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Sustainability of Small Farming Households: an Outcome of their Being a Sufficiency Economy Unit

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ABSTRACT

This study aims to investigate the effects of small farming households' adherence to the principles of Sufficiency Economy Philosophy (SEP) on the sustainability of their occupational pursuits, using the Sustainable Livelihood Index (SLI). It is confined to 447 samples of small farming households in Chiang Mai Province. The results from the least-squares regression method reveal three factors that have a statistically significant positive effect on the households' sustainability and confirm that the factor of being a Sufficiency Economy (SE) of the household is the most crucial for the realization of sustainability compared to the other two factors, namely, farmland area and adequacy of water for farm irrigation in descendent Furthermore, the tendency for the farming household's sustainability is found to be order. higher with the increased level of the household's being an SE unit. Therefore, the knowledge about sufficiency economy principles and guidelines should be extended to farmers to enable them to have a greater understanding of the nature and the benefits of the SEP. Moreover, the application of the SEP in the development efforts employing the Sustainable Livelihoods Approach (SLA) can enhance the capability of the development agencies to help eliminate rural-farming households' poverty problems effectively and concretely toward achieving the long-run sustainable livelihood of farming households.

Keywords: Household Sustainability, New Theory Agriculture, Sufficiency Economy, Sustainable Livelihood Index, Thai Agriculture, Rice Farmers

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Background and the Significance of the Research Problem

Despite being characterized as an agricultural society, Thailand has undergone some structural changes particularly the mean age of farm household heads has increased from 56 years old in the 2013/2014 crop year to 58 years old in the 2018/2019 crop year, and the number of farming labors (15- 64 years old) per household has decreased from 2.81 persons to 2.60 persons in the corresponding crop years (OAE, 2020a). Moreover, it might be difficult for the current Thai farmers to move out of the agricultural sector to take up a non-farming career in the hope to earn a higher family income because most of them on average are not only any longer young but also financially poor and graduated with basic education. The limited opportunities and alternatives for the typical Thai farmers to engage in highly-paid non-farm employment result in a large number of Thai farming households remaining economically poor with almost 40% of them living below the national poverty line (Chantarat, Attavanich, & Sa-ngimnet, 2018).

Nevertheless, Thai agriculture has long played the role of providing food security for the population in the country and it has recently proved the other roles in minimizing the risk of food insecurity and the problem of urban unemployment due to the COVID-19 pandemic in Thailand because many Thai farmers can be self-reliant doing mixed or diversified farming (OAE, 2020b). Therefore, building up the strength of Thai farming households, particularly those small-scale which constitute the largest portion of the Thai agricultural sector, for them to have an improved livelihood is synonymous with laying a firm foundation for the national economy.

The Sufficiency Economy Philosophy (SEP) has been widely recognized in Thai society as the means for those that follow its principles to achieve sustainable livelihood as evident from the outcomes of the extensive efforts to promote the use and application of SE principles in many segments of the country. Consequently, this article intends to point out the impact of the application of the Sufficiency Economy Philosophy in the daily life of farming households which are the smallest social unit; and to make policy recommendations based on the research findings to foster the development of the farming households toward the goal of sustainable household livelihood. Moreover, this philosophy can be applied at all levels from the household level to the community level and the country level and it is also the principle of national development in the National Economic and Social Development Plan successively from the 9th to the present Plan (Issue 13: 2023-2027) and has been included in the Vision of Thailand 2037, which is the national strategy for 2018-2037 (NESDB, 2018).

For this reason, the study also intends to prove the hypothesis that those farming households that follow the SEP will be able to adapt themselves toward sustainable livelihood. In terms of suggestions at the policy level, the results of this research will support the formulation of effective policies to improve the livelihood of farming households.

Literature Review

The Sufficiency Economy Philosophy (SEP) which the late His Majesty King Rama IX granted to the Thai people on December 4, 1997 (Mongsawad, 2012) is a philosophy that is both a concept, principle, and guideline that is appropriate according to the middle path. In Thai society, the Sufficiency Economy Philosophy is understood to have three attributes: moderation, reasonableness, and the need for self-immunity to adapt to any impact from changes in both internal and external factors, which are based on two conditions: knowledge which means knowledge, prudence, and carefulness in applying knowledge; and morality which emphasizes honesty, living with patience, perseverance, and intelligence (Piboolsravut, 2004).

