

Legal Frameworks and the Efficacy of a Sustainable Livelihood Program for Victims of Mount Merapi Eruption

Heribertus Jaka Triyana¹, Putri Widhyastiti Prasetyo²

^{1, 2} Faculty of Law Universitas Gadjah Mada, Sleman, Indonesia

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Author E-mail

¹ Correspondence:

jaka.triyana@mail.ugm.ac.id

²

putriwidhiastutiprasetyo@mail.ugm.ac.id

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Abstract

Subsequent to the significant volcanic catastrophe of Mount Merapi eruption in 2010 in Yogyakarta, the Indonesian government, with assistance from non-governmental organizations, commercial organizations, and international benefactors, initiated sustainable livelihood programs for the affected survivors. This study evaluates the effectiveness of a collaborative approach within the sustainable livelihoods program by analyzing key initiatives and interviewing critical stakeholders and communities, focusing on its impact on the resilience of victims' livelihoods following the Mount Merapi eruption in 2010. In this regard, this study aims to cross-examine the legal frameworks, achievements, community actual activities, efforts, and multiplier effects of the livelihood resilience in Cangkringan Subdistrict in order to give feedback in the future as one of the crucial elements of community capacity to mitigate upcoming eruptions as their own culture of adaptation. The social-legal study was conducted through legal analysis of legal instruments on disaster management and primary data collected from the field, such as interviews from farmers, pen breeders, and horticulture respondents, as well as from resource persons such as local authorities and representatives of the Merapi Resilience Consortium and International Organization for Migration, which were involved after the eruption between 2010-2015. Essential components of effective coordination and the allocation of resources among stakeholders and local authorities have proven instrumental in fostering livelihood resilience, despite persistent challenges such as limited access to training, networking opportunities, and essential assets.

1. INTRODUCTION

Mount Merapi, one of the active volcanoes located on the border between Central Java province and the Special Region of Yogyakarta, Indonesia, is generally known as the best lesson learned on how to cope with eruptions in Indonesia since it has a regular eruption pattern every 2-5 years.¹ In September 2024, the Yogyakarta Geological Disaster Technology

¹ Kurniati, et al, "Mineralogical Properties of Pyroclastic Materials from Mount Merapi, Indonesia," *Bio Web Conference* 99 (2024):1-2.

Research and Development Center reported that Mount Merapi erupted again with lethal hazard materials to communities and alerted local authorities.² This event underscores the ongoing volcanic activity and potential hazards faced by nearby communities in five respective villages, i.e., Kepuharjo, Umbulharjo, Wukirsari, Argo Mulyo, and Glagaharjo. The Mount Merapi eruption had long-term effects on livelihoods, agriculture, and local economies in the affected areas as lesson learned and particular cultural coping strategy.³ In 2011, as a baseline of this study, Theresia revealed that during the 2010 Mount Merapi eruption, heavy damage was inflicted on public infrastructure as well as private properties such as houses, bridges, roads, and schools in Yogyakarta and Central Java provinces disrupting livelihood aspects of the communities.⁴

There have been many programs and studies on sustainable livelihood communities since the Mount Merapi eruption in 2010, such as that conducted by the United Nations Joint Programme (UNJP).⁵ The UNJP program was managed by the New Zealand Government (NZ-Aid) and channeled by the Indonesia Multi-Donor Fund Facility for Disaster Recovery (IMDFF-DR).⁶ The Merapi Volcanic Eruption Livelihoods Recovery Programme was conducted in two phases; for phase 1, it was implemented jointly by the United Nations Development Programme (UNDP), Food and Agriculture Organization (FAO), and International Organization for Migration (IOM), while for phase 2, only UNDP and FAO were involved until 2015.⁷ The UNJP program had spent USD 1,533,512 in total for both phases. In this

² Tempo.Co, "Indonesia's Mount Merapi Volcano Spewed Hot Clouds Twice in 24 Hours, (2024)." <https://en.tempo.co/read/1917606/indonesias-mount-merapi-volcano-spewed-hot-clouds-twice-in-24-hours>.

³ Yuka Kaneko, et al, *Recovery of Disaster Victims: Results of Joint Survey in East Japan, Aceh, Sichuan, and Tacloban*. (Berlin: Springer, 2023)., 5-6.

⁴ Theresia Tuti Andayani, "Dana Sumbangan Masyarakat Untuk Pembangunan Ekonomi Pasca Bencana Merapi," *Jurnal Dialog Penanggulangan Bencana* 2, no. 1 (2011): 41-42.

⁵ See M.W.W. Krisanti et al, "Community-Based land use models for sustainable livelihoods in Merapi Volcano disaster prone areas III in Sleman Regency," *IOP Conference Series: Earth and Environmental Science* (2024): 1-10; Yosi S. Mutiarni et al, "The Resilient Community: Strengthening People-Centered Disaster Risk Reduction in the Merapi Volcano Community, Java, Indonesia," *Sustainability* 14, no. 4 (2022): 1-28; Nugroho Hari Purnomo, "Sustainable Livelihood Strategies After Merapi Volcanic Eruption: Aspects of Sustainable Rural Development," *International Conference on Sustainable Rural Development (2013)*; and Zuhud Rozaki et al, "Exploring Agricultural Resilience in Volcano-Prone Regions: A Case Study from Mount Merapi, Indonesia," *Journal of Sustainable Agriculture* 38, no. 2 (2023): 284-296.

⁶ Kementerian Perencanaan Pembangunan Nasional/Badan Perencanaan Pembangunan Nasional (Bappenas), "Mewujudkan Ketahanan Penanggulangan Bencana melalui Peran Indonesia Multi Donor Fund Facility for Disaster Recovery," www.bappenas.go.id/index.php/berita/mewujudkan-ketahanan-penanggulangan-bencana-melalui-peran-indonesia-multi-donor-fund-facility-for-disaster-recovery.

⁷ Food and Agriculture Organization in Indonesia, "Merapi Villagers Embrace New Life After the Eruption," (2016). www.fao.org/indonesia/programmes-and-projects/success-stories/merapi/en/.

regard, UNJP, under communication and procedure of the UN Resident Coordinator (UNRC), underwent a 28 (twenty-eight) months program to support actions of the Government of Indonesia's Rehabilitation and Reconstruction Action Plans or *Rencana Aksi* (RENAKSI) in two regencies, i.e., Sleman Regency, Special Province of Yogyakarta and Magelang Regency, Central Java Province.⁸ It was revealed that between 2010 and 2015, a sustainable livelihood program, a capacity-building program aiming to improve socio-economic conditions in the aftermath of a disaster, was successfully implemented at the community level, and it also increased social adaptability and acceptability from the affected communities.⁹

At the strategic level, the UNJP program resulted in the government initiating the production of at least 10 regulations to support disaster management or initiatives regarding programs, actions, institutionalization, and funds. Meanwhile, at the lowest level, especially in Cangkringan Subdistrict, Sleman Regency, Special Region of Yogyakarta, there is a significant improvement in the opportunity for beneficiaries to improve their livelihood skills in the areas as described by the map below.¹⁰ Their active participation in the program has increased their capacity in disaster risk reduction (DRR) issues, such as management of funding issues, which are one of the barriers to equitable disaster recovery, as revealed by Ferreira, Davidson, and others.¹¹ Before UNJP, the percentage of respondents from livelihood recovery outputs who said they had difficulties coping with disaster risk was seventy-eight percent (78%), and after the program, the percentage decreased to fifteen percent (15%). The serial interventions were conducted, such as disseminating DRR, community-based DRR, and system information development at the village level.¹²

⁸ Md Ohidur Zaman and Mohammad Mojammel Hussain Raihan, "Community Resilience to Natural Disaster: A Systematic Review of Contemporary Method and Theories," *Natural Hazard Research* 3, no. 3 (2023): 584-586.

