

From Remoteness to Connectivity: Ecotourism Resilience in the Melolo Transmigration Area, East Sumba

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Article Info	ABSTRAK
Article history: Received Desember 2025 Revised Februari 2026 Accepted April 2026	Kawasan Transmigrasi Melolo di Kabupaten Sumba Timur menyimpan potensi ekowisata yang signifikan, namun menghadapi krisis multidimensi yang menghambat pengembangannya. Kajian ini bertujuan mengidentifikasi tipologi krisis yang dihadapi ekowisata Kawasan Melolo serta merumuskan strategi resiliensi yang kontekstual. Pendekatan kualitatif dengan desain studi kasus digunakan, didukung observasi lapangan selama kegiatan KKN Ekspedisi Patriot Universitas Indonesia dan data sekunder dari sumber resmi pemerintah serta jurnal ilmiah. Hasil kajian menunjukkan bahwa kawasan ini menghadapi dua tipologi krisis: krisis exogenous berupa kerentanan iklim kekeringan El Niño dan dampak residual pandemi COVID-19, serta krisis endogenous berupa keterbatasan aksesibilitas infrastruktur dan rendahnya visibilitas destinasi. Dalam kerangka Faulkner (2001), kawasan ini terperangkap dalam fase pre-event berkepanjangan. Strategi resiliensi yang direkomendasikan mencakup penguatan konektivitas fisik-digital, pengembangan ekowisata berbasis masyarakat, dan integrasi mitigasi perubahan iklim dalam perencanaan
Kata Kunci: Resiliensi pariwisata, Ekowisata, ManajemenKrisis, Kawasan Transmigrasi, Sumba Timur.	ABSTRACT <i>The Melolo Transmigration Area in East Sumba Regency holds significant ecotourism potential, yet faced multidimensional crises that hindered its development. This study aimed to identify crisis typologies affecting ecotourism in the Melolo Area and formulate contextual resilience strategies. A qualitative approach with a case study design was employed, supported by field observations during the Universitas Indonesia Patriot Expedition KKN program and secondary data from official government sources and scientific journals. Findings revealed two crisis typologies: exogenous crises comprising El Niño drought vulnerability and residual impacts of the COVID-19 pandemic, and endogenous crises comprising infrastructure accessibility limitations and low destination visibility. Within Faulkner's (2001) framework, the area remained trapped in a prolonged pre-event phase. Recommended resilience strategies included strengthening physical-digital connectivity developing</i>
Keywords: <i>Tourism Resilience; Ecotourism; Crisis Management; Transmigration Area; East Sumba.</i>	



	<i>community-based ecotourism, and integrating climate change mitigation into destination planning.</i>
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1. INTRODUCTION

The tourism sector is one of the economic pillars most vulnerable to various forms of crisis, both exogenous, originating from outside and difficult to control, such as pandemics and climate change, and endogenous, rooted in the destination's internal structural weaknesses, such as limited infrastructure and low visibility (Faulkner, 2001; Ritchie & Jiang, 2019). The COVID-19 pandemic since 2020 has underscored the urgency of building destination resilience, especially in regions that are still structurally underdeveloped (Zenker & Kock, 2020). In Indonesia, the impact has been significant, with domestic tourist visits declining by 61 percent nationwide in 2020 (BPS, 2020), threatening the lives of more than 13 million direct workers in the tourism sector.

East Nusa Tenggara (NTT) was one of the provinces significantly impacted, with the accommodation and food and beverage business sector contracting by 26.92% in 2020 (Lintas NTT, 2021), while tourist visits by May 2020 only reached under 30,000 people (Antara News, 2020), ironic considering that NTT was named one of the world's top destinations in 2020 by Lonely Planet. It is important to note that the pandemic was not the sole cause of the crisis; in less-developed regions, it served as an amplifier, exacerbating pre-existing fragile conditions rather than creating a crisis from scratch (Pyke et al., 2021). Although recovery is evident in NTT's visit growth of 17.99% in 2025 to 1.84 million visits (Disparekraf NTT, 2026), this recovery is uneven, with remote areas with limited accessibility left further behind.

