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Participatory Management for Sustainable Low-Carbon Community in Highland Community, Thailand

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Abstract

The concept of sustainable development by using participatory management is trendily favored for developing low-carbon communities. This research aimed to investigate participatory management for developing sustainable low-carbon communities, community performances in sustainable low-carbon communities, and contributing factors of these performances. The research area was located at Pa Pae Village, Pa Pae Sub-District, Mae Sa Rieng District, Mae Hong Son Province, Thailand. Data were analyzed from in-depth interviews, focus groups, and document investigations. The results indicated that participatory management consisted of a cycle of three stages, need identification, planning, and implementation, which required community meetings to make discussion and decision. The performances in sustainable low-carbon communities also involved environmentally friendly agriculture, forest restoration, conservation, community health management, community strength, and efficient use of resources. These performances relied on socio-culture of community, community leaders, and encouragement of agency. Therefore, participatory management should include the stage of evaluation. Leadership development in participatory management should be also focused to continue the community performances in sustainable low-carbon communities, along with encouraging active social learning process to achieve the goal of sustainable development.

Keywords: food waste, compost, household compose bin

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1. Introduction

There has been an economic trend towards a low-carbon community, society or city which aims to control the use of natural resources and pollution and involves different strategies under the concept of sustainable development [1]. UK government promotes hundreds of low-carbon community groups to reduce greenhouse gas emissions in response to climate change [2]. The energy policy of Japan also directs to increasing the use of renewable energy up to 22-24 percent in 2030 and reducing greenhouse gas up to 80 percent in 2050 [3]. In addition, China drives programs and projects through provincial and municipal government to create a low-carbon eco-city that involves performance indicators of efficient use of resources, a friendly environment, sustainable economy, and harmonious society [4]. In Thailand, the low-carbon society was included in the national, social, and economic development plan since 2011 which focuses on changing human behavior to reduce greenhouse gas emissions in residential communities, workplaces, business, industry, agriculture, and tourism [5].

The term 'low-carbon community' has been discussed in various perspectives. Liu e et al (2021) describes this term as a community that has low carbon emission and environmentally friendly environment such as green buildings and effective energy management [6]. In contrast, Heiskanen et al (2010) argued that a low-carbon community is a form of cooperation and collaboration to strengthen behavior change for reducing carbon emissions in communities which depends upon the appropriate mechanisms and contexts of each community [7]. Low-carbon community also associates with three stages of low-carbon development; low-carbon economy or primary stage (achieve low-carbon industry, low-carbon tourism), low-carbon society or developmental stage (achieve low-carbon community, low-carbon life, and low-carbon city), and low-carbon world or maturity stage (achieve low-carbon over the world in economy, politics, culture, and life), respectively [8]. However, the literature indicates that communities have the capacity to create low-carbon activities and drive individual behav-

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ior change toward the environment [9]. For example, indigenous communities in Uganda adapt their knowledge in response to climate change especially in agricultural practices (planting, weeding and harvesting) [10]. In Thailand, Sampaya Community, Cha-Am District, Phetchaburi Province, determines four low-carbon strategies which consist of reducing carbon emissions from activities of production and consumption, educating community members about low-carbon community, building participation with community members and agencies, and developing low-carbon transportation [11].

In addition, participatory management has been implemented as a tool or strategy for developing low-carbon communities since this approach focuses on the process that builds participation in practices to achieve the goal of organization or community [12]. Such process is a series of activities and actions engaging with sharing decision-making, implementation, benefits, and evaluation [13]. Therefore, participatory management provides several advantages; stimulating a sense of belonging to common missions, improving decisions and actions, facilitating collective learning, increasing opportunities for success, and strengthening community [14]. For example, Bangladesh people in the southwestern region participated in reforestation to increase carbon stocks along roads and highways [15]. The carbon market developed by Vietnamese people also contributes to reducing greenhouse gas emissions by nine percent [16]. Farmers at the learning center at Klong Noi Community, Mueang District, Surat Thani Province, Thailand achieve the practices of a low-carbon agricultural community after farmer leaders stimulate group activities of non-chemical agricultural practices. They also obtain benefits from non-chemical agricultural practices, such as reducing production costs and encouragement of sub-district administrative organizations and departments of agriculture to be obtained encouragement in need [17]. However, some scholars mention about barriers of participatory approach; for example, inadequate community skills, limited time, and insufficient conversation [18].

This research aimed to investigate participatory management for developing sustainable low-carbon communities, community performances in sustainable low-carbon communities implementing participatory management, and contributing factors of these performances. Participatory management was defined as the process that built participation in sustainable low-carbon communities and sustainable low-carbon communities referred to the participation of community members to perform activities reducing carbon emissions in response to the concept of sustainable development. The research was conducted in the area of Pa Pae Village, Pa Pae Sub-district, Mae Sa Rieng District, Mae Hong Son Province where people had experience in participatory management for developing sustainable low-carbon communities and the performances of sustainable low-carbon communities, certified by the Royal Project and Highland Research and Development Institute and Mahidol University.

