



SWOT Analysis of Post-Disaster MSME Revitalization in Local Communities of Aceh

Syaifuddin Yana¹, Rita Nengsih², Rahmah Yulianti², Marlina¹, Mukhdasir¹, Ayu Rahmi³

¹Department of Management, Faculty of Economics, Universitas Serambi Mekkah, Banda Aceh 23245, Indonesia

²Department of Accounting, Faculty of Economics, Universitas Serambi Mekkah, Banda Aceh 23245, Indonesia

³Student of Accounting Department, Faculty of Economics, Universitas Serambi Mekkah, Banda Aceh 23245, Indonesia

Corresponding Author: rita.nengsih@serambimekkah.ac.id

Abstract

Aceh is one of the most disaster-prone regions in Indonesia, where recurring natural hazards pose significant challenges to local economic sustainability, particularly for Micro, Small, and Medium Enterprises (MSMEs). As the backbone of community-based economies, MSMEs play a critical role in post-disaster recovery by restoring livelihoods, generating employment, and revitalizing local economic circulation. Nevertheless, their recovery process is frequently hindered by structural constraints such as limited access to capital, low financial and managerial literacy, inadequate digital adoption, and high exposure to recurrent disaster risks. This study aims to examine the revitalization of post-disaster MSMEs in local communities of Aceh using a SWOT (Strengths, Weaknesses, Opportunities, and Threats) analytical framework. A qualitative descriptive approach was employed, drawing on field observations, interviews with MSME actors and relevant stakeholders, and an extensive review of related literature. The findings reveal that strong social capital, business flexibility, and the availability of Islamic social finance represent key internal strengths, while capital limitations and weak institutional capacity remain major weaknesses. External opportunities include government recovery programs and digital economy expansion, whereas recurring disasters and market instability constitute significant threats. The study underscores the need for integrated, community-based, and risk-sensitive strategies to enhance MSME resilience and support sustainable post-disaster economic recovery.

Article Info

Received: 13 November 2025

Revised: 15 December 2025

Accepted: 20 December 2025

Available online: 26 December 2025

Keywords

Post-disaster recovery

MSMEs

SWOT analysis

Community-based economic development

Aceh

1. Introduction

Aceh is one of the provinces in Indonesia with a high level of vulnerability to natural disasters, including earthquakes, floods, landslides, and tsunamis. Its geographic position at the convergence of major tectonic plates and its long coastal line expose the region to recurring disaster risks [1], [2]. These disasters not only cause human casualties and physical destruction of infrastructure but also generate severe and long-term economic consequences for local communities [3]. Post-disaster conditions often lead to the disruption of production activities, damage to business assets, breakdown of supply chains, and a decline in purchasing power [4]. In many cases, economic recovery becomes slow and uneven,

particularly in rural and coastal areas where access to financial resources, markets, and institutional support is limited [5]. As a result, disasters frequently push vulnerable households deeper into poverty and increase unemployment, thus prolonging the cycle of economic fragility in affected communities [6].

Micro, Small, and Medium Enterprises (MSMEs) play a strategic role in the structure of Aceh's local economy and serve as the backbone of community-based economic activities. MSMEs dominate the business landscape, absorb the largest share of the labor force, and function as a primary source of income for many households [7], [8]. In post-disaster contexts, the role of MSMEs becomes even more critical because they are often the first economic actors to resume operations and revive local economic circulation [9]. Through small-scale production, trade, and service activities, MSMEs contribute directly to job creation, income generation, and the restoration of community livelihoods [10]. However, despite their strategic importance, MSMEs are simultaneously among the most vulnerable sectors during and after disasters due to limited capital, low asset ownership, weak access to formal financing, and inadequate risk management capacity [11].

Revitalizing MSMEs after disasters is therefore not merely an economic necessity but also a fundamental component of sustainable community recovery. Post-disaster MSME revitalization involves more than restoring damaged physical assets; it encompasses strengthening business capacity, improving access to capital and markets, enhancing managerial and financial literacy, adopting digital technologies, and building resilience to future risks [12], [13]. Nevertheless, the revitalization process faces numerous challenges, including the limited effectiveness of recovery policies, the fragmentation of support programs, weak coordination among stakeholders, and the absence of systematic frameworks to assess internal and external conditions of MSMEs comprehensively [14], [15]. Without proper strategic planning, revitalization efforts risk being short-term, fragmented, and unable to generate lasting economic resilience for local communities [16].

