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Ecovillage in Thailand: Lessons from Applying the Concept to Practice

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Abstract

The ecovillage approach offers extensive and applicable insights for planning and developing both rural and urban communities. This participatory action research aimed to apply the ecovillage concept to transform a typical Thai community into an ecovillage, and to formulate guidelines along with the lessons learned. The practical process which emerged can be adapted to the Thai context and developing countries alike, and can serve as guidelines for other communities: 1) community selection and assessment; 2) community preparation; 3) designing and implementing an ecovillage training module; 4) learning from other successful environmental management communities; 5) planning for the ecovillage; and 6) reflection on the whole process.

***Keywords**: Ecovillage transformation, sustainable community, sustainable rural development, learning process, Thailand*

Introduction

The current environmental and ecological crisis in the world (Borsos, 2007) arises in part from the diminishing biodiversity and resources (Foster & York, 2004) that unavoidably affect human beings. One of the ways to confront the challenges of environmental issues and the global ecological crises is to implement the principles of sustainable development at the rural level. The ecovillage concept, based on principles of sustainable development (Borsos, 2013) exemplified by a small community, thus arose to create ecological sustainability whereby it can meet the needs of today's society without affecting the future of the next generation (United Nations, 1987).

The ecovillage concept was introduced in the 1960s; the aim is to develop and structure communities that can be self-reliant through ecological, environmental, social and economic systems based on sustainable development principles. The ecovillage concept also values spiritual systems and common purposes (Kasper, 2008; Farkas, 2017). While not attempting to return to the way of life in the past, where the community relied totally on nature, it rather focuses on a lifestyle that reduces environmental impacts, creates social change, and applies new and modern technologies (e.g. waste management technology, renewable energy) that suit the community (Mare, 2000; Wagner, 2012; Würfel, 2012). It also emphasizes the importance of people participating in all aspects of community development, including the environmental dimension – reducing ecological footprints and impacts; social dimension – creating a new society that is benevolent, self-reliant and less dependent on external factors; economic dimension – generating food, work, and income; and spiritual dimension – connecting people in the community. The term *ecovillage* was formally named by the United Nations in 1998 (Global Ecovillage Network, 2014). Since then, ecovillages have emerged around the world (Bang 2005), and the Global Ecovillage Network (GEN) is uniting these ecovillages spread all over the globe and continuously expanding as more and more new communities join it (Ardzijauskaite, 2009).

Several projects and models from around the globe have adopted ecovillage concepts. For example, the Findhorn (2015) in Scotland laid the foundation for an ecovillage; Ecovillage Ithaca (2017) in the USA featured land use design for agriculture and forestry. Beddington Zero Energy Development (BedZED) in London, UK, and Sieben Linden, Germany featured the use of energy saving technologies in urban systems (Global Ecovillage Network, 2014; Würfel, 2014; Sites Ecovillage, 2014). Jiande, Zhejiang Province in China featured a space design to facilitate a lifestyle that reduces the impacts on the environment and established social institutions that enable humans to live with the environment (Hu & Wang, 1998). In Thailand, two known communities have adopted ecovillage concepts: 1) Wongsanit Ashram, which offers a short-term training program (Wongsanit Ashram, 2015) and 2) Panya Project, which was started by a group of volunteers from Western countries who are interested

in making changes in Asia (Panya Project, 2015). However, both projects are managed as organizations that have adopted and applied ecovillage-like concepts, not as full-fledged ecovillages.

Thailand is a developing country that focuses on economic and technological development, economic growth, and export revenue, resulting in over-exploitation of natural resources, negative environmental impacts, worsening pollution, and frequent natural disasters. In view of these problems, a wise path to the country's sustainable development should be considered. The country should recognize the importance of ecologically-based development, which can be found in the ecovillage concept. However, applying such a lifestyle-changing concept to already well established communities with different ways of life from Western countries may not be simple, despite the concept's usefulness. This paper therefore aims to present lessons learned from applying the ecovillage concept to transform a Thai community, Khok Muang community, in southern Thailand into an ecovillage. It hopes to sketch guidelines for other communities in developing countries that wish to create ecovillages but do not know how by highlighting effective and necessary steps for doing so.

Theory Background

Definition and Meaning of Ecovillage

An ecovillage is a community designed with a system of settlements that integrates activities within the community (Gilman, 1991; Bang, 2005). Residents share common goals and use participatory processes in shaping the direction of the community (Gilman, 1991; Bang, 2005; Global Ecovillage Network, 2014). In addition, Gilman (1991) has added four aspects of ecovillage definitions:

1) *Human-scale settlement* (usually between 50 and 500 members) refers to a size in which people are able to know and be known by the others in the community, and where each member feels he or she is able to influence the community's direction;

2) *Full-featured settlement* is one where all major functions of normal living – residence, food provision, manufacture, leisure, social life, and commerce – are present in balanced proportions;

3) *Human activities are harmlessly integrated into the natural world*. Thus, the goal is the harmless integration of human activities into the environment; and

4) *It is supportive of healthy human development in physical, emotional, mental, and spiritual ways, and is able to continue into the indefinite future*. This healthy development needs to be expressed not just in the lives of individuals, but also in the life of the community.

The definition of an ecovillage not only describes what an ecovillage is, but also encompasses the intention and spirit of an ecovillage that attracts many communities to consider changing their way of life. Understanding the real meaning of an ecovillage can inspire a community to walk on a more sustainable path, which is called for in the present global crisis.

Ecovillage Development

The ecovillage concept has been accepted worldwide and often considered as an alternative to sustainability, although originally it was created by only a few people hoping to make a change in their own living. The ecovillage movement can be divided into four phases (Findhorn, 2015; Global Ecovillage Network, 2014; Hildur & Jackson, 2004):

1) In 1957, Peter and Eileen Caddy and Dorothy Maclean came to manage the Cluny Hill Hotel and founded the Findhorn Community in 1962.