⁹ Fiona Nunan et al, *The Routledge Handbook on Livelihood in the Global South* (Routledge: Taylor and Francis, 2023), 194-196.

¹⁰ Badan Pusat Statistik Kabupaten Sleman, "Kecamatan Cangkringan Dalam Angka 2024", (2024).
<https://slemankab.bps.go.id/id/publication/2024/09/26/af7cae87b4e78cdb6c0f0622/kecamatan-cangkringan-dalam-angka-2024.html>

¹¹ Regard Ferreira, et al, "Barriers to Equitable Disaster Recovery: A Scoping Literature Review," *International Journal on Disaster Risk Reduction* 110 (2024): 1-2.

¹² United Nations Development Group and International Organization for Migration, "Indonesia Multi-Donor Fund Facility for Disaster and Recovery," https://mptf.undp.org/sites/default/files/documents/20000/imdff-dr_merapi_final_report_2012-2013-iom.pdf, 10-11.

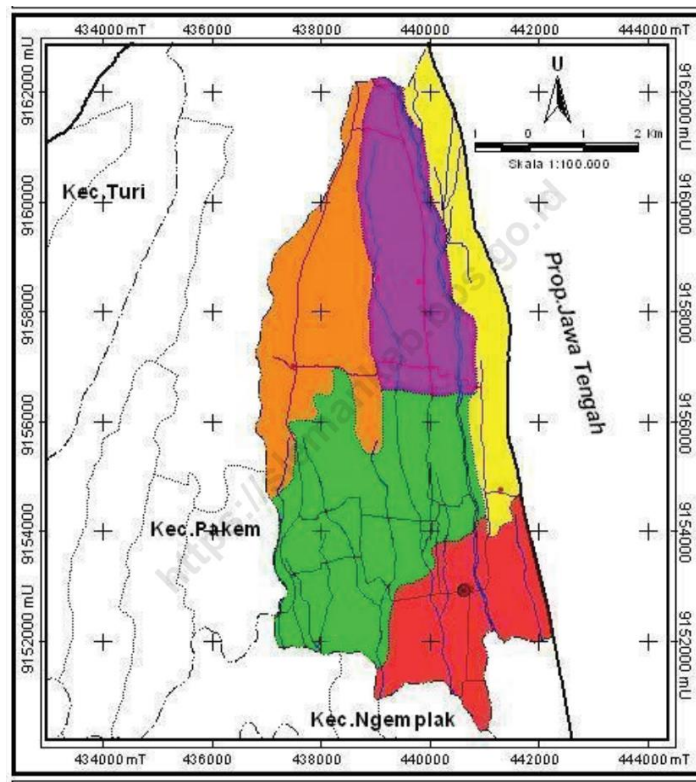


Figure 1. Administrative Map of Cangkringan Subdistrict¹³

In line with the aforementioned program, this study aims to cross-examine achievements, community actual activities, efforts, and multiplier effects of the livelihood resilience in Cangkringan Subdistrict in order to give feedback in the future as one of the crucial elements of community capacity to mitigate upcoming eruptions as their own culture of adaptation.¹⁴ Although several similar studies discuss the sustainable livelihood programs following the 2010 Mount Merapi eruption, previous studies have predominantly focused on qualitative analysis, providing limited quantitative insights, making it challenging to assess the significance of the findings more comprehensively.¹⁵ Moreover, previous studies have not addressed aspects related to government policies and support, as well as their long-term impacts on the affected community.¹⁶ The use of limited samples in previous studies fails to adequately represent the experiences and strategies of all individuals affected in the areas surrounding Mount Merapi.

¹³ Badan Pusat Statistik Kabupaten Sleman, *loc.cit.*

¹⁴ Wikan Amirudin Fahmi and Dyah Rahmawati Hozbaron, "Evaluasi Kapasitas Masyarakat Tangguh Bencana di Kawasan Rawan Erupsi Merapi," *Jurnal Teknosains* 13, no. 1 (2023): 65.

¹⁵ Krisanti et al, *loc.cit.*; Rozaki et al, *loc.cit.*; and Lia Kusumaningrum, et al, "Local Wisdom of Merapi Slope Village in Ensuring the AvailabilUmbulity and Sustainability of Springs in Glagaharjo Village Cangkringan District of Sleman Yogyakarta," *Journal of Global Environmental Science* 2, no. 3 (2021): 32-37.

¹⁶ Purnomo, *loc.cit.*; and Mutiarni et al, *loc.cit.*

Additionally, no recent studies have examined and discussed the impacts of the UNJP program on livelihood resilience affected by the 2010 Mount Merapi eruption.

This study focuses on the achievements of sustainable livelihood in Cangkringan Subdistrict after the recovery phases and its achievements in the latter stages and their long-term period. In doing so, this study uses the evaluation criteria: relevance, efficiency (with special consideration to timeliness), effectiveness, sustainability, and impact for farmers, pen breeders, and horticulture groups impacted by the eruption in those five villages. Hence, this study examines (1) the legal framework and approaches to sustainable livelihood and (2) the evaluation of sustainable livelihood and community resilience programs in Cangkringan Subdistrict.

This study is socio-legal research since it analyzes the implementation of binding legal instruments on disaster management law, particularly Indonesian Law No. 24 of 2007 on Disaster Management (Law 24/2007). Furthermore, this study was conducted to gain primary data from informants in Cangkringan Subdistrict, i.e., local authorities (Head of Cangkringan Subdistrict and Coordinator of Micro Economic Empowerment of Cangkringan Subdistrict); Head of Wukirsari, Glagaharjo, Argomulyo, Kepuharjo, and Umbulharjo Villages; representatives of Non-Governmental Organizations (NGOs) (Jaga Warga, Merapi Watch, and Satu Nama); representatives of Merapi Resilience Consortium and IOM who are residing in Sleman Regency and Yogyakarta City; and representatives of breeders, pen farmers, and horticulture in those five respective villages. These instruments aimed to discover their knowledge of livelihood resilience programs and actions, their mitigation of potential risks, and their resources to comply with directives, incentives, and specific affirmations on the production and distribution of their products and harvests in the present time. Furthermore, it is important to gain background information on the areas under study, and such data can be elicited from secondary sources based on surveys and reports from the UNJP, IOM, and FAO reports in 2016; Cangkringan Subdistrict Annual Report and also reports from Sleman Regency Bureau Statistic Reports, plans, journalistic articles, newspaper, and research papers to confirm notions of resilience, adaptation, and mitigation.¹⁷

2. RESULT AND ANALYSIS

2.1. Legal Frameworks and Approaches in Sustainable Livelihood

Sustainable livelihood resilience means gaining a continuous living, highlighting working elements of economic modalities and how persons or

¹⁷ Anil Kumar Gupta, et al, *Disaster Risk and Management Under Climate Change* (Berlin: Springer, 2024), 3-4.

