



Sustainable Competitiveness of Red Onion through Collective Action of Farmers in West Sumatra

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Abstract. *The competitiveness and sustainability of agriculture are closely related to small-scale farming efforts. This research contributes to the transformation of individual farmers into a collective for small-scale farm enterprises, which face constraints necessitating the development of synergies. This is particularly relevant for red onion farmers in the high plains of the Gumanti Valley, Western Sumatra. The research questions are: How do the community's strengths sustain competitiveness and sustainability? What strategies can be formulated to enhance these aspects for the red onion farming community? The study aims to explore the strengths of onion farmers' communities and strategies to reinforce them, thereby promoting sustainability and competitiveness. Conducted in the agricultural area of the Gumanti Valley district of Solok Province from 2019 to 2020, this descriptive research employs CEEI, SWOT, and QSPM methodologies. The findings indicate that the competitiveness and sustainability of the red onion business have improved, with increases observed in collective innovation, supply chain management, and access to economic resources and opportunities, leading to enhanced income accumulation and profit sharing.*

Keywords: *small-scale farming; community entrepreneurship; shallot farming regional development; strategies entrepreneurship.*

Type of the Paper: Regular Article.



1. Introduction

Agricultural development integrates sustainability and competitiveness. The demand is complex, necessitating the production of goods that can compete in both domestic and global markets [1]. This process, which spans from farm to market, requires efficiency in actions and cost reduction [2–5]. Such efficiency is essential for maintaining sustainability [6].

Sustainability is the responsibility of present generations to meet their needs without compromising those of future generations. Future generations deserve to enjoy the resources available to the present. Three interrelated concepts underpin sustainability: social, economic, and environmental. The Triple-P framework encompasses the sustainability of the business economy

(profit), the durability of human social life (society), and the sustainable environment (planet) [7–9]. Agricultural development plays a crucial role, particularly through small-scale farming efforts [10–19]. West Sumatra’s onion farmers in the Gumanti Valley exemplify this small-scale agricultural business. Research indicates a need to enhance community strength, as many farmers in the Gumanti Valley have not prioritized sustainable development, and competitiveness requires improvement in community entrepreneurship [7,20,21]. Building synergies in community entrepreneurship is essential [22–26]. In Gumanti Valley, red onion farmers are categorized into landowners and small farmers, with most land holdings under 0.5 hectares. They face significant challenges, including limited land, insufficient capital, difficult access to credit and production facilities, and obstacles in selling their products, such as high transportation costs, unavailable markets, and low prices. While community entrepreneurship exists in the form of farmer groups and traditional institutions, their functions require enhancement.

The sustainable development of competitive agriculture necessitates building synergies in community entrepreneurship, as a support system needs to be developed [27,28]. Entrepreneurship functions as an agent of change in the economy; however, the right mechanisms are required. Entrepreneurship involves more than merely starting or running a small business; it also depends on accessibility. Small-scale efforts are increasingly challenging when pursued individually. To encourage farmers to adopt the concept of entrepreneurship, new skills and knowledge are essential. Traditional support systems often fail to provide these, as agriculture is intertwined with social relationships and networks, new institutional arrangements, and professional structures that require negotiation and alliance-building among various interests and actors. Therefore, it is crucial to facilitate communities that support small-scale farming businesses in agricultural areas through training, business establishment, and the availability of financial resources and information. This is where the role of community entrepreneurship becomes vital. Business actors must collaborate, supported by both formal and informal institutions, with a focus on transforming institutional arrangements and management. This collective action not only leverages local advantages but also enhances competitiveness, sustainability, and local welfare. Community entrepreneurship can strengthen small-scale farming enterprises by transforming individualism into collectivity. The synergy between small-scale farming efforts, sociopreneurship, and community power can generate transformative energy. Collective action has the potential to empower red onion farmers to overcome resource limitations, scale challenges, and weak access. This collective strength is essential for competitiveness and sustainability. Sustainable and competitive onion farming requires strategies that incorporate a community perspective rather than an individual approach. Although previous research has examined the formulation of strategies and the development of red onions [23–25,29–31], this new study highlights the importance of a

collective perspective as the foundation for onion business strategies aimed at enhancing sustainability and competitiveness [23–25,31–35].

The research questions are: How is community entrepreneurship among red onion farmers developed, and how are strategies formulated to enhance the sustainability and competitiveness of red onions based on community entrepreneurship? This study aims to identify the development of community entrepreneurship among red onion farmers and to develop strategies that enhance their sustainability and competitiveness. The novelty lies in the concept, framework, and implementation of community entrepreneurship [36,37].