2) 1960 – 1980, the Findhorn Conference was held and an ecovillage network was formed. The Findhorn Foundation was registered in 1972, and a publication was created to disseminate the ideas to more than 30 countries around the world.

3) 1981 – 2000, eco-friendly models of homes and buildings starting to be built, and an academic conference was held to spread ideas. The term *ecovillage* was officially adopted by the United Nations, and a global ecovillage network was formed.

4) 2001 – Present Colleges were established and began to offer short-term ecovillage educational programs, as well as Bachelor and Master Degree Programs.

At present, ecovillages have emerged worldwide. The Global Ecovillage Network (2018) claims more than 10,000 communities and related projects where people live together in greater ecological harmony on every continent. In Thailand, two organizations are interested in this concept, but neither has fully implemented a full-featured ecovillage (Panyaproject, 2015; Wongsanit Ashram, 2015).

Ecovillage Conceptual Framework

The ecovillage operation has five conceptual frameworks, each of which comprises detailed components that altogether show holistic integration approach covering all major ecological and environmental sustainability issues (Figure 1). Each issue will be taken into consideration for developing an ecovillage in this case study.

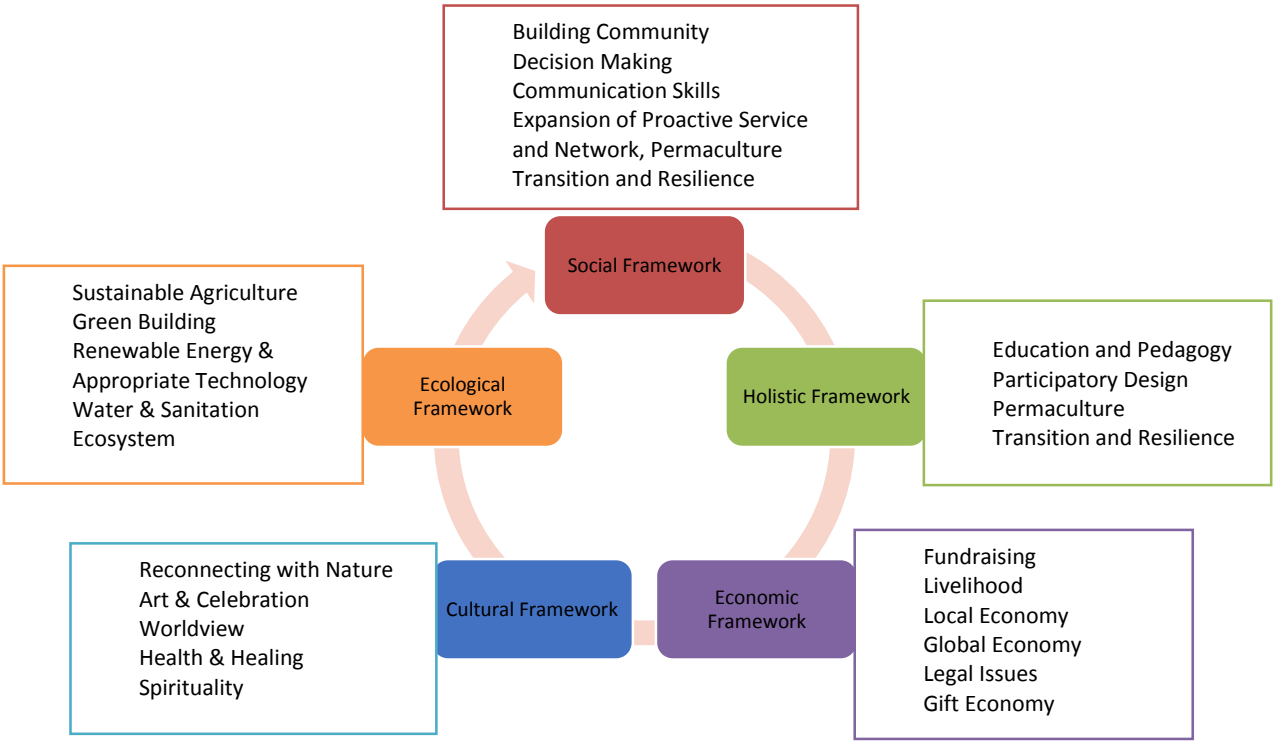

Figure 1. Ecovillage Framework (Database of the Global Ecovillage, 2015)

Study Area and Methodology

This study was an action research project with community participation. The community chosen for the case study was Khok Muang community, in Bang Riang Sub-district, Khuan Niang District, Songkhla Province in southern Thailand. It is located at 7°09'01.5"N latitude and 100°25'30.8"E longitude (see Figure 2 below). The area is rich with natural resources such as forests, mangroves, lakes, and land suitable for agriculture. In addition to natural capital, the community has high social capital: i.e. active and democratic leaders, close familial bonds among community members, effective communication, and members' willing attitude toward learning and improving.

The case study was purposefully selected as is frequently done in qualitative research (Palinkas, et al., 2015). Suri (2011) affirmed that many qualitative scholars recommend that an in-depth synthesis of purposefully selected studies is more desirable than a superficial synthesis of a large number of studies. This technique involves identifying and selecting individuals or groups of individuals that are especially knowledgeable about or experienced with a phenomenon of interest (Cresswell & Plano Clark, 2011, quoted in Palinkas, et al., 2015). Aside from knowledge and experience, availability and willingness of participants to be involved, the ability to communicate experiences and opinions in an articulate, expressive, and reflective manner also needed to be considered (Palinkas et al., 2015).

