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Applying the Resilience to the Community Development in Taiwan

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I. Abstract

In 1999, the Shishui community in Nantou County, Taiwan was severely damaged by the 921 earthquakes, with many houses collapsing and community facilities suffering unprecedented damage. In late 2001, a community development association was established, and with the efforts of residents, the community was awarded the title of "Classic Rural Area" by the government in 2007, becoming a nationally recognized leisure agriculture demonstration base. However, with the subsequent reduction of external resources, continuous loss of internal talents, and operational dysfunction of community organizations, the Shishui community eventually stagnated. How can we evaluate the community's resilience in this situation? This study takes the Shishui community as its research field, integrates expert and scholar research on community resilience, constructs the elements of Shishui community development resilience through in-depth interviews with community residents, and analyzes Shishui community resilience indicators using the Fuzzy Delphi Method (FDM), with five main dimensions: sustainable development capacity, organizational leadership capacity, financial management capacity, community cohesion, and network resource capacity. Then, using the Similarity-based Importance-Performance Analysis (SBIPA) method, the study analyzes the evaluations of Shishui community residents on the satisfaction and importance of each resilience indicator. Finally, a total of 18 issues that residents consider important but have not yet reached the expected level of performance are identified, such as community resources and mechanisms to support young people returning to their hometowns and fair distribution of community resources by community organizations, which will become important directions for future community governance improvement.

Keywords: Community resilience, indicator construction, Fuzzy Delphi Method, Similarity-based Importance-Performance Analysis.

II. Introduction

Before the United Nations formally introduced community development work, Taiwan had already operated community work during the Japanese colonial period and started implementing community work plans. In 1965, the Executive Yuan promulgated the "People's Livelihood-oriented Social Policy" which officially listed "community development" as one of the seven major social welfare items, marking the beginning of Taiwan's application of community work methods to promote social construction.

Previous research on resilience has focused on conceptual and case analysis studies (Tyler et al., 2016). Scholars have used the perspective of community resilience to understand the factors affecting community fluctuations (e.g., Cai et al., 2018; Folke, 2006; Gunderson, 2000; Jiang et al., 2021; Tseng et al., 2022), which also impact community development. By incorporating the concept of resilience, one can understand past and present community problems and facilitate adaptation and effective use of relevant resources.

"Shishui Community" is situated in the northern part of Yuchi Township, Nantou County, Taiwan. It is a typical rural community, surrounded by hilly terrain, with approximately 223 residents and an elevation ranging between 600 and 800 meters. The community boasts a diverse industry and rich biodiversity, making it suitable for in-depth ecological tourism development. However, many homes were damaged after the 921 Jiji earthquake, which led to the emergence of community actions. The community gained widespread popularity through its black tea industry and ecological environment, becoming an entity with leisure agriculture and tourism industries. In 2007, the government awarded it the "Classic Rural Community," making it a role model for community development in Taiwan (Lai, 2008). However, due to the gradual success of individual home reconstruction, the withdrawal of

external counseling teams, and the shrinking of public and private resource support, the capital available for Shishui community construction was eventually consumed, and several related problems became obstacles community development (Liao, 2014).

Under the government's relevant policies, some symptoms have appeared in the community, such as conflicts between community interest groups, competition for deep resources, community work only benefiting a few specific individuals, and the output of star communities causing relative deprivation among general members (Huang, 2014).

Thus, this study constructed resilience factors for community development by conducting in-depth interviews with community residents and assessments by professional organizations and analyzes Shishui community resilience indicators using the Fuzzy Delphi Method (FDM). Finally, the Similarity-based Importance-Performance Analysis (SBIPA) (Chu & Guo, 2015) was used to analyze the correlation between satisfaction and importance. This helped identify attributes that needed improvement or strengthening, providing a clear understanding of the community's strengths and weaknesses and enabling the discovery of ways to enhance community development.

III . Literature Review

(i) Community Resilience

Adger (2000) defined community resilience as the ability of a community to respond to external pressures and disturbances brought by social, political, and environmental changes. Cutter (2008) viewed community resilience as the ability of social systems to respond to and recover from disasters, including the internal conditions of absorbing and mitigating negative impacts. Skerratt (2013) further identified five characteristics of community resilience: 1. It is both an outcome and a process. 2. It depends on the utilization and management of community resources by community members and the community. 3. It can be nurtured through repeated mechanisms and pathways. 4. It has individual, community, and regional effects. 5. The changes faced by the community are normal.

Holling(1973), an ecologist, introduced the concept of resilience into ecological research, defining it as "a measure of the ability of an ecosystem to absorb changes and continue to maintain its functions." The concept of resilience was later introduced into the social sciences, where it began to focus on the resilience of human systems, social systems, and communities, known as the study of social resilience (Adger, 2000). Community resilience refers to a community's ability to maintain normal functions, attract resources, and respond to challenges and changes caused by external disturbances (Norris et al., 2008). In other words, community resilience can be seen as the ability of a community to recover from or adapt to changes resulting from disasters (Lew, 2016).