2. Materials and Methods

2.1. Research Site

This research was conducted in the Gumanti Valley district of Solok Province, Western Sumatra, which includes four existing *kenagarians*: Sungai Nanam, Alahan Panjang, Aie Dingin, and Salimpat. The study site was purposefully selected as it is a red onion production center. The research was conducted from 2018 to 2019, which was then reviewed and re-confirmed in 2022 to 2023. Sample selection was determined [36]. Data were obtained from the leaders and members of 14 farmer groups.

2.2. Data Analysis

Data analysis employed SWOT and QSPM. SWOT analysis is a framework that integrates internal and external perspectives to identify strengths, weaknesses, opportunities, and threats, as demonstrated [28,37–41].

This research involved measuring internal factors using the Community Entrepreneurship Effectiveness Index (CEEI). CEEI encompasses collective innovation, collective supply chain management, collective accessibility to economic resources and opportunities, and the accumulation of profits and sharing of benefits, based on 30 criteria. External factors include industrial environments, macro-business conditions, politics, law, technology, population, and social culture [42]. In this study, external factors are defined as commodity-based macro conditions managed by the farming community and aligned with local conditions. The macro conditions affecting onions as external factors include (a) opportunities: market opportunities, supply, distribution services, prices, availability of inputs, government regulations, and ecological/environmental factors; (b) threats: technology mastery, supporting infrastructure, producer competition, price fluctuations, and natural factors.

QSPM (Quantitative Strategic Planning Matrix) is an advanced extension of SWOT analysis. The QSPM matrix is employed to evaluate strategies objectively based on key internal and external

success factors. This matrix is utilized at the decision stage to assess the relative effectiveness of various alternatives that can be implemented as a result of the matching stage [43,44].

3. Results and Discussion

The results indicate that the population of the Gumanti Valley district engaged in the agricultural sector has been assessed, highlighting the empowerment of the red onion farmers' community in the Gumanti Valley during the years 2018-2019 and 2022-2023. Additionally, strategies for the development of the red onion farmer community have been formulated.

3.1. Profile of Farmers in the Gumanti Valley District

The population of the Gumanti Valley district engaged in the agricultural sector reached 77.55 percent. According to Solok Beureu of Statistics, in 2016 and 2022, the Gumanti Valley district's population is primarily involved in the entrepreneurial sector of agriculture, including both farmers and supporting sectors such as trade, transportation, and landfill. The agriculture and trade sectors serve as the backbone of the region's economy, with horticulture farming dominating labor absorption in the area.

Agricultural production in the Gumanti Valley district demonstrates an upward trend in red onion commodities. Farmers in the Gumanti Valley have formed a community [Table 1](#).

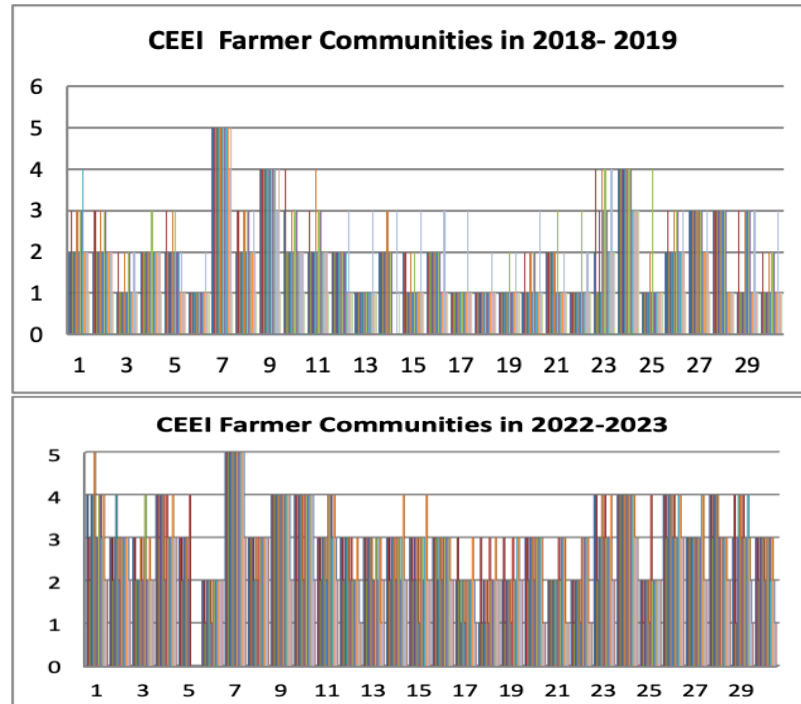
Table 1. Growth of the red onion farmers' strength in the Gumanti Valley

