food options, as highlighted by Nurfahilin & Norhasmah (2015) based on their study about food insecurity among the Orang Asli women in Malaysia.

The rising cost of living, compounded by the economic downturn resulting from the pandemic, has further strained household budgets. Food prices have increased, while incomes have dwindled or become unstable. In response to these challenges, Bidayuh households have resorted to reducing their food intake as a strategy to cope with financial

constraints and stretch their limited resources. Other coping strategies include reducing meal frequency, or consuming wild foods (Nurfahilin & Norhasmah, 2015).

Moreover, the psychological and emotional toll of constantly worrying about food scarcity and financial instability cannot be understated. The stress and anxiety associated with not knowing where the next meal will come from or how to afford basic necessities can have detrimental effects on mental health and overall well-being especially during the Covid-19 pandemic.

4.5.4 Limited Gardening Space

Limited gardening space is a significant factor affecting food security among the Bidayuh community in Padawan, Sarawak. A total of 100 respondents claimed that they have insufficient space to do gardening, which, according to them, is a sustainable way to secure food for their households. Home gardens or backyard garden are a promising strategy for improving household food security and well-being, especially in rural setting (Abdullah et al., 2021; Galhena et al., 2013). Gardening is a practical and cost-effective method for households to supplement their food supply with fresh, nutritious produce. It can also help mitigate the financial burden of purchasing food and provide a buffer against market fluctuations and supply chain disruptions.

This issue of limited space for gardening has significant implications for the community, particularly in light of recent challenges such as the Covid-19 pandemic. Although majority of the Bidayuh households who settled in a rural or suburban area where they have access to big piece of land, there are many who live in areas where space is limited, making it difficult to establish and maintain home gardens.

During the Covid-19 pandemic, the importance of gardening became even more evident (Abdullah et al., 2021). Movement restrictions and lockdowns imposed to curb the spread of the virus disrupted food supply chains and limited access to markets. Many respondents stated that people in their community turned to gardening as a means of ensuring a reliable food source amid these uncertainties. Despite this proactive approach, the lack of adequate gardening space hindered their efforts. According to their responses and based on researcher's observations, the constrained space for gardening is due to several factors, including the geographical layout of the villages, land use policies, the size of residential plots and land used for development purposes. This restriction on gardening space not only limits the ability of households to produce their own food but also affects the overall resilience of the community to external shocks, such as pandemics or economic downturns.

In conclusion, while this study does not focus specifically on the impact of Covid-19 on household food security, it is clear that the pandemic has highlighted and worsen the existing challenges within the Bidayuh community to maintain their household food security.

4.5.5 Financial Dependence

More than half of the respondents (equivalent to a total of 129 respondents) have indicated that their food security depended on their financial status/situation. This heavy reliance on financial resources for food security highlights several underlying issues within the sampled community. Firstly, the dependence on financial status underscores the economic vulnerability faced by many Bidayuh families. With limited income sources and often precarious employment conditions, these families are at constant risk of food insecurity. When income is insufficient or unstable, the ability to purchase adequate food is

also severely compromised. This financial fragility makes it difficult for households to consistently secure the food they need, leading to periods of scarcity.

Additionally, the reliance on financial resources for food security is further complicated by the rising cost of living and food prices. Even when families do have some financial means, inflation and high food prices can erode their purchasing power. This means that even minor fluctuations in income or unexpected expenses can have a significant impact on their ability to afford sufficient food, forcing families to make difficult choices between food and other essential needs.

Moreover, the Covid-19 pandemic has worsened these financial pressures. Many respondents indicated that they (or their family members) experienced job losses or reduced income due to movement restrictions and economic slowdowns as a result of the Covid-19 pandemic. This situation has made financial dependence even more precarious. Bear in mind that there are respondents from various socio-economic background (e.g. retirees, housewife, and unemployed), their financial standing is not as stable as those who are civil servants or working in private sectors. It should be noted that during the Covid-19 pandemic, the income of civil servants remains unchanged, thus, offering them the stability that may be lacking for those in the other employment groups.

In the case of the precarious nature of livelihoods, respondents opted to resort to traditional coping mechanisms, such as growing their own crops, traditional food restoration, sharing of food products from friends or family. When Bidayuh households have surplus vegetables, crops, or meat, they typically share it with friends, relatives, and neighbours. These are the customs that have been practiced over the years and, in some cases, still exist today. The Covid-19 pandemic has highlighted the need for more resilient and diversified income sources to ensure food security.

The relationship between food security and financial status reflects bigger concern of inequality as well as access to resources (Bakeri et al., 2023; Arshad, 2022; Clay, 1996, Sen, 1981). Further explained, families with higher incomes can afford a more varied and nutritious diet, while those with lower incomes is limited to cheaper, less nutritious options. This disparity not only affects physical health but also perpetuates social and economic inequalities within the community. This can be related to Sen's concept of entitlement, which argued that individuals or households can legally access resources via direct entitlement, exchange entitlement and transfer entitlement. In the context above, it is related to Sen's exchange entitlements which refers to acquiring food through trade, labour, or the market and its direct entitlements which means owning land or producing food (Sen, 1981).

4.6 Barriers to Food Security

Food security is a complex issue influenced by various barriers, including land scarcity and traditional practices. These barriers are particularly pertinent for communities like the Bidayuh, who rely heavily on land and traditional farming methods for their subsistence and cultural identity.

4.6.1 Land scarcity

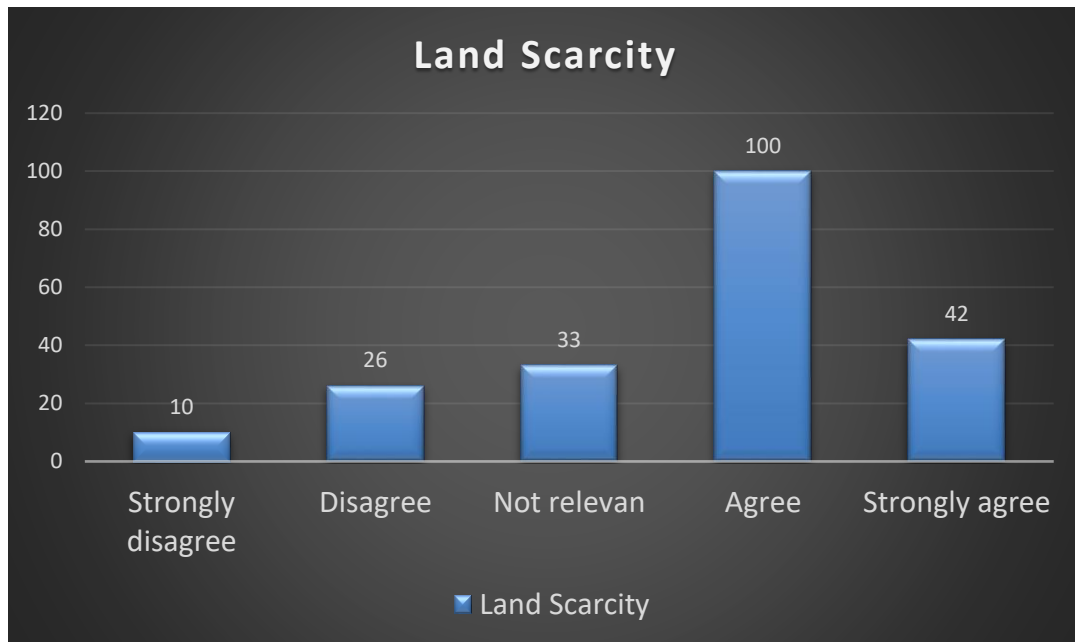


Figure 4.4: Experience of land scarcity among the Bidayuh Community in Padawan, Sarawak

Land scarcity poses a significant barrier to food security, as it directly impacts the availability of arable land needed for agricultural production. The figure above shows that a majority of respondents recognize land scarcity as an issue. Out of the total responses, 100 individuals agreed, and 42 strongly agreed that land scarcity is a concern to them. This majority, totalling 142 respondents, highlights the widespread acknowledgment of land scarcity as a significant barrier to food security. These respondents are experiencing and anticipating challenges related to limited land availability for agricultural activities, which can lead to reduced crop yields and higher food prices. For the Bidayuh community, the issue of land scarcity is particularly relevant due to their traditional dependence on land for subsistence farming and cultural practices.

Conversely, a smaller segment of the population does not perceive land scarcity as a critical issue. Specifically, 26 respondents disagreed and 10 strongly disagreed with the notion that land scarcity is a problem. This group, totalling 36 individuals, is located in areas with relatively abundant land or might have access to alternative resources that mitigate the impact of land scarcity. Limited arable land means less space for growing crops and raising livestock, which can lead to lower food production and potential shortages.

