

Sustainable Livelihood Strategies for Women Agripreneur Resilience in East Java

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Keywords:

Innovative capability;
Pentagonal asset
Resilience;
Sustainable livelihood;
Woman agripreneurs

Submitted:

11-08-2025

Accepted:

26-09-2025

Published:

29-09-2025

ABSTRACT

Women agripreneurs in East Java are critical in supporting household income and contributing to local economic development, especially in rural and vulnerable areas. However, they often face challenges, including limited resource access, fluctuating markets, and external shocks. This study aims to analyze the implementation of sustainable livelihood strategies to enhance the resilience of women agripreneurs and examine the mediating role of innovation capability in strengthening resilience amidst digital socio-economic challenges. Using the Sustainable Livelihood Framework (SLF), this research explores five key pentagonal assets: human, social, natural, physical, and economic capital. A quantitative method was applied through a survey of 70 women agripreneurs across several regions in East Java. Data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) and VUCA to develop business resilience strategies. The results showed that all five capital assets significantly influence agripreneurial resilience, with social and economic capital playing the most dominant roles. This finding underscores the importance of integrated, asset-based strategies to strengthen women's adaptive capacity and business sustainability. Meanwhile, Innovative capability does not mediate the sustainable livelihood and resilience strategy. Based on VUCA, the study recommends targeted policies and support programs that enhance women's access to resources, networks, and entrepreneurial skills to build more resilient and inclusive local economies.

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1. Introduction

Women play a strategic role in the national economy, particularly through their dominance in micro, small, and medium enterprises (MSMEs). In Indonesia, MSMEs contribute approximately 61% to the national gross domestic product (GDP), and more than 64% of the country's 64 million MSME actors are women (Ministry of Cooperatives & SMEs, 2023). In East Java Province, women entrepreneurs, often called women agripreneurs in the context of agriculture-based businesses, constitute a driving force in the informal sector and household-based economy. Their entrepreneurial activities significantly strengthen household income, create community-based employment, and promote social empowerment. These women-run enterprises span various sectors such as food processing, handicrafts, and other agricultural products. They often combine domestic responsibilities with economic participation, reinforcing their dual role as caregivers and economic actors (Hendratmi *et al.*,

2022; Priambodo, 2024).

The graph below shows that women's income contribution to household income increases every year. However, the government has yet to implement specific policies to protect and develop this potential. Hendratmi *et al.*, (2022) stated that during the COVID-19 pandemic, many SMEs were affected, both economically and operationally. Many small businesses have been significantly impacted by disruptions in the entrepreneurial ecosystem, particularly during the COVID-19 crisis, as adapting to the new economic reality has proven challenging. Moreover, external pressures such as economic fluctuations, climate change, and rapid social transformation exacerbate their vulnerability. The advancement of digital technologies, including e-commerce platforms, social media, and online payment systems, creates both opportunities and challenges, as women entrepreneurs are increasingly required not only to adopt these tools but also to understand consumer behavior, market trends, and competitor strategies (Dwivedi *et al.*, 2021; Erick *et al.*, 2025).

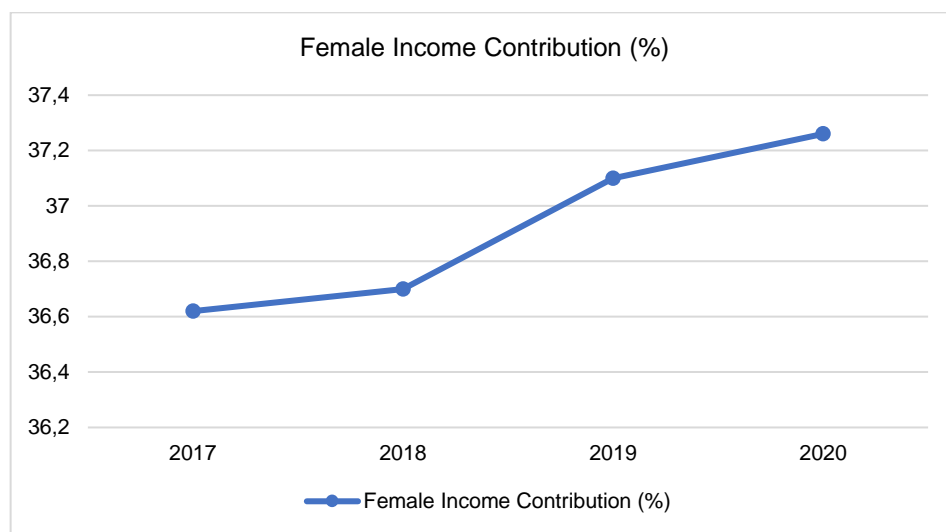


Figure 1. Contribution of Women's Work and Income to Household Income in Indonesia
Source: BPS (2020)