2. Methods

2.1 Area of Study

The area of study selected for this research was limited to a small highland village in the North of Thailand which is located at Pa Pae Village, Pa Pae Sub-district, Mae Sa Rieng District, Mae Hong Son Province. The total population of this village was 405 residents in 93 households and most villagers were Laue, an ethnic group. This village was surrounded by mountains and trees which was related to livelihoods depending upon natural resources, especially agricultural practices.

2.2 Scope of Study

The investigation in this study focused on the issues about sustainable low-carbon communities:1) how leaders conduct participatory management for developing sustainable low-carbon communities; 2) what community performances in sustainable low-carbon communities implementing participatory management are; and 3) what factors contributed to such community performances and how they were.

2.3 Data Collection

Permission to conduct this research were granted by the village leader at Pa Pae Village. After that, three qualitative methods were used to collect data, i.e., document investigation, focus group, and in-depth interview. Document investigation included archival materials from participants such as reports, memos, and pictures. Researcher purposively selected twenty participants, who were able to provided information according to the objectives of this study, for in-depth interview and focus groups. Entire participants were able to provide information voluntarily and stop providing information whenever they want. They were divided into three groups—leaders, villagers, and agencies. Leaders consisted of the village leader and the community committee at Pa Pae Village who had experience in participatory management for developing sustainable low-carbon communities. Villagers were community members who lived in Pa Pae Village and engaged in the performances of sustainable low-carbon communities. Agencies included representatives of government officials from Mahidol University and the Royal Project at Pa Pae District who encouraged leaders to develop sustainable low-carbon communities. In in-depth interviews, researchers used semi-structured interview forms which focused on different sets of questions for each group of participants.

Leaders were asked about how to conduct participatory management for developing sustainable low-carbon communities, what community performances in sustainable low-carbon communities and what suggestions for improving community performances are, and what and how contributing factors are involved in such community performances. Villagers were asked about what and why they engaged in sustainable low-carbon communities, and what suggestions for improving the performances of sustainable low-carbon communities. Agencies were asked about how to encourage sustainable community development at Pa Pae Village. In addition, researchers organized focus group discussions to gain information according to the objective of this research. Five leaders were invited to discuss about participatory management for developing sustainable low-carbon communities, community performances in sustainable low-carbon communities, suggestions for improving such community performances, and contributing factors of such community performances, and five villagers were invited to discuss about their engagement in sustainable low-carbon communities and suggestions for further performances of sustainable low-carbon communities.

2.4 Data Analysis

All data collected from in-depth interview and focus group, along with document investigation, were recorded, transcribed, and analyzed, respectively. Data analysis consists of coding, constant comparative methods, and memo-writing which were important procedures for the accuracy and completion of descriptive data. Coding was the stage of categorizing segments of data or naming and organizing data. During coding, constant comparative methods were occurred to distinguish the similarities and differences between data and categories. At the same time, memo writing or simple note taking were continuously developed and improved. In other words, memo writing provided a draft of description and directed further coding and constant comparative methods until the description was completed.

3. Results

3.1 Participatory Management

Participatory management for developing sustainable low-carbon communities was embedded in the process of community development. It consisted of a cycle of three stages (see figure 1): need identification, planning, and implementation. This cycle required community meetings where Pa Pae villagers were able to make decisions from sharing and discussing information, need, problems, ideas, and opinions about community performances of sustainable low-carbon communities. Normally, the community committee at Pa Pae Village organized and led the community meetings for managing the development of the village on regular basis every month. The details of each stage were described below.

3.1.1 Need Identification

This stage focused on identifying the advantage and need to conduct sustainable low-carbon development before making decision in the next step. After the community committee and villagers obtained information about sustainable low-carbon communities from the Royal Project Development Center at Mae Sa Rieng District, Mae Hong Song Province, they discussed about sustainable low-carbon communities in the community meeting and agreed that carbon emission for sustaining community economy was inevitable. Moreover, the community committee and villagers accepted that they would obtain several advantages from engaging with sustainable low-carbon communities; living in magnificent environment, conserving forests for further use maintaining sufficient livelihoods, and enhancing quality of life.

3.1.2 Planning

Since the community committee and villagers realized the need to conduct sustainable low-carbon communities, relevant information was gathered to identify what and how to conduct. The Royal Project Development Center at Mae Sa Rieng District, Mae Hong Son Province also provided them information and checklist of actions before they discussed about action plan for sustainable low-carbon communities, including environmentally friendly agriculture, forest conservation, environmental health, community strength, and natural resource use. This action plan was imbued with the master plan of village development. The community committee and villagers also assigned the tasks of each team in the action plan to demonstrate their accountability toward the environment.