Cultural traditions and practices are central to Bidayuh community's identity and lifestyle, shaping their farming techniques, dietary habits, and food preferences. These practices, while important for maintaining cultural heritage, it somehow can conflict with modern nutritional needs and economic conditions. Traditional farming practices often rely on local knowledge of the environment and may involve methods like crop rotation, intercropping, and the use of native plant species. While these techniques can be sustainable, they might not produce the yields needed to support growing populations or to compete in modern markets. Additionally, cultural preferences for certain foods can affect food security if these foods become difficult to obtain due to environmental changes or economic factors.

4.6.2 Traditional Practices

Cultural factors and traditional practices might also influence food security. While traditional farming and dietary practices are vital to their identity, they may not always align with modern nutritional requirements or economic realities, thereby posing another layer of challenge. Cultural preferences for certain foods can pose challenges if those foods become scarce or are affected by environmental changes.

Historically, the Bidayuh community engaged in hunting activities, targeting wild boar and other wild animals in the forest for meat, as meat is a crucial part of their diet (Bennett, 2002). This occurred because Bidayuh settlements were mostly located in the mountains and foothills where wildlife populations and forest resources were abundant because it is far from cities. However, with the onset of development, the population of wild animals has decreased due to habitat destruction and increase in human activity. This reduction has directly impacted the Bidayuh's ability to source traditional meats.

One of the male respondents age 48 noted:

“My friends and my relatives in this village are still doing the hunting activities, however they often come back empty handed. It is a rare occasion to find a wild meat as of these days. If you are lucky, will get a big size of wild boar or a mousedeer. Unlike before, we can easily obtain all those wild meat...”

(Respondent No. 5; male, age 48 years old)

Additionally, in response to declining wildlife populations and the need to protect endangered species, governments have implemented regulations that restrict hunting. These laws, while necessary for conservation, limit the Bidayuh's ability to continue their traditional hunting practices.

In the past, without access to refrigeration, the Bidayuh had developed their own methods for preserving meat. This includes methods of smoking, drying, salting or fermenting. These techniques allowed the community to store food for longer periods, which was essential for their food security. For example, smoked meats, which was preserved by drying, can last longer and more resilient to environmental conditions. Similarly, salting and

curing ensures that rural communities with limited refrigeration have access to the salted meat/fish during lean periods. In this modern day, with better facilities and options, such methods may not be as widespread as it used to. As stated by Sayok & Teucher (2018), the knowledge about traditional practices are declining.

Balancing the preservation of cultural identity with the need to adapt to new realities is a significant challenge. Efforts to maintain traditional practices must be weighed against the benefits of adopting more sustainable and productive methods. Understanding the influence of cultural factors and traditional practices on food security is crucial for developing effective strategies that respect cultural heritage while promoting nutritional and economic well-being. For communities like the Bidayuh, this means finding ways to integrate traditional knowledge with modern practices, ensuring food security in a changing world. This might involve community-led initiatives, government support for sustainable practices, and education on nutrition and modern farming techniques.

4.7 Cultural Resilience and Adaptation

Cultural resilience refers to the ability of a community to sustain and adapt its cultural identity, practices, and social structures in the face of external pressures and challenges. It encompasses the ways in which cultural traditions and practices are preserved, modified, and passed down through generations, allowing communities to maintain a sense of continuity and identity despite changing circumstances.

Adaptation within the context of cultural resilience involves the strategies and actions taken by communities to adjust to environmental, economic, social, and political changes while preserving core cultural values. Adopting new practices or technologies, modifying

traditional customs, or integrating new influences in a manner that complements and strengthens the existing cultural framework is a sustainable approach (Altieri & Nicholls, 2012).

4.7.1 Gardening

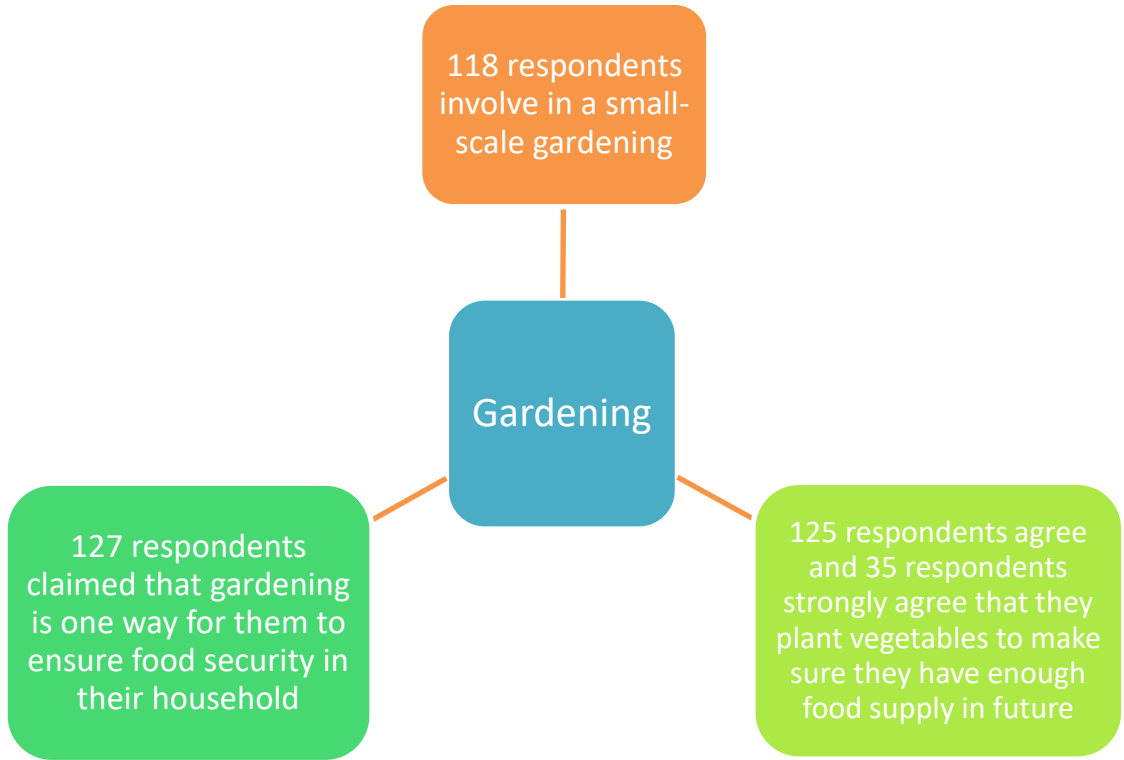


Figure 4.5: Gardening as a means of resilience and adaptation for the Bidayuh community

Gardening is a crucial aspect of cultural resilience and adaptation within the Bidayuh community, reflecting their deep connection to land and tradition. A total of 127 respondents, showing a significant number of individuals engage in gardening to ensure food security for their households. In this context, gardening refers to vegetable gardening. While a substantial majority (118 respondents) are involved in small-scale gardening primarily for

personal consumption. This highlights the importance of gardening as a common and essential practice within the community, aimed at providing a stable and reliable source of food for their families.

The primary motivation for engaging in gardening is to ensure food security. By growing their own vegetables, Bidayuh households often diversify the types of food that they grow, gather or store to mitigate food insecurity. This means that the household can directly control the quality and quantity of their food supply. In addition, the households can create buffer against seasonal shortage as well as reducing dependence on external food sources. All in all, the household is capable of mitigating the risk of food shortages.

The data shows strong community consensus regarding the importance of gardening for future food supply among the respondents. Among the respondents, 125 indicated their agreement and 35 respondents strongly agree that planting vegetables in the village is a crucial strategy to secure adequate food for the future. This consensus demonstrates the collective understanding and shared commitment to gardening as a vital practice for sustaining their way of life.

Gardening is not only a practical activity but also a cultural one, deeply ingrained in the Bidayuh way of life. It represents a form of cultural resilience, allowing the community to maintain their agricultural traditions, pass down knowledge, and stay connected to their heritage. Gardening serves as an adaptive strategy to cope with environmental and economic changes. By cultivating their own food, the Bidayuh can adapt to external pressures such as rising food prices, supply chain disruptions, and changing climatic conditions. This adaptability is a key component of their resilience.

The sampled Bidayuh community practice gardening not only to get food but also to keep their cultural traditions alive. For many other indigenous communities, gardening is mainly used to survive during tough times (Lal, 2020; Galhena et al., 2013; Deppe, 2010). However, for the sampled Bidayuh respondents, gardening also helps them stay connected to their land, pass down knowledge to younger generations, and strengthen family ties. In other words, this shows that gardening is more than just a way to secure food. This makes the Bidayuh community different from many others, as they use gardening to support both their food needs and their cultural identity at the same time.

