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Philosophy of sufficiency economy for community-based adaptation to climate change: Lessons learned from Thai case studies

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ABSTRACT

Major components within the philosophy of a sufficiency economy include moderation, prudence, and self-immunity together with knowledge and morality. These components were proposed to safeguard local communities from adverse changes and crises. Climatic crises due to global warming can impact upon local agricultural production and consumption systems. Yet, it is still questionable whether communities following the sufficiency economy philosophy can cope with climate change. The objective of this research was to study the coping and adaptive capacity to climate change of local agricultural communities following the sufficiency economy philosophy and to analyze the success factors of adaptation to climate change. The research found five adaptive strategies leading to a resilient livelihood: (1) self-evaluation, (2) diversity dependency, (3) storage and reserve, (4) cooperation, and (5) mobility over space and time. These strategies help to reduce exposure and sensitivity, while increasing adaptive capacity to climate change with the aims of sustainability and adaptation for survival, and protecting natural resource bases for food and settlement security. Moderation, prudence, and self-immunity are critical success factors of adaptation measures, whereas local ecological knowledge with morality is a core enabling factor for adapting to climate change. These factors can be applied in community-based climate change adaptation in the National Adaptation Plan.

Introduction

Increasing climatic variability and extremes including long-term changes in temperature and precipitation patterns induced by global warming pose an important threat to mankind. Ecological as well as social systems need increasing resilience against current and future climate change. However, at present, impacts from climate change and human responses remain highly uncertain. Efforts among academics emphasize identifying factors that strengthen ecosystems and human communities to cope with long-term climatic changes, variability and crises (Bryan & Behrman, 2013; CARE, 2010; Meinzen-Dick et al., 2010). Yet, the confounding effects of socio-economic development bring about unclear pictures of climate change and adaptation among human communities.

Community-based adaptation to climate change takes into account the concept of sustainable development while adapting to climate change. Analytical frameworks to assess community-based climate change adaptation have been variously proposed by scholars. Examples include gender interface with adaptation to climate change (Bryan & Behrman, 2013) by combining the Sustainable Livelihoods (SL) framework (Department for International Development [DfID], 2001), Institutional Analysis and Development (IAD)

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framework (Ostrom, 2005), IFPRI Gender and Assets (GAAP) framework (Meinzen-Dick et al., 2010), and climate change framework of the Third Assessment Report of the Intergovernmental Panel on Climate Change (IPCC, 2001). CARE (2010) also developed a conceptual framework that emphasizes success factors on several levels. Those factors include strategies that support resilient livelihood, that reduce risks from natural crises in order to reduce impacts on vulnerable households, that strengthen adaptive capacities of citizens and governmental organizations, and that support research on vulnerability factors.

Community-based adaptation to climate change is viewed as a part of normal livelihoods. Communities normally are facing questions of sustainability while managing natural resources. Hence, adaptation measures to climate change need to be reconsidered to match with community-based resource management in order to achieve sustainable goals (Christian Aid, 2009). Climatic risks continuously accumulate from the past and into the future. Therefore, from the point of view of community development, it is necessary to integrate an adaptation framework within community-based resource management, with the concept of sustainable development and to expand the time frame into the future.

The sufficiency economy (SE) philosophy is an example of merging adaptation measures within sustainable development. Therefore it is important to find out how the SE philosophy shapes the success of climatic adaptation among local communities.

The SE philosophy was initiated by His Majesty King Bhumibol Adulyadej of Thailand. The philosophy proposes major principles of thoughts and practices to achieve a balanced way of living under sustainable development. The philosophy presents itself as a middle path toward a well-balanced life through ***moderation*** or self -reliance, ***prudence*** or social and ecologically responsible production and consumption activities, and ***self-immunity*** to be resilient to unpredictable shocks. To live their lives under the philosophy, people need to use ***knowledge and morality*** in everyday activities. The philosophy is developed to strengthen not only individual but also community capacities in order to achieve sustainable development goals (Office of the Royal Development Projects Board, 2009; UNDP, 2007).