The principles in the Sufficiency Economy Philosophy can be applied discretely in many ways depending on the area and environment; for example, sufficiency at the micro-level is pertinent to the daily-life activities of people at the household and community levels (Ubonsri and Pannun, 2012). Sufficiency at the individual and household levels starts from the individual himself/herself by training his/her mind to restrain from distraction, and inculcating in his/her household members the need for one to be moral, content with what one has, self-reliant as far as possible; not to do things beyond one's capacity, not to over-invest, not to hurt oneself and others; to seek education and knowledge and develop oneself continuously; to be able to have a secure livelihood in the future, and able to help other people eventually (Utsahajit, 2014). Examples to reflect behavior and practices in the "sufficiency" way include the provision of the four necessities of life for the family by making an honest living, keeping household financial records, being thrifty but not stingy, avoiding and staying away from all vices, recognizing the value of saving money and how to make use of money and what one possesses, maintaining good health, sharing with others in the family, the community, and the larger society, cherishing local and Thai culture and traditions, living in harmony with natural resources and the environment, and managing risks that can threaten household livelihood by building immunity with the use of physical, social, environmental, and cultural capitals.

For the agricultural sector, the New Theory Agriculture is considered a concrete practice following the Sufficiency Economy Philosophy in managing the available resources for maximum

benefit. Particularly, those farmers who follow the fundamental guidelines in the New Theory Agriculture will eventually achieve their occupational development and a better quality of life (Office of the Royal Development Projects Board, 2011).

Furthermore, the New Theory Agriculture has been considered to be one of the livelihood strategies as it represents a form of sustainable farming alternative. This is because those farmers who follow the guidelines in the New Theory Agriculture can become self-reliant in attaining a sufficient and secure livelihood and be able to lower the risk of their being vulnerable to external changes and fluctuation (Suwansrinon, 2001).

Research Objective

The aim of this study is to evaluate the effects of households' practices according to the principles of Sufficiency Economy on the sustainability of small farming households.

Scope of Research

Rice farming households are selected to be samples in this study because 46.5 % of the total land of the country is now under agriculture with 5.9 million total farming households and more than 60 % of which or 3.9 million households cultivating rice (OAE, 2018). Moreover, Chiang Mai Province is selected to be the study site as its topography is featured by many types of land ranging from lowland basin, upland, highland, to mountainous areas with small and large intermountain valleys and catchments. Thus, the rice farming households in Chiang Mai Province can represent those in the entire upper Northern Region.

The unit of analysis in this study is the household. Sampled households are identified by the purposive sampling method, for the needed data and information collection in 2017 (Prabripu, 2020). The in-depth interview according to the structured questionnaire is made to obtain the socio-economic background of the samples. The sample size for this study is determined by the simplified formula of Yamane (1967), and thus 447 rice farming households from 28 Sub-districts of 11 Districts in Chiang Mai Province will be selected as samples. These sampled households can be further distinguished into those farming in the lowland area using agrochemical inputs as typical as the majority of rice farmers in Thailand (Conventional farming system), those farming in organic or chemical-safe systems (Alternative farming system), and those farming in the upland or highland areas with some of the farmers being local Thai or hill-tribe villagers that grow rice mainly for home consumption (Subsistence farming system).

Research Methodology

Assessments

Self-evaluation by farmers on the levels of their adherence to the principles of Sufficiency Economy is divided into two parts, one for the production domain and the other for the personal life domain. To be evaluated are 108 question items that the researcher extracted from the definitions of Sufficiency Economy Philosophy and the meanings of the three constituents and the two conditions of SE referred and interpreted from a number of papers, academic journals as well as all related research works, (Wasi,1999; Piboolsravut, 2000; Puntasen, 2001; Wiboonpongse & Sriboonchitta, 2009). The evaluation, thus, covers all aspects of an individual's conduct reflecting reasonableness, moderation, self-immunity; knowledge (not only proficiency but also prudent and careful use of knowledge); and morality (including honesty, integrity, diligence, perseverance, and sharing).

