

Article

Key Factors in the Success of Eco-Communities in Taiwan's Countryside: The Role of Government, Partner, and Community Group

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Abstract: The ideals of the successful implementation of an eco-community involve several key elements. This study used a literature review to clarify the key factors for the successful implementation of an eco-community and established the influence of these key elements through expert questionnaires. The results of the study showed that the most crucial part of building a successful eco-community is the community group, followed by the partners who assist the community, and finally the assistance and support of the government. The leader of a community plays the most critical role, followed by the community group, and community self-consciousness. In addition, if the community can establish partnerships with experts, scholars, nongovernmental organizations, and nonprofit organizations, and construct a stable autonomous financial system, the eco-community is guaranteed to continue operating.

Keywords: green community; sustainable development; partnership; policy

1. Introduction

In the face of the destructive effect of human activities on various environmental resources, numerous scholars and planners are committed to incorporating ecological conservation and sustainable development ideas into their planning concepts.

Ample literature has proposed to mitigate the destruction of the ecological environment caused by industrialization and urbanization using concepts, such as the “sustainable community” [1–7], “eco-community” [5,8–12], “low-carbon community” [13], “sustainable city” [2,5,14–17], “green city” [14,17–20], “low-carbon city” [21], “eco-city” [5,12,15,16,18], and “eco-urbanism” [22–28]. The eco-city approach advocates balancing the economic, environmental, and social dimensions of development. Incidentally, the eco-community approach has its origin in the eco-city itself. Therefore, the ultimate objective of both approaches remains the same: working together for better social, economic, and environmental outcomes [5].

In defining an eco-city, the Organisation for Economic Co-operation and Development notes that “in an eco-city, people would be conscious of their local and global responsibilities for the environment, environmental problems would be addressed continually and proactively, environmental considerations would be integral to a wide range of policies and sectoral activities, and greater attention would be given to providing a better quality of life for all urban citizens” [15].

Eco-Urbanism appeared first in 1998 and was defined by the author as “the development of multi-dimensional sustainable human communities within harmonious and balanced built

environments” [28]. However, Community is a group of people living in the same place or having a particular characteristic in common. Whether in urban or rural communities, people’s sustainable lifestyle can be consistent with the spirit of eco-city, eco-community, and eco-urbanism. To promote sustainable development and the concept of ecological communities, in 1996, Taiwan’s government officially announced the intention of its public and private sectors to promote environmental protection, energy conservation, and carbon reduction [12,14,29,30]. In 1999, the green building assessment system (Ecology, Energy Saving, Waste Reduction, and Health, EEWH) was established in Taiwan [31,32], and in 2009, the green building assessment system of eco-community (EEWH-EC) was set as a standard for assessing eco-communities [33].

The promotion of eco-communities must begin with the composition of a community, a partnership between the public sector, private sector, and community, and the participation of community residents in public policy research to condense community self-consciousness and aggregate the actions of community residents [34]. However, after several earthquakes and windstorms, Taiwan gradually introduced the community’s disaster prevention concept and adaptive planning to the overall construction of the community [35,36]. Since the 1980s, the concepts of energy conservation [12], ecological conservation [8,31,33], and sustainable development [3,34,35,37,38] have been more actively integrated into the overall community construction projects. Under this context of development, the plan is to establish a community self-consciousness and aggregate the actions of community residents before gradually creating a sustainable eco-community [39].

In terms of sustainable development, rural areas have more potential than urban areas [9,35]. In addition to their roles as food suppliers, rural areas are essential to providing resource conservation, diversity of landscapes, and recreational opportunities. The internal structure of rural areas has particularly different characteristics from urban communities. The degree of identity between residents and community affairs is higher than that of urban areas. In addition, the environmental problems in rural areas are simple, thus, allowing rural eco-communities a certain degree of creativity and success [35]. To achieve sustainable development, the development of eco-cities and eco-communities has always been the direction of the efforts of governments [3,14,33,40]. In Taiwan, the practice of the eco-community concept by rural communities will simultaneously achieve both rural development and ecological conservation objectives. However, the promotion of the eco-community requires effort from all parties [3].