The philosophy has been continuously contained in the National Economic and Social Development Plan of Thailand since the 8th plan (1997–2001) up until the newly proposed 12th plan (2017–2021). The philosophy has been applied to lead the way of living at many levels—individuals, households, communities, societies, and the country. The current plan focuses on the usefulness of the philosophy in terms of risk management amidst rapid socio-economic and environmental changes in order to achieve sustainable development for the country. The current strategic plan emphasizes the development of the country towards a "cooperative society with happiness, equity, fairness, and resilience to changes". The current development plan, thus, strengthens people, societies, and the economic system of the country to be resilient to social, economic, and environmental changes and to have high adaptive capacities to absorb shocks.

Climatic crises arising from global warming are bringing about adverse impacts upon local agricultural production and consumption systems. The ultimate goal of this research was to determine household- and community-level critical success and enabling factors of adaptation to climate change under the SE philosophy, which could shed some light on the development of an analytical framework of community-based climate change adaptation and the national adaptation plan (NAP). The research objectives include: studying the coping and adaptive capacity of local agricultural communities to climate change, assessing vulnerability, and analyzing factors of adaptation to climate change under the SE philosophy.

Research Methods

Selection of Communities

Communities renowned for best practices with regard to the SE philosophy and that have won awards from the Office of the Royal Development Projects Board, the Community Development Department under Ministry of Interior, or the Office of the Permanent Secretary for the Ministry of Agriculture and Cooperatives were purposively selected to be cases studies. Sixteen communities consisting of four communities from four parts of the country were selected:

(1) North: Ban Maerawan in Tak province, Ban Thapapao in Lamphun province, Ban Dokbua in Phayao province, and Ban Phayakaew in Nan province;

(2) Central: Ban Thungkraprong in Nakhonnayok province, Ban Klongchong in Samut Songkram province, Ban Chumrung in Rayong province, and Ban Khanna in Trat province;

(3) Northeast: Ban Donmun in Mahasarakram province, Ban Kham in Chaiyaphum province, Ban Tah-Rue in Nakhonpanom province and Ban Phu in Mukdahan province; and

(4) South: Ban Bangkaewnoy in Ranong province, Ban Klong-Rue in Chumporn province, Ban Bangrong in Phuket province, and Ban Teenped in Phang-Nga province.

Data Collection

Four local experts from the Maetha SE Learning Center in Chiangmai province, the Songsalung SE Learning Center in Rayong province, Wat Suanthamruamjai in Yasothon province, and Wat Payang in Nakhonsrithammarat province provided in-depth interviews as key informants of the SE philosophy. In addition, in-depth interviews were also conducted with the leaders of the selected communities regarding best practices following the SE philosophy.

Data Analysis

The qualitative data were analyzed based on a vulnerability framework (IPCC, 2007) with its major components being exposure, sensitivity, and adaptive capacity, and the SE philosophy framework (Office of the Royal Development Projects Board, 2009) with its components of moderation, prudence, self-immunity, knowledge, and morality.

Results

Coping and Adaptive Strategies Among SE Communities

Climatic variability and extreme events cause adverse impacts on household-level agricultural production and consumption systems. The SE philosophy promotes the concept of self-assessment and helps farmers to moderately adjust their activities appropriately with changing ecosystems and societies. In addition, the philosophy leads the practices of followers with prudence, and emphasizes self-immunity or strengthens adaptive capacities to crises. Five strategies to cope with these changes were found among the SE communities studied, even though they were in different parts of the country. These strategies can reduce the climatic vulnerability of the communities across space and time and equip them with ecological, social, and economic immunity.

Strategy 1: Self Evaluation

The SE philosophy promotes self-evaluation among followers. They evaluate their own knowledge and skills and match them with the surrounding environment in order to live their lives with social and ecological responsibility. Self-evaluation can bring about ecological, social, and economic immunity in the sense that the followers are aware of their abilities, economic needs, societies, and ecosystems. Apart from self-evaluation, household accounting is promoted in all SE communities as a household-level, self-assessment strategy that helps household members to reduce expenditure, to balance production and consumption, and to access savings and community welfare in crisis times.

The SE philosophy emphasizes strengthening self-sustenance livelihoods through consuming, sharing, exchanging, and selling agricultural products. The focus is on self-reliance—that is, production for household consumption. The leftover products can be given away or exchanged, whereas the accumulated knowledge can be shared. The shared knowledge can be integrated to provide capacity to assess risks and define a wider range of adaptation options. Knowledge includes: (1) individual learning to live with changes and uncertainties, (2) integrating climatic knowledge from various sources, (3) integrating various types of information such as traditional and scientific information, and (4) integrating knowledge from various fields. The diverse knowledge comes from self-experiences and sharing and learning among people and organizations in assessing climatic risks.

