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Community Resilience After Disaster-Induced Relocation, The Case of Huntap Batur

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Abstract

This study discusses the correlation between post-relocation well-being of residents in Huntap Batur following the 2010 Merapi eruption. It also examines how communities can work together to strengthen their social well-being. The community has to have an occupation and positive perception, adjusted to the shift of settlement in a post-eruption environment. This research utilised a qualitative methods approach for data collection, combining questionnaires, interviews, and secondary data. Findings show that relocation shifted some residents' occupations from agriculture to tourism or informal sectors. Community collaboration proved crucial in fostering resilience and inclusive development. By contrast, weaker collaboration was associated with less favorable outcomes. This study aims to identify the challenges, adaptation strategies, and supporting factors for the resettled community, decade following the eruption. It will contribute to a deeper understanding of how community-based approaches to relocation support resilience and sustainable development in disaster-prone areas.

INTRODUCTION

A resilient community can be achieved through a prosperous livelihood, able to acquire enough wealth to sustain the life of the population. As a common practice, the community has to maintain employment, providing enough jobs for the people. To achieve this, the field architecture holds potential to connect the built environment with healing and well-being with focus beyond the physical structures but also inclusive to enhancing human well-being, especially in disaster-prone areas, healing environments, and user-centered spaces. The main aspect of resilient architecture is adaptive reuse of space, minimizing the required adjustment of the use of space and building (Mouhcine, 2025). Thus, the resilience community has to effectively use the available space, multiple stages of the disaster cycle.

The eruption of Mount Merapi in 2010 led the government to designate the surrounding slopes as disaster-prone areas (Kawasan Rawan Bencana), prompting local residents to relocate to safer zones. However, the resettlement areas provided by the government were too small to accommodate large populations in one location, making it difficult for residents to continue agricultural practices. In some cases, villagers had to travel back to their original farmland higher up the mountain to collect cattle feed, such as grass, which required considerable time and effort. This situation contributed to a decline in the community's socio-economic activities.

Since the shift of employment is still being discussed regarding the effects to the residents' well-being and their problems or challenges after the relocation process, some people in the same permanent housing areas have their own experience and takeaways in their process to achieve their own resilience. This is due to each individual possessing different financial ability, cultural attachment, and risk perception on volcanic activity of Mount Merapi. Nevertheless, a community-wide resettlement program was necessary to maintain inclusive aid among the affected population. As part of the resettlement program, the government established permanent housing known as *Hunian Tetap* (*Huntap*) across several hamlets. One such settlement, *Huntap* Batur, became home to displaced communities, who relocated together from three hamlets: Kopeng, Jambu, and Batur. Their neighborhood structure was maintained

from the original land so that families and neighbors could remain close to one another. This permanent housing also provided common facilities such as a mosque, kindergarten, community hall, and communal cattle shed. Alongside these spatial arrangements, many residents shifted their livelihoods from agriculture to tourism-related work. These changes in settlement patterns and occupations inevitably affect residents' well-being, sense of identity, and overall quality of life in the post-relocation context.

Tourist attractions around Mount Merapi had existed prior to the 2010 eruption, but they began to expand significantly in the aftermath of the disaster and subsequent relocation. In Kepuharjo Village, for example, sites such as Batu Alien and Kaliadem have gained prominence as symbols of community resilience. These tourism sites were developed in disaster-affected areas during the 2010 eruption. The original site was buried below the pyroclastic material; thus, several landscaping projects were conducted to resurface the rocks and a World War II bunker in Kaliadem. New livelihood opportunities emerged as the sites developed, as multiple families shifted from agricultural income basis to tourism sector, filling various different roles. By transforming disaster-affected landscapes into space of memory, economy, and healing, tourism has become a central means for residents to adapt, sustain their well-being, and reinforce their sense of identity. On the other hand, there are opportunities in the post-eruption land owned by residents, which according to regulations, cannot be used to build houses or other permanent structures, as the area is categorized as a hazard-prone zone. However, several households with seniors reinstated to remain in their owned land to continue their farming activities, despite being unable to perform it effectively due to the aging factor, which limits their mobility and physical activity. Contrary to the older generation, the young population are reluctant to continue working in the agricultural sector due to uncertainty of future prospects in the sector, thus possessing a higher willingness to embrace the newly developed tourism sector.

