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**MALAYSIA SMALL FARMERS RISK MANAGEMENT
DURING COVID 19**

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DECLARATION

Except for quotations and summaries that have been properly acknowledged, I declare that the work in this thesis is all mine. The thesis has not been accepted for any degree and is not being submitted for any other degree at the same time.



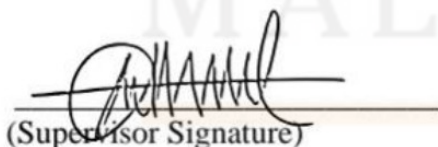
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Malaysia Small Farmers Risk Management During CoVID 19

ABSTRACT

The CoVID 19 pandemic and lockdown in Malaysia impacted everybody including the agriculture industry. This industry is facing various challenges including climate change, market instability, and disease. However, this pandemic is making the situation the worst disaster, especially for the small farmers. Hence this study is assessing various risks faced by small farmers during CoVID 19 pandemic. The common risk was faced by smallholder farmers in agriculture including production, farm incomes, labour shortage, intermediate inputs, delay of transport, and logistics because of having lockdown during CoVID 19. About 47 % of the farmers said the outbreak had made them unable to implement new farm and technology due to pandemics. The objective of this study is to determine the severity and probability of price risk, market risk, and production risk among farmers in Malaysia and to identify the strategies on market risk, price risk, and production risk among small farmers to overcome the risk during CoVID 19 in Malaysia. Based on data collected from a sample of 58 farmers based on simple random sampling and used descriptive statistics and risk matrix for analyzing farmers' risk on market risk, price risk, and production risk. The results show for the three top risks for market, price and production are "lack of marketing skills", "high repayments commitments", and "lack record-keeping". The percentage for each resource are risk management strategies are "Enter into sales or price contract with buyers"(55.2%), "agricultural support payments"(44.8%), and "operation production cost" respectively. From the survey overall confident level of farmers to overcome the difficulties during the pandemic is moderate. The research has found in risk management approaches differ significantly depending on a variety of resources and categories on understanding the risk during CoVID 19 pandemic among farmers. For researchers and policymakers to formulate effective policy measures, they have a thorough understanding of CoVID 19 pandemic in Malaysia on 2020 regarding farmers risk management

Keywords: Risk, pandemic, farmers, CoVID 19, small farmers, risk management, severity, strategies,

Pengurusan Risiko Peladang Kecil Malaysia Semasa CoVID 19

ABSTRAK

Pandemik dan penutupan CoVID 19 di Malaysia memberi kesan kepada semua orang termasuk industri pertanian. Industri ini menghadapi pelbagai cabaran termasuk perubahan iklim, ketidakstabilan pasaran dan penyakit. Walau bagaimanapun, pandemik ini menjadikan keadaan menjadi bencana yang paling teruk terutama bagi petani kecil. Justeru kajian ini menilai pelbagai risiko yang dihadapi oleh petani kecil semasa pandemik CoVID 19. Risiko biasa dihadapi oleh petani pekebun kecil dalam bidang pertanian termasuk pengeluaran, pendapatan ladang, kekurangan buruh, input perantaraan, kelewatan pengangkutan dan logistik kerana penutupan semasa CoVID 19. Kira-kira 47% daripada petani berkata wabak itu menyebabkan mereka tidak dapat menghasilkan tanah ladang akibat wabak. Objektif kajian ini adalah untuk menentukan tahap keterukan dan kebarangkalian terhadap risiko harga, risiko pasaran dan risiko pengeluaran dalam kalangan petani di Malaysia dan untuk mengenal pasti strategi risiko pasaran, risiko harga dan risiko pengeluaran dalam kalangan petani kecil untuk mengatasi risiko semasa CoVID 19 dalam Malaysia. Berdasarkan data yang dikumpul daripada sampel 58 petani berdasarkan persampelan rawak mudah dan menggunakan statistik deskriptif dan matriks risiko untuk menganalisis risiko petani terhadap risiko pasaran, risiko harga dan risiko pengeluaran. Keputusan menunjukkan untuk tiga risiko utama untuk pasaran, harga dan pengeluaran ialah "kekurangan kemahiran pemasaran", "komitmen pembayaran balik yang tinggi", dan "kekurangan penyimpanan rekod". Peratusan bagi setiap sumber ialah strategi pengurusan risiko ialah "Memasuki kontrak jualan atau harga dengan pembeli" (55.2%), "bayaran sokongan pertanian" (44.8%) dan "kos pengeluaran operasi" masing-masing. Daripada tinjauan keseluruhan tahap keyakinan petani untuk mengatasi kesukaran semasa pandemik adalah sederhana. Penyelidikan mendapati dalam pendekatan pengurusan risiko berbeza dengan ketara bergantung pada pelbagai sumber dan kategori tentang pemahaman risiko semasa wabak CoVID 19 di kalangan petani. Bagi penyelidik dan penggubal dasar untuk merangka langkah dasar yang berkesan, mereka mempunyai pemahaman yang menyeluruh tentang pandemik CoVID 19 di Malaysia pada 2020 berkaitan pengurusan risiko petani.

Kata kunci: Risiko, pandemik, petani, CoVID 19, petani kecil, pengurusan risiko, keterukan, strategi,

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CHAPTER 1

INTRODUCTION

1.1 Research Background

Farming is a major industry for every country. Crops, vegetables, fruits, and flowers are all part of the process. Agriculture is the sole source of income for every country. Farming is influenced by factors such as geography, product demand, labour, and technological advancements (Types of Farming in India – Procedure, Benefits and Role 9 March 2021). Agricultural sectors in most countries are greater exposed than industrial and service sectors. Although various normative studies have been conducted about how the farmers must act to face risk and uncertainty. Farmers' aspects are critical in guiding farmers in making better decisions about risky agriculture companies (Richard, 2018). Adaptability is also required for strategic risk management. Adaptability is a behavioural trait that includes a desire to adopt as well as the capability to change when necessary.