Strategy 2: Diversity Dependency

To cope with climatic variability and extremes, SE communities adjust their modes of living to depend on the diversity of biological resources, production modes, knowledge types, and income sources. Diversity dependency is a strategy that expands the range of adaptation options across space and time, and provides ecological, social, and economic immunity to local communities. In terms of ecological immunity, households grow diverse varieties and species of vegetables and plants on their homesteads and adjust their modes of production across seasonal cycles. Agro-forest plots are full of food resources in different forest layers, dubbed as "***3 types of forest with 4 benefits***". The three types of forest are: (1) fast-growing species such as bamboo and Siamese neem tree, (2) food plant species such as fruit orchards and vegetables, and (3) timber species such as teak and other hardwood species. The four benefits are: (1) benefits from resource use such as charcoal, handicrafts, livestock cages, and fences, (2) benefits from household consumption such as cooking ingredients and herbs, (3) benefits from economic timber use, and (4) benefits from ecological services from conserving soil and water, nurturing soil and keeping moisture in agro-forest plots.

Diverse knowledge of farm management comes from the learning and networking processes. In terms of socio-economic immunity, in a particular community, each farmer has developed his/her own experiences and knowledge in farm management, which are shared among household and community members. The knowledge is, thus, diverse, dynamic, and adaptive to environmental changes. In addition, each household has diverse supplemental occupations with alternative earning sources. Off-farm skills include producing handicrafts, fixing agricultural tools, and working as laborers in agricultural manufacturing factories.

Strategy 3: Storage and Reserve

Another important strategy to cope with climatic change includes the storage and reserve of agricultural products, seeds, labor, and tools, as well as conservation of land and water resources in order to secure economic needs. The strategy also includes the wise use of water and forest protection as natural capital. Storage and reserve is an economic strategy to secure necessities across time, especially to survive extreme crises. Households have food sources around their house, can get access to food in all seasons, produce their own agricultural needs such as biological fertilizers, save and select their own seeds and breed for types that they need to meet household consumption requirements. All communities conserve natural resources for household use.

Strategy 4: Cooperation

Cooperation is a social strategy to pool individual risks together for collective action in risk alleviation, whereas in normal years, individuals are pooled together within networks of product and knowledge exchange. Cooperatives, community enterprises, and occupational groups are examples of cooperation strategy. Such collective institutional arrangements can safeguard members against losses from climatic fluctuation.

Many SE communities have set up cooperatives. The cooperatives initiate group processes and strengthen

community enterprises and occupational groups, such as groups that produce shrimp paste and fish sauce and groups that help each other in adjusting modes of production such as a multi-cropping system in place of paddy rice production, exchanging seeds, delaying planting time, and zoning to avoid flooding.

Strategy 5: Mobility over Space and Time

Mobility over space and time is an ecological strategy including area zoning, seasonal shift of land use, and temporary migration to be adaptive to ecological changes. In the case of repeated flooding, households or communities learn from their experiences and try to live with crises by zoning agricultural plots to reduce exposure to flooding in the crisis time, and selecting plant species with a short life span to match the intermittent period of flooding. In addition, coastal aquaculture is transformed to be land-based aquaculture with controllable water quantities in the hot season. Temporary migration is also adopted.

These five strategies reflect appropriate adaptation measures that bring about resilience to problems and changes in ecosystems, including climate change.

Vulnerability Reduction from Collective Adaptation Measures

Vulnerability to climate change is a function of exposure, sensitivity, and adaptive capacity (IPCC, 2007). Table 1 shows collective adaptation measures that can be applied when SE communities face climatic crises. These collective measures come from community-level decision making after experiencing the crises. Vulnerability analysis was conducted to assess the strategies in accordance with vulnerability components as follows.

Exposure

Exposure to climate change means not only the extent of climatic hazards, but also how communities expose themselves to the hazards. SE communities have moderate production and consumption activities that are suited to ecosystems leading to healthy ecosystems that provide a wider range of adaptation options and enhance community resilience to climate change.