In fact, the eco-community lacks a comprehensive strategy of practice and promotion at the implementation level as a basis for the establishment of eco-communities and the implementation of related programs [2,13,41,42]. The purpose of eco-communities requires further clarification and promotion. The development of eco-communities also necessitates long-term and comprehensive policy support [3,12,30,35]. Rural areas may be the areas with the most potential and the most suitable areas for implementing sustainable projects. Therefore, in this study, we only focus on some main factors of creating successful eco-community in the countryside in Taiwan.

Numerous existing studies have investigated the various critical roles for building successful eco-communities [2–6,8–14,18,31,33,35,36,38–40,43–49], but they lack a systematic investigation and discussion. Therefore, this study explored the key factors of these different roles, which urban areas also have, for promoting the ecology in rural communities and establishing a complete rural eco-community practice and promotion strategy. These relevant indicators will become a basis for evaluation and will continue to guide and assist the achievement of sustainable development [16,45,50,51].

2. Materials and Methods

Investigating the key factors for rural eco-community development, this study integrated both qualitative and quantitative research and employed literature analysis and expert survey research methods. First, through literature analysis, previous records of community development and eco-communities were analyzed to learn from valuable experience. Subsequently, the results of previous academic research were organized to identify the key factors of eco-community development.

This study integrated the overall construction of the community and relevant literature on eco-communities. It included elements of community formation and the overall operational relationship and success of a community from the theoretical perspective, and it summarized the core focus of a community's overall success. Moreover, this study focused on the background, connotation, and evaluation indicators of the formation of eco-communities. It integrated the functionalities with diverse emphases and organized the resource background and content of different communities. Through the community building and eco-community literature discussion and mutual verification, the key factors driving rural eco-communities were deduced and used as a basis for the follow-up expert questionnaire.

Some studies have mentioned that eco-communities involve a training system [8,47,48]; incentives, subsidies, or tax breaks [3,14,29,30,35]; an evaluation system [1,4,14,31–33,41]; praise or reward [3]; an experience exchange platform [5,9,11,39,47,51]; and a counseling and guidance mechanism [3,9,13] as the key government-related factors. Some articles have reported that partnerships (e.g., between schools, mutual benefit organizations [9,44], nongovernmental organizations (NGOs) and nonprofit organizations (NPOs) [8,36,38,43,44], experts or scholars [8,36,44], partner communities [8,9], and representatives [1,40,41]) could play major roles in building a sustainable community. Furthermore, some research results indicate that having a leader [9,36,41,49], a community group [46,48], self-consciousness [47,48], an independent finance system [18,49], an eco-education [8,47,48], and an eco-development blueprint [9,32,39,50] is the foundation and guarantee of the successful establishment of an eco-community.

In addition, this research used the concept of the Analytic Hierarchy Process (AHP), and the results of the literature analysis were used as the basis for an expert survey. This study used the AHP [45,52,53], literature discussion, and case study to obtain the key factor structure of rural eco-community practice. It designed an expert questionnaire and conducted questionnaire surveys for experts in the industry, government departments, academic circles, communities, and other fields. The data of the valid questionnaires were collected to analyze various statistics, and the consistency was verified to control the credibility of the results.

Through the pairwise comparison of the AHP, the weight values of the relative influences of factors promoting rural eco-community were obtained, and the most crucial factors were identified. The main reasons for adopting the AHP were as follows. 1. Expert opinions are more forward-looking than historical data. 2. The AHP can systematically and hierarchically solve complex problems, and the first level of the target is divided into distinct levels. In turn, the problem can be divided into separate levels of projects and factors. The relevant level factors are analyzed through mutual comparison to determine the meanings filled in the expert questionnaires, and the hierarchical index weights or priority selection schemes are obtained through statistical analysis.