Farmer Group	CEEI Development		Intensity of Development		Quality Development	
	2018-2019	2022-2023	2018- 2019	2022-2023	2018- 2019	2022-2023
Joker Merah	59	92	II	IV	Weak	Strong
Nawaitu Ikhlas	62	78	III		Good	
Matahari Terbit	56	67	II	III	Weak	Good
Kayu Ambun Saiyo	58	89	II	III	Weak	Good
Orida Elba	56	90	II	III	Weak	Good
Pawuah Sapakaik	75	95	III	IV	Good	Kuat
Berkah Tani	59	66	II	III	Weak	Good
Agrobisnis Rimbo	80	99	III	IV	Good	Strong
Pauh Sepakat	68	88	III		Good	
Kembali Jaya	52	84	II	III	Weak	Good
Tuah Saiyo	49	88	II	III	Weak	Good
Aneka Usaha	76	98	III	IV	Good	Strong
Harapan Gumanti	48	67	II	III	Weak	Good
Usaha Bersama	33	56	II		Weak	

Source: Field data

[Table 1](#) describes that in 2018-2019, the internal strengths of the onion farmers' community were already good, while the majority were weak. By 2022-2023, community empowerment was identified as experiencing increased intensity, not only in collective innovation. Aspects that were previously weak began to improve, including collective supply chain management (SCM) and collective accessibility, thereby increasing profits and benefits. For red onions, the development

strategy needs to be enhanced in line with efforts to strengthen community entrepreneurship.



Legend:

Source: Field Data. Farmer’s group: 1=Bukik Radjo; 2= Cahaya Baru; 3= Gunung Talang; 4= Sawah Rawang; 5= Pinang Saiyo; 6= Joker Merah; 7= Nawaitu Ikhlas 8= Matahari Terbit; 9= Kayu Ambun Saiyo; 10= Orida Elba’; 11= Pawuah Sapakaik; 12= Berkah Tani; 13= Agrobisnis Rimbo; 14= Pauh Sepakat; 15= Kembali Jaya; 16= Buah Saiyo; 17= Aneka Usaha; 18=Harapan Gumanti; 19= Usaha Bersama.

NI (number of indicator): I. Collective Innovation: 1.1. Shapes: {(1). affective (2). kognitive (3). pschycomotoric}; 1.2. Process: {(4). Source (5). way (6). knowledge management (7). adoption innovation (8). participation (9). monitoring}; 1.3. Result: { (10). target (11). target variation}. II. Collective SCM: 2.1. Planning { (12). participation (13). scope } 2.2. Organizing {(14). SOP, (15). aspects }; 2.3. Controlling {(16). standard, (17). bargaining (18). problem solution}; (2.4). Value added creation {19). market power .(20). kind of value added}; 3. Collective Access { (21). rule, (22). access (23). Fasilitation (24). Consequency (25). regulation}; 4. Profit accumulation and benefit sharing {(26).productivity, (27). efficiency (28). Collective profit (29). Collective value added (30). Collective benefit

Fig. 1. The power movement of the red onion farmers community in The Gumanti Valley, in years 2018- 2019 and 2022 -2023

Fig. 1 indicates that in 2018-2019, collective innovation facilitated improvements through technical innovation (cultivation) but did not extend to marketing, environmental, and social innovations. Collective supply chain management and collective accessibility to economic resources and opportunities were also weak. The accumulation of profits and the sharing of benefits necessitated enhancements in the management of collective innovation, collective supply chain management, and collective accessibility to economic resources and opportunities.

In 2022-2023, there was an improvement in community entrepreneurship among red onion farmers. Farmer groups performed well, demonstrating entrepreneurial attitudes that included self-confidence, mutual trust in community programs and strengths, awareness of the importance of community, recognition of risks, shared rights and responsibilities, motivation for improvement, and a willingness to collaborate despite varying levels of achievement. Knowledge and skills were

primarily acquired internally, through government extension workers, the private sector, and media sources. Innovation adoption was collective and participatory, managed in an orderly administrative manner. Monitoring and updates were conducted to build attitudes, knowledge, and competencies, both formally and informally, with rewards given for successfully improving business performance. The majority of farmer groups implemented technical, product, and marketing innovations. Several groups, such as Pauah Sapakek, Joker Merah, Kayu Ambun, and Orida Elba, developed and improved product innovations, including the processing of shallots into red onion oil and fried onions. This product innovation remains a group activity and requires further development to contribute to community income. While it has not yet significantly impacted the scale of farmers' businesses, it serves as a backup alternative to cope with price fluctuations.