The Melolo Transmigration Area in East Sumba Regency reflects this reality while simultaneously presenting an interesting paradox. Compared with conventional tourist destinations, transmigration areas should have structural advantages, including better-organized land, greater diversity of natural and cultural resources, and support from national revitalization policies under the 2020–2024 National Medium-Term Development Plan (RPJMN) (Coordinating Ministry for Human Development and Culture, 2024). However, this potential has not yet been converted into a tangible ecotourism force (Jocom et al., 2021; Ndjurumbaha et al., 2024). Based on field observations during the University of Indonesia Patriot Expedition in the Melolo area, the road conditions to the tourist site remain difficult, and the potential of both natural and cultural destinations remains unknown to tourists.

Previous studies on tourism in East Sumba have generally focused on the regional economy (Ndjurumbaha et al., 2024), the tourism value chain in general (Jocom et al., 2021), and the development of community-based tourism villages (Wadu & Mbana, 2024). However, no study has specifically addressed ecotourism resilience in the Melolo transmigration area, distinguishing between exogenous crises (climate change and the pandemic, which require adaptation) and endogenous crises (accessibility and visibility, which require active policy intervention). This distinction is not merely an academic categorization; effective resilience strategies must distinguish between crises that require adaptation and crises that must be resolved (Pyke et al., 2021; Posch et al., 2024). This paper fills this gap using Faulkner's (2001) crisis management framework in the context of a remote transmigration area. Based on this, this paper aims to (1) identify and map the forms of crises, both exogenous and endogenous, that hinder ecotourism development in

the Melolo Transmigration Area, East Sumba; and (2) formulate resilience strategies and sustainable ecotourism development that are contextual and applicable according to the typology of the crisis faced. The results of this study are expected to make an academic contribution to the literature on tourism resilience in remote destinations within transmigration areas, as well as provide practical input for local stakeholders and the regional government of East Sumba Regency.

2. METHODOLOGY

This research employed a qualitative approach with a descriptive literature review. The compilation was conducted in a structured, systematic manner to collect, analyze, and synthesize all relevant literature and findings for the research topic (Snyder, 2019). This approach was chosen because the phenomenon of ecotourism resilience in the Melolo Transmigration Area, East Sumba, is a complex, contextual, socio-spatial phenomenon that has not been systematically documented in academic or policy literature.

Table 1. Sources and Types of Research Data

DATA TYPE	Source	FUNCTIONS IN RESEARCH
Primary Data	Field observations & informal conversations during the UI Patriot Expedition in the Transmigration Area, Melolo	Verify the actual condition of the area (road accessibility, physical condition of the destination)
Secondary Data	SINTA & internationally indexed scientific journals, BPS reports, NTT Tourism and Creative Economy Office, Kemenkopmk	Primary sources of crisis analysis, policy context, and theoretical framework
Secondary Data	Verified online news source (Across NTT)	Contextual data on the impact of the COVID-19 pandemic on tourism in NTT

The primary data obtained through the Patriot Expedition served as complementary data that contextualized and validated findings from secondary sources, not as the primary research data. This is important to emphasize, given the informal and methodologically unstructured nature of the field observations. This limitation was explicitly acknowledged as part of the research's transparency (Ritchie & Jiang, 2019).

Data analysis was conducted descriptively and analytically by mapping the area's conditions into the six phases of Faulkner's (2001) framework: pre-event, prodromal, emergency, intermediate, recovery, and resolution. This mapping allowed for systematic identification of the Melolo area's critical position as a transmigration area and the formulation of resilience strategies appropriate to the current phase. The theoretical framework and field data were integrated through source triangulation to enhance the validity of the findings (Faulkner, 2001; Pyke et al., 2021).

3. RESULTS AND DISCUSSION

The Melolo transmigration area is administratively divided into eight sub-districts in East Sumba Regency, East Nusa Tenggara, namely Wulla Waijelu, Umalulu, Rindi, Pandawai, Pahunga Lodu, Paberiwai, Ngadu Ngala, and Kahaungu Eti. This area is spread from the south coast to the eastern interior of Sumba Island, namely Wulla Waijelu and Rindi on the east coast, Umalulu and Pandawai in the south-central part, Pahunga Lodu and Paberiwai in the central interior area, and Ngadu Ngala and Kahaungu Eti in the southwestern part of the area, which collectively form a transmigration area unit with diverse natural and cultural

resource potential; however, this area is still faced with several crises that require in-depth study.