Orchiston et al. (2016) provide an opportunity to compare the organizational resilience of the tourism sector with studies on general organizational resilience and to highlight leading

indicators of resilience for the tourism sector. Prayag et al.'s (2018) findings also have implications for tourism managers and owner-operators regarding investment strategies to prepare for and recover from disasters. Prayag et al.'s (2020) findings have implications for small tourism businesses as they navigate the recovery process following major disasters. Similarly, Prayag, Spector, et al.'s (2020) findings also have implications for small tourism businesses during recovery following major disasters. Lee et al.'s (2021) research employed spatial and aspatial regression models via a case study of sixty-seven counties in Florida. Their findings showed that accommodation and food service specialization led to higher levels of community resilience, whereas arts, entertainment, and recreation instability led to lower levels of community resilience. Furthermore, these effects of tourism clusters on community resilience were spatially heterogeneous. Such findings are essential for policymakers in establishing community-based resilience planning and policies involving tourism clusters.

The recovery from various impacts related to poverty involves decentralizing power and exhibiting resilience in the face of a lack of funds and power sharing. Over time, community resilience has significantly increased, with economic, institutional, and ecological resilience showing varying degrees of improvement, while social resilience has decreased (Yang et al., 2021). Although research on resilience has mainly focused on disasters, social ecology, economy, and organizational behavior, issues related to community resilience have increasingly garnered attention in recent years (Tseng et al., 2022).

(ii) Resilience Indicators and Development

The ability of a community to recover from destructive events and bounce back can be contextualized by its resilience (Burton, 2015). However, quantifying resilience can be

complex due to different definitions of terms used in research, challenges in selecting and defining resilience indicators, and a lack of validation for derived indices (N. Lam et al., 2016). As the destruction caused by natural disasters continues to increase, quantifying community resilience becomes increasingly important (E. Yang et al., 2021). Moreover, community resilience indicators in Taiwan's indigenous areas include "maintaining traditional teachings and respecting ancestral norms" (Tseng et al., 2022).

(iii) Preliminary Drafting of Community Resilience Indicators

To establish an effective and objective framework for assessing the resilience of community development, this study collected and analyzed relevant literature as the basis for selecting indicators. The proposed indicators for resilience studies are summarized in Table 1.

Table 1: Community Development Assessment Factors

Scholars	Resilience Assessment Factors
Norris et al. (2008)	Construct the Community Resilience Network (CRN) portfolio of indicators, including four major indicators on information and communication, economic development, social capital and community capacity.
Mayunga and Peacock (2010)	The Community Disaster Resilience Index (CDRI) evaluates social, economic, physical, and human capital in disaster management's preparedness, response, mitigation, and recovery phases of disaster management; it consists of 75 individual indicators.
Cutter et al. (2010); (Mayunga & Peacock, 2010)	The Baseline Resilience Indicators for Communities (BRIC) contains 36 indicators in five areas: social resilience, economic resilience, institutional resilience, infrastructure resilience, and community capital.
Sherrieb et al. (2010)	The ability of community members to cope with disasters is the

	<p>key to enhancing community resilience. With the ability of individuals to cope with disasters as the core, the Community Resilience Index was constructed by selecting 17 indicators in four areas: economic development, social capital, information exchange, and community competitiveness.</p>
Joerin et al. (2012)	<p>The index is designed to increase the community's responsibility and enhance its resilience. Based on this concept, the Action-oriented Resilience Assessment (AoRA) includes five dimensions: physical, economic, social, institutional, and natural resilience.</p>
Liu(2013)	<p>Various aspects, elements, and indicators of the community capacity scale were put forward, which were divided into five static indicators: social, human, financial, environmental, and cultural capital; and eight dynamic indicators: community participation, cohesion and integration, interaction and networking, access to resources and problem-solving ability, leadership development, community organization development, community organization operations, and successful community action experiences.</p>
Jiang, et al.(2014)	<p>In the indicators for sustainable community governance, five key indicators have been identified: environmental and ecological protection, community economic development, community living networks, community cultural preservation, and good governance mechanisms.</p>
Huang(2015)	<p>Five indicators for regenerating rural communities are proposed: improvement of community policies, development of community organizations, development of community</p>

	industries, maintenance of the community environment, and participation of community residents.
Liang(2017)	The five indicators of community organizational capacity include organizational strength, implementation, orientation, cohesiveness, and sustainability.
Huang(2017)	The four major capabilities for community resilience are economic development, social capital, community capacity, and information and communication.
Tseng et al. (2022)	Community resilience can be categorized into five major dimensions: social, cultural, economic, ecological, and political.

