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Grassroots Movements for the Existence of Trees and Water in Gunungkidul: Between Tradition and Ecological Work

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Abstrak

Gunungkidul merupakan salah satu kabupaten di Daerah Istimewa Yogyakarta yang memiliki kawasan hutan terluas dibandingkan wilayah lainnya. Keunikan wilayah ini tidak terlepas dari kuatnya tradisi komunitas masyarakat serta keselarasan dengan visi kebudayaan Yogyakarta, *Hamemayu Hayuning Bawana*, yang bermakna menjaga keharmonisan dan keindahan dunia. Secara ekologis, Gunungkidul berfungsi sebagai kawasan penyangga bagi wilayah sekitarnya. Namun, keberadaan hutan menghadapi ancaman serius akibat penebangan untuk industri mebel serta alih fungsi lahan menjadi area pertanian. Jika berlangsung tanpa pengendalian, kerusakan ekologis seperti banjir berpotensi terjadi, meskipun wilayah ini dikenal rentan terhadap kekeringan. Merespons situasi tersebut, berbagai gerakan akar rumput berbasis komunitas lokal tumbuh dan berkembang. Penelitian ini menggunakan pendekatan netnografi (*digital ethnography*) dengan teknik analisis dokumen daring, khususnya pemberitaan media *online* dan publikasi digital komunitas, untuk menelusuri representasi, narasi, dan konstruksi makna gerakan lingkungan di ruang publik digital. Temuan menunjukkan bahwa gerakan seperti Resan Gunungkidul, Daksina Arga, dan Sanggar Lumbung Kawruh tidak sekadar mendorong penanaman pohon, tetapi mereinterpretasi nilai *Hamemayu Hayuning Bawana* dan *Traditional Ecological Knowledge* sebagai praktik tata kelola ekologis berbasis komunitas. Integrasi nilai kosmologis, pengetahuan siklus air, serta etika relasi manusia–alam diwujudkan dalam aksi kolektif yang partisipatoris. Dengan demikian, tradisi berfungsi sebagai kerangka normatif dalam *ecological governance* lokal.

Kata Kunci: tradisi; kearifan lokal; hutan; ekologi; gerakan akar rumput; netnografi

Abstract

Gunungkidul is one of the regencies in the Special Region of Yogyakarta with the largest forest area compared to other regions. The uniqueness of this area is closely related to the strong traditions of local communities and their alignment with Yogyakarta's cultural vision, Hamemayu Hayuning Bawana, which means maintaining the harmony and beauty of the world. Ecologically, Gunungkidul functions as a buffer zone for surrounding areas. However, the forests face serious threats due to logging for the furniture industry and land conversion into agricultural areas. If these practices continue without control, ecological damage such as flooding may occur, even though the region is widely known for its vulnerability to drought. In response, various grassroots movements based on local communities have emerged and developed. This study employs a netnographic (digital ethnography) approach through the analysis of online documents, particularly media reports and community digital publications, to trace representations, narratives, and meaning constructions of environmental movements in digital public spaces. The findings show that movements such as Resan Gunungkidul, Daksina Arga, and Sanggar Lumbung Kawruh not only promote tree planting but also reinterpret Hamemayu Hayuning Bawana and Traditional Ecological Knowledge as community-based ecological governance practices.

Keywords: *tradition; local wisdom; forests; ecology; grassroots movement*

INTRODUCTION

Gunungkidul Regency, located in the southern part of the Special Region of Yogyakarta, Indonesia, faces ecological vulnerability shaped by its karst landscape, limited water retention capacity, and increasing environmental pressures. Characterized by limestone hills, underground rivers, caves, and dryland agricultural systems, the region presents a complex socio-ecological environment shaped by both natural constraints and human adaptation (Sudarsono, 2005). In recent decades, however, deforestation, land conversion, and changing rainfall patterns have intensified ecological risks, including water scarcity, land degradation, and potential flooding. These pressures reflect broader governance tensions between environmental conservation and market-driven economic activities.

Within this challenging ecological context, local communities have long relied on cultural principles to guide their relationship with nature. One of the most significant is the Javanese philosophical concept of *Hamemayu Hayuning Bawana*, which emphasizes the responsibility of humans to preserve the harmony and balance of the world. Rather than functioning solely as an abstract moral value, this philosophy operates as an ethical framework shaping social norms, environmental practices, and collective responsibilities within Javanese communities. In Gunungkidul, such values historically informed how communities managed limited water resources, cultivated dryland agriculture, and maintained ecological balance in a fragile karst ecosystem.

These culturally embedded practices can be understood within the broader concept of Traditional Ecological Knowledge (TEK). TEK refers to the cumulative body of knowledge, beliefs, and practices developed through long-term interactions between local communities and their environments. It encompasses ecological observations, resource management strategies, cosmological values, and ethical frameworks governing human–nature relations. Previous studies highlight TEK as a crucial foundation for sustainable environmental governance, particularly in indigenous and rural contexts. However, much of the existing literature treats TEK as a static cultural inheritance rather than a dynamic system continuously reinterpreted in response to contemporary environmental and socio-economic pressures.

This perspective reveals an important research gap. Limited scholarship examines how TEK is mobilized and reconstructed within contemporary grassroots movements, particularly in regions experiencing ecological vulnerability and rapid socio-economic transformation. Furthermore, little attention has been given to how such reinterpretations are articulated within digital public narratives, where community actors increasingly communicate environmental concerns, share knowledge, and build broader ecological awareness.