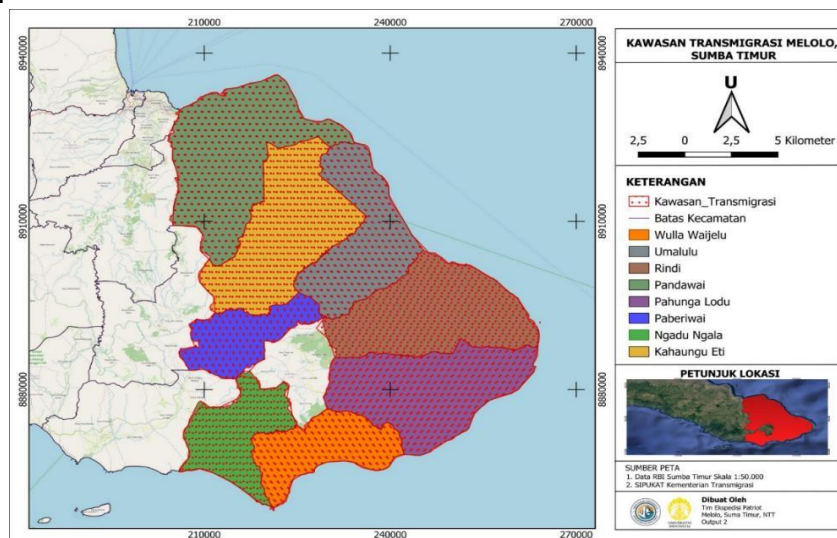


Figure 1. Map of the Melolo Transmigration Area, East Sumba Regency, NTT Source: UI Patriot Expedition Team (2025)

3.1. Exogenous Ecotourism Crisis

An exogenous crisis in ecotourism is a disruption originating outside the tourism system that significantly affects the sustainability of a tourist destination. Ritchie and Jiang (2019) define an exogenous crisis as an external event or condition whose intensity and timing cannot be controlled by actors in the tourism industry, thus requiring a much more fundamental resilience capacity than that required by an endogenous crisis. In the context of the Melolo Transmigration Area in East Sumba, the two most dominant exogenous crises are climate change and the COVID-19 pandemic. Both present with different characteristics, but both demand adaptive responses that exceed existing local capacities.

Climate change is one of the most significant exogenous crises in ecotourism development, particularly in areas that rely on natural ecosystems as their primary attraction. East Sumba is climatologically highly vulnerable to drought. This condition is not a transient phenomenon but rather a recurring structural pattern exacerbated by El Niño. Karuniasa and Pambudi (2022), using observational data from the Umbu Mehang Kunda Meteorological Station for 1982–2019, found that annual rainfall in East Sumba ranged from 219 mm to 785 mm. Furthermore, they concluded that "East Sumba, which has an arid climate, has more challenges in dealing with drought and water deficits during El Niño... The dry day series is dominated by an extreme drought (>60 days) which generally occurs from July to October" (Karuniasa & Pambudi, 2022, p. 181). These findings indicate that climate pressures on the region are not only persistent but also intensifying, as the frequency of El Niño events has increased over the last two decades compared to the previous two.

The impact of this drought extends beyond the agricultural sector and the clean water supply, and also directly affects the ecosystem that serves as the primary foundation for ecotourism in the Melolo area. East Sumba, including the Kanatang sub-district and Waingapu City, geographically adjacent to Melolo, is dominated by tropical savanna ecosystems with dual strategic value. Setiawan et al. (2024) emphasized that tropical savannas are complex landscapes that play an essential role in providing various ecosystem services, including biodiversity, carbon storage, and socio-economic and cultural values for surrounding communities. However, this ecosystem is also the most vulnerable to changes in rainfall patterns. The intensification of drought due to El Niño directly threatens both the landscape's quality as a tourist attraction and the area's ecological integrity, which is the basis for sustainable ecotourism. Furthermore, Setiawan et al. (2024) noted that knowledge

of sustainable land management practices, particularly the integration of conservation efforts and planned fire management, remains a major challenge in the East Sumba savanna area, indicating that local adaptive capacity to climate stress is very limited.