Investigate the short- and long-term effects of the COVID-19 pandemic in small farmers. The phrase "short-term effects" begins with the initial shocks created by anti-pandemic actions. This involves effects on the everyday production process, spring tillage and planting, farm products, revenues, and prices. "Long-term effects" are methods of production or ideas, such as crop layout modification, property modification, and the desire to participate in various agricultural insurance programs.

Small farmer's producers seem to be the most susceptible since they must deal with the shock of hygienic, ecological, and economic problems. They have not been thrown into a crisis as a result of the global pandemic rather, it has worsened existing ones (International Trade Centre 2020).

1.2 Problem Statement

This research is mostly focused on Malaysian small farmers' risk management during covid 19. Is that COVID-19's has possible effects on smallholder farmers? Yes, farmers in Malaysia was having a risk during the covid 19 pandemic. Furthermore, most countries have declared the agriculture and agri-food industry to be important, excluding it from company closures and movement restrictions. The pandemic's direct effects on main farming should be limited in many states because the disease has little effect on the natural resources that are used to produce food. The common risk was faced by smallholder farmers in agriculture production, farm incomes, labor shortage, intermediate inputs, delay of transport, and logistic because of having lockdown during covid 19. (COVID-19 and the food and agriculture sector: Issues and policy responses 29 April 2020) For example, In Liberia, 47 per cent of the farmers said the outbreak had made them unable to produce farmland. As a result of quarantines and social stigma, Ebola-affected families had lower-than-average crops and earnings. Travel restrictions impacted marketplaces in difficult countries such as Guinea, Liberia, and Sierra Leone (Yang & Shaobo Shi, 2020) . The farm is also short on migrant labour due to travel limitations, which stop from bringing in fresh staff. Most of the farmers was facing risk in 2020 which are market risk,

price risk, and also in production risk. The difference in average earnings in 2020 is between 75 % and 79% per cent less than in 2019 (Maureen O'Hara & Xing (Alex) Zhou, 2021).

1.3 Objectives

The objective of this study is:

1. To determine the severity and probability of price risk, market risk, and production risk among farmers in Malaysia
2. To identify the strategies on market risk, price risk, and production risk among small farmers to overcome the risk during Covid 19 in Malaysia.

1.4 Hypothesis

In this experimental study, there is no hypothesis to be developed in risk management protocol. However, according to Patton (1998), it consists of risk hypothesis which also refers to problem formulation. This study is exploratory in nature. Thus, it does not have any hypothesis.

1.5 Scope of the study

This research is mainly conducted among Small farmers in Malaysia. This research was carried out by distributing a questionnaire through Google form and the data will analyse by using SPSS Statistics. The purpose of the studies demographic characteristics among farmers in Malaysia and to identify top risk and strategies on market, price and production.

1.6 Significance of the study

This study will help farmers to have a clearer picture of risk management and its strategies during CoVID 19. This study will surely give new knowledge and literature about management during pandemic times among small farmers in Malaysia.

The study more or less will be an eye-opener for the young generation to press more on risk management and create alternative ways to overcome the risk. This helps to create how the small farmers manage the risk during CoVID 19.

CHAPTER 2

LITERATURE REVIEW

To survey risk management during Covid 19 among Malaysia small farmers. Therefore, a review of literature has been presented below about the above-mentioned points.

2.1 Definition of small farmers

Small farms can be addressed from a different perspective. Small-scale agriculture is commonly referred to as smallholder, family farm, subsistence, resource-poor, low-income, low input, or low-technology farm, though this is not necessarily the case. Family farms, according to Lipton, are "operated entities in which the majority of labour and enterprise comes from the small farmer, which dedicate a significant portion of its work hours to the farm." (Nagayets, 2005) . For example in South Africa agriculture, there are two types of agriculture which are subsistence farmers in the homeland areas and large-scale commercial (mostly white) farmers.

2.2 Important Small Farmers in Malaysia

In Malaysia, plantation, livestock, or crop diversification is undertaken. Farmers are developing and growing a variety of crops rather than one or two key crops, which has long been the norm. The largest crops farmed by the private and public sectors have

been and continue to be oil palm, rubber, cocoa, and rice. Smallholders and the private sector, on the other hand, grow coconut, tropical fruits, vegetables, flowers, annual crops, and other crops (Tunku Mahmud Bin Tunku Yahya). Since the 1980s, there has already been an increase in attention in small-scale dairy farming throughout Southeast Asia. There are approximately 693 dairy producers in Malaysia, with 84 per cent being small size farmers and 9 per cent and 8 per cent being semi-commercial and commercial farms, respectively. Small farmer's documentation practices, helped to the development of the Malaysian dairy industry (Vickneswaran Jeyabalan 11 October 2010).

Through informal workshops, the Malaysian government is encouraging farmers to gain skill sets. These classes will focus on teaching managerial skills as a necessary component of small farm success by encouraging farmers to be more creative and innovative (Rezai, G., Mohamed 2011).

The importance of the country creating small farmers is to raise the economic level and lead to entrepreneurship. In Malaysia, the rise of agro-based has grown significantly as a business. Based on their identifying the importance of the quality of Good Aquaculture Practices, species cultured, total family income, and social benefit factors, human and financial assets are essential components in the livelihood of small-scale farmers. In terms of improving the lifestyle of smallholder farmers in Malaysia efforts aimed at improving their knowledge and financial situation were categorized (Roslina, K. 2018).

