

Sustainability Goals of Organic Rice Value Chain and Its Integration on Food Security in Oriental Mindoro, Philippines

Maria Cristina F. Melo

The Graduate School, University of Santo Tomas, Manila

Philippines, Divine Word College of Calapan, Oriental Mindoro Philippines

— *Review of* —
**Integrative
Business &
Economics**

— *Research* —

ABSTRACT

This study aimed to determine the sustainability of the organic rice value chain and its integration on food security in the province of Oriental Mindoro. The attainment of a sustainable value chain involves social, economic, and ecological sustainability goals for organic agriculture. The availability, accessibility, and utilization of organic rice can determine farmers' capability to transform and upgrade their produce for food security. The findings revealed that economic and social sustainability has a strong effect on the value chain's sustainability. Additionally, ecological sustainability is not the main concern of the consumers within the integration of the value chain to food security. The role of the value chain in upholding food security is significantly affected by nutritional information, knowledge, the application of nutritional practices, and the price of organic rice, which is necessary to intensify the marketing strategies.

Keywords: Food security, organic rice, sustainability, value chain.

1. INTRODUCTION

Organic farming is one of the preferences for environmentally sustainable agricultural production. It is an approach within a composite system of established and acknowledged laws and regulations (Pugliese, 2001). Sustainable agriculture is an integrated production system relevant over the long term to enhance environmental quality, efficient use of non-renewable resources and on-farm resources, sustain the economic viability of farm operations, and enhance the quality of life for farmers and society as a whole (Velten et al., 2015). Commercial fertilizers and pesticides have resulted in a diverse increase in the production and efficiency of crops. However, they have obvious harmful effects on soil health, soil microbes, quality of groundwater, and food material. Therefore, sustainable agriculture has intervened to sustain farmers' livelihoods and protect consumers' health; it is an eco-friendly technology that improves the quality and nutritional value of farm produce. The strong need to

invent and innovate strategies and programs of action is necessary to enhance and sustain rice production and attain resilient food security and environmental protection (FAO, 1996).

The further development of sustainable agriculture is signified by integrated farming; organic farming; and agro-forestry, which involves ecological, economic, and social farming systems. An ecological aspect is a factor in sustainable agriculture that aims to balance the ecosystem and biological diversity, alleviate chemical pollution, ensures high soil fertility and clean water, and is animal and human friendly. Furthermore, the economic aspect of organic farming aims to lower the farmer's investment, increase the volume of the yield, lower external input, and maximize local resources. Moreover, the social aspect of organic farming intends to achieve food security, be economically sustainable, satisfy local needs, balance natural ecology, and respect the local culture (FAO, 2016).

Value chain integration is one of the needed documented dimensions of food security, the consistent availability of safe food, individual access to appropriate food, and proper food utility. Food utility describes food processing and storage techniques, adequate knowledge, and applied nutrition (Fowler, 2012). In the long run, value chains are practical approaches to achieving sustainable development, which address the environmental, economic, and social perspectives of sustainability (Brinzan, 2012). In the component of food value chains, food availability and stability address the supply side of food security and are determined by food production, stock levels, and trade. Access to food includes household incomes and expenditures, markets, and food prices, and utilization relates to food distribution within households and individual health status (Zainol, 2015). The sustainability of the value chain is determined by its ability to positively affect value-adding activities on the natural environment, viable/profitable activities, and socially and culturally acceptable outcomes regarding the distribution of the benefits and costs associated with the increased value creation (Neven, 2014). Understanding the value chain can lead to a comprehensive description of the condition of the industry, enabling appropriate and actionable solutions to sustain business continuity (Purbasari, R., Chan, A. 2017).

Food security is divided into two areas: the quantity affecting the availability and access to the food supply and the quality affecting food security's stability and health dimensions (Bazga, 2015). One of the significant challenges of food security is the "price volatility" of a commodity for countries dependent on producers of raw materials. Farmers encounter difficulty in future production decisions because of uncertainty about future prices. Conflicts arise in regions and directly affect the local community's food security, as access to food is limited by high prices.

