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Do Smallholder Farmers Need Paddy Microtakaful Scheme?

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Abstract: Smallholder farmers play a crucial role in the agricultural sector of developing nations, but they are exposed to a number of risks that could result in sizable financial losses. As an alternative risk-sharing mechanism that can assist smallholder farmers in effectively managing their risks, microtakaful has been introduced. The article intends to propose the Paddy Microtakaful Scheme (PMTS) exclusively for smallholding farmers in Malaysia. This protection is significant for smallholder farmers to provide sustainable economic growth and food security. A few key areas must be observed to understand the necessity of having the scheme. An overview of Malaysia's agriculture sector is presented focusing on land use, employment, and production of food crops among the smallholder farmers. Risks and perils in agriculture, including natural disasters, pests, and crop diseases, are also outlined. The role of PMTS is also discussed, highlighting its many benefits to smallholder farmers. A survey was carried out among 275 smallholder farmers to gain information on their demographic profiles, farming activities as well as their willingness to contribute to the PMTS. The information is vital in developing a suitable and well-accepted PMTS, specifically among smallholder farmers in Malaysia. The PMTS framework presented in this report is based on a hypothetical product that contains four main attributes: 1) types of crops to be insured, 2) type of coverage, 3) contribution or the price, and 4) sum assured/benefit. The scheme includes coverage for natural disasters, pests, and crop diseases with the ultimate objective to reduce the vulnerability of the global food system. Further research will consist of the execution of a pilot program formulated to evaluate the effectiveness of PMTS. With the government's three-way coordination and active roles, the smallholder farmers and Takaful company will become the essential constituents in realizing the PMTS.

Keywords: microtakaful, paddy, smallholder farmers.

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INTRODUCTION

Agriculture in Malaysia aims to turn a traditionally small-scale, productive sector into a large-scale agri-business sector that contributes to growth and sustainability of the economy (COMCEC, 2015). Nearly twenty-four per cent of Malaysia's land area is agricultural land where 7,605,000 hectares is arable and permanent cropland.

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The tropical climate with a humidity level of 90% provides Malaysia's proper conditions to produce various crops. Palm oil, rubber, cocoa, or tea are types of cash crops dominating the agriculture industry and are exclusively grown for sale. These are usually produced in large scale farming for domestic and export markets. In present days, the advancement of modern agro-technology has allowed traditional food crops such as paddy, vegetables, and fruits also to be commercially grown for revenue; particularly in developed countries including Malaysia. Agriculture remains an important sector of Malaysia's economy through its contribution to the national income and export earnings. In 2018, the sector contributed 7.3% or RM99.5 billion to Malaysia Gross Domestic Product (GDP). Oil palm was the major contributor to the agriculture sector's GDP at 37.9%, followed by other agriculture, including food crops at 25.1% for the year 2018. The sector continues to be one of the vital growth engines with a 2% increase in productivity growth in 2019, employing 10.36% (Malaysia Department of Statistics, 2018).

Paddy is the most crucial crop in Malaysia as rice is the staple food for many people. The temperature regime and the rainfall distribution in the country are suitable for year-round cultivation of rice. Most farmers, however, plant and harvest rice more or less during the same period. The cycle starts with the paddy plot being ploughed and then flooded with water to grow seedlings (https://www.malaysiarice.com/index.php/en/paddy-plantation-harvesting). This is followed by the gradual reduction of the visible water surface as the height of the darker green paddy plants grow. As the plants continue to mature, they produce grains, giving a golden-yellow colour to the paddy field. Soon after, the field is harvested before it reverts to being a plot of exposed soil. The whole germination process of harvesting takes 120 days (Che Omar et al., 2019).

In Malaysia, per capita rice consumption is 82.3 kg in 2016, which is about 26% of the total caloric intake per day, costing an average of RM44/month per household. Report to Khazanah Research Institute 2019, Malaysia consumed 2.7 million metric tons (MT) of rice, whereby 67% was produced locally, and the rest was imported primarily from Thailand, Vietnam, and Pakistan. The land use of 684,416 Hectares for food crops is mainly dedicated to the cultivation of paddy as rice is consumed in Malaysians' everyday diet. Thus, rice production, which stood at 2.91 million metric tons in 2019, plays a crucial part in the country's agriculture in ensuring national food security. Paddy farmers remain in the B40. MADA reported that these farmers' household income was RM 2,527/month while the national mean was RM6,958/month. Without subsidies, the cost of production (COP) is high. The net profit from paddy cultivation in MADA in 2014 stood at RM2,892/Ha/season, and this is affected by the COP at RM 3,766/hectare/season (Che Omar et al., 2019). The largest contributions to the COP are land rental and machinery, at 42% and 30%, respectively, while input and labor costs contributed less (Table 1).