Self-evaluation by each farmer in the production domain is to be made on 63 question items to judge whether or not he/she adheres to particular principles of the Sufficiency Economy Philosophy. For examples, the question related to the reasonableness principle is whether "you use exchange labor to reduce production cost", that for moderation is whether "you produce first to ensure food sufficiency for your capability", that for self-immunity is whether "you produce first to ensure food sufficiency for your family, and then sell the domestic surplus for money", that reflecting the knowledge principle is whether "your household practices integrated/mixed farming method (multi-farming activities in a farming area or in the same season such as field crops – leguminous crop intercropping, poultry and fish raising, free-range poultry raising in paddy fields) or whether "you apply local knowledge and wisdom in farming (like the use of herbal substances to repel insect pests), and that corresponding to the morality condition is whether "when hiring farmhands, you do not get the laborers to overwork/ you pay them reasonable wage and do not take advantage of them" or whether "you are keen to seek knowledge which is useful for your occupational undertakings and family", etc.

In the personal life domain, there are 45 question items. The question relating to the reasonableness principle is whether "you take into consideration the worthiness and the need before spending the money", that for moderation is whether "you do not spend extravagantly (spend no more than earning) or whether "in case you have made borrowing, you use the loan for farm investment or necessary items only (such as for children's education, for hospitalization or medical treatments)", that reflecting self-immunity is whether "you have enough saving for spending in case of emergency" or whether "you encourage and support your family members

to get more education / training", that associated with the knowledge principle is whether "when you get information from any sources, you generally think it over before believing or consult knowledgeable or relevant persons before using the information in practice", and that reflecting the morality principle is whether "you give advice / assistance to your neighbors when they are in troubles" or whether "you try to use brain to deal with or find solution to the problems you encounter" or whether "when you have conflict with other persons, you will try to make compromise, and avoid using force or violent action to end the problem", etc.

The sustainability of farming households is assessed upon the results of the analysis of three main livelihood elements: economic, social, and environmental. The Income diversification index or Simpson Index of Diversity (SID) is used as the indicator of economic sustainability, the Social Security Index (SSI) is used for determining social sustainability, and the Environmental Friendly Index (EFI) is used to indicate the environmental sustainability of the rice farming households. Then, the average values from the assessment of these three indicators are used for constructing the Sustainable Livelihood Index (SLI) to assess the overall sustainability of farming households.

Data Analysis

SEP Score:

A five-point Likert scale was applied for self-assessment of the extent of applying principles of SEP in both the production domain and the personal life domain. The self-assessment was made on a total of 108 items in the production and personal life domains (maximum total score = 540), households farming with high scores represent a high SE level. However, the total score obtained from each household was transformed into a percentage to facilitate the interpretation of the result.

Economic Sustainability Assessment:

The economic sustainability in this study is assessed by income diversification of the sampled households using the Simpson's Index of Diversity (SID), a measure of diversity that takes into account the number of income sources as well as the relative share of different sources in the total income (Joshi et al., 2003; Minot et al., 2006) as in the formula below.

$$SID = 1 - \sum_{i=1}^{I} P_i^2$$
 (1)

Where P_i is the share of the ith income source in the total income, and SID is the indicator of income sources' distribution having a value in the 0 – 1 range. This means, with only one

income source, the P_i of the household will have the value of 1 and its SID will have the value of 0. As the number of income sources increases, the share of P_i will decrease so will the aggregate value of income share raised to the power of two of all sources. Thus, the value of SID will approach with the increasing number of income sources. In other words, the higher the SID, the higher the diversity of income sources. Equation (2) is the formula for calculating the SID.

