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CONCEPTUALISING RESILIENCE LIVELIHOOD STRATEGIES OF PADDY FARMERS TOWARDS MALAYSIA NATIONAL FOOD SECURITY AGENDA

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Abstract

The paddy production in Malaysia is characterised as small-scale agriculture, with modest plots of less than 2 ha and approximately 194,000 farmers employed. Majority of these farmers primarily rely on low-income agricultural production. This situation was exacerbated by the COVID-19 pandemic in the first quarter of 2020, resulting in a 3.11% reduction (17.03 million tonnes) in the overall agricultural output across Southeast Asia. Rural communities are recognised as vulnerable and must adapt to these sudden changes. Despite the vulnerability and shocks experienced by rural communities, especially paddy farmers, the resilience of sustainable livelihood for staple food is the main issue to be taken into consideration. Sustainable livelihoods, which are closely related to rural development communities, serve as the primary force behind the preservation of the economic well-being in rural areas. The primary concern is the lack of imperative strategies to empower the paddy farmers and key stakeholders in the staple food ecosystem in facing uncertainties and shocks. The Sustainable Livelihood Framework has been adopted since 1992 in several countries and international organisations to eradicate poverty. However, this framework raised an issue as a generic concept and required further enhancement to visualise the response to uncertainties and shocks. The framework's adaptability to climatic and non-climatic food insecurity is dependent on the adaptation strategies that are based on socioeconomic and cultural factors, such as household composition, gender, household asset distribution and external instructions.

Keywords: Livelihood Strategies, Resilience, Food Security, Paddy Farmers and framework

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INTRODUCTION

Approximately 8.9% of the global population are experiencing hunger. This trend indicates an increase of 10 million within a year. In 2019, nearly 750 million people, or approximately one out of every ten people, on the planet faced adverse food insecurity. The 2030 Agenda for Sustainable Development's Target 2.1, 'By 2030, end hunger and ensure access to safe, nutritious, and sufficient food for all people, particularly the poor and people in vulnerable situations, including infants, throughout the year', will remain unfulfilled unless relevant stakeholders at all levels, from the subnational to the global, take imperative and consistent actions to overturn the current trends. The COVID-19 pandemic will expose more people to face food insecurity, unless immediate action is taken (FAO, 2020).

In line with the global agenda, Malaysia has undertaken a comprehensive approach to address food security. The demand for food is increasing every year, a scenario that mirrors the challenges encountered on a global scale. In 2017, Malaysia imported 9.7 billion USD of food and beverage products, indicating a rise of 3.5% compared with that in the previous year (MARDI, 2020). Although the country's food production is low, the primary focus must be placed on rice production. Rice is a staple food not only for Malaysia but also for many other Asian nations. At present, Malaysia produces 2.4 million tons of rice. However, the consumption trend of rice to satisfy the local demand is approximately 3.4 million tons annually. Consequently, the country is compelled to import rice from various countries to meet the local demand. In 2018, this additional supply was obtained from rice-producing countries, such as Thailand (48.8%), Vietnam (25%), Cambodia (8.2%), India (7.8%), Pakistan (5.5%), Singapore (2.6%) and Myanmar (1.4%) (Tridge.com, 2020).

The scale of the economy in Malaysia is a contributing factor that poses challenges in achieving 100% rice self-sufficiency (SSL) (R. Badaruddin et al., 2020). In addition, paddy farmers, who play a crucial role in producing the country's staple food, serve a significant role in the supply chain to meet the local demand. Paddy farmers also experience various challenges and uncertainties in operating this sector. Farmers serve as one of the most crucial components in guaranteeing the nation's food security, underscoring the necessity for concerned parties to consider their livelihood. In 2016, Malaysia had a workforce of 14 million people. Out of this total, 1.6 million people worked in Category A (agricultural, forestry and fishing), accounting for 11.4% of the overall workforce. A closer look at the agriculture industry revealed that the food production sub-sector employs nearly 500,000 farmers. Paddy farmers account for approximately 200,000 people in this sub-sector. Previous agricultural policies were efficient in eradicating hard-core poverty over time. However, farmers remained poor compared with their contemporaries in other occupational

categories. According to the 2016 MADA Annual Report, paddy farmers in the region had a monthly household income of RM2,527. In 2016, paddy farmers earned less than the national median household income (RM5,228) and mean household income (RM6,958), with paddy farmers falling into the B40 income group. In an idealistic situation, the issue of a paddy farmer's livelihood should be considered as part of a larger picture, and the effort should holistically address their contribution towards the national food security agenda (Khazanah Research Institute, 2019).