The COVID-19 pandemic is the most destructive exogenous crisis in contemporary tourism history, global in nature, sudden in nature, and devastatingly impacting tourism demand in a short period of time (Zenker & Kock, 2020). In Indonesia, domestic tourist arrivals declined by 61 percent nationwide in 2020 (BPS, 2020), threatening more than 13 million direct tourism workers (BPS, 2020). East Nusa Tenggara (NTT) experienced an even deeper impact, with the accommodation and food and beverage sector contracting by 26.92% in 2020 (Lintas NTT, 2021), while tourist arrivals by May 2020 reached just under 30,000 people (Antara News, 2020). This is ironic considering that NTT had just been named one of the world's top destinations by Lonely Planet in 2020. For the Melolo region, which lacks a strong visitor base, this loss of momentum is even more devastating than for established destinations, as there is no backup of reputation or tourist loyalty to act as a buffer.

It is important to understand that the pandemic was not the sole cause of the crisis in the Melolo Region but rather an amplifier, deepening pre-existing fragile conditions (Pyke et al., 2021). Before the pandemic, the region was already facing low visitor numbers due to limited accessibility and minimal promotion. The pandemic exacerbated these conditions by completely cutting off the already thin tourist flow, halting the activities of local businesses with limited capital, and disrupting the process of accumulating experience and learning necessary to develop competitive ecotourism products. In destinations still in the development stage, operational continuity is crucial for gradually building local human resource capacity and the destination's reputation, and the pandemic has completely disrupted this continuity.

Signs of recovery are beginning to emerge, with visitor numbers in NTT increasing by 17.99% in 2025 to 1.84 million (NTT Tourism and Creative Economy Agency, 2026). However, this recovery is uneven, with destinations with good accessibility and high visibility, such as Labuan Bajo and Lombok, recovering faster and surpassing pre-pandemic figures. At the same time, remote areas like Melolo fell further behind due to their limited appeal in the increasingly competitive post-pandemic environment. This disparity underscores that an effective resilience strategy cannot focus solely on external crisis preparedness; it must also address the internal structural weaknesses that made these regions vulnerable in the first place, as discussed in the Endogenous Ecotourism Crisis Discussion.

3.2. Endogenous Ecotourism Crisis

In contrast to exogenous crises, which originate from outside and require adaptation, endogenous crises stem from the destination's internal structural weaknesses and require active policy intervention (Pyke et al., 2021). In the Melolo Transmigration Area, two major endogenous crises were identified: limited physical accessibility and low destination visibility. These two are not merely technical barriers, but rather structural roots that made the area systemically vulnerable even before the pandemic hit.

Accessibility is a fundamental prerequisite for tourism development in remote areas (Lohmann & Netto, 2017). Based on field observations during the University of Indonesia Patriot Expedition, road conditions to tourist sites in the Melolo Area remain difficult to navigate, especially during the rainy season. This condition creates what Faulkner (2001) calls pre-existing vulnerability, a fragile state that existed before the external crisis. In the context of transmigration areas, accessibility issues have a more complex dimension. Transmigration areas are generally built on geographically isolated land, so road infrastructure is often not designed to accommodate the influx of tourists (Jocom et al., 2021). As a result, the ecotourism potential, theoretically superior in terms of natural diversity, cultural landscapes, and landscape authenticity, cannot be optimally accessed by tourists. This limitation creates a vicious cycle: the lack of visits reduces the economic

incentive to build infrastructure, while the lack of infrastructure continues to suppress visitor numbers.

The lack of adequate public transportation to the Melolo area from downtown Waingapu further exacerbates this situation. Tourists, who generally rely on rental vehicles, face relatively high travel costs, thereby undermining the region's competitiveness compared to other, more accessible destinations in Sumba.

The second endogenous crisis is the destination's low visibility, both nationally and within the digital tourism ecosystem. Unlike physical accessibility, the visibility crisis is cognitive, where the destination is not present in the minds of potential tourists when they plan their trips (Ritchie & Jiang, 2019). Field observations indicate that the potential of natural and cultural destinations in the Melolo area remains largely unknown to tourists, even among domestic visitors.

This low visibility stems from several interrelated factors. First, the lack of structured digital documentation and promotion makes the Melolo area virtually undetectable on travel-planning platforms such as Google Maps and TripAdvisor, as well as on tourism-focused social media. Second, the absence of a cohesive destination narrative a destination brand capable of distinguishing Melolo from other Sumba tourist destinations results in a lack of a strong identity. Third, the limited capacity of local human resources in digital marketing exacerbates this situation, given that current tourism promotion relies heavily on an internet-based content ecosystem (Ndjurumbaha et al., 2024).