Currently, there is no stand-alone crop insurance or takaful scheme available in Malaysia. Additionally, as provided by the private insurance sector, coverage is not sufficient as Malaysian farmers also face other loss exposures such as drought, crop disease, climatic changes, pest outbreak, reduced rainfall, and the variability of crop production loss of harvest, and landslide. Hence, the need for a comprehensive crop and plantation takaful scheme is crucial, considering the impact of the above natural perils that have caused substantial economic loss to the country (Alam et al., 2020; Salleh et al., 2021; Azizan et al., 2022).

Fair contribution for smallholder farmers must be adopted to attract the plantation community towards the proposed Paddy Microtakaful Scheme (PMTS). An integrated and holistic protection scheme outline will ensure comprehensive benefit towards these smallholder farmers while reducing risk aversion and building resilience. In this research, researchers investigate necessary preliminary information in developing PMTS. There are several areas of concern related to cash crops that need to be reviewed. The central objective is to elaborate on the crop disaster damage cost incurred and the development of PMTS. This objective is relevant to provide insight into PMTS and present a policy drawn from this research.

Table 1 Cost of production breakdown and net profit for a renter in MADA, 2014 (RM/Ha)

Description	Unit (RM/Ha)	Formula
Gross Profit (per Ha)		
Yield (MT/Ha)	5.54	(A)
Cut-off rate (%)[1]	17%	(B)
Paddy price per MT[2]	1,448.10	(C)
Gross profit (per Ha)	6,658.65	(A) x [100% - (B)] x (C) = (D)
Production Cost (per Ha)		
Land rent	1,591.98	
Input cost[3]	663.40	
Labour cost[4]	343.42	
Machinery cost[5]	1,146.30	
Others[6]	21.16	
TOTAL cost (with input subsidies)	3,766.26	(E)
Input subsidies[7]	1,466.60	(F)
TOTAL cost (without input subsidies)	5,232.86	(E) + (F) = (G)
Net Profit (per Ha)		
Net profit with input subsidies	2,892.39	(D) - (E)
Net profit without input subsidies	1,425.79	(D) - (G)

METHODS

A survey was conducted to gather information on smallholder farmers; demographic profiles, types of crops grown by them, types of perils, and the community's affordable premium. A sample of 275 smallholder farmers generated by the Federal Agricultural Marketing Authority (FAMA) identified to participate in the survey. Information gathered through a questionnaire survey designed into three sections. The first section investigates the smallholder farmer's agricultural operations and the selection of natural perils. Meanwhile, the second section of the questionnaire requests the respondents to state the affordable contribution for the takaful scheme. The last section accumulates the demographic profiles of smallholder farmers.

Some essential information must be drawn from selected stakeholders to achieve the Crop Microtakaful Scheme structure. Thus, focus group discussion (FGD) held among related agencies such as the Ministry of Agriculture and Food Industry (MAFI), Malaysian Takaful Association (MTA), Bank Negara Malaysia (BNM), and Majlis Keselamatan Negara (MKN). The discussion is necessary to draw some vital information about designing a framework: product, the sum insured, contribution and parametric. The meeting was intended to gather information from the industry experts regarding the proposed framework outcomes as their perceptions and opinion play an essential role in conducting the smallholders' farmers takaful framework.

RESULTS AND DISCUSSION

The preliminary findings from the survey can influence decisions at many levels regarding cash crops disaster damage in formulating the PMTS. Based on 275 responses obtained, a demographic profile of respondents is presented in Table 2. Eight demographic characteristics are discussed, which include gender, age, race, education level, state, number of family dependent, type of housing, and housing status to describe the sample characteristics. The majority of the respondents are male (81.5%) compared to female (17.8%), who mainly come from the age group between 31 to 50 years old, which accounted for 52.7%. This is followed by 35.2% elder respondents with more than 50 years old and 12.0% of young smallholder farmers with less than 30.

