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Civic engagement of Tengger indigenous community in strengthening ecological citizenship

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Abstract

This study aims to analyze the involvement of the Tengger Indigenous People in strengthening ecological citizenship. Using a case study approach, this research examines how the values of *Tri Hita Karana* which emphasize harmony between humans and God (*parahyangan*), among fellow humans (*pawongan*), and with the environment (*palemahan*) support sustainable nature conservation practices. Data were collected through in-depth interviews, participatory observation, and documentation involving traditional leaders, community members, and key stakeholders in the Tengger region. The findings reveal that civic engagement rooted in local wisdom contributes to the preservation of natural resources such as water, reduces soil erosion, and promotes the sustainability of the Mount Bromo ecosystem. Moreover, collective community participation through traditional rituals such as *Kasada* and *Entas-entas* serves as a mechanism for fostering environmental awareness and strengthening social cohesion. These findings align with the theory of ecological citizenship, which posits that local community involvement in environmental stewardship is a critical factor in ensuring ecological sustainability. The study recommends the integration of local wisdom into sustainable conservation policies as an effective bottom-up approach.

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Introduction

Biodiversity conservation represents one of the key challenges in global environmental preservation efforts (Syaifullah et al., 2020; USAID, 2018). The sustainability of ecosystems rich in biodiversity depends not only on conservation policies implemented by governments and international organisations but also on the active participation of local communities, particularly Indigenous peoples(Dawson et al., 2021; Reyes-García et al., 2019). The contribution of Indigenous communities to conservation has received global recognition since the 2003 World Parks Congress in Durban, South Africa (Bongaarts, 2019; Brosius, 2004). The involvement of Indigenous peoples not only makes conservation efforts more equitable but also enhances their effectiveness in achieving the Sustainable Development Goals (SDGs) (Garnett et al., 2018; United Nations Environment Programme, 1999).

Despite progress in acknowledging the role of Indigenous peoples in conservation, the implementation of inclusive conservation policies still faces numerous challenges. The rights-based conservation principle, which integrates social and ecological objectives, is often not optimally applied at the local level (Gannon et al., 2019; Oviedo et al., 2010). Furthermore, there remains a gap between policy and practice, where exclusive conservation approaches frequently overlook local wisdom that has long proven effective in maintaining ecological balance (Witter & Satterfield, 2019).

As the second most biodiverse country in the world after Brazil, Indonesia bears a significant responsibility in safeguarding its ecosystems (E. Setiawan & Triyanto, 2021). Its tropical rainforests, coastal ecosystems, and expansive marine areas make Indonesia home to thousands of plant and animal species, many of which are endemic. However, environmental pressures continue to escalate due to deforestation, land conversion, natural resource exploitation, and climate change (Dewi & Istiadi, 2016; Istiawati, 2016; Triyanto et al., 2023).

In this context, Indigenous peoples play a vital role in maintaining ecological (Adinda & Sarmini, 2021). Indigenous communities have developed traditional ecological knowledge systems that enable them to manage natural resources sustainably (Oviedo et al., 2010; von der Porten et al., 2019). A notable example of successful Indigenous-based conservation practices can be observed among the Tengger Indigenous community surrounding Bromo Tengger Semeru National Park (TNBTS) (Damanik et al., 2020; Hariyati et al., 2020).

The Tengger Indigenous community is one of the groups that has preserved its belief systems, customs, and environmental management practices rooted in local wisdom (Hekmatyar & Adinugraha, 2021). One of their key conservation practices is a conservation-based agricultural system that aligns planting cycles with seasonal changes and traditional rituals (Anggiana et al., 2014; Suharto et al., 2023). The Tengger community also upholds taboos against the overexploitation of natural resources, including customary regulations on forest and water resource management (Pramita et al., 2023).