It was found that strategies 2 and 5 can reduce exposure. In terms of diversity dependency, with knowledge and morality, modes of agricultural production promote good quality of the soil, water, and forest, and maintain biodiversity in agricultural plots. The three types of forest with four benefits is a good example. Dependency on biodiversity brings about different levels of exposure to climate change. Production and consumption systems are safeguarded by diversity of drought-, flood-, disease-, and pest-tolerant varieties. Some species or varieties on which households depend, which cannot grow well in climatic crises can be replaced by other tolerant types. Almost all households grow diverse species and varieties to diversify food and income sources. In terms of mobility over space and time, modes of production are flexible via land use zoning with short-life, annual plant species in flood-prone areas and perennial species in repeatedly flooded areas. Water mass is allowed to pass through the settlement area during floods.

Table 1
Collective adaptation measures and outcomes of reduced vulnerability

Reduced vulnerability	Coping/adaptive activities	Community
- Reduced exposure (strategies 2 and 5)	- Zoning of agricultural areas and shift of planting period to fit to regimes of repeated flooding	Ban Maerawan
	- Diversifying income sources, not depending on only aquaculture that is facing climatic risks	Ban Klongchong
	- Diversifying agricultural products	All communities
- Reduced sensitivity (strategy 1)	- Self-evaluation and household assessment	All communities
- Increased adaptive capacities (all strategies)	- Changing varieties to suit changing rainfall	Ban Teenped
	- Reserving over 150 rice varieties and breeding for drought-tolerant varieties	Wat Suanthamruamjai
	- Researching drought-tolerant tuber species	Maetha Center
	- Building check dams, water storage ponds, and irrigation system	Ban Maerawan Ban Tha-rua Ban Thapapao Songsalung Center
	- Sharing knowledge	All communities
	- Changing mode of production from annual cultivation to multi cropping	Ban Thungkraprong
	- Shifting careers to off-farm employment	Ban Donmun
	- Reducing water use	Ban Phu
	- Integrating knowledge to assess crises and plan to cope with repeated flooding	Ban Maerawan
	- Cooperatives	Ban Bangrong, Ban Kham Ban Chumrung, Ban Dokbua Ban Klong-Rue Wat Payang, Maetha Center
	- Conserving forest	All communities

Sensitivity

Strategy 1 was found to respond to sensitivity. Self-evaluation and household assessment shapes followers to have awareness of their own capacities, societies, and ecosystems. They can fit and adjust themselves with their surroundings even though they are facing socio-economic and ecological changes. In addition, learning and accepting risks from climate change and uncertainties are perceived as normal situations by SE farmers. Households are less sensitive when they accept impacts and can assess future risks.

Adaptive Capacities

SE communities are highly dependent on nature. From close ecological investigation, the farmers accumulate knowledge and skills to manage the water system, recover soil quality, control pests and diseases, change varieties, or shift the planting time. This knowledge of crop management is necessary to cope with climate variability including changing temperature and the pattern of quantity, distribution, frequency, and onset of rainfall.

All strategies were found to increase adaptive capacity; farmers assess future risks from climatic variability that they are yet to face on their farms and select species and varieties in order to survive climatic crises. Some communities protect themselves from rainfall fluctuation and flooding by building check dams in mountainous areas to alleviate flooding, and reservoirs on agricultural farms to store water to use in dry periods.

The philosophy brings about diverse adaptation options, such as: (1) risk reduction through changing production modes and precise on-farm management, and (2) risk diversification via diversity of biological resources, agricultural products, markets, exchanges, and support. In addition, the philosophy favors sharing knowledge within and between communities leading to the capacity to make decisions to select and implement adaptation options. Decision making to adapt or plan to adapt to future climate change comes from past experiences and current impacts. However, the assessment of future risks, and preparation to adapt to future climate change are still challenging for households and communities.

Critical Success Factors of Adaptation Among SE Communities

The philosophy of SE brings about critical success and enabling factors for communities to adapt to climatic changes. Moderation, prudence, and self-immunity are critical success factors that can pave the ways for communities to follow adaptive practices, whereas knowledge and morality are needed to enable adaptation to climate change.