Most respondents are smallholder farmers on the East Coast of Malaysia (Terengganu, Kelantan, and Pahang), which accounted for 40.3%. Meanwhile, 37.5% of the respondents are from the northern states (Kedah and Pulau Pinang), 13.5% from Johor and a small percentage of 8.7% is from Selangor. In terms of race, most respondents are Malay (96.0%), with a small fraction of Chinese and Indians (2.2%). The majority of the respondents accounting for 54.9%, received education at the secondary level, and 26.9% at the tertiary level. A large percentage of the respondents, comprising 92.3%, live in bungalows, whereas 3.3% are in semi-detached housing and 4.4% live in terrace houses. The majority of them (89.4 per cent) live in houses and land, and the rest either rent their homes, rent the land, or squat. Table 2 illustrates the demographic profiles of the respondents.

Table 2 Demographic Profiles of the Respondents

Respondent's Characteristics	Percentage(%)
Gender	
Male	81.5
Female	17.8
Age group	
Below 20	0.7
21-30	11.3
31-40	29.1
41-50	23.6
51-60	18.5
Above 60	16.7
Race	
Malay	96.0
Chinese	1.5
Indian	0.7
Education	
SRP	22.5
SPM	32.4
Diploma	22.2
Bachelor Degree	4.7

State	
Terengganu	17.8
Kelantan	18.5
Pahang	4.0
Kedah	18.2
Pulau Pinang	19.3
Selangor	8.7
Johor	13.5
Number of Family Dependent	
3 or less	49.8
4 to 6	42.5
7 to 9	7.7
Type of Housing	
Terrace	4.4
Semi-Detached	3.3
Bungalow	92.3
Housing Status	
Personal house and land	89.4
The personal house rented land	1.8
Personal house, temporarily occupied land	2.9
Rented House	3.7
Temporarily occupied house	2.2

Table 3 shows the farm size, cost, and income of the respondents for each farmland's acre. The data indicate that, on average, the smallholder farmers spent RM3719.94 to cultivate their cash crops with an average income of RM7069.19. However, it must be noted that the data is taken across different types of cash crops and farming methods.

Table 3 Farm Size, Cost and Income of the Smallholder farmers

	Average	Average per acre
Cost (RM)	7080.80	3719.94
Income (RM)	13456.10	7069.19
Size of the farm (acre)	1.9	-

In order to create a practical and sound crop takaful protection scheme, we are proposing the following Paddy Micro Takaful Scheme (PMTS) Scheme (Table 4).

Table 4 Proposed Paddy Micro Takaful Scheme (PMTS)

Themes	Items
1. Name of the scheme	Paddy Micro Takaful Scheme
2. Crop Insured	Paddy
3. Peril Covered	Natural disaster Pests Diseases
4. Sum insured	The total cost of input material per hectares
5. Contribution Fee	TBA
6. Period of cover	The insurance coverage starts from the date the certificate of coverage (CIC) or seed growth (coleoptiles) is issued, whether directly seeded or transplanted, and continues as long as the coverage remains in effect.
7. Insured	Smallholder farmer (Income –less than RM4,000 per month)
8. Technique	Parametric cover

The parametric technique in disaster protection is the most appropriate insurance options. The parametric tools used a payout model as compensation for the PMTS to quantify actual damage. It also makes a much quicker payout, as no loss adjusters are necessary to measure the damage after the incident. In the event of a loss, losses can be dealt with quickly, and cases are processed more reliably and consistently with other insurance options via the parametric program outlined in Figure 1.