The disruption caused by Merapi's 2010 eruption expands beyond displacing communities but also reshaped their socio-economic trajectories and subjective well-being, a dimensional crucial to understanding long-term recovery (OECD, 2013). Given the magnitude of the shift, especially in community settlement, this research explores how residents of the Huntap settlements perceive their well-being after relocation. Previous researcher have highlighted the necessity to identify challenges in building community resilience on post-disaster environment (Fernandez & Ahmed, 2019). This study evaluates the community well-being, developed in the past decade following the 2010 Mount Merapi eruption. To achieve the objective, this research aims to: (1) identify the challenges and livelihoods changes among the communities on relocation and post-relocation phases; (2) examine community adaptation and build resilience, as well as its connection to perceptions of well-being; (3) Identify the supporting forms and condition to strengthen sustainability, well-being, and resilience in relocated community. This paper highlights on case studies from Huntap Batur, where former residents from various dusun (hamlets) currently settled. Using survey and interview data, the study investigates how different type of livelihoods, particularly those outside of agriculture and tourism, can cope with this transformation.

LITERATURE REVIEW

Merapi Eruption

Mount Merapi is a stratovolcano with an elevation of 2.980 meters above sea level, located at 7° 32.5' South Latitude and 110° 26.5' East Longitude. Administratively, Mount Merapi lies at the intersection of four regions, including Sleman Regency in the Special Region of Yogyakarta, and Magelang, Boyolali, and Klaten Regencies in Central Java Province. Due to its location, eruption of Mount Merapi has affected multiple regions, requiring inter-governmental collaboration between regions (Astari et al, 2025). Thus, to remain resilient, each region must have a proper management of their population and victims regarding resettlement, providing adequate housing for the victims to avoid overreliance on neighboring regions.

On 20th September 2010, the status of Merapi Mountain's activity was increased from 'Normal' (Level I) to 'Waspada' (Level II), and followed by 'Siaga (Level III)' status on 21st October 2010. Starting from 25th October 2010 at 06.00 am, the activity status of Merapi Mountain was raised again from 'Siaga (Level III)' into 'Awas (Level IV)'. Finally, on 28th October 2010, Merapi Mountain had its first eruption, which was followed by a series of eruptions until the beginning of November 2010 (Global Volcanism Program, 2010).

The volcanic hazards caused by the 2010 Merapi eruption include pyroclastic flows – locally known as *wedhus gembel* – and ash plumes during the main eruptive phase, followed by deadly lahars, which were triggered by heavy rainfall mobilizing volcanic deposits. These hazards caused extensive damage to infrastructure, agriculture, and housing, and caused secondary fatalities linked to the post-eruption lahars. Due to its severity, the cascading effect of the eruptions are loss of housing and income, potentially hampering future local economic development (Maharani et al, 2016). To evaluate the impact of the eruption, this study utilised damage and loss data assessed using DaLA Method (as of December 31, 2010) as the result of analysis by National Agency for Disaster Countermeasure

(BNPB), National Development Planning (Bappenas), and Yogyakarta Development Planning, as presented in Table 1.

Table 1. Recapitulation of damage and loss in D.I.Yogyakarta

Sector/Subsector	Damage (IDR)	Loss (IDR)	Total Damage + Loss (IDR)
Housing Sector	560,820.54	25,000.00	585,820.54
Infrastructure Sector	216,692.26	0.00	216,692.26
Productive Economy Sector	179,840.73	623,711.28	803,552.01
Social Sector	39,245.00	22,320.63	61,565.63
Cross-sectoral	0.00	473,807.15	473,807.15
Total	996,598.54	1,159,608.06	2,141,437.59

Source: Bappenas & BNPB, 2011

The government has its rehabilitation and reconstruction strategy for handling people's housing that affected by the Merapi eruption, divided into housing, public infrastructure, and social (including various components such as health, education, religion, social community, and culture). In housing strategy, there are two steps in here, including relocation for people who affected directly by Merapi eruption (short-term strategy) and relocation for people who lived in KRB (*Kawasan Rawan Bencana*; Disaster Risk Area) III as mid-term strategy (Bappenas & BNPB, 2011).