Problem Statement

The primary concern is the lack of imperative strategies to empower the paddy farmers and key stakeholders in the staple food ecosystem to effectively confront uncertainties and shocks. Understanding the fundamental issue to face the emerging issues that hindered the progress of their production's productivity may help in advocating policymakers for future action plans. This research attempts to contribute to the body of knowledge on the expanded model of sustainable livelihood framework, specifically on resilience strategies to empower the livelihood of paddy farmers. Since the establishment of the sustainable livelihood model in 1999, a few more expanded models had been formulated to eradicate poverty. This study attempts to support the direction of global and national policies to address the current issue of food security. A few national policies and global agenda are Sustainable Development Goals (SDGs): SGD 1 (No Poverty), SGD 2 (No Hunger) and SGD 17 (Partnership). In line with the direction of the national policy — the Twelfth Malaysia Plan (12th), which has just started from 2020 to 2025, the core of economic empowerment focuses on strategies to reform the agricultural sector and develop resilient rural areas. The core of social re-engineering also focuses on the vulnerable B40 income elevation and job creation for locals:

1. Rural Development Policy (2019–2030);
2. Rural Physical Planning Policy (2017–2030);
3. National Agro-food Policy 2.0 (2021–2030);
4. National Food Security Action Plan (2021–2025).

LITERATURE REVIEW

Agricultural Sector in Malaysia

The global situation of agricultural transformation is typically not stimulating. The development of the world agricultural sector shows a decrease in the share of agriculture in GDP, whilst the non-agricultural sector successfully increases. Consequently, the declining employment opportunities in the agricultural sector contributed to the limited number of jobs in the rural areas. The transformation

of the agricultural sector in Malaysia is also experiencing the same trend as is happening in the world today. The share of agricultural GDP in the country's total GDP dropped from approximately 46% in 1961 to 7.7% in 2018. Non-farm and non-rural agro-industrial processing provided an additional 6.3% of GDP in 2010. The ratio of agricultural employment to total employment also decreased from 37% in 1980 to 27% in 1991 and 11.1% in 2018. In the 1960s, this ratio accounted for almost two-thirds of the total employment. By 2014, the industry's contribution to the GDP had reached a ratio of 40%. In 1987, production surpassed agriculture as the main sector for the first time: 22.6% compared with 21.7% (World Bank Group, 2019) (**Figure 1**). Since then, the growth of the modern industrial economy has been the main focus of livelihoods amongst the Malaysian population. This opportunity is available in urban areas, acting as a motivating factor to the migration of the rural population in pursuit of continued survival. This pattern is seen as one of the major and significant aspects to be strengthened because its effect would cause the deterioration of the rural agricultural sector over time.

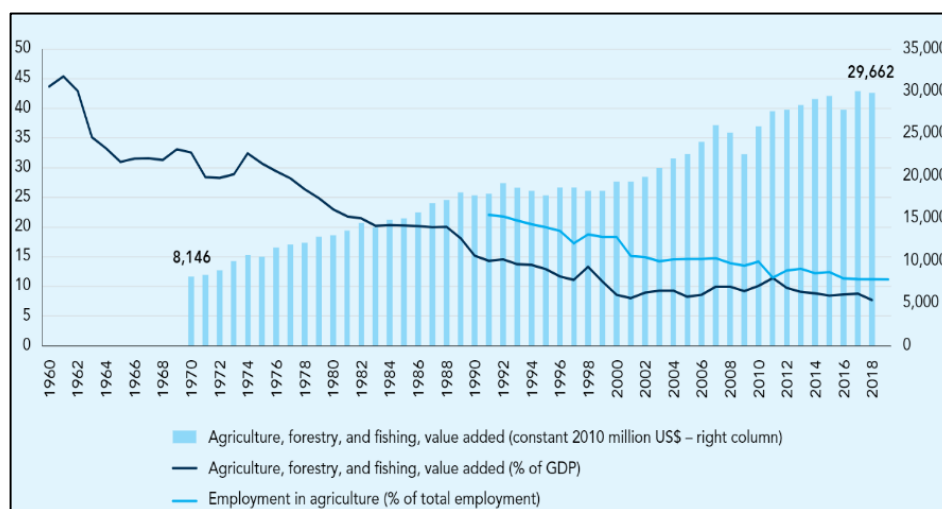


Figure 1: Trends of Agricultural Sector in Malaysia

Source: World Bank Group (2019)

