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Under the Volcano: Responses of a Community-Based Tourism Village to the 2010 Eruption of Mount Merapi, Indonesia

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Abstract: This paper assesses the responses of community-based tourism (CBT) and local governments to natural disasters. The tourism community in rural areas that are at high risk of natural disasters is largely overlooked in the literature on tourism and disaster management. It can be argued that CBT management is vulnerable to such natural disasters and, therefore, its presence should be considered in the recovery process. Time series observations and in-depth interviews were performed in Pentingsari village on the slopes of Mount Merapi, a stratovolcano in Yogyakarta, Indonesia. The findings show that the local government's preparation plans were focused only on disaster management, in general, and that it had only reactive programmes for tourism recovery. Moreover, CBT was able to respond and recover from the disaster by transforming the tourism destination with support from external agencies. In other words, it is concluded that transformation of the destination, organization, and human and community factors have taken place in the community-based tourism that leads to the post-disaster resilience.

Keywords: community-based tourism; resilience; recovery; transformation; eruption; disaster

1. Introduction

Many tourist destinations experience a wide range of stress factors, including natural disasters, simultaneously [1]. Natural disasters influence the willingness of tourists to visit an affected destination, because their perception of the destination as a non-safe area discourages them from travelling. Proactive planning within the tourism industry could minimize this negative impact [2–4]. For mature destinations with a stable market and decent management, such crises might be easier to handle. However, for small tourist destinations managed by the community in more 'communal' ways, the recovery from crises may have different dynamics and be more challenging.

For over three decades, community-based tourism (CBT) has been popularized as a way of development in the local community that offers the collaboration of the social, environmental, and economic dimensinos by providing a tourism product [5]. CBT is presented as an alternative to mainstream tourism, and it has such attractiveness that it has rarely been subjected to critical review. However, one point of attention is that many CBT destinations are located in areas that are at high risk of natural disasters, such as floodplains, coastal areas, and the slopes of volcanoes. The risk of a natural disaster may lead to the vulnerability of rural communities due to livelihood disruption, as has been shown for Thailand, where local communities have had difficulty recovering from the tsunami [6] and in Merapi, post-eruption [7]. Therefore, the process of recovery from natural disasters in CBT locations should be explored to help CBT communities in other areas to successfully design, manage, and demonstrate the potential of tourism as an alternative livelihood strategy following a disaster.

In the context of the resilience and post-disaster recovery of a tourism destination, there are some gaps in the literature that require further investigation. First, the discussion on CBT in dealing with

natural disasters is relatively new because more attention has been paid to private entrepreneurship in cities and government-based tourism management. Second, tourism recovery studies are more focused on marketing strategy recovery and getting tourists to come back, and there is only limited discussion of product and institutional coping strategies. This paper assesses the CBT responses to the recent (2010) eruption of Mount Merapi, focusing on Pentingsari, a village tourism community located on its slopes, and fills the gaps in the discussion on tourism and disaster management. Two questions are addressed in this paper: (i) How did the local government and community respond to the Merapi eruption in 2010 in the CBT village? (ii) How has the transformation taken place in the CBT village post-disaster?

The paper is structured as follows: The following section reviews the literature on CBT. Section 3 discusses the methods used to gather and analyses the data. Section 4 provides the context of the research setting of the Merapi eruption and its impact on the region's tourism. Section 5 explains the findings and analyses the government's and the community's responses. Section 6 discusses the implications of the findings for the academic debate about tourism and community resilience. Section 7 presents the conclusion and outlines some implications for future research.

2. Community-Based Tourism and Natural Disasters

The management of crises and disasters in general mostly comprises three stages: (1) planning and preparation actions before a disaster event; (2) response to or management of a disaster as it happens; and (3) recovery and resolution to a new or improved condition post-disaster [4]. This work focuses on the second and third steps, namely efforts by community organizations to rebuild tourism, including possible innovations.

2.1. The Characteristic of Community-Based Tourism Management

Community-based tourism (CBT) has been introduced in many countries to improve the living conditions of people by strengthening democratic processes at the local level and increasing the value of local leadership in developing tourism. In rural areas, CBT is a new way of creating economic opportunities for people to acquire benefits that are not related to farming. CBT differs from mainstream tourism in that it involves local people in the planning process and in benefiting from the tourism-taking place in their locality, the positive local cultures and uniqueness, and the conservation of community resources [8]. CBT essentially concerns involving the local community in planning and maintaining tourism development, in which the goal is sustainable tourism [9]. Thus, CBT is based on a fundamental concept of resident participation; for instance, residents become employees of a tourism enterprise, local entrepreneurs themselves, or tourist guides. Russel [10] pointed out that CBT fulfils three criteria: (1) local community support and participation; (2) people living at or near the destination benefit from the tourism activities; and (3) local people's cultural identity and natural environment are well-preserved during the tourism activity. The tourism literature mostly mentions that tourism would be more successful with the residents' participation [11].

Generally, literature on CBT can be categorized as either supportive or non-supportive. Scholars who support CBT mostly subscribe to the statement that CBT can lead to sustainability, generate social justice, empower the community, extend access for the community to control the political and economic process in their surroundings, and establish emancipatory communal responses to local issues [9,12]. Stone and Stone [13] stated that: "It would therefore be premature to say that CBT is not useful for rural communities and unfair to generalise that CBT projects are a failure".

The non-supportive literature, however, points to some of the concept's limitations and its failure to contribute to solving developmental problems. For example, Blackstock [11] stated that CBT is "naïve and unrealistic" because it focuses on industry development rather than community empowerment, and disregards the internal dynamic of community and neglects the external barriers. In addition, the disruption of local control and the relationship between developers and community members lead to inequality [11].