The paradox that emerges is that the transmigration area's status, which should be a highlight of its cross-ethnic cultural diversity, pristine, untouched landscape, and unique development narrative, has not been articulated as a tourism asset. This potential remains latent because no actors are actively communicating it to the market

3.3. Crisis Mapping and Tourism Resilience Strategy

Before formulating a strategy, it is necessary to map the Melolo Transmigration Area within Faulkner's (2001) six-phase crisis management framework. This mapping is crucial to ensure that the strategy formulated is contextual and appropriate to the crisis phase being faced, rather than generic. The integration of field and secondary data indicates that the Melolo Area is in an unusual situation, trapped in a prolonged pre-event market in which multiple structural barriers prevent ecotourism from developing even before a single dramatic crisis occurs.

Table 2. Mapping the Ecotourism Conditions of the Melolo Transmigration Area in Faulkner's Framework (2001)

Phase	Phase Description (Faulkner, 2001)	Conditions in the Melolo Area	Status
Pre-event	Pre-crisis conditions; potential threats already exist but have not yet manifested	Road infrastructure is difficult to pass, visibility is almost zero, local human resource capacity is limited, and the ecosystem is.	Current position
Prodromal	Early signs of crisis are being detected; there is still time for mitigation.	The COVID-19 pandemic (2020) served as a prodromal signal: visits that were already thin stopped altogether, and local business actors lost momentum in development.	It has happened (2020)

Emergency	The crisis is in full swing; focus on emergency response.	There is no single, dramatic crisis; rather, the prolonged pre-event conditions are cumulatively more damaging than the acute crisis.	Not identified.
Intermediate	Emergency response and stabilization; short-term needs are met.	NTT's post-pandemic tourism recovery is beginning to be seen in aggregate (17.99% growth by 2025), but is not felt evenly in remote areas like Melolo.	Partial in NTT.
Recovery	Gradual recovery; destinations are starting to function normally.	Not yet achieved because Melolo has never achieved adequate visitation levels, so there is no "normal condition" to restore.	Not yet achieved.
Resolution	Normalization and learning; the system is more resilient than before.	The phase aimed for is a comprehensive resilience strategy that requires planned, medium-term structural interventions.	Medium-term target.

The mapping above reveals a critical finding: the Melolo area never progressed through the recovery phase because it failed to achieve adequate visitor capacity from the outset. This distinguishes it from destinations that were impacted by the pandemic and then recovered, as Melolo requires a development-first resilience strategy that builds basic capacity before attempting recovery (Posch et al., 2024). Consequently, the most effective interventions are those in the ongoing pre-event phase that improve structural conditions before the next crisis, rather than waiting until a crisis occurs to react.

Regarding local human resource (HR) capacity, field observations indicate that residents in the Melolo area lack sufficient experience in managing organized tourist visits. This condition is not simply a matter of individual deficiencies, but rather a logical consequence of limited exposure to tourism activities due to historically low visitor numbers. Without structured training and mentoring interventions, increasing accessibility and visibility alone will not be enough to convert potential into a competitive ecotourism product (Wadu & Mbana, 2024).

Referring to the crisis typology and phase mapping above, resilience strategies must clearly distinguish between responses to exogenous crises and interventions to endogenous crises. Faulkner (2001) emphasized that the failure of resilience strategies in many remote destinations stems from the generalization of these two types of crises. For exogenous crises, relevant strategies include developing community-based early warning systems, diversifying tourism products away from reliance on a single market segment, and strengthening economic safety nets for local businesses through tourism cooperative schemes (Posch et al., 2024). For endogenous crises, interventions in the accessibility dimension are most effective through cross-actor collaboration between local governments, the Ministry of Villages and Transmigration, and the private sector (Jocom et al., 2021). The revitalization mandate of the 2020–2024 National Medium-Term Development Plan (RPJMN) (Kemenkopmk, 2024) can provide a gateway to integrating tourism infrastructure development into the regional development agenda. In terms of visibility, it is necessary to develop destination branding that emphasizes Melolo's uniqueness as a multicultural transmigration area, to develop a digital content ecosystem by training local human resources, and to integrate it into well-known Sumba tourism packages (Ndjurumbaha et al., 2024).