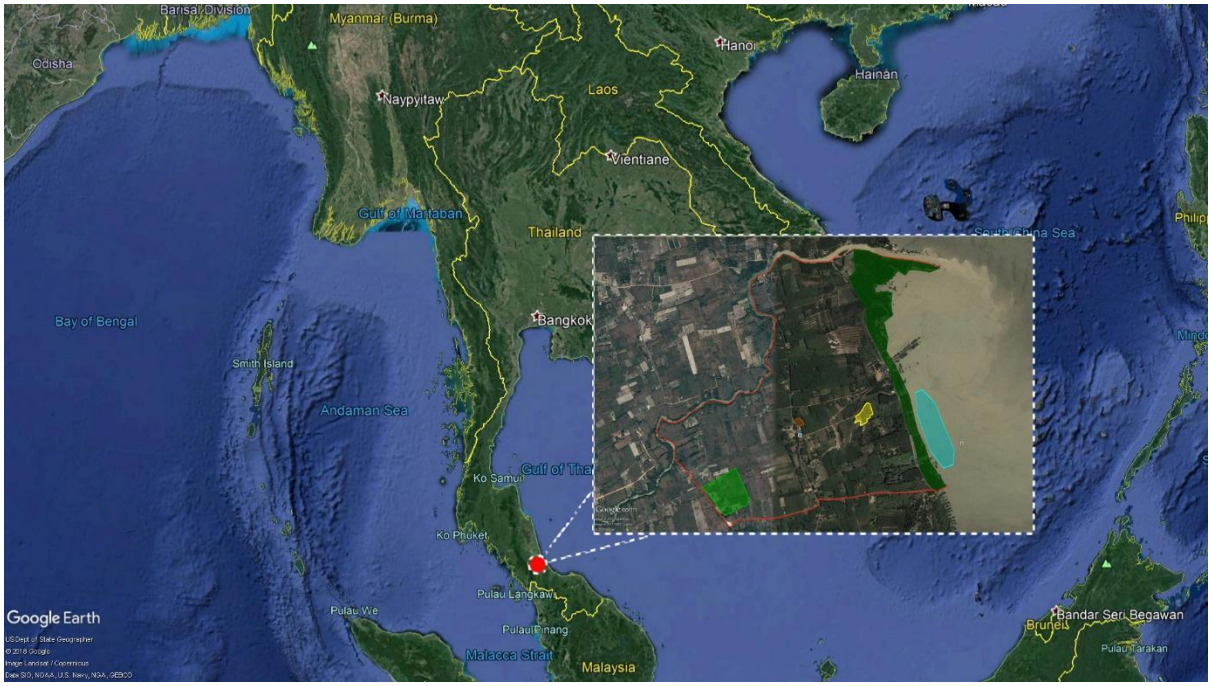

Figure 2. Map of the Community (Modified by Authors from Google Earth, 2015 and 2017)

Having collaborated with this community on two prior research projects, the researchers determined that this community satisfied the criteria mentioned above. Community members showed an interest in sustainable and self-reliant development, gaining knowledge and experience in similar phenomenon, had the capacity to share, express or communicate their ideas well, agreed to provide time to participate, and were willing to take on the ecovillage concept as a model to develop their community. The community also showed interest in the ecovillage concept when it was presented to them, and aspired to develop itself as a model community. Nonetheless, the community still lacked the knowledge and understanding of implementing all five ecovillage dimensions, which is why this research study was needed.

This research was thus designed as action research where community people can participate throughout the whole process, which is true to the core ecovillage concept (Mychajluk, 2017). The action research process is cyclical with five steps: diagnosing, action planning, action taking, evaluating and specifying learning (Järvinen, 2009). Being an action research study with participation, a rigid research plan may not be realistic and applicable as Kemmis (2001), quoted in Davis, 2004) puts it:

> "In reality, the [action research] process is likely to be more fluid, open, and responsive. The criterion of success is not whether participants have followed the steps faithfully, but whether they have a strong and authentic sense of development and evolution in their practices, their understandings of their practices, and the situations in which they practice (p. 595)."

Therefore, a flexible, open research plan was constructed that could be adjusted throughout the study according to the situation, with agreement of the participants. The original plan was crafted to include these steps: a community study to gather existing data and understand the local context; creation of an ecovillage training module for the community; and brainstorming and planning their own version of an ecovillage by the community. However, the actual plan was adjusted as follows:

1. Community Preparation and Empowerment
2. Design and Implement the Training Module
3. Learn from Others: Knowledge Exchange Visit
4. Action Taking and Monitoring: Ecovillage Plan
5. Reflection

Research participants include two levels: the community leaders' level, both formal and informal (30 persons); and the community level, including every household (147 households). Due to the number of participants, their availability, and roles, the former were involved in every step of the study, including making research plans, whereas the latter involved mostly in receiving training, brainstorming the ecovillage plan, and carrying out the plan.

Data collection was carried out both during and after each step of the research process by individual interviews, group discussions, observation records, participant observation, and evidence in the form of participant drawings, writings, answers, assignments, discussions, and practices.

Results

This section presents the results according to the actual steps taken in the research process to apply the ecovillage concept and transform the chosen community into an ecovillage.

Step One: Prepare and Empower the Community

Before starting the process of transforming a community into an ecovillage, some preliminary tasks need to be completed. These are to help community people recognize their own potential and shortcomings in order to be able to make effective changes and plans later on. This step also gives communities an opportunity to reflect on their past development, failures and successes, and conduct a SWOT (Strengths, Weaknesses, Opportunities, and Threats) analysis of current situation. The results of Khok Muang's self-analysis are shown in Table 1 (please see following page).