The total of housing that affected directly by the eruption is 2.856 units, because of the limited lands in real situation, the following action such as (a) Relocation following the designated locations or site by the government by compacting village or relocation to other villages, and (b) Relocation that happens to be self-relocation, either it is from collective initiation or individual (Bappenas & BNPB, 2011).

Post Disaster Resettlement

In previous findings in neighboring hamlets, the resettlement process has been conducted with significant results of positive perception among the population (Mei et al, 2016). This result reflects the understanding and necessities of resettlement. Leaving their previous settlement location. Safety of the location became the most highlighted factor of resettlement location, as people tend to avoid being affected in future eruptions. The relocated population are also expected to live and work within the safe area, instead of returning to the initial settlement location.

To accommodate the safety requirement, The National Agency for Disaster Countermeasure (BNPB) conducts a risk assessment with three hazardous zones around Mount Merapi: KRB I, KRB II, and KRB II, with KRB III being the area with the highest risk. According to the IMDFF-DR (2012) document, which aligns with government policy, people living in the vicinity of KRB III are required to relocate their homes to safer areas. This activity is expected to support the government of Indonesia's "zero growth policy" aimed at restricting the development of villages within the KRB III zone. Due to its alignment between the understanding of the affected population and government regulation, the resettlement commenced in 2011. However, residents face challenges in securing land that is safe enough to live on. In response, the government provided a solution by allowing the use of TKD land *(tanah kas desa,* or village-owned land). In Cangkringan District, 12 out of 15 *Huntaps* were built on TKD land (Maly et al., 2015), including *Huntap* Batur, which is the focus of this study. The relocation process continued for 3 years until 2014 (Singgih et al., 2019).

As the relocation proceeds, new challenges emerge among the resettled community. Certain hamlets did not follow the instructions to move into the *Huntap* at the same time, due to the misunderstanding in government policy related to land deeds. In these cases, the legality of the *Huntap* houses remained under government ownership, since the land was originally purchased by the government. However, residents were later allowed to obtain land deeds for their *Huntap* properties, following the reissuance of legal documents related to their previous land ownership. This process took a considerable amount of time, reducing the efficiency of resettlement. Moreover, conflicts between residents also occurred as the handover of landownership occurred gradually, developing tension as they wanted to secure their home and post-disaster employment in a short time (Depari and Kindell, 2023).

The residents began moving into the *Huntap* in 2012. With government support, each household was allocated 100 m^2 of land and received a development fund of 30 million rupiah to build or improve their homes. This amount of aid also includes the cost of construction of seismic-resistant houses with a standard size of 36 m^2 (Mei et al., 2015). A total of 206 houses were built in *Huntap* Batur (Maly et al., 2015). With the aforementioned disputes of landownership in the relocation process and the limited amount of land and funding allocated for each household, the well-being of the community became a concern in this study. Previous researchers have stated the positive impact of adequate well-being, results in a better resilience community (Blackman et al, 2023). Moreover, most settlers receive updates of volcanic activities from their community, raising the necessity to maintain the harmony in the

neighborhood and sense of security (Mei et al, 2013). Thus, it is necessary to identify the perception of resettled communities in their daily lives.

Community Well-Being

Community well-being is a multifaceted concept encompassing various dimensions of human life. According to Wiseman and Brasher (2008: 358), it can be defined as: 'The combination of social, economic, environmental, cultural, and political conditions identified by individuals and their communities as essential for them to flourish and fulfill their potential.' This definition highlights that well-being is not limited to individual satisfaction or health, but also includes broader communal and structural factors that enable collective flourishing. Atkinson et al. (2017) propose a three-tiered model to understand well-being across different levels: individual, community, and national. Individual well-being refers to both subjective feelings about one's life and the objective fulfillment of basic needs, such as health, income, and education, and is typically measured through indicators like life satisfaction, anxiety levels, employment status, and educational attainment. Community well-being extends beyond individual experiences and is shaped by shared social dynamics, institutions, and place-based factors; it is assessed through collective evaluations, community narratives, group data, public discussions, and local policy or cultural elements. At the national level, well-being reflects an aggregation of individual and community well-being, supplemented by broader indicators such as national surveys, statistical data, and international indices (Morshedi et al., 2024).