Despite their substantial contribution, women agripreneurs in East Java face persistent structural and cultural challenges. Limited access to capital, low digital literacy, restricted marketing networks, and the dual burden of household and business responsibilities continue to hinder their potential (Setyaningrum *et al.*, 2023; Zoltán J. Ács *et al.*, 2017). Their resilience in the face of digital disruption largely depends on their ability to build competitive advantages through value creation, product differentiation, and effective utilization of digital networks. Therefore, it is essential to develop strategies that can strengthen business resilience to protect and enhance the contribution of SMEs. Enterprises must build the capacity to adapt to environmental changes in response to constantly shifting internal and external conditions in order to remain sustainable.

Sustainable livelihood strategies (SLS) provide a valuable framework for analyzing how women agripreneurs can strengthen resilience. This approach emphasizes the management of five key assets: human, social, economic, physical, and natural capital, which is a foundation for sustaining livelihoods (Carole Rakodi, 2002; Krantz, 2001). For women entrepreneurs, particularly those engaged in agribusiness, these assets are vital for overcoming resource constraints and maintaining business continuity. However, the mere

possession of livelihood assets does not automatically translate into resilience. The ability to adapt, innovate, and strategically utilize resources determines business sustainability (Manzanera-Román & Brändle, 2016). In this context, innovation capability emerges as a crucial mediating factor. Innovation capability refers to the capacity of entrepreneurs to generate ideas, develop new products, respond to market changes, and adopt relevant technologies. It bridges livelihood assets and resilience by transforming resources into innovative practices that enhance competitiveness in volatile, uncertain, complex, and ambiguous (VUCA) environments (Farida & Setiawan, 2022). Without innovation, the capital owned by women agripreneurs may remain passive and underutilized. Conversely, with innovation capability, these assets can be converted into strategies that strengthen resilience and ensure long-term business sustainability.

As one of Indonesia's significant economic growth centers, East Java presents opportunities and challenges for women agripreneurs. Their success and continuity depend not only on access to livelihood assets but also on their ability to transform them through innovation. Therefore, investigating the role of sustainable livelihood strategies and innovation capability in shaping entrepreneurial resilience becomes essential. This study aims to analyze how women agripreneurs in East Java develop sustainable livelihood strategies and examine the innovation capability's mediating role in strengthening resilience amidst dynamic socio-economic challenges.

2. Methodology

This study employed a mixed-method approach, combining quantitative and qualitative methods, to analyze the sustainable livelihood strategies women entrepreneurs adopt in East Java. The quantitative method was used to measure the utilization level of the five sustainable livelihood assets (human capital, social capital, economic capital, natural capital, and physical capital) and their relationship to business sustainability, particularly in the context of Volatility, Uncertainty, Complexity, and Ambiguity (VUCA). Meanwhile, the qualitative method was employed to gain in-depth insights into women entrepreneurs' experiences, motivations, and adaptive strategies in responding to the current digital era's economic, social, and environmental challenges.