$$SID = 1 - \left[\left(\frac{\operatorname{ric}}{\operatorname{tic}} \right)^2 + \left(\frac{\operatorname{fic}_1}{\operatorname{tic}} \right)^2 + \left(\frac{\operatorname{fic}_2}{\operatorname{tic}} \right)^2 + \dots + \left(\frac{\operatorname{fic}_n}{\operatorname{tic}} \right)^2 + \left(\frac{\operatorname{vic}}{\operatorname{tic}} \right)^2 + \left(\frac{\operatorname{flic}}{\operatorname{tic}} \right)^2 + \left(\frac{\operatorname{fric}}{\operatorname{tic}} \right)^2 + \left(\frac{\operatorname{nfic}_1}{\operatorname{tic}} \right)^2 + \left(\frac{\operatorname{nfic}_1}{\operatorname{tic}} \right)^2 + \left(\frac{\operatorname{nfic}_2}{\operatorname{tic}} \right)^2 + \dots + \left(\frac{\operatorname{nfic}_n}{\operatorname{tic}} \right)^2 \right]$$
(2)

Where; tic = total income, ric = income from rice, fic₁ = income from food crop 1, fic₂ = income from food crop 2, fic_n = income from food crop n^{th} , vic = income from vegetable, flic = income from flower, fric = income from fruit tree, lic = income from livestock, oic = income from other sources in agriculture, nfic₁ = income from nonfarm income 1, nfic₂ = income from nonfarm income 2, nfic_n = income from nonfarm income n^{th}

Social Sustainability Assessment:

The Social Security Index (SSI) was used for assessing social sustainability. It is based on the total assessment score of the household converted into an index using the formula below.

Social Security Index (SSI) =
$$(S_x - S_{min})/(S_{max} - S_{min})$$
 (3)

Where S_x = Total score of each farming household, S_{min} = Minimum score of the group, and S_{max} = Maximum score of the group. SSI ranges from 0 to 1, with the closest value to 1 representing social stability

To be analyzed for presentation in this topic were the findings from the self-assessment by the farming households on various factors explaining life satisfaction and livelihood security, e.g., 1) You are satisfied with your present life and living conditions, 2) You feel secure about your farmland right/ tenureship, or 3) You are able to make loan repayment without difficulty (in case you have made borrowing), etc., and the satisfaction with surrounding social and environmental conditions, e.g., 1) You live in a good community neighborhood (free from drugs and crimes problems), 2) In your village/community, there are cooperation and mutual help in terms of occupational promotion or solving agricultural problems, or 3) The community in which you live has handy access to public facilities and infrastructure (road, electricity, piped water supply, and communications), etc. A total of 22 question items were covered in the assessment.

Environmental Sustainability Assessment:

The researchers used the Environmental Friendly Index or EFI for the assessment. To construct the EFI, the scores from farmers' self-assessments of their production practices that have environmental implications were used. The total assessment score follows six indicators of production practices, e.g., You try to minimize the use of chemicals for plant protection and pest control, You produce your own compost/bio-fertilizer, and three indicators of satisfaction with the environmental conditions surrounding the village community, i.e., You live in a community which is safe from natural disasters, You live in a community having a rich natural condition (fertile soil, plentiful water resource, etc.), The community in which you live has a good environment, good air quality, and no pollution. The total score of all nine indicators was used for calculating the EFI with the following formula.

Environmental Friendly Index (EFI) =
$$(E_x - E_{min})/(E_{max} - E_{min})$$
 (4)

Where $E_x =$ Total score of each farming household, $E_{min} =$ Minimum score of the group, $E_{max} =$ Maximum score of the group. The EFI will have a value ranging from 0 to 1, with the value approaching 1 indicating the decreasing environmental risks.

Evaluating the Effects of Sufficiency Economy Practices on the Sustainability of Rice Farming Households:

The Multiple Linear Regression Analysis was used to prove whether following the concept of sufficiency economy influences the sustainability of the rice farming households. The equation below was employed to analyze economic, social, and environmental sustainability.

$$Y = \boldsymbol{\beta}_0 + \boldsymbol{\beta}_1 X_1 + \boldsymbol{\beta}_2 X_2 + \dots + \boldsymbol{\beta}_k X_k + \boldsymbol{\epsilon}$$
(5)