In Gunungkidul, grassroots initiatives have emerged as important actors in addressing ecological degradation while revitalizing cultural values related to environmental stewardship. Movements such as Resan Gunungkidul, Daksina Arga, and Sanggar Lumbung Kawruh illustrate how community actors reinterpret *Hamemayu Hayuning Bawana* and TEK as practical foundations for ecological action. Their activities include tree planting, spring conservation, environmental education, and cultural knowledge transmission, often organized through participatory community networks.

Building on this context, this study examines how grassroots movements in Gunungkidul reconstruct cultural philosophy and Traditional Ecological Knowledge as frameworks for community-based ecological governance. By analyzing digital narratives, community publications, and online media representations, the research explores how local actors reinterpret tradition as a dynamic resource for addressing contemporary environmental challenges. Through this perspective, the study contributes to broader debates on environmental governance by demonstrating how culturally grounded collective action can function as an alternative governance mechanism in contexts of ecological vulnerability and development pressures.

LITERATURE REVIEW

Grassroots movements have increasingly been recognized as central actors in environmental governance, particularly in rural and ecologically vulnerable regions where formal state interventions are limited or insufficient. The literature emphasizes that grassroots environmental movements commonly emerge from direct experiences of ecological degradation, livelihood insecurity, and governance exclusion, motivating collective action to protect and sustain local natural resources. Rather than functioning solely as reactive protests, these movements often develop alternative forms of environmental governance rooted in local knowledge, collective norms, and everyday practices. Studies on forest-based social movements

demonstrate that communities can become effective environmental stewards when they possess recognized rights, meaningful participation, and the capacity to organize collectively, challenging the assumption that conservation must be imposed externally by the state or international actors (Cronkleton et al., 2008).

Within the broader framework of environmental governance, grassroots movements are understood as both social and institutional actors. They mobilize collective identities, moral claims, and cultural values while simultaneously organizing concrete ecological practices such as reforestation, watershed protection, and resource monitoring. This dual character distinguishes grassroots movements from formal environmental organizations, as their legitimacy is grounded in lived experience and local accountability rather than professional expertise alone. Environmental governance scholarship increasingly highlights that sustainable outcomes are more likely when governance arrangements incorporate local actors who have long-term stakes in ecosystem health and who understand the ecological specificities of their landscapes.

Political ecology perspectives further explain grassroots environmental movements as responses to unequal power relations in resource access and environmental decision-making. In the context of Gunungkidul, these asymmetries involve the intersection of state authority, market forces, and local communities. The Special Region of Yogyakarta operates under a distinctive governance structure in which the Sultanate (*Kesultanan* Yogyakarta) holds significant political authority over land and spatial arrangements, shaping environmental regulation and development priorities. At the same time, market-driven pressures particularly the furniture industry's demand for timber and the expansion of commercial agriculture intensify resource extraction and land conversion. These dynamics create uneven control over forest resources and water systems, often marginalizing community-based ecological practices. By situating Gunungkidul within this configuration of state–market power, political ecology provides a lens to understand grassroots movements not merely as cultural expressions, but as strategic responses to structural imbalances in environmental governance.

Environmental degradation is often the outcome of structural inequalities, marginalization, and development models that prioritize economic extraction over ecological sustainability. Grassroots movements challenge these dominant paradigms by asserting local rights, alternative values, and context-specific ecological knowledge. Research on grassroots environmental politics shows that community-based initiatives are particularly effective when environmental issues such as forest loss or water scarcity are directly linked to everyday survival, making environmental action inseparable from social reproduction and livelihood strategies (Stolar, 2019).

The literature also emphasizes that grassroots environmental movements are deeply embedded in place-based social relations. Unlike large-scale advocacy organizations, grassroots initiatives are shaped by local histories, cultural identities, and moral obligations toward nature. This embeddedness strengthens movement resilience, as environmental protection is framed not merely as activism but as a continuation of customary responsibilities. In many rural contexts, environmental stewardship is not articulated in technical or scientific terms but through moral narratives of care, obligation, and respect for ancestral land and resources, reinforcing collective commitment to conservation practices.

A significant body of research highlights the role of tradition and local wisdom in sustaining grassroots environmental action. Indigenous and local communities possess ecological knowledge accumulated through long-term interaction with specific environments, which is embedded in customary rules, rituals, and social institutions. Far from being static, tradition is increasingly understood as dynamic and adaptive, capable of responding to contemporary environmental challenges. Studies on community forestry show that traditional norms regulating tree cutting, water use, and land management often function as

effective conservation mechanisms, particularly in contexts where state enforcement is weak or absent.

The integration of tradition into ecological work also carries important symbolic and ethical dimensions. Rituals related to tree planting, sacred springs, or seasonal cycles reinforce collective responsibility and intergenerational ethics. Environmental practices rooted in tradition often frame nature not as a resource to be exploited but as a living system requiring respect and balance. This moral framing contributes to what scholars describe as environmental moral economies, where ecological sustainability is linked to cultural identity and social cohesion rather than external regulation alone

Community-based forest and water management is another dominant theme in the literature relevant to grassroots environmental movements. Empirical studies consistently demonstrate that when communities are directly involved in managing forests and watersheds, environmental outcomes improve due to stronger local accountability and contextual understanding. Integrated approaches to watershed management emphasize the ecological interdependence of forests, water systems, and livelihoods, particularly in fragile landscapes where