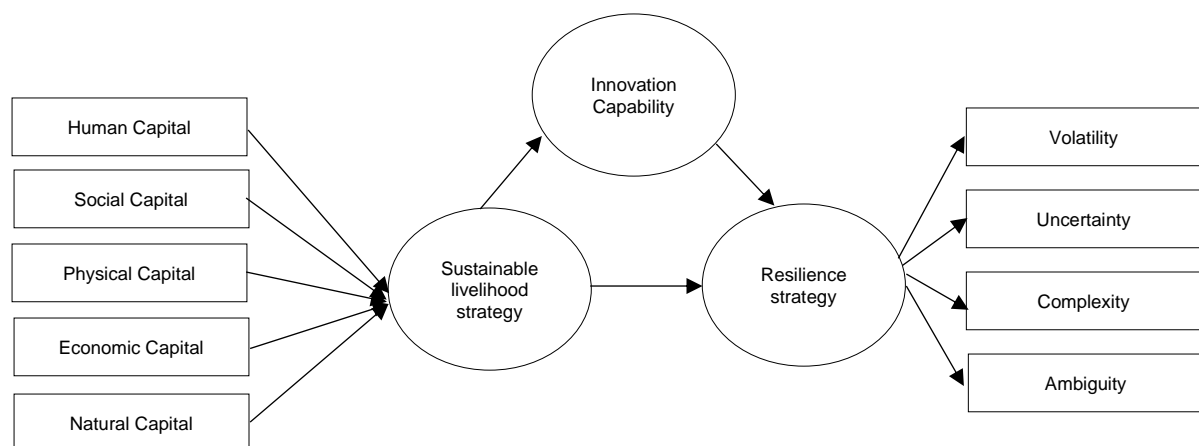
The data used in this research consist of both primary and secondary sources. Primary data were collected through interviews and questionnaires (using a 1–5 Likert scale). The questionnaires were distributed in seven cities/regencies in East Java with the highest number of MSMEs. The sampling technique used in this study is purposive sampling, with 70 respondents for SEM-PLS analysis and 10 participants for the Focus Group Discussion (FGD). Sampling was carried out based on the 10 time rules by Hair *et al.* (2019), which states that the number of samples = 10 x the most significant indicator or the largest path. Secondary data were obtained from previous research or journals, data from the Central Bureau of Statistics (BPS), and relevant reports or news articles related to the research topic.

Table 1. Operational Definitions of Sustainable Livelihood Indicators.

Indicator	Definition
Human Capital	Resources related to individuals include personal talents, skills, and the ability to think or behave in new ways (Nurbaini <i>et al.</i> , 2022)
Social Capital	Increased social prestige, decision-making ability, cooperation with the community, satisfaction with their business, and delivering the best possible outcomes. (Kabir <i>et al.</i> , 2012)
Economic Capital	Economic capital refers to monetary assets such as savings, remittances, pensions, or credit that individuals and households use to support their livelihoods (Kalantarzadeh & Savari, 2025)
Natural Capital	Resources, which refer to stocks of natural assets, serve as the foundation for livelihood activities. This form of capital shapes both the vulnerability context and resilience capacity (Kalantarzadeh & Savari, 2025)
Physical Capital	The economic (capital) flow process and the basic infrastructure and productive assets needed to support livelihoods (Hendratmi <i>et al.</i> , 2022)

Source: Primary data, 2025

Five indicators of livelihood strategies were incorporated into the analytical framework and methodology. These include economic, physical, social, and human capital (Carney, 2004; P. Blaikie & J. Soussan, 2002) and natural capital. In this study, endogenous constructs refer to latent variables that function solely as dependent variables, such as survival strategies (Sarstedt *et al.*, 2017). Conversely, when latent variables are used only as independent variables, they are referred to as exogenous constructs. In this research, livelihood strategies serve as the exogenous constructs (J. Hair & Alamer, 2022).

**Figure 2.** Conceptual Framework

Tables 1 and 2 present the indicators for livelihood and survival strategies, with VUCA as a proxy framework. The collected data will be analyzed using SEM-PLS, and the constructed model will be tested to examine the relationships between variables. The illustration of the research model is presented above (Figure 2).

Table 2. Operational Definitions of Sustainable Livelihood Indicators

Indicator	Definition
Volatility	A quality that changes rapidly and significantly (Hendratmi <i>et al.</i> , 2022; N. Bennett & Lemoine, 2014)
Uncertainty	A situation characterized by a lack of knowledge about whether a particular event is significant enough to be a meaningful cause (Hendratmi <i>et al.</i> , 2022; N. Bennett & Lemoine, 2014)
Complexity	A response that is distinct and entirely separate from the responses required by the other components of VUCA (Hendratmi <i>et al.</i> , 2022; N. Bennett & Lemoine, 2014)
Ambiguity	A situation in which there is uncertainty about the nature of cause-and-effect relationships (Hendratmi <i>et al.</i> , 2022; N. Bennett & Lemoine, 2014)