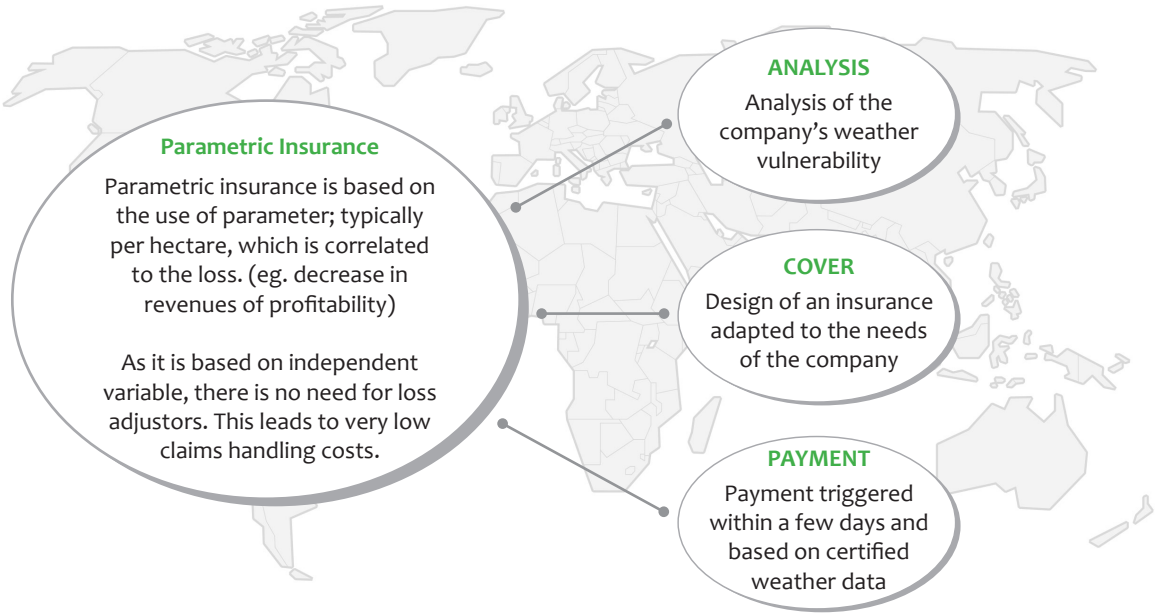

Figure 1 The Parametric Based Insurance (PBI)

Contribution of Food Crops to Domestic Demand and Food Security

Nearly twenty-four per cent of Malaysia's land area is agricultural land, where 7,605,000 hectares is arable and permanent cropland. The tropical climate with a humidity level of 90% provides Malaysia's proper conditions to produce various crops. In this report, we focus on paddy, which dominated the supply for domestic demand. Table 5 shows the land use (in hectare) and production (in metric tonne). On average, a Malaysian citizen consumes 82.3 kilograms of rice per year. Thus, rice production, which stood at 2.91 million metric tonnes in 2019 plays a crucial part in the country's agriculture in ensuring food security.

Table 5 Paddy Land Use and Production the year 2015-2019

Crop Type	2015	2016	2017	2018	2019
Land Use (hectares)					
Paddy	681,086	688,770	685,548	700,306	684,416
TOTAL	953,575	947,309	956,677	957,557	946,704
Production (Metric Tonnes)					
Paddy	2,741,404	2,739,606	2,570,513	2,639,916	2,912,203
TOTAL	5,883,212	5,600,046	5,066,650	5,178,062	5,597,817

Table 6 Total Number of Paddy Cropping Farmers by State for the Year 2019

State	Paddy
Johor	1,017
Kedah	56,964
Kelantan	24,077
Melaka	952
Negeri Sembilan	1,086
Pahang	4,833
Perak	22,321
Perlis	13,371
Pulau Pinang	6,623
Selangor	9,632
Terengganu	6,058
TOTAL	146,934

Agricultural development plays a significant role in improving the country's food security by increasing food quantity and diversity (Qaim, 2020; Sekaran et al., 2021; Viana et al., 2022). The development also acts as a driver of economic transformation because it has become the primary income source for an estimated 350,000 farmers in Malaysia. Of total employment, 10.36% reported in Malaysia's agriculture sector in 2019. In Table 6, you can see the number of paddies that the state will use farmers in 2019, which will total 146,934. Therefore,

the farming community needs to earn sufficient income from their paddy harvest, which directly determines its food security. Development in agriculture includes technological advancement in producing high-quality seeds and fertilisers for better crops and harvest—also, the improvement in irrigation systems and planting techniques to increase yields per cultivation area. Nevertheless, development is also necessary to protect their crops from the risks and uncertainties of the future. This way, highlighting the Paddy Microtakaful Scheme's significance for smallholder farmers' community for the agriculture sector's sustainability is made apparent.

Crop Insurance/Takaful in Selected Countries

Crop insurance schemes provide more than just protection from risk. It plays a vital role in keeping the agriculture industry functioning (Zakaria et al., 2020; Hazell & Varangis, 2020; Jha et al., 2021). Crop insurance in many countries is considered necessary. Agricultural producers, including farmers, purchase it, ranchers and others to protect against either the loss of their crops due to natural disasters or the loss of revenue due to declines in agricultural commodities' prices (Graddy-Lovelace, 2021; Belasco & Smith, 2022). The authorities are using a combination of subsidies and education to increase the acceptance of relevant policies in crop insurance.