Scholars	Resilience Assessment Factors
Norris et al. (2008)	The Community Resilience Network (CRN) portfolio includes four major indicators: information and communication, economic development, social capital, and community capacity.
Mayunga and Peacock (2010)	The Community Disaster Resilience Index (CDRI) evaluates social, economic, physical, and human capital in disaster management's preparedness, response, mitigation, and recovery phases. It consists of 75 individual indicators.
Cutter et al. (2010); (Mayunga & Peacock, 2010)	The Baseline Resilience Indicators for Communities (BRIC) contain 36 indicators in five areas: social resilience, economic resilience, institutional resilience, infrastructure resilience, and community capital.
Sherrieb et al. (2010)	The key to enhancing community resilience lies in the ability of community members to cope with disasters. Thus, the

	<p>Community Resilience Index was constructed with the ability of individuals to cope with disasters as the core, and includes 17 indicators across four areas: economic development, social capital, information exchange, and community competitiveness.</p>
Joerin et al. (2012)	<p>responsibility. Based on this concept, the Action-oriented Resilience Assessment (AoRA) includes five dimensions: physical, economic, social, institutional, and natural resilience.</p>
Liu(2013)	<p>Several aspects, elements, and indicators have been proposed for the Community Capacity Scale, which are divided into five static indicators: social, human, financial, environmental, and cultural capital, and eight dynamic indicators: community participation, cohesion and integration, interaction and networking, access to resources and problem-solving ability, leadership development, community organization development, community organization operations, and successful community action experiences.</p>
Jiang, et al.(2014)	<p>The indicators for sustainable community governance include five key elements: environmental and ecological protection, community economic development, community living networks, community cultural preservation, and good governance mechanisms.</p>
Huang(2015)	<p>Proposed are five indicators for regenerating rural communities: (1) improvement of community policies, (2) development of community organizations, (3) development of community industries, (4) maintenance of the community environment, and (5) participation of community residents.</p>

Liang (2017)	The five indicators of community organizational capacity are organizational strength, implementation, orientation, cohesiveness, and sustainability.
Huang(2017)	The four main components of community resilience are economic development, social capital, community capacity, and information and communication.
Tseng et al. (2022)	The categorization of community resilience can be grouped into five major dimensions: social, cultural, economic, ecological, and political.

IV . Research Methodology

(i) Study Area

Before the 921 earthquakes, most buildings in the Shishui community were old courtyard houses, with only a few made of bricks. However, about 80% of these old buildings collapsed during the earthquake. During the post-earthquake reconstruction process, the community's residents converted their surplus rooms into homestay spaces, and the community's natural landscape and ecology became its defining characteristics. The scope and location of the community are depicted in Fig 3-1. The total population of the Shishui community is 223, with 95 households (Global Information Network of the Department of Household Affairs of the Ministry of Interior, 2022).

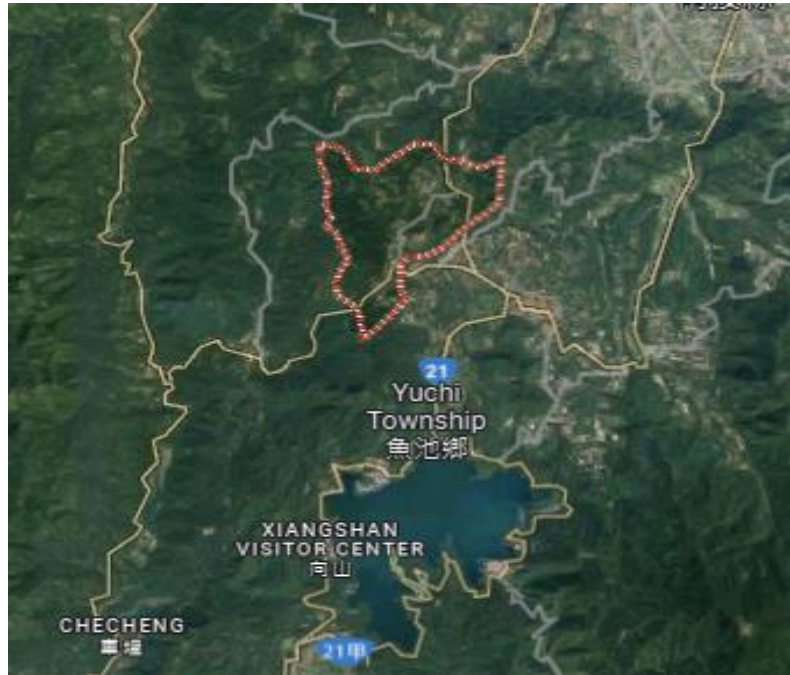


Fig 3-1 Scope and Location Map of Shishui Community(red area)

(ii) Preliminary Drafting of Interview Questions for Community Development Resilience Indicators and the Selection of Interviewees

To gain a comprehensive understanding of community resilience, this study utilized a purposeful sampling method to select suitable candidates for the scope of the study. In total, 11 individuals were interviewed, including civil servants, community leaders or 'cadres,' and young returnees who participated in the community-building process in Shishui. This approach allowed for establishing and generalizing community resilience indicators from diverse perspectives. The interviews lasted between 30 and 60 minutes and were recorded with the interviewees' consent. To ease the interviewees' apprehension and enable them to express their experiences and thoughts on tribal development fully, the interviews were conducted in a relaxed manner. The audio files were transcribed verbatim after the interviews to ensure the accuracy of the content for archival and analysis purposes.