During his early years, President Marcos promoted the green revolution in the Philippines through the “Masagana 99” program and government support on training and loans. High-yield crop varieties and the heavy use of agrochemical inputs resulted in soil degradation, acidic soil, erosion, salinity in some areas, and a low supply of nutrients for crop uptake, requiring massive amounts of fertilizers to be applied to achieve high-yield goals. This challenge pushed the government and convinced the farmers to adopt ecologically sound and organic, chemical-free methods of sustainable agriculture (Manigbas NL, 2018). Sustainable agriculture for small-scale farmers basically involves an agricultural system that will lead farmers to self-sufficiency. There are different sustainable agriculture systems, including the integrated farming system, organic farming, and agro-forestry. These methods of farming sustain the ecological equilibrium and stabilize farming communities (Talisa Niemmaneea, 2015).

Oriental Mindoro’s rich and arable land is appropriate for agriculture. It produces large quantities of rice, corn, vegetables, coconut, and fruits such as calamansi, banana, rambutan, lanzones, marang, and durian. In 2019, the province was one of the top rice producers, becoming a source of rice for the National Food Authority’s rice procurement target (The Market Mirror “Minding the Nations Business,” 2019). The province of Oriental Mindoro is one of the earliest provinces to respond to the Department of Agriculture’s call to promote organic agriculture, and the province supports the Organic Act of 2010 in the implementation of sustainable organic agriculture. Through regional and provincial field offices, the Department of Agriculture initiated an intervention to reach the program’s target and encourage more farmers to participate in organic farming. On the one hand, organic farming is a sustainable production system, contributing to food security and biodiversity conservation. On the other hand, commercialization is a risk-prone undertaking of the organic farmers that requires capacity and capability to handle challenges of the enterprise development process. Conventional products are typically cheaper than organically produced commodities. Most of the existing literature identified that the demand for organic rice is a common challenge faced by organic farmers; conventional rice is cheaper than organic rice.

Analyses on the drivers influencing the sustainability goals of the organic rice value chain and its integration into food security have brought attention to the need for an appropriate business strategy to improve the growth of the organic rice industry. From the perspective of food security, it is essential to understand the integration of value chain that influences food security issues. Therefore, this study aims to determine the sustainability of the organic rice value chain and identify actors that affect the integration of the value chain into food security.

2. THEORETICAL BACKGROUND

Sustainable agriculture is a farming system that applies a complete method of organic crop growing, including ecological, economic, and social undertakings.



Figure 1: Sustainability Goals of Organic Agriculture

Source: FAO, United Nations, 2015

The figure shows the sustainability goals of organic agriculture, involving the ecological, social, and economic aspects. The ecological aspect of organic farming aims to balance the ecosystem, improve biological diversity, alleviate chemical pollution, create high soil fertility, provide clean water, and be animal and human friendly. The social aspect of organic farming intends to achieve food security, be economically sustainable, satisfy local needs, balance natural ecology, and respect local cultures. Moreover, the economic aspect of organic farming aims to lower the farmer's investment, increase the volume of the yield, low external input, and maximize local resources (FAO, 2015).

The theory of sustainability has been utilized to identify the long-term effect of organic farming on ecology, the economy, and people's social welfare. Sustainability is social, economic, and environmental policy. The importance of sustainability in agriculture is emphasized in programs and projects, and various studies were conducted to determine the sustainability of the organic farming system (Ekard, 2018). In practice, sustainable development requires integrating economic, environmental, and social objectives across sectors, territories, and generations (Emas, 2015).

2.1 Related studies

Sustainable agriculture defines an economic and social form that is long term on a global scale. Sustainability is an environmental, economic, and social policy (Ekard, 2018b), requiring the integration of environmental, economic, and social objectives

across regions, places, and generations. Sustainable development must be implemented through decision-making to achieve an agricultural method that is genuinely sustainable (Emas, 2015). According to Talisa Niemmanee et al. (2015), mixed-crop systems, reducing chemical fertilizer and pesticides; using organic matter, such as manure and other agricultural residues as organic fertilizer; applying knowledge gained from training to production systems management, constant practicing; and sharing knowledge are all essential factors in sustainable agriculture. Findings in Ampadu-Ameyaw (2017)'s research report revealed that quality grain production, processing, and marketing are major challenges in the value chain. Zainol and Fakhrol Anwar (2018) mentioned that respondents had perceived that the components of the food value chain greatly influence food security on accessibility, availability, stability, and utilization.