Moderation encompasses the idea of a middle way between want and extravagance leading to the pursuit of a livelihood with self-reliance and frugality. The main strategy to promote moderation involves self-evaluation and household assessment, whereas all strategies help support ***Prudence and Self-immunity. Prudence*** means responsibility to oneself, to others in the society, and to the environment. The people are aware of the short and long term consequences of their activities. Prudence brings about analytical capability, self-awareness, foresight, compassion, and empathy, whereas ***Self-immunity*** reflects built-in resilience and the ability to withstand shocks, to adjust to external change, and to cope with events that are unpredictable or uncontrollable. ***Knowledge***, or wisdom with prudence, and ***Morality*** or virtue and ethical behavior, are needed in all strategies.

Moderation, prudence, and self-immunity have shaped the people in the study area to live their lives with self-reliance, producing agricultural products with care, and not to take advantage of ecosystems and societies. With accumulated knowledge and experiences together with morality, they earn their living with minimal risks from social and ecological stresses. Knowledge shapes how they know and understand social and ecological surroundings, whereas morality shapes how they use knowledge to respond to the surroundings. Local knowledge with morality found in the studied SE communities included: (1) construction of knowledge and understanding the dynamics of resources and ecosystems, (2) knowledge and morality in integration of ecological knowledge and adaptive farming management practices, (3) knowledge with morality in resilient institutional arrangements and collective networks, and (4) a worldview of sustainability in adaptation for survival, and for protecting natural resource base for food and settlement security.

Discussion and Conclusion

The five adaptive strategies to climatic changes were (1) self-evaluation, (2) diversity dependency, (3) storage and reserve, (4) cooperation, and (5) mobility over space and time. These strategies were enabled by wisdom and morality, and shaped with moderation, prudence, and self-immunity, which are major components of the SE philosophy. These strategies help to reduce exposure and sensitivity, while increasing adaptive capacity to climate change with the aims of sustainability in adaptation for survival, and of protecting the natural resource base for food and settlement security.

Moderation, prudence, and self-immunity to be resilient to external shocks were found as critical success factors to adapt to climate change through the five adaptive strategies. These strategies were found to reduce the vulnerability of the communities to climatic risks. These strategies correspond to some strategies proposed by Agrawal and Perrin (2008), namely mobility, storage, diversification, communal pooling, and exchange. The reduced vulnerability comes from reducing exposure to climate change, reducing the sensitivity of households and communities to impacts, and increasing the adaptive capacities of communities (IPCC, 2007).

Local knowledge with morality was found to be an enabling factor of the adaptive strategies and included: (1) construction of knowledge and understanding in the dynamics of resources and ecosystems, (2) knowledge and morality in the integration of ecological knowledge and adaptive management practices, (3) knowledge with

morality in resilient institutional arrangements and collective networks, and (4) a worldview of sustainability in adaptation for survival, and for protecting the natural resource base for food and settlement security.

Social factors inducing adaptation to climate change found among scholars include local ecological knowledge (Adger et al., 2009; Hahn, Olsson, Folke, & Johansson, 2006), social bonding or social capital (Agrawal, 2008; Hahn et al., 2006) and collective networks (Agrawal, 2008; Hahn et al., 2006). The findings of the current research agree with these scholars. The SE communities use local ecological knowledge with cooperative strategies in order to cope with climatic variability.

The SE philosophy brings about critical success and enabling factors for communities to adapt to climatic changes. Moderation, prudence, and immunity are critical success factors that can pave the ways for communities to follow adaptive practices, whereas the enabling factors of the adaptive strategies are local wisdom and morality. These factors can be applied to the conceptual framework of community-based adaptation to climate change within the context of sustainable development as well as the national adaptation plan. Communities have to face problems including socio-economic development, poverty, deterioration of environment, and biodiversity loss, while coping with climatic changes and shocks. They need to remain in their context, adapting to those changes while keeping sustainable development as their ultimate goal.

The National Adaptation Plan (NAP) was proposed by the Conference of the Parties to the United Nations Framework Convention on Climate Change at its 17th session to enable all developing and least-developed countries to address adaptation planning in the broader context of sustainable development planning. The implementation of adaptation planning should be based on nationally identified priorities, including those reflected in the relevant national documents, plans, and strategies, and should be coordinated with national, sustainable development objectives, plans, policies, and programs (LDC Expert Group, 2012). Due to the concern of sustainable development and country-specific issues, the SE philosophy, then can be proposed as a major part of the NAP.

Conflict of interest

There is no conflict of interest.

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