2.3 Effects of CoVID 19 pandemic among farmers

The COVID-19 pandemic in 2020 is having an unexpected effect on society all around the world. As government agencies authorize social distancing practices and advice non-essential businesses to shut down to slow the spread of the outbreak, there is significant uncertainty about the impact such measures will have on people's lives and livelihoods. The need for public transport and tourist services has decreased. At the same time, many businesses are having supply problems as governments restrict non-essential industry activity and workers are restricted to their homes (R Maria del Rio-Chanona, 29 August 2020). The COVID-19 pandemic has the potential to inflict damage on short-term manufacturers and suppliers. The pandemic issue in India and the following long lockdown have had a significant influence on both supply and demand for agro-foods (Mahendra Dev, 2020). Moreover, In India grains (spring crops) are stored in cold storage or donated to food banks and sold from smallholder people. When the majority of cereal output is unable to reach the market, food costs rise, mainly in urban areas (Kumar, P Singh 2021). Production is affected by limited access to supply and output markets, as well as future uncertainty, and there are fewer incentives to produce. Disruption of the ecological infrastructure of agro-ecosystems. The needs of farmers and their (crucial) social role in food production were emphasized. Rural communities are getting more attention as locations to stay (Tittonell, 2021)

2.4 Risk management among small farmers before pandemics

In all farming systems, the primary source of revenue is farming yield. The ability to identify and control production risks is critical for farmers. In farming systems, improving agriculture is very significant (Ali, U.2016). Farmers differ in their willingness to take risks. Some farmers are more willing to take on a higher level of risk than others. Risk perceptions are frequently linked to a farmer's economical ability to absorb minor gains and losses. Farmers' views may be divided into three categories which are risk-averse farmers who attempt to avoid taking chances, risk-takers who are open to more dangerous economic opportunities, and risk-neutral farmers who fall somewhere in between. Examples of risk lack of rain, drought, storm, or severe rains are all risks, as are pests and disease, equipment malfunction, and replacement parts shortages were faced by small farmers before the pandemic. The causes for the poor implementation of management of risks among limited resource farmers, however, get over a lack of understanding (Dismukes, Harwood, & Bentley, 1997). This category of farmers grows items (fruits and vegetables, or livestock) that aren't often subsidized by the government. Furthermore, collecting knowledge is difficult, and small and limited-resource farmers may not be interested in spending those expenses if the returns are marginal. Large farms, on the other hand, may justify information-gathering expenses since it is a public benefit, allowing them to take advantage of economies of scale (Chembezi, D. M. 2006).

To begin with, small-scale farmers have a variety of risk management options, including informal society efforts, on-farm production decisions, and off-farm jobs. Next, insurance systems face a significant common risk for families frequently do not get an

insurance pay-out when their farms suffer significant crop losses. crop insurance for small farmers is prohibitively costly due to fixed expenses (Smith, V. H.,2016). Most of the small farmers used in agricultural outputs are fertilizer usage, involvement in self-help groups, adoption of better crop variety, and speculative produce storage as those key for risk management. Smallholders have a lack of access to new agricultural technology, expensive upgraded technologies, a lack of access to weather information, and a lack of financial resources. Finally, certain national food security implications were drawn (Okereke, C.O.2012). Climate also is one of the factors for smallholder farmers. Climate managing risk must be an element of the worldwide agriculture community's response to the combined crises of severe poverty and a changing climate. The most viable options for adapting to climate change include taking action on a smaller period while still addressing immediate development issues (Ngugi, R. K. 2007).

2.5 Risk management among farmers during Covid 19 pandemic

2019 was the year of coronavirus (COVID-19). Several processes in agri-food supply chains in emerging economies have been disrupted, posing new challenges, particularly for small and medium-sized agri- based businesses. The lockdown presented a wide range of issues for agri-food the most common of which was a drop in sales, disrupted their input and output supply chains, making it impossible to satisfy their scope of work. Other challenges increased difficulties finding financing, difficulties paying old debt instalments payroll rent, and other invoices (Assem Abu Hatab 2020). Due to current issues in the food supply chain, food production, processing, transportation, and

consumption are causing worry. labour' mobility limitations, shift in consumer demand, the closure of food production facilities, limited food trade laws, and financial constraints in the food supply chain because of COVID-19 (Serpil Aday, 2020).



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CHAPTER 3

METHODOLOGY

To study “Malaysia small farmers risk management during covid 19”. The survey will be conducted primary data were collected by surveying a questionnaire by distributing Google form.

3.1 Study area and population

This study was designed to determine the Malaysia small farmers' risk management during covid 19, this study will be conducted among farmers in Malaysia. The target population for this study is farmers in Malaysia. The total number of farmers is 24% in Malaysia.

3.2 Study design

A cross-sectional study is used to identify risk among small farmers in Malaysia during covid 19. This survey was conducted from Nov to Jan.

3.3 Research instrument

The questionnaire is divided into three sections. Section A is about demographic information such as gender, age, educational level, state, residential area, size of the farm, and what kind of farm.

Section B is risk management in small farms during CoVID 19 Pandemic. Section B was divided into three parts which are Part A market risk, Part B price risk, and Part C production risk. Part A contains 15 questions, Part B contains 12 questions and Part C contains 13 questions. Section B (Part A, B, and C) indicated and choose a scale of severity and portability in each question. The instrument was structured based linear numeric scale for both severity and probability. Section B for severity the linear scale, from none, minimal, significant, major, and critical. The values assigned to the options were 1,2,3,4 and 5. For probability, the linear scale, from the impossible condition, unlikely, maybe, like and very likely. The values assigned to the options were 1,2,3,4 and

Next is section C risk Managements strategies in Small farms. Section C was divided into three parts which are Part A market risk, Part B market risk, Part C production risk. The instrument was structured top task analysis In Section C (Part A, B, and C) select and rate the most important risk on their farm on each part.

The last part will be Section D The confident level of handling your farm in a pandemic. Section C contains 2 questions indicating and choosing the scale based on the confidence level. The instrument was structured based on a Likert scale ranging. For section D, the Likert scale ranges from not at all confident, only slightly confident,

somewhat confident, moderately, very confident. The values assigned to the options were 1,2,3,4 and 5.

3.4 Method of data collection

This study is used primary data. The primary data were collected by surveying a questionnaire by distributing Google form. The Google form was distributed to small farmers in Malaysia.

3.5 Sampling technique

Sampling is a technique of taking an ample range of values from a population so that we can analyse the sample and recognize its properties or characteristics so that we can categorize those properties or characteristics to the population. The technique that used in this research is the stratified sampling technique to determine the respondents among farmers in Malaysia. Stratified random sampling was used as it involves a process of segregation which relevant, appropriate and meaningful in the context of the study, and it provides more information with a given sample size (Uma Sekaran, 2006).