In this context, SWOT (Strengths, Weaknesses, Opportunities, and Threats) analysis provides a relevant and practical strategic tool for assessing the condition of post-disaster MSME revitalization in local communities. SWOT analysis enables the identification of internal factors such as business capacity, resources, and institutional support, as well as external factors including market opportunities, government policies, technological developments, and disaster risks [17]. By systematically mapping these four dimensions, stakeholders can formulate more targeted and adaptive strategies for MSME recovery and development. For community-based economic development, especially in post-disaster settings, SWOT analysis is valuable in bridging empirical field conditions with strategic planning, thus supporting evidence-based decision-making for government agencies, community organizations, and development practitioners [18].

Based on these considerations, this article aims to analyze the revitalization of post-disaster MSMEs in local communities of Aceh using a SWOT approach. Specifically, the objectives of this study are: (1) to identify the internal strengths and weaknesses of MSMEs in post-disaster conditions, (2) to examine external opportunities and threats affecting MSME recovery, and (3) to formulate strategic recommendations for strengthening community-based economic revitalization in disaster-prone areas. The importance of this community service-oriented article lies in its contribution to providing a practical analytical framework for policymakers, local governments, community organizations, and academics in designing more effective and sustainable MSME recovery programs [19]. This study also contributes theoretically by enriching the literature on post-disaster community economic development and practically by offering implementable strategies to enhance the resilience and sustainability of MSMEs in Aceh and other disaster-prone regions [20].

2. Methodology

This study adopts a qualitative literature-based research approach to examine the role of technological innovation in improving efficiency and profitability of micro and small enterprises within the circular economy framework. Data were collected from reputable international journals indexed in Scopus and Elsevier, reports from global institutions such as OECD, UNIDO, UNEP, and the World Bank, as well

as national policy documents issued by the Indonesian Ministry of Industry and the Ministry of Cooperatives and SMEs. Selected national journals were also included to reflect local empirical contexts.

The research was conducted through three main stages: (1) identification and selection of relevant literature based on publication period (2017–2025), thematic relevance, and contribution to efficiency and profitability issues; (2) thematic analysis to classify findings into key dimensions such as cost efficiency, technological mechanisms, economic impact, and business performance; and (3) qualitative synthesis to link technological innovation with performance indicators including revenue growth, profit margins, and cost reduction.

To enhance analytical robustness, SWOT and comparative analysis were applied to examine business conditions before and after the adoption of recycling technologies. Data validity was ensured through source triangulation by cross-referencing academic publications and official institutional reports. An overview of the main literature sources and their roles in the analysis is summarized in Table 1.

Table 1. Key Literature Sources and Their Roles in the Study

Literature Source	Year	Role in the Study
UNEP. Global Plastic Waste Management Outlook	2021	Provides a global reference for plastic waste management technologies and innovation trends.
OECD. Improving Plastics Management	2020	Offers policy frameworks and innovation strategies for sustainable plastics management.
UNIDO. Sustainable Recycling Technologies for SMEs	2021	Explains inclusive recycling technology development for SMEs.
Ministry of Industry of Indonesia	2023	Serves as a national policy guideline for plastic recycling technology adoption.
Rahman & Hossain	2022	Provides empirical evidence on technology adoption barriers in plastic recycling SMEs.
World Bank. Technology and Innovation for Circular Economy	2022	Explores the relationship between technological innovation, economic efficiency, and sustainability.

3. SWOT Analysis of Post-Disaster MSME Revitalization

3.1 Strengths

Post-disaster MSME revitalization in local communities of Aceh is supported by several internal strengths. One of the primary strengths is the strong social capital and community solidarity that characterizes Acehnese society. Mutual cooperation (*gotong royong*), community trust, and social networks play an essential role in accelerating business recovery after disasters [21]. These social ties facilitate information sharing, collective problem-solving, and mutual assistance in restoring production facilities and market activities. In addition, MSMEs in Aceh generally have high flexibility and adaptability due to their small scale of operation, enabling them to adjust more quickly to post-disaster market changes compared to large enterprises [22].

Another significant strength lies in government support programs for post-disaster economic recovery. Various forms of assistance, including emergency grants, subsidized financing, business equipment provision, and training programs, have been introduced to support MSMEs affected by disasters [2]. The existence of Islamic financial institutions and social finance instruments such as zakat, waqf, and *qardhul hasan* also provides alternative financing mechanisms that are culturally and religiously appropriate for Aceh [23]. Furthermore, the abundance of local resources and unique local products—particularly in agriculture, fisheries, and creative industries—constitutes an important comparative advantage for MSME revitalization and market reactivation after disasters [24].