Importantly, community well-being is not just the sum of each individual's well-being. There is an extra dimension, often referred to as "collective flourishing", that emerges from the interactions, networks, and shared resources among community members (Atkinson et al., 2017). A resettlement case in Aceh shows the importance of collective contribution towards resilience community (Ab Samah et al., 2025). The existence of the community in Huntap Batur is expected to support their resilience in post-disaster environment.

There are several variables that outlines key dimensions for assessing quality of life across countries based on the OECD's How's Life well-being framework (OECD, 2013). Relevant domains include income and wealth, which relate to financial well-being and job security; housing, assessed through indicators such as the number of rooms per person and housing affordability; subjective well-being, reflected in measures of life satisfaction; social connection, captured through perceived social support; and education and skills, which focus on access to educational opportunities.

METHODS

This research was conducted in Huntap Batur, located on the southern slope of Mount Merapi in Kepuharjo Village, Cangkringan Subdistrict. Huntap Batur is one of the permanent housing sites developed after the 2010 eruption, accommodating residents originally from high-risk *dusun* (hamlets) in the KRB III zone, including Kopeng, Pagerjurang, Jambu, and Batur. Primary data collection combined field observations with structured and in-depth interviews. Field observations were carried out to contextualize housing conditions, mobility, and community routines. Structured interviews were conducted with 20 participants from different hamlets to capture diverse experiences related to livelihoods, housing, mobility, well-being, and access to public services. These interviews also referred to the OECD "How's Life" framework, which was used to guide both the interview process and the analysis.

An in-depth, semi-structured interview was conducted with the head of Dusun Batur, to understand broader processes of relocation, socio-economic transformation, tourism development, and perceived community resilience. Additional insights were drawn from relevant government reports, statistical documents, and academic literature related to post-disaster resettlement and rural livelihoods. Thematic analysis in this study was performed to analyze qualitative data from field observations and interviews. The analysis was structured around five main themes, including relocation process, economic activity, well-being, tourism, and aspirations and support. These themes were developed to highlight key patterns in the data, such as livelihood transition, adaptation challenges, and aspirations for community recovery. Table 2 shows the age distribution of respondents within Huntap Batur, including the hamlets of Batur, Kopeng, and Jambu.

Table 2. Respondent Demographic by Age and Hamlet

Age Group (Year)	Hamlet's Origin			Total All Hamlets
	Batur	Kopeng	Jambu	
20-30	1	-	1	1
31-40	2	2	1	5
41-50	3	2	3	8
51+	1	1	4	6

Source: Author, 2025

RESULTS AND DISCUSSION

This section presents the results of the fieldwork conducted in Huntap Batur, covering three hamlets: Batur, Jambu, and Kopeng. The findings are organized thematically and discussed in relation to each other, the theoretical framework by Norris et al. (2008), and relevant prior studies. Both observational and interview data are analyzed to understand the complex interplay between relocation, livelihood, well-being, tourism adaptation, and community aspirations.

Relocation Process: Patterns, Experiences, and Impact

This subsection describes the relocation timeline and the key factors influencing settlement decisions. The relocation process for Huntap Batur occurred in two phases. Phase one took place in 2012 and involved 206 units from three hamlets, Jambu, Batur, and Kopeng, with most households coming from Jambu. Phase two followed in 2020 and included an additional 47 units. Relocation patterns differed across hamlets: Batur and Kopeng relocated gradually, while Jambu moved collectively in a single wave. According to Nareswari and Fatchurrohmah (2025), these collective patterns were also found in their study, which describes how the entire *padukuhan* was relocated to a new site, referred to as *bedol desa*, denoting a full-scale community relocation.