3.6 Reliability

Reliability or internal consistency is commonly measured by Cronbach coefficient alpha. Internal consistency refers to how well the items' scores correspond with one another, indicating that they are all measuring the true score rather than random error. Above 0.7 is considered suitable for demonstrating the instruments' reliability (Zainuddin, 2018).

3.7 Theoretical framework

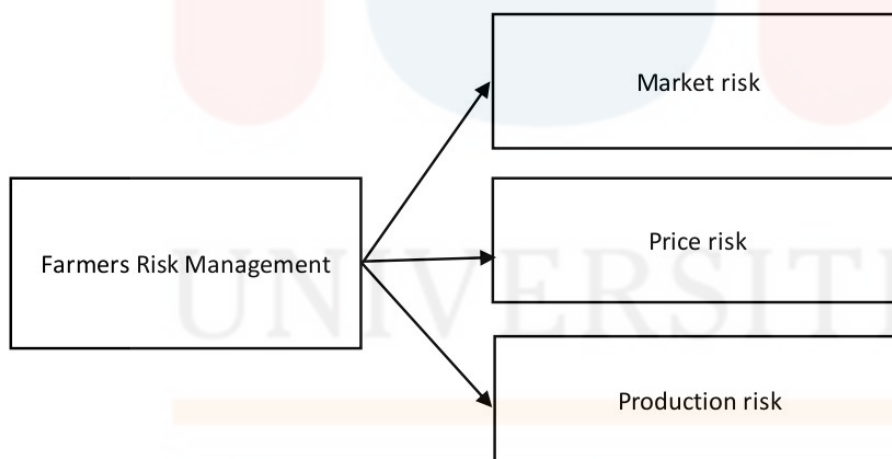


Figure 3.7.1: Famers risk management (Dilshad Ahmad, 2020).

Figure 3.7.1 shows due to CoVID 19 pandemics, the frequent studies have focused farmers risk management regarding market risk, price risk and production risk

3.8 Procedure for data analysis

. Data collected will be analyzed with the Statistical Package for the Social (SPSS) version 26.0.

3.8.1 Descriptive statistic

Descriptive statistics is a way of describing, showing, or summarizing data more simply. It helps to visualize raw data which have a larger amount in a way easier to understand. The pie chart, bar graph, and line chart will be used to deliver the data received from the survey.

3.8.2 Risk matrix

A risk matrix (also known as a risk diagram) is a graphic that visualises risks. The hazards are grouped in the picture according to their likelihood, consequences, or level of impact, so that the worst-case scenario may be assessed at a glance. As a consequence of the risk analysis and risk assessment, the risk matrix is an important component in project and risk management.

CHAPTER 4

RESULTS AND DISCUSSION

This chapter presents the results of the study. Firstly, the results show the descriptive analysis of the respondents' demographic characteristics. Then it followed by the results of is risk management in small farms during the CoVID 19 pandemic, risk management strategies in the Small farm Pandemic, and the confidence level of handling among farmers in a pandemic.

4.1 Demographic characteristics

Table 4.1 Demographic characteristics of farmer's

QUESTIONS		FREQUENCY	PERCENTAGE
Gender	Male	34	58.6%
	Female	24	41.4%
	Total	58	
Age	< 20 years old	3	5.2%
	21 - 30 years old	26	44.8%
	31 - 40 years old	18	31%
	41 - 50 years old	7	12.1%
	> 50 years old	4	6.9%

		Total	58
Level of education	SPM/STPM	27	46.6%
	Diploma	14	24.1%
	Degree	14	24.1%
	Master	2	3.4%
	PhD	1	1.7%
	Total	58	
State	Perak	16	27.6%
	Johor	3	5.2%
	Kedah	8	13.8%
	Penang	5	8.6%
	Wilayahpersekutuan	2	3.4%
	Perlis	5	8.6%
	Negeri Sembilan	3	5.2%
	Melaka	2	3.4%
	Pahang	6	10.3%
	Selangor	5	8.6%
	Kelantan	2	3.4%
	Terengganu	0	
	Sabah	1	1.7%
	Sarawak	0	
Total	58		

Residential area	Urban area	14	24.1%
	Sub-urban area	23	39.7%
	Rural area	21	17.2%
	Total	58	
Size of farm	<1 hectar	21	36.2%
	1 – 2 hectar	27	46.6%
	>2 hectar	10	17.2%
	Total	58	
What kind of farm	Vegetables or fruit production	32	55.2%
	Livestock production	20	34.5%
	Plantation	6	10.3%
	Total	58	

The frequency and percentage for each category of each variable listed under the demographic characteristics of the respondents are shown in table 4.1. This study consists of 58 respondents where 34 (58.6%) are male and 24 (41.4%) are females respectively. Most of the farmers were 21-30 years old (44.8% and 26 respondents) while 18 farmers (31%) and 7 (12.1%) were under age 31-40 years old and 41-50 years old respectively.

Three respondent (5.2%) was < 20 years old and four respondent for < 50 years old. Most of the respondents are SPM/STPM.it shows 27 respondents (46.6). There are 14 respondents and (24.1%) was from diploma and degree. The lowest respondent was 1 respondent and (1.7 %) from PhD.

Moreover, the highest respondent from Perak state was 16 respondents (27.6%) and the lowest respondent from Sabah was 1 respondent (1.7%). There was 8 respondent from Kedah and 6 respondents from Pahang. The percentage is (13.8%) and (10.3%) respectively. There was 3 respondent from Negeri Sembilan (5.2%). There 5 respondent (8.6%) from 3 state which are Penang, Perlis, and Selangor and 2 respondent (3.4%) from Wilayah Persekutuan, Melaka and Kelantan. Next, Most of the respondents are from suburban areas and the lowest respondent from urban areas. The respondent from sub-area 23 (39.7%) and 14 (24.1%). the 21 respondents are from a rural area and the percentage is (36.2%).