This research questionnaire employed the theoretical design of the AHP. The questionnaire's scale was used to measure the scoring based on the purpose, content, and explanation of the questionnaire. In addition, after analysis of the hierarchical structure, the experts were asked to provide the relative influences of each evaluation factor. Targeted at experts from industries, government departments, academic institutions, and communities, 25 surveys were collected and statistically analyzed. All of the valid questionnaires were calculated and confirmed to pass the consistency check (Inconsistency Ratio > 0.1). The 23 valid expert questionnaires (recovery rate 92%) encompassed five professionals, six scholars, seven government officials, and five community leaders (Table 1).

This study was conducted in the respect of professions and considering the opinions of industries, the government, academics, and the public. It was aimed at academic, government, industry, and community fields that are familiar with eco-communities, environmental conservation, energy conservation, carbon reduction, community building, and urban planning. Questionnaires were issued to these experts for investigation. The questionnaire survey period extended from 30 March to 22 April 2015. A total of 23 questionnaires were distributed and collected, and a consistency check of

each questionnaire was conducted. All the questionnaires were verified. Valid questionnaires were included in the basic data during weight calculation.

Using the internal factors and external support resources of the community to form the hierarchy, a key factor indicator framework for rural eco-community development was established with the first level comprising three factors, “A. Government”, “B. Partner”, and “C. Team”, and the second layer was composed of over 18 factor indicators (Table 2).

Table 1. Expert background information from expert questionnaire.

No.	Classification	Title	Expertise or Practical Experience
1	Professional	General manager	Assistance of enterprises and communities in energy saving, carbon reduction, creation of a controlled and healthy environment
2		General manager	Energy-saving and carbon-reducing systems for air conditioning, electricity, lighting, solar energy, and the Environmental Protection Agency’s low-carbon home; counseling in energy conservation planning
3		General manager	Energy saving and carbon reduction, resource recycling, green building materials, organic waste recycling technology
4		Deputy general manager	Environmental quality planning management; planning and design of various environmental projects
5		General manager	Technical consultancy in the fields of urban planning, architecture, landscape, civil engineering, and environmental engineering
6	Government official	Director	Urban renewal, urban planning, cultural assets, community building
7		Deputy Director	Natural environment conservation, hillside resource survey planning, soil and water conservation
8		Director	Urban planning practice, landscape design, urban space transformation
9		Technical Specialist	Urban renewal, urban planning, community building
10		Deputy executive secretary	Planning and analyzing the knowledge elements of eco-communities and promoting the establishment of demo eco-communities
11		Section chief	Urban design review, urban style transformation
12		Section chief	Environmental education, green procurement, low-carbon community
13		Adjunct assistant professor	Architectural and environmental design, green building and eco-community planning and design
14	Scholar	Associate Professor	Green building, landscape, and environmental planning, urban greening, heat island effect
15		Associate Professor	Environmental control, building energy efficiency, ventilation and air conditioning, building fire protection
16		Assistant professor	Community building, regional governance, urban and regional planning, architectural and environmental design
17		Associate Professor	Environmental planning and design, landscape design, green building planning and design
18		Associate Professor	Urban renewal and redevelopment, urban environmental planning and design, community-building practice, ecological environment planning and design
19	Community leader or cadre	Chief of Village	Environmental landscape, community safety, social welfare and medical care, environmental protection and ecology
20		Chairman	Environmental landscape, community safety, social welfare and medical care, environmental protection and ecology, humanities education
21		Chief of Village	Environmental landscape, social welfare and medical care, humanitarian education, environmental protection and ecology
22		Chief of Village	Environmental protection work and publicity, construction of green maps, energy saving, and carbon reduction
23		Director general	Community industry, environmental landscape, community safety, social welfare and medical care, humanitarian education, environmental protection and ecology

Table 2. Most crucial factor indicators for creating an eco-community.