groups of individuals connect for their means of life in normal or emergency situations.¹⁸ Livelihood resilience is proven when it results in proper and prompt responses to daily life activities due to changes, irregularities, and/or disruptive factors impacting personal, group, and communities in short, medium, and extended periods.¹⁹ Hence, livelihood resilience has become an emerging approach used by donors and global agencies to help communities dealing with the aftermath of natural disasters since 2005. Assessing local communities in Cangkringan Subdistrict is relevant to see whether they have developed coping mechanisms revealing their sustainable livelihood in rural areas where this mechanism succeeded in relation to the 2015 Nepal earthquake.²⁰

This study uses the Sustainable Livelihood Framework the Department for International Development (DFID) provided in 1999. It is accepted as a simple approach or mechanism for developing the institutionalization of projects and for attainable delivering policies, programs, and actions on livelihood resilience in post-disaster situations.²¹ It then offers prospective, relevant, and equal schemes for intervention modes to the affected communities who always face complex problems and challenges due to disasters. In particular, the framework helps shape objectively verified indicators of whom, what, how, when, and where intervention modes are properly deployed to attain objects and purposes of creating a livelihood resilience community. Using the framework, this study captures changes that occurred before and after the intervention through specific policies, programs, and actions between 2010 and 2016 and when they are dealing right now (2017-present) in the five villages in Cangkringan Subdistrict accordingly. Related to the implementation, efficiency, and effectiveness indicators empower local governments to initiate and sustain, for example, multiple plans of action delivered to the affected communities for their progressive, locally attainable, and contextual approaches, maximizing all available resources and minimizing negative stereotypes and exiting inequalities of the affected community. The said programs help lay down a foundation based on local initiatives, programs, and actions on disaster

¹⁸ Lufeyo Chitondo, et al, "Disaster Management and Mitigation Strategies in Zambia: A Systematic Review," *World Journal of Advanced Research and Review* 21, no. 3 (2024): 2406-2407.

¹⁹ Nithya Natarajan, et al, "A Sustainable Framework for the 21st Century," *World Development* 155 (2022): 2-3.

²⁰ Jeevan Karki, et al, "From Goods to Goats: Examining Post-Disaster Livelihood Recovery in the Aftermath of the Nepal Earthquake 2015," *Natural Hazard* 114, no. 3 (2022): 3788-3789.

²¹ Swedish International Development Cooperation Agency, "The Sustainable Livelihood Approach to Poverty Eradication, An Introduction," <https://commdev.org/wp-content/uploads/pdf/publications/The-Sustainable-Livelihood-Approach-to-Poverty-Reduction-SIDA.pdf>, 5-7.

management in the future for resilient livelihoods in the areas per their localities and modalities.²²

Through this framework, the Pentagon of assets provides the core of the Sustainable Livelihoods Framework in its vulnerable and prone contexts relevant to the 2010 Merapi eruption, where volunteers were actively engaged with the affected communities in Central Java and Yogyakarta Provinces.²³ The Pentagon has been developed to ensure that information on human modalities can be easily obtained visually and accurately count the number of victims, damages, and losses as the foremost intervention baseline. In essence, all five lines shall be articulated simultaneously, while the outer perimeter shows a maximum opportunity to gain other benefits available in a post-disaster event. A mixed understanding may also be drawn to describe affected victims and groups of individuals. The Pentagon helped to see the implementation of RENAKSI at the field level and how it was translated by the local authority at the provincial and district level into regulation, and actions were conducted in line with this framework in Cangkringan Subdistrict.

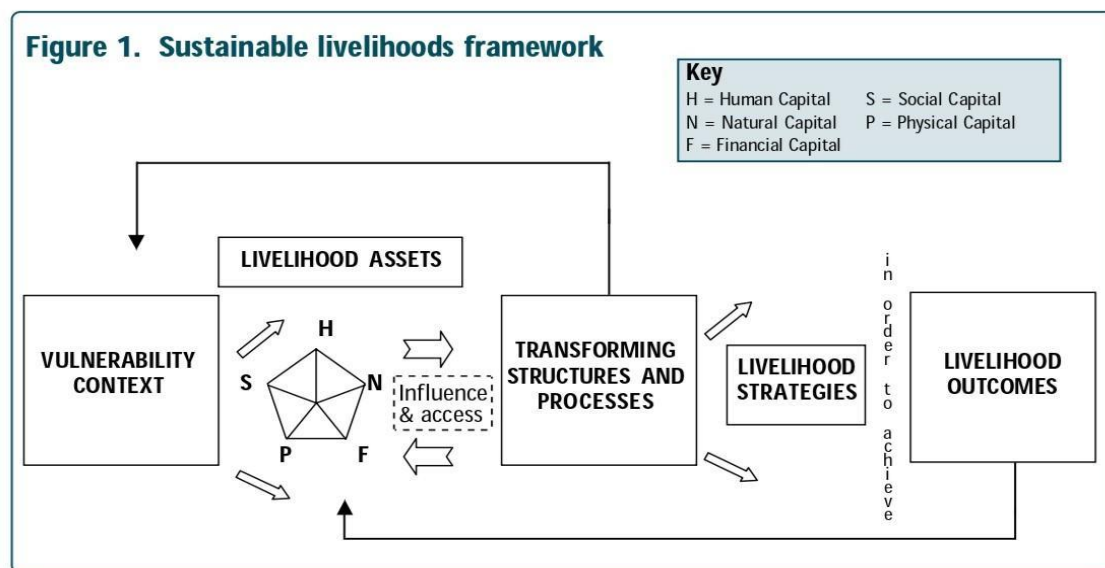


Figure 2. Sustainable Livelihoods Framework ²⁴

²² Ardianto Budi Rahmawan, et al, “A Comparative Study of Earthquake Disaster Management Laws Between USA and Indonesia,” *Jamba-Journal of Disaster Risk Study* 16, no. 1 (2024): 1-3.

²³ Hilda Maulida, “The Implementation of Disaster Management and Legal Protection for Disaster Relief Volunteers (Case of Central Java Province),” *Journal of Law and Legal Reform* 1, no. 3 (2020): 416-418.

²⁴ Department for International Development, “Sustainable Livelihoods Guidance Sheet,” <https://www2.cruzeroja.es/documents/114097690/114438878/Sustainable+livelihoods+guidance+sheets.pdf/594e5ea6-99a9-2a4e-f288-cbb4ae4bea8b?t=1569512091877>, 3.

Reorganization and reformulation of livelihood resilience systems and operations play crucial roles in post-disaster recovery for the affected community and their future adaptation.²⁵ This observation is particularly relevant for Indonesia, a country often regarded as a comprehensive disaster laboratory due to its exposure to various natural hazards, including droughts, floods, tsunamis, earthquakes, and volcanic eruptions. In the aftermath of these events, communities are often left with shattered infrastructure, disrupted economies, and uncertain futures.²⁶ Rebuilding sustainable livelihoods is essential to restoring communities' resilience and enabling them to thrive in the face of future challenges. Article 1 (12) of Law 24/2007 defines reconstruction as “the rebuilding of all infrastructure and facilities, institutions in a post-disaster area, both at the government and community levels with the main targets of growth and development of economic, social and cultural activities, the upholding of law and order, and the revival of community participation in all aspects of social life in the area post-disaster”. Sustainable livelihood resilience is a key target for ensuring the long-term well-being of communities in Cangkringan Subdistrict in this study for the upcoming eruptions.²⁷

Sustainable livelihood refers to the capacity of individuals or communities to meet their basic needs in a sustainable manner, which aligns with the principles of human rights. The Constitution of the Republic of Indonesia mandates that every person has the right to life and to sustain their life and existence as stipulated in Article 28A, as well as the right to develop oneself through fulfilling basic needs as stated in Article 28C. This is further reinforced in Article 9 of Law No. 39 of 1999 concerning Human Rights. In this regard, the state is obligated to guarantee its citizens the right to a decent life through sustainable livelihoods, including in the context of disasters. Sustainable livelihood is also in line with several SDGs, namely: (1) no poverty; (2) decent work and economic growth; (3) reduce inequalities; (4) sustainable cities and communities; and (5) climate action. In this case, Indonesia also strives to realize these global goals through Presidential Regulation No. 111 of 2022 concerning the Implementation of Achieving Sustainable Development Goals as stated in Article 2(2).