3.2 Weaknesses

Despite these strengths, MSME revitalization in post-disaster contexts faces substantial internal weaknesses. Limited capital and asset ownership remain the most critical constraints for MSMEs in Aceh. Many business actors lose production equipment, inventories, and working capital during disasters, while access to formal financial institutions remains restricted due to a lack of collateral and weak credit records [25]. This condition reduces their ability to restart operations promptly and hampers business expansion during the recovery phase. In addition, low levels of managerial capacity and financial literacy further weaken MSMEs' ability to manage recovery funds effectively and to plan for long-term sustainability [26].

Another major weakness is the limited adoption of digital technology among MSMEs, particularly in rural and disaster-prone areas. Although digital platforms offer significant opportunities for market expansion, many MSME actors still face barriers related to digital skills, infrastructure, and access to the internet [27], [28]. Moreover, business risk management and disaster preparedness remain underdeveloped. Most MSMEs do not have insurance coverage, emergency savings, or business continuity plans, making them highly vulnerable to recurrent shocks [29]. Institutional coordination among MSME support agencies is also often fragmented, leading to overlapping programs and inefficient aid distribution.

3.3 Opportunities

Post-disaster MSME revitalization in Aceh also benefits from various external opportunities. One of the most significant opportunities is the strong commitment of the government to promote MSME development as a pillar of economic recovery. National and regional recovery policies prioritize MSMEs through credit restructuring, interest subsidies, digitalization programs, and inclusive financing schemes [30]. In addition, rapid technological advancement and the growing digital economy provide new opportunities for MSMEs to access wider markets through e-commerce, digital payments, and online marketing platforms [31].

Growing consumer demand for local and community-based products also offers a promising opportunity for post-disaster MSME recovery. Increased awareness of sustainability and local economic empowerment encourages the consumption of locally produced goods, especially in the food, handicraft, and creative industries [32]–[35]. Furthermore, the presence of donor agencies, NGOs, and international development organizations operating in disaster-prone regions creates opportunities for technical assistance, capacity building, and funding support for MSMEs [36]. Collaboration between universities, government agencies, and community organizations also opens avenues for innovation-based MSME development and community empowerment programs.

3.4 Threats

Notwithstanding these opportunities, MSME revitalization in post-disaster Aceh faces significant external threats. The most substantial threat is the high probability of recurring natural disasters. Repeated exposure to hazards such as floods, earthquakes, and coastal erosion undermines long-term business sustainability and discourages investment [36]. Without adequate mitigation measures, recurrent disasters can repeatedly destroy productive assets and erode the limited capital base of MSMEs. In addition, climate change is intensifying the frequency and severity of hydro-meteorological disasters, further increasing business risks [37].

Economic uncertainty and market instability also pose serious threats to post-disaster MSME recovery. Fluctuations in raw material prices, disruptions in supply chains, and declining consumer purchasing power can reduce MSME profitability and competitiveness [38]. MSMEs also face growing competition from large corporations and imported products, particularly in the digital marketplace, which may marginalize local businesses if they fail to adapt technologically [39]. Institutional threats, such as inconsistent policies, bureaucratic barriers, and weak law enforcement, further hinder the effectiveness of MSME support programs and long-term recovery strategies [40].

Table 4 presents an integrated SWOT matrix that summarizes the key internal and external factors influencing post-disaster MSME revitalization in local communities of Aceh. This matrix was developed based on field observations, stakeholder interviews, and a review of relevant literature to

provide a comprehensive overview of the strategic conditions faced by MSMEs during the recovery process.

Table 2. Integrated SWOT Matrix for Post-Disaster MSME Revitalization in Aceh

Aspect	Key Factors	Description / Field Evidence	Supporting Literature
Strengths	Strong social capital	High community solidarity (<i>gotong royong</i>) accelerates business recovery after disasters	[21]
Strengths	High business flexibility	MSMEs quickly adapt production and marketing after disasters	[41]; [32]
Strengths	Availability of Islamic social finance	Zakat, waqf, and qardhul hasan support post-disaster MSME funding	[23]
Weaknesses	Limited capital	Loss of assets and lack of collateral restrict access to finance	
Weaknesses	Low financial & managerial literacy	Weak financial records and planning capacity	[34]
Weaknesses	Low digital adoption	Limited use of e-commerce and digital payment systems	[39]
Opportunities	Government recovery programs	Credit restructuring, subsidies, and MSME assistance programs	[40]; [42]
Opportunities	Digital economy growth	Expanding access to new markets through online platforms	[39]
Opportunities	Rising demand for local products	Consumer preference for community-based products	[34]; [43]; [35]; [32]
Threats	Recurring natural disasters	Repeated floods and earthquakes damage productive assets	[36]
Threats	Market uncertainty	Volatile demand and raw material prices	[38]
Threats	Competition from large firms	MSMEs face pressure in digital and conventional markets	[39]

The SWOT matrix indicates that while local MSMEs in Aceh possess strong internal strengths and face promising external opportunities, they are also constrained by significant internal weaknesses and external threats. These findings highlight the importance of formulating adaptive and integrated strategies that can leverage existing strengths and opportunities to overcome structural weaknesses and mitigate disaster-related risks in a sustainable manner.