Category	Indicator	Condition Description	Reference
A. Government	A1. Training system	Train community residents to obtain the relevant technology for creating an eco-community.	[8,11,47,48]
	A2. Incentives, subsidies or tax breaks	Plan an eco-community and related policies, planning and enabling community organizations to compete, providing incentives or subsidies, providing community housing tax and land tax relief.	[3,14,29,30,35]
	A3. Evaluation system	Establish a clear policy evaluation system for eco-communities, promote community application.	[1,4,14,31–33,41,51]
	A4. Praise or reward	Select as a priority to promote a particular community object, counseling community development into an ecological demonstration community.	[3]
	A5. Experience exchange platform	Establish an eco-community communication platform to strengthen the experience-sharing between communities and enable them to inspire each other.	[5,9,11,39,40,47,51]
	A6. Counseling and guidance mechanism	Provide eco-communities related technology consulting and counseling.	[2,3,9,13]
B. Partner	B1. Schools	Achieve the ideal eco-community by regrouping elementary schools or junior high schools together, share resources.	[8,36,44]
	B2. Mutual benefit organizations	Enable civil society organizations and the community to establish long-term cooperative relationships, share resources and financing, create a symbiotic partnership.	[9,40,44]
	B3. NGO or NPO	Provide resources or donations to assist the community and develop the eco-community.	[8,9,36,38,43,44]
	B4. Experts or scholars	Establish a long-term partnership with the community, and providing the community assistance and advice.	[9,36,38,43,44]
	B5. Partner communities	Interact with other communities and becoming partners to observe and learn from each other.	[8,9]
	B6. Representatives	Assist with community development.	[1,40,41]
C. Team	C1. Leader	Community leaders with a positive attitude and excellent ability.	[8,9,36,41,49]
	C2. Community group	Public participation in the community is high; moreover, a sound organization strengthens the community-building work.	[8,9,34,46,48,51]
	C3. Self-consciousness	Community residents have a high consensus.	[39,47,48]
	C4. Independent finance	High community financial autonomy.	[18,49]
	C5. Eco-education	Implementation of ecological education, community resources survey, and environmental management for community residents.	[8,47,48]
	C6. Eco-development blueprint	Complete and properly planned community eco-development, and gradual application.	[9,32,39,50]

3. Results

In this study, the weight ratio of all the selected items in the software construction was filtered according to this criterion. An overall consistency check and a weight value calculation were performed. After confirming that the overall consistency check qualified, a software program was used to perform a hierarchical weight analysis and obtain the overall hierarchical weight result.

According to the survey analysis results (Table 3), “C. Team” had the greatest weight value of 59.7%. The top five factors in the key factor hierarchy weight were “C1. Leader” (20.2%), “C2. Community group” (15.0%), “C3. Community self-consciousness” (11.7%), “B4. Experts or scholars” (6.5%), and “C4. Independent finance” (5.3%). These findings demonstrate that experts

believe the main success factors in building an organized structure are a community leader with active attitudes and competency and a community with high public participation levels. If the community self-consciousness can be raised and the actions of the community coordinated, they will become the main factors in developing eco-communities. As critical factors in the ecological community development, the community should perform self-reviews on the rich natural environment or valuable cultural environment of the rural community at the beginning to establish the objectives of ecological development.

Table 3. Most influential factor indicators for creating an eco-community (weights and ranking).

Category (Weights)	Indicator	Category Weights	Category Ranking	Total Weights	Total Ranking
A. Government (0.174)	A1. Training system	0.287	1	0.050	6
	A2. Incentives, subsidies or tax breaks	0.244	2	0.042	9
	A3. Evaluation system	0.098	6	0.017	17
	A4. Praise or reward	0.145	3	0.025	14
	A5. Experience exchange platform	0.115	4	0.020	15
	A6. Counseling and guidance mechanism	0.112	5	0.02	15
B. Partner (0.229)	B1. Schools	0.137	5	0.031	13
	B2. Mutual benefit organizations	0.196	2	0.045	7
	B3. NGOs or NPOs	0.189	3	0.043	8
	B4. Experts or scholars	0.283	1	0.065	4
	B5. Partner communities	0.147	4	0.034	11
	B6. Representatives	0.047	6	0.011	18
C. Team (0.597)	C1. Leader	0.338	1	0.202	1
	C2. Community group	0.252	2	0.150	2
	C3. Self-consciousness	0.196	3	0.117	3
	C4. Independent finance	0.089	4	0.053	5
	C5. Eco-education	0.058	6	0.034	11
	C6. Eco-development blueprint	0.067	5	0.040	10