The study also found that gardening emerges as the main adaptive strategy among the Bidayuh community, focusing on food security and cultural continuity. This aligns with the view of Kuhnlein et al. (2013), who emphasized that traditional practices like gardening are vital for sustaining indigenous food systems and ensuring community resilience. They noted that gardening maintains culturally significant food production, and enabling communities to uphold a direct relationship with the land while navigating modern economic challenges.

Altieri and Nicholls (2012) support this connection by stating that the used of traditional and modern agricultural practices, such as adopting new crop varieties while maintaining cultural methods, can enhance food security without undermining cultural identity. The sampled Bidayuh community are using more than one farming method to make sure they have enough food. They continue traditional vegetable gardening, which is part of their culture. At the same time, they also diversify their farming activities by growing other types of crops like palm oil and fruit trees in orchards. This mix of old (traditional gardening) and new or commercial (palm oil/orchard farming) strategies helps them become more resilient against food shortages.

“We have both small and large-scale plantation. Around our house, my husband and I grow various vegetables and fruit. Whenever we have extra, I will share it to my relatives and neighbours. We also do have palm oil estate and an orchard, which are about 15 to 20 minutes away. Since my husband and I is not working, we visit them almost every day...”

(Respondent No. 4; female, age 56 years old)

As mentioned by the respondents above, growing various vegetables and fruits around their house, it shows that they not only meet their own nutritional needs but also build resilience against food shortages. Sharing surplus produce with relatives and neighbours strengthens community ties and creates a local safety net, enhancing communal food security. This practice ensures that excess food is utilized rather than wasted, contributing to overall food availability in their community.

Furthermore, their ownership of a palm oil estate and an orchard, despite being slightly distant, indicates a diversified approach to agriculture. Visiting these estates almost daily, due to their availability of time, demonstrates their commitment to maintaining and managing multiple sources of food and income. This diversification is a key adaptation strategy, reducing their vulnerability to any single crop failure or market fluctuation, thus reinforcing their food security.

Growing their own vegetables ensures access to fresh and nutritious food, contributing to the overall health and well-being of the community. It also fosters a sense of accomplishment and well-being derived from working the land and harvesting the fruits of their labour. The practice of gardening promotes social cohesion within the Bidayuh

community. Sharing surplus produce with friends, relatives, and neighbours strengthens social bonds and fosters a spirit of cooperation and mutual support. This social network is crucial for resilience, as it creates a safety net for families in times of need.

In conclusion, gardening (vegetable gardening) is a multifaceted practice that supports the Bidayuh community's food security, preserves their cultural heritage, enhances economic stability, promotes health and well-being, and strengthens social cohesion. The widespread participation and strong consensus on the importance of gardening highlight its central role in the community's resilience and adaptive strategies.

4.7.2 Online

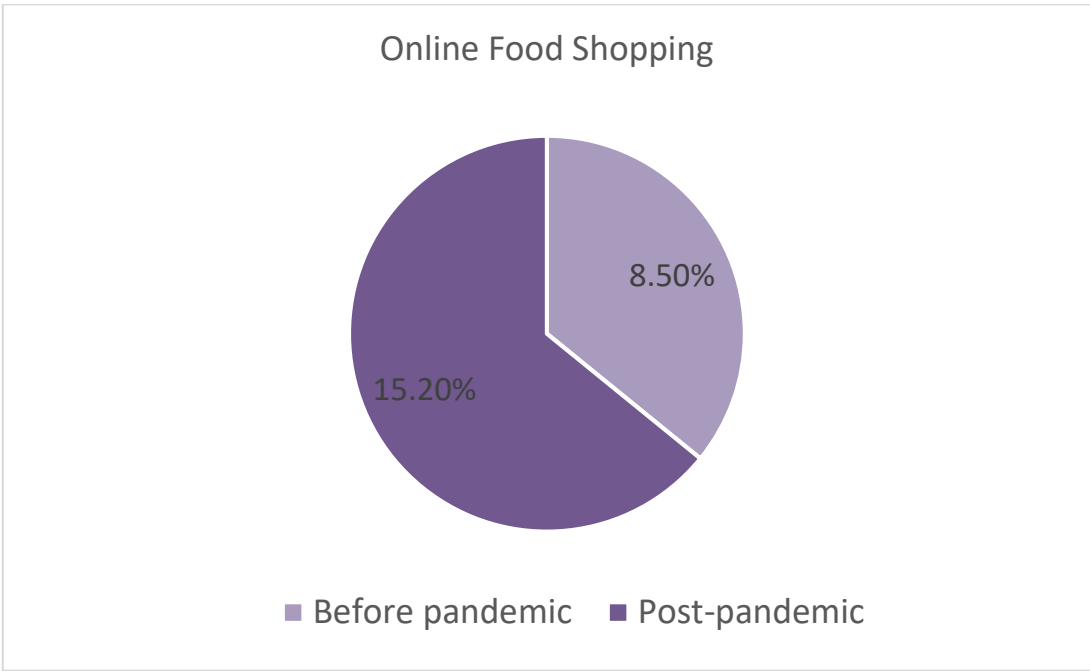


Figure 4.6: Comparison for online food shopping before pandemic and post-pandemic

The Bidayuh community's adaptation to modern food acquisition methods, particularly online food sourcing, reflects their resilience and ability to integrate new practices while maintaining traditional values. This shift has been significantly influenced by the Covid-19 pandemic.

Before the pandemic, only 18 respondents (8.5%) reported obtaining food online. This low percentage suggests that online food sourcing was not a prevalent practice within the community due to the location of their village. Most of the village is located far from the town and cities, makes it difficult for the food delivery to take place. Moreover, findings suggested that the Bidayuh community traditionally relies on local markets, supermarkets, wet markets, and grocery stores for their food supply. These methods are ingrained in their daily routines and social interactions, offering not just food but also opportunities for community engagement and the exchange of cultural values.

The shift toward online food shopping, which was accelerated by the COVID-19 pandemic, represents a modern adaptation strategy. The concept aligns with what Sobal, Khan, and Bisogni's (1998) observation that while migration and urbanization challenge traditional food systems but it also strengthens cultural flexibility. The sampled Bidayuh community's use of online food shopping along with their traditional ways shows how they are adapting to changes while still keeping their culture identity.

There have been limited awareness or accessibility to online food sourcing platforms. The necessary infrastructure, such as reliable internet access and digital literacy, might not have been sufficiently developed or widespread especially in the rural areas. In addition, trust in the quality and reliability of online food sources might have been low. Since the Bidayuh community have been doing the plantation for paddy, corn, pepper, and rubber since the olden days, they have been very used to produce fresh crops on their own. The

community preferred to personally select their food items to ensure freshness and quality, something not easily guaranteed through online purchases.

Meanwhile after the pandemic, the number of respondents started using online food sources. The figure increased from 8.5% to 15.2% (i.e. 32 respondents). The shift in the Bidayuh community's use of online food sourcing before and after the pandemic is a notable example of cultural adaptation in response to external pressures. When asked if they obtain food online in addition to other sources like supermarkets, wet markets, and grocery stores, 57 respondents (27%) answered yes. This was, according to them, involved particularly those affected by the Covid-19 pandemic. In response, individuals and households turned to online food sourcing as a safer option, aligning with public health guidelines advised for social distancing and reduced physical interactions. Despite the increased reliance on online channels, traditional methods like supermarkets, wet markets, and grocery stores remain significant in obtaining food. These are similar to the observations made by Abdullah et al. (2021) during the Covid-19 pandemic in Sarawak.

The data shows a growing shift towards online food sourcing within the Bidayuh community, particularly accelerated by the pandemic. However, the accessibility and satisfaction with online food procurement are mixed, reflecting diverse experiences and perceptions within the community. This adoption of online food sources demonstrates an aspect of cultural resilience and adaptation, integrating modern practices to supplement traditional methods while addressing contemporary challenges.

4.8 Household Coping Strategies

The third objective of this study is to explore how the Bidayuh in the case study area adapt in medium and long term to the challenges of food insecurity. These strategies reflect

the community’s resilience and their ability to adapt to changing economic and environmental conditions (Altieri & Nicholls, 2012; Kuhnlein et al., 2013). The findings reveal a combination of traditional practices such as gardening and modern adaptations like online food purchasing and reduced food intake.