Both the supportive and the non-supportive literature on CBT pay little attention to resilience, particularly how the unique management of CBT is vulnerable to natural disasters and whether community management is resilient enough to handle the recovery. Indeed, studies on CBT have mostly been limited to the political, financial, and economic aspects of tourism [11–16] and rarely discussed the resilience of CBT to natural disasters. Kunjuraman, Hussin, and Yasir [17], however, did discuss the challenges faced by CBT. The authors divided them into two categories, namely, internal challenges—that is, a lack of financial and capital resources assistance, a lack of skills in, and knowledge, of management, and language barriers—and external challenges, such as a lack of a 24-h electricity supply and the absence of clean water. Although they discussed the challenges, they did not touch upon the dimension of challenge resulting from a natural disaster that can be predicted given the location.

In the wider context, the study of the relationship between tourism, in general, and natural disasters is quite new and somewhat overlooked [18–20]. Therefore, understanding CBT post-disaster needs to be linked with the tourism concept in general. CBT is a unique form of tourism industry, because it is usually located in rural areas, is managed by the community in 'communal' ways, and involves a small number of people. Studying CBT recovery post-disaster may improve the understanding of the extent to which CBT is resilient in dealing with natural disasters and tourism becomes part of the community's recovery strategy.

2.2. Recovery, Resilience, and Transformation Post-Disaster in CBT

Recovery after a catastrophe has been discussed in many dimensions, such as economic, transport, demographics, facilities, and infrastructure [21]. Although many researchers adopt the conventional definition of recovery as 'restore to pre-disaster', it should be stressed that this is not a static situation. Aldrich [22], for example, stated that recovery is "the process of repopulation by survivors, who may have fled or been evacuated, and new residents along with the gradual resumption of normal daily routines for those occupants", which is focused on population changes in the time series data. In this paper, recovery concerns not only the demographic, but also the economic transformation in relation to community-based tourism that has been disturbed by the event of an eruption. Moreover, the analysis of the recovery process has an intersection with the resilience concept. Both academia and practice have recognized the role of resilience in the recovery process. For example, the United Nations International Strategy for Disaster Reduction (2005) emphasized 'building resilience for nations and community to disaster' in the Hyogo Framework for action.

The term 'resilience' has been used in a variety of contexts and defined in different ways. Henstra et al. [23] define it as "the capacity to adapt to stress from hazards and the ability to recover quickly from their impacts". Resilience is also a method to handle uncertainty, because future changes can rarely be predicted and the vulnerability of a community system cannot be fully known in advance. Moreover, the United Nations International Strategy for Disaster Reduction [24] determines resilience as "The ability of a system, community or society exposed to hazards to resist, absorb, accommodate to and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions".

In the tourism field, however, resilience remains relatively unexplored. The tourism industry must adapt to the changes and have the flexibility to accommodate extreme conditions in order to recover quickly from unwelcome impacts. The adaptation and transformation process in response to changing environmental conditions requires initiatives by many tourism stakeholders with different roles in the tourism supply chain, and at many levels of government, to be able to mitigate, prepare, and manage resilience [25].

To understand the resilience of the tourism industry, one must understand the paradoxical principle that the planet's entire ecosystem, from a solo cell to a whole culture, undergoes constant change or transformation [26]. This view has been connected with 'sustainability' in the context of managing the process of transformation without diminishing sustainability. Holling [27] stated that

'sustainability' is "the capacity to create adaptive competence" and 'development' is "the process that creates opportunities'; 'sustainable development' is "the process that promotes adaptive competences while also creating opportunities" [27]. Resilience, therefore, becomes the key to achieving better performance without damaging sustainability. As put forward by Folke et al. [28], resilience offers an indicator of sustainability that can be applied to understand a socio-ecological system. Furthermore, sustainable development will only be achieved when the resilience is consistently performed [27]. Acknowledging that a CBT destination is managed by the community and depends on nature and culture, unlike a destination managed by the government or a large company, raises the question of whether CBT is resilient to natural disasters. Since the community manages the CBT, the dynamic of building resilience is an interesting topic. The success criteria for CBT can perhaps only be applied in a steady situation, which might not exist post-disaster. Therefore, a study on the dynamic of CBT in recovery from natural disaster is necessary. Smit and Wandel [29] mentioned that community resilience is reinforced by a community's adaptive capacities to reorganize themselves, thus, continually withstanding the impact of external forces. According to Norris et al. [30], in the aftershock of a disaster, communities have the ability to adapt efficiently to the new condition.

Recovery is often mentioned as the least discussed stage of the disaster life cycle [31]. The response to disasters is different in each society and community, and for each individual. In some cases, the window of opportunity created by a catastrophe could allow the tourism industry to transform itself and achieve better performance. The transformative capacity is the primary dimension of social resilience. It is the capacity to overcome and cope with immediate adversities (coping capacity), the capacity to learn from past experiences and adjust to the new threats in the future (adaptive capacity), and the capacity to innovate institutions that improve individual wellbeing and societal robustness both during the current crisis and future disaster possibility [32].

In relation to transformation post-disaster, Ritchie [4] categorized three post-disaster transformations in tourism, namely, organizational transformation, destination transformation, and human and community transformation. First, an organization can use a disaster as a tool for increasing its vitality and longevity, re-evaluating the relationship with other stakeholders and tourists, and possibly developing a new product, market, and programme, along with the organizational team spirit and cohesion in the organization [4]. Second, a disaster could also increase the awareness and cohesiveness within the tourism destination and between the tourism industry and emergency agencies. Disaster triggers changes in policy that have a positive impact on tourism and its value. Similarly, Faulkner [33] said that the infrastructure might be rebuilt and improved to integrate the mitigation and disaster planning considerations. Third, a disaster may provide the community with an opportunity to reflect on its past and to plan for its future. There is a chance to revitalize the destination through resilient community actions, for example, through innovation and adaptation to a changing market and leadership, which ensures that the destination will not perish due to permanent decline, but will reinvent itself.