4. Discussion

According to the results of the expert questionnaire, the “leaders” with the highest weight value (20.2%) and the “community group” (15.0%) are the most critical factors for promoting a rural eco-community. This result is consistent with the conclusions of the existing literature [9,36]. Even though some of the research literature results show that the government is very helpful to the eco-community, according to the results of this study, community leaders and community teams play a more important role. Promoting the operation of eco-communities should be the primary task of the community. If we promote the eco-community as part of community action, it is crucial to promote it with a voluntarily formed organization by selecting competent leaders and community groups within the community. This is also the main reason why several relevant assessment indicators incorporate community organizations into the assessment system [51].

The tasks of the community leaders and the community groups are to combine and mobilize the resources [9] and strength of the community as well as to confirm the direction and concept of the community’s ecological development. Subsequently, the ecological imagination may be embodied. Through the discussion, feedback and correction of community residents, a common ecological concept and team spirit (community “self-consciousness”, 11.7%) are formed, and ecological goals in line with the community characteristics are set accordingly.

The formation of community self-consciousness is based on the common interests of the community [47]. The power of community self-consciousness is the service function of the community.

In community development work, an organization specializing in coordinating and planning various operations is required to facilitate combination and mobilization. A strong community can, thus, be formed based on the existing resources and strength, development of a collective building power, formation of a common philosophy, and team spirit.

Financial support is required for the normal function of the community [49]. The community must increase the funding for ecological goals and daily operations, expand the source of community group funding, balance the financial revenues and expenditures of the community, and seek financial autonomy (5.3%) to enable the community to progress toward ecological goals. If a community can establish a work team based on development goals, increase self-employment income through organizing exchange activities and selling various types of agricultural products, and appropriately seek government project plan grants and private sector project grants, it can be regarded as a financially autonomous community capable of promoting everything based on community goals. Therefore, setting some development goals and blueprints for the eco-community is a crucial part of sustainable development [9].

The community should gradually integrate external resources according to its ecological goals and needs. The external resources of the community come from the public and private sectors, including funding, human resources, and professional counseling (6.5%), cooperation and alliances, and exchange of experiences between communities. Community involvement in government programs or competitions is recommended for incentives, grants, tax breaks, participation in government-sponsored eco-community talent training programs (5.0%), and professional assistance from experts, academics, or community planners. In addition, the community can also form alliances with various organizational units (4.5%) to focus on financial resources, grow together, and actively seek NGOs or NPOs (4.3%) to assist the community or provide them with resources and donations. In fact, several successful examples of eco-communities' practice are based on partnerships with NPOs or NGOs that have corporate social responsibility [38,43].

In addition, the community can independently develop eco-communities that meet its needs, identify ecological goals, and integrate future resources into the community to properly plan for the future ecological development blueprint (4.0%). To ensure the sustainable protection and planning of the resources, the community will strengthen the ecological education among residents (3.4%), and provide the residents with ecological care, ecological awareness, ecological knowledge, ecological determination, and ecological conservation actions.

The community should maintain openness in their opinion exchange, public participation, and resources. In addition, other communities should actively conduct exchanges of ecological technology, professional talents, community resources, and information. These exchanges could be mutual observation and learning with other partner communities (3.4%), development of eco-communities (3.1%) with community proximity schools and primary schools, and urging the government to help establish community communication platforms for eco-community-related information exchange (2.0%).