(iii) Indicator Screening - Fuzzy Delphi Method (FDM)

Dalkey and Helmer introduced the Delphi Method in 1960 as a systematic way of representing the views of a group of experts (Gordon, 1994). Since Bellman and Zadeh first proposed the application of Fuzzy Theory to decision-making problems in 1970, Fuzzy Theory has been used in a wide range of disciplines with a large amount of fuzzy data. The Fuzzy Delphi Method (FDM) is an example of the application of Fuzzy Theory to the traditional Delphi Method (Bellman et. al., 1970).

FDM is a method for factor screening that generally follows a three-step procedure: (1) establishing the set of influencing factors, (2) collecting opinions from the decision group, and (3) using FDM to calculate the evaluation value (Xu, 1998). Compared to the traditional Delphi method, the most significant feature of FDM is addressing the shortcomings of the conventional Delphi method in terms of time, cost, and the decreasing response rate caused by repeatedly asking experts for their opinions. It eliminates the traditional two-valued logic ("yes" or "no") or several equidistant single-choice responses when conducting the expert survey. Instead, experts provide a fuzzy answer with a range of possibilities to obtain a closer result to the experts' opinions. Therefore, FDM is used to perform factor screening to further achieve the objectives set in the study (He et al., 2009).

Klir and Folger (1988) proposed introducing the generalized mean model into the Delphi method and established the triangular fuzzy function based on the evaluation value of the expert questionnaire. The generalized mean's minimum (L) and maximum (U) are the two endpoints of the expert consensus triangular fuzzy function. The geometric function (M) represents the consensus of the expert group on evaluating the influencing factors. Finally,

the researcher determines the threshold value (Z_i) according to the research scope to select the appropriate evaluation factors.

This research tool is an expert questionnaire constructed through literature compilation and in-depth interviews. The preparation process can be divided into three stages. The first stage is data collection, which mainly summarizes the resilience theory and related indicators of community development by reviewing and sorting out relevant literature. In the second stage, the community resilience index was extracted through in-depth interviews. The FDM was used in the third stage to screen evaluation factors through the "Fuzzy Delphi expert questionnaire."

(iv) Similarity-based Importance-Performance Analysis, SBIPA

Traditionally, Importance-Performance Analysis (IPA) has been used to evaluate the improvement of customer service quality demand items. IPA is a technique that prioritizes the relevant attributes of a particular assessed service item based on their "importance" and "performance" (Sampson & Showalter, 1999).

Chu and Guo (2015) proposed the concept of pattern recognition and Intuitionistic Fuzzy Set (IFS) to address the limitations of traditional IPA and developed the Similarity Based Importance-Performance Analysis (SBIPA). This approach combines similarity IPA and pattern recognition with diagonal IPA, introducing the concept of "similarity diagonal IPA". Based on the study's findings, this method does not require prior decision-making on quadrant segmentation points or any survey on respondents' perceptions of attribute importance.

The Similarity Based Importance-Performance Analysis (SBIPA) method can be divided into the following steps in its implementation (Chu et al., 2016):

Step 1: The scores of each respondent on each service attribute ($X_{k/ij}$) were normalized to obtain the normalized scores (N_{ij}^k).

Step 2: Intuitionistic fuzzification of the standardized and normalized scores.

Step 3: The Intuitionistic Weighted Arithmetic Mean (IWAM) proposed by Beliakov et al. (2011) (as in Formula 4), is used to sum up the IFS of individual respondents to obtain the intuitionistic fuzzy set for each attribute A_j (as in Formula 5).

$$\begin{aligned} \text{IWAM}(a_{1j}^k, a_{2j}^k, \dots, a_{nj}^k) &= \left(\sum_{i=1}^n w_i \mu_{ij}^k, 1 - \sum_{i=1}^n w_i (1 - v_{ij}^k) \right) \\ &= \left(\sum_{i=1}^n w_i \mu_{ij}^k, \sum_{i=1}^n w_i v_{ij}^k \right) \dots \dots (4) \\ A_j &= \{ (I, u_j^I, v_j^I), (P, u_j^P, v_j^P) \} \\ &= \left\{ \left(I, \left(\frac{1}{n} \right) \sum_{i=1}^n \mu_{ij}^I, \left(\frac{1}{n} \right) \sum_{i=1}^n v_{ij}^I \right), \left(P, \left(\frac{1}{n} \right) \sum_{i=1}^n \mu_{ij}^P, \left(\frac{1}{n} \right) \sum_{i=1}^n v_{ij}^P \right) \right\} \dots \dots (5) \end{aligned}$$