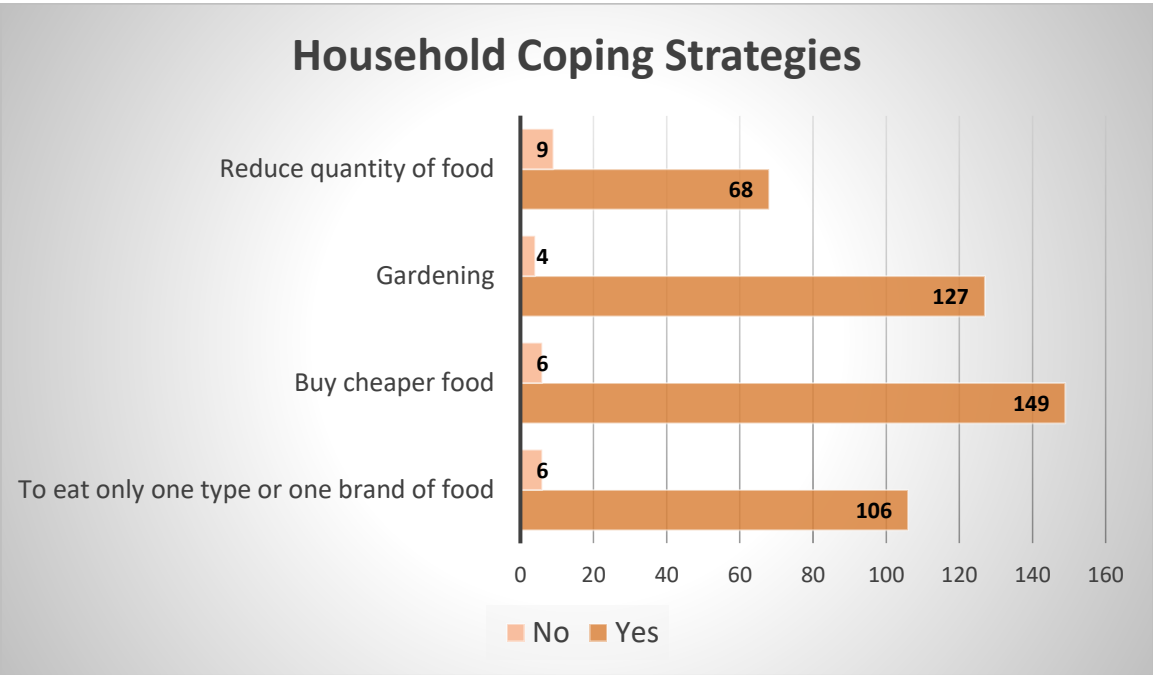


Figure 4.7: Coping strategies of the Bidayuh household in Padawan, Sarawak

Figure 4.7 above outlines the household coping strategies in terms of food consumption and budgeting. Based on the findings, the most commonly adopted coping strategy is buying cheaper food, with 149 households admitting to this practice. This suggests that a significant number of households are focused on cost-saving measures by opting for more affordable food options. This behaviour is likely driven by economic

constraints, such as rising food prices or limited household income, prompting families to prioritize budget-friendly choices to stretch their financial resources further.

Gardening also appears to be a relatively popular strategy, with 127 households indicating they grow their own food. This reflects a turn towards self-sufficiency and reducing dependency on purchased food. Growing food at home can provide a sustainable and cost-effective source of fresh produce, reducing grocery bills and enhancing food security. Additionally, as claimed by Thompson (2018), gardening can offer health benefits through increased consumption of fresh vegetables and fruits, as well as recreational and therapeutic advantages from engaging in outdoor activities. This study illustrates how economic pressures are met with culturally rooted responses. This observation is similar to that of Okoye et al. (2017) and Zhou (2010), who reported that indigenous coping mechanisms during food insecurity are often grounded in traditional practices, emphasizing household self-sufficiency and community solidarity.

The "No" responses are significantly lower across all categories compared to the "Yes" responses, indicating that the majority of households surveyed are engaging in at least one coping strategy to manage food-related challenges.

The data highlights a trend towards economic and practical adjustments in response to food scarcity or financial constraints, with households prioritizing cheaper alternatives and self-production (gardening) over cutting down on food quantity.

4.9 Chapter Summary

In this Chapter, the focus is on the strategies and challenges related to food security within the Bidayuh community. The chapter delves into various coping mechanisms adopted by households to ensure food security amidst economic constraints. Gardening emerges as a prominent strategy, reflecting the community's deep connection to land and tradition. A significant number of households engage in small-scale gardening primarily for personal consumption, which not only helps reduce dependence on external food sources but also enhances their ability to deal with food scarcities.

Additionally, the chapter addresses the impact of financial constraints on food security. Many households resort to purchasing cheaper food options as a common coping strategy, highlighting the economic pressures faced by the community. The Covid-19 pandemic further triggering these challenges, causing some households to experience food insecurity and the need to reduce their food intake. Overall, the chapter emphasizes the need for sustainable and adaptive strategies that integrate traditional knowledge with modern practices to ensure long-term food security among the Bidayuh community.

CHAPTER 5

CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

As mentioned earlier, this study aims to investigate the issue of food security among the Bidayuh community specifically in Padawan, Sarawak. It seeks to examine how the Bidayuh community in Padawan perceive the concept of food security, to explore the factors that are influencing the Bidayuh's food security, and to find out how the Bidayuh in the case study cope with the challenges of food insecurity.

This study did just that. It provides a detailed examination of the food security challenges faced by the sampled Bidayuh community in Padawan Sarawak. Thus, offering a comprehensive view on the community's perceptions on household food security, the factors influencing food security within this community and how they cope with the challenges in maintaining their household food security.

Findings of this study had highlighted the complexity of food security as perceived by the sampled community. It has, to a large extent, highlighted the need to consider define food security in a multi-dimensional angle. The respondents have indicated that food security is still largely linked to the concepts of availability and accessibility of food. A majority of them still relate their notion of food security with the availability and access to food.

It became evident, however, that food security cannot be fully understood using those "traditional" concept alone. There is a great need to define or understand food security by integrating the new focus of food security, the cultural significance of food and the sustainability of food systems. This was highlighted when a large majority of respondents

indicated that they chose food safety and nutritious (healthy) food as an indicator of being food-secured. There are others who stated that they are willing to travel to get their preferred food, instead of just relying on the local shops for their food supplies. This notion of food security is very much tied with the concept of food environment: preference, convenience, affordability. These are also very much in line with the findings by other scholars, such as Reyes-Puente et al. (2022) and Swinburn et al. (2013). These findings strengthen the idea that food security should not only be understood through the traditional lens of availability and affordability but also in terms of quality, cultural relevance, and food environment.

This study managed to extract those perceptions from the sampled community. The methodology approach enables the traditional knowledge to be analysed alongside modern challenges to present a thorough understanding of household food security issues. The study found that the community is diverse, with a slight majority of female respondents and a significant portion employed in the government sector. These demographic insights are crucial as they influence the community's food security dynamics.

The perception of food security, revealed the profound impact of the Covid-19 pandemic on the community. Many households faced food shortages and had to reduce their food intake, highlighting the community's vulnerability to external shocks. The pandemic demonstrated the critical need for local food production to enhance resilience. It also identified several primary factors affecting food security. The geographical location of the Bidayuh villages makes access to markets challenging and expensive. High costs of nutritious food often lead to reduced intake and potential malnutrition. Additionally, financial dependence emerged as a significant issue, with limited and unstable incomes making it difficult for families to afford food consistently.

The study also shows that the barriers to food security are tied with the challenges posed by land scarcity and traditional practices. Limited land for vegetable gardening or planting other crops severely impacts agricultural production and food availability. This was mentioned by the respondents as posing a significant challenge to a majority of them. Traditional farming and dietary practices, while culturally significant, may not always align with modern nutritional needs or economic conditions, creating additional hurdles for food security.

Modern challenges, exemplified by modernization and urbanization, further complicate the food security landscape. Environmental changes and development pressures disrupt traditional food sources and practices. For instance, the reduction in wildlife populations has impacted traditional hunting activities, exacerbating the community's food security issues. Respondents indicated the changes that they saw in terms of the diet consumed in the good old days that were gathered from hunting and foraging, but not longer available in the present time.

Overall, the study highlighted the complexity of food security within the Bidayuh community, influenced by a blend of traditional and modern factors. While traditional knowledge and cultural practices play a significant role in shaping food systems and dietary habits, they intersect with contemporary challenges such as economic instability, environmental changes, and global pandemics like Covid-19. This intersection creates a dynamic landscape where historical practices must adapt to meet present-day realities. Understanding and addressing this complexity is crucial for developing effective strategies to enhance food security and resilience within the community.

5.2 Recommendations

In order to address the food security challenges faced by the Bidayuh community in Padawan, Sarawak, several recommendations are proposed. The findings of this study emphasize the urgent need for policy interventions made to rural and indigenous communities like the Bidayuh. One of the significant factors that can overcome these challenges is infrastructure development. By improving access to markets and transportation is essential. Developing infrastructure, such as better road conditions can reduce the distance and cost associated with accessing food markets. Establishing local markets or food distribution centres within the community would further minimize travel time and transportation expenses, making it easier for residents to obtain necessary food items.