The community has various assets including natural, social, human, and cultural capital, which are crucial factors in building an ecovillage. However, it lacks knowledge about ecovillages, a good management system, and a holistic view of development. Conducting a SWOT analysis as a community brings realization to the people of what assets they have and what they still lack, and how they would use this new insight for community development. As one participant put it,

> "Our community has in fact many good things like natural resources, local wisdom, and we have been able to go through different crises because of our cooperation in the community. So if we are to continue to improve, by collaborating with this research project on ecovillage, it will give us opportunity to learn new things and strengthen what we are lacking. We can also develop our people in the future too."

Lessons we learned from this step are:

a. Preparing and empowering the community is a necessary step that should be initiated for a community to be ready for what comes next. They need to prepare well to move from a consumerism-based community to a more ecological and environmentally-friendly community; and

b. Reflecting on past difficulties and struggles and how they were overcome to arrive at where they are now helps to empower the community. Community reflection gave determination, as well as assurance that they can achieve what is carefully planned for the future, too.

Step Two: Design and Implement Ecovillage Training Module

2.1) Design Ecovillage Training Module

The training module's objective was for participants to understand the ecovillage concept and enable them to plan for transforming the community into an ecovillage. Core contents are comprised of ecovillage concept, development and progress of ideas, and details of 25 aspects of the five conceptual dimensions and practical content that would lead to designing an ecovillage. Also included were examples of some global ecovillage operations to inspire participants. Altogether, there were six learning units with 18 learning activities.

The learning activities were carefully chosen for adults in particular. Small group discussions, group drawings, brainstorming, educational games, and group presentations were used to achieve the module sub-unit's learning goals. Visual media were mainly selected for each unit. Formal assessment

of learners' achievement was done by pretest-posttest score comparison, and informal evaluation was observed during each unit learning.

Table 1. The Community's Self-Analysis

Community Strengths	Past Community Development Problems	How They Were Overcome
Social Aspects		
Strong Social Bonds Drug-free People Respect Each Other Culture Preservation	Most adults left for work outside of community	Those who left returned at some point after nation-wide economic depression, and became active in creating group to solve problems
Economic Aspects		
Low Expenses, Debt Levels Sharing of Products Direct Exchange, No Market Trade	Community people started to incur debts from unwise use of money	Community saving fund was organized; household financial accounts were encouraged
Environment Aspects		
Clean Air and Water Abundant Natural Resources Many Local Plant Species	Competitive use of local resources such as fishery	Set up a community mangrove conservation group, establish a conservative zone in lake

Community Success Factors	
Internal Factors	**External Factors**
Good Communication and Participation ● Different platforms for communication within community ● Broad participation in community activities Abundant Natural Resources ● Lake ● Mangroves ● Forest ● Canals for water use Community Capital ● People are self-reliant, civic-minded, and dedicated ● Development that focuses on people ● Visionary leader ● Good networking ● Strong social bonds	Opportunities to learn from outside communities ● Many opportunities to learn and exchange knowledge with outside communities or organizations who visit Khok Muang ● Cooperation with other communities or organizations ● More advanced technology/communication enhances community work Infrastructure ● More facilities and infrastructure: community's drinking water factory, more standard road in the community Social and economic ● Community holds to sufficiency economy principle

SWOT Analysis	
Strengths:	**Weaknesses**:
• Rich natural capital: coastal resources (mangroves and Songkhla Lake), water and forest resources, diverse species of medicinal plants, arable low land • Social capital: strong and dependable community connections • Human capital: formal & informal leaders, civic consciousness, community groups • Cultural capital: community preservation/ conservation of traditional culture	• Lack knowledge in ecovillage management • Weak participation in community development by younger generation • Community management still lacks good system • Low budget for community management
Opportunities:	**Threats**:
• Collaboration possible between community and external agencies • Many opportunities to learn and gain new knowledge from community's network.	• Global and national economic fluctuations may affect the quality of life • Changing state policy on rural development

2.2) Implement Ecovillage Training Module

Implementing modules was agreed to be on a bi-weekly basis unless the community had other engagements. It was to be organized in two levels: one for the community leaders, and the other for each household, which were grouped according to community zoning. It took three months to complete the whole implementation process. The result of a t-test from the pre-post test showed that the mean score difference was statistically significant, with a t-test score of 13.92, and a *p*-value of 0.000. An interview with one participant proved that they understood the concept of ecovillage well:

> "If our community is able to develop into ecovillage according to the meaning and concept that we learned from the module, we will be one of the community that its members develop holistically and can be a learning center for other communities."

Lessons we learned from this step are:

a. Designing and implementing an ecovillage training module was the most crucial step in the whole process. To be able to make successful changes, solid knowledge, positive perception, and awareness of why and how it needs to be changed was the foundation. Through the active learning activities in the module, many useful ideas and discussions were exchanged and gathered.

b. Apart from knowledge, inspiration kindled a flame that kept burning and made the whole learning process come alive.

Step Three: Knowledge Exchange Visit to another Successful Environmental Management Community

Along with learning from the examples of other ecovillages presented, the community was also inspired and got ideas from visiting another community that has succeeded in environmental management. For this study, Prik Municipality in another District was selected because of its effective and practical management of environmental waste problems, which led to a learning process through community involvement. An environmentally friendly approach was the result, and was adopted to manage household and central waste. Participants gained insight into practical steps that could be adopted for improving their own environmental management. One participant said,

> "To make our community be aware of environmental management, the most important task is to educate people continuously by creating learning activities and collaborating with networks and other sectors. It is important to move toward the same direction, in which Prik Municipality has shown its wise planning to include youth in their movement. We can learn from them, too."