The sustainability of the value chain is determined by its ability to positively affect value-adding activities on the natural environment, viable/profitable activities, and socially and culturally acceptable outcomes regarding the distribution of the benefits and costs associated with the increased value creation (Neven, 2014).

The integration of the value chain approach into food security involves consistent availability of appropriate and safe food from domestic production, commercial imports, and donors and individual access to suitable food and proper food utilization. The value chain approach ensures that incentives are in place to promote desired behavior, which is an efficient way of achieving desired sustainable results. It is market-driven, which focuses on involving households in growing markets to earn income to purchase additional food. This involvement may diversify people's diets and reduce the risk of relying solely on personal production for food security. It is a systems approach that assists in understanding the systemic impacts of project interventions (USAID, Market Links, n.d.). The value chain is the distribution side of food security. Addressing food security using a value chain approach will vary depending on the context and particular underlying causes of food insecurity, the amount and allocation of project funding, and the capacity of the implementing agency and its staff (Market Links).

2.2 Objectives of the Study

This study determines the sustainability goals of the organic rice value chain and its integration into food security.

Specifically, this study aims to answer the following questions:

1. What are the effects of economic, ecological, and social sustainability on the production and marketing aspect of the value chain of organic rice?

2. What are the factors that influence the integration of the value chain into food security?
3. Based on the findings, what are the recommendations?

3. METHODOLOGY

This study aimed to determine the value chain’s economic, ecological, and social sustainability and identify factors that influence the integration of the value chain into food security. This paper is based on a descriptive quantitative research design using a sample of 60 small-scale organic farmers. This research used survey questionnaires, and the respondents were smallholder farmers and owners of agricultural land practicing organic farming in Oriental Mindoro province. The first part of the questionnaire contained the sustainability of the value chain regarding economic sustainability, ecological sustainability, and social sustainability. Part 2 of the questionnaire focused on factors that significantly influence the integration of the value chain into food security. The questionnaire used a Likert scale to determine whether the respondents agreed or disagreed with a verbal statement that was translated in the local dialect so that the farmers could understand it. Then, the farmers were given ample time to answer the questionnaire. The gathered data were then processed to statistical treatments through the application of regression.

4. RESULTS

This study determined the sustainability of the value chain’s goals in terms of economic, ecological, and social sustainability, based on the interviews, perception of the respondents, and extensive review of the existing literature and related studies.

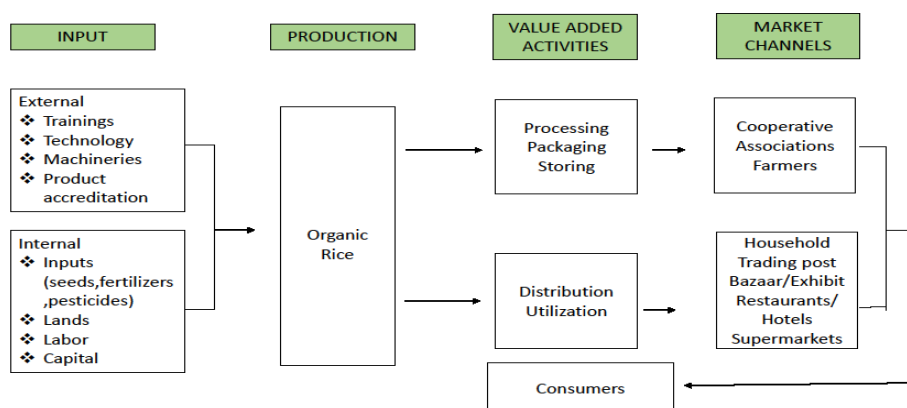


Figure 2: Organic rice value chain

Figure 2 illustrates the existing value chain of organic rice farmers in Oriental Mindoro. Most of the organic farmers were assisted by Provincial Agriculture (PAgO), the Agricultural Training Institute, and the Department of Agrarian Reform through training, technology, provision of machinery, and product recognition. The organic rice farmers were responsible for farm inputs (seeds, fertilizers, and pesticides), lands, labor, and capital. Processing, packaging, and storing were done through a cooperative, organic farmer's associations, and individual private farmers' facilities, whereas distribution and utilization were done in households, trading posts, bazaars/exhibits, restaurants/hotels, and supermarkets.