Due to delayed funding from the Ministry of Public Works, residents began relocating through self-organized construction groups starting in 2012. The relocation site maintained similar spatial arrangements to the original settlement, preserving RT/RW (Neighborhood) groups and neighborhood proximity. These spatial arrangements are also supported by the findings of Nareswari and Fatchurrochmah (2025), stating the similarity of spatial layout of the government and the community organized *huntap* and the original hamlet. Similar patterns are also observed across other Merapi relocation sites, where settlement layouts were shaped by land contours, building density, and accessibility considerations (Naufal and Nareswari, 2025). In this arrangement, each house was placed according to its respective *dusun*, RW (*rukun warga*/community unit), and RT (*rukun tetangga*/neighborhood unit). However, limitations on available land required some residents from Pagerjurang to resettle in Jambu, which dictates relocation patterns and influenced the community's broader resilience strategies.

Among the 20 respondents from Batur, Kopeng, and Jambu, most were over 41 years old (14 respondents), while only one respondent was between 20 and 30. Older respondents relocated more slowly because their farmland was far from the new settlement, and strong emotional attachment to their original land further affected their mobility. According to Pak Kuwat, head of Dusun Batur, residents initiated construction using their limited resources while awaiting formal assistance from the Ministry of Public Works and Housing (PUPR), which arrived later.

Residents also maintained their physical and social organization by preserving their original RT/RW residents also maintained their physical and social organization by preserving their original RT/RW structure and rebuilding key communal facilities, including the mosque, communal hall, and shared cattle farm. This planning faced challenges, particularly the uneven pace of housing construction and issues related to land and legal status, with some households continuing to pay land taxes on both their old and new properties. These findings are supported by Maly et al. (2015), who reported that only 69% of households in the volcano-affected area of Sleman participated in the REKOMPAK (Community-Based Rehabilitation and Reconstruction Settlement Project) program. Similar issues were also identified by Nareswari and Fatchurrochmah (2025), who found that some residents experienced dual land ownership, as they retained rights to their original property while also receiving ownership of their *huntap* units.

Economic Activity After Relocation: Sectoral Shifts and Income Sources

The 2010 Merapi eruption caused a major economic shift in Huntap Batur. Before the disaster, most residents relied on agriculture, sand mining, and livestock raising, but limited agricultural space in the relocation site forced many to transition into tourism-related livelihoods. This shift in livelihood patterns is also discussed by Aji et al. (2021), who note that the Merapi eruption significantly affected the social and economic life of surrounding

communities. Before the eruption, residents depended on the fertile volcanic soils around Merapi, but the disaster resulted in the loss of livestock and extensive damage to agricultural resources, causing severe economic impacts. In Dusun Jambu, for example, the community initiated and now manages the Batu Alien tourist attraction as an alternative source of income. This shift illustrates the community's adaptive capacity as they reorganized their economic activities to sustain their livelihoods in the new environment.

The data shows the residents shifted to tourism-based livelihoods after the eruption, working as jeep drivers, souvenir sellers, food stall owners, and ticket booth operators, particularly around the Batu Alien attraction. Krisanti et al. (2024) also report that some residents converted portions of their land into tourist destinations or used it to cultivate animal feed crops. The development of new tourism attractions further stimulated related occupations, supporting residents' broader livelihood adaptation strategies. These data were summarized in Table 3, which links respondents' occupations with their income classifications. The classification consists of seven categories (A-G), covering residents who remained in their previous occupations, those who shifted to non-agricultural or formal work, and those who are unemployed. Income levels range from irregular or unstable earnings to more than three million rupiahs per month, as detailed in Table 3.