4. Result & Discussion

4.1 Interpretation of SWOT Results in the Context of Aceh

The SWOT analysis reveals that post-disaster MSME revitalization in Aceh is largely shaped by the interaction between strong social capital, government support, and persistent structural vulnerabilities. The identified **strengths** such as high community solidarity, flexible business models, and the availability of local resources indicate that Acehnese MSMEs possess an intrinsic capacity to recover and adapt after disasters. This finding is consistent with [44], who emphasize that social capital and community cohesion are critical determinants of recovery speed and quality in disaster-affected regions. In Aceh, the tradition of *gotong royong* and strong religious-cultural ties support collective action in restoring business premises, sharing information, and rebuilding market linkages.

At the same time, the **weaknesses** identified limited capital, low managerial and financial literacy, and low technology adoption suggest that this social capital is not yet fully translated into productive economic resilience. Similar patterns are reported in studies of MSMEs in other developing countries, where small firms often lack access to formal finance and face capacity constraints in financial management and risk planning [45]. In the context of Aceh, these weaknesses are further exacerbated

by recurring disasters, which repeatedly erode productive assets and discourage long-term investment. The SWOT results therefore underline a dual reality: strong community-based strengths coexisting with structural economic weaknesses that must be addressed through targeted interventions.

4.2 The Position of MSMEs in Post-Disaster Economic Recovery

The analysis positions MSMEs as a **central engine of post-disaster economic recovery** in Aceh, yet one that operates under significant constraints. MSMEs are typically the first economic actors to resume activities after disasters, re-opening small shops, services, and home-based production that quickly restore cash flow within communities [32]. The **opportunities** identified policy support, growing digital markets, and increased demand for local products further strengthen this role. When leveraged effectively, these opportunities can turn MSMEs into catalysts for inclusive and sustainable recovery, generating employment and stabilizing household incomes [10].

However, the **threats** of recurring disasters, market volatility, and competition from larger firms indicate that MSMEs' position in the recovery process is fragile. [46], argue that small enterprises are disproportionately affected by shocks because they lack diversification and buffers. The SWOT results for Aceh echo this argument: without improved risk management, insurance, and access to adaptive technologies, MSMEs risk being trapped in a cycle of "build-destroy-rebuild," which is costly and inefficient. Thus, while MSMEs occupy a strategic position in post-disaster recovery, their long-term contribution depends on the extent to which strengths and opportunities can be mobilized to neutralize weaknesses and threats.

4.3 Comparison with Previous Studies

The findings of this study are broadly consistent with previous empirical work on MSMEs and disaster recovery in other contexts. Studies in Southeast Asia and other disaster-prone regions show that community participation and government incentives are recurrent **strength factors** for green and local economic initiatives, while high initial costs and limited expertise represent key **weaknesses** [44]. Likewise, the **opportunities** associated with supportive policy frameworks, international aid, and technological advancements have been documented as drivers of post-disaster recovery and local business development [32], [39], [40].

Where this study adds nuance is in highlighting the specific role of Islamic financial instruments and Aceh's distinctive social-cultural context in shaping MSME revitalization. While many previous SWOT-based studies on community businesses emphasize conventional policy and market factors [47]. The Aceh case introduces the additional dimension of sharia-based social finance (zakat, waqf, *qardhul hasan*) as both a strength and an opportunity for recovery. Furthermore, this study underscores how recurring disaster risk and climate-related hazards constitute persistent **threats** that are more acute in Aceh than in some of the contexts discussed in earlier literature. In this sense, the Aceh experience both confirms global patterns and provides context-specific insights that can enrich comparative discussions on MSMEs in disaster-prone regions.

4.4 Implications for Community-Based Economic Development

The SWOT results carry several implications for community-based economic development in Aceh. First, they suggest that **policy interventions must be designed to strengthen existing community assets** rather than replace them. Programs that build on social capital such as group-based lending, cooperative marketing, and community-driven recovery planning are likely to be more effective and sustainable than purely top-down schemes [48]. Second, there is a clear need to **integrate disaster risk reduction into MSME development agendas**, for example by promoting business continuity planning, micro-insurance, and savings mechanisms tailored to small enterprises.