Challenges In Paddy Agriculture as A Staple Food in Malaysia

According to Dardak (2021), Malaysia's agricultural sector is divided into two, namely, plantation and food production. The plantation sector efficiently performs. The value of palm oil in the export reached MYR 90 billion per year. However, the food production is considerably behind the neighbouring countries. Currently, 5.8 million hectares of land is cultivated to oil palm compared with 1 million hectares of land that are left for food crops. In the context of livelihood,

income from cultivating food crops is not promising and fails to attract farmers to engage in this type of agriculture. Modern farmers have begun to feel that palm oil is easier in terms of maintenance, and its price is more stable compared with that of food crops. However, numerous farmers have stopped planting food crops and started working on palm oil plantations, even selling the agricultural land to be developed as an industry, housing and other land uses. In these issues, various factors contribute to the country's food source crops. The lifespan of most food crops is only within a few months and years compared with that of palm oil, which lasts for up to 25 years. Food crops also have a high turnover rate and require substantial amount of human labour. Farmers also need to use fertilisers and pesticides in producing food crops, and the resources to obtain these planting aids must be imported from abroad. The price of this product is also rising due to the volatility and weakness of the purchasing power of the Malaysian currency. Furthermore, the management of these food crops entails dealing with the risk of diseases and pests. Paddy farmers must deal with blast diseases.

Paddy is a staple food in Malaysia. Paddy is Malaysia's most significant crop in the food subsector for two reasons. For instance, rice is the bulk of the population's basic meal. Malaysian adults eat 2.5 dishes of rice each day on average (Kasim et al., 2018). Second, the crop is the principal source of income and livelihood for the paddy farming community, particularly for small-scale farmers and landless agricultural labourers (R. Badaruddin et al., 2020). Malaysia's population increased to 32 million, and it is expected to increase to 37 million by 2030. The government places a high priority on addressing the challenge of ensuring adequate food supply to ensure it remains sustainable and adequate. This aspect can be shown by the SSL percentage indicator as a measure of food security. Rice, which is a staple food, is not at a good level (68.7% in 2018 compared with 73% in 1990) (**Figure 2**). Population growth and demand trends for food, especially staple foods, are very closely linked and have an effect on the country's SSL. This effect can be seen where population growth has changed the SSL rice landscape with a decline yearly. Hence, Malaysia must import more rice from the neighbouring countries, such as Thailand, Pakistan, India and Vietnam, to meet the needs of its population.

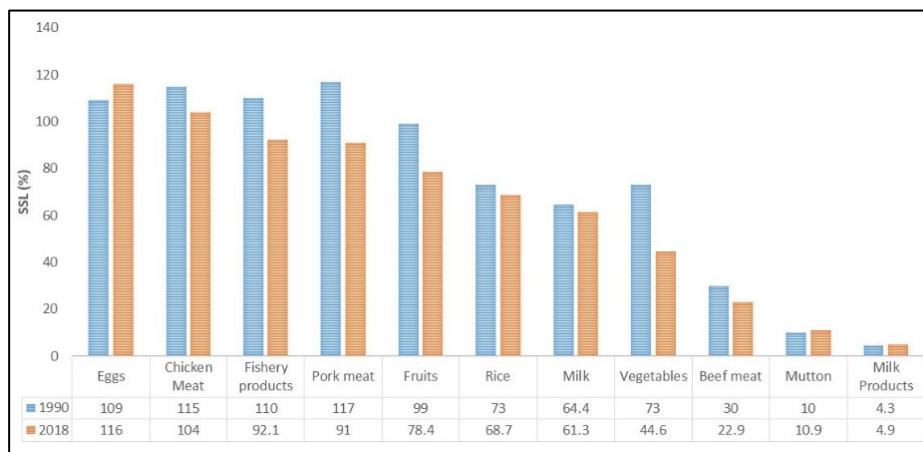


Figure 2: Self Sufficiency Level of Selected Agri-Food Commodities (%) 1990 to 2018
 Source: Department of Agriculture (2019)