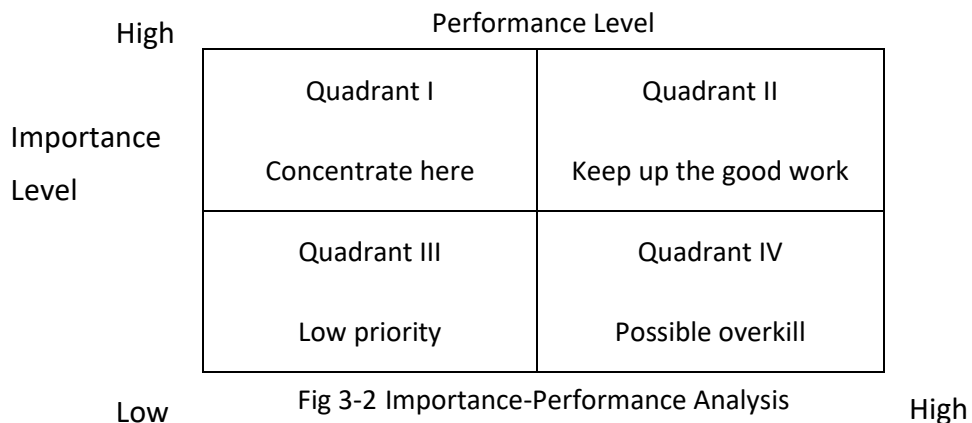
where a_{ij}^k is the intuitive ambiguity of the i -th respondent for the j -th assessed attribute on the k -th criterion (in this study, $k=1$ for importance and $k=2$ for satisfaction); μ_{ij}^k is the affiliation of the i -th respondent for the j -th assessed attribute on the k -th criterion; and v_{ij}^k is the non-affiliation of the i -th respondent for the j -th assessed attribute on the k -th criterion.

Step 4: Use the correlation coefficient of each item performance and the overall performance as the derived importance score. Calculate the similarity between the attributes and the standard samples $S(Q_k, A_j)$, $k=1,2,3,4$.

Step 5: Calculate the similarity measure $S(A_i, A_j)$ between the j -th attribute and the i -th quadrant standard type (A_i). Compare $S(Q_k, A_j)$ and assign the attributes to the state with the highest similarity.

Step 6: Select the next attribute and repeat steps 3 to 5 until all attributes are classified.

As a result of these steps, the Similarity Based Importance-Performance Analysis (SBIPA) method eliminates the need for prior decisions on the segmentation method for determining the positions of the vertical and horizontal axes. Unlike other fuzzy IPA methods, it does not require a defuzzification step (see Fig. 3-2).



IV. Research Findings

(i) Literature review and in-depth interviews to compile resilience indicators for Shishui community development

Based on the in-depth interviews and literature review discussed above, this study extracted opinions from the qualitative interviews and identified five major components and 42 assessment items. In addition to the indicators previously identified in the literature review, indicators related to community resilience were also identified through in-depth interviews with professional groups. These indicators are presented in Table 4-1.

Table 4-1: Assessment Items of Community Development Resilience Indicators Extracted from Professional Group and In-depth Interviews