Source: Primary data, 2025

The FGD activities were conducted with women entrepreneurs from several cities/regions in East Java to explore the survival strategies adopted by MSMEs in the current digital era. VUCA was used as the guiding framework for the developed model approach, with innovation capability as a mediation variable

3. Results and Discussion

The research findings indicate that 70 respondents met the study's criteria, namely women agripreneurs who have been operating their businesses for at least three years, have a minimum monthly turnover of 20 million rupiah (Arman *et al.*, 2024). The sampling technique used was non-probability sampling, with respondents distributed across various regions in East Java. Most respondents came from Gresik, Sidoarjo, Tulungagung, Tuban, Lamongan, and Surabaya. Table 3 classifies individual expenditure categories into four types, representing the basic needs of entrepreneurs as individuals. Most respondents reported monthly personal expenses ranging from 3 to 4.5 million rupiah, which aligns with the characteristics of MSME actors defined in this study. Based on the questionnaire results, 68.5% of respondents were senior high school graduates, while 15.74% held a bachelor's degree. These data suggest that most women entrepreneurs in Indonesia possess a sufficient educational background to support the development of their knowledge and entrepreneurial capacity.

Table 3. Respondents Characteristic

Domicile	Respondents	Percentage (%)
Sidoarjo	16	22,82
Gresik	28	40,00
Tuban	6	8,60
Lamongan	2	2,86
Tulungagung	7	10,00
Surabaya	11	15,72
Age		
≤ 25	2	2,80
26 – 29	17	24,30
30 – 35	34	48,57
36 – 39	9	12,83
≥ 40	8	11,50
Education		
SD	3	4,30
SMP	5	7,14
SMA	48	68,5
D1/D2/D3	2	2,90
D4/S1	11	15,74
S2/S3	1	1,42
Spending (Rp)		
< 1.500.000	5	7,15
1.500. 000 – 2.999.999	24	34,29
3.000.000 – 4.499.999	26	37,14
> 4.500.000	15	21,42

Source: Primary data, 2025

The data obtained were analyzed using Warp PLS 7.0 to examine the influence between variables. The SEM–PLS (Structural Equation Modeling – Partial Least Squares) analysis was carried out in two stages: outer model testing and inner model testing. The results of the analysis are presented as follows:

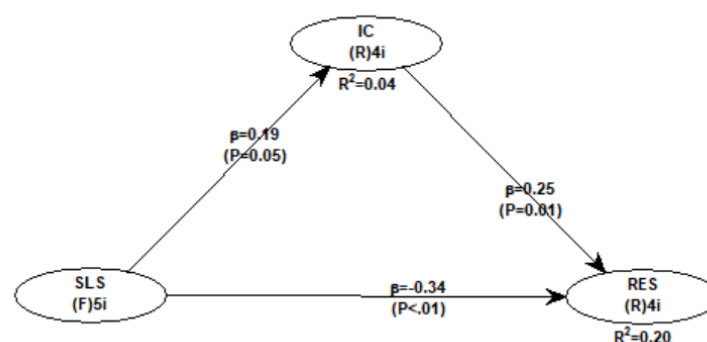
**Figure 3.** Illustration of the Research Model Analysis Results

Table 4 presents the outer model testing results. This table illustrates the analysis results using the Partial Least Squares (PLS) method at the outer model testing stage for each variable under study. All variables were analyzed comprehensively using a first-order construct approach. Three primary latent constructs are used in this study: Livelihood Strategies, Innovation Capability, and a VUCA-based survival Strategy. The Livelihood

Strategies construct consists of five leading indicators: human capital, social capital, economic capital, physical capital, and natural capital.

Meanwhile, the Survival Strategy construct includes four dimensions representing VUCA conditions: volatility, uncertainty, complexity, and ambiguity. The Innovation Capability construct consists of four indicators: market responsiveness, idea generation, product innovation, and technology adoption. The indicator criteria are valid and reliable in a constructive manner if they have a loading factor value greater than or equal to 0.7. All have more variance with their measures than other constructs (Chin *et al.*, 2016; Restu Bayu Nuarie & Dwi Cahyono, 2024), and all indicators meet the discriminant validity test. It means that the variables meet the discriminant validity, and all dimension values are more significant than 0.5.