Enhancing local food production is another crucial strategy. Promoting and supporting community gardening and small-scale farming initiatives can empower households to grow their own food, reducing dependency on external food sources. Providing resources like seeds, tools, and training can facilitate this process. Additionally, integrating traditional agricultural practices with modern techniques can boost productivity and sustainability. Educating the community on practices such as crop rotation, sustainable farming, and soil conservation can improve local food production.

Increasing the availability and affordability of nutritious food is vital for improving food security. Subsidizing the cost of nutritious food items can make them more accessible to low-income families, potentially through government support or partnerships with non-governmental organizations (NGOs). Encouraging local production of high-nutrition crops and livestock can also reduce reliance on expensive imported food items, ensuring a more stable supply of healthy food within the community.

Addressing financial stability and support is another important recommendation. Providing financial assistance and job opportunities can reduce economic vulnerability within the community. Initiatives such as training, and support for small businesses can help families achieve financial stability. Additionally, developing programs to assist families in better managing their finances can ensure they can consistently afford adequate food.

Environmental challenges affecting food security must also be addressed. Implementing conservation programs to protect and restore natural resources vital for traditional food sources, such as hunting and collecting forest resources, is necessary. Promoting sustainable land use practices and supporting the community in adapting to environmental changes that impact food production and availability can mitigate some of these challenges.

Finally, as this study contributes to the ongoing discussion on food security by highlighting the perspectives of a marginalized indigenous community, it highlights how socio-economic vulnerability, geographic isolation, cultural values, and environmental changes intersect to shape the food security. Policymakers should take note of the community's reliance on both traditional knowledge and modern coping strategies. By adapting the interventions to include both elements, for example, integrating traditional agricultural methods into sustainable farming policies can eventually lead to more culturally sensitive and effective solutions.

Moreover, by enhancing the community's resilience to external shocks is also crucial. Developing contingency plans and maintaining emergency food supplies can ensure food security during crises like pandemics or natural disasters. Fostering community networks for mutual aid, where families can share surplus food and resources during times of need, can further strengthen community resilience. By implementing these

recommendations, the food security of the Bidayuh community in Padawan, Sarawak, can be significantly improved, enhancing their overall resilience and well-being.

5.3 Limitations of study

This study, while comprehensive in its investigation on the issue of food security among the Bidayuh community in Padawan, Sarawak, has several limitations that should be acknowledged.

Firstly, the sample size of the study may not fully represent the entire Bidayuh community. Although efforts were made to include a diverse range of participants, the sample may still be limited by geographic, socioeconomic, and demographic factors. This could potentially affect the generalizability of the findings to the broader community. Thus, the findings are only valid for the sampled community and could not be generalized to the wider community.

Another limitation is the cross-sectional nature of the study. The research provides a snapshot of the food security situation at a specific point in time, which may not capture the dynamic and evolving nature of food security challenges. Longitudinal studies would be more effective in understanding how food security issues and the factors influencing them change over time. As the study was conducted during and after the Covid-19 pandemic in Sarawak, the responses obtained from the respondents are very much influenced by their experience during the pandemic. The responses may not be the same if the study was conducted during other times.

Additionally, while the study attempted to incorporate both traditional knowledge and modern challenges, there may be gaps in the integration of these perspectives. The

complexity of food security requires a deep understanding of cultural practices and how they intersect with contemporary issues. The study might not have fully captured all aspects of this intersection, potentially overlooking some critical factors.

Future studies could explore comparative analyses across other Bidayuh settlements or indigenous communities in Malaysia to assess whether similar patterns exist. Longitudinal research could also provide deeper insight into how food security perceptions and challenges evolve over time, particularly in response to environmental changes or economic development. The complexity of food security within the sampled Bidayuh community reveals the need for holistic, culturally informed, and policy-driven solutions. By addressing both immediate and structural challenges faced by the community, stakeholders can work towards a more food-secure and resilient future for the Bidayuh in Padawan and potentially other similar communities in Malaysia.

In conclusion, while this study provides valuable insights into the food security challenges faced by the Bidayuh community in Padawan, Sarawak, the above-mentioned limitations should be considered when interpreting the findings. Acknowledging these limitations is crucial for refining future research and developing more effective strategies to address food security within the community.

REFERENCES

- Abdullah, R. G., Wong, S.K., & Mersat, N. I. (2021). Household food security and coping strategies during Covid-19 pandemic. *Jurnal Kinabalu*, 27, 185-196.
- Abdullah, R. G., Mersat, N. I., & Wong, S. K. (2021). Implications of COVID-19 pandemic on household food security: Experience from Sarawak, Malaysia. *International Journal of Business and Society*, 22(1), 1-13.
- Acharya, K. C. S. (1983). *Food Security System of India*. Concept Publishing Company.
- Ajayi, V. O. (2017). Primary sources of data and secondary sources of data. *Benue State University*, 1(1), 1-6.
- Alhojailan, M. I. (2012). Thematic analysis: A critical review of its process and evaluation. *West East Journal of Social Sciences*, 1(1), 39-47.
- Altieri, M. A., & Nicholls, C. I. (2012). Agroecology scaling up for food sovereignty and resiliency. In *Sustainable Agriculture Reviews*, 11(pp. 1-29). Dordrecht: Springer Netherlands.
- Arshad, A. (2022). Impact of financial inclusion on food security: evidence from developing countries. *International Journal of Social Economics*, 49(3), 336-355.
- Asadi-Lari, M., Jahromi, L. M., Montazeri, A., Rezaee, N., Mehrizi, A. A. H., Shams-Beyranvand, M., ... & Gholami, A. (2019). Socio-economic risk factors of household food insecurity and their population attributable risk: A population-based study. *Medical journal of the Islamic Republic of Iran*, 33, 119.

- Babbie, E. R. (2020). *The practice of social research*. Cengage Au.
<https://doi.org/10.2307/1318620>
- Bala, B. K., Alias, E. F., Arshad, F. M., Noh, K. M., & Hadi, A. H. A. (2014). Modelling of food security in Malaysia. *Simulation Modelling Practice and Theory*, 47, 152-164.
- Bakeri, N. A., Sulaiman, N., Mansor, N. S., Gan, W. Y., & Tan, S. K. (2023). Socio-economic Status, Food Security Status and its Coping Strategies among 'The Lost Food Project'(TLFP) Recipients in Klang Valley during COVID-19 Pandemic. *Malaysian Journal of Medicine & Health Sciences*, 19(80). <https://doi.org/10.47836/mjmhs19.1.12>
- Bastian, A., & Coveney, J. (2013). The responsabilisation of food security: What is the problem represented to be? *Health Sociology Review*, 22(2), 162-173.
- Bennett, E. L. (2002). Is there a link between wild meat and food security? *Conservation Biology*, 16(3), 590-592.
- Bhan, G., Anand, G., & Ramachandran, V. (2020). Livelihoods, coping, and support during Covid-19 crisis: A study of vulnerable communities in India. Centre for Policy Research, New Delhi.
- Bharucha, Z., & Pretty, J. (2010). The roles and values of wild foods in agricultural systems. *Philosophical Transactions of the Royal Society B: Biological Sciences*, 365(1554), 2913-2926.
- Bondad-Reantaso, M. G., Subasinghe, R. P., Josupeit, H., Cai, J., & Zhou, X. (2012). The role of crustacean fisheries and aquaculture in global food security: past, present and future. *Journal of Invertebrate Pathology*, 110(2), 158-165.

- Boon, E. K. (2007). Food security in Africa: challenges and prospects. *Regional Sustainable Development Review, Africa*. <https://www.eolss.net/ebooks/Sample%20Chapters/C16/E1-48-02.pdf>
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77-101.
- Brimblecombe, J., Van Den Boogaard, C., Wood, B., Liberato, S. C., Brown, J., Barnes, A., Rogers, A., Coveney, J., Ritchie, J., & Bailie, R. (2015). Development of the good food planning tool: a food system approach to food security in Indigenous Australian remote communities. *Health & Place*, 34, 54-62.
- Brück, T., d'Errico, M., & Pietrelli, R. (2018). Food Insecurity and Violent Conflict: Causes, Consequences, and Addressing the Challenges. *World Development*, 101, 166-176.
- Bullough, A., Guelich, U., Manolova, T. S., & Schjoedt, L. (2022). Women's entrepreneurship and culture: gender role expectations and identities, societal culture, and the entrepreneurial environment. *Small Business Economics*, 58(2), 985-996.
- Burchi, F., & De Muro, P. (2016). From food availability to nutritional capabilities: Advancing food security analysis. *Food Policy*, 60, 10-19.
- Cafiero, C., Viviani, S., & Nord, M. (2018). Food security measurement in a global context: The food insecurity experience scale. *Measurement*, 116, 146-152.
- Calloway, E. E., Carpenter, L. R., Gargano, T., Sharp, J. L., & Yaroch, A. L. (2023). New measures to assess the “Other” three pillars of food security—availability, utilization, and stability. *International Journal of Behavioral Nutrition and Physical Activity*, 20(1), 51.
- Capone, R., Bilali, H. E., Debs, P., Cardone, G., & Driouech, N. (2014). Food system sustainability and food security: connecting the dots. *Journal of Food Security*, 2(1), 13-22.