There are three sizes of the farm which are < 1 hectare, 1-2 hectare, and > 2 hectares. Most respondents are from small farmers which are 1 – 2 hectares and the lowest respondent from larger farmers which are >2 hectares. There were 27 respondent (46.6%) and 10 respondent (17.2%) respectively .There are 21 respondents from marginal farmers which are < 1 hectare and the percentage will be (21%). Moreover, the more respondent from vegetable and fruit products which are 32 respondents and (55.2%). There were 20 respondents (34.5%) from livestock production and 6 respondent from the plantation (10.3%)

4.2 Market Risk

Table 4.2 Severity of market risk

NO	QUESTIONS	NONE	MINIMAL	SIGNIFICANT	MAJOR	CRITICAL	MEAN
1	Income reduction in your farm	4	5	15	28	6	3.47
2	Fewer sales over time	1	4	15	34	4	3.62
3	Less social networking	1	8	16	29	4	3.47
4	Fewer market stocks on your farm(poultry, vegetable, etc.)	2	3	18	26	9	3.64
5	Market information can more cause costly implement	1	1	22	27	7	3.66
6	Decrease sales or price contracts with buyers	0	6	22	26	4	3.48
7	Less offering information on farmers markets	2	4	16	28	8	3.62

8	Improper record-keeping	3	8	14	24	9	3.48
9	Low marketing power in your farm	0	4	20	27	7	3.64
10	Loss market assets	1	5	19	25	8	3.59
11	Lack of marketing skills and hard to negotiate better market terms	0	3	21	25	9	3.69
12	Hard to respond to market condition	2	4	27	20	5	3.38
13	Difficult to the growth of farmers business	0	4	20	29	5	3.60
14	Difficult to deliver in a specific time of services	2	4	16	29	7	3.60
15	Difficult to communicate and sell with customers	1	6	13	33	5	3.60

Table 4.3 Probability of market risk

NO	QUESTIONS	IMPOSSIBLE CONDITION	UNLIKELY	MAYBE	LIKE	VERY LIKE	MEAN
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1	Income reduction in your farm	0	4	23	25	6	3.57
2	Fewer sales over time	2	2	25	21	8	3.53
3	Less social networking	2	2	25	22	7	3.52
4	Fewer market stocks on your farm(poultry, vegetable, etc.)	1	9	18	26	4	3.40
5	Market information can more cause costly implement	0	5	22	26	5	3.53
6	Decrease sales or price contracts with buyers	3	5	22	25	3	3.34
7	Less offering information on farmers markets	1	6	20	22	9	3.55
8	Improper record-keeping	1	6	19	25	27	3.53
9	Low marketing power in your farm	1	6	22	22	7	3.48
10	Loss market assets	0	5	23	19	11	3.62

11	Lack of marketing skills and hard to negotiate better market terms	3	2	21	25	7	3.53
12	Hard to respond to market condition	0	5	20	27	6	3.59
13	Difficult to the growth of farmers business	0	7	19	25	7	3.55
14	Difficult to deliver in a specific time of services	2	6	24	18	8	3.41
15	Difficult to communicate and sell with customers	2	4	22	26	4	3.45

The following table 4.2 and table 4.3 presents the risk farmers during COVID 19 pandemic on market risk. The risk was assessed by their severity and probability. The most farmer's respondent on scales 3 and 4 in table probability and severity. Two response categories as "significant" and major in severity and "maybe" and "like" in probability. The highest mean in market risk for severity are (n = 3.69) which is "Lack of marketing skills and hard to negotiate better market terms" meanwhile the highest mean in market risk probability are (n = 3.62) which is "Loss market assets"

4.3 Price Risk

Table 4.4 Severity of price risk

NO	QUESTIONS	NONE	MINIMAL	SIGNIFICANT	MAJOR	CRITICAL	MEAN
1	High expenses input and output	3	4	12	26	13	3.72
2	Lack of agricultural support payments	0	4	18	34	2	3.59
3	Lack of storage facilities	1	5	24	24	4	3.49
4	Low intermediate inputs	0	1	22	27	8	3.72
5	Difficult in transport supply chain	1	2	20	27	8	3.67
6	Difficult to implement small technology	2	2	19	30	5	3.59
7	Insurances for labourers due to health conditions	1	2	29	21	5	3.47
8	High insurance death of farmers due to CoVID 19	1	6	22	23	6	3.47

9	Increase of taking loans	0	3	16	31	8	3.76
10	High payment of interest	1	1	23	29	4	3.59
11	Over budget farm	1	3	22	28	4	3.53
12	High repayments commitments	0	1	20	30	7	3.74

Table 4.5 Probability of price risk

NO	QUESTIONS	IMPOSSIBLE CONDITION	UNLIKELY	MAYBE	LIKE	VERY LIKE	MEAN
1	High expenses input and output	2	6	20	25	35	3.43
2	Lack of agricultural support payments	0	6	20	29	3	3.50
3	Lack of storage facilities	0	6	19	31	2	3.50
4	Low intermediate inputs	1	5	26	20	6	3.43
5	Difficult in transport supply chain	0	4	22	28	4	3.55

6	Difficult to implement small technology	3	4	19	28	4	3.45
7	Insurances for labourers due to health conditions	1	4	23	26	4	3.48
8	High insurance death of farmers due to CoVID 19	1	1	26	21	9	3.62
9	Increase of taking loans	1	5	17	30	5	3.57
10	High payment of interest	3	4	16	31	4	3.50
11	Over budget farm	1	1	23	24	9	3.67
12	High repayments commitments	1	1	22	29	5	3.62

The following table 4.4 and table 4.5 presents the risk of farmers during the COVID 19 pandemic on price risk. Two categories result from market risk which is severity and probability. The most farmer's respondent on scales 3 and 4 in table probability and severity. Two response categories as "significant" and major in severity and "maybe" and "like" in probability. The highest mean in price risk for severity are (n = 3.76) which is an "increase of taking loans" meanwhile the highest mean in market risk probability are (n = 3.67) which is "over the budget farm"