Structure	Assessment Item	Structure	Assessment Item
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<p style="text-align: center;">A. Sustainable Development Capability</p>	<p>A1. Young people in the community return to settle in their hometowns. (Tseng et al., 2022) *</p> <p>A2. Public facilities in the community are regularly maintained or updated. (Jiang et al, 2014)*</p> <p>A3. The community regularly cleans up the environment and implements waste separation. (Liang, 2017)*</p> <p>A4. The community pays attention to the conservation of ecological habitats, flora and fauna. (Jiang et al, 2014)*</p> <p>A5. The community provides opportunities for cadres and volunteers to learn and absorb new knowledge. (Liang , 2017)*</p> <p>A6. The community cultivates leadership successors so that the future development of the community will not be affected by re-election. (Liu, 2013) *</p> <p>A7. Neighborhood support services are set up in the community to respond to disasters. (Tseng et al.2022; Jiang et al, 2014)*</p> <p>A8. The community establishes a mechanism to gather local traditional cultural and historical information. (Tseng et al.2022; Jiang et al, 2014).*</p>	<p style="text-align: center;">C. Financial and Economic Capacity</p> <p>C1. The community's financial management is functioning well, with a stable balance of income and expenses.(Cutter el al.,2010; Liang, 2017)*</p> <p>C2. The community has regular financial income (e.g., funds, donations, etc.). (Huang, 2015)*</p> <p>C3. Grant funding is sufficient for the community organization to operate properly. (Jiang et al, 2014)*</p> <p>C4. The community is able to develop various sources of funding.(Liu, 2013)*</p> <p>C5. The community uses the characteristics of the community to add value to the community's tourism or industry. (Joerin et al., 2012; Liang , 2017)*</p> <p><i>C6. The community has a mechanism to raise its own funds so that it can maintain basic financial preparedness and move toward autonomous development.✘</i></p> <p><i>C7. Whether the community has an awareness of historic preservation and revitalization mechanisms within the community that represents the characteristics of the community. ✘</i></p> <p><i>C8. Whether the community has a fair and transparent financial accounting system. ✘</i></p>
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<p>A9. The community has a mechanism for human resource training to avoid talent gap in the community. (Tseng et al. 2022; Jiang et al, 2014)*</p> <p>A10. The community has resources and mechanisms to support the return of youth to their hometowns.*</p> <p>A11. The community's ability to control pollution (e.g., household waste water and garbage).*</p> <p>A12. Ability to maintain traditional culture and community appearance.*</p> <p>A13. The use of natural farming methods and friendly farming practices in the community.*</p>	<p style="text-align: center;">D. Community Cohesion</p> <p>D1. Community residents trust the decisions made by community leaders. (Cutter et al.,2010; Liang 2017)*</p> <p>D2. The extent to which community residents identify with community leaders. (Liu, 2013)*</p> <p>D3. Community residents' recognition of the contribution of community development associations.(Norris et al.,2008; Lai, 2008) *</p> <p>D4. The extent to which community residents participate in community activities.(Norris et al., 2008; Huang, 2015)*</p> <p>D5. The ability to accommodate different opinions. (Liang, 2017)*</p> <p>D6. The effect of the community's homogeneous background (e.g., clan) on cohesiveness. (Liu, 2013)*</p> <p>D7. The ability of the community to accept new immigrants and external stimuli.*</p> <p>D8. The establishment of community elder care system.*</p>
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B. Organizational Leadership	<p>B1. Community leaders have the capacity to run community organizations. (Norris et al., 2010; Liang 2017)*</p> <p>B2. The community has sufficient mobilization capacity. (Huang, 2017; Liu, 2013)*</p> <p>B3. The community can appropriately mediate disputes among residents. (Sherrieb et al., 2010; Huang, 2015)*</p> <p>B4. There is a clear division of labor in the community organization system. (Joerin et al., 2012; Tseng et al., 2022)*</p> <p>B5. Community organizations can distribute community resources equitably. (Liu, 2013)*</p> <p>B6. Whether the community has an open and transparent information platform.*</p> <p>B7. Whether community residents understand and trust the use of various grants.*</p>	E. Network Resource Capability	<p>E1. The community is able to bring in experts and scholars from outside the community to provide guidance. (Jiang et al, 2014)*</p> <p>E2. The community has the ability to secure external resources (funding) through other means. (Huang, 2015)*</p> <p>E3. The community has the ability to work with village organizations and community associations to help each other. (Liu, 2013)*</p> <p>E4. The community has a foundation of mutual trust with outside organizations (or other communities). (Joerin et al., 2012; Tseng et al., 2022)*</p> <p>E5. The community has a shared experience of working with neighboring communities. (Liu, 2013)*</p> <p>E6. The ability to use modern cluster resources (e.g., communication, networking, marketing). (Liang, 2017)*</p>
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Note: *Resilience indicators for community development for academic research

** Community development resilience indicators extracted from in-depth interviews*

(ii) Fuzzy Delphi Method Expert Questionnaire Distribution and Collection

Based on the results of the expert questionnaire and the application of Klir and Folger's (1988) Fuzzy Delphi method, Microsoft Excel software was used to determine the items assessed by each expert on the questionnaire. The decision maker could adjust the threshold (S) if too few factors were identified, or increase it if there were too many factors (Klir & Folger, 1988). In this study, the threshold was set at 6, and any items that did not reach the threshold of convergence or expert consensus below 6 were excluded.

In this study, 14 questionnaires were delivered in person after telephone contact, and 12 questionnaires were delivered by email. All 26 questionnaires were completed and returned by the experts, resulting in a 100% response rate.

(iii) Final Results of Community Resilience Indicators by Fuzzy Delphi Method

Based on the expert consensus values higher than 6, a total of 35 items were extracted from professional groups and in-depth interviews. The subsequent evaluation of community resilience indicators based on SBIPA (Similarity Based Importance-Performance Analysis) also took into consideration the opinions of expert scholars. The 35 assessment items are listed in Table 4-2.