- Carletto, C., Zezza, A., & Banerjee, R. (2013). Towards better measurement of household food security: Harmonizing indicators and the role of household surveys. *Global Food Security*, 2(1), 30-40.
- Carney, D. (1998, July). Sustainable livelihoods. What differences can we make. In Department for International Development's Natural Resources Advisers Conference.
- Castell, G. S., Rodrigo, C. P., de la Cruz, J. N., & Bartrina, J. A. (2015). Household food insecurity access scale (HFIAS). *Nutricion Hospitalaria*, 31(3), 272-278.
- Chagomoka, T., Unger, S., Drescher, A., Glaser, R., Marschner, B., & Schlesinger, J. (2016). Food coping strategies in northern Ghana. A socio-spatial analysis along the urban–rural continuum. *Agriculture & Food Security*, 5(1), 4.
- Chen, K., Zhan, Y., Zhang, Y., & Fan, S. (2020). The impacts of COVID-19 on global food security and the coping strategy. *China Rural Economy*, 5(9). <http://zgncjj.crecrs.org/UploadFile/Issue/my4ibqdl.pdf>
- Choi, Y. J., Crimmins, E. M., & Ailshire, J. A. (2022). Food insecurity, food environments, and disparities in diet quality and obesity in a nationally representative sample of community-dwelling older Americans. *Preventive Medicine Reports*, 29, 101912. <https://doi.org/10.1016/j.pmedr.2022.101912>
- Clauss-Ehlers, C. S. (2010). Cultural resilience. *Encyclopedia of Cross-Cultural School Psychology*, 324-326. <https://doi.org/10.1007/978-0-387-71799-9>
- Clay, E. (2002). Food security: concepts and measurement. *Trade reforms and food security: Conceptualising the linkages*, 2002,25-34. https://www.researchgate.net/publication/285667097_Food_security_concepts_and_measurement_trade_reforms_and_food_security_conceptualizing_the_linkages_Rome

- Clay, E. (1996). Chapter 2: Food security: concepts and measurement. World Food Summit.
- Comerford, K. B., Miller, G. D., Kapsak, W. R., & Brown, K. A. (2021). The complementary roles for plant-source and animal-source foods in sustainable healthy diets. *Nutrients*, 13(10), 3469. MDPI.
- Cooper, E. E. (2013). Evaluating household food insecurity: applications and insights from rural Malaysia. *Ecology of Food and Nutrition*, 52(4), 294-316.
- Crush, J., Hovorka, A., & Tevera, D. (2011). Food security in Southern African cities: The place of urban agriculture. *Progress in Development Studies*, 11(4), 285-305.
- Cyril, M. C., Kasuma, J., Kanyan, A., Roney, P. S., Brodie, B., & Gregory, M. L. (2023). Engagement Of Sarawak's Gen Y Bidayuh Farmers In Agropreneurship. *European Proceedings of Social and Behavioural Sciences*.
- D'Alessandro, C., Bizzotto Molina, P., Dekeyser, K., & Rampa, F. (2021). Understanding and managing trade-offs in food systems interventions: The case of Nakuru County. *Kenya. Maastricht. ECDPM*.
- Darmon, N., & Drewnowski, A. (2008). Does social class predict diet quality? *The American Journal of Clinical Nutrition*, 87(5), 1107-1117.
- Deppe, C. (2010). The resilient gardener: Food production and self-reliance in uncertain times. Chelsea Green Publishing.
- DiCicco-Bloom, B., & Crabtree, B. F. (2006). The qualitative research interviews. *Medical Education*, 40(4), 314-321.
- Doustmohammadian, A., Fadavi, G., Alibeyk, S., Hajigholam-Saryazdi, M., & Mohammadi-Nasrabadi, F. (2023). An overview of food insecurity during the global COVID-19 outbreak:

- transformative change and priorities for the Middle East. *Agriculture & Food Security*, 12(1), 40. Proceedings of Social and Behavioural Sciences.
- Echoh, D. U., Nor, N. M., Gapor, S. A., & Masron, T. (2017). Issues and problems faced by rural farmers in paddy cultivation: A case study of the Iban paddy cultivation in Kuala Tatau, Sarawak. *Journal of Regional and Rural Development Planning (Jurnal Perencanaan Pembangunan Wilayah Dan Perdesaan)*, 1(2), 174-182.
- Etikan, I., Musa, S. A., & Alkassim, R. S. (2016). Comparison of convenience sampling and purposive sampling. *American Journal of Theoretical and Applied Statistics*, 5(1), 1-4.
- FAO. (2008). An introduction to the basic concepts of food security. Food Security Information for Action Practical Guides. Rome: FAO.
- FAO (2006). The State of Food Security in the World. Rome: Food and Agriculture Organization of the United Nations.
- Farahbakhsh, J., Ball, G. D., Farmer, A. P., Maximova, K., Hanbazaza, M., & Willows, N. D. (2015). How do student clients of a university-based food bank cope with food insecurity? *Canadian Journal of Dietetic Practice and Research*, 76(4), 200-203.
- Frankfort-Nachmias, C., & Nachmias, D. (1992). Research methods in the social sciences (4th ed.). New York: St. Martin's Press.
- Galanakis, C. M. (2020). The Food Systems in the Era of the Coronavirus (COVID-19) Pandemic Crisis. *Foods*, 9(4), 523.
- Galhena, D. H., Freed, R., & Maredia, K. M. (2013). Home gardens: a promising approach to enhance household food security and wellbeing. *Agriculture & Food Security*, 2(1), 8.

- Given, L. M. (Ed.). (2008). *The Sage encyclopedia of qualitative research methods*. Sage publications.
- Glauber, J., Laborde, D., Martin, W., & Vos, R. (2020). COVID-19: Trade restrictions are worst possible response to safeguard food security. *Issue Post*, March, 27, 2020.
- Goundar, S. (2012). Chapter 3 - Research Methodology and Research Method. Research Gate. Pp 1-43.
- Gouvea, R., Kapelianis, D., & Li, S. (2022). Innovation, ICT & food security. *Journal of Food Science*, 87(5), 1234-1242.
- Gregory, P. J., Ingram, J. S., & Brklacich, M. (2005). Climate change and food security. *Philosophical Transactions of the Royal Society B: Biological Sciences*, 360(1463), 2139-2148.
- Guadagno, R. (2010). Writing up your results-Guidelines based on APA style. Recuperado a partir de http://ich.vscht.cz/~svozil/lectures/vscht/2015_2016/sad/APA_style2.pdf.
- Gupta, P., Singh, K., Seth, V., Agarwal, S., & Mathur, P. (2015). Coping strategies adopted by households to prevent food insecurity in urban slums of Delhi, India. *Journal of Food Security*, 3(1), 6-10.
- Gupta, N. R., & Freedman, D. A. (2021). Food security moderate's relationship between perceived food environment and diet quality among adults in communities with low access to healthy food retail. *Public Health Nutrition*, 24(10), 2975-2986.
- Headey, D., & Ecker, O. (2013). Rethinking the measurement of food security: From first principles to best practice. *Food Security*, 5(3), 327-343.

- Heidhues, F., Atsain, A., Nyangito, H., Padilla, M., Ghersi, G., & Vallée, L. (2004). *Development strategies and food and nutrition security in Africa: An assessment* (Vol. 38). Intl Food Policy Res Inst.
- Hesselberg, J., & Yaro, J. A. (2006). An assessment of the extent and causes of food insecurity in northern Ghana using a livelihood vulnerability framework. *GeoJournal*, 67(1), 41-55.
- Ibok, O. W., Osbahr, H., & Srinivasan, C. (2019). Advancing a new index for measuring household vulnerability to food insecurity. *Food Policy*, 84, 10-20.
- Ihab, A. N., Rohana, A. J., Manan, W. W., Suriati, W. W., Zalilah, M. S., & Rusli, A. M. (2012). Association of household food insecurity and adverse health outcomes among mothers in low-income households: A crosssectional study of a rural sample in Malaysia. *International Journal of Collaborative Research on Internal Medicine & Public Health*, 4(12), 0-0.
- Johnston, M. P. (2017). Secondary data analysis: A method of which the time has come. *Qualitative and Quantitative Methods in Libraries*, 3(3), 619-626.
- Kahn, J. A. (2023). Food environment. Doi: 10.1016/b978-0-12-821848-8.00148-7
- Kakaei, H., Nourmoradi, H., Bakhtiyari, S., Jalilian, M., & Mirzaei, A. (2022). Effect of COVID-19 on food security, hunger, and food crisis. In COVID-19 and the sustainable development goals (pp. 3-29). Elsevier.
- Kamaruddin, R., Ali, S. M., & Samat, N. (2021). The impact of Covid-19 on livelihoods in Malaysia: Coping strategies and resilience. *Journal of Southeast Asian Social Sciences*, 12(2), 89-102
- Kanter, R., Kennedy, G., & Boza, S. (2023). Local, traditional and indigenous food systems in the 21st century to combat obesity, undernutrition and climate change. *Frontiers in Sustainable Food Systems*, 7, 1195741.