The analysis results indicate that Average Variance Extracted (AVE) values above 0.5 demonstrate good construct validity for latent variables. The calculation results show that all indicators of the Strategic Leadership (SL) latent construct, innovation capability, and the VUCA strategy latent construct have AVE values exceeding 0.5. This confirms that all latent indicators of each variable possess adequate construct validity. Furthermore, as presented in Table 4, the SL and survival strategy dimensions, considered latent constructs, have Cronbach's alpha and composite reliability values greater than 0.7. Therefore, all variables can be considered reliable.

Table 4. Outer Model Testing Phase

No	Variable	Indicator	LF	CR	CA	AVE
1	Sustainable Livelihood Strategy	Human Capital	0.939	0.976	0.969	0.944
		Social Capital	0.937			
		Physical Capital	0.946			
		Economic Capital	0.940			
		Natural Capital	0.956			
2	Innovation Capablity	Market Responsiveness	0.934	0.963	0.949	0.932
		Ide Generation	0.934			
		Product Innovation	0.926			
		Technology Adoption	0.934			
3	Resilience Strategy	Volatility	0.936	0.968	0.957	0.941
		Uncertainty	0.946			
		Complexity	0.942			
		Ambiguity	0.940			

The structural model in WarpPLS 7.0 was evaluated using the R^2 value to assess the path coefficient of the dependent variable and the p-value to test the significance of the relationship between variables in the model. The R^2 value measures the level of variance in the dependent variable explained by the independent variables. The higher the R^2 value, the

better the predictive power of the research model. The following are the R^2 results used to assess the level of variance explained in this study.

Table 5. Example Table for Reference

No	Arah Konstruk	β	SE	p value (%)	R^2
1	SLS -> IC	0.191	0.112	0.047	0.036
2	IC -> RES	0.245	0.110	0.015	
3	SLS -> RES	-0.344	0.107	<0.001	

Source: Primary data, 2023

Based on the table above, the R^2 value for the SLS variable is 0.2, indicating that the model explains 20% of the variance in the agripreneurs' resilience, an acceptable level considering the complexity of behavioral models in social research. Although this value is statistically considered moderate, it is still acceptable within the context of complex social research, particularly those involving human behavior. This aligns with the view of (J. F. Hair *et al.*, 2019) who stated that in social science research, an R^2 value of 0.20 or higher is generally considered adequate especially when the model seeks to explain behavioral phenomena that are influenced by various external and uncontrollable factors. The results reveal a significant and positive association between sustainable livelihood strategies and innovation capabilities ($\beta = 0.191$; $p = 0.047$). This implies that women agripreneurs with stronger access to livelihood capital, namely human, social, natural, physical, and economic capital, are more likely to develop innovative behavior such as product innovation, market responsiveness, technology adoption, and idea generation. These findings are consistent with Arman *et al.*, (2024) & Priambodo (2024) who argued that access to livelihood capitals serves as the foundation for adaptive behavior and entrepreneurial success in rural contexts. The significant path coefficient also suggests that the accumulation of assets is not merely a passive condition but an enabling platform for innovation among rural women entrepreneurs.

Innovation capabilities have a statistically significant positive effect on resilience ($\beta = 0.245$; $p = 0.015$), indicating that the ability to generate new ideas, respond to market dynamics, innovate products, and adopt technology contributes meaningfully to the capacity of women agripreneurs to manage volatility, uncertainty, complexity, and ambiguity (VUCA). These results affirm the argument by (Muhamad *et al.*, 2017; Niu & Zhou, 2025) that entrepreneurial innovation is central to resilience building, especially under external shocks and systemic uncertainty. Surprisingly, the direct effect of sustainable livelihood strategies on resilience is negative and statistically significant ($\beta = -0.344$; $p < 0.001$). This counterintuitive finding suggests that livelihood capitals alone may not enhance resilience without transformation into innovation capabilities. In certain conditions, such capitals may become liabilities when entrepreneurs cannot adapt or repurpose their resources in changing market environments. This reinforces the idea that resilience is not simply the result of resource possession but rather of resource utilization and transformation.