4.4 Production Risk

Table 4.6 Severity of Production risk

N O	QUESTIONS	NON E	MINIMA L	SIGNIFICAN T	MAJO R	CRITICA L	MEA N
1	Labour shortage	4	6	10	26	12	3.62
2	High operation production cost	0	4	24	22	8	3.59
3	Production delay because of distribution for inputs supply chain	0	5	18	29	6	3.62
4	Post-harvest lost due to delay in procurement by traders	0	3	18	30	7	3.71
5	Fewer resources to continue production	1	4	16	31	6	3.64
6	Supply raw material delay	3	5	20	23	7	6.45
7	Fewer time limits in production	0	3	22	29	4	3.59
8	Less quality and quantity of product affected	1	1	29	21	6	3.52

9	Lack record keeping	1	1	22	30	4	3.60
10	Taking more time to develop the products	1	4	18	27	8	3.64
11	Low management control with farm	2	3	17	28	8	3.64
12	Lack of communication between farmers to run the production	1	5	19	24	9	3.60
13	Less narrow production specialization on the farm	1	3	13	35	6	3.72

Table 4.7 Probability of production risk

NO	QUESTIONS	IMPOSSIBLE CONDITION	UNLIKELY	MAYBE	LIKE	VERY LIKE	MEAN
1	Labour shortage	3	6	19	25	5	3.40
2	High operation production cost	0	5	21	25	7	3.59
3	Production delay because of distribution for inputs supply chain	0	6	24	20	8	3.52

4	Lost due to delay in procurement by traders	0	5	18	27	8	3.66
5	Fewer resources to continue production	2	4	20	27	5	3.50
6	Supply raw material delay	5	3	16	29	5	3.59
7	Fewer time limits in production	0	4	21	27	6	3.60
8	Less quality and quantity of product affected	0	6	22	23	7	3.53
9	Lack record keeping	0	5	16	28	9	3.71
10	Taking more time to develop the products	1	6	22	22	7	3.46
11	Low management control with farm	1	6	18	25	8	3.57
12	Lack of communication between farmers to run the production	1	6	18	25	8	3.57
13	Less narrow production specialization on the farm	0	4	23	25	6	3.57

The following table 4.6 and table 4.7 presents the risk of farmers during the COVID 19 pandemic on production risk. Two categories result in production risk which is severity and probability. The most farmer's respondent on scales 3 and 4 in table probability and severity. Two response categories as "significant" and major in severity and "maybe" and "like" in probability. The highest mean in production risk for severity are (n = 3.72) which is "less narrow production specialization on the farm" meanwhile the highest mean in market risk probability is (n = 3.66) which is "Post-harvest lost due to delay in procurement by traders

4.5 The risk matrix analysis

4.5.1 Market Risk

Table 4.8 Market Risk

NO	SEVERITY	PROBABILITY	RISK	
Q1	3.47	3.57	12.4	12
Q2	3.62	3.53	12.8	13
Q3	3.47	3.52	12.2	12
Q4	3.64	3.40	12.4	12
Q5	3.66	3.53	13.0	13
Q6	3.48	3.34	11.6	12

Q7	3.62	3.55	12.8	13
Q8	3.48	3.53	12.2	12
Q9	3.62	3.48	12.6	13
Q10	3.59	3.62	13.0	13
Q11	3.69	3.53	13.0	13
Q12	3.38	3.59	12.1	12
Q13	3.60	3.55	12.8	13
Q14	3.60	3.41	12.2	12
Q15	3.60	3.45	12.4	12

Figure 4.8.1 Market Risk Matrix

Severity probability	1	2	3	4	5
1	5	10	15	20	25
2	4	8	12	16	20
3	3	6	9	12	15
4	2	4	6	8	10
5	1	2	3	4	5

The two risk categories in market risk which severity and probability. Table 4.8 shows the calculation risk and figure 4.8.1 show the risk matrix for price risk the severity ranges from none to critical and probability ranges from impossible condition to very like. Based on the matrix, significant and major will be the for market risk on the severity and maybe and like for probability. The calculation is showing the numbers 12 and 13 are the risk. Severity mean and probability mean times to get the value of risk. The quantified risk falls into number 12. It categorizes this risk as medium-high based on market risk.

There are three main risk sources are " Difficult to communicate and sell with customers", "lack of marketing skills and hard to negotiate better market terms" and "market information can more cause costly implement". The highest mean in market risk for severity are (n = 3.69) which is "Lack of marketing skills and hard to negotiate better market terms" meanwhile the highest mean in market risk probability are (n = 3.62) which is "Loss market assets" This will be the main risk was faced by farmers during CoVID 19 pandemic. Farmers difficulties of communicate face to face with customers and also retails to sell their products. Most farmers are losing market assets because they can't repay the loan and bills such as tractors, lorry, and machines. They promote only via social media can cause a lack of marketing skills and hard to negotiate better market terms due to pandemics. For example, with vegetables and fruits selling online due to pandemics the profit for the farmers will be lower and it will be hard to deliver due to restrictions.

4.5.2 Price Risk

Table 4.9 Price Risk

NO	SEVERITY	PROBABILITY	RISK	
Q1	3.72	3.43	12.7	13
Q2	3.59	3.50	12.5	13
Q3	3.49	3.50	12.2	12
Q4	3.72	3.43	12.7	13
Q5	3.67	3.55	13.0	13
Q6	3.59	3.45	12.3	12
Q7	3.47	3.48	12.1	12
Q8	3.47	3.62	12.6	13
Q9	3.76	3.57	12.4	13
Q10	3.59	3.50	12.6	13
Q11	3.53	3.67	13.0	13
Q12	3.74	3.62	13.5	14

Figure 4.9.1 Price Risk Matrix

Severity probability	1	2	3	4	5
1	5	10	15	20	25
2	4	8	12	16	20
3	3	6	9	12	15
4	2	4	6	8	10
5	1	2	3	4	5

The two risk categories in price risk which severity and probability. Table 4.9 shows the calculation risk and figure 4.9.1 shows the risk matrix for price risk. The severity ranges from none to critical and probability ranging from impossible condition to very like. Based on the matrix, significant and major will be the for price risk on the severity and maybe and like for probability. The calculation is showing the numbers 12,

13, and 14 are the risk. Severity mean and probability mean times to get the value of risk. The quantified risk falls into yellow colour which is number 12. It categorizes this risk as medium-high based on price risk.