According to the results from the literature analysis, government is important for eco-community. Nevertheless, based on the result of key factor weight analysis, this study proposes that the development of rural eco-community should be spontaneous. In addition, the strategies should be formed using both bottom-up and top-down approaches to enable the growth of the community while taking external factors into consideration. In addition, the results of this study provide a more comprehensive approach than numerous existing relevant studies, in that they clearly address the key tasks that different roles should be responsible for when establishing successful eco-communities.

5. Conclusions

Environmental protection and sustainable development have become common concerns worldwide. The development of eco-communities is an international vision that is both forward-looking and challenging. An ecological community is based on the health and comfort of people. It can be based on a comprehensive and systematic environmental design for the ecological

living environment while emphasizing the environmental design concept of coexistence with the global environment and sustainable development.

The ideals of the successful implementation of an eco-community involve numerous key elements. After literature review and key factor weight analysis results, the strategy should be formed from the bottom up, and the community can self-grow while considering external factors. The practice and promotion strategy recommendations under different roles, such as those of the government and community partners, can be referenced for more flexibility in the promotion of eco-communities.

5.1. Community Role—the Practice and Promotion Strategy of Community Autonomy

The community must be composed of excellent leaders and community groups to form a spontaneous organization. According to the results from existing literature, the effective use of resources inside and outside the community is crucial for the sustainable governance of the community [36]. Through the exploration of the community's natural environment and human resources and through the growth and learning within the community, self-consciousness is developed, and the ecological goals in line with the community characteristics are set accordingly. The community's financial revenues and expenditures should be balanced for financial autonomy to develop independently toward ecological goals. The community also should combine external resources (government, partners) to properly plan the blueprint of future ecological development. Thus, the overall plan can be closely integrated within the lives of residents and implemented in normal work, and the self-improvement and promotion of the eco-community can be maintained.

5.2. Government Role—Government Practice and Promotion Strategy

The government should be inspired by the social work of grassroots talent (community leaders, community groups) and conduct eco-community talent training to equip the population with ecological awareness, knowledge, and skills. The government should also use its influence to turn knowledge into action and promote community ecology education to the most basic members of the community as the core of the community's natural environment, human environment, and ecological system. Furthermore, the government must develop action plans and establish policies to provide incentives (rewards, subsidies) and assistance (consultation and counseling) based on the ecological development of the community, and promote influential partners in the community. Therefore, community planners (such as scholars, NGOs, and NPOs) can enter the community and provide technical coaching. In addition, the government can also select eco-community models, build community-to-community exchange platforms, promote community-based eco-concepts, observe exchanges, and broaden the community's vision. Finally, the eco-community assessment system will be promoted to review the effectiveness of the planning and implementation of the eco-community and to examine the sustainability of the eco-community development.

5.3. Partner Role—Collaboration Practice and Promotion Strategy

Good interaction and cooperation between partners and community organizations are two of the keys to promoting the development of eco-communities. Experts, scholars, community planners, NGOs, or NPOs can provide the community with professional technical services, build a foundation of trust, a consensus on cooperation, and partnerships. Through the integration of these external partners into the operation of the community, based on the concept of protecting the natural and human environment, the eco-community is guided through ecological learning, resource integration, communication, and coordination. The aim is to develop the community self-consciousness and reach a consensus between partners and communities. Partners can either directly guide the community or jointly implement government plans with the community and strive for rewards and subsidies in a mutually beneficial manner. Sharing resources and mutual benefits between communities and partners can enable the community to grow and enhance its benefits for sustainable development.

In conclusion, community leaders and community groups play the most critical roles in creating or maintaining a sustainable community. Furthermore, communities must intend to strengthen their self-consciousness and build a stable community management financial system to establish the foundation for a successful eco-community. Finally, the community can be assisted by partnerships with experts, scholars, NGOs, and NPOs. Education, training, and tax relief should be actively requested from the government. Ultimately, the community will achieve its goal of building a sustainable eco-community.

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