Historically, agricultural insurance policies were costly, under-appreciated and lacked numbers for government, insurance and farms to make it a responsive proposal. Crop insurance in some countries is either federally subsidised or unsubsidised. Insurance subsidies often used to achieve multiple goals: to increase agricultural production and exports, to improve equality of coverage, to shore up farm incomes, to substitute for safety net and disaster assistance spending, to provide disaster assistance money on-demand when disasters strike, and to insulate agricultural credit programs from bad debt, in ASEAN countries such as the Philippines, Vietnam, and Thailand, subsidies provided for agricultural insurance, with social and personal benefits. Agricultural insurance is widely practised worldwide in developed and developing countries (Wandel et al., 2019). Figure 2 tabulated agricultural insurance generally implemented in most ASEAN countries such as the Philippines, Thailand, and Vietnam. Meanwhile, other ASEAN countries are steering towards employing insurance. However, Malaysia is still at the stage of finalising the insurance policy.

Smallholder farmers play a significant role in the agricultural sector, particularly in developing countries (Bizikova, 2020; Mizik, 2021; Yi et al., 2021). However, they are exposed to various risks that can cause significant financial losses, such as adverse weather conditions, fluctuating prices, and crop diseases (Daud et al., 2016; Shahzad & Abdulai, 2020; Bhowmik et al., 2021, Elahi et al., 2022). They also need to plan for old age such as a pension scheme (Foziah et al., 2018) starting from successful risk management planning in their jobs as smallholder farmers (Garba et al., 2022). These risks can result in reduced yields, income instability, and even poverty. Microtakaful has emerged as an alternative risk-sharing mechanism that can help smallholder farmers manage their risks effectively (Garba et al., 2022). Microtakaful is a Shariah-compliant form of microinsurance that aims to provide affordable and accessible insurance products to the underserved population (Ali et al., 2020; Ashfaq & Zada, 2021). However, in Malaysia, agricultural insurance policies have been introduced several times, but never with much success. Private commercial insurance for cocoa, fruit, coconut oil palm, and rubber for plantation export crops has limited since the 1980s. The plantation or forestry fire policy and additional hazards insured for all these crops. Malaysia's general planting crop policy only focuses on a widely known issue, such as insurance for growing trees such as palm oil and rubber.

Two insurance companies offer a large scale of plantation crop insurance, Syarikat Takaful Malaysia and Lonpac Insurance Berhad, but private insurance coverage is limited. The costly expenses of implementing crop insurance are the main factor why the government faces a delay in introducing crop insurance to the Malaysian

farmer's community. There is no government support for agricultural insurance in Malaysia at present. However, the government extended assistance in crop compensation programmes during public disasters. Affected crops are rubber, oil palm, cocoa and coffee, and covered hazards including fire, flood, windstorm, animal damage (elephant) and insect damage (bagworms). The compensation plans were obligatory for the settlers and participants in the FELDA, FELCRA and RISDA systems. The government-funded the compensation funds directly or the government rubber with the cessation of the rubber exports of the grower and the government. The government has raised its allocations for the Minister of Agriculture and Agri-based Industry from 4.4 billion RM in 2019 up to 4.9 billion RM in 2020 to boost farmers' earnings in line with the program innovations and improvements.