Where Y is the dependent variable which is the quantitative variable. In this study, this is the Sustainable Livelihood Index (SLI) which is the total average obtained from the sustainability assessment in the economic (SID), social (SSI), and environmental (EFI) dimensions. X_1 is the SEP score of farmers. X_2 to X_k are the capital asset type k (i.e., HHM (X_2) = Household members, EDU>12 (X_3) = Having at least one working-age family member with education higher than senior high school/ vocational school certificate (Dummy) =1, LUSE (X_4) = Farming land area (rai), LOWNE (X_5) = Land ownership (% of the land with ownership in total land available for household utilization), SWAT (X_6) = Sufficient water for farm irrigation (Dummy) =1, DEBTA (X_7) = The proportion of debt per household asset, NPA (X_8) = Number

of organizations that household members participate in). β_0 is the point of the Y-axis intersection when $X_1 = X_2 = ... X_k = 0$ and $\beta_1, ..., \beta_k$ are partial regression coefficients, whereas ϵ is the random-error term.

Results

Analysis of the Levels of Being a Sufficiency Economy of the Farming Households

The primary analytical results based on descriptive statistics reveal the households in the alternative farming system to have average self-assessment scores higher than those in the subsistence farming and the conventional farming systems in all elements of being a sufficiency economy, with the total scores combining the production domain and personal life domain being 3.82, 3.39, and 3.38, respectively. Specifically, the alternative farming households have the average scores of being an SE in the production domain and the personal life domain at 3.74 and 3.93, respectively which are higher than the other two farming systems. Furthermore, farmers in the alternative farming system generally got a high score from employing the chemical-safe production process and thus they also got high scores for their adherence to the principle of reasonableness and the condition of morality in the SEP and the use of appropriate knowledge in agricultural production. Farmers in the subsistence farming system on average got a higher score than their counterparts in the conventional farming system for the production domain because of their reasonableness in avoiding the use of chemicals for pest and disease control which is environmentally harmful and their self-reliance by emphasizing the use of family labor and using hired labor only as necessary in their farming. However, their average score for being SE in the personal life domain was lower compared to farmers in the conventional farming system, especially for the self-immunity element and the knowledge condition.

Moreover, being a sufficiency economy in the production domain was found to relate to that in the personal life domain of the farming households at the .01 significance level; and this demonstrates that farmers have a mindset towards the SEP thus applying the principles and guidelines possible within their means in both the production and the personal life domains in balance and harmony.

Analysis of the Sustainability of the Farming Households

To assess the economic sustainability of the farming households, the Simpson Index of Diversity (SID) is applied to evaluate Income diversification. Although no statistically significant difference was found across groups; surprisingly, the SID value of the subsistence farming households is higher compared to the other 2 groups. However, the overall SID appears low at only .46 (out of 1.0) implying the low diversity of income sources since income diversification has proved to be a key strategy for enhancing the quality of life especially of the rural population (Ellis, 2000) which has also been observed by other scholars (Slater, 2002; Niehof, 2004; Démurger, et al., 2010; Sultana, et al., 2015; and Wan, et al., 2016). Meanwhile, Mongsawad (2012) undertook a study in the context of Thailand and made a recommendation that farmers should switch from monoculture to an integrated farming system which provides the farming household not only the food source but also additional income from different kinds of produce year-round.

For social stability, the sampled farmers made a self-assessment of their satisfaction with their livelihood, security in life, and social surroundings. The overall Social Security Index (SSI) obtained was rather high (.63) while the SSI of the alternative farming household group was measured statistically significantly higher than that of the other two groups. The Environmental Friendly Index (EFI) was used to assess satisfaction with the richness of the environment, and the mean score for all three groups is low at only .38, with the EFI of the alternative farming household group being .64 and that of the conventional farming household group and subsistence farming household group being .36 and .34 respectively.