Third, the opportunities linked to digitalization and market expansion imply that **capacity-building initiatives must prioritize digital skills and financial literacy**, enabling MSMEs to access e-commerce, digital payments, and online marketing channels [39], [49]. Finally, the combination of strengths, weaknesses, opportunities, and threats highlights the importance of **multi-stakeholder collaboration** involving local governments, universities, financial institutions, NGOs, and community organizations to design integrated programs that simultaneously address capital constraints, skills gaps, and institutional fragmentation [36], [40]. For community-based development, this means moving from

fragmented, short-term aid towards long-term, knowledge-based partnerships that aim at building resilient local economies.

5. Strategic Recommendations

Based on the integrated SWOT analysis presented in the previous section, strategic recommendations are formulated to support the sustainable revitalization of post-disaster MSMEs in local communities of Aceh. These strategies are structured into four main groups: SO, WO, ST, and WT strategies. Each group reflects a different strategic orientation that combines internal and external factors to enhance MSME resilience, competitiveness, and long-term sustainability in disaster-prone environments.

5.1 SO Strategies (Maximizing Strengths and Opportunities)

SO strategies focus on leveraging internal strengths to optimally exploit external opportunities. In the context of Aceh, the strong social capital and community solidarity (*gotong royong*), high business flexibility, and the availability of Islamic social finance represent key strengths that can be maximized through government recovery programs, digital economy growth, and rising demand for local products. One strategic recommendation is the development of **community-based MSME clusters** supported by cooperative institutions and sharia-based financing. By integrating MSMEs into production and marketing clusters, communities can strengthen bargaining power, improve efficiency, and expand market access, particularly through digital platforms.

Another SO strategy is the **integration of Islamic social finance with digital MSME platforms** to accelerate post-disaster recovery. Zakat, waqf, and *qardhul hasan* can be channelled productively to support working capital, while e-commerce and digital payment systems expand market reach beyond local boundaries. In addition, **promotion of local superior products** through government-supported branding and tourism-linked markets can further strengthen MSMEs' competitiveness. These strategies align with evidence that synergy between community capital, government support, and digitalization significantly enhances post-disaster economic recovery and inclusive growth.

5.2 WO Strategies (Overcoming Weaknesses with Opportunities)

WO strategies aim to address internal weaknesses by utilizing existing external opportunities. The main weaknesses identified limited capital, low financial and managerial literacy, and low digital adoption can be mitigated by taking advantage of government recovery programs, donor support, and the expansion of the digital economy. A key recommendation is the implementation of **integrated capacity-building programs**, combining financial literacy, basic accounting, business planning, and digital marketing training for disaster-affected MSMEs. These programs should be delivered continuously and tailored to local conditions.

In parallel, **inclusive financing schemes** should be strengthened through credit restructuring, subsidized loans, and microfinance mechanisms supported by both conventional and Islamic financial institutions. Digital platforms can also be used to improve access to finance through fintech-based peer-to-peer lending and mobile banking services. Moreover, **technology adoption incentives**, such as subsidized internet access, digital tool grants, and mentorship for online business transformation, are essential to ensure that MSMEs can fully benefit from the opportunities offered by the digital economy. Through these WO strategies, structural weaknesses can be gradually transformed into new sources of competitiveness.

5.3 ST Strategies (Using Strengths to Mitigate Threats)

ST strategies are designed to use internal strengths to reduce the impact of external threats. Given the recurring risk of natural disasters, market uncertainty, and increasing competition from large firms, Acehnese MSMEs must utilize their social capital, flexibility, and local resource base as defensive and adaptive tools. One recommended ST strategy is the development of **community-based disaster risk management for MSMEs**, which integrates business continuity planning into local disaster preparedness systems. Through community networks, MSMEs can jointly prepare emergency response plans, share resources, and restore operations more quickly after disasters.

Another important ST strategy is the **strengthening of local value chains**, especially in agriculture, fisheries, and creative industries. By prioritizing local sourcing and short supply chains, MSMEs can reduce their exposure to global market volatility and external supply disruptions. Furthermore, **product differentiation based on local identity and culture** can serve as a strategy to counter competition from large firms and imported goods. Unique local branding not only enhances market competitiveness but also supports sustainable community-based economic development.

5.4 WT Strategies (Minimizing Weaknesses and Avoiding Threats)

WT strategies represent defensive approaches aimed at minimizing internal weaknesses while simultaneously avoiding external threats. In the post-disaster context of Aceh, this strategy is particularly relevant due to the compound risks of limited capital, low preparedness, and recurring disasters. One critical recommendation is the promotion of **micro-insurance and risk-sharing mechanisms** tailored for MSMEs. Insurance schemes supported by government subsidies and community-based mutual aid systems can help protect MSMEs from total asset loss during future disasters.