The three main risks are "high repayments commitments", "over budget farm" and "difficult in the transport supply chain". Farmers have faced problems in high repayments commitments because incomes are not enough for running for their daily life and the salary for the farmers was reduced compared before the pandemic. So from that they not able to pay rent, bills and commitment were became higher on pandemic time. Since farmers, do not have enough income to buy equipment for farms or low income will cause take loans to run their life and farm. Moreover, farmers faced Difficult in a transport supply chain due to lockdown and roadblocks. Farmers need to prepare legal forms and change delivery schedules as well. Because of the roadblock.it can cause high petrol, and take time to the delivered product. Over budget farms causes because low profit or incomes faced difficulties to run the farm.

4.5.3 Production Risk

Table 4.10 Production Risk

NO	SEVERITY	PROBABILITY	RISK	
Q1	3.62	3.40	12.3	12
Q2	3.59	3.59	12.9	13

Q3	3.62	3.52	12.7	13
Q4	3.71	3.66	13.6	14
Q5	3.64	3.50	12.7	13
Q6	3.45	3.59	12.4	12
Q7	3.59	3.60	12.9	13
Q8	3.52	3.53	12.4	12
Q9	3.60	3.71	12.4	13
Q10	3.64	3.46	12.6	13
Q11	3.64	3.57	13.0	13
Q12	3.60	3.57	12.8	13
Q13	3.72	3.57	13.3	13

Figure 4.10.1 Production Risk Matrix

Severity probability	1	2	3	4	5
1	5	10	15	20	25
2	4	8	12	16	20
3	3	6	9	12	15

4	2	4	6	8	10
5	1	2	3	4	5

The two risk categories in production risk which severity and probability. Table 4.10 shows the calculation risk and figure 4.10.1 show the risk matrix for price risk The severity ranges from none to critical and probability ranges from impossible condition to very like. Based on the matrix, significant and major will be the for production risk on the severity and maybe and like for probability. The calculation are showing the numbers 12, 13, and 14 are the risk. The quantified risk falls into yellow colour which is number 12. It categorizes this risk as high based on price risk. It categorizes this risk as medium-high based on production risk.

There three main risks are selected by the farmers are which are "Low management control with farm ", " Lack of communication between farmers to run the production " and "Less narrow production specialization on the farm". Low management control because most of farmers need to quarantines if there are close contact with CoVID 19 patient and it is take 14 days to quarantines as well. Throughout the food supply chain, including production, postharvest handling, processing, distribution, and consumption, every produced food for human use was lost or wasted. Secondly, lack of keeping records due to labour health conditions because the specific labour is lacking updates on the record of farms and food production.

4.6 Descriptive analysis of risk Managements strategies on Market, price, and production

4.6.1 Market Risk Strategies

Table 4.11 Market risk strategies

NO	QUESTIONS	FREQUENCY	PERCENTAGE
1	Income in your farm	-	-
2	Spread sales over time	-	-
3	Social networking	-	-
4	Market stocks on your farm (poultry, vegetables, etc.)	-	-
5	Market information can implement	26	55.2%
6	Enter into sales or price contract with buyers	30	51.7%
7	Offering information on farmers markets	22	37.9%
8	Record keeping	20	34.5%
9	Marketing power in your farm	18	31%
10	Market assess	8	13.8%
11	marketing skill and hard to negotiate better market terms	19	32.8%
12	Respond market condition	11	19%

13	Timely delivery on services	12	20.7%
14	Communication and selling with customers	16	27.6%

The frequency and percentage for each category of each variable listed under risk management strategies of the respondents are shown in table 4.11. This study consists of 58 respondents. Respondents were select resources were used as market strategies in their farm. Most of the respondents are used "Enter into sales or price contract with buyers" and "Market information can implement" which shows 30 respondents and 26 respondents respectively. There are 20 (34.5%) respondents for record-keeping and 19 (32.8%) respondents from marketing skills and hard to negotiate better market terms. Some of the respondents were choose marketing power in your farm (31% and 18 respondents) while 16 respondents (27.6%) choose Communication and selling with customers and 12 respondents (20.7%) choose Timely delivery of services. Finally, 11 respondents (19%) and 8 respondents (13.8%) were under "Respond market condition" and "Market assess".

4.6.2 Price Risk Strategies

Table 4.12 Price risk strategies

NO	QUESTIONS	FREQUENCY	PERCENTAGE
1	The key of expenses input and output	25	43.1%
2	Labour salary	26	44.8%
3	Agricultural support payments	26	44.8%
4	Storage facilities	19	32.8%
5	Intermediate inputs	23	39.7%
6	Transport supply chain	23	39.7%
7	Small technology implement	22	37.9%
8	Insurance for labourers due to a health condition	20	34.5%
9	Raw material cost	21	36.2%
10	The seeding rate for your farm	8	13.8%
11	Insurance death of farmers due to CoVID 19	19	32.8%
12	Taking loans	11	19%
13	Payments of interest	10	17.2%
14	Farm budgets	16	27.6%
15	Repayments commitments	17	29.3%

The frequency and percentage for each category of each variable listed under risk management strategies of the respondents are shown in table 4.12. This study consists of 58 respondents. Respondents were select resources were used as price strategies in their farm. Most of the respondents are used "labour salary" and "agricultural support payments" which shows 26 respondents and are 44.8%. Next, 25 respondents for the key of expenses input and output. There is 23 (39.7%) respondent on Intermediate inputs and transport supply chain. Some of the respondents chose small technology implement (37.9% and 22 respondents) while 21 respondents (36.2%) choose raw material cost and 20 respondents (34.5%) choose insurance for labourers due to health conditions. Moreover, 19 respondent (32.8%) was tick Storage facilities and insurance death of farmers due to CoVID 19. There are 17 respondents for repayments commitments and 16 respondents for farm budget. The percentage was (27.6%) and (29.3%). Finally, 10 respondents (17.2%) and 8 respondents (13.8%) were under "payments of interest" and "Seedling rate for your farm".