The collective supply chain management (SCM) developed to facilitate increasingly widespread marketing, not only of red onions but also of red onion seeds, enabling dominance in the market to meet the demand for red onions in Western Sumatra and beyond, including Medan and Java. Farmers can maintain prices even when market prices are low, thereby securing higher profits.

Fig. 1 illustrates that collective access is facilitated through cooperative relationships between agricultural services, such as the agricultural service of the district/city in West Sumatra and the agricultural service of North Sumatra or other regions. This collaboration benefits the group, particularly in marketing their products. The farming department coordinates efforts when farmers require red onion seeds, allowing members of the farmer group to collectively sell their red onions. The accumulation of profit results from these efforts, which automatically increases income, supported by the establishment of a specialized network for seed marketing.

3.2. Red Onion Development Strategy

The strategy for developing entrepreneurship in agricultural areas is constructed by formulating the strengths and weaknesses of internal factors, along with the opportunities and challenges arising from external factors [45].

SWOT analysis

(a). Internal factors

Internal factors are conditions influenced by the state of the enterprise, resulting in advantages (strengths) and weaknesses. These factors include collective innovation, collective supply chain management, collective accessibility to economic resources and opportunities, and the accumulation of profits along with the sharing of benefits [45].

- i. The CEEI value serves as a guideline for determining which criteria are classified as strengths or weaknesses. A value of 3-5 indicates a strong criterion, categorizing it as a strength, while a value of 1-2 is classified as weak, thus representing a weakness.
- ii. Weighting is based on 30 criteria that have equal weight, with each criterion assigned a value of 0.03 to meet the maximum value requirement of 1. The strength rating is 4, while the weakness rating is 3.

(b). External Factors

External factors include (a) opportunities, which consist of market opportunities, supply, distribution services, pricing and availability of inputs, government regulations, and ecological/environmental considerations; and (b) threats, which arise from technological mastery, supporting infrastructure, producer competition, price fluctuations, and natural factors.

b.1. The opportunity

- i. The market opportunity: The FAO (2019-2021) estimates that China occupies a leading position in the red onion trade, while Indonesia no longer holds this position, as cited by the Food and Agriculture Organization (FAO). From 2010 to 2014, Indonesia had export demand for Singapore, Malaysia, and Brunei Darussalam. For the domestic market, the prospects are high. Red onions are one of the main commodities, serving as spice supplementation in cuisine, raw materials for the roasted onion industry, and sources of anti-cancer substances and antibiotic substitutes that can lower blood pressure, cholesterol, and blood sugar levels.
- ii. According to the data of Statistics Indonesia from 2015 and 2022, domestic production of red onions remains concentrated on the island of Java, specifically in four provinces: Central Java, East Java, West Java, and West Nusa Tenggara. The Gumanti Valley agricultural area is one of the red onion production centers outside of Java, supplying both local and domestic market needs.
- iii. Price and input availability: Input prices, including those for fertilizers, seeds, pesticides, and medicines, align with market prices or subsidy prices due to government subsidies. The availability of agricultural inputs in the Gumanti Valley is timely, meeting farmers' needs adequately.
- iv. Government support plays a crucial role in financing farmers, as the government provides various forms of assistance, including fertilizer subsidies, superior seed aid, and people's enterprise credit (KUR). This support is intended to assist farmers with limited capital. In 2014, red onions were designated as warehouse receipt commodities. The Warehouse Receipt System (SRG) Regulation is governed by Law No. 9 of 2006 and updated by Law No. 9 of 2011. This legislation aims to address the challenges farmers face in securing funding for processing businesses. The SRG established in Indonesia pertains to the issuance, redirection,

guarantee, and settlement of warehouse revenue transactions, benefiting agricultural enterprise groups, particularly in onion agribusiness.

b.2. Threats

- i. Price fluctuations: Red onions are essential for consumers, making them one of the most volatile commodities in the market. Consequently, there are frequent price hikes associated with this commodity.
- ii. The natural factor is another dominant influence on price fluctuations, particularly the weather. Uncertain weather conditions significantly impact the price changes of red onions, as farmers in production centers continue to apply the same practices. Most farmers tend to switch to other commodities during the rainy season or avoid planting altogether due to the high incidence of disease and the increased risk of harvest failure.
- iii. The distribution infrastructure is significantly hindered. Inadequate infrastructure conditions, particularly in rural areas, along with distance barriers, result in high logistics costs for distributing red onions from production centers to consumer regions. Transportation is a crucial component for facilitating access to farming and market areas. Additionally, the storage of red onions is vital in the farming process; traditionally, farmers have dried harvested onions by hanging them with their leaves on the roofs of their houses.