In addition, **institutional strengthening and policy harmonization** are required to reduce fragmentation among MSME support programs and prevent inefficiencies in aid distribution. Establishing an integrated MSME recovery database at the regional level can improve targeting, monitoring, and evaluation of recovery interventions. Lastly, **basic disaster education and risk literacy for MSME actors** must be institutionalized as a long-term preventive measure. By strengthening fundamental preparedness and risk awareness, MSMEs can avoid severe vulnerability to future shocks while gradually improving their resilience and sustainability.

6. Conclusion

6.1 Key Findings of the SWOT Analysis

This study shows that the revitalization of post-disaster MSMEs in local communities of Aceh is strongly influenced by the interaction between internal and external factors. The main **strengths** lie in strong social capital, high business flexibility, and the availability of Islamic social finance instruments that support community-based recovery. These strengths enable MSMEs to recover relatively quickly and to re-activate local economic activities after disasters. However, significant **weaknesses** persist, particularly in the form of limited access to capital, low financial and managerial literacy, and low adoption of digital technologies, which constrain long-term business sustainability and growth.

From the external perspective, important **opportunities** arise from government recovery programs, the rapid growth of the digital economy, and increasing demand for local products. These opportunities offer considerable potential for expanding markets and strengthening MSME competitiveness. Nevertheless, MSMEs also face serious **threats**, including recurring natural disasters, market uncertainty, and competition from large firms. The key finding of this SWOT analysis is that while Acehnese MSMEs possess strong local-based resilience, their long-term sustainability depends on their ability to overcome internal structural weaknesses and to adapt to an increasingly uncertain external environment.

6.2 Policy and Practical Implications

The findings of this study have important implications for policy and practice. From a policy perspective, MSME recovery programs should not focus solely on short-term financial assistance but must also strengthen institutional capacity, financial literacy, and digital transformation. Governments at both regional and national levels need to integrate MSME development with disaster risk reduction policies, ensuring that business continuity planning, micro-insurance, and risk-sharing mechanisms become part of standard MSME assistance schemes.

From a practical standpoint, the results emphasize the importance of multi-stakeholder collaboration involving local governments, financial institutions, universities, NGOs, and community organizations. Capacity-building programs, inclusive financing, and digitalization initiatives should be implemented in an integrated and continuous manner. Community-based approaches that leverage existing social

capital and local resources are crucial to enhancing the effectiveness and sustainability of post-disaster MSME revitalization efforts.

6.3 Limitations of the Study

This study is subject to several limitations that should be considered when interpreting the findings. First, the SWOT analysis is primarily based on qualitative data derived from field observations, interviews, and secondary sources, which may involve subjective judgments from both researchers and respondents. Second, the scope of the study is limited to selected local communities in Aceh and may not fully represent the diverse conditions of MSMEs across all disaster-prone regions in Indonesia. Third, the analysis does not quantitatively measure the economic impact of MSME revitalization or the effectiveness of specific recovery programs, which limits the ability to make precise causal inferences.

6.4 Recommendations for Future Community Service Programs

Based on the results and limitations of this study, several recommendations are proposed for future community service and research programs. First, future programs should prioritize **integrated capacity-building interventions** that combine financial literacy, digital skills, and disaster preparedness training for MSME actors. Second, community service initiatives should emphasize **the development of MSME clusters and cooperative-based institutions** to strengthen collective bargaining power, market access, and production efficiency. Third, there is a need to expand **inclusive and risk-sensitive financing mechanisms**, including micro-insurance and Islamic social finance instruments, to enhance MSME resilience to future disasters.

In addition, future studies and community service programs should incorporate **quantitative impact assessments** to measure the economic benefits of MSME revitalization more accurately. Comparative studies across different disaster-prone regions are also recommended to identify best practices and scalable models for post-disaster community economic recovery. Through these efforts, community service programs can contribute more effectively to building resilient, inclusive, and sustainable local economies in Aceh and beyond.

Acknowledgement

The authors would like to express their sincere appreciation to all parties who contributed to the completion of this research and community service activities. This work was carried out with funding that represents the collective contribution of all authors. No external funding was received for this study. The authors also acknowledge the support provided through collaboration, discussions, and shared expertise among the authors, which were essential to the successful implementation and completion of this work.