Lessons we learned from this step are:

a. Visiting a real community is a valuable experience for participants to feel related and authentic. This visit motivated participants to achieve the goal of becoming a model ecovillage.

b. Model communities should be carefully chosen to help fulfill the purpose of setting up an ecovillage. Suggested criteria are to choose a community that, for example, is successful in community-based management from capital within the community, rather than that received from outside help; has practical ecosystem preservation or environmental management; and is able to constructively share and transmit their experience in a meaningful way.

c. It is significant that the participants must come together after visitation and synthesize what was learned to apply it to their situation.

Step Four: Ecovillage Plan

Two units in the module were to have the whole community, both at the community and the household levels, design their own ecovillage according to each aspect in the five-dimensional framework, with action plans and a monitoring program. The community was able to adapt the concept well and design an ecovillage that is appropriate for the community context (Table 2).

Table 2. Ecovillage as Designed by Khok Muang Community People

Ecovillage Framework	Results of Community Design Based on Ecovillage Concept	
	Household Level	Community Level
Ecological Framework		
Sustainable Agriculture - Food Sovereignty - Organic Gardening - Forest Gardening - Animal Husbandry - Bee Keeping	- Produce and consume own food - Organic farming, home vegetable gardening - Plant trees around houses, land boundaries - Animal husbandry e.g. cattle, poultry, ducks, fish, and catfish	- Organic farming - Community forests were divided into 2 zones i.e. mangrove forests and medicinal gardens - Encourage community to plant trees around houses, in agroforest - Establish a community egg farm - Study feasibility of bee-keeping project in 20 households
- Green Buildings - Natural Buildings - Architecture	- Reducing energy consumption - Designing energy-saving house - Planting trees around houses	- Set up renewable energy learning center - Modify community buildings to save more energy
Renewable Energy & Appropriate Technology - Solar, wind, hydro, pedal energy - Biogas & Biofuels	- Twenty solar cells learning center - Nine biogas learning centers - Three charcoal incinerator learning centers	- One renewable energy and three solar cell learning centers - One learning center for energy generator from spinning bicycle to pump water from mangrove forest
Water & Sanitation - Compost Toilets - Water Purification - Water Catchment	- Household waste water management and utilization - Install water storage system and rainwater utilization	- Phumi Canal Water Conservation - Community plumbing - Drinking water factory using an ozone water system
Ecosystem - Waste Management - Recycling - Reforestation - Urban Regeneration	- Households waste management through waste sorting	Manage the community ecosystem which were divided into 4 zones: 1) Public area zones e.g. mangrove forest and herb garden areas 2) Learning center zone e.g. temple, school, house model 3) Agricultural zone e.g. rubber agroforestry, palm farming, rice field 4) Residential area zone
Social Framework		
Building Community - Building trust - Embrace diversity, collective intelligence	- Creating trust and good relationships at household level	- Create trust through personal dialogue in both small and large groups e.g. at monthly meetings
Communication Skills - Facilitator - Conflict resolution & nonviolent communication - Reconciliation	- Promote communication that minimizes conflict, peaceful communication within households through continuous talk and activities	- Create continuous learning process - Conflict resolution through peaceful talk and compromise
Decision Making - Consensus - Democracy - Leadership - Media & Social Media	- Putting emphasis on opinions of majority and democratic system in households - Using online social media to communicate	- Weigh opinions of majority and democratic system in community - Community use of social media - Community radio - Gathering community information and generating learning materials in learning center

Economic Framework		
Fundraising - Microcredit - Empowered Fundraising - Funding Applications	- Do household income-expenditure statement focusing on reducing household expenditures, increasing incomes and savings	- Community savings system - Funds from network partners for community activities e.g. mangrove conservation, marine farming, alternative energy, ecotourism
Livelihood - Crafts - Business Plans - Eco-tourism	- Create household supplemental income through handicrafts (e.g. weaving), food processing (e.g. catfish chili paste), homestays	- Support jobs in community - Promote ecotourism via homestays, learning community ways of life
Local Economy	- Encourage household savings	- Establish community banking
Global Economy	- Supporting fair trade	- Supporting fair trade and regulations
Legal Issues	- Pay attention to laws/regulations	- Stress importance of laws/regulations on mangrove conservation, marine farming, savings rules and groups.
Gift economy	- Practice sharing within families	- Exchange goods/items without money e.g. trade coconut for eggs.
Cultural Framework		
Reconnecting with Nature - Deep ecology	- Understand the importance and value of nature and environmental friendly zones	- Emphasize importance and respect of nature in community through zoning, utilizing area for natural space, housing, and agriculture
Art & Celebration	- Sing and play traditional folk music e.g. flute, long drum, etc.	- Celebrate community religious rituals & arts e.g. long-drum dance, making merit to ancestors, etc.
Worldview	- Adapt lifestyle and live in harmony with nature, reduce negative impacts on environment i.e. embrace sustainable living	- Adapt lifestyle and live in harmony with nature, reduce negative impact on environment i.e. promote sustainable living
Health & Healing - Nutrition - Natural remedies - traditional healing - Convention medicine - Physical exercise, sports	- Grow food for own consumption - Cook and eat nutritious food - Use medicinal plants and common medicine to treat diseases - Exercise through household chores such as cleaning house, planting trees, gardening around house	- Promote community health system through monthly campaign and network activities on food safety and nutrition, exercise by providing two fitness centers in community - Use naturopathy on mangrove forest area and Phumi canal
Spirituality	- Practice Buddhism, other spiritual disciplines	- Practice Buddhism, other spiritual disciplines
Holistic Framework		
- Education & Pedagogy	- Focus on teaching through learning at the household level e.g. growing organic vegetables for household consumption	- Provide ecovillage training and community environmental management based on community and network issues/interests
- Participatory Design	- Allow opportunity for all household members to participate, express feedback, and ideas at every stage of decision/solution-making process	- Allow participation at all levels in community activities, like monthly meeting to create community engagement/participation at every stage of decision/solution processes
- Permaculture	- Apply 12 steps of permaculture to design natural environment and change household behavior to reduce environmental impact	- Introduce/apply 12 permaculture steps to design natural environment, change household behavior to reduce environmental impact
- Transition & Resilience	- Being ready to change in all aspects especially everyday living and environmental conscious activities	- Being ready to change in all aspects especially everyday living and environmental conscious activities