However, considering a compound index called the Sustainable Livelihood Index (SLI) to assess the overall social, economic, and environmental abilities and strengths, all considered households obtained a low average SLI of only .49 (Table 1), indicating the low to moderate level of the sustainability of the farming households, due to the weakness in the environmental dimension (.38) and the income dimension (.46) despite some strength in the social dimension but the value is still low at only .63 (Only the alternative farming household group obtained the SLI of .59 more than a half of the full scale = 1)

	Subsistence	Conventional	Alternative		
Index	Farming	Farming	Farming	Mean	SD.
	Households	Households	Households		
SEP Score (1-100)	67.84	67.69	76.33	68.39	9.05
Income Diversification Index	.48	.46	.42	.46	.18
(SID or DI) (0-1)					
Social Security Index (SSI) (0-1)	.59	.63	.70	.63	.18
Environmental Friendly Index	.34	.36	.64	.38	.18
(EFI) (0-1)					
Sustainable Livelihood Index	.47	.48	.59	.49	.12
(SLI) (0-1)					

 Table 1
 Levels of being a Sufficiency Economy and the Sustainability of the Farming Households

Remark: Sustainable Livelihood Index (SLI) is the overall index of SID, SSI, and EFI

The results from the least-squares regression analysis reveal three variables that have effects on the sustainability of the farming households (Table 2). Evidently, the level of being a sufficiency economy exerts the strongest effect on the farming households' sustainability as the household's sustainability tends to increase with the rising level of the household's being a sufficiency economy (Figure 1). With the highest Bata weight at .672, an increase in the SEP score by 1 unit will result in an increase in the value of the Sustainable Livelihood Index by .009 units. The farming area of the household has the next highest effect with an estimated Beta weight of .074. An incremental increase in the farming area by one rai will contribute to the increase in the value of the Sustainable Livelihood Index by .001 unit. Another important factor is the sufficiency of water for farm irrigation. With the Beta weight of .070, those households having adequate irrigation supply will have the value of the average Sustainable Livelihood Index higher than that of the otherwise group by .020 units.

Variable	В	SE	Beta
SEP Score	.009***	.000	.672
HHM	.004	.003	.049
EDU>12	.001	.009	.004
LUSE	.001**	.001	.074
LOWNE	7.159E-06	.000	.002
SWAT	.020*	.011	.070
DEBTA	8.783E-05	.000	.043
NPA	.002	.002	.037
Constant	173***	.038	

 Table 2
 OLS Estimates of Sustainable Livelihood of Rice-based Households

Remark: R^2 = .452, SEE = .0900485, F = 45.077, Sig. of F = .000, * p < .1, ** p < .05, *** p < .01





Conclusions and Discussions

The objective of this study is to establish the relationship between the farming households' practices according to various principles in the Sufficiency Economy Philosophy based on the Sustainable Livelihood Index (SLI), obtained from the SEP scores the farming households assigned by the self-assessment method to their practices according to the SEP principles, expressed in percentage. The OLS regression estimation provided the findings that there are three factors affecting the sustainability of farming households. The household's being

a SE was confirmed to be the most effective factor contributing to the sustainability of rice farming households

Moreover, the findings indicate the significance of land and water which are the fundamental capital inputs for farming. Those farming households having relatively larger farmland areas can produce more output and diversify more their farming activities if they have adequate water for farm irrigation. In other words, more land and water resources not only directly enable the farming households to get higher farm productivity but also widen crop choices for farmers to diversify their farming activities and income sources that indirectly contribute to a higher household income and an improved livelihood.

Previous studies that indicated the effect of farmland area on the sustainability of farming households confirmed such a relationship based on the empirical findings of a positive association of access to land resources with the possible selection of various livelihood strategies in a mixture (Panahi et al., 2009) and with the diversification of farming activities and income sources (Soltani et al., 2012). These findings are consistent with the results from the study by Findley (1987) that indicated the vital role of access to land and land ownership in contributing to a sustainable livelihood in the agricultural society, particularly in rural areas. Access to land not only generates employment and income for farmers but also helps reduce out-migration from the farming sector; and large farms which can make high income will enhance the ability in farming survival (Kimhi and Bollman, 1999; Goetz and Debertin, 2001; Glauben et al., 2006). However, Prabripu (2020) observed that the farming households having relatively larger farmland areas tended not to do intensive farming activities according to the guidelines in the SEP and thus suggested that the increase in farmland area must be compatible with the managerial capacity of the farming households. This demonstrates that, in connection with farmland size, it is crucial for the farming households that have larger farmland areas to apply to a greater extent the principles in the SEP in their farming management. As it is difficult for the state sector to play role in expanding agricultural land areas, state support for efficient agricultural land use becomes one of the most critical policies.