Suppliers of seeds, fertilizers, and pesticides were not the major concerns for the organic farmers. Most of their seeds were self-pollinated, and they produced their own fertilizers and pesticides. Management practices enhanced the successful production of organic rice. Organic farmers value the importance of the cyclical method of natural resources, which have a positive return on their produce. This method of organic agriculture proved that organic farming activities are sustainable and well managed; considering the contribution of organic system to food security, they are in harmony with natural resources and conservation of the ecosystem. It was found that the value-adding activities along the production and marketing channels were the main concerns of the organic farmers within the chain.

4.1 The effects of economic, ecological, and social sustainability in integrating the value chain into food security

Table 1 presents the sustainability of production and marketing within the organic rice value chain regarding the farmers' perceptions of economic, ecological, and social sustainability.

The findings revealed that economic and ecological sustainability positively affects efficient and cost-effective production. As perceived by the farmers, yield in the production of organic rice is constant. External inputs in organic rice farming are economical because of the availability of local resources. In studies by Meemken (2018), Sitthisuntikul (2018), and Morshedi (2017), organic agriculture was found to be sustainable through the use of available resources, leading to the optimization of production and promotion of food security. Organic farmers were able to make use of local resources, leading to inexpensive external inputs. Canete (2019) and Othman (2016) stated that smallholder farmers recognized the importance of input resources in organic agriculture. Interviews with the farmers confirmed that organic farming is ecologically sustainable because of crop management, physical quality of soil, and water improvement. The practice of organic agriculture is insect- and animal-friendly

and resilient to typhoons, heavy rains, intense heat stress, and prolonged drought.

Table 1 Sustainability goals of organic rice.

| Dependent Variable: Production is efficient and cost effective. | | | | | |
|---|-------------------|------------|----------|------------|--------|
| | | (Constant) | Economic | Ecological | Social |
| | B | 1.259 | .497 | .287 | -.175 |
| Standardized Coefficients | Beta | | .465 | .269 | -.147 |
| | Sig. (two-tailed) | .059 | .003 | .020 | .107 |
| Dependent Variable: Marketing is effective. | | | | | |
| | | (Constant) | Economic | Ecological | Social |
| | B | .658 | .744 | -.004 | .037 |
| Standardized Coefficients | Beta | | .852 | -.004 | .081 |
| | Sig. (two-tailed) | .001 | .001 | .001 | .001 |

However, social sustainability has a moderately negative influence on production because of labor scarcity and lower participation from women. Most of the younger females prefer to work in malls and other business establishments. According to a study by Waleerat Suphannachart and Tittayatorn Boonkaew (2019), younger workers in Thailand had a significant impact on agricultural labor productivity. The labor force, especially workers aged 15–24 years, declined nationwide. Organic farming requires intensive labor that helps to create employment opportunities within the society. Sitthisuntikul (2018) stated that organic agriculture empowers people within a community by involving long-term employment and promoting entrepreneurship that ensures food security.

Furthermore, economic and social sustainability positively affect marketing in the value chain of organic rice. Results have indicated that economic sustainability positively affects the effectiveness of marketing in the value chain. Through partnerships with different sectors, organic rice is available and accessible in the market. The absence of a middleman resulted in a cost-effective distribution system and a well-ordered price of organic rice from the farmers. Most of the farmers had adequate farm-to-market road infrastructure, which facilitated the production and trade of their organic rice, and organic farmers implemented the wholesale and retail market systems. Social sustainability in the marketing of organic rice along the value chain has shown a positive effect of health benefits for consumers; organic rice is

known to be safe and nutritious. However, the ecosystem balance, conservation of natural resources, and biological diversity on ecological sustainability are not the consumers' main concerns. According to the farmers, they committedly and dedicatedly adapted to the environmental law to sustain the ecological balance.