- Keenan, D. P., Olson, C., Hersey, J. C., & Parmer, S. M. (2001). Measures of food insecurity/security. *Journal of Nutrition Education*, 33, S49-S58.
- Kennedy, G., Kanter, R., Chotiboriboon, S., Covic, N., Delormier, T., Longvah, T., Maundu, P., Omidvar, N., Vish, P., & Kuhnlein, H. (2021). Traditional and indigenous fruits and vegetables for food system transformation. *Current Developments in Nutrition*, 5(8), nzab092.
- Khanna, A., & Kaur, S. (2019). Evolution of Internet of Things (IoT) and its significant impact in the field of Precision Agriculture. *Computers and Electronics in Agriculture*, 157, 218-231.
- Khor, G. L., & Shariff, Z. M. (2019). Do not neglect the indigenous peoples when reporting health and nutrition issues of the socio-economically disadvantaged populations in Malaysia. *BMC Public Health*, 19(1), 1685.
- Khor, G. L., & Zalilah, M. S. (2008). The ecology of health and nutrition of Orang Asli (Indigenous people) women and children in Peninsular Malaysia. *Tribes and Tribals*, 2, 66-77.
- Kittler, P. G., Sucher, K., & Nahikian-Nelms, M. (2011). Food and culture.
- Kuhnlein, H. V., Erasmus, B., Spigelski, D., & Burlingame, B. (2013). Indigenous Peoples' food systems and well-being: Interventions and policies for healthy communities. Rome: FAO.
- Kuhnlein, H. V., Smitasiri, S., Yesudas, S., Bhattacharjee, L., Dan, L., & Ahmed, S. (2006). Documenting traditional food systems of indigenous peoples: international case studies. Centre for Indigenous Peoples' Nutrition and Environment, McGill University, Sainte-Anne-de-Bellevue, Quebec. Downloadable from: www.mcgill.ca/files/cine/manual.pdf.

- Lal, R. (2020). Home gardening and urban agriculture for advancing food and nutritional security in response to the COVID-19 pandemic. *Food Security*, 12(4), 871-876.
- Lakra, E. J., & Kumar, S. (2017). Predicament of Hunger, Poverty & Food Security among the Pvtgs of Jharkhand.
- Law, L. S., Norhasmah, S., Gan, W. Y., Siti Nur'Asyura, A., & Mohd Nasir, M. T. (2018). The identification of the factors related to household food insecurity among indigenous people (Orang Asli) in peninsular Malaysia under traditional food systems. *Nutrients*, 10(10), 1455.
- Leisner, C. P. (2020). Climate change impacts on food security-focus on perennial cropping systems and nutritional value. *Plant Science*, 293, 110412.
- Ma, X., Liese, A. D., Bell, B. A., Martini, L., Hibbert, J., Draper, C., Burke, M. P., & Jones, S. J. (2016). Perceived and geographic food access and food security status among households with children. *Public Health Nutrition*, 19(15), 2781-2788.
- Ma, C., Song, Z., Yan, X., & Zhao, G. (2018). Accounting for tastes: do low-income populations have a higher preference for spicy foods? *The Journal of Chinese Sociology*, 5, 1-16.
- Maletta, H. E. (2014). From hunger to food security: A conceptual history. *Available at SSRN* 2484166.
- Malthus, T. R. (2018). An essay on the principle of population: The 1803 edition. Yale University Press.
- Manditsera, F. A., Lakemond, C. M., Fogliano, V., Zvidzai, C. J., & Luning, P. A. (2018). Consumption patterns of edible insects in rural and urban areas of Zimbabwe: taste, nutritional value and availability are key elements for keeping the insect eating habit. *Food Security*, 10(3), 561-570.

- Manfredo, M. J., Vaske, J. J., Rechkemmer, A., & Duke, E. A. (2014). Understanding society and natural resources: *Forging New Strands of Integration Across the Social Sciences* (p. 288). Springer Nature.
- Manohar, S., Downs, S., Shaikh, S., Mak, S., Sok, S., Graham, E., Miachon, L., & Fanzo, J. (2023). Riverine food environments and food security: a case study of the Mekong River, Cambodia. *Bulletin of the World Health Organization*, 101(2), 140.
- Marks, D. F., & Yardley, L. (Eds.). (2004). *Research methods for clinical and health psychology*. Sage. <https://doi.org/10.4135/9781849209793>
- Maxwell, S. (1996). Food security: a post-modern perspective. *Food Policy*, 21(2), 155-170.
- Milena, Z. R., Dainora, G., & Alin, S. (2008). Qualitative research methods: A comparison between focus-group and in-depth interview. *Annals of the University of Oradea, Economic Science Series*, 17(4), 1279-1283.
- Misselhorn, A. A. (2005). What drives food insecurity in southern Africa? A meta-analysis of household economy studies. *Global Environmental Change*, 15(1), 33-43.
- Mohamadpour, M., Sharif, Z. M., & Keysami, M. A. (2012). Food insecurity, health and nutritional status among sample of palm-plantation households in Malaysia. *Journal of Health, Population, and Nutrition*, 30(3), 291.
- Molnar, J. J. (1999). Sound policies for food security: The role of culture and Social organization. *Applied Economic Perspectives and Policy*, 21(2), 489-498.
- Mora-Rivera, J., & van Gameren, E. (2021). The impact of remittances on food insecurity: Evidence from Mexico. *World Development*, 140, 105349.

- Mugambiwa, S. S., & Tirivangasi, H. M. (2017). Climate change: A threat towards achieving Sustainable Development Goal number two (end hunger, achieve food security and improved nutrition and promote sustainable agriculture) in South Africa. *Jàmbá: Journal of Disaster Risk Studies*, 9(1), 1-6.
- Musante, K. (2015). Participant observation. *Handbook of Methods in Cultural Anthropology*, 251-292.
- Nguyen, T. H., Le, Q. A., & Pham, N. P. (2021). Coping with Covid-19 in the informal sector: Livelihoods and survival strategies in urban Vietnam. *Journal of Development Studies*, 57(5), 785-803
- Niko, N. (2020). Poor and Hunger: How Do Indigenous Peoples' Respond to COVID-19 in Indonesia? *Journal of Community Development Research (Humanities and Social Sciences)*, 14(1), 81-92.
- Nurfahilin, T., & Norhasmah, S. (2015). Factors and coping strategies related to food insecurity and nutritional status among Orang Asli women in Malaysia. *International Journal of Public Health and Clinical Sciences*, 2(2), 55-66.
- Nwanesi, P. K., & Samat, T. P. (2021). The Shrinking Paddy Farms and the Bidayuh Women Rice Farmers: What Has/Have Changed? *Journal of Borneo-Kalimantan*, 7(2), 60-72.
- Okoye, J. I., & Oni, K. (2017). Promotion of indigenous food preservation and processing knowledge and the challenge of food security in Africa. *Journal of Food Security*, 5(3), 75-87.
- Onn, L. P. (2018). Property Rights, Food Security, and Gender: The Impact of the Expansion of Palm Oil Plantations on Native Communities in Sarawak, Malaysia. *Ensuring a Square Meal: Women and Food Security in Southeast Asia*, 147.