²⁵ Patrick Daly, et al, “Rethinking Relief Reconstruction and Development: Evaluating the Effectiveness and Sustainability of Post Disaster Livelihood Aids,” *International Journal of Disaster Risk Reduction* 49 (2020): 3-4.

²⁶ Leideke Verburg, “Donor or Partnership, Does the Concept of a Real Partnership Represent the Relief and Rehabilitation Operations during Post Natural Disaster Situation, Case Studies: Aceh Tsunami 2004 and Yogyakarta Earthquake 2006” (Thesis, Faculty of Arts Rijkuniversiteit Groningen, 2007), 11-12.

²⁷ Chatarina Muryani, “Community Based Disaster Management in Indonesia,” *Seminar Nasional Manajemen Bencana PSB, SHEs: Conference Series* 3, no. 1 (2022): 38-39.

Law 24/2007 provides a clear basis for implementing livelihood programs as part of post-disaster reconstruction for communities affected by natural disasters, especially in Articles 57–59. Furthermore, several legal instruments in Indonesia regulate disaster management, such as Government Regulation No. 22 of 2008 on Disaster Relief Funding and Management. Then, there is also the Minister of Domestic Affairs Regulation No. 46 of 2008 on Guidelines for the Organization and Work Procedures of the Regional Disaster Management Agency containing guidelines and work procedures for Regional Disaster Management Agencies or Badan Penanggulangan Bencana Daerah (BPBDs). Since 2008, BPBDs have also established numerous legal instruments related to disaster management, starting from BNPB Regulation No. 1 of 2008 on the Organization and Work Procedures of BNPB, and in 2024, there is the Decree of the Head of BNPB No. 308 of 2024 on Disaster Management Clusters. In the Special Region of Yogyakarta, there is also Local Regulation of Special Region of Yogyakarta No. 8 of 2010 jo. No. 13 of 2015 on Disaster Management, Governor Regulation of the Special Region of Yogyakarta No. 12 of 2016 on Guidelines for Disaster Emergency Response Command System in the Special Region of Yogyakarta, Governor Regulation of the Special Region of Yogyakarta No. 39 of 2020 on Regional Disaster Management Plan Year 2018-2022, Governor Regulation of the Special Region of Yogyakarta No. 65 of 2023 on Regional Disaster Management Plan Year 2023-2027, and Governor Regulation of the Special Region of Yogyakarta No. 8 of 2024 Guidance and Supervision Plan of the Implementation of Minimum Service Standards for Regency or City Regional Disaster Sub Affairs in 2024-2027. All of them emphasize the relevance of the meaningful participation of the affected community in initiating and implementing livelihood policies, programs, and actions for disaster recovery.²⁸

In addition to national laws as outlined above, there are many international norms that address the issue of livelihood recovery, such as international human rights law, i.e., the International Covenant on Economic, Social and Cultural Rights 1966 (ICESCR), the United Nations General Assembly Resolution 46/182 of 1991, the Guidelines for the Domestic Facilitation and Regulation of International Disaster Relief and Initial Recovery Assistance (IDRL Guidelines), and others. As a state party to the ICESCR that has ratified it in Law No. 11 of 2005, Indonesia certainly has an obligation to implement the provisions contained in the convention, particularly the fulfillment of economic rights for its citizens. Furthermore, as a member state of the United Nations, Indonesia also must implement the provisions of the General Assembly Resolution 46/182 of 1991, which

²⁸ Heidi Tuhkanen, “Shifting Power Through Participation in Post Disaster Recovery: A Scoping Review,” *International Journal of Disaster Risk Reduction* 97 (2023): 5-6.

has established provisions for countries to provide humanitarian assistance and protect the victims of natural disasters and other emergencies occurring on its territory. They empower relevant authorities to support livelihood programs, particularly after disasters, highlighting trust and avoiding potential horizontal conflicts.²⁹ This study further examined the relevance of the existing national, regional, and village governance in implementing these provisions for the affected community affected by the Mount Merapi eruption. It also explores the purpose and long-term outcomes of resilience livelihood programs in the agriculture and livestock sectors, which are vital sources of domestic income.

Legal fiction theory presumes universal knowledge and understanding of the law.³⁰ In the context of livelihood programs, communities are assumed to be aware of relevant regulations and their rights. However, ensuring effective communication of this information and these rights to all segments of society remains challenging since there is still potential loss, casualty, and economic and institutional vulnerability.³¹ Therefore, this study further examines the community's understanding of livelihood programs and optimally participates in supporting these programs. It is essential for ensuring the long-term resilience of communities in disaster-prone areas. Implementing law can play a significant role in supporting livelihood recovery efforts, but it is also important to recognize that legal frameworks alone are not enough without paying attention to other factors such as social, economic, political, and cultural. Consequently, resilience livelihood recovery requires a coordinated and integrated approach that involves all stakeholders.³²

The 2010 eruption provides a valuable case study to better understand prominent challenges and opportunities for rebuilding livelihood resilience recovery in the areas. In the aftermath of the eruption, the affected communities had to resolve several imminent problems and challenges, including disruption of agricultural production and distribution and increased risk of future eruption. Several studies have evaluated the effectiveness of livelihood programs.³³ Through the use of this framework

²⁹ Dae Wong Lee and Da Sol Lee, "Government Disaster Relief Services and Disaster Conflict," *International Journal of Disaster and Risk Reduction* 106 (2024): 1-3.

³⁰ Fathul Hamdani, et al, "Fiksi Hukum: Idealita, Realita, dan Problematikanya di Masyarakat," *Primagraha Law Review* 1, no. 2 (2023): 72.

³¹ Erika Akemi Goto, et al, "Do the Type of Impact and Vulnerability Dimension Matter When Assessing Natural Hazards Vulnerability?," *International Journal of Disaster Risk Reduction* 98 (2023): 6-9.

³² Asian Development Bank, "Addressing Climate Change and Migration in Asia and the Pacific: Final Report," (2012). <https://www.adb.org/sites/default/files/publication/29662/addressing-climate-change-migration.pdf>, 57.