4.2 Factors that influence the integration of the value chain

Table 2 lists the farmers' assessments of the value chain integration to food security. The null hypothesis ($H_0: B = 0$) that "there were no factors affecting food security" from the point of view of the farmers was rejected at a five percent (5%) level of significance. The alternative hypothesis ($H_a: B \neq 0$) that "there were factors affecting food security" was accepted because nine B-parameters were significant at a five percent (5%) level. The test indicated that factors affected the value chain integration into food security.

Table 2 The factors affecting value chain integration to food security.

| | | B | Standardized Coefficients | |
|-----------------------------------|---|-------|---------------------------|-------------------|
| | | | Beta | Sig. (two-tailed) |
| | (Constant) | 1.286 | | .001 |
| Availability | Established mkt. of organic rice | .120 | .306 | .001 |
| | Constant supply of organic rice | .053 | .138 | .001 |
| | Mkt. info system | .058 | .162 | .001 |
| Accessibility | Affordable price | -.026 | -.065 | .001 |
| | Accessible place | .083 | .217 | .001 |
| | Diversified distribution | .105 | .288 | .001 |
| Utilization | Knowledge and Application of Nutritional Practices | .016 | .036 | .001 |
| | Resources | .097 | .265 | .001 |
| | Nutritional info into the value chain | .020 | .041 | .001 |
| Dependent Variable: Food security | | | | |

The findings revealed that the established market, diversified distribution, utilization of resources, accessible place, market information system, and constant supply significantly influence the integration of the value chain into food security. Farmers perceived that established markets were available permanent places recognized and accepted by the government and the community, such as trading posts or cooperatives within the local market. The supply of organic rice in Oriental

Mindoro was available through different distribution channels, such as trading posts, bazaars, and trade fairs, usually in small quantities offered in a kilogram. Canete (2019) found that marketing linkages and established markets were typical concerns for organic farmers. Consumers of organic rice were able to purchase directly from the producers, cooperatives, and trading posts. Similarly, Othman (2016) stated that farmers market their organic rice themselves or through cooperatives. Moreover, nutritional information, knowledge, and application of nutritional practices and the price of organic rice negatively influence the integration of the value chain into food security. Farmers were able to gain knowledge and apply the nutritional information of organic rice in their households. However, it was not indicated or properly integrated into the value chain because organic rice was only introduced in niche markets. Consumers were economically able and can afford the price of organic rice. Farmers perceived that consumer bought organic rice because they believed in the quality of the product, which was available at reasonable prices. Sitthisuntikul (2018) stated that rice consumers in Thailand were willing to pay for organic products from smallholder farms without bargaining because they trusted the quality of the product; the price had no significant effect on organic rice consumers in Thailand. According to the farmers in Oriental Mindoro, organic consumers in the supermarket were willing to pay more for organic rice, but consumers in the community demanded a lower price.

The supply and consumption of organic food with nutritional value can be included in the production and distribution chain (Maestre, 2017) and made possible in food production, trade, and the supply chain (Zainol, 2015). Organic rice is accessible through different local marketing channels; however, farmers do not sell their produce to the supermarkets because of rigid requirements and an inability for the farmers to handle large supplies. Meemken (2018) cited that consumers/households were aware of the health benefits of organic rice. Therefore, the result implies that the utilization of local resources resulted in the availability of inputs, stability of production, and availability and accessibility of organic rice.

5. CONCLUSION

The following conclusions were drawn from the results of this study.

1. Ecological and economic consciousness has a positive effect on efficient and cost-effective production. However, the small portion of organic produce sold in the market cannot ensure the supply for the community, depicting the negative effects on social sustainability for the farmers. In addition, the

production of organic rice suffers from a labor scarcity due to less participation of women and the younger generation. However, economic and social sustainability greatly influence marketing in integrating the value chain, but the ecological feature of organic production is not the primary concern for consumers.