Table 6. Indirect Effect

No	Arah Konstruk	Path	SE	p value (%)
1	SLS -> IC -> RES	0.047	0.875	0.288

Source: Primary data, 2025

Table 6 presents the results of the indirect effect analysis in the PLS model. Although the individual pathways from SLS to IC and from IC to RES are significant, the indirect effect ($SLS \rightarrow IC \rightarrow RES$) is not statistically significant ($p = 0.288$). This indicates that innovation capabilities do not mediate the relationship between livelihood strategies and resilience in a statistically robust way. The absence of full mediation suggests that other factors such as policy support, digital literacy, or access to networks may moderate or mediate this relationship. It also opens up possibilities for future research using moderated mediation frameworks to capture the complexity of rural innovation and adaptation. This finding aligns with (Ma *et al.*, 2021) who demonstrated that human capital and livelihood strategies influence resilience, but the indirect effect through coping mechanisms only explained a limited portion of the variance in outcomes (Zhang *et al.*, 2025). Similarly, (Niu & Zhou, 2025) found that mediation through livelihood diversification and factor mobility accounted for only 12–30% of the influence on resilience, further indicating that other contextual variables such as policy and literacy may play a significant role (Khodor *et al.*, 2024).



Figure 4. Recommendation Strategy Based on VUCA

Sustainable livelihood strategies for women agripreneurs in East Java must be formulated through an integrated approach that strengthens their capacity to adapt and remain resilient in the face of volatility, uncertainty, complexity, and ambiguity (VUCA). First, enhancing human capital is essential through entrepreneurial training, digital literacy programs, and the development of adaptive mindsets that encourage creativity and innovation. Second, optimizing social capital is necessary by building community-based

business networks, strengthening institutional support such as cooperatives and women entrepreneur associations, and fostering cross-sector collaboration with government, NGOs, and private actors. Third, economic capital should be reinforced by expanding access to microfinance, fintech platforms, and inclusive credit schemes while improving economic literacy and sustainable cash flow management. Fourth, developing physical capital involves improving access to production facilities, digital infrastructure, and environmentally friendly technology, and utilizing online marketplaces for broader product distribution. Fifth, sustaining natural capital requires the use of local resources in a sustainable manner, encouraging green entrepreneurship, and diversifying businesses based on local potentials such as agro-tourism, eco-friendly handicrafts, and processed local food. However, these livelihood assets alone do not automatically translate into resilience; they must be transformed into innovation capabilities, including product innovation, market responsiveness, idea generation, and technology adoption, that serve as the foundation for resilience.

These results have significant practical implications for farmers. They indicate that applying dolomite and other fertilizers, such as guano, to near-neutral pH soil may not be a cost-effective strategy for increasing shallot yields. This insight can assist farmers in optimizing their resource allocation by avoiding unnecessary expenditures on inputs that do not provide substantial returns on investment. Ultimately, these findings contribute to the improvement of agricultural practices and the promotion of sustainability by discouraging the excessive use of fertilizers when their benefits are not evidenced.

4. Conclusion

This study reveals that sustainable livelihood strategies comprising human, social, physical, economic, and natural capital are critical in shaping innovation capabilities among women agripreneurs in East Java. The SEM–PLS analysis results demonstrate that while these livelihood assets contribute positively to innovation behaviors such as product development, market responsiveness, and technology adoption, they do not directly enhance resilience unless they are transformed through innovative practices. Innovation capability is significant in building entrepreneurial resilience, particularly in navigating the volatile, uncertain, complex, and ambiguous (VUCA) environment. However, the absence of a strong mediating effect suggests that resource ownership alone cannot ensure business sustainability. The findings emphasize that resilience is not merely a result of resource possession but of the ability to strategically leverage and adapt those resources. These insights contribute to the growing discourse on sustainable livelihoods and women's entrepreneurship by highlighting the need for integrative policies, digital literacy programs, and capacity-building initiatives tailored to local conditions. Further research is recommended to explore moderated mediation involving policy, digital access, and social networks to deepen our understanding of how agripreneurs can sustain their businesses in an increasingly complex ecosystem.

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