³³ Krisanti et al, *loc.cit.*; Rozaki et al, *loc.cit.*; Kusumaningrum et al, *loc.cit.*; Purnomo, *loc.cit.*; and Mutiarni et al, *loc.cit.*

and approach, the analysis does not limit itself to the micro level only but also supports systems that enable the farmers, breeders, and horticultures to sustain the interventions. Changes in mindset and acceptance of new intervention modes can be assessed through empirical research directed to the groups of farmers, pen breeders, and horticulture and local authorities. Thus, it answers whether they have improved access to information, a more consolidated and cohesive social interaction, more firming to domestic revenues, access to new infrastructure, and more equitable access to the competitive market of their products as genuine coping mechanisms of the Mount Merapi eruption.³⁴

2.2. Evaluation of Sustainable Livelihood in Cangkringan Subdistrict

Livelihood resilience refers to all capital assets as the basic standard of living for domestic revenue.³⁵ It utilizes human, natural, physical, social, and financial capital to adapt and accept new coping mechanisms to sustain new life in new conditions.³⁶ In crisis and post-crisis situations, such as what happens in the areas, capital assets were easily lost, hindering psychological pressures and often causing mental health problems. As a result, the community's capacity to preserve or recoup these capital assets determines the impact of a crisis on livelihood resilience recovery, creating a particular coping mechanism as the root of the particular culture in the affected community.³⁷ Communities returning from evacuation often face uncertainty and challenges in sustaining their livelihoods in disaster-prone areas, as happened after the Mount Merapi eruption.³⁸ Their dependence on donors and government aid during the emergency phase highlights the lack of pre-disaster financial savings and attainable escape plans.³⁹ Recent research shows communities in disaster-prone areas around Mount Merapi have adapted land use practices, including changes in settlement patterns, land management, livestock types and management, agricultural practices, and disaster risk reduction activities due to economic and traditional beliefs of reasons.⁴⁰

The Merapi Volcanic Eruption Livelihoods Recovery Program was implemented from 2012 to 2014 and involved the Merapi Resilience

³⁴ Andayani, *loc.cit.*

³⁵ Nusrat Habib, et al, "The Influence and Impacts of Livelihood Capitals on Livelihood Diversification Strategies in Developing Countries: A Systematic Literature Review," *Environmental Science and Pollution Research* 30, no. 27 (2023): 69882-69883.

³⁶ Anne Tiernan, et al, "A Review of Themes in Disaster Resilience Literature and International Practice Since 2012," *Policy Design and Practice* 2, no. 1 (2019): 56-57.

³⁷ United Nations Development Programme, "Livelihoods and Economic Recovery in Crisis Situations," (2013). <https://www.local2030.org/library/116/Livelihoods-&-Economic-Recovery-in-Crisis-Situations.pdf>, 5; Ratarajan, et al, *op.cit.* 10-11.

³⁸ Mutiarni, et al, *loc.cit.*

³⁹ Purnomo, *loc.cit.*

⁴⁰ Krisanti, et al, *loc.cit.*

Consortium (MRC).⁴¹ Its members are respected people in Yogyakarta Province, offering influence of the program to the macro level based on principles of relevance, efficiency, sustainability, and impacts on the victims, creating socially enhanced attachment.⁴² Nevertheless, the consortium was vacated after the program closed due to time constraints for each member, which impacted ways of better livestock training.⁴³ Since then, the local government has been the only institution in supporting local community to manage their livestock production. Coordination between authorities and NGOs, such as IOM, has been able to replicate best practices of sustainable livelihood after disasters in other areas. For example, the Magelang Regency government has been committed to replicating the Village Information System for all disaster-prone villages developed in the Cangkringan Subdistrict, where data on groups and livelihood activities are available and accessible.⁴⁴

In carrying out activities related to introducing village disaster response teams, IOM has successfully taken the BNPB Regulation No. 1 of 2012 on Resilient Villages (BNPB Regulation 1/2012) as the essential foundation to deploy resilience livelihood recovery programs in the areas. As a reference, IOM established five (5) resilience villages in Cangkringan Subdistrict, where they are actively engaged at village levels until now.⁴⁵ However, resilience needs to be assessed in long-term intervention adopted by IOM due to particular situations in the areas.⁴⁶ Regarding implementation, efficiency and effectiveness require local governments to develop specific plans and actions tailored to local needs, unique circumstances, and the available resources and capacities of the affected communities in the region.⁴⁷ They undeniably fit the objectives and purposes of the livelihood resilience recovery program by the government.⁴⁸ The relevance of data resilience

⁴¹ Indonesia Multi-Donor Fund Facility, “MPTF Office End of Programme Narrative Report,” https://mptf.undp.org/sites/default/files/documents/20000/final_report_unjp_imddff-dr.pdf, 3.

⁴² M. Bobby Rahman, et al, “Community Resilience: Learning from Mt. Merapi Eruption in 2010,” *Procedia-Social and Behavioral Sciences* 227 (2016): 387-388.

⁴³ *Ibid.*

⁴⁴ Indonesia Multi-Donor Fund Facility, *loc.cit.*

⁴⁵ International Organization for Migration, “Sustainable Livelihood Program in Cangkringan Subdistrict,” Interview by Heribertus Jaka Triyana, July 18, 2024; Joko Sumarsono (Head of Cangkringan Subdistrict), “Sustainable Livelihood Program in Cangkringan Subdistrict,” Interview by Heribertus Jaka Triyana, August 16, 2024; Umi Khotimah (Coordinator of Micro Economic Empowerment of Cangkringan Subdistrict), “Sustainable Livelihood Program in Cangkringan Subdistrict,” Interview by Heribertus Jaka Triyana, August 17-18, 2024; Handung Tri Rahmawan (Head of Wukirsari Village), “Sustainable Livelihood Program in Cangkringan Subdistrict,” Interview by Heribertus Jaka Triyana, August 16, 17 and 18, 2024.

⁴⁶ Indonesia Multi-Donor Fund Facility, *op.cit.*, 16.

⁴⁷ Rahman et al, *op.cit.*, 389

⁴⁸ Kusumaningrum, *loc.cit.*

villages on the number of groups of farmers, pen breeders, microeconomic activities, and horticulture has increased in significant numbers in Cangkringan Subdistrict before and after an eruption, as described in Table 2 below:

Table 1. Livelihood Groups in Cangkringan Subdistrict

Groups	Before Eruption 2000-2010	After Eruption 2011-2016	After Eruption 2017-2024
Farmers	25	45	65
Pen Breeders	6	8	6
Micro Economic Groups	35	52	30
Horticulture	15	25	35
Total	81	130	136

Source: Field research conducted by Authors in 2024 in Cangkringan Subdistrict.

Table 2 reveals a dynamic shift in the composition of various groups following a volcanic eruption in Cangkringan Subdistrict. While the total population initially surged, it stabilized in the latter period. Farmers emerged as the most significant beneficiaries due to increased land availability and favourable conditions. Micro-economic groups also experienced growth, indicating a rise in economic activity in that region. In contrast, pen breeders faced challenges, possibly due to market fluctuations and post-eruption difficulties in their product distribution. Horticulture showed steady growth, potentially driven by increased demand and suitable conditions. The overall increase in population could be attributed to factors like immigration, changes in birth rates, and government support. However, a more comprehensive analysis requires additional data on demographics, economics, and social factors for mapping and intervening contingencies based on community participation at village levels, as revealed by Sari et al (2022).⁴⁹

Economic recovery activities for microeconomic activities began with a value chain analysis of market demand in 2011.⁵⁰ It also focused on the potential to raise household income, the number of micro and small enterprises in the value chain, the potential workforce, the potential relationship between the government and donors, and retailers or sellers based on the efficiency principle.⁵¹ Efficiency in terms of increasing local products has been initiated. In this regard, the production and distribution

⁴⁹ Kanthi Pamungkas Sari et al, "The Re-contingencies of Merapi Eruption Disaster in Implementation of Sister Village," *Journal of Community Services and Engagement* 2, no. 1 (2022): 30-31.