References

- [1] B. Meteorologi dan G. Klimatologi, "Prakiraan Musim Kemarau Tahun 2022 di Indonesia," 2022.
- [2] BNBP, "Buku Data Bencana Indonesia tahun 2023," 2023.
- [3] S. Hallegatte, A. Vogt-Schilb, J. Rozenberg, M. Bangalore, and C. Beaudet, "From poverty to disaster and back: A review of the literature," *Econ. Disasters Clim. Chang.*, vol. 4, no. 1, pp. 223–247, 2020.
- [4] M. Aronsson-Storrier, "UN office for disaster risk reduction (2019)," *YB Int'l Disaster L. Online*, vol. 2, p. 377, 2021.
- [5] N. Shiiba, "Financing climate-resilient coasts: tracking multilateral aid for ocean and coastal adaptation to climate change in Asia-Pacific," in *Financing Investment in Disaster Risk Reduction and Climate Change Adaptation: Asian Perspectives*, Springer, 2022, pp. 101–121.
- [6] R. L. Segura *et al.*, "A multidisciplinary approach to understanding vulnerability and building

climate resilience to levee failures and flooding in historically marginalized communities," *J. Environ. Stud. Sci.*, pp. 1–17, 2025.

[7] P. Silaen and S. Tulig, "The role of accounting in managing micro, small and medium enterprises (MSMEs): The case of Indonesia," *Australas. Accounting, Bus. Financ. J.*, vol. 17, no. 2, 2023.

[8] T. T. H. Tambunan, "Development of MSMEs in Indonesia and Uganda," 2024.

[9] T. Poh Ling, N. Hassim, and N. N. B. Mohammad Bashir, "SME Preparedness in Surviving the Health Pandemic in Malaysia," *SAGE Open*, vol. 14, no. 2, p. 21582440241251730, 2024.

[10] T. T. H. Tambunan, *Fostering Resilience Through Micro, Small and Medium Enterprises: Perspectives from Indonesia*. Springer Nature, 2022.

[11] Y. Sawada and F. Zen, "Disaster management in ASEAN," *ERIA Discuss. Pap. Ser.*, vol. 3, no. s 1, 2014.

[12] A. Rose, "Economic resilience in regional science: research needs and future applications," in *Regional Research Frontiers-Vol. 1: Innovations, Regional Growth and Migration*, Springer, 2017, pp. 245–264.

[13] N. Adel, "The impact of digital literacy and technology adoption on financial inclusion in Africa, Asia, and Latin America," *Heliyon*, vol. 10, no. 24, 2024.

[14] T. Neise, M. T. Sambodo, and J. Revilla Diez, "Are micro-, small-and medium-sized enterprises willing to contribute to collective flood risk reduction? Scenario-based field experiments from Jakarta and Semarang, Indonesia," *Organ. Environ.*, vol. 34, no. 2, pp. 219–242, 2021.

[15] U. N. ESCAP, "Micro, small and medium-sized enterprises' access to finance in Bangladesh," 2021.

[16] A. Bec, C. McLennan, and B. D. Moyle, "Community resilience to long-term tourism decline and rejuvenation: A literature review and conceptual model," *Curr. Issues Tour.*, vol. 19, no. 5, pp. 431–457, 2016.

[17] F. Trapsilawati, Subagyo, D. A. Firmansyah, N. A. Masruroh, I. G. B. B. Dharma, and B. S. Wibowo, "Concurrent product-process-supply chain strategy formulation for small medium enterprises," *Concurr. Eng.*, vol. 30, no. 4, pp. 411–423, 2022.

[18] B. Phadermrod, R. M. Crowder, and G. B. Wills, "Importance-performance analysis based SWOT analysis," *Int. J. Inf. Manage.*, vol. 44, pp. 194–203, 2019.

[19] H. Canton, "Asian Development Bank—ADB," in *The Europa Directory of International Organizations 2021*, Routledge, 2021, pp. 444–448.

[20] S. F. IRENE, "A study on the integration of social protection and disaster management in Indonesia," 2022.

[21] D. P. Aldrich and M. A. Meyer, "Social capital and community resilience," *Am. Behav. Sci.*, vol. 59, no. 2, pp. 254–269, 2015.

[22] H. Canton, "United nations development programme—UNDP," in *The Europa Directory of International Organizations 2021*, Routledge, 2021, pp. 179–184.

[23] M. Asfarina, A. Ascarya, and I. S. Beik, "Classical and contemporary fiqh approaches to re-estimating the zakat potential in Indonesia," *J. Islam. Monet. Econ. Financ.*, vol. 5, no. 2, pp. 387–418, 2019.

[24] S. Kedia *et al.*, "Greening Post COVID-19 Economic Recovery in India," 2020.

[25] A. Verma, K. C. Das, and P. Misra, "Digital finance and MSME performance in India: evidence from World Bank Enterprise Survey data," *J. Econ. Stud.*, 2024.

[26] D. Aassouli and H. Ahmed, "Supporting SMEs financial resilience during crises: A framework to evaluate the effectiveness of financial literacy programs targeting SMEs," *Malaysian J. Econ. Stud.*, vol. 60, no. 1, pp. 105–121, 2023.