In general, the literature reflects a consensus that tourism is vulnerable to specific shocks, but that some destinations could use a disaster as an opportunity to transform their products, markets, and institutions. A review of tourism recovery studies reveals some gaps that require further investigation. First, the way that CBT deals with a natural disaster is rarely discussed, because more attention is paid to private entrepreneurship in cities and government-based tourism management. Second, tourism recovery studies are more focused on marketing strategy recovery and strategies to get tourists to come back, than on product and institutional coping strategy. In this respect, the themes of analysis in this paper cover:

(1) Governmental and institutional responses to disaster and tourism in the case study area. This concept is analysed in the context of whether the policy and governmental response have met the need for disaster management in community-based tourism.

(2) CBT organization responses to the Merapi eruption. These responses are discussed in a separate section because the actors and the nature of management are different.

(3)　The post-disaster rural tourism destination transformation. This transformation is examined to find the relationship between the speeds of recovery, how it leads to community resilience, and the factors that influence the community resilience in CBT.

Table 1 shows the key areas of enquiry, the research themes, and the conceptual frameworks for each theme.

Table 1. Key areas of enquiry, research themes, and conceptual framework.

Key Areas of Enquiry	Research Themes	Conceptual Framework
Government and community organization responses to the natural disaster	Theme 1: Government responses to the Merapi volcano eruption Theme 2: CBT organization responses to the Merapi volcano eruption	Disaster management lifecycle → emergency, recovery, prevention (Faulkner, 2001) [33]
Transformation in CBT post-disaster	Theme 3: The post-disaster rural tourism destination	Tourism transformation (Ritchie, 2009) [4]

3. Methodology

This paper assesses the CBT responses to the recent (2010) eruption of Mount Merapi, focusing on Pentingsari, a village tourism community located on its slopes, and fills the gaps in the discussion on tourism and disaster management. Hystad and Keller [3] argued that the examination of disaster management should also focus on the government organization, such as tourism organization and disaster management organization. Therefore, interviews were conducted not only with the community impacted by the eruption, but also with the government officers concerned with tourism development and disaster management.

The data collection and analysis were conducted in the following order: desk research, observation and photography, and in-depth interviews. The fieldwork was undertaken in several phases, namely in July 2011, February–March 2015 and June–July 2016. Respondents were selected in the categories of community and local government (tourism board and disaster agency). A total of 33 respondents were interviewed; of them, 23 were Pentingsari villagers or government officials from the Sleman Tourism Board, Magelang and Yogyakarta Province, Agriculture Fishery and Forestry Board, or Regional Disaster Management Agency (RDMA). The author contacted and interviewed the chief of the tourism organization; through this stakeholder, the names of people who could be contacted for further interviews were acquired (snowball sampling). The author visited the village, acted as a visitor, joined the tourist package tours and had some short stays in the village to experience living in the research location. This participative research method allowed engagement with the community in their daily activities, as the respondents were more relaxed and better able to remember their tourism recovery strategy. Table 2 provides the coding of the respondents and the information gained from them.

The interviews, each of which lasted between one and two hours, were held in the village of Pentingsari. Moreover, some phone calls were made and some text messages exchanged to confirm or clarify parts of some of the initial interviews. Interviews were conducted in two languages, Javanese and Indonesian, which are the author's native languages. The interviews data were transcribed in paper and translated into English. The data were then manually grouped and subjected to thematic analysis in descriptive narrative texts using regular text processing software (MS Word).

Table 2. Research respondents.

Type of Stakeholder	Number of Interviews	Dimension of Questions
Government official: Sleman Tourism Board	2	Support and programme conducted for villages on the slopes of Merapi post-eruption 2010
Government official: Disaster Management Organization (BPBD) of Sleman Regency	2	Support and programme conducted for villages on the slopes of Merapi post-eruption 2010
Government official: Disaster Management Organization (BPBD) Province of Yogyakarta	2	Support and programme conducted for villages on the slopes of Merapi post-eruption 2010
Government official: Tourism Board of Yogyakarta Province	2	Support and programme conducted for villages on the slopes of Merapi post-eruption 2010
Government official: Agriculture Fishery and Forestry Board	1	Support and programme conducted for villages on the slopes of Merapi post-eruption 2010
Community Leader (Chief)	1	Disaster management strategy includes: preparation for disaster, situation in emergency, strategy for recovery post the eruption 2010
Tour guides	2	Strategy to get tourists to return to the village
Tourism organization leader (*Pokdarwis*)	1	Strategy to get tourists to return to the village includes product, market and institutions
Residents of tourism village	20	Their individual recovery strategy post-eruption in terms of livelihood diversification using tourism
Number of respondents	33	

4. Context: Pentingsari and the Merapi Eruption

Pentingsari is located in Umbulharjo sub-district, Cangkringan district, Sleman Regency, the Special Province of Yogyakarta. Figure 1 illustrates the location of Pentingsari. In 2016, the sub-district of Umbulharjo had 5163 residents, representing 15% of the total population of the district of Cangkringan. The majority of the Umbulharjo economy is centred on agricultural activities, which include the cultivation of food crops and horticulture, plantation, fishery, forestry, and livestock.

Pentingsari provides meals, homestays, campgrounds, and playgrounds. The main job of more than 10% of the population is in the tourism industry and their monthly salaries are the regional standard minimum. A further 30% work in tourism as a side job (their primary job is in agriculture), for example, helping to prepare events.

Pentingsari is located in 'Danger Zone 2' of Mount Merapi, meaning that it should be ready for evacuation if the volcanic activity increases. Merapi has several of the characteristics of the world's most dangerous volcanoes, and it has erupted more than 70 times since 1548 [34]. The Merapi eruptions occur every 4–6 years [35]. The Merapi valley is home to around 1.6 million people and 34 CBT village attractions. Land-use changes from agriculture to services and housing have been on the rise [36] and have consequently created a diversity of livelihoods.