Table 3. Occupation Transition and Income Classification

Classification Code	Income Range	Total	Total
A agriculture → agriculture	Irregular	2	6
	< Rp 1.000.000	2	
	Rp 1.000.000 – Rp 2.000.000	1	
	Rp 2.000.000 – Rp 3.000.000	-	
	> Rp 3.000.000	1	
B agriculture → non-agriculture (tourism)	Irregular	-	1
	< Rp 1.000.000	-	
	Rp 1.000.000 – Rp 2.000.000	1	
	Rp 2.000.000 – Rp 3.000.000	-	
	> Rp 3.000.000	-	
C agriculture → non-agriculture (laborer)	Irregular	-	2
	< Rp 1.000.000	1	
	Rp 1.000.000 – Rp 2.000.000	1	
	Rp 2.000.000 – Rp 3.000.000	-	
	> Rp 3.000.000	-	
D informal/factory/mining → tourism	Irregular	1	5
	< Rp 1.000.000	1	
	Rp 1.000.000 – Rp 2.000.000	-	
	Rp 2.000.000 – Rp 3.000.000	2	
	> Rp 3.000.000	1	
E informal work → formal sector	Irregular	-	2
	< Rp 1.000.000	-	
	Rp 1.000.000 – Rp 2.000.000	1	
	Rp 2.000.000 – Rp 3.000.000	-	
	> Rp 3.000.000	1	
F unemployed → unemployed, dependent on family	Irregular	-	2
	< Rp 1.000.000	1	
	Rp 1.000.000 – Rp 2.000.000	1	
	Rp 2.000.000 – Rp 3.000.000	-	
	> Rp 3.000.000	-	
G same occupation	Irregular	1	2
	< Rp 1.000.000	-	
	Rp 1.000.000 – Rp 2.000.000	-	
	Rp 2.000.000 – Rp 3.000.000	-	
	> Rp 3.000.000	1	
	Total	20	20

Source: Author, 2025

A cross-table analysis shows that residents working in tourism-related occupations (Category B and D) reported more stable or improved incomes than those who remained in agriculture (Category A) or shifted to labor work (Category C). For instance, jeep drivers and store owners often benefit from profit-sharing arrangements or receive operational support from community cooperatives. In contrast, this transition also produced negative outcomes as agricultural workers continue to face low and unstable incomes, with many earning less than Rp 1.5 million per

month. Age and limited mobility became challenges to access their remaining farmland, located on uphill terrain. Thus, many rely on informal and irregular work such as caregiving, grass collection, and seasonal farming, and some depend on small gifts or wages from others, further weakening their economic resilience. These conditions reflect deficits in job quality and financial security, reinforcing existing inequalities.

In addition to economic changes, residents also face several structural challenges. Limited access to capital, skills training, and transportation. Although training in tourism management and small business development have been provided, public participation was lower than expected. A more inclusive institutional support was needed, a factor emphasized in both Norris et al.'s resilience framework and the OECD well-being dimensions.

In conclusion, the economic landscape of Huntap Batur reflects both emerging opportunities and persistent inequalities. Tourism has created new livelihood pathways, particularly for younger and more mobile residents, contributing to local revitalization and improved well-being. However, many others continue to rely on low-income and physically demanding work with limited prospects for upward mobility. Addressing this disparity requires sustained investment in capacity building, equitable access to resources, and institutional support mechanisms that strengthen long-term economic resilience.

Well-Being Perceptions and Their Connection to Adaptation Strategies

The perceived well-being in Huntap Batur shows significant variation based on residents' adaptive capacity after relocation. Table 4 indicates that tourism and formal-sector workers most commonly report improved well-being, while those in agriculture and manual labor more often experience stagnation or decline. These patterns demonstrate how occupational shifts, mobility, and resource access shape subjective well-being. Based on Samekto and Nuh (2017), it is stated that from the Merapi 2010 reconstruction illustrates that residents' satisfaction and well-being were closely related to social conditions and their ability to reorganize livelihoods in the new settlement.

Table 4. Distribution of Well-Being Levels by Occupation Category After Relocation

Occupation Category	Better	Same	Worse	Total
Agriculture	-	4	2	6
Tourism	3	2	-	5
Entrepreneur	2	-	1	3
Laborer	-	-	2	2
Formal Sector	1	1	-	2
Unemployed - Housewife	-	2	-	2
Total	6	9	5	20

Source: Author, 2025

Similar adaptation patterns have been identified in earlier research. Krisanti et al. (2024) note that residents in Disaster-Prone Area III transitioned from agriculture to tourism by converting land into tourist destinations. Comparable dynamics appear in Huntap Batur, where residents entering tourism roles such as jeep driving, ticketing, or stall operations report more stable income and stronger community belonging. Those who remained in agriculture or low-skilled labor continue to face limited earnings and mobility constraints, aligning with previous findings on vulnerability in relocation contexts.