Livelihood Challenges of Paddy Farmers

The rural community has been described as the most vulnerable community to climate change due to their reliance on agricultural production towards their livelihoods (Morton, 2007). The socio-economic status of farmers (immediate and most vulnerable) is greatly affected climate change. Climate change causes crop destruction, low productivity and high cost of production, resulting in loss of farmers' incomes, high poverty levels, high inequality and a decrease in farmers' active participation in agriculture (Alam, 2012). The findings of the study also show that the off-farm wage rate is higher than the agricultural profits. Consequently, farmers attempt to engage in part-time farming. The government has formulated rules to produce specific crops in a particular region. However, farmers switch crops due to changes in agricultural profitability. Hence, the paddy production area has been slowly declining over the last few years.

Alam et al. (2020) showed that climate change, crop disease, loss of livestock, loss of fertility of the soil, price variability, floods and deforestation are amongst the sources of risk faced and identified by farmers in Malaysia. Climate change, floods and crop disease are the major risks that farmers face. To adapt, farmers have prepared their strategies to stay afloat in pursuing their livelihood. Amongst the key strategies identified are delaying the sale of crops, off-farm income, different planting dates, working on crop diversification and using more advanced technologies. Although Malaysia strives to be self-sufficient in terms of food production, particularly for rice as a staple food, urbanisation and the moving of rural populations due to migration have resulted in decreased agricultural productivity, which can be attributed to the shortage of manpower to cultivate the land (Marzuki, A., & Jais, 2020). A system that

incorporates stakeholders' integrated roles is required to achieve Malaysia's sustainable agricultural strategic plan. Policymakers and planners play a vital role in the recognition of advantages and other components that contribute to the sustainability of the agricultural system throughout the planning and implementation of integrated support systems for agriculture (Ramaloo et al., 2018).

Malaysian Food Security Agenda

Food security exists when all people have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and preferences for an active and healthy life (FAO,2008). Food security is not a new issue in Malaysian national policy. A long-standing national agricultural policy priority for decades has been to solve food security challenges driven by rice, the country's staple food. This situation explains why the Malaysian government insists on rice self-sufficiency as a critical national policy goal. The government's stance on food security is referred to as complete dependence on domestic production without supplement from external sources. The government made an extraordinary policy decision in its most recent national development plan to pursue an autarky economy in the rice sector, thus closing borders to foreign markets in the future. Thereafter, the government resolved to seek and aim for total rice self-sufficiency by 2020 as part of the national policy goal reformulation. However, under the new Sustainable Development Goals, this goal has been extended to 2050, the National Transformation 2050 (2020–2050) (Tapsir, 2019). Accordingly, more serious efforts are focused on enhancing production, support systems and services and strengthening the food value chain under the Twelfth Malaysia Plan 2021–2025, which will further contribute to the food system's resilience. The agro-food sector will be heavily influenced by modernisation through IR4.0, mechanisation and technological adoption to improve the contribution of total agriculture value-added to the gross domestic product (GDP). The National Agro-Food Policy (NAP) 2021–2030, commonly known as the NAP 2.0, reflects MAFI's commitment to food security (Malaysian Agricultural Research and Development Institute (MARDI), 2021).

In the face of the global pandemic challenge, a short-term action plan in line with the Twelfth Malaysia Plan 2021–2025 has been drafted. The National Food Security Action Plan (2021–2025) is currently being created to address urgent and pressing concerns. This plan incorporates recommendations and ideas derived from discussions amongst several ministries, agencies, academics, private sectors and non-governmental organisations. The developed action plans will catalyse change in the face of the food security crisis. This action plan is formulated with five main thrusts, namely, expansion of technological usage, enhancing study and research, strengthening food security data, expansion of

strategic collaborations and strengthening governance amongst the departments and agencies.