In practice, the Tengger Indigenous community possesses a rich heritage of traditional ecological knowledge and spiritual beliefs that drive collective environmental action, such as through *sedekah bumi* (earth offerings) and customary land stewardship practices (Putri et al., 2022). The local wisdom of the Tengger people is deeply rooted in the concept of *Tri Hita Karana*, which emphasises harmony between humans, nature, and spirituality manifested through three interrelated dimensions: *Parahyangan* (the relationship between humans and the divine), *Pawongan* (the relationship among humans), and *Palemahan* (the relationship between humans and the natural environment) (Sukmawan & Alifah, 2024). This value system is reflected in various aspects of daily life, including field and livestock management, the protection of customary forests, and religious rituals such as the *Karo* and *Kasada* ceremonies, which serve as mechanisms for maintaining ecological balance (Ayuninggar et al., 2011). Another important ritual is *Unan-unan*, which exemplifies the community's philosophy of coexistence with nature and represents a holistic village purification process, both physical and metaphysical, entirely reliant on natural elements.(Sukmawan, 2017).

Although the Tengger Indigenous community has successfully preserved its ecosystem for centuries, modernisation and conservation policies that disregard local wisdom often

present serious challenges. Several top-down conservation policies tend to sideline traditional management practices, leading to conflicts between Indigenous communities and conservation authorities (Büscher & Fletcher, 2019; West et al., 2006). In some instances, exclusive conservation approaches have negatively impacted Indigenous well-being and hindered conservation effectiveness (Agrawal & Redford, 2009; Howe et al., 2014).

In comparison, the Tengger community's concept of living in harmony with nature differs from that of the Baduy Indigenous people of Banten, who enforce customary laws that strictly prohibit the use of chemicals and advanced technologies in daily life (Nuraeni, 2024; N. Setiawan et al., 2023). While both communities share an orientation toward ecological harmony, the Tengger people demonstrate a selective openness to technological advancement, particularly by limiting chemical use an example of internal restraint in balancing tradition and innovation (Abduh et al., 2023; Irsyad et al., 2020; Kymlicka, 2002)

Sustainable biodiversity conservation cannot be separated from the social and cultural dimensions of the communities surrounding protected areas. Recent studies show that active participation of Indigenous peoples in conservation management contributes to improved ecological outcomes and enhanced social well-being(Blackman et al., 2017; Garnett et al., 2018; Persha et al., 2011; Schleicher et al., 2017). Therefore, conservation approaches should accommodate local knowledge and principles of community-based governance (Sabin et al., 2019).

Integrating Indigenous knowledge systems into conservation strategies fosters a more comprehensive understanding of ecosystems, given that these groups have historically managed their environments. Their traditional ecological knowledge, cultivated over generations of engagement with the environment, provides significant insights into local species, seasonal variations, and land management techniques frequently disregarded by conventional scientific methodologies. Recognising and incorporating these methods can improve biodiversity conservation initiatives by promoting adaptive tactics that are better aligned with the particular requirements of local ecosystems (Dunlap & Fairhead, 2021). In this setting, coordination among Indigenous peoples, local authorities, and conservation organisations is crucial for developing conservation approaches that are ecologically viable and culturally suitable.

The concept of ecological citizenship is highly relevant in this context, where local communities are recognised as integral components of broader ecological systems, as well as rights holders and duty bearers responsible for the sustainable management of natural resources (Jessen et al., 2022; Maulana et al., 2024; Triyanto et al., 2023). This concept underscores that conservation is not solely the responsibility of states or international organisations, but rather a collective obligation involving all segments of society (Dwi Mustikarini & Ardian Feriandi, 2020; Gusmadi & Samsuri, 2020; Mariyani, 2017).

Although the concept of ecological citizenship has been widely discussed in environmental and citizenship studies (Dobson, 2003; Gao, 2025), much of the existing literature tends to focus on urban communities within Western liberal democracies. These studies often emphasise the moral and political responsibilities of individuals toward the environment, while paying less attention to the ecological values and practices Indigenous peoples have cultivated over centuries (Cao, 2015; Wolf et al., 2009).