The Merapi eruption in 2010 impacted tourism in Sleman Regency and the whole province, mainly because the transport flow was disrupted. The most imperative determinant was the closing of Adi Sutjipto airport in Yogyakarta for two weeks in response to the eruption. The ash could get into aeroplane engines and this led to major disruptions, such as the cancellation of 2467 flights [37]. The Merapi eruption had an impact on the number of domestic and foreign tourists visiting Sleman Regency. To illustrate, the Figure 2 displays a drop in the number of foreign tourists and domestic tourists of around 32% and 68.8%, respectively [38]. In monetary terms, the loss was reported as being about IDR 5.821 trillion (USD \$530 billion), of which 39% was related to settlements, 13% to water and irrigation, 43% to agriculture, and 12% to industry and small or medium-sized enterprises [39].

The eruption destroyed hundreds of hectares of farmland for horticultural activities, as well as government and private sector enterprises [40].
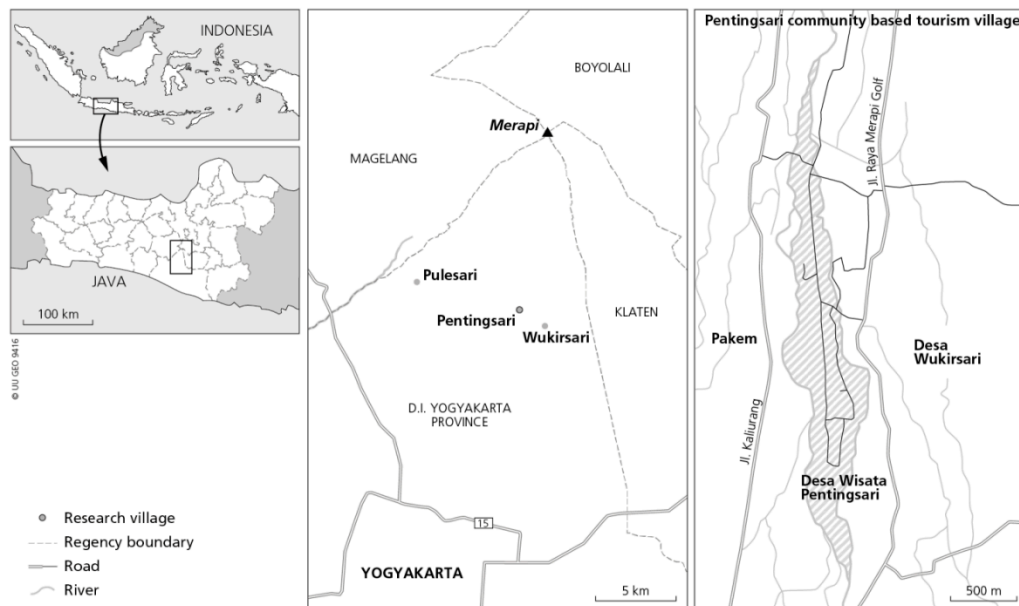

Figure 1. Location of Pentingsari. Source: Author's modification from Pentingsari Village Tourism Board, 2016 and documentation of Community Service Program, University of Gadjah Mada, Unit 114, 2009.
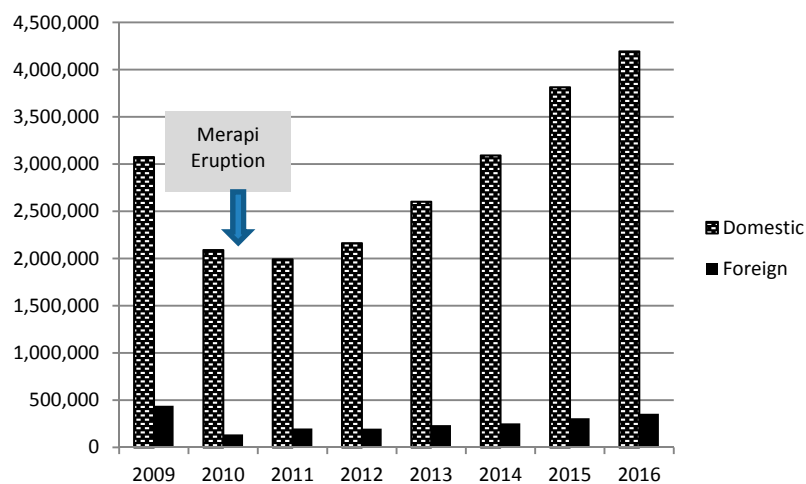

Figure 2. Number of domestic and foreign tourist visits to Sleman Regency. Adapted from Sleman Regency, 2009–2016 [39].

Although the eruption killed 350 people and injured 277, and led to the evacuation of a further 410,388 [41], no deaths in Pentingsari were reported. However, the total monetary loss in Pentingsari was reported to be IDR 406,660,000 (USD $30,000). One mosque was reported damaged and small cracks appeared in the walls of several buildings used for homestays, but nothing was seriously damaged or needed much renovation (Pentingsari community leader; Interview, 2015). Since the houses and the environment were covered with ash, it took a couple of weeks to get back to normal, except where tourism activities were concerned. The majority of the houses in Pentingsari are built of concrete and other strong materials that withstood the heavy ash. Houses built of bamboo and wood

did not survive the hot ash. Vegetation, including crops and the Salaka plantation, collapsed and died. Offices and schools were closed; students and employers were discouraged from going outside due to the hot ash. However, the level of destruction in Pentingsari was less than that in the villages higher up the slopes of the volcano.

These conditions, of course, disrupted tourism activities. The booking of homestays and packages declined dramatically. This forced the community to halt tourism activities for six months (Pentingsari community leader; Interview, 2015). The community had to find ways to obtain alternative incomes.