Underpinning Theory: Resilience Theory

Holling (1973) invented the term ‘resilience’ to describe the ability of ecosystems with alternative attractors to maintain their original condition in the face of disruptions (Folke et al., 2010). According to Schoon (2005), the definition of resilience is entirely based on C.S. Holling’s work. Almost all of the literature makes reference to the work of C.S. Holling in some capacity. In essence, resilience theory is concerned with the capabilities that people and systems exhibit to overcome adversity (Duplessis Vanbreda, 2001). A few definitions link resilience to the concept of adaptation, which is a particularly relevant extension of resilience. According to Walker et al. (1981; p. 495), ‘resilience is the ability to adapt to change by exploiting instabilities’, and it is not merely ‘the ability to absorb disturbance by reverting to a stable state after being disturbed’. Adger (2003: p. 1) defined resilience as ‘the ability to persist and adapt’.

Three characteristics are crucial: resilience, adaptability and transformability. These elements are interconnected on different scales. In this sense, resilience refers to an SES’ ability to evolve and adapt throughout time whilst remaining within the key limits. Adaptability is a component of resilience. This component refers to the ability to modify reactions to changing environmental factors and internal processes, allowing for continued development on the existing path (stability domain). Transformability refers to the ability to cross thresholds into new development trajectories. We must concentrate on these three key concepts to completely comprehend resilience theory: thresholds, adaptive cycles and panarchy (Pisano, 2012) (**Table 1**).

Table 1: Three Key Concept of Resilience Theory

Resilience Key Concept	
Threshold (or critical transition)	A change in crucial feedback causes the system to self-organise along a different trajectory—that is, towards a different attractor—due to a change in the level or amount of a governing, generally slowly changing variable.
Adaptive cycle	A heuristic model for social-ecological systems and other complex adaptive systems that depicts an endogenously driven four-phase cycle. The typical path is from a phase of rapid growth (Exploitation or Growth, r), where resources are abundant, and resilience is high, through capital accumulation into a gradually rigidifying phase (Conservation, K). Under this phase, most resources are locked up, flexibility or novelty is reduced, and resilience is low. This cycle culminates in a sudden collapse into a release phase (Creative

Resilience Key Concept	
	destruction or Release) of chaotic dynamics in which relationships and structures are destroyed. The r-K dynamics indicate a relatively sluggish, more or less predictable ‘for-loop’, whereas the dynamics represent a chaotic, quick ‘back loop’ that has a considerable influence on the form of the next for-loop. External or larger-scale stimuli might cause a transition from one phase to the next. The growth and conservation phases together make up a relatively long developmental period with fairly predictable, constrained dynamics. The release and reorganisation phases make up a quick, chaotic period, during which natural, human, social, built and financial capital are lost, and novelty can thrive.
Panarchy	The interactive dynamics of a hierarchical collection of adaptive cycles and a set of hierarchically structured scales (of space, time and social organisation). This concept is also understood in terms of how states and dynamics of (sub)-systems at scales above and below the scale of interest influence certain qualities, such as precariousness, resistance and latitude.

Conceptual Framework

A number of cohesive key models are available to address this problem. One of the models is the sustainable livelihood framework (SLF). The SLF model is constructed around five main categories of livelihood assets, visually represented as a pentagon to illustrate their interrelationships and emphasise that livelihoods rely on a combination of different classes of asset rather than just one category (Figure 3). A significant portion of the analysis involves defining people’s ability to access and effectively use various types of assets (physical, human, financial, natural and social). The framework also provides a method for evaluating how organisations, policies, institutions and cultural norms shape livelihoods by identifying individuals who has access to particular assets and defining the type of livelihood strategies accessible and preferable to people. A framework for sustainable livelihoods serves as the basis for analysing community livelihoods. This framework ultimately encourages authorities, policymakers, academicians and other relevant parties to determine where assistance and intervention can be provided (Farrington et al., 1999).