4.6.3 Production Risk Strategies

Table 4.13 Production risk strategies

N	QUESTIONS	FREQUENCY	PERCENTAGE
1	Number of labour	21	36.2%
2	Operation production cost	29	50%

3	Distribution to inputs supply chain for production	22	37.9%
4	Post-harvest procurement by traders	27	46.6%
5	Resources to continue production	21	36.2%
6	Supply raw material	26	44.8%
7	Time limits production	21	36.2%
8	Quality and quantity of products	20	34.5%
9	Record keeping details of production	13	22.4%
10	Taking time to develop	15	25.9%
11	Fertilizer application	17	29.3%
12	Management control with farm	13	22.4%
13	Communication between farmers to run the production	14	24.1%
14	Narrow production specialization on the farm	15	25.9%

The frequency and percentage for each category of each variable listed under risk management strategies of the respondents are shown in table 4.13. This study consists of 58 respondents. Respondent has selected resources that were used as production strategies on their farm. Most of the respondents are used "Operation production cost" and "Post-harvest procurement by traders which shows 29 respondents and 27 respondents respectively. There are 26 (44.8%) respondents for supply raw material and 22 (36.9%) respondents for distribution to the inputs supply chain for production. Some of the respondents chose the Number of labour, resources to continue

production, and Time limits production were carried (36.2% and 21 respondents) while 17 respondents (29.3%) choose fertilizer application and 15 respondents (25.9%) choose taking times to develop. And narrow production specialization on the farm. The lowest respondents are 14 (24.1%) "Communication between farmers to run the production" and 13 respondents (22.4%) were under Record keeping details of production and management control with farm.

4.7 Analyses confidence level among farmers

Table 4.14 Confident level among farmers during COVID 19 pandemics

NO	QUESTIONS	NOT AT ALL CONFIDENT	ONLY SLIGHTLY CONFIDENT	SOMEWHAT CONFIDENT	MODERATELY	VERY CONFIDENT	MEAN
1	How confident are you that you will be overcome the risk during CoVID 19?	1 (1.7%)	5 (8.6%)	17 (29.5%)	24 (41.4%)	11 (19.0%)	3.67
2	2. How confident are you that you will improve your small farm based on production, financial, marketing, and farmer's increment during a pandemic.	0	5 (8.6%)	18 (31.0%)	19 (32.8%)	16 (27.6%)	3.79

When questions the farmers "How confident are you that you will be overcome the risk during COVID 19?" There is (41.4 %) of the 24 respondents indicated concerns about their workers and farmers. Farmers' confidence level is moderately and 17 respondents are still in doubt in overcoming the risk during COVID 19 Pandemic. There are also 11 (19%) of farmers who are very confident on overcome risk during COVID 19 Pandemics. Moreover, there are still (1.7%) 1 respondent are not confident at all, and (8.6%) 5 respondent was only slightly confident to overcome the pandemic. Other challenges are "how confident are you that you will improve your small farm based on production, financial, marketing and farmer's increment during pandemic'. The 19 (32.8%) farmers respond moderately and 18 (31%) farmers respond somewhat confident because farmers are concerned about employment availability. Next, 16 (27.6%) respondents are very confident on run their farm and 5 (8.6%) respondents are not much confident on farm-based on production, financial, marketing and farmer's increment during pandemic'. Farmers can improve their small farm based on production, financial, marketing, and farmer's increment during a pandemic because the means shows 3.79 meanwhile 3.67 on the confident level on overcoming the risk during CoVID 19.

CHAPTER 5

CONCLUSION AND RECOMMENDATION

5.1 Conclusion

Risk management measures that were thought less important by this group of farmers were discussed. Market, price, and production risks were more significant to farmers in their farm operation. Market, price and market risk management techniques were medium-high because of the CoVID 19 Pandemic. Even though attempting to deal with projects and uncertainly is a common topic in risk management, slight research was done to investigate the risk management among small farmers in market risk, price risk, and production risk. The highest mean in market risk for severity are (n = 3.69) which is "Lack of marketing skills and hard to negotiate better market terms" meanwhile the highest mean in market risk probability are (n = 3.62) which is "Loss market assets" The highest mean in price risk for severity are (n = 3.76) which is an "increase of taking loans" meanwhile the highest mean in Price risk probability are (n = 3.67) which is "over the budget farm. The highest mean in production risk for severity are (n = 3.72) which is "less narrow production specialization on the farm" meanwhile the highest mean in market risk probability is (n = 3.66) which is "Post-harvest lost due to delay in procurement by traders. The top three risk which are "difficult to communicate and sell with customers" for market risk, over budget farm for price risk and low management control for production risk. Top strategies were selected by farmers on market risk strategies, price risk strategies

and production risk strategies are market information can implement, agricultural support payments, agricultural support payments and operation production cost. From the survey overall confident level of farmers to overcome the difficulties during the pandemic is moderate.

5.2 Recommendation

One of the most major disadvantages of this study was the lack of time to identify the farmers, which reduced the sample group of farmers. Another big obstacle is the usage of online and internet surveys. Because the contact information of respondents was unknown, an online survey was believed to be the best way to reach them. The use of the internet to conduct the questionnaire may have resulted in the questionnaire not reaching certain farmers, particularly those with no or limited internet access and those who do not have android mobile. Malaysia should take steps to safeguard agricultural labourers' health. Farmer's disease conditions should be tracked by on-site healthcare providers. To reduce transportation, nations should create agricultural production collecting facilities in easily accessible areas for smallholder's farmers. Agricultural produce collecting centres should be built to hold a lot of things. Moreover, capability to return operations to their previous state before the interruption, whereas learning relates to the ability to enhance activities depending on the disruption's outcomes. To get the accurate risk and risk management strategies based on visiting the farmers and collecting the data.

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