3.1.3 Implementation

This stage focused on the implementation or performances as specified in the previous stage for achieving sustainable low-carbon communities. During implementation, the community committee and the villagers were able to share their problems, obstacles, and results in the community meeting. They made decisions to continue the activities that derived advantageous results. In contrast, disadvantageous activities were changed to improve the performances of sustainable low-carbon communities. They also continued the next cycle to review their decisions, revise the action plan, and adjust implementation.

3.2 Community Performances in Sustainable low-Carbon Communities

The performances of leaders and villagers at Pa Pae Village complied with the indicators of sustainable low-carbon communities developed by the Highland Research and Development Institute and Mahidol University. These performances were divided into

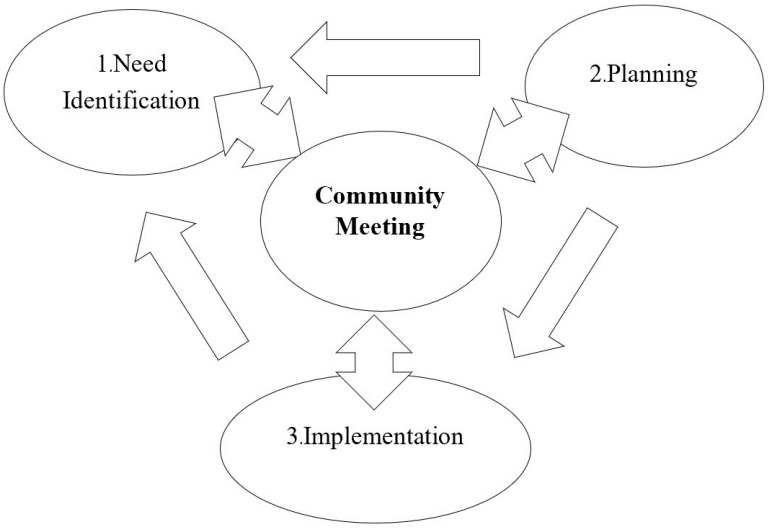

Figure 1: The process of participatory management

five categories as demonstrated in Table 1. Each category also required regular actions and improvements to create sustainable low- carbon communities at Pa Pae Village continuously.

3.3 Contributing Factors to Community Performances

3.3.1 Socio-Culture in Community

In general, Pa Pae villagers had strong culture of social cooperation and sufficient livelihoods. They respected the leaders of the village and cooperated in social events of the village and community members. Their livelihoods also depended upon natural resources in forest areas around the village, especially agricultural practices and collecting forest products, which promoted their awareness to protect natural resources and the environment.

3.3.2 Community Leaders

The village leader and the community committee at Pa Pae Village agreed to lead community to sustainable development since they realized the importance of natural resource and environment in livelihoods. Then, they focused on explaining to villagers in the community meeting and daily talk about the advantages of driving to achieve sustainable low-carbon communities; for example, living in magnificent environment, conserving forests for further use, maintaining sufficient livelihoods, and enhancing the quality of life. Consequently, most villagers participated in the activities of sustainable low-carbon communities.

3.3.3 Agency Support

The Royal Project Development Center at Mae Sa Rieng District, Mae Hong Son Province encouraged Pa Pae Village to perform activities of sustainable low-carbon. They acted as mentor to guide and advise the community leaders how to develop and achieve sustainable low-carbon. They also educated leaders and villagers about sustainable low-carbon communities at Pa Pae Village which helped promote participation in the program. In addition, local administrative encouraged related activities of sustainable low-carbon communities, especially community cleaning and forest conservation.

4. Discussion

The findings of this research highlighted the process of participatory management for developing performances of sustainable low-carbon communities which included need identification, planning, and implementation. This process required the regular meeting, e.g., a community meeting, where functioned as a common platform for communication and discussion leading people to make decisions and commitment toward the mission of carbon emissions [12]. However, building participation should include the stage of evaluation which emphasized the achievement of sustainable low-carbon communities and the benefits toward community members and environment [13]. In addition, the levels of participation should be considered in participatory management, information provision (one-way communication), consultation (two-way communication), active involvement (resources, time, tools, and costs), and social learning (intensive sharing idea and knowledge to convince other people) [19]. In the case of Pa Pae Village, the stage of need identification implied participation at the level of information provision from agency about what sustainable low-carbon communities are. Two-way communication was also conducted between community leaders and community members directing to share ideas and responsibilities for implementing sustainable low-carbon communities which indicated participation at the level of