Similarly, academic literature on civic engagement in environmental issues is often associated with modern forms such as activism, advocacy, or civil society movements (Holley, 2010; Putnam, 2000). In contrast, Indigenous civic participation, as in the case of the Tengger community in Indonesia, is more commonly viewed through the lens of cultural preservation rather than as an expression of ecological citizenship. However, there remains a lack of scholarly literature integrating contemporary ecological citizenship theory with Indigenous based civic engagement, especially from localised, non-Western perspectives grounded in local cosmology and ecological spirituality (Maulana et al., 2023; Taufiqurrahman & Suharno, 2021; Wangpakapattanawong et al., 2010).

To achieve more inclusive and sustainable conservation, synergy between Indigenous communities, governments, and other stakeholders is crucial (Karatekin, 2018; Taufiqurrahman & Suharno, 2021). Collaborative approaches that integrate conservation policies with time-tested local practices may provide viable solutions to the complex conservation challenges of our time (Guerrero et al., 2018; Liu et al., 2018). This study aims to analyse the involvement of the Tengger Indigenous community in strengthening ecological citizenship based on their local wisdom, particularly the values embedded in *Tri Hita Karana*.

Method

The researcher employed a qualitative research approach aimed at understanding a phenomenon within its natural context using an appropriate interpretive framework (Creswell, 2014). Key informants in this study included three traditional leaders or village shamans, who were considered capable of providing valuable insights into environmental conservation practices carried out by the Tengger Indigenous community, as well as two local residents of Hindu and Muslim faiths. The study focused specifically on the Ranu Pane Lake area, which is located within the Bromo Tengger Semeru National Park (TNBTS).

This study employs a qualitative approach that effectively elucidates the ecological aspects of Tengger Indigenous activities, enabling the researcher to investigate the meanings and beliefs inherent in local traditions. By actively engaging with traditional leaders and community members of many religions, the research acquires a comprehensive view on the practice of environmental conservation across religious and cultural boundaries. This interpretive involvement underscores the community's shared sense of ecological citizenship, wherein human activities are profoundly linked to spiritual responsibilities and indigenous knowledge. This approach emphasises the significance of cultural rituals, such as the Barikan ceremony, as dynamic systems of knowledge that influence environmental ethics and social responsibility.

From a critical perspective, the researcher's dependence on triangulation—integrating interviews, observation, and document analysis—enhances the study's credibility while simultaneously provoking enquiries over interpretive subjectivity. Although direct observation of the Barikan ceremony reveals genuine community engagement, the researcher's positionality and interpretive framework may affect the portrayal of these behaviours. Moreover, the limited number of key informants, while warranted in qualitative research, may restrict the generalisability of the findings beyond the Ranu Pane context. This methodological decision highlights the conflict between depth and breadth in ethnographic research, necessitating a balance between the richness of local insights and broader analytical assertions.

The researcher conducted direct observations by visiting the site during the Barikan ceremony, which is one of the manifestations of ecological citizenship. This ceremony reflects the community's understanding of rights and responsibilities through active participation in sustainable environmental conservation.

In addition, document analysis was conducted by collecting various relevant materials, including customary documents and previous research literature. After collecting data through source triangulation, primarily from key informant interviews, the researcher performed data condensation by simplifying, categorising, and eliminating irrelevant information to ensure that only the most pertinent data supported the study. The next step was data presentation, in which findings were organised systematically. Finally, the researcher conducted data validation to ensure the quality and reliability of the research outcomes, resulting in clear and trustworthy findings (Miles et al., 1994).

The emphasis on Ranu Pane Lake as the research location prompts a critical examination of the convergence between traditional ecological knowledge and governmental conservation policies in the Bromo Tengger Semeru National Park. The existence of governmental conservation frameworks may transform local practices, resulting in a hybrid model of environmental management where indigenous knowledge coexists or competes with institutional ecological administration. The study contributes to the broader discourse on the

decolonisation of environmental knowledge, highlighting that sustainable methods must integrate indigenous worldviews rather than treat them as simply cultural artefacts. This critical perspective frames the research as both a documentation of Tengger traditions and an intervention in reconsidering how contemporary conservation can benefit from indigenous knowledge systems.