Furthermore, it cannot be denied that the adequacy of water for farm irrigation is a production input of priority importance in the sustainability of farming households. Water is not only a natural capital fundamental for farming with focuses on diversity, natural balance, and sustainable ecological systems but also instrumental for lowering the use of financial capital in agricultural production and enabling farming households to become self-reliant (Mariano et al. 2012). Therefore, the application of the New Theory Agriculture, which emphasizes the

management of the available agricultural resources for optimum benefits and the building of a farm pond for irrigation supply in the dry season, will help build the self-immunity of the farming households. To deal with the problem of limited water available for farming in the subsistence system, promoting the cultivation of alternative drought-tolerant crops in a mixed farming nature can be a solution and help increase the income of the subsistent farmers to improve their livelihood.

Suggestions

The findings from the present study help confirm that adherence to the principles in the Sufficiency Economy Philosophy will lead farming households to realize sustainable livelihood. Therefore, the knowledge about sufficiency economy principles and guidelines should be extended to farmers to enable them to have a greater understanding of the nature and the benefits of the SEP such that they, particularly those farmers in the conventional and subsistent farming systems, can change their mindset toward making their life in the sufficiency economy ways.

For policy suggestions, the application of the SEP in the development efforts employing the Sustainable Livelihoods Approach (SLA), which aims at long-term sustainability, is for assessing the livelihood strategies of the target households or communities and making plans to solve their poverty problems effectively and concretely toward the sustainable livelihood. The SEP - SLA combined framework is applicable to not only the research and development attempts in the Thai context but also elsewhere for attaining the SDGs. For Thailand, its signing in the cooperative agreement with the United Nations Partnership Framework which aligns with the 13th National Economic and Social Development Plan will enable it to achieve its development goals faster.

References

- Chantarat, S., Attavanich, W., & Sa-ngimnet, B. (2018). *Micro Thai farmers through farmer registration database: Focus on Thai farming structure change from the past to present* (In Thai). Retrieved from https://www.pier.or.th/wp-content/uploads/ 2018/05/aBRIDGEd 2018 009.pdf
- Démurger, S., Fournier, M. & Yang, W. (2010). Rural households' decisions towards income diversification: Evidence from a township in northern China. *China Economic Review*. 21(S1) 32–44.

- Ellis, F. (2000). *Rural Livelihoods and Diversity in Developing Countries*. Oxford, UK: Oxford University Press.
- Findley, S.E. (1987). Rural Development and Migration: a Study of Family Choices in the *Philippines. Colorado*, USA: West View Press, Boulder, CO.
- Glauben, T., Tietje, H. & Weiss, C. (2006). Agriculture on the move: exploring regional differences in farm exit rates. *Review of Regional Research*. 26(1): 103–118.
- Goetz, S.J. & Debertin, D.L. (2001). Why farmers quit: a county-level analysis. *American Journal* of Agricultural Economics. 83(4): 1010-1023.
- Joshi, P.K., Gulati, A.A., Birthal, P.S. & Twari, L. (2003, February). *Agriculture diversification in South Asia: Pattern, determinants and policy implications.* Discussion paper no. 57. Market structure studies division. International food policy Research Institute. Washington D.C.
- Kimhi, A. & Bollman, R. (1999). Family farm dynamics in Canada and Israel: the case of farm exits. *Agricultural Economics*. 21(1): 69–79.
- Mariano, M.J., Villano, R. & Fleming, E. (2012). Factors influencing farmers' adoption of modern rice technologies and good management practices in the Philippines. *Agricultural Systems.* 110(C): 41–53.
- Minot, N.W., Epprecht, M., Anh, T.T.T. & Trung, L.Q. (2006). *Income Diversification and Poverty in the Northern Uplands of Vietnam.* International Food Policy Research Institute Research Report. 145: 1–111. doi: 10.2499/0896291480
- Mongsawad, P. (2012). The Philosophy Sufficiency Economy: A contribution to the Story of Development. *Asia-Pacific Development Journal*. 17(1): 123–143.
- National Economic and Social Development Board (NESDB). (2018). *The national strategy for* 2018-2037 (In Thai). Retrieved from
 - http://www.ratchakitcha.soc.go.th/DATA/PDF/2561/A/082/T_0001.PDF
- Niehof, A. (2004). The significance of diversification for rural livelihood systems. *Food Policy*. 29(4): 321–338.
- Office of Agricultural Economics. (2018). *Agricultual Production Statistics* (in Thai). Retrieved from http://www.oae.go.th/view/1/ Agricultural production information /TH-TH.
- Office of Agricultural Economics. (2020a). *Indicators of Socio-economic Conditions of Farming Households* (in Thai). Retrieved from