- Parpart, J. L., Connelly, P., & Barriteau, E. (Eds.). (2000). *Theoretical perspectives on gender and development*. IDRC. [https://books.google.com.my/books?hl=en&lr=&id=6xunfW2ShQkC&oi=fnd&pg=PR3&dq=Parpart,+J.+L.,+Connelly,+P.,+%26+Barriteau,+E.+\(Eds.\).+\(2000\).+Theoretical+perspectives+on+gender+and+development.+IDRC.&ots=liq28N7R0y&sig=zyWeSZZeQaupVQ6lkuiTvsdUjHtM&redir_esc=y#v=onepage&q&f=false](https://books.google.com.my/books?hl=en&lr=&id=6xunfW2ShQkC&oi=fnd&pg=PR3&dq=Parpart,+J.+L.,+Connelly,+P.,+%26+Barriteau,+E.+(Eds.).+(2000).+Theoretical+perspectives+on+gender+and+development.+IDRC.&ots=liq28N7R0y&sig=zyWeSZZeQaupVQ6lkuiTvsdUjHtM&redir_esc=y#v=onepage&q&f=false)
- Paul, C. J., Paul, J. E., & Anderson, R. S. (2019). The local food environment and food security: the health behavior role of social capital. *International Journal of Environmental Research and Public Health*, 16(24), 5045.
- Pei, C. S., Appannah, G., & Norhasmah, S. (2019). Predictors of Diet Quality as Measured by Malaysian Healthy Eating Index among Aboriginal Women (Mah Meri) in Malaysia. *Nutrients*, 11(1), 135.
- Pinstrup-Andersen, P. (2009). Food security: Definition and measurement. *Food Security*, 1(1), 5-7.
- Prosekov, A. Y., & Ivanova, S. A. (2018). Food security: The challenge of the present. *Geoforum*, 91, 73-77.
- Rahman, M. M., Hossain, M. I., & Sarker, S. (2021). Impact of Covid-19 on rural livelihoods in Bangladesh: A case study of coping strategies and resilience. *International Journal of Rural Studies*, 18(2), 42-58
- Rasul, G. (2016). Managing the food, water, and energy nexus for achieving the Sustainable Development Goals in South Asia. *Environmental Development*, 18, 14-25.
- Reyes-Puente, A. L., Peña-Portilla, D. G., Alcalá-Reyes, S., Rodríguez-Bustos, L., & Núñez, J. M. (2022). Changes in food environment patterns in the metropolitan area of the valley of

- Mexico, 2010–2020. *International Journal of Environmental Research and Public Health*, 19(15), 8960.
- Saint Ville, A., Po, J.Y., Sen, A., Bui, A., & Melgar-Quinonez, H. (2019). Food security and the Food Insecurity Experience Scale (FIES): ensuring progress by 2030. *Food Sec.* 11, 483–491.
- Saleem, F., & Hassali, M. A. (2016). Cost assessment for healthy diet in the state of Penang, Malaysia. *Value in Health*, 19(7), A851.
- Sani, S. A., Osman, N. D., Saari, E. M., & Idrus, W. A. R. W. (2022, November). A review on food security policy on agriculture and food in Sabah, Malaysia. In *IOP Conference Series: Earth and Environmental Science* (Vol. 1103, No. 1, p. 012023). IOP Publishing.
- Sayok, A. K., & Teucher, U. (2018). Loss of food plants knowledge and identity among indigenous peoples in Malaysia. *Journal of Advanced Research in Social and Behavioural Sciences*, 11(1), 174-188.
- Sen, A. (1981). Poverty and famines: An essay on entitlement and deprivation. Oxford: Clarendon Press.
- Sen, A. (1981). Ingredients of famine analysis: availability and entitlements. *The Quarterly Journal of Economics*, 96(3), 433-464.
- Shariff, Z. M., & Lin, K. G. (2004). Indicators and nutritional outcomes of household food insecurity among a sample of rural Malaysian women. *Pakistan Journal of Nutrition*, 3(1), 50-55.
- Sharif, Z. M., & Ang, M. (2001). Assessment of food insecurity among low income households in Kuala Lumpur using the Radimer/Cornell food insecurity instrument—a validation study. *Malaysian Journal of Nutrition*, 7(1 & 2), 15-32.

- Shaw, D. J. (2007). World Food Conference 1974. In *World Food Security* (pp. 121-149). Palgrave Macmillan, London.
- Siamwalla, A., & Valdes, A. (1994). Food security in developing countries; international issues. IFPRI Washington D C.
- Sim, H. C. (2001). Of marriage, money and men: Bidayuh working mothers and their households in Kuching. *Asian Journal of Social Science*, 29(2), 285-304.
- Simon, G. A. (2012). Food security. University of Roma Tre: Rome, Italy.
- Skinner, K., Hanning, R. M., Desjardins, E., & Tsuji, L. J. (2013). Giving voice to food insecurity in a remote indigenous community in subarctic Ontario, Canada: traditional ways, ways to cope, ways forward. *BMC Public Health*, 13, 1-13.
- Smith, M., Pointing, J., & Maxwell, S. (1993). *Household food security: concepts and definitions: an annotated bibliography* (Vol. 8). Brighton, Sussex: Institute of Development Studies.
- Sobal, J., Khan, L. K., & Bisogni, C. (1998). A conceptual model of the food and nutrition system. *Social Science & Medicine*, 47(7), 853-863.
- Sraboni, E., Malapit, H. J., Quisumbing, A. R., & Ahmed, A. U. (2014). Women's empowerment in agriculture: What role for food security in Bangladesh? *World Development*, 61, 11-52.
- Stebbins, R. A. (2001). *Exploratory Research in the Social Sciences* (Vol. 48). Sage. <https://doi.org/10.4135/9781412984249>
- Subramaniam, Y., Masron, T. A., & Azman, N. H. N. (2022). Remittances and food security. *Journal of Economic Studies*, 49(4), 699-715.

- Swedberg, R. (2020). Exploratory research. *The production of knowledge: Enhancing progress in social science*, 2(1), 17-41.
- Swinburn, B., Sacks, G., Vandevijvere, S., Kumanyika, S., Lobstein, T., Neal, B., Barquera, S., Friel, S., Hawkes, C., Kelly, B., L'Abbé, M., Lee, A., Ma, J., Macmullan, J., Mohan, S., Monteiro, C., Rayner, M., Sanders, D., Snowdon, W., Walker, C., & Informas. (2013). INFORMAS (International Network for Food and Obesity/non-communicable diseases Research, Monitoring and Action Support): overview and key principles. *Obesity Reviews*, 14, 1-12.
- Tabassum, N., & Nayak, B. S. (2021). Gender stereotypes and their impact on women's career progressions from a managerial perspective. *IIM Kozhikode Society & Management Review*, 10(2), 192-208.
- Teoh, W. J., Law, L. S., Helmy, H., Stephen, J. A., Cheah, W. L., & Salleh, Y. A. (2024). Household Food Insecurity among Indigenous Communities in Sarawak, Malaysia: Predictors and Coping Strategies. *Indian Journal of Public Health*, 68(3), 380-386.
- Terra Branca, et al. (2022). Sustainable agriculture and food security. *Journal of Sustainable Agriculture*, 26(2), 1234-1242.
- Thompson, R. (2018). Gardening for health: a regular dose of gardening. *Clinical Medicine*, 18(3), 201.
- Titus, O.B., & Adetokunbo, A.G. (2007). An analysis of food security situation among Nigerian urban households: Evidence from Lagos State, Nigeria. *Journal of Central European Agriculture*, 8(3), 397-406.
- Turner, C., Aggarwal, A., Walls, H., Herforth, A., Drewnowski, A., Coates, J., Kalamatianou, S., & Kadiyala, S. (2018). Concepts and critical perspectives for food environment research:

- a global framework with implications for action in low-and middle-income countries. *Global Food Security*, 18, 93-101.
- United Nations. (1975). Universal Declaration on The Eradication of Hunger and Malnutrition, World Food Conference, Rome, 5-16 November 1974. New York.
- Van den Broeck, G., & Maertens, M. (2016). Horticultural exports and food security in developing countries. *Global Food Security*, 10, 11-20.
- Vasantharaju, N. N. S. H., & Harinarayana, N. S. (2016). Online survey tools: A case study of Google Forms. In *National Conference on Scientific, Computational & Information Research Trends in Engineering, GSSS-IETW, Mysore*.
- Wheeler, T., & von Braun, J. (2013). Climate Change Impacts on Global Food Security. *Nature Climate Change*, 3(10), 885-890.
- Witoonchart, S., Khempet, K., & Rattanabanchuen, M. (2020). Coping with the Covid-19 economic fallout: Livelihoods and welfare of migrant workers in Thailand. *Asian Labour Review*, 35(1), 55-68
- Wong, S. (2005). Market gardening as a livelihood strategy: A case study of rural-urban migrants in Kapit, Sarawak, Malaysia (Doctoral dissertation, Open Access Te Herenga Waka-Victoria University of Wellington).
- Yeh, C. W., Lo, Y. T. C., Chen, Y. C., Chen, W. C., & Huang, Y. C. (2021). Perceived food insecurity, dietary quality, and unfavorable food intake among children and adolescents from economically disadvantaged households. *Nutrients*, 13(10), 3411.
- Yusriadi, Y., & Cahaya, A. (2022). Food security systems in rural communities: A qualitative study. *Frontiers in Sustainable Food Systems*, 6, 987853.

- Zalilah, M. S., & Tham, B. L. (2002). Food security and child nutritional status among Orang Asli (Temuan) households in Hulu Langat, Selangor. *The Medical Journal of Malaysia*, 57(1), 36-50.
- Zhou, Z. (2010). Achieving food security in China: Past three decades and beyond. *China Agricultural Economic Review*, 2(3), 251-275.