⁵⁰ Purnomo, *loc.cit.*

⁵¹ Rozaki, *loc.cit.*

of *salak* and its derivative products, *bakpia*, and traditional batik have been assessed by representatives from 25 respondents of the existing 136 groups.⁵² Based on the assessment, the following microeconomic activities were selected as the target of respondents.⁵³ Along with this creation, the market-selling net and cooperation with suppliers and groceries in Yogyakarta, Magelang, and Solo cities have been able to distribute their home industries of *salak* and *bakpia*.⁵⁴

The COVID-19 outbreak between 2019 and 2022 reduces supplies of these products, impacting their incomes since demands also drop.⁵⁵ Home industries began operating in 2023 within these microeconomic groups, generating revenue as Cangkringan Subdistrict emerged as a popular tourist destination, offering attractions such as lava tour adventures and Mount Merapi sightseeing activities.⁵⁶ Cattle livestock has also been distributed to other places as their domestic incomes are managed by a group of pen breeders in their new relocation sites in Gondang, Wukirsari, and Umbulharjo.⁵⁷ This commitment strengthened the progressive achievement of the program; despite the setback, many government officers who participated in the implementation have been replaced by other departments. IOM was only involved in the first phase, which was focused on two activities until 2016, making the Head of Cangkringan Subdistrict and Heads of Umbulharjo, Wukirsari, Kepuharjo, Glagaharjo, and Argomulyo Villages become the only authorities who support these activities.

The economic recovery program was first implemented by *Lembaga Pengembangan Teknologi Pedesaan* (LPTP), delivering three consecutive programs for training, assisting, and enlarging market access and network, working hand in hand with government representatives between 2013-2015.⁵⁸ The beneficiaries of these activities are those who own businesses. LPTP implemented measures to enhance business plans, improve product marketing capabilities, increase savings and financial investments, and optimize the production and distribution of goods and services. Additionally, efforts were made to refine human resource management and job descriptions within small-scale economic activities.⁵⁹ LPTP also engaged beneficiaries in applying for a home industry product license. Business

⁵² Field research conducted by Authors in July-August 2024 in Cangkringan Subdistrict.

⁵³ *Ibid.*

⁵⁴ *Ibid.*

⁵⁵ *Ibid.*

⁵⁶ *Ibid.*

⁵⁷ *Ibid.*

⁵⁸ Handung Tri Rahmawan (Head of Wukirsari Village), "Sustainable Livelihood Program in Cangkringan Subdistrict," Interview by Heribertus Jaka Triyana, August 16, 17 and 18, 2024.

⁵⁸ Rahman et al, *op.cit.*, 389.

⁵⁹ *Ibid.*

training performed by IOM was confirmed by 25 respondents in Kepuharjo, Umbulharjo, and Argomulyo between 2011-2016.⁶⁰ All respondents say that they participated in business development training held by IOM.⁶¹ The training topics covered a range of subjects, including business planning, group-based financial management, and production management.⁶² However, the topics of the training appeared to be less varied in Argomulyo and Wukirsari. While in Argomulyo the training topics were limited to business planning, group-based financial management, and production management, in Kepuharjo and Umbulharjo the training also included topics such as market identification and human resource management.⁶³ The aforementioned training was continued by local authorities from 2017 to 2019 but has been inactive since COVID-19 struck the areas.⁶⁴

In terms of respondents' perceptions toward the explicability of the training, five respondents in Argomulyo say that they could not fully understand what was presented in the training, although written materials were distributed to the training participants.⁶⁵ Business coaching and excursions were also held. To improve market access, Village Promotion Teams are established and serve as a connecting point between producers and end-users, such as between mushroom farmers and "Jejamuran," a restaurant specializing in mushrooms; between *bakpia* producers and "Bakpia Djogja," an outlet specializing in selling Yogyakarta's snack specialties; and between snack producers and street vendors in the community and porridge outlets in Kuningan.⁶⁶ Most of the respondents perceive that the Village Promotion Team should be maintained to promote the village's main product.⁶⁷ While some groups of small businesses experience improvement, some other groups have not had similar benefits. Their production depends heavily on orders, and they do not make products without any conviction that their product will be absorbed well by the market, primarily due to the scarcity and the high price of the ingredients needed, such as catfish, purple sweet potatoes, saplings, fertilizer, and fuel for distributing their products.⁶⁸

⁶⁰ *Ibid.*

⁶¹ *Ibid.*

⁶² Umi Khotimah (Coordinator of Micro Economic Empowerment of Cangkringan Subdistrict), "Sustainable Livelihood Program in Cangkringan Subdistrict," Interview by Heribertus Jaka Triyana, August 17-18, 2024.

⁶² Rahman et al, *op.cit.*, 387.

⁶³ *Ibid.*

⁶⁴ Field research conducted by Authors in July-August 2024 in Cangkringan Subdistrict.

⁶⁵ *Ibid.*

⁶⁶ *Ibid.*

⁶⁷ *Ibid.*

⁶⁸ *Ibid.*

During the discussion amongst beneficiaries' groups, *salak* association, and livestock groups, there is an opportunity to connect the groups to create mutual benefits among them and with potential retailers in Yogyakarta, Solo, and Semarang.⁶⁹ Internal challenges faced by the livestock groups in Kuwang, Argomulyo Village show a need for regular checks from veterinarians. At the same time, they have to manage composting houses to produce organic fertilizer, making very intensive management and operation where they lack this ability.⁷⁰ Unfortunately, both groups never realized about this potency and the opportunity delivered by the local government of Cangkringan Subdistrict to provide management of training and regular visits of veterinarians. In the end, it is believed that identifying linkages between output and its target beneficiaries would increase the achievement of outcomes and strengthen sustainability for their fruit and livestock production. Effective communal pens provide space for the community to organize and share information. On the other hand, the *salak* association, Prima Sembada, for example, has been the umbrella for its 30 *salak* farmers groups in over 10 villages across Pakembinangun, Tempel, and Turi Subdistrict. These conditions should be utilized to build community resilience and system information.⁷¹

A village information system is needed by the community and local government, as is practiced in the Kepuharjo and Argomulyo villages.⁷² Regarding the findings in connectivity and lack of village staff capacity in operating computers, it is suggested that the infrastructure and capacity be assessed before implementing the intervention so that the program can set for preparation efforts to accommodate gaps in capacity and contextualize the intervention.⁷³ The response from the government at the district and provincial levels is considered the most progressive achievement of this program.⁷⁴ The formation of a multistakeholder forum to support the program's sustainability, namely MRC, was considered a correct intervention. The subsequent process, which still becomes homework,

⁶⁹ *Ibid.*

⁷⁰ *Ibid.*

⁷¹ Karen McNamara, et al, "The Role of a Woman's Collective in Rebuilding Livelihood After a Disaster: Case Study of Salam Village, Yogyakarta," in Riyanti Djalante, et al, *Disaster Risk Reduction in Indonesia: Progress, Challenges and Issues* (Berlin: Springer, 2017): 395-397.

⁷² Maulana Istu Pradika, et al, "Peran Pemuda dalam Pengurangan Risiko Bencana dan Implikasinya terhadap Ketahanan Wilayah Desa Kepuharjo, Kecamatan Cangkringan Kabupaten Sleman, Daerah Istimewa Yogyakarta," *Jurnal Ketahanan Nasional* 24, no. 2 (2018): 263-264.