http://www.oae.go.th/assets/portals/1/files/socio/socio10june63.pdf

- Office of Agricultural Economics. (2020b). *Press release of OAE on COVID-19 causing workers to return home to depend on farming* (in Thai). Retrieved from. http://www.oae.go.th/view/1/รายละเอียดข่าว/ข่าว%20สศก./34348/TH-TH
- Office of the Royal Development Projects Board. (2011). *The Sufficiency Economy Philosophy Contest*. Bangkok, Thailand: Arun Printing Ltd.
- Panahi, F., Malekmohammadim, I., Chizari, M. & Samani, J. M. V. (2009). The Role of Optimizing Agricultural Water Resource Management to livelihood Poverty abolition in Rural Iran. *Australian Journal of Basic and Applied Sciences*. 3(4): 3841–3849
- Piboolsravut, P. (2000). *An introductory note. Sufficiency Economy*. Excerpt partly from the conference statement of the 10th UNCTAD, Bangkok.

Piboolsravut, P. (2004). Sufficiency economy. ASEAN Economic Bulletin. 21(1),127–134.

- Prabripu, P. (2020). Effects of Sufficiency Economy Philosophy Practices on Sustainability of Rice Farming Career in Chiang Mai Province. (Unpublished doctoral dissertation). Chiang Mai University, Chiang Mai, Thailand.
- Puntasen, A. (2001). *Buddhist Economics: Evolution, Theory and Application to Various Economics.* Amarin publishing, Bangkok.
- Slater, R. (2002). Differentiation and diversification: Changing livelihoods in Qwaqwa, South Africa, 1970–2000. J South. Afr. Stud. 28(3): 599–614
- Soltani, A., Angelsen, A., Eid, T., Naieni, M. S. N. & Shamekhi, T. (2012). Poverty, sustainability, and household livelihood strategies in Zagros, Iran. *Ecological Economics*. 79(C): 60–70.
- Sultana, N., Hossain, E. & Islam, K. (2015). Income diversification and household well-being: A case study in rural areas of Bangladesh. *Int. J. Bus. Econ. Res*, 4(3): 172–179.
- Suwansrinon, A. 2001. *The New Theory: A Part to Sustainable Agriculturally Based Rural Livelihood in Thailand.* (Unpublished master's thesis). London School of Economics, UK.
- Thongpakdee, N. (2011). *Sufficiency economy philosophy and the Thai society. Bangkok: Sufficiency Economy Study Center*. The National Institute of the Development Administration.
- Ubonsri, B. & Pannunb, A. (2013). "A Study of Applying Sufficiency Economy to Lifestyles and use of Resources at Community Levels". *Procedia Environmental Sciences*. 17: 976-83.
- Utsahajit, V. (2014). *Sufficiency economy and human resource development*. Faculty of Human Resources Development. National Institute of Development Administration. Printing of Chulalongkorn University. Bangkok.

- Wan, J., Li, R., Wang, W., Liu, Z., & Chen, B. (2016). Income diversification: A strategy for rural region risk management. *Sustainability*. 8(10): 1–12.
- Wasi, P. (1999). Sufficiency Economy and Civil Society Guidelines. "Ways to revive the economy and society". Folk Doctor Foundation, Bangkok.
- Wiboonpongse, A. & Sriboonchitta, S. (2009). *The research- development project on agriculture and community enterprise system based on the sufficiency economy philosophy.* Report submitted to Thailand Research Fund, Chiang Mai University.

Yamane, T. (1967). *Statistics: An Introductory Analysis*, 2nd Ed.. New York: Harper and Row.