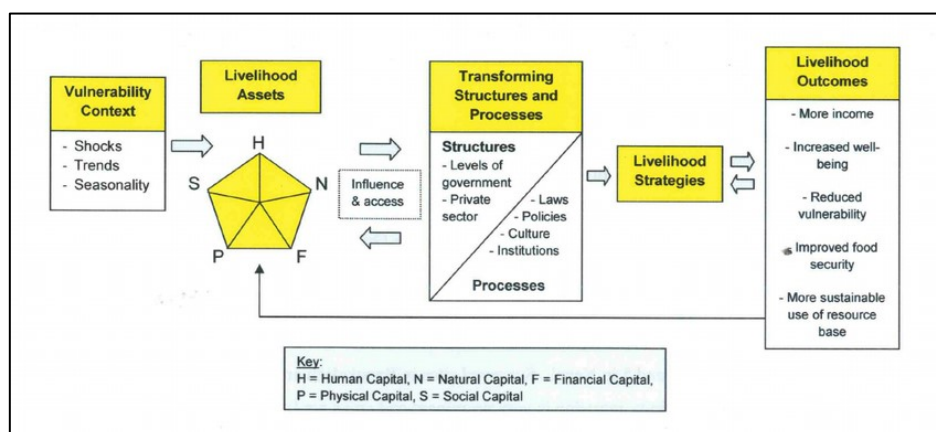


Figure 3: Sustainable Livelihood Framework, DFID (1999)

Although the SLF model has been adopted by a number of previous studies, a section of this model can still be expanded (i.e. in transforming structures and processes). According to DFID (1999), the institutions, organisations, policies and legislation that shape livelihoods are referred to as transforming structures and processes in the livelihood framework. Integration between models is necessary to expand this SLF model, especially in providing resilience livelihood outcomes for paddy farmers. Accordingly, a model introduced by the FAO, specifically to the context of vulnerability, can be integrated with the SLF model. The resilience of the agricultural livelihood model is context-specific and rooted in the community livelihood system (Figure 4). This model leverages a wide range of technical expertise on different types of shocks, agricultural subsectors and the four interconnected priority actions indicated below, which comprise a mix of short-term humanitarian and long-term development and investment interventions (FAO, 2017).

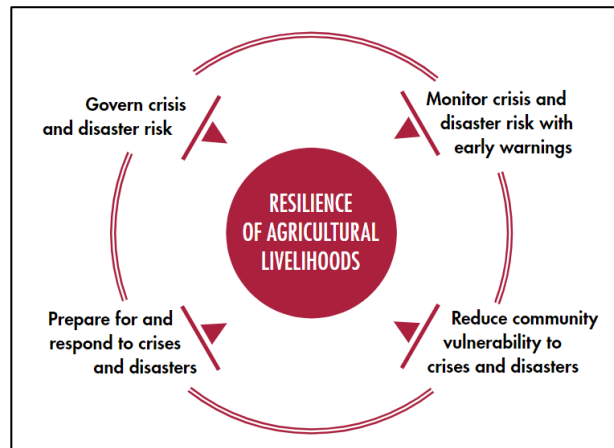


Figure 4: Resilience of agriculture livelihoods model, FAO (2017)

Based on the four main pillars of this model, the vulnerability of paddy farmers must be overcome to achieve long-term and short-term resilience agricultural livelihoods. The description of the four pillars of this model is to govern crisis and disaster risk, monitor crisis and disaster risk with early warnings, reduce community vulnerability to crises and disasters and prepare for and respond to crises and disasters. Furthermore, a model that specialises in integration is essential for stakeholder intervention processes to develop the transforming structure and process section of the SLF model. Accordingly, the model introduced by Wellbrock et al. (2012a) is capable of connecting key stakeholders in a mechanism and process. This model has three large structures (Figure 5), each of which contains several mechanisms or processes. We have the region (rural territory) in the first of these structures, and development actions are generated as a result of the different players' activities and capabilities. A second component is made up of the knowledge and innovation support system (involving academia, private and public institutes, training facilities, consultants, etc.). This system acts as a catalyst for the development of new ideas. Finally, the public sector (which includes a wide range of actors in various public administrations; local, regional and national) is critical to rural innovation processes because it is where a set of public policies and initiatives is planned, organised, directed, implemented and controlled. Such innovation processes are the consequences of the interactions between systems and the numerous players acting in each of them, not merely of mechanisms and actions in each of the three basic systems (Esparcia, 2014).