Results and Discussion

The Correlation Between the Local Wisdom Values of Tri Hita Karana and Ecological Citizenship

Indigenous peoples hold a unique position in ecosystem restoration and protection due to their profound knowledge of the land, its resources, and the dynamics that affect them (Gashute & Hale, 2023; Wehi & Lord, 2017). Additionally, they have a direct stake in ecosystem restoration, as they benefit immediately from healthy ecosystems (Babai & Molnár, 2014; Shaffer, 2010; Wangpakapattanawong et al., 2010). Although the extent of Indigenous participation in global restoration efforts remains unclear, evidence shows that they actively contribute to ecosystem restoration at regional levels within their respective territories (Lyver et al., 2016; Nagendra, 2007; Storm & Shebitz, 2006).

The contribution of Indigenous ecological knowledge to environmental conservation aligns strongly with the concept of ecological citizenship, which expands the rights and responsibilities of citizenship to include non-human entities and ecological relationships (Dobson, 2003, 2007). In practice, Indigenous groups such as the Māori in Aotearoa New Zealand and the Sahtú Dene and Métis in Canada not only preserve the environment through generational practices but also engage in complex ecological classification based on direct, in-depth interactions with their ecosystems. For example, a Māori proverb about the pollination of harakeke (flax) by the kakā bird has informed ecological restoration knowledge when scientific data were lacking (Wehi, 2009). Similarly, the Dene people's classification of caribou based on behavioural and morphological traits has been shown to correspond with scientific genetic data, reinforcing their role in conservation planning (Polfus et al., 2016).

Such knowledge systems reflect intersubjective relationships at the heart of ecological citizenship. Indigenous communities serve as representatives of nature (Stone, 2010) and holders of ecological authority rooted in spiritual, social, and ecological integration. This concept intersects with Fraser and Honneth's theory of recognition and redistribution, which emphasises the importance of acknowledging cultural identities and knowledge systems as prerequisites for achieving social and ecological justice (Voice, 2005).

Thus, recognising Indigenous Peoples as ecological citizens is a normative expansion of citizenship and a strategic approach for developing more inclusive, locally grounded, and sustainable conservation policies (Martin et al., 2013). This approach aligns with the Multiple Evidence Base (MEB) framework, which promotes epistemic justice and cross-knowledge collaboration in biodiversity governance (Tengö et al., 2014, 2017).

We identify three key ways in which Indigenous Peoples in Indonesia directly participate in sustainable conservation practices (1) Maintaining traditional environmental management practices based on local knowledge; (2) Restoring degraded lands affected by resource exploitation and extraction; and (3) Collaborating with other Indigenous groups and environmental activists to provide input to government institutions in environmental governance (Dawson et al., 2021; Maulana et al., 2023; Triyanto et al., 2023).

The Tengger Indigenous People reside in what is now known as the Tengger region (Rahmawati & Suseno, 2021). This area lies within the enclaves and exclaves of the Bromo Tengger Semeru National Park (TNBTS), spanning four districts in East Java Province: Lumajang, Probolinggo, Malang, and Pasuruan. The term "Tengger" has dual meanings: it is an acronym derived from their ancestors, Rara Anteng and Jaka Seger, and it is also interpreted as Tengering Budi Luhur, symbolising virtuous character (Punta Yoga Astoni, 2018).

The Tengger community maintains a robust yet straightforward social structure, as reflected in their customary institutions and laws, such as the "Sumpah Banyuroto" oath, which binds all members of the community and is rooted in the values of Tri Hita Karana (Damanik et

al., 2020). The customary leadership system is embodied by the role of the dukun, who serves not only as a spiritual leader but also as the guardian of local norms and customary law (Hidayat, 2019).

Tengger culture is deeply interwoven with the Tri Hita Karana philosophy, which encompasses three fundamental elements: *Parahyangan* (harmonious relationship with the divine), *Pawongan* (harmonious relationship among people), and *Palemahan* (harmonious relationship with nature) (Antika et al., 2014; Santoso et al., 2009). Ecological citizenship demands environmentally sustainable actions and the internalisation of ecological values in daily life (Maulana et al., 2023). These three elements are evident in the daily practices of the Tengger community, including religious rituals, communal cooperation, and respect for the environment (Oktaviana & Suasthi, 2024).