a. Well-Being Perceived as "Better", Linked to Economic and Social Adaptation
   Residents reporting improved well-being typically diversified their livelihoods, entered tourism-related work, or opened home-based businesses. Access to capital, vehicles, and family support enabled mobility and stable income, contributing to higher satisfaction. This adaptation pattern is also observed in other Merapi relocation sites, where families gradually expanded or modified their permanent houses to improve comfort and maintain well-being among limited land and house size (Ramadhan and Adninda, 2022).
b. Well-Being Perceived as "Same", Modest Adjustments or Sector Continuity
   Those with unchanged well-being often continued in agriculture or small enterprises. Although income remained modest, stability was maintained through routine continuity, family proximity, and basic services. This pattern mirrors findings from Nareswari and Fachurrochmah (2025), who observed that relocated households maintained well-being partly by continuing agricultural routines and staying close to extended family networks. Older residents particularly expressed neutral perceptions due to reliance on family support.
c. Well-Being Perceived as "Worse", Limited Resources, Physical Labor, or Aging

Respondents reporting decline commonly faced unstable income, limited land access, or aging-related physical constraints. Their work, such as grass collection or part-time farming, was labor-intensive and low paid, contributing to dependency and low subjective well-being.

Using the OECD How's Life framework, these patterns reflect differences in income, mobility, social connections, and life satisfaction. Norris et al. (2008) provides additional insight by highlighting variations in adaptive capacity, social capital, and access to resources. Improved well-being corresponds to stronger resource access and community participation, while stagnation reflects routine-based stability, and decline indicates limited adaptive capacity. Similar patterns were noted by Mei et al. (2013), highlighting social cohesion and safety.

The results show the spatial arrangements are crucial to shape post-relocation well-being. Multiple residents were resettled near their original sites, their social connections remained intact, supporting both their adjustment process and their overall well-being. This suggests that future relocation strategies should, where possible, maintain proximity to existing social networks while ensuring physical safety. In addition, several residents successfully converted their original land into tourism-related activities, enhancing their adaptive capacity and improved their economic stability. Therefore, relocation should facilitate access to livelihood opportunities that align with local potential. However, elderly and low-income groups experienced greater difficulty due to limited mobility, resources, and physical capacity, thus vulnerable groups must be prioritized in the future. It should incorporate community participation in decisions related to safety, livelihood continuity, and social network preservation with adequate training and livelihood assistance for residents of different ages and occupations

Tourism as a Strategy for Community Resilience

The development of tourism in Huntap Batur has developed as a key resilience strategy, particularly for communities adapting to the post-relocation process after the Merapi eruption. Tourism-based economic activities offered new opportunities for income and community engagement. According to the head of Dusun Batur, many residents, especially from Dusun Jambu, shifted from agriculture, sand mining, or informal labor into tourism-related work such as jeep driving, food stalls, and ticketing at the Batu Alien site. Managed through a community-based profit-sharing model, this system not only provides stable income but also reinvests in local infrastructure, reinforcing both economic resources and community competence as key elements of resilience. Based on data from the Central Agency of Statistics of Sleman District, a comparison between pre-eruption in 2010 and latest update in 2024 tourism development, especially Kaliurang and Merapi Golf, there were increased in the total tourist visits, in total of 689.632 people. This data reflects and strengthens the hypothesis of strong post-eruption recovery and growth, especially in livelihood changes in the tourism sector.

One of the keys to the success of tourism in Huntap Batur lies in its alignment with traditional rhythms and social structures. In this case, many tourism workers follow shift schedules based on the Javanese *weton* calendar, such as Kliwon and Wage. This allows them to balance work with personal, religious, or familial activities, supporting their psychological and social resilience. Alongside this, the community has begun receiving institutional training, such as tour guide programs in 2025 and tourism management capacity-building in 2023, from the Sleman Tourism Office. While these efforts have strengthened local skills, residents still highlight the need for more targeted training in financial literacy, marketing, and digital tools.

Beyond its economic function, tourism in Batur has changed into a platform for collective recovery and long-term development. It maintains social cohesion, cultural preservation, and community interaction, that are critical components of adaptive capacity. Residents have also expressed interest in transforming into coffee-based agro-tourism, blending traditional farming with modern entrepreneurship. In this way, tourism supports both post-disaster survival and transformative resilience, aligning with the community-based model of Norris et al. (2008) and the multidimensional well-being indicators of the OECD framework.