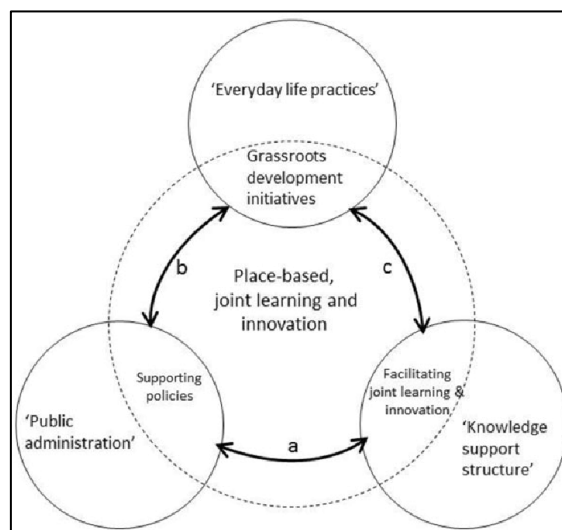


Figure 5: An integrated conceptual framework of rural regional learning (Wellbrock et al., 2012)

The SLF model must be developed and integrated to specifically address the needs of paddy farmers in achieving sustainable and resilient livelihood outcomes. Figure shows the conceptual framework that has been produced through the modification of the aforementioned three models. The first part of this framework focuses on the vulnerability context faced by paddy farmers, particularly addressing the uncertainties that pose challenges to their livelihoods. The second part expands the transformation of structures and processes. The focus will be on shaping influence and access strategies for paddy farmers. In this section, all key stakeholders will be organised and integrated into the paddy farmer's ecosystem. The fourth part of this framework is an intervention or mechanism that acts in the form of a strategy that is applied with a resilience element to produce the outcomes of the livelihoods of paddy farmers (Figure 6). Finally, the primary goal of this framework is to achieve resilience outcomes alongside the livelihoods of paddy farmers. This framework follows an inductive approach in the initial stage to generate a resilience final output in the ecosystem of paddy farmer livelihoods.

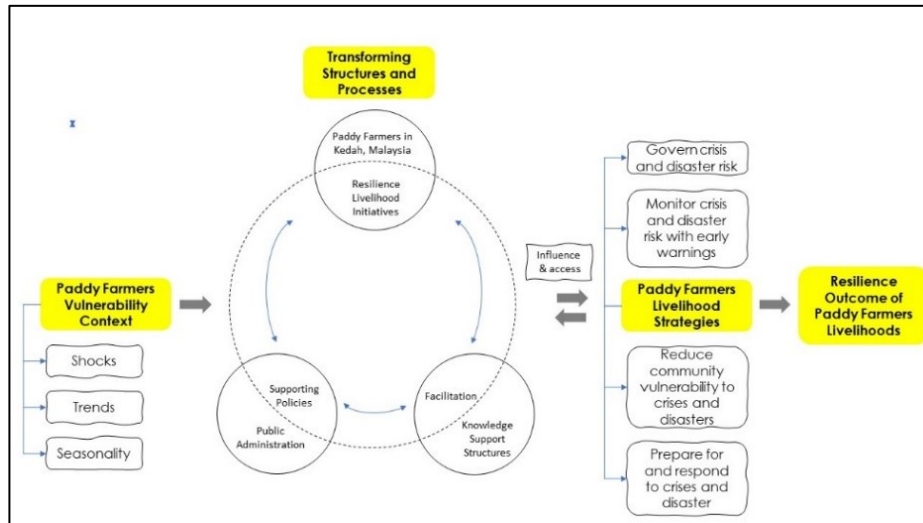


Figure 6: Proposed Conceptual Research Framework

CONCLUSION

This conceptual work aims to address current critical issues, given the heightened importance of food security for the country to ensure a sufficient and dependable national food supply that caters to the needs of all Malaysians. This research approach specifically focuses on the livelihood of paddy farmers, who play a pivotal role in producing rice, which serves as the staple food for the Malaysian population. The proposed conceptual framework has been specifically designed to investigate the vulnerability of paddy farmers, the changes occurring in the structure and processes in the paddy farmer ecosystem, and the livelihood strategies in terms of resilience and adaptability. Lastly, this study has the potential to make practical contributions in enhancing the empowerment of the livelihoods of paddy farmers, who play a vital role in ensuring the security of the country’s staple food. The development of resilience livelihood strategies in the staple food ecosystem may provide the imperative action plans for policymakers to assist in food security assurance. This initiative may help key stakeholders in fostering coordination to achieve the objectives of the food security agenda.

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