⁷³ Widati, et al, "The Integration of Sister Village Function in Mount Merapi on Disaster Management During the Covid-19 Pandemic," *Jurnal Pemberdayaan Masyarakat dan Dakwah Pembangunan* 5, no. 2 (2021): 384-385.

⁷⁴ Joko Sumarsono (Head of Cangkringan Subdistrict), "Sustainable Livelihood Program in Cangkringan Subdistrict," Interview by Heribertus Jaka Triyana, August 16, 2024.

ensures the forum will bridge the micro and macro levels. At the same time, coordination among groups of stakeholders and local government initiatives needs to be scheduled with fixed thematic empowerment strategies for strengthening livelihood resilience.⁷⁵

Viewed from normative settings, the deployment of the programs empowers local authorities to construct their best efforts to manage disasters as part of their sustainable development program and action. They were deployed in accordance with genuine and meaningful community participation, which included the assessment of potential hazards and vulnerabilities, the establishment of community-based institutions, the formation of community-managed organizations, and participatory monitoring and evaluation as key vehicles for development.⁷⁶ In this regard, the cluster approach inspires beneficiaries to cope with their livelihood recovery by managing and improving cattle production, as experienced in Argomulyo and Kuwang villages, where pen breeders are located. Furthermore, the diversification of food products, particularly salak, served as an effective mechanism to better access potential markets. Ultimately, intervention strategies and local institutional frameworks were established as objective indicators of effectiveness and efficiency in fostering resilience and livelihood recovery in the affected areas.

In Yogyakarta Province itself, at least 10 initiations of local regulations have been imposed resulting from the previous program. The notion of “Merapi Mystery” becomes a new coping mechanism to avoid potential eruptions heading to the dense population of Yogyakarta residential areas.⁷⁷ The Government of Yogyakarta has initiated both norms and institutions to cope with this imminent threat by drafting the aforementioned local regulations and initiatives. At the same time, an upgraded disaster empowerment to microeconomic activities and risk mitigation.⁷⁸ From the programs, there are successful pilot projects in Cangkringan Subdistrict, specifically Glagaharjo Village, on how groups of communities, such as farmers, pen breeders, and horticulturists, manage themselves as active participants in a recovery program initiated by the local government.

The accessibility and the availability of correct information about areas, true and meaningful participation from the community of breeders,

⁷⁵ Field research conducted by Authors in July-August 2024 in Cangkringan Subdistrict.

⁷⁶ Rajib Shaw, “Disaster Recovery as a Development Vehicle”, in Rajib Shaw, Editor, *Disaster Recovery: Used or Misused Development Opportunity*, Springer (2014): 411-412.

⁷⁷ Fitria Yusrifa and Agus Danugroho, “Regional Resilience in Post Disaster Recovery Efforts of Merapi Eruption Based on Local Wisdom in Sleman Regency,” *Jurnal Sosiologi Dialektika* 17, no. 2 (2022): 160-161.

⁷⁸ Lusi Nuryanti, et al, “The Cultural-Based Model of Community Disaster Resilience in Merapi Communities in Indonesia,” in Andri N. R. Mardiah, et al, *Post Disaster Governance in Southeast Asia, Response, Recovery and Resilience Society* (Berlin: Springer, 2022): 226-227.

horticulture, and farmers, and distribution of equal benefits among stakeholders are indicators for prompt and adequate spatial planning for land and water consumption for fish farming in Cangkringan Subdistrict.⁷⁹ Following this method, local institutions based on villages and functional economic network groups of economic activities enhance local governments' roles as facilitators, enablers, and resource providers for improving the livelihood resilience recovery program.⁸⁰ In this framework of action, local government, especially the Cangkringan Subdistrict, has to provide technical assistance in a timely manner that is attainable in terms of achieving targeted objectives and purposes. Lastly, local governments should allocate certain funds as incentives to families and community groups for disaster risk reduction, preparedness, and responses. Collaboratively, in the programs' implementation, effectiveness and efficiency relate to initiatives of community mobilizing, organizing, and capacity building and information on risks, vulnerabilities, and preparedness actions in terms of capacity enhancement of community volunteers and groups, strengthening community coping mechanisms, and increasing community participation in the decision-making process of risk reduction and of increasing their capacities toward upcoming eruptions.

Institutionalization of new disaster management of village information systems, such as Village Information System or *Sistem Informasi Desa* (SID) and Local Financial Information System or *Sistem Informasi Keuangan Daerah* (SIKD) in Sleman Regency is an example of the effectiveness and efficiency of the commencement of the programs which system information technology help shape the most suitable options of recent coping mechanism.⁸¹ For example, Argomulyo village has successfully developed its own monitoring system, the GeoEye System, to monitor cold lava spills around Gendol and Opak rivers, causing floods and ruins.⁸² Furthermore, institutionalizing the village disaster task force with the coordinator of the heads of subdistricts in Sleman is one of the relevant examples of how locals

⁷⁹ Nurrohman Wijaya, et al, "Spatial Planning, Disaster Risk Reduction and Climate Change Adaptation in Indonesia: Progress, Challenges and Approach," in Riyanti Djalante, et al, *Disaster Risk Reduction in Indonesia: Progress, Challenges and Issues* (Berlin: Springer, 2017): 235-237.

⁸⁰ Joko Sumarsono (Head of Cangkringan Subdistrict), "Sustainable Livelihood Program in Cangkringan Subdistrict," Interview by Heribertus Jaka Triyana, August 16, 2024.

⁸¹ Beth M. Nolan and Hans Jochen Scholl, "A Commercial Cloud-Based Crisis Information Management System: How Fit and Robust Is It in Response to a Catastrophe?" in Hans Jochen Scholl, et al, *Disaster Management and Information Technology, Professional Response and Recovery Management in the Age of Disaster* (Berlin: Springer, 2023): 325-326.

⁸² Wisnu Adji Nugroho, "Evaluasi Tingkat Efektivitas Program Sistem Informasi Kebencanaan Desa Dalam Pengurangan Risiko Bencana Limpasan Banjir Lahar Berbasis Kesiapsiagaan Masyarakat: Desa Argomulyo, Kecamatan Cangkringan Sleman," (Master Thesis Geo Information, Faculty of Geography, Universitas Gadjah Mada, 2013): 1-5.

actively engage with particular directives from the authority.⁸³ Simplification of procedure and coordination among duty bearers such as local disaster management bodies (BNPB *Kabupaten* (BNPB at the regency level) and BNPB *Provinsi* (BNPB at province level)) with villages (community) to form a distinguishing mechanism for better management of the imminent threat of the “Merapi Mystery” in the future directed to those groups are a must and need to be disseminated regularly to mitigate imminent threat of future eruption.⁸⁴

Land plays a crucial role as a primary resource in sustaining human life. Lands in areas affected by the eruption of Mount Merapi generally exhibit high fertility levels. Local residents have taken advantage of this by cultivating various food products, both through agriculture and livestock farming. Data from the head of Cangkringan Subdistrict reveals diverse groups of farmers and herders in Cangkringan Subdistrict, particularly in Umbulharjo, Kepuharjo, Glagaharjo, and Wukirsari villages.⁸⁵ Based on the data, the number of agricultural and livestock farming groups established in these areas before and after the 2010 Mount Merapi eruption tends to be stagnant.⁸⁶ Four agricultural groups are known to have been established before the 2010 eruption and three after the eruption in Umbulharjo Village, with most of these groups cultivating chili, coffee, and rice.⁸⁷ In Kepuharjo Village, five agricultural groups are known to have been established after the 2010 eruption, all of which cultivate coffee plantations.⁸⁸ Furthermore, in Wukirsari Village, a total of 34 agricultural groups have been established, with 21 of these groups being established after the 2010 eruption.⁸⁹ Conversely, the data for Glagaharjo Village indicates a decline, with five agricultural groups known to have been established before the 2010 eruption, mostly cultivating coffee and perennial plants, and only two groups established after the eruption, cultivating fruits, vegetables, and perennial plants.⁹⁰ Regarding livestock farming groups, one group was established before the 2010 Mount Merapi eruption, and two groups were established afterward in Umbulharjo Village.⁹¹ In Kepuharjo Village, one livestock farming group existed before the eruption, and two were

⁸³ Lexi Jalu Aji, et al, “Pengurangan Risiko Bencana Berbasis Destana Di Desa Glagaharjo Dalam Mewujudkan Ketahanan Wilayah Kabupaten Sleman,” *Jurnal Manajemen Bencana* 8, no. 1 (2022): 104-105.