Community Aspirations and Institutional Support Needs

Although the progress of development in Huntap Batur regarding income and occupational expansion has increased, the context of sustained well-being, inclusion, and resilience still needs to be carefully discussed and planned. This section will discuss community aspirations and institutional support needs so that the resilience framework within Norris et al. (2008) and the OECD well-being domains remain intact. Based on interviews of respondents from three different hamlets, they have a vision for the future that can diversify livelihoods, strengthen community cohesion, and improve infrastructure and services. They also mentioned the need to be expanding of agro-tourism, especially coffee-based tourism that can linked into local crops, increasing access to stable employment, establishing marketplaces and more permanent business stalls near tourist routes, and improving basic infrastructure (roads, water, and electricity), especially in upper areas of Dusun Jambu

These aspirations reflect not only economic needs (income, jobs), but also subjective well-being (sense of belonging, pride, autonomy), aligning closely with OECD's dimensions such as housing, civic engagement, and environmental quality. They also mentioned institutional support for tourism development in Huntap Batur, including training in coffee processing, hospitality, and agro-tourism, as well as financial guidance for community groups managing Batu Alien. However, residents have voiced concerns about the limited scope and continuity of this support, citing a lack of follow-up after training, uneven access to funding and promotion among the three hamlets, and unresolved land ownership issues that hinder housing investment. For instance, double taxation on both their original and relocated properties, creating ongoing financial strain. This highlights the need for consistent, equitable, and coordinated institutional involvement.

This case offers several key lessons, ranging from individual adaptation during relocation to the collective processes that enabled community resilience, as well as the ongoing challenges faced by residents. Although the relocation followed the Ministry of Public Works' policy framework, additional considerations, such as land taxation and other regulatory issues, remain essential for supporting long-term recovery. This finding aligns with Aji et al. (2021), who highlighted the adaptive strategies of farmers in the Merapi region, but this study contributes a different perspective by examining the shift from agriculture to tourism and its role in strengthening collective resilience.

CONCLUSION

This study concludes that the 2010 Merapi eruption and the resulting relocation process significantly altered many aspects of residents' lives, particularly their livelihoods and perceptions of well-being. The shift from agriculture-based occupation to tourism, formal, informal, or unemployed categories illustrates diverse post-relocation experiences. Residents who entered tourism-related sectors generally reported improved well-being "better", while those who remained in agriculture tended to perceive no significant change or "same", and others in labor-intensive or unemployed roles often reported a decline or "worse". These outcomes reflect the complexity of post-disaster recovery and the varying capacities of individuals to adapt.

The role of tourism, in particular, emerges as a catalyst for positive change, providing economic alternatives and enhancing perceptions of life satisfaction. However, these transformations also present challenges for residents lacking the skills, access, or support needed to transition effectively. According to the OECD's How's Life framework, the domains of income, employment, housing, and subjective well-being are deeply interconnected in shaping post-relocation outcomes. Likewise, Norris et al.'s resilience framework underscores the importance of adaptive capacity, social capital, and institutional support in fostering community resilience after disaster.

Moving forward, sustained community resilience in Huntap Batur depends on both internal strategies and external support. Institutions must prioritize inclusive policy-making that supports local livelihoods, provides capacity-building initiatives, improves infrastructure, and ensures residents are actively involved in new tourism-based developments. As private investment continues to grow in areas like Kaliurang, protecting local ownership and participation will be key to preventing socio-economic exclusion. The post-relocation process, therefore, is not only about physical movement or housing provision, but also about how settlement design can sustain community networks and long-term social well-being.

Limitations in this study was exclusivity to the resettlement area in Kepuharjo Village, which has Huntap Batur as the subject. While tourism activities and attractions within the settlement were discussed, the study did not extend to a detailed examination of settlement design or to broader tourism networks beyond Huntap Batur. Future research could integrate spatial and architectural perspectives, and further explore how resettlement areas connect with surrounding tourism development, to provide a more holistic understanding of resilience.

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