The Tri Hita Karana philosophy upheld by the Tengger community can be regarded as a local knowledge system. This aligns with the perspectives of Gavin and Berkes, who assert that such knowledge systems can provide insights, methods, theories, and practices for sustainable ecosystem management. This definition emphasises the system through which (Berkes, 2017; Gavin et al., 2015) knowledge is generated and shared (Tengö et al., 2017).

As ecological citizenship encompasses both pro-environmental behaviours and the underlying values and motivations, activating relevant pro-environmental values can foster positive changes across all dimensions of environmental citizenship (Steg, Perlaviciute, et al., 2014). In the Tengger community, the value of *gotong royong* (cooperation) is deeply embedded and manifested in various activities such as agriculture, traditional ceremonies, and conflict resolution. This aligns with the principles of ecological citizenship, which are grounded in values such as fair distribution of environmental resources, civic participation, and collaborative sustainability policymaking (Balundė et al., 2020; Schild, 2016).

Numerous studies have also linked components of ecological citizenship and pro-environmental behaviours to locally embedded values, including Tri Hita Karana (Steg, Bolderdijk, et al., 2014; van der Werff et al., 2013). Moreover, these values relate closely to social norms and motivations crucial for cultivating ecological citizenship (Abrahamse & Steg, 2013; Stern et al., 1999). These practices reflect collectivist principles at the heart of the Tengger people's efforts to maintain social harmony, consistent with ecological citizenship ideals (Rahmawati & Suseno, 2021).

Tri Hita Karana and ecological citizenship both place an emphasis on maintaining healthy interactions with the natural world outside of oneself. There is a direct alignment between the *Palemahan* element of Tri Hita Karana and the ideals of ecological citizenship, which advocate for environmentally responsible behaviour and stewardship (İzgi Onbaşılı & Ercan Yalman, 2025; Suci et al., 2018; Wiwin, 2021).

Increasing ecological citizenship can be accomplished through the incorporation of local knowledge values, such as those contained in *Tri Hita Karana*, into environmental education. This can be accomplished by encouraging a deeper awareness of nature and appreciation for it. Social harmony, also known as Pawongan, is something that Tri Hita Karana works to promote, which is a vital component of community-based environmental efforts. Communities that place a priority on social fairness and collective action are ideal environments for the growth of ecological citizenship (Clarke & Agyeman, 2011; Suci et al., 2018; Wiwin, 2021).

For example, the adoption of *Tri Hita Karana* in tourism communities is an example of how community empowerment and engagement may lead to more responsible and sustainable environmental practices. It is possible to effectively teach ecological citizenship in younger generations through the implementation of environmental education programs that combine *Tri Hita Karana* and its values. Students are able to gain a better understanding of the link between human actions and environmental health through these programs, which in turn encourages sustainable behaviours (Jayanthi et al., 2025; Primayanti & Puspita, 2022; Salain & Mahastuti, 2021).

Ecological Citizenship in Local Wisdom-Based Conservation Practices

The Tengger Indigenous Community in the Bromo Tengger Semeru National Park (TNBTS) region demonstrates a unique and sustainable environmental conservation model that integrates spiritual, social, and ecological dimensions within a cohesive cultural framework. Their relationship with nature is not solely grounded in ecological principles. Still, it is also rooted in cosmological beliefs that consider sacred areas such as Lake Ranu Regulo and Ranu Pane as spiritually protected spaces inhabited by ancestral spirits or danyang. These beliefs form the moral foundation for resource management practices in partnership with the TNBTS authorities under a land tenure system recognised by the state (Putri et al., 2022; Santoso et al., 2009).

In implementing conservation practices, the Tengger community applies the Tri Hita Karana principle, which originated from Balinese tradition but was locally adapted as the foundation of their environmental ethics. This approach emphasises harmony among humans, the divine, and nature, positioning conservation as an ecological, spiritual and social imperative(Pasek Suryawan et al., 2022). Hence, environmental stewardship becomes an inseparable part of everyday life.