(c). Analysis of IFE-EFE

The internal and external analyses are formulated in the IFE-EFE Analysis. The designation is based on the clusters that have been obtained through the CEEI, i.e. strong, good and weak categories [Table 2](#).

Table 2. IFE and EFE of the red onion farmers’ strength in the Gumanti Valley

	Strong		Good		Weak	
	S	W	S	W	S	W
X1	1.11	0.06	0.91	0.14	0.27	0.45
X2	0.69	0.07	0.23	0.38	0.00	0.45
X3	0.47	0	0.20	0.18	0.09	0.18
X4	0.52	0	0.46	0	0.09	0.18
Total	2.78	0.13	1.80	0.7	0.45	1.26
IFE (S+W)	2.9		2.50		1.71	
O	2					
T	1.62					
EFE (O+T)	3.62					

Source: Formulated from IFE &EFE. Legend: S = Strengths, W=Weaknesses, O= Opportunities, T=Threats. X1= Collective innovation, X2= Collective SCM, X3= collective accessibility toward economic resources and opportunities, X4= revenue accumulation and profit sharing.

QSPM

Strategies to be implemented alongside the growth of community entrepreneurship in the Gumanti Valley are based on the QSPM. The QSPM refers to the Internal Factor Evaluation (IFE)

and External Factor Evaluation (EFE) analysis (Table 2), which produces values for each cluster as a reference for determining the occupied quadrants (Fig. 2).