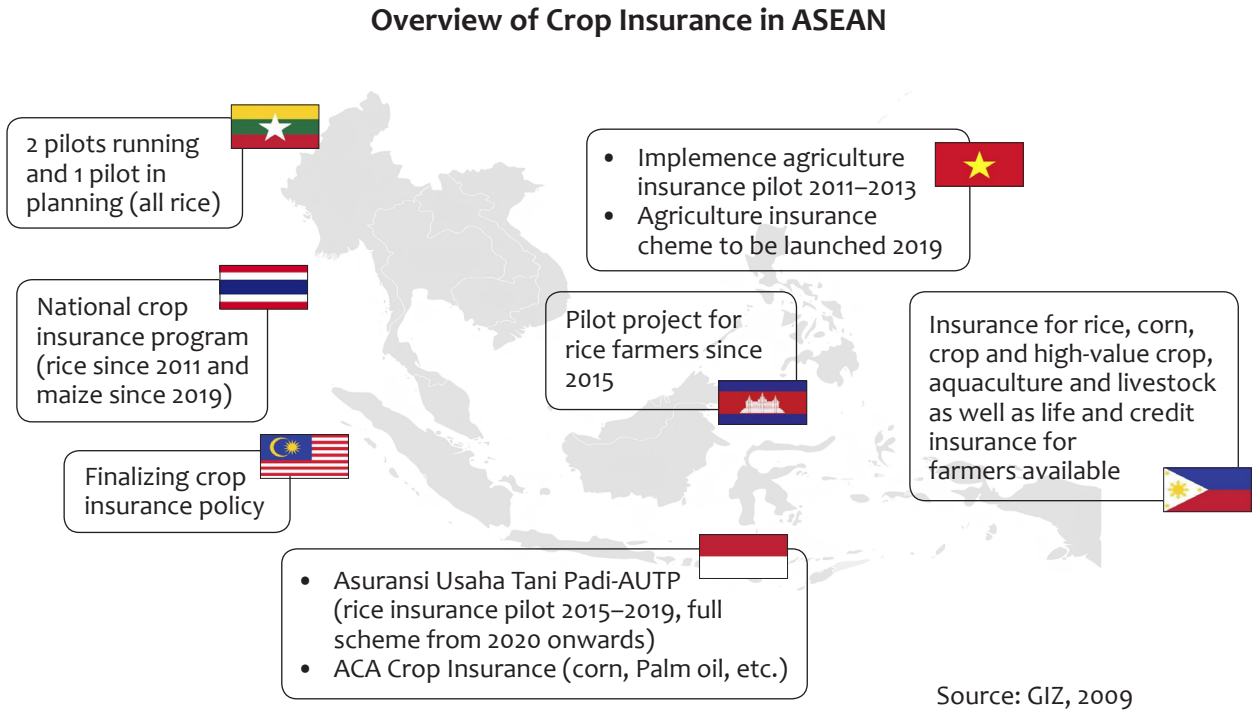

Figure 2 Overview of Crop Insurance in ASEAN

Therefore, for large-holder farmers, the government should consider crop insurance and focus on smallholder farmers. Agricultural insurance should not only be especially appealing to cover smallholder farmers, but it also needs to be a cost-effective scheme for smallholder farmers.

CONCLUSION

In conclusion, the Paddy's Microtakaful Scheme has the potential to provide smallholder farmers in the paddy cultivation sector with financial protection against a variety of risks, including production-related risks, price-related risks, and weather-related risks. The design and implementation of the scheme have a number of strengths, including the fact that it is affordable, that it complies with Shariah, and that it provides adequate coverage. However, there are obstacles that need to be overcome, such as a lack of awareness among farmers, operational challenges in the implementation of the scheme, and restricted access to financial services.

These problems need to be resolved. The research presents a number of suggestions for overcoming these obstacles, such as raising farmers' awareness of the issue, enhancing distribution channels, and tightening the regulatory framework. The findings of this study have implications for policymakers, regulators, and industry practitioners who are interested in promoting financial inclusion and enhancing the resilience of the agricultural sector. In general, microtakaful possesses a significant potential to contribute to the development of inclusive and sustainable insurance markets in developing countries, particularly for underserved populations such as smallholder farmers. This is especially true in the case of smallholder farmers. Developing countries, such as Malaysia, comprise three individuals: the rich, middle-class, and poor. Undoubtedly, income protection is vital for everyone; however, the priority of each group varies accordingly. In most cases, individuals who have better income choose the best Takaful protection plan, whereas those who can only afford low contribution rates would prefer a cheaper method. The government generally provides takaful schemes to its citizens, especially those from low and middle-income backgrounds. The formation of the PMTS is expected to help policymakers demonstrate their seriousness in improving the poor's welfare and those in informal sectors. PMTS provides financial mechanisms for protecting and promoting a good income protection plan by ensuring that middle and low-income citizens have access to income protection. In the absence of a PMTS, many poor farmers suffer if their breadwinner dies or losses the ability to generate income. Also, some of them are burdened with the debt left by the unfinished agriculture activities. The availability of PMTS benefits both individuals and the whole community, such as a farmer's ability to for the sustainability of the agriculture sector. PMTS can also play a role in poverty reduction and increase personal savings for the future. The framework includes coverage for natural disaster, pest and crop diseases with the ultimate objective to reduce the vulnerability of the global food system. Finally, the country's economy will flourish with a healthy and well-earning society. Hence, this study can reduce the community's dependence on the government with stakeholders' involvement in contributing a certain sum as part of their corporate social responsibility initiative.

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