Khok Muang Community demonstrated that it could properly apply each ecovillage conceptual principles and integrate them with the community's previous knowledge. The community was able to make 3-5 year strategic and action plans to become an ecovillage. Some plans, however, may require a longer period of operation, such as an aspect of high interest to the community – renewable energy by household solar cells. After completing the module, the community established a group of twenty interested households to start voluntary household solar energy production.

Lessons we learned from this step are:

a. For a community to become an ecovillage, no framework can be left out. However, it was genuinely difficult to help all households to grasp the meaning of every aspect, particularly the more abstract social and spiritual ones. We resorted to conveying broad concepts and leaving participants to interpret and relate them to their own experiences. We also encouraged sharing; when thoughts were shared by others, the concepts were not as abstract as they had first thought.

b. This step is the second most important step in the whole process, for it defines the target goals with practical actions to follow. It also helps the community to see how each framework is intertwined together, and provides a holistic view of an ecovillage's final design.

Step Five: Reflect on What Has Been Learned and What Can Guide Them in the Future

After the training and planning were completed, the community people were given an opportunity to reflect upon themselves, the research process, the outcome of the process, and the plan for future changes. It was obvious from the tangible output of ecovillage design and plan that the community accommodated the concept well and were profoundly capable of applying the ecovillage concepts to create their own version. The 3-5 year plans were well agreed upon by the community, their commitment to continue moving forward was strong, and the actions to be taken were started. Finally, the people of the community shared many good comments about the project – for example,

> "*We can use the knowledge gained from this project and readily apply it in practical and daily life. In addition, we now have community plans for an ecovillage, both at the household and community levels. We also have individually and collectively increased our capacity in environmental and community management in a more systematic manner."*

Discussion

Although initially, ecovillages were to be intentional communities, Dias, Loureiro, Chevitarrese, and Souza (2017) suggested that defining ecovillages as such is probably too narrow. The same authors also mentioned the possibility of ecovillages being initiated by governments or outside NGOs (thus being non-intentional), but a good model is needed for that. This is true in the Thai context as well, where most communities were already established with the direction set for them by the Thai government. Thus, it is rare to find a Thai community that will intentionally adopt the ecovillage concept despite the fact that the concept is a means to community sustainability. Hence, initiation from the outside is necessary.

When outsiders wish to transform an already established community into an ecovillage, the community's interests and readiness for change should be the first consideration. This agrees with the experience reported by Fadaee (2016), because the ecovillage development process involves intensive local participation to integrate holistic, ecological, economic, social and cultural dimensions of sustainable development (Global Ecovillage Network, 2014) in order to create a new social and natural environment in the community (Bang, 2005; Esteves, 2017). Therefore, readiness assessment is an important step in selecting the right community.

In the Thai context as well as in other developing countries, the choice of communities to be transformed is important because ecovillage creation process involves situated learning, communities of practice, and legitimate peripheral participation (Mychajluk, 2017). Thus, we recommend that prospective communities should possess ability to learn, adapt, and improve; show traits such as cooperative culture, participation, and social competencies; and pursue sustainability as one of their development goals. Other aspects to be considered include positive attitudes of community leaders

and members toward community improvement, willingness to learn new things, availability of resources specifically time and labor, and readiness to change lifestyles to fit ecovillage concepts.

Applying the ecovillage concept to already established communities needs to equip people with a right concept; otherwise, a common vision will not be reached. We propose that the crucial step of educating community people in ecovillage frameworks is to design and implement a training module. Though hardly mentioned as a formal procedure in the literature about creating ecovillages, learning processes were utilized as a way of enhancing people's understanding of concepts during the time when ecovillages were being founded (Findhorn, 2018). In fact, ecovillages in many countries around the world have focused on creating content for short programs so that communities could manage and continue to learn lessons on building ecovillages (GESOTA, 2008; Losardo, 2016). Gilchrist (2013) acknowledged that informal education has a vital part to play in increasing access to information and enabling people to communicate new ideas, and enhances individual and collective capacities to make and implement real choices. The outcome of later steps (ecovillage planning) confirms the importance of this step, as without it, other outcomes would not be realized.

Learning from other communities through knowledge exchange visits is a development step that improves the knowledge and practices of visitors and their organizations, and integrates the experience gained from visits into their daily lives (Matras, Sidi, & Treinen, 2013). This activity benefits communities by exchanging experiences and outcomes to inspire and motivate both existing and new communities (Gen-Europe, 2014; Sites Ecovillage, 2014).

The next most important step is for already established communities to contemplate each of the 25 aspects in the ecovillage framework and design plans for their own ecovillage version. We found that this step is essential and realistic for transformation as plans were devised and action plans were rolled out. Ecovillage design at both the household and community levels is a tangible result of the Kok Muang community. In urban areas, emphasis is on designing areas to reduce energy usage and renewable energy technologies as well as eco-friendly architectural and waste management designs.

The last step is using reflection to create models from a body of previous knowledge as Schön (1983, quoted in Vaccarino, Comrie, Murray & Sligo, 2007) suggested. Reflecting on changes in self is a significant part of action research; it gives participants who identified problems and interventions a chance to analyse and determine what changes they will make in the future (Zeichner & Liston, 1996 quoted in Rademaker, 2013).