2. Established market, diversified distribution, resource utilization accessible place market information system, and constant supply of organic rice positively influenced the integration of the value chain into food security. Availability, accessibility, and utilization of organic rice in the value chain integration ultimately influenced the volume production, contributing to the constant supply of organic rice to the public, thus enabling strong food security. This integration provided opportunities to increase organic rice production and improve supply to unserved markets within the community. Hence, the community could access organic rice if it was available from nearby markets and had a diversified product distribution strategy. Furthermore, nutritional information, knowledge, the application of nutritional practices, and the price of rice negatively influenced the integration of the value chain to food security. Since most organic farmers operated on small scales, they were able to distribute the rice individually. As a result, the farmers neglected different programs and strategies that included improved production of inputs, information dissemination on the value-added product, branding, and marketing.

6. RECOMMENDATIONS

Based on the findings and conclusions of the study, the following recommendations are made. Social sustainability can be maintained by:

- continuously building and strengthening the partnerships between organic stakeholders;
- improving technology to encourage the participation of women and the younger generation in organic advocacy; and
- comprehensively promoting ecological sustainability in integrating the value chain to food security, indicating the importance of ecological well-being as an important factor through word of mouth, social media, labeling, and packaging promotions.

1. To further improve the availability, accessibility, and utilization of organic produce, the following should happen:
 - Governments and farmers should focus on linkage development and increase the capacity of the farmers to handle large supplies of organic rice, considering the need to explore the complex effects of organic rice prices for both supply and demand sides in the market channels.
 - Farmers should continue innovating organic rice by integrating nutritional information into the market information system, including the nutritional information on the packaging, and introducing a diverse variety of organic rice, such as organic dinorado rice, a familiar brand consumed by most Oriental Mindoro residents.
 - Position the organic rice in the market as a valuable food, applying knowledge and nutrition practices integrated into the value-added product, e.g., using the “Mindororganic” mark in their branding and marketing as a symbol of organic rice originating from Oriental Mindoro.

ACKNOWLEDGMENTS

The author gratefully acknowledges the following; The Commission on Higher Education (CHED) for the opportunity of K12 scholarship. The Provincial Agriculture and organic farmers. To the research director of UST, Dr. Grecebio Jonathan Alejandro and his staff. To the adviser of the researcher, Dr. Dante Garcia and to the panel of examiners for this dissertation, Dr. Nancy Eleria, Dr. Marinor Quintilla, Dr. Manuel Morga, Dr. Jackson Tan, and, most especially, Dr. Belinda Mandigma; their meaningful suggestions and ideas made this study a reality. The Administrators of the Divine Word College of Calapan, VPAA Dr. Aleli C. Dugan, CPA, Dean of SBHTM, Dr. Shirley I. Mendoza, and the author’s co-faculty. The author’s mentor, Dr. Florida Leuterio, and Mr. Jessie Melo, the author’s spouse, for his love and moral support. Above all, to our almighty God: Thank you very much. To God be the Glory!

REFERENCES

- [1] Ampadu-Ameyaw, R. O. (2017). “Development and Analysis of the Rice Value Chain”. *FARA Research*, p41.
- [2] Bazga, B. (2015). “Food Security Component of Sustainable Development-*Science Direct*”, 1075. pp. 1075-1082.