This outlook aligns with the concept of ecological citizenship defined by Dobson (2003; 2007), which expands the scope of citizenship to include political and social rights and duties and moral and ecological responsibilities. The Tengger community exemplifies this ecological responsibility through individual and collective environmental conservation engagement. For example, they restore and adapt agricultural land to the local geographic conditions, create new ecosystems with high biodiversity, and safeguard culturally significant sites with ecological importance (Babai & Molnár, 2014; Cuerrier et al., 2015; Garibaldi & Turner, 2004).

Despite modern challenges such as tourism and intensive agricultural pressures, the Tengger people strive to preserve ecosystem sustainability through various adaptive strategies. Whereas many reforestation efforts in TNBTS have resulted in monocultures or the use of non-endemic species (Hua et al., 2016), the Tengger maintain mixed agricultural systems that preserve soil fertility. Conservation efforts are strictly monitored through information dissemination regarding permissible and prohibited activities in protected zones, recruitment of residents as TNBTS staff, and zoning revisions to accommodate indigenous religious rituals (Anggiana et al., 2014).

For the Tengger community, land is a means of rural production and a key element in forming both individual and collective identity. This value is reflected in an inclusive and equitable system of land inheritance regardless of gender or birth order, which underscores the linkage between conservation values, social structure, and intergenerational continuity (Hekmatyar & Adinugraha, 2021). Thus, the Tengger's conservation model preserves natural ecosystems and the collective identity and values transmitted across generations.

Comparable expressions of ecological citizenship can also be observed in other Indigenous communities worldwide. In the Arctic, for instance, the Inuit have adapted to climate change by reducing their hunting of endangered marine species and shifting to alternative species such as geese and reindeer. They have also developed methods for preserving food by freezing it outdoors in suitable weather or indoors under controlled conditions. In Africa, Indigenous Forest management practices are rooted in spiritual values and traditional ecological knowledge (TEK), including sacred groves, taboos, and conservation-oriented rituals that regulate resource use (Makondo & Thomas, 2018). A prominent example is the Nashulai Maasai Conservancy in Kenya, where human-wildlife coexistence is facilitated through community-based conservation models (Bai et al., 2022; Sele & Mukundi, 2024).

These practices exemplify ecological citizenship, a form that integrates ecological ethics, social responsibility, and active participation in ecosystem management. They not only support environmental sustainability but also contribute to the preservation of identity, cultural values, and intergenerational resilience. Consequently, the traditional practices of Indigenous peoples such as the Tengger community represent an ideal embodiment of ecological citizenship that fuses environmental morality, social justice, and cultural continuity.

Conclusion

Integrating Indigenous knowledge systems, such as Tri Hita Karana, with ecological citizenship offers a compelling and culturally grounded framework for sustainable environmental governance. The Tengger Indigenous community exemplifies this synthesis through their daily practices, spiritual worldviews, and social norms, collectively fostering a harmonious relationship with nature. By internalising ecological values and applying them in traditional land use, ritual practices, and community cooperation, the Tengger people conserve their natural environment and preserve cultural identity and social cohesion.

This case illustrates how ecological citizenship extends beyond legal-political definitions to encompass ethical responsibilities toward non-human entities, intergenerational justice, and epistemic plurality. Moreover, comparative insights from Indigenous communities around the world, such as the Inuit in the Arctic and the Maasai in Africa, further reinforce the global relevance of localised, community-based conservation models rooted in spiritual and cultural values.

Recognising and supporting such models through inclusive policies, cross-knowledge collaboration, and respecting Indigenous autonomy is essential to achieving long-term ecological resilience. In this context, environmental citizenship is not merely a theoretical construct. Still, a lived reality embodied, practised, and sustained by Indigenous peoples like the Tengger, whose wisdom and stewardship are vital to the future of biodiversity and environmental justice.

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The authors declare no potential conflicts of interest concerning this article's research, authorship, and/or publication.

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Ethics Approval

This study was exempt from requiring ethical approval. Universitas Sebelas Maret has confirmed that no formal ethics approval is necessary for this type of research.

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