5. Finding and Analysis

5.1. Government Responses to the Eruption

Indonesian Disaster Risk Reduction Law Article 44/letter states that mitigation is to be undertaken to reduce the risk for people in disaster-prone areas. The Regional Disaster Management Organisation of Sleman Regency is responsible for routine monitoring and issuing alerts. The Centre of Volcanology and Geological Hazard Mitigation (CVGHM) constantly monitors Mount Merapi's volcanic activity. It has the responsibility to analyse the possibility of danger, inform the government, and broadcast the status to the public. CVGHM has full authority to judge the alert level as 'normally active', 'be on guard', 'be prepared', or 'be watchful'. CVGHM also issues a map showing danger zones that are derived from the volume of pyroclastic material.

The government's preparations for future eruptions can be categorized into zoning policy, early warning system, resettlement, and evacuation drilling. First, spatial arrangement by zoning policy is one of the local government's programmes in disaster risk reduction based on recommendations from the Centre of Volcanology and Geological Hazard Mitigation. The zoning policy results from the mitigation process that covers assessing the risks, mapping disaster-prone areas, developing the zoning and establishing disaster scenario simulations (RDMO, interview, 2015). There are five zones on the slopes of Merapi based on the disaster risk zones: (1) The Merapi National Park, which is designated as a protected area; (2) Directly exposed area: no settlement should occur here; (3) Disaster risk zone 3, which is high-risk exposure and development. This zone covers Merapi National Park with the concept of living in harmony with disaster/zero growth; (4) Disaster risk zone 2, which allows settlement under the tight control of the volcanology board; (5) Disaster risk zone 1, which is the area at high risk of a cold lava channel.

Second, the regional disaster management agency stated on its website that the disaster preparation plan and the early warning system had been established to respond to Merapi's volcanic activity. Preparations to ensure prompt and appropriate efforts in the event of a disaster had been made by preparing and testing the disaster emergency response plan; organizing, installing, and testing early warning systems; providing and preparing supplies to meet people's needs; establishing evacuation sites; providing accurate data and information, and updating the disaster response emergency procedures; and providing materials, goods, and equipment for the fulfilment of recovery of infrastructure and facilities. One of the RDMO officers stated: "The zoning policy is counted as the soft early warning system by the government because it contains zoning levels of vulnerability. It is hoped to remind the community about the limit of danger." (RDMO; interview, 2015). In addition, the government updates Merapi's status on its website every day. The information presented on the website is primarily the level of hazard or volcanic activity and the steps to be taken.

Third, the relocation programme was established as a consequence of the zoning policy. For the villages located in relatively safe areas, rather than relocation, disaster risk reduction, preparation, and recovery are conducted. Leaving the area became an option for more than 4000 people affected by the 2010 Merapi eruption. The local government of Sleman Regency encouraged people to leave the area by offering free permanent resettlement. The decision to move or stay put was voluntary, which means that no pressure was brought to bear by the government. The local government of Sleman claimed that there was enough space of sufficient quality and safety to permanently resettle the

400 families living in the disaster-prone area within 10 km of the summit. The government facilitated both the evacuation process and the relocation. Since the 2010 eruption, nine hamlets have been evacuated because of their extreme exposure to the hazard.

Finally, although the majority of the villagers know about the risk posed by Merapi, the government regularly disseminates information to remind the community about the risk and the actions to be taken in an emergency. As the disaster management board said: "Our community is very forgetful. They are mobile and often forget the right procedure. So we remind them again and again." (RDMO; interview, 2015).

Information about the volcano's activity is disseminated to convey and explain the situation and to maintain the readiness of both the residents and the relevant government agencies. Furthermore, the government established the Merapi Forum, an informal institution focused on the risk posed by Merapi. The Merapi Forum was established to disseminate information about the Merapi volcano and its activity level, and to act as a communication channel between residents and the government. The members of the forum are representative of the regencies of Klaten, Boyolali, Magelang, and Sleman, and the CVGHM. The government also reported that it had performed the compulsory training of disaster mitigation for the community (RDMO of Yogyakarta Province; interview, 2015). Compared to the recovery and responses following the 2006 eruption, the Yogyakarta government has shown better preparation, especially regarding the zoning policy and early warning system. Information is now disseminated via social media, radio, and siren. Some village-level meetings have also been held to keep in touch with those on the ground. As regards promoting entrepreneurship, the government shows its commitment to accommodating new entrepreneurs who want to access money to capitalize their businesses. Cash and grants have also been provided for those affected by the eruption.

Disaster management in tourism has recently been included in the tourism planning document, the Master Plan for Regional Tourism Development (Rencana Induk Pembangunan Kepariwisataan) 2015–2025, particularly in clause 22, Perda Sleman No 11/2015. The tourism-planning document clearly states that 'the public facilities include safety tools, fire-fighter tools, and disaster readiness tools in the tourism destination located in the prone area'. The Master Plan was reviewed and renewed in 2011 to elaborate the new paradigm of tourism. Yet, in Pentingsari, the tools are not available, and it is limited to the traditional emergency strategies to cope with the disaster.

In sum, the response of the government to the Merapi volcano risk is limited to general disaster management, the aim of which is to ensure the safety of the community. Preparation programmes targeting tourists and tourism are overlooked by the disaster management agency. Coordination between the disaster agency and the tourism board is limited. The majority of the programmes for tourism are reactive programmes, such as providing funds for recovery.

5.2. Community Organization's Response during the Emergency

During the emergency, Pentingsari villagers followed the authority's order to evacuate their village, as the status of Merapi was now 'watch'. Cars, trucks, and buses were put on standby close to the village to transport the villagers to the evacuation centre, namely Maguwoharjo sports hall. The evacuation process was guided and facilitated by the BPBD (the local disaster management board) together with the community initiative. They had to leave the village due to the danger posed by the hot ash and the possibility of a pyroclastic flow (a rapidly moving fluidized mass of rock fragments and gases). A total of 122 families were evacuated to the sports hall, which is about 15 km from the village. Together with the other evacuees, the Pentingsari villagers remained at the centre for over two weeks, until the authorities considered it safe for them to return to their homes.