More fundamentally, the long-term resilience of the Melolo Area can only be achieved if the local community is positioned not merely as an object of development, but as an active subject with the capacity to manage, adapt, and innovate independently (Wadu & Mbana, 2024). Therefore, developing the capacity of local human resources, including tour guide training, digital marketing literacy, and mentoring for micro-tourism business management, must be a core component of the resilience agenda, not merely a supplementary program. This integration of exogenous crisis management, structural interventions for endogenous crises, and the strengthening of local community capacity forms a comprehensive and context-specific ecotourism resilience framework for the Melolo Transmigration Area.

Table 3. Summary of Ecotourism Resilience Strategy in the Melolo Transmigration Area

Dimensions	Types of Crisis	Root Causes	Resilience Strategies	Key Actors
COVID-19 pandemic.	Exogenous	Tourism demand collapses, no visitor buffer.	Tourism demand collapses, no visitor buffer. Tourism product diversification: tourism cooperatives as a local economic safety net.	Local communities, local government, Ministry of Tourism and Creative Economy.
Prodromal	Exogenous.	Vulnerability of natural destinations to seasonal disturbances.	Community-based early warning systems; tourism calendar adaptation.	Local communities, BPBD, local government.
Climate change.	Exogenous.	Vulnerability of natural destinations to seasonal disruptions.	Community-based early warning system; tourism calendar adaptation.	Local communities, the Regional Disaster Management Agency (BPBD), and the local government.
Accessibility.	Endogenous.	Difficult road conditions, lack of adequate public transportation.	Cross-actor collaboration for road infrastructure; integration into the RPJMN revitalization agenda.	Ministry of Villages, local government, private sector.
Visibility.	Endogenous.	Absence from the digital ecosystem and the national tourism market.	Multicultural destination branding, digital content training and integration of Sumba tourism packages.	NTT Tourism and Creative Economy Agency, local government and local business actors.

Human resource capacity.	Structural.	Limited tourism management and marketing capabilities.	Tour guide training, digital literacy, micro-business mentoring.	Universities, local governments, NGOs.
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4. CONCLUSION

This study identified that the Melolo Transmigration Area in East Sumba Regency faces a multi-layered crisis in its ecotourism development, which can be categorized into two distinct types. The exogenous crisis, encompassing climate vulnerability, including repeated extreme droughts driven by El Niño, and the residual impacts of the COVID-19 pandemic, demands anticipatory adaptation and diversification strategies. The endogenous crisis, characterized by limited access to physical infrastructure and low destination visibility in the digital tourism ecosystem, demands active policy interventions that foster structured cross-actor collaboration. These distinct crisis typologies are not merely academic categorizations but rather the foundation for formulating targeted resilience strategies.

Within Faulkner's (2001) crisis management framework, the Melolo Area is in a prolonged pre-event phase, a state in which accumulated structural barriers prevent ecotourism from developing even before a single, dramatic crisis occurs. This situation makes interventions in this phase more cost-effective and impactful than post-crisis management. The formulated resilience strategy encompasses three complementary pillars: strengthening physical and digital connectivity as a basic prerequisite for visits; developing community-based ecotourism that positions residents as active subjects rather than mere objects of development; and integrating climate change mitigation into long-term destination planning. These three pillars need to be integrated into the national transmigration area revitalization agenda, which already has a policy umbrella through the 2020–2024 National Medium-Term Development Plan (RPJMN) (Kemenkopmk, 2024).

This study is limited by the scope of primary data, which consists of field observations and informal conversations during the University of Indonesia Patriot Expedition Community Service Program (KKN), making the findings exploratory in nature. Further research requires a more systematic field study, including in-depth interviews with local stakeholders, the East Sumba Regency government, and tourism businesses, as well as quantitative resilience measurement. This will enable a more comprehensive, measurable, and empirically grounded roadmap for ecotourism resilience in the Melolo Transmigration Area.

5. ACKNOWLEDGMENTS

The author would like to thank the University of Indonesia for its support through the Patriot Expedition program, which made field observations possible in the Melolo Transmigration Area, East Sumba Regency, East Nusa Tenggara. He also extends his deepest appreciation to all residents of the Melolo Transmigration Area for their welcoming, openness, and willingness to share information during the activity. He also thanks all members of the University of Indonesia Patriot Expedition Team for their collaboration in collecting field data and preparing the area maps used in this study.

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