Table 4-2: Assessment Items of Community Development Resilience Indicators by Professional Groups and In-depth Interviews

Structure	Assessment Items (35 items)
A. Sustainable Development Capability	1. Young people in the community gradually return to their hometowns.
	2. The community regularly cleans up the environment and implements waste separation.
	3. The community pays attention to the conservation of ecological habitats, flora and fauna.
	4. The community provides opportunities for cadres and volunteers to learn and absorb new knowledge.
	5. Neighborhood support services are set up in the community in case of disasters.
	6. The community can systematically collect information on local traditions and history.
	7. The community has a mechanism for human resource training to avoid a talent gap in the community.
	8. The community has resources and mechanisms to support the return of youth to their hometowns.
	9. The community's ability to control pollution (e.g., household waste water and garbage)
	10. The ability to maintain traditional culture and community appearance.
	11. The use of natural farming methods and friendly farming practices in the community.
B. Organization	1. Community leaders have the capacity to run community organizations.
	2. The community has sufficient mobilization capacity.

	3. The community is able to appropriately mediate disputes among residents.
	4. There is a clear division of labor in the community organization system.
	5. Community organizations can distribute community resources equitably.
	6. The community has an open and transparent information platform.
	7. Community residents understand the use of various grants.
C. Financial and Economic Capacity	1. The community's financial management is functioning well, with a stable balance of income and expenses.
	2. The community has regular financial income (e.g., funds, donations, etc.)
	3. The community is able to develop various sources of funding.
	4. The community uses the characteristics of the community to increase the value of the community's tourism or industry.
	5. The community has a mechanism to raise its own funds, so that the community can maintain basic financial preparedness and move toward autonomous development.
	6. The community has a fair and transparent financial accounting system.
D. Community Cohesion	1. The extent to which community residents participate in community activities.
	2. The ability to accommodate different opinions.
	3. The effect of the community's homogeneous background (e.g., clan) on cohesiveness.
	4. The ability of the community to accept new immigrants and external stimuli.
	5. The establishment of a community elder care system.
E. Network Resource Capability	1. The community is able to bring in experts and scholars from outside the community to provide guidance.
	2. The community has the ability to secure external resources (funding) through other means.
	3. The community has the ability to work with village organizations and community associations to help each other.
	4. The community has a foundation of mutual trust with outside organizations (or other communities).
	5. The community has shared experience of working with neighboring communities.
	6. The ability to use modern clustering resources (e.g., communication, networking, marketing).

(iv) Analysis of Similarity Based Importance-Performance Analysis

The questionnaires were distributed to 76 households, of which 50 were returned,

representing a coverage rate of 66% of the total households. The resilience indicators were extracted from domestic and international literature on resilience and through in-depth interviews. Furthermore, Fuzzy Delphi method expert questionnaires were used to select resilience indicators for community development, which were then allocated into five major components and 35 assessment items. These 35 indicators were distributed to community residents through a questionnaire and analyzed using the SBIPA method. The assessment items for the quadrant assessment of community development resilience indicators are shown in Table 4-3.

Table 4-3: Community Development Resilience Indicator Quadrant Assessment Items

Quadrant I <i>Concentrate Here</i>		Quadrant II <i>Keep Up the Good Work</i>	
A1. The community's youth population is gradually returning to their hometowns.	B5. Community organizations can distribute community resources equitably.	A2. The community regularly cleans up the environment and implements waste separation.	D3. The effect of the community's homogeneous background (e.g., clan) on cohesiveness.
A3. The community pays attention to the conservation of ecological habitats, flora and fauna.	B6. The community has an open and transparent information platform.	A6. The community can systematically collect information on local traditions and history.	E1. The community is able to bring in experts and scholars from outside the community to provide guidance.
A4. The community provides opportunities for cadres and volunteers to learn and absorb new knowledge.	B7. Community residents understand the use of various grants.	A10. The ability to maintain traditional culture and community appearance.	E2. The community has the ability to secure external resources (funding) through other means.
A5. Neighborhood support services are set up in the community in case of disasters.	C1. The community's financial management is functioning well, with a stable balance of income and expenses.	B1. Community leaders have the capacity to run community organizations.	E6. The ability to use modern clustering resources (e.g., communication, networking, marketing).
A7. The community has a mechanism for human resource training to avoid a talent gap in the community.	C5. The community has a mechanism to raise its own funds, so that the community can maintain basic financial preparedness and move toward autonomous development.	B2. The community has sufficient mobilization capacity.	
A8. The community has resources and mechanisms to support the return of youth to their hometowns.	C6. Whether the community has a fair and transparent financial accounting system.	C4. The community uses the characteristics of the community to increase the value of the community's tourism or industry.	
A9. The community's ability to control pollution (e.g., household waste water and garbage)	D1. The ability to accommodate different opinions.	D2. The extent to which community residents participate in community activities.	
A11. The use of natural farming methods and friendly farming practices in the community.	D5. The establishment of community elder care system.		
B4. There is a clear division of labor in the community organization system.	E3. The community has the ability to work with village organizations and community associations to help each other.		