The villagers then spent several weeks cleaning their houses and their villages. Although local markets were closed because products were difficult to access, government and donators provided clean water and meals at several places in the community. Since many bookings were cancelled, tourism activities stopped. During this period, community members who had been working full time

in tourism had to live on their savings. Those who relied on agriculture were in the same situation, as their crops had collapsed and could not be harvested. The community had a hard time for six months. Many of the respondents said that they had spent all their savings and some had borrowed money from relatives or neighbours (residents of Pentingsari; interview, 2015).

Pentingsari learned from the 2010 eruption how to prepare for the worst possible future eruption. Safety preparations have been conducted with the local authority (the Regional Disaster Management Agency of Sleman), which was very active in disseminating information and providing the community with training. Pentingsari is one of the target villages on the list of dangerous areas, part of the programme called 'Disaster-Ready Village' (Desa siaga bencana).

Furthermore, the safety of tourists has also received attention. First, the community has sign-posted evacuation routes through the village, especially at several crossroads. The routes lead to a meeting point that is accessible for buses and trucks to pick people up. Second, the community added the training of disaster emergency assistance to their programme. Tour guides were taught what to do when an eruption warning is issued, and they are expected to help tourists when the latter must be evacuated.

5.3. Recovery and Transformation Post-Disaster

Recovery following the 2010 Merapi eruption allowed the Pentingsari community to move on to a better stage of CBT. Below, the transformation is assessed based on Richie's [4] framework on transformation post-disaster, namely human and community factors, organizational, and destination transformation.

5.3.1. Human and Community Transformation

Transformation may occur in each individual before it spreads to all members of a community [42]. Mezirow [42] stated that personal transformation begins with a "disorienting dilemma" (e.g., a stressful life experience or relationship, a new environment, a death, or a life-threatening accident) that disturbs the normal life. In the context of this paper, the Merapi eruption, when individuals in Pentingsari were threatened, can be considered a momentous event. Those who experienced the Merapi eruption and the ensuing chaos and evacuation now have more will to empower and recognize new possibilities and connect with other people. The personal transformation leads to an increasing will to live, becoming more productive, experiencing an increased creativity, and acquiring an improved ability to handle stress [43].

Some individuals mentioned the role of bonding between community members in helping each other to build more social resilience. They said that help from neighbours reflected the importance of a strong relationship between communities. The network and the sense of dependence between communities increased after the eruption, especially when the community members realized they could not live alone. One respondent said: "Our ancestors teach us to be kind to others, especially our neighbour, because our neighbour is our close family although we have no blood relation." (Pentingsari resident; interview, 2015)

The eruption allows the community to reflect on the past and plan for the future. Individually, they were under great stress because they were forced to take action, in both a physical and a psychological sense, in ways that they had previously not expected. The ashes and rocks covering the villages forced people to do extra work to clean, replant, rebuild, and reconstruct. During this time, the community had space to debrief their vision and mission of the tourism organization. The leader of the organization reported: "Help and support from the government and others are important for us, but our commitment to using the money, funds and successful programmes are also important to recover from the eruption." (tourism organization leader (Pokdarwis); interview, 2015). Additionally, as one resident said: "Because of the eruption, we are more harmonious. We have a programme of Jumat Bersih [Friday clean]—where we get together to clean our environment." (Interview, 2015).

The increasing bonding between communities is an essential social capital to build tourism in the village. In Pentingsari, the impact of the eruption on the community is likely to increase psychological morbidity among both individuals and communities. There is a tendency that the community to be more willing to participate in village tourism development compared to before the disaster, when they faced the same problems. More attention has also been paid to tourists as their guests and to creating safety and a feeling of security during their stay in the village.

Several respondents pointed to the role of one person, namely the leader of the community tourism organization. This man and his family were working full time to develop and manage the tourism activities in the village, and they had opened their house as the office for the organization without payment. The majority of the villagers said that the role of the tourism organization leader is important, as he can create an awareness of the benefits that tourism can bring, especially since post-disaster Pentingsari has become more popular than before. This shows that leadership has an important role in recovery. This is in line with a study conducted by Nakagawa and Shaw [44] in Kobe, Japan, who found that the role of community leaders had been prominent in developing social capital in the recovery process and in enabling collective decision-making.

5.3.2. Organizational Transformation

The interview with the community leader revealed that the 2010 eruption had a significant impact on how the community thought about the relationship between tourism and the Merapi eruption. The community had derived benefits from tourism since 2006 and the eruption made them realize that tourism is sensitive and vulnerable to natural disasters. Pentingsari tourism, as well as Jogjakarta tourism, suffered from a drop in the number of tourists for about six months following the biggest eruption. One of the tour guides said:

> In the beginning, we never thought that the problem from the volcano would happen. We had no confidence in promoting our village because all the trees had collapsed, the surrounding areas were no longer beautiful and the road to our village was broken. (Tour guide; interview, 2015)

The community understands that disaster management is important for their business, as they increasingly rely on tourism; they had to conduct special programmes to keep the tourists coming. However, at the same time, they also understand that tourism is a vulnerable business. The eruption led them to re-evaluate their vision and mission by establishing a programme for disaster risk preparation. The Pentingsari tourism organization has revisited its strategy for dealing with challenges. Externally, the community now builds stronger networks and better communication with other villages to face the challenges resulting from the Merapi eruption. Pentingsari has joined the Desa Wisata (village tourism forum), which allows them to create more cohesive and stronger relationships with other villages and with the local government of Sleman. They have also learned that keeping in contact with people who have visited the village is important.