- [3] Brinzan, O., Radu, D. & Tigan, E. (2012). Food Consumption and Sustainability. *Journal of environmental protection and ecology*. 13. 253-257.
<https://tinyurl.com/kzsuvj6h>
- [4] Canete, D. (2019). "Value Chain of Rice (in Transition to Organic) in Region 02, Philippines". *EJFOOD, European Journal of Agriculture and Food Sciences*, 9.
<https://tinyurl.com/2jfz8asf>
- [5] Ekard, F. (2018). "Theory of Sustainability". *Research Unit Sustainability and Climate Policy*
- [6] Emas, R. (2015). "The Concept of Sustainable Development: Definition and Defining". *Brief for GSDR*
- [7] Fowler, B. I. (2012). "Integrating Food Security and the Value Chain Approach" *Market Links*. Retrieved from *Market Links*: <https://tinyurl.com/epzks34b>
- [8] FAO Agriculture of the United Nations. (2015). Retrieved from <https://tinyurl.com/cea25rfz>
- [9] Maestre, M., Poole, N. & Henson, S. (2017). "Assessing Food Value Chain Pathways, Linkages and Impacts for Better Nutrition of Vulnerable Groups," *Food Policy, Elsevier*, vol. 68(C), pages 31-39. DOI: 10.1016/j.foodpol.2016.12.007
- [10] Manigbas, N. L., Porciuncula, F. L., & Mendoza, T. C. (eds). 2018." Approaches to Organic Rice-based Production: Meeting the Challenges of Low-external-input Rice Production System". *Philippine Rice Research Institute, Science City of Muñoz, Nueva Ecija: Central Luzon State University, Science City of Munoz, Nueva Ecija: University of the Philippines Los Baños, College, Laguna*. 197
- [11] Meemken, E.-M. a. (2018a). "Organic Agriculture, Food Security, and the Environment". *Annual Reviews of Resource Economics*, 54.
<https://tinyurl.com/27nb7v8n>
- [12] Morshedi, L. F. (2017a). "The Role of Organic Farming for Improving Food Sustainability MDP" I, I. <https://tinyurl.com/teyytm6b>
- [13] Neven, D. (2014a). "Developing Sustainable Food Value Chain: A Guiding Principle. Rome": *Food and Agriculture Organization of the United Nations*.
- [14] Niemmanee, T. &. (2015a)."Assessing the Economic, Social, and Environmental Condition for the Sustainable Agricultural System Planning in Ban Phaeo District, Samut Sakhonn Province, Thailand. *Procedia*" - *Social and Behavioral Sciences*. 197. 2554-2560. 10.1016/j.sbspro
- [15] Othman, S. N. (2016). "Sustainable Rice Production and Its Impact on the Rice Value Chain: A Case Study of Rural Paddy Farm in Kedah". *International Conference on Applied Science and Technology* (pp. 0220085-3). Malaysia: AIP Publishing. <http://surl.li/rasq>
- [16] Pugliese, P. (2002). "Organic Farming and Sustainable Rural Development: A

- Multifaceted and Promising Convergence”
<https://onlinelibrary.wiley.com/doi/abs/10.1111/1467-9523.00172>
- [17] Purbasari, R., Chan, A., (2017). “Value Chain Analysis of the Impact of the Leather Raw Material Scarcity on the Leather Shoe Industry in Cibaduyut, West Java” *Review of Integrative Business and Economics Research*, Vol 6(1).388-400
- [18] Sitthisuntikul, K, Yossuck, P. & Budsara, L.(2018a) “How Does Organic Agriculture Contribute to Food Security of Small Land Holders? A case study in the North of Thailand”. *Cogent Food & Agriculture*, 4:1,
<https://tinyurl.com/5ym8weab>
- [19] Sustainable Development Goals. (2018, August 15). “Sustainable Development Goals”. Retrieved from <https://tinyurl.com/2d2vzejf>
- [20] USAID, Market Links. (n.d.). “Market Links. Retrieved from *Market Links:*”
<https://bit.ly/3pSWXeH>
- [21] Velten, Sarah & Leventon, Julia & Jager, Nicolas & Newig, Jens. (2015). “What Is Sustainable Agriculture? A Systematic Review. *Sustainability*” 2015. 7833-7865. 10.3390/su7067833.).
- [22] Suphannachart, W. & Boonkaew, T. (2019) Economic “Transformation and Productivity in Thailand: Why Small is Beautiful for the Size of Agriculture?” *Review of Integrative Business and Economics Research*, Vol. 8, Issue 2 52-68
- [23] Zainol, F. A., Aik, C. K., Hadi, N. M. H., Daud, W. N. W., Rashid, N. & Afthanorhan, A. (2018a). “Food Security and Food Value Chain: Identifying the Influencing Components in Malaysian Seed Industry”. *International Journal of Academic Research in Business and Social Sciences*, 8.
[10.6007/IJARBS/v8-i12/5078](https://doi.org/10.6007/IJARBS/v8-i12/5078). <https://tinyurl.com/dpftmfw8>