Quadrant III <i>Low Priority</i>		Quadrant IV <i>Possible Overkill</i>
B3. The community is able to appropriately mediate disputes among residents.	D4. The ability of the community to accept new immigrants and external stimuli.	
C2. The community has regular financial income (e.g., funds, donations, etc.)	E4. The community has a foundation of mutual trust with outside organizations (or other communities).	
C3. The community is able to develop various sources of funding.	E5. The community has shared experience of working with neighboring communities.	

Note: A: Sustainable Development Capability; B: Organizational Leadership; C: Financial and Economic Capacity; D: Community Cohesion; E: Network Resource Capability

VI. Conclusions and Implications

(i) Conclusions

In recent years, global crisis management organizations have prioritized establishing disaster-resistant communities, as they are likely to experience less damage and recover faster in the face of adverse events (Scherzer et al., 2019). According to Lew (2017), the current development stage of the Shishui community should be considered as consolidation, based on Holling's theory of the life cycle of tourism and the adaptive cycle theory's four stages: reorganization, growth, consolidation, and collapse. It is evident that the Shishui community had already experienced a period of stagnation in the collapse stage after the 921 earthquakes. However, in recent years, Shishui has collaborated with the public sector to revitalize the community and gradually regain its vitality and appearance. This is similar to

Folke et al.'s (2010) discussion of using resilience on multiple scales to achieve transformation on a smaller scale and to utilize crises as opportunities for innovation.

(ii) Implications for Rebuilding Community Resilience

1. Sustainable Development

Currently, the primary development focus for the Shishui community is on the tourism industry. However, little attention is being paid to the community's environmental aspects, impeding a balanced state for sustainable development. The community possesses abundant natural resources and should strengthen its ecological conservation expertise. It is necessary to establish a mechanism for young people to return to their hometown, embrace diverse opinions, and enhance the community's ability to absorb new knowledge. For instance, promoting friendly farming practices or effectively controlling pollution sources within the community. These efforts will attract visitors, promote the community's industries, and drive the development of neighboring businesses. The development of sustainable tourism in rural areas will help improve the resilience of local communities. Strategies are required to ensure sustainable rural tourism and maintain the resilience of local communities (Amir et al., 2015).

2. Organizational Leadership

Community development requires transparent labor allocation and open access to information. Community resources should be distributed evenly, and residents should be able to understand how grants are being used. An effective operating model involves high levels of community feedback, leadership that is willing to listen and take action, and community involvement (Zautra et al., 2008). Establishing an elder care system is critical to enhance community development, especially the establishment of inter-community support mechanisms that enable the community development association to continue operating steadily.

3. Financial and Economic Capacity

The willingness of tourists to support the local community by buying locally is crucial. It is also important for the community to collaborate and create job opportunities, enhance their ability to raise funds, increase financial reserves, and promote transparency and fairness in accounting. Diversification of economic sources provides more employment opportunities, especially for young people, helping to retain them in the area (Buikstra et al., 2010). The community should strive to contribute to the economic benefits of the community and activate its financial and economic autonomy.

4. Community Cohesion

Ainuddin and Routray (2012) suggested that the community cohesion model can enhance community awareness, preparedness, and response to disasters. Therefore, establishing an elderly care system in the Shishui community and strengthening the mutual aid capacity among the village community would be highly beneficial in promoting community cohesion.

5. Network Resource Capacity

Perhaps the most critical and complex challenge in community disaster management is understanding the impact of resources on the community (Buikstra et al., 2010). To address this, communities can actively invite experts and scholars through various government programs to exchange ideas and provide guidance. They can also establish mechanisms for human resource development, enhance counseling, and improve community software and hardware to promote overall community development.

(iii) Limitations of this Study and Recommendations for Future Research

This study has identified 18 issues in the Shishui community that residents consider important, but their level of performance has not yet reached the expected standard.

However, with the advancement of technology and changes in society, future interviews could involve youth participation to assess the community's sustainability and resilience. The prevalence and utilization of technology/products could also be evaluated as a measure of the feasibility of dynamic community growth.

Considering the limitations of this study, it was primarily based on only one Taiwanese community site, and the identified indicators may not be generalizable globally due to different cultural contexts and ethnic differences. This regional study provides strategies for local and tourism-based community resilience but lacks research on tourism-based disaster preparedness programs (Ritchie & Jiang, 2019). Future research Implications may include exploring the policy and geographic context of Taiwan. It is also suggested to expand the scope of the study by conducting interviews and questionnaires with additional community members operating in various communities throughout Taiwan to obtain comprehensive data for analysis. This will provide important information for the government or related entities to promote policy and better understand the resilience of communities in different regions.

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