> Maintaining contact with people who have visited us is important. Our strategy is to inform them that we are safe and the village is safe. They helped us a lot in recovering from the disaster. Many of them come to our village on purpose: they act like tourists, but actually, they want to help us. (Tour guide; interview, 2015)

The community planned new activities for the organization, gained new knowledge and skills to implement new plans, renegotiated new relationships, and reintegrated them into their organization's programme. Many new ideas on how to manage the CBT began to emerge. The organizational transformation was influenced by a community that now fully believed, and had confidence in, the future of tourism in the village.

Pentingsari received government support under the PNPM Mandiri Pariwisata programme conducted by the Ministry of Culture and Tourism (no. KM.18/HM.001/MKP/2011). The programme

provided cash for community empowerment of village tourism. The community used the money to rebuild their livelihoods and to conduct training for the community, such as teaching guides some English. There are now better facilities and increased capacity to support tourism in the village. Cooperation with the other institutions, such as the Tourism Board of Sleman, local media, and tour agents, was regarded as the critical factor for recovery in Pentingsari. The village now has a reliable communication channel with the Tourism Board of Sleman Regency. It is also building cooperation with the local media, tour agents and potential tourists.

Interviews with villagers whose communities are engaged in tourism revealed that there were some programmes conducted by banks and the local government to provide the necessary support for those affected by the eruption. Although the programme does not directly focus on tourism, the increasing number of loans given to small- or medium-sized enterprises indicates that entrepreneurship is now flourishing, including in Pentingsari. The Ministry of Cooperation and Small and Medium Enterprises (Kementerian Koperasi dan Usaha Kecil Menengah) provided livestock farmers with 15 billion rupiahs (roughly USD 1,250,000). Additionally, the Indonesia Bank agreed to extend the loan repayment period for people affected by the disaster. The Ministry of Agriculture also provided a grant for a new plantation.

In Sleman, there have been some efforts to promote private sector activities besides agriculture. They included the establishment of many new small- or medium-sized enterprises for food producing and CBT. The plan to develop village tourism using the disaster as the main product was integrated into the tourism development master plan of Magelang and Sleman regencies. The effort seems to have increased the livelihood diversification on the slopes of Merapi by adding services and tourism to agriculture.

5.3.3. Destination Transformation

The tourist destinations are networks of stakeholders [45]. The crisis reconfigured the network structure, leading to a more cohesive industry-wide or community-wide response mechanism, better information flows, and new organizational structures [4]. Mezirow [46] suggested that central to transformation is self-examination and critical reflection on one's experiences. The experience of the falling number of tourists and the lack of income following the Merapi eruption drove the community to create a new product and explore a new market. The destination transformation has corroborated Mezirow's [47] analysis that transformation often occurs through a series of cumulative meaning schemes or as a result of a stressful and painful personal or social crisis [48]. The crisis may catalyse the development of new services and products as a result of the responses to the disaster. It may occur on the small scale of a tourist destination, as in this case study.

Pentingsari has undergone changes in services and products. Since the eruption, more attention has been paid to product diversification. One of the drivers behind the introduction of new products is the establishment of training programmes for small- or medium-scale entrepreneurs financed by local governments using funds from the National Programme for Community Empowerment (PNPM). The recovery programme has led to several new tourism products.

New products have emerged in other villages, too, such as Jeep trips to Merapi and the ruins of Kinahrejo (a village close to the summit of Merapi destroyed by the eruption), as well as the rivers where the pyroclastic material has accumulated. The Pentingsari community cooperates with the Jeep community by offering the products, so that tourists staying in Pentingsari can book a Jeep trip package. "We offer a Jeep trip for tourist who wants to see the death village, Kinahrejo. We do not provide them, but we can connect them." (Tourism organization leader (Pokdarwis); Interview, 2015).

The Pentingsari community rebuilt tourism infrastructures with financial assistance from aid agencies and the government. More funding has also been provided to enhance the quality of homestays, install modern toilets, and cement the road. Although the tourism activities stopped for six months, the number of tourists increased from 5008 in 2009 to 9576 in 2010 and 13,156 in 2011.

6. Discussion

Several reports have shown that disasters impact tourism destinations [2,4,48–51]. Disasters make tourism destinations vulnerable, and especially vulnerable when the community manages the tourism destination in a 'communal' way, namely as an informal organization that depends strongly on social commitment. Until now, studies on tourism and disaster have overlooked small-scale management. The present research, therefore, explored the local government's and the community's responses to regularly-occurring disasters. The focus was on the 2010 eruption of Mount Merapi in Indonesia and the subsequent governmental responses and transformations in the community.

Analyses have shown that the government's responses to the recovery were focused on emergency responses and preparation for future disasters, in general. The government claimed to have provided support for disaster preparation, disaster mitigation, emergency evacuation, and post-disaster recovery. This includes sirens, early warning system installations in several villages, radio communication, evacuation routes and places, standard operational procedures, the dissemination of information, relocation schemes, and recovery funds. The government's response to the loss of livelihoods came late, and there was a lack of coordination between the disaster management agency and the tourism board. The community and its members had to sort things out themselves until governmental agencies finally arrived at the villages.

In the eight years since the eruption, Pentingsari has gained many benefits from tourism. In 2017, it was awarded an Indonesian Sustainable Tourism Award in 2017 [52]. The transformations observed in Pentingsari include destination transformation, organisational transformation, and human and community transformation. The transformations result from the shifting of the community's way of thinking about tourism and the disaster. The disaster allows them to reflect on many aspects, such as changing the organizational structures and programmes, establishing new products and services, and enhancing their sense of ownership of the tourism activities. As Hills [53] noted, disasters may also become political events in and of themselves, prompting or accelerating change within an affected community. The Pentingsari villagers have shown that tourism activities increase community resilience. Furthermore, this finding corroborates the statement by Marschke and Berkes [54] that people at the community level remain active and continuously 'doing something' in response to various shocks and stresses to their livelihood systems. Moreover, livelihood strategies could create community resilience, but this is not always the case [54].