Table 1. The community performances and suggestions for sustainable low-carbon community at Pa Pae Village, Mae Hong Son Province

No.	Categories	Performances	Suggestions
1	Environmentally Friendly Agriculture	- Avoid using chemical substances and pesticides in farmland by focusing on organic farming and good agricultural practices (GAP); however, ten farmers and twenty-four farmers are certified respectively. - Focus on soil restoration by using lime and organic fertilizer (manure and compost) including crop rotation, and planting vetiver. - Use sprinkles and traditional methods to save water (rainwater, watering can, and stagnant water in filed plot) in agricultural practices, including releasing less water into rice fields.	- Should encourage entire farmers to request certification of organic farming or GAP. - Should promote water management plans to control water use and maintain water quality. - Should monitor water and soil quality regularly.
2	Forest Restoration and	- Collect data about forest area boundary of community, agriculture areas, tree position, fire brake line, and forest fire areas which help plan forest restoration and conservation. - Determine community regulations for protecting forests such as banning felling trees and using forest products. - Conduct related activities such as breeding plants, planting trees and local plants, building firebreaks, and building weirs to increase humidity in the forest. - Report and monitor activities of forest restoration and conservation.	- Should post forest regulations to community members in public space and continue activities of forest conservation to stimulate conservation awareness. - Should encourage propagation and cultivation of local plants for forest and biodiversity conservation.
3	Community	- Promote neat, tidy and clean houses supported by local administrative organization, public health volunteers and the Royal Project at Pa Pae District which led to obtaining the clean community award of the year 2021 from the local administrative organization. - Encourage waste sorting in households to organic waste, recycle waste, and hazardous waste. For wastewater drainage, connect the wastewater pipe from households to layer filters of rock, sand, and soil in a circular cement pond before releasing water to the ground. - Determine the area for a community waste pit and regulations for using the community waste pit. - Maintain quality of drinking water sources by cleaning water tanks and monitoring water quality in the water tanks. - Educate community members about using water filter and boiling water before drinking.	- Should record the type and amount of waste in households and communities for developing a waste management plan. - Should promote waste reduction such as using cloth bags instead of plastic bags, and reusing waste. - Should improve community waste management such as preventing rubbish scattering from animals in the community waste pit, and building participation with community members.
4	Community Strength in Response to Changes	- Focus on planning process for community development: problem and need identification, SWOT analysis, and solution proposal. - Integrate the philosophy of sufficiency economy into community activities; for example, saving, cooperative management, promoting occupation and income, preventing youth from drug addiction, and conducting public benefit activities. - Provide handicraft learning center of Lava ethnics.	- Should promote learning process to empower leaders and community members for adapting to changes.

Table 1. The community performances and suggestions for sustainable low-carbon community at Pa Pae Village, Mae Hong Son Province (Con.)

No.	Categories	Performances	Suggestions
5	Resource	- Educate energy saving in the household; for example, carpooling and using firewood. - Reduce forest exploitation. - Promote planting economic trees after felling trees.	- Should save economic forest products for sustainable livelihoods.

consultation and active involvement, especially individual resources and times. However, Pa Pae Village should improve participation at the level of social level to empower intensive communication and education.

This research also indicated that the community leader is a contributing factor to community performances in sustainable low-carbon communities implementing participatory management. Therefore, leadership development is essential to achieve sustainable low-carbon communities. In this sense, the community leaders should have the competency of self-management (awareness of leadership, learning ability, and conflict management), social skills (building and maintaining relationships, building effective teamwork, and communicating with people), and facilitation skills (creative thinking, strategic thinking, managerial skill, and coping with change) [20]. Kirk and Shutte (2004) [21] propose triangle framework of community leadership development which are composed of connective leadership (building common goal and team work), leading change through dialogue (promoting collective learning and participatory action), and collective empowerment (developing social relationship which leads to realize on community role). However, how to develop community leadership for participatory management is required further research to achieve sustainable low-carbon communities, especially in a period of rapid change in the community.

5. Conclusion

Participatory management for developing sustainable low-carbon communities was embedded in community development and involved a cycle of need identification, planning, and implementation. This cycle was driven by regular meetings where people were able to make discussions and decisions together. The community performances of sustainable low-carbon communities derived according to participatory management included environmentally friendly agriculture, forest restoration and conservation, community health management, community strength, and resource-saving. The contributing factors of these performances consisted of socio-culture in the community, leaders, and agency support. However, community leaders should emphasize the stage of evaluation in participatory management to increase the effectiveness of developing sustainable low-carbon communities. The government should also focus on leadership development to continue the community performance in sustainable low-carbon communities and should encourage an active social learning process to fulfill participatory management for achieving the goal of sustainable development. In addition, a study about developing leadership in participatory management for sustainable low-carbon communities should be conducted.

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