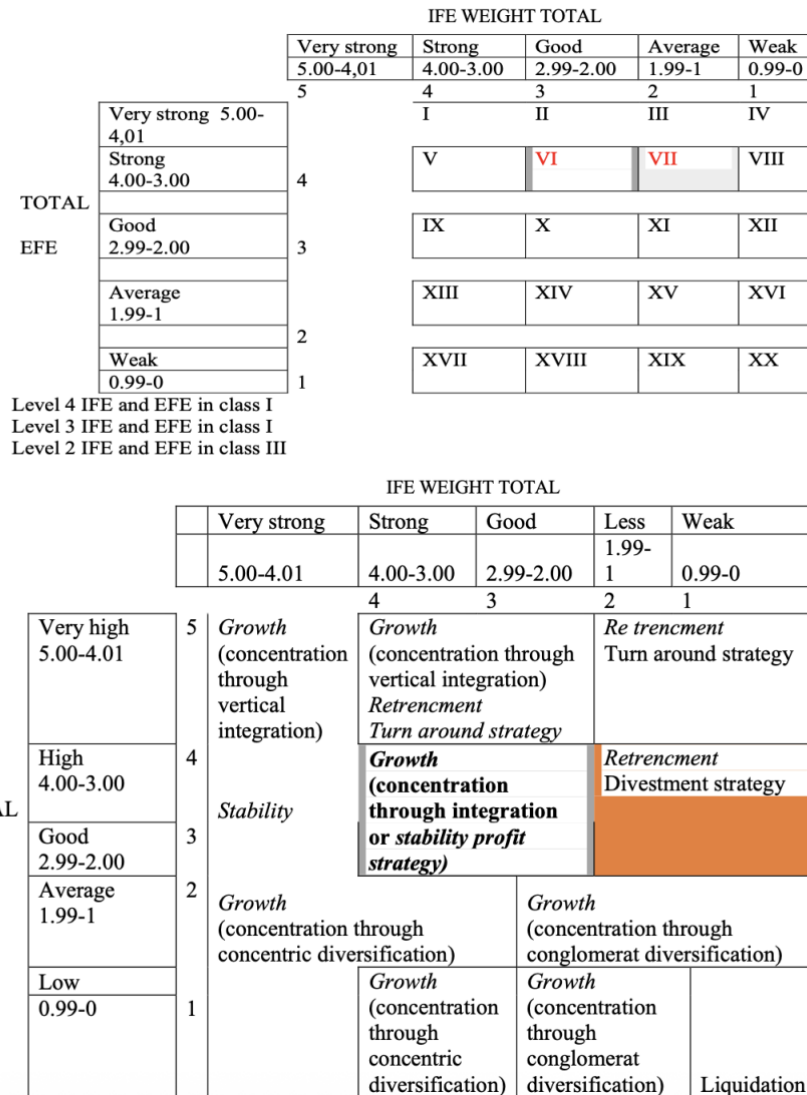


Fig. 2. Matriks and strategies in QSPM based on CEEI in Gumanti Valley

Fig. 2 illustrates the QSPM matrix formulated from the internal and external factors affecting the entrepreneurship of the Gumanti Valley community. These quadrants define the positions and strategies that can be adopted to enhance community entrepreneurship in the region. The QSPM analysis in Fig. 2 indicates a strong and well-organized farmer community regarding growth strategies, while the weaker community requires significant improvement [45].

- a. Red onion farmers with strong community entrepreneurship are encouraged to capitalize on opportunities and effectively manage challenges. The selected strategy is a growth strategy that emphasizes integration and the stabilization of profits. A community that has demonstrated strength and effective management in collective innovation still needs to enhance collective chain management and collective accessibility to economic resources and opportunities. This enhancement will strengthen capabilities at the forefront by increasing the supply of raw materials or by improving the distribution network to expand market share. The

ability to manage collectively and access economic resources and opportunities will enhance both quantity and quality. Given the limitation of production due to restricted land resources, growth strategies through integration can be implemented. Horizontally, this can involve expanding market segments to reduce competition, thereby increasing economies of scale and enabling cooperation within the same industry [45]. Vertically, this can be achieved by taking over functions previously provided by suppliers (backward integration) or distributors (forward integration). In other words, one or more of these strategies can be pursued through both internal and external approaches. The internal approach involves developing a new enterprise to supply raw materials and semi-finished products for the needs of goods and services. The external approach focuses on cooperation aimed at supplying goods to customers.

- b. Red onion farmers who have weak community entrepreneurship can use a retrenchment de-investment strategy. This requires building synergies with the various parties. We need strategies to work together to get out of current constraints, to innovate economically and to find added value to come out of conditions. The entrepreneurship of the onion farmers community still needs to improve the ability to take advantage of opportunities.

4. Conclusions

The strength of the onion farmers' community from 2018-2019 with a weak majority becoming a good and strong majority by 2022-2023. In 2018-2019, collective innovation needs to be enhanced in almost all aspects. By 2022-2023, this community's strength will not only survive the COVID outbreak, but also maintain the competitiveness and sustainability of the red onion business. Increase occurs on all aspects of collective innovation, collective SCM, the collective accessibility to economic resources and opportunities, while improving the accumulation of income and profit sharing. But Community entrepreneurship requires improvements in SCM and accessibility. This requires policy attention and external collaboration. Government support encourages community social businesses that manage downstream processes and build collaborations with strategic partners.

A strategy for a strong and good farmers community is a growth strategy that focuses on integration and stabilizing the profits obtained. This initiative relates to strengthening collective chain management and collective accessibility to economic resources and opportunities, to strengthen capabilities at the forefront by increasing the supply of raw materials or by delaying the improvement of the distribution network in order to expand market share. For the red onion farmer community that has weak community entrepreneurship, it is necessary to do a cutting. It requires internal refinement and collaboration to get out of constraints, to innovate economically and to

find added value to come out of conditions.

Abbreviations

Not applicable

Data availability statement

Data includes photos of the Gumanti Valley are publicly available via the following link: https://drive.google.com/drive/folders/1tm_uNBHgMEgmERnaFnPDM4L60dcJJWJv?usp=sharing). We are also happy to provide reasonable help involving our original images and data if the corresponding author is contacted.

CRedit authorship contribution statement

Silfia: all activity include conceptualization, data curation, formal analysis, funding acquisition, investigation, methodology, project administration, resources, software, supervision, validation, visualization, writing – original draft, writing – review and editing. **Amelia R. Nicolas:** conceptualization, formal analysis, methodology, validation, writing – review and editing. **Elfa Rahmi Fitri:** data curation, formal analysis, funding acquisition, investigation, methodology, project administration, resources. **Resa Yulita:** formal analysis, funding acquisition, software, validation, visualization, writing – writing – review and editing. **Lady Chania:** formal analysis, funding acquisition, writing – review and editing.

Declaration of Competing Interest

The authors of this manuscript declare no conflict of interest or competing interest.

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