[27] S. M. Mouzam, "UNESCAP and UNCTAD, Asia-Pacific Trade and Investment Report 2019: Navigating Non-tariff Measures (NTMs) Towards Sustainable Development, United Nations Economic and Social Commission for Asia and the Pacific and United Nations Conference on Trade and Dev." SAGE Publications Sage India: New Delhi, India, 2020.

[28] R. Rupeika-Apoga and K. Petrovska, "Barriers to sustainable digital transformation in micro-, small-, and medium-sized enterprises," *Sustainability*, vol. 14, no. 20, p. 13558, 2022.

[29] M. Murray and P. K. Watson, "Adoption of natural disaster preparedness and risk reduction measures by business organisations in Small Island Developing States-A Caribbean case study,"

Int. J. Disaster Risk Reduct., vol. 39, p. 101115, 2019.

[30] S. Supari and H. Anton, “The impact of the national economic recovery program and digitalization on MSME resilience during the COVID-19 pandemic: a case study of bank rakyat indonesia,” *Economies*, vol. 10, no. 7, p. 160, 2022.

[31] A. Kumar, G. S. Bapat, K. Tiwari, T. Hashem, and A. D. Rroy, “How Mobile E-Commerce is Revolutionizing Marketing Strategies for Indian MSMEs.,” *Int. J. Interact. Mob. Technol.*, vol. 19, no. 14, 2025.

[32] UNDP, “UNITED NATIONS DEVELOPMENT PROGRAMME Development Never Stops,” 2021.

[33] M. Cosa, “Can MSMEs Foster Inclusive Growth? Evidence From Poverty and Inequality Dynamics in Latin America and the Caribbean,” *Corp. Soc. Responsib. Environ. Manag.*, vol. 32, no. 6, pp. 8225–8241, 2025.

[34] A. Atkinson, “Financial education for MSMEs and potential entrepreneurs,” 2017.

[35] OECD, *Small, Medium, Strong TRENDS IN SME PERFORMANCE AND BUSINESS CONDITIONS*. 2017.

[36] UNDRR, “United Nations Office United Nations Office for Disaster Risk Reduction 2019 Annual Report,” 2019.

[37] I. P. on C. C. (IPCC), *Climate Change 2021 – The Physical Science Basis: Working Group I Contribution to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge: Cambridge University Press, 2023. doi: DOI: 10.1017/9781009157896.

[38] World Bank, “Analysis Note Micro , Small and Medium Enterprises - Economic Indicators,” no. December, pp. 1–26, 2019.

[39] UNCTAD, “Reducing Inequality,” 2021.

[40] ADB, “ADB Asia Small and Medium-Sized Enterprise Monitor Volume 1: Country and Regional Reviews,” 2020.

[41] T. T. H. Tambunan, “The Potential Role of MSMEs in Achieving SDGs in Indonesia,” in *Role of Micro, Small and Medium Enterprises in Achieving SDGs: Perspectives from Emerging Economies*, Springer, 2023, pp. 39–72.

[42] K. UKM, “Laporan Kementerian UKM RI,” 2025.

[43] H. Bouwman, S. Nikou, and M. de Reuver, “Digitalization, business models, and SMEs: How do business model innovation practices improve performance of digitalizing SMEs?,” *Telecomm. Policy*, vol. 43, no. 9, p. 101828, 2019, doi: <https://doi.org/10.1016/j.telpol.2019.101828>.

[44] E. Yanuarni, M. Iqbal, E. S. Astuti, M. K. Mawardi, and R. Alfisyahr, “Determinants of business recovery: The role of government support as moderator (a study on tourism SMEs affected by Lombok earthquake, Indonesia),” *Hum. Syst. Manag.*, vol. 43, no. 1, pp. 79–97, 2024.

[45] A. L. I. SAJJAD, “SMEs CAPABILITIES & PERFORMANCE: THE MODERATING ROLE OF ENVIRONMENTAL TURBULENCE,” 2023.

[46] D. Heller, P. Karapanagiotis, and O. A. Nilsen, “Small and vulnerable during crises? Firm size and financing constraint dynamics.,” *Small Bus. Econ.*, vol. 65, no. 1, pp. 451–473, 2025.

[47] N. Hidayat, “Islamic Religiosity and Tax morale: The Case of Self-employed Taxpayers in Indonesia,” 2022.

[48] UNDP, “Human Development Report 2020: The Next Frontier Human Development and the Anthropocene,” *UNDP New York, NY, USA*, pp. 1–7, 2020.

[49] OECD, “SMEs Going Digital : Policy challenges and recommendations,” pp. 1–37, 2021.