The whole process of transforming Khok Muang into an ecovillage using action research with participation seemed to yield an overall satisfactory outcome, as Khok Muang community is slowly being transformed into an ecovillage.

Conclusion

The aim of ecovillages is to create a holistic, self-reliant community that embraces the notion of environment and ecosystem recognition. However, in Thailand and many developing countries, most communities are already well established. There is not a blank sheet; hence, application of the ecovillage concept should be by transforming rather than creating. Past experience in Thailand shows no successful such cases; thus, this paper attempts to propose guidelines through an action research project with one community in Southern Thailand as a case study, which can be summarized into process guidelines for transformation into an ecovillage (Figure 3; please see next page).

In this research process, although the community in the study may not be an intentional ecovillage as originally proposed by the founder, we still see positive results of this community moving toward a modified, more sustainable, self-reliant ecovillage. We strongly recommend adopting the concept and proposed guidelines (Figure 3), keeping in mind the lessons learned, to transform communities with similar contexts in developing countries. By so doing, we hope that developing communities will move closer to being sustainable communities than in the past. Finally, further research in the area of integration between modern technology and local wisdom in waste

management and renewable energy will greatly benefit communities in developing countries in applying ecovillage concepts, too.

Figure 3. Guidelines for Transforming a Typical Community into an Ecovillage

In this research process, although the community in the study may not be an intentional ecovillage as originally proposed by the founder, we still see positive results of this community moving toward a modified, more sustainable, self-reliant ecovillage. We strongly recommend adopting the concept and proposed guidelines (Figure 3), keeping in mind the lessons learned, to transform communities with similar contexts in developing countries. By so doing, we hope that developing communities will move closer to being sustainable communities than in the past. Finally, further research in the area of integration between modern technology and local wisdom in waste management and renewable energy will greatly benefit communities in developing countries in applying ecovillage concepts, too.

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References

Ardzijauskaite, V. (2009). Ecovillages: is it a way to reach environmental sustainability? Case studies in Denmark, Maastricht University/ Aalborg University 2008/2009, Innovation Systems, Social and Ecological Change. Retrieve from http://esst.eu/wp-content/uploads/Vilma+Thesis.pdf

Bang, J. (2005). *Ecovillages: A Practical Guide to Sustainable Communities*. Canada: New Society Publishers.

Borsos, B. (2007). *The eco-village concept and its place in sustainable settlement and rural development* (Doctoral dissertation). Pécs University of Sciences Faculty of Natural Sciences Pécs. Retrieved from http://old.foldrajz.ttk.pte.hu/phd/phdkoord/nv/at/borsos_bela_at_nv.pdf

Borsos, B. (2013). The Eco-Village concept in a model experiment in South-West Hungary. *Journal of Settlements and Spatial Planning*, *4(*1), 69-76. Retrieved from http://www.academia.edu/31863339/The_Eco-Village_Concept_in_a_Model_Experiment_in_South-West_Hungary

Database of the Global Ecovillage. (2015). Project database. Retrieved from http://db.ecovillage.org/en/projects (accessed May 13, 2015).

Davis, J. (2004). Writing an action research thesis: One researcher's resolution of the problematic of form and process. In McWilliam, Erica, Danby, Susan & Knight, John (Eds). *Performing Educational Research: Theories, Methods and Practices* (15-30). Flaxton, QLD: Post Pressed. Retrieved from https://eprints.qut.edu.au/2668/

Dias, M., Loureiro, C., Chevitarese, L.; Souza, C. (2017). The meaning and relevance of ecovillages for the construction of sustainable societal alternatives. *Ambiente e Sociedade*, *20(*3), 79-96. Retrieved from http://www.scielo.br/pdf/asoc/v20n3/1809-4422-asoc-20-03-00079.pdf

Ecovillage Ithaca (2017). Live. Retrieved from http://ecovillageithaca.org/live/

Esteves, A. (2017). Radical environmentalism and communing: synergies between ecosystem regeneration and social governance at Tamera Ecovillage, *Portuga, 49(*2), 337-376. Retrieved from https://doi.org/10.1111/anti.12278

Fadaee, S. (2016). Post-contentious politics and Iran's first ecovillage. *Local Environment*, *21(*11), 1305-1316. doi: 10.1080/13549839.2015.1112367

Farkas, J. (2017). "There are no recipes." An anthropological assessment of nutrition in Hungarian ecovillages. *Acta Ethnographica Hungarica*, *62(*2), 319-338. Retrieved from https://hungary.pure.elsevier.com/en/publications/there-are-no-recipes-an-anthropological-assessment-of-nutrition-i

Findhorn (2015). What is an Ecovillage. Retrieved from https://www.findhorn.org/aboutus/ecovillage/ (accessed January 10, 2015.

Findhorn (2018). About the Findhorn Foundation. Retrieved from https://www.findhorn.org/aboutus/ecovillage/

Foster, J., & York, R (2004). Political economy and environmental crisis: Introduction to the special issue (Special issue). *Organization & Environment*, *17*, 293-295. doi: 10.1177/1086026604268016

Gen Europe (2014). Global ecovillage network Europe. Retrieved from http://gen-europe.org/home/home/index.htm (accessed January 1, 2015).