⁸⁴ Gunawan, “Kesiapsiagaan Masyarakat Dalam Penanggulangan Bencana: Kasus di Kecamatan Cangkringan, Kabupaten Sleman,” *Informasi* 9, no. 2 (2014): 100-102.

⁸⁵ Field research conducted by Authors in July-August 2024 in Cangkringan Subdistrict.

⁸⁶ *Ibid.*

⁸⁷ *Ibid.*

⁸⁸ *Ibid.*

⁸⁹ *Ibid.*

⁹⁰ *Ibid.*

⁹¹ *Ibid.*

established afterward.⁹² Conversely, Glagaharjo Village experienced an increase in the number of livestock farming groups, with three groups established before the 2010 eruption, one in 2010, and four after the eruption.⁹³ These groups are primarily engaged in dairy cattle farming.⁹⁴

As for the communal pen project, it must be acknowledged that, in general, the economic condition of the beneficiaries could be raised. However, there was also a fact showing that for some beneficiaries, the livestock distributed to them was not seen as a long-term asset to fulfill their household's needs. Due to their post-disaster situation, some beneficiaries were compelled to sell their livestock. Furthermore, there was also a significant economic impact derived from this project for their immediate needs. This initiative also matches the basic livestock farming skills held by the beneficiaries.⁹⁵ The establishment of facilities to utilize animal manure (composting house and biodigester in Kuwang) has to some extent reduced the household expenditure on cooking gas and fertilizer. The communal pens system has also contributed to social cohesion since this system encourages people to cooperate in managing their livestock.⁹⁶ The communal pen system is relevant and could reasonably respond to the community's needs in many aspects. First, providing livestock in Kuwang constitutes a proper response to the community's post-disaster (Merapi eruption) need to have assets to develop their livelihood. Most of the beneficiaries of this livestock provision program have already had adequate basic skills in livestock management.⁹⁷ This condition ensured that the initiatives would not be ignored due to the beneficiary's lack of capacity to look after the livestock, which should be taken into account for future imminent disasters.

Business and technical training organized by IOM was the implementation of the economic resilient activities, which are a requirement that a resilient village should fulfil according to the BNPB Regulation 1/2012. The "match-making" activities that tried to connect micro/small enterprises with buyers were particularly important in terms of market expansion.⁹⁸ However, this connection would mean a lot more if the production process of the micro or small was continuous. The problem is that for some microenterprises, continuous production seems to be less viable. Due to the price of some basic ingredients in the food industry (such

⁹² *Ibid.*

⁹³ *Ibid.*

⁹⁴ *Ibid.*

⁹⁵ *Ibid.*

⁹⁶ *Ibid.*

⁹⁷ *Ibid.*

⁹⁸ Gunawan, *loc.cit.*; Aji, et al, *loc.cit.*

as catfish and sweet potatoes), the production continuity of food requiring those ingredients would mostly depend on orders.

According to Articles 75 and 76 of Law 24/2007, the principle of capacity development requires that the implementation of disaster management should apply the autonomy of local communities based on their active, free, and meaningful participation in development and fair distribution of benefits.⁹⁹ Furthermore, all of these minimum standards uphold the communities' self-resilience and their self-independence on the management of their lives within the context of their availability, acceptability, accessibility, and adaptability to their living environment guaranteed by governments to cope with disaster resilience. This principle substantially requires community empowerment as one of the core or legal ethical principles under Article 3 of Law 24/2007. According to Article 3 (3) of Law 24/2007, the operational principles, such as the principles of justice, humanity, balance, and harmony, and the implementation principles, for example, the principles of the use of appropriate technology and science, have to be implemented in accordance with the condition, acceptability, and adaptability of the said beneficiaries as the main intervention logic in the programs commenced jointly by UNDP, IOM, and FAO. Management of livestock, reorganization of local potentials, simplification of procedures among duty bearers (local governmental agencies, i.e., head of subdistrict, BPBD, thematic agencies, such as Veterinary Agents, and university: Universitas Gadjah Mada (UGM)) are best practices of real capacity development in the programs.

Sustainable livelihood has been able to sustain community economic consumption and their daily adaptation into a more cohesive and supportive social cohesion in the aftermath of the 2010 Mount Merapi Eruption in Cangkringan Subdistrict. This ability to adapt, at least, poses a promising mechanism to mitigate future life disruption through their livelihood activities as part of their own culture. Key elements of meaningful coordination and the distribution of modalities among them and local authorities have proved this sustainable livelihood despite the fact that they are still facing common problems of limited access to training, networking, and assets. The selection of sustainable livelihood recovery as the focus of the program reconstruction was considered a proper choice since the Merapi eruption directly disrupted their source of income. Sustainable livelihood in the context of disasters refers to efforts to rebuild the lives of disaster-affected communities, not only in physical terms but also in economic and social terms. The goal is for communities not only to recover but also to become more resilient to future disasters. However, specific interventions should be aligned with a continuous time frame and provide 'quick win' to

⁹⁹ Rahman, et al, *loc.cit.*

affected communities, as proven in those five villages. The livelihood intervention at the community level did not solely focus on providing immediate economic empowerment for the beneficiaries. Instead, it also created opportunities for sustaining long-term outcomes. However, persistent challenges, such as access to fertilizers, quality saplings, and economic networking with suppliers, still need to be addressed and delivered promptly by the authorities.

3. CONCLUSION

Sustainable livelihood recovery in Cangkringan Subdistrict has effectively supported community economic consumption and social cohesion following the 2010 Mount Merapi eruption. Despite the existence of several regulations, the implementation of sustainable livelihood still faces various challenges. *Firstly*, while the legal framework provides a clear basis for recovery programs, many community members have not fully understood their rights and the resources available, indicating that implementing these regulations is not yet optimal. *Secondly*, the regulations may not be sufficient to guarantee protection for all disaster victims. There remain gaps in access to training, networks, and other essential resources, suggesting that the protections afforded by current regulations are inadequate. *Lastly*, there is an urgent need for lawmakers to consider amendments to specific provisions within these laws and regulations. Such changes could include an emphasis on more timely resource distribution and improved access to training and networks for affected communities. By involving communities in the policy-making process and listening to their needs, regulations can be made more responsive and effective in supporting sustainable livelihood recovery. Overall, the success of sustainable livelihood recovery heavily relies on effective implementation and regulatory adjustments to meet the real needs of post-disaster communities.

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