The analysis of transformation and responses can be categorized into two categories of CBT resilience, that is, internal and external resilience factors. Figure 3 demonstrates the elements of increasing community resilience in the case study. The internal factors are the availability of attractions in the village (natural and cultural), the willingness of the local people, the innovation in tourism (social capital), the leadership of the village leader, the capacity of the community to adjust to deviations and its creative ability to change the product for a broader market.

The external factors include the support from the local government through economic recovery programmes and community empowerment mechanisms. The availability and accessibility of new knowledge, technology, and adaptations depend on a community having contact and being part of a network with higher levels or broader level of organization. NGOs can facilitate multilevel interaction through networks, deliberation, and inclusivity, in turn, leading to social learning and resilience building [55].

The role of tourism in strategies to enhance post-disaster recovery and increase the resilience of communities in disaster-prone areas was also discussed in this case study. The fact that a large number of tourists visited the community during the recovery period gave the community hope and also increased their connection to other communities. By building tourism together, the community has a space for creating innovation in their villages. It may help them to alleviate the stresses caused by the disaster.
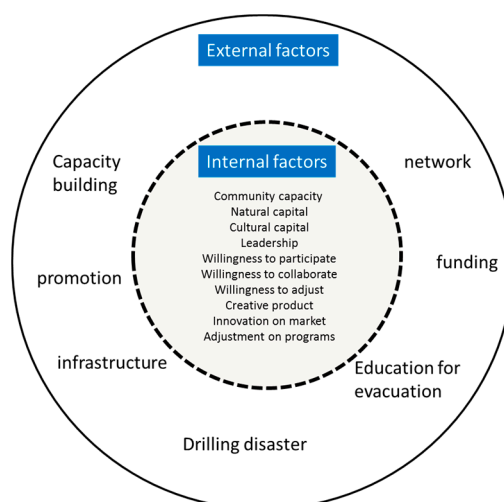
Figure 3. The factors of community resilience in the case study. Source: author's analysis, 2018.

Since the Merapi eruption, CBT has undergone a transformation, mainly regarding the role of disasters in drawing attention to innovation in, for example, products, markets and institutions. This transformation is reflected in three dimensions: (1) human and community; (2) organizational; and (3) destination. The eruption allowed the community to reflect on the past and plan for the future, as well as debrief their vision and mission of a CBT organization. It also provided a better understanding of disaster management. The implication of this finding for the CBT is on the aspect of measuring the success of CBT. The transformations post-disaster can be seen as indicators of community resilience and, in the end, can be a parameter for successful CBT. Nevertheless, when planning CBT in the village, attention should be paid to the danger posed by natural disasters and to how the community could be prepared for a worst-case scenario through clear disaster management planning and strategies at a very local and technical level.

7. Conclusions

This paper has assessed the responses of community-based tourism (CBT) and local government to a natural disaster. Community-based tourism in rural areas that are at high risk of natural disaster is largely overlooked in the literature on tourism and disaster management. It can be argued that CBT management is vulnerable to such natural disasters and, therefore, its presence should be considered in the recovery process.

The findings show that the local government's preparation plans were focused only on disaster management, in general, and that it had only reactive programmes for recovery in tourism. Moreover, CBT was able to respond and recover from the disaster by transforming the tourism destination with support from external agencies, including the local government. In addition, CBT has undergone a transformation following the natural disaster. The transformation was especially observed in three aspects: destination (new tourism products and broader market segment), organization (more formal, more organized, and better performance), and community and human (stronger social cohesion and leadership at the local level) factors. The eruption led the community to reflect on the past and plan for the future, as well as to debrief their vision and mission of the CBT organization and to change their products and create a new market. It also offers a better understanding of disaster management.

In the case study, the factors that increased the community resilience of CBT can be divided into internal and external factors. Concerning CBT, which has been introduced in many countries to improve the living condition of rural communities, this research has revealed some new insights. The former include community capacity, natural capital, cultural capital, leadership, willingness to participate, willingness to collaborate, willingness to adjust, availability of creative product,

innovation of the markets and adjustment of the programmes to be more disaster aware. The external factors include networking, funding, education for evacuation, drilling for disaster, availability of infrastructure, promotion of the CBT, and community capacity-building programmes. Tosun [8] stated that what makes CBT different from other forms of tourism management is that it involves local people in the planning process. To recover from a natural disaster, CBT needs intervention from the local government and a strong commitment from its internal community organization. As long as these two circumstances are fulfilled, CBT has the potential to provide rural communities with an alternative in terms of economic livelihood.

Finally, the present study has provided the insight that the resilience concept can be considered an indicator of the success of CBT. The transformation of human and community factors, organization, and destination that occurred in the CBT village following the disaster, led to an increase in the resilience of the community. This new understanding can contribute to the new knowledge of tourism, particularly in planning for community-based tourism. This paper recommends tourism researchers to apply the 'resilience to natural disaster' as part of the evaluation indicators of successful CBT in rural areas that are located in areas prone to natural disaster. Therefore, before establishing CBT in a certain area, possible dangers should first be mitigated. Then a strategy to cope with the challenges by increasing the community's capability and gaining government support should be developed.

The above leads to several implications and recommendations for tourism development managed by the community located in a disaster-prone area: the relationship with markets should be strengthened, communities should be open to the innovation of tourism products, the community's self-defence mechanisms should be improved, and intervention from governmental and other agencies should be enhanced. The present research was limited to one case study; therefore, further research should be conducted to establish a more complete understanding of community resilience in another form of community-based economic activity.

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