Gesota, B. (2008). *Ecovillages as models for sustainable development: A case study approach* (Master's Thesis). The Philosophical Faculty of Albert-Ludwigs-Universitat Freiburg i. Br. (Germany) and the University of KwaZulu-Natal, Durban (South Africa). Retrieved from https://portal.uni-freiburg.de/globalstudies/research/ gesota-2008-ecovillages.pdf

Gilchrist, A. (2013). Community development as a learning process. Insights from the UK. In: *Magazin erwachsenenbildung.at, 19*, 2-7. Retrieved from https://erwachsenenbildung.at/magazin/13-19/meb13-19.pdf

Gilman, R. (1991). The Eco-village challenge. Retrieved from http://www.context.org/iclib/ic29/gilman1/

Global Ecovillage Network (2014). What is an Ecovillage? Retrieved from http://gen.ecovillage.org/en/article/what-ecovillage

Global Ecovillage Network (2018). About GEN. Retrieved from https://ecovillage.org/global-ecovillage-network/about-gen/

Google Earth (2015, December 12). V 9.2.63.0. Thailand, [map], 15° 40' 21.79" N, 100° 50' 47.53" E, Eye alt 1813.67 mi. Retrieved from https://www.google.com/earth/

Google Earth (2017, March 12). V 9.2.63.0. Khok Muang, [map], 7° 10' 15.46" N, 100° 24' 30.65" E, Eye alt 1253 ft. Retrieved from https://www.google.com/earth/

Hu, D., & Wang, R. (1998). Exploring eco-construction for local sustainability: An eco-village case study in China. Paper presented at ICEE 96-International Conference on Ecological Engineering, Beijing, China, 7-11 October 1996. *Ecological Engineering*, 11(1), 167-176. doi: https://doi.org/10.1016/S0925-8574(98)00032-9

Hildur & Jackson, R (2004). Global ecovillage network history 1990-2004. Retrieved from http://www.gaia.org/mediafiles/gaia/resources/HJackson_GEN-History.pdf

Järvinen, P. (2009). On various characteristics of action research. Paper presented at the IRIS32 Conference, Molde, Norway, 9-12 August, 2009. Retrieved from http://www.sis.uta.fi/cs/reports/dsarja/D-2009-4.pdf

Kasper, S. (2008). Redefining community in the ecovillage. *Research in human ecology*, *15(*1), 12-24. Retrieved from http://www.humanecologyreview

Losardo, M. (2016). "New ways of living, as old as the world: Best practices and sustainability in the example of the Italian ecovillage network." *Studia Ethnologica Croatica*, *28(*1), 47-70. doi:10.17234/SEC.28.3

Mare, C. (2000). *The Ecovillage as a living cell – Biological structures and metaphors*'. (Independent Study) Antioch University Seattle. USA: Village Design Institute. Retrieved from http://www.villagedesign.org/vdi_writings/Ecovillage_Living_Cell.pdf

Matras, F., Sidi, F., & Treinen, S. (2013). Exchange visits: Advice for improving the impact. (Fact Sheet) Rome: Knowledge Management and Gender, Food and Agriculture Organization (FAO). Retrieved from http://www.fao.org/docrep/019/aq213e/aq213e.pdf

Mychajluk, L. (2017). Learning to live and work together in an ecovillage community of practice European *Journal for Research on the Education and Learning of Adults, 8(*2), 179-194. DOI: 10.3384/rela.2000-7426.rela9092

Palinkas, L., Horwitz, S., Green, C., Wisdom, J., Duan, N., & Hoagwood, K. (2015). Purposeful sampling for qualitative data collection and analysis in mixed method implementation research. Administration and Policy in Mental Health, 42(5), 533–544. http://doi.org/10.1007/s10488-013-0528-y

Panyaproject (2015). Permaculture design course: October 7th -23rd, 2015. Retrieved from http://www.panyaproject.org/permaculture-design-course-october-7th-23rd-2015/

Rademaker, L. (2013). Action research as formalized reflection. *Inquiry in education,* 4(1), 1-3. Retrieved from: http://digitalcommons.nl.edu/ie/vol4/iss1/1

Sites Ecovillage (2014). Ecovillage networking. Retrieved from http://sites.ecovillage.org/en (accessed January 22, 2015).

Suri, H. (2011). Purposeful sampling in qualitative research synthesis. *Qualitative Research Journal*, *11(*2), 63-75. Retrieved from https://pdfs.semanticscholar.org/e287/d5579e587325ebaf789834124c4f94969de4.pdf

United Nations (1987). Report of the World Commission on Environment and Development (General Assembly Resolution 42/187). Retrieved from http://www.un.org/documents/ga/res/42/ares42-187.htm

Vaccarino, F., Comrie, M., Murray, N. & Sligo, F. (2007). Action research reflection: The Wanganui adult literacy and employment programme. Palmerston North, New Zealand: Department of Communication and Journalism, Massey University. Retrieved from https://www.massey.ac.nz/massey/fms/Colleges/ College%20of%20Business/Communication%20and%20Journalism/Literacy/Publications/Action_Research_Reflections.pdf?A29032502C0118C4A017245B9095FC1A

Wagner, F. (2012). Ecovillage Research Review. In Andreas M. & Wagner, F. (Eds.), *Realizing Utopia: Ecovillage Endeavors and Academic Approaches*. (81-94). RCC Perspectives no. 8. Retrieved from http://www.environmentandsociety.org/sites/default/files/ecovillage_research_review_0.pdf

Wongsanit Ashram. (2015). Ecovillage. Retrieved from https://www.wongsanit-ashram.org . (accessed January 22, 2015).

Würfel, M (2012). The ecovillage: A model for a more sustainable future-oriented lifestyle. In Andreas M. & Wagner, F. (Eds.) Realizing Utopia: Ecovillage Endeavors and Academic Approaches. (11-16). RCC Perspectives no. 8. Retrieved from http://www.environmentandsociety.org/sites/default/files/wuerfel_-_the_ecovillage_0.pdf

Würfel, M. (2014, July 23). *Sieben Linden 2014*. [Video File]. Retrieved from https://www.youtube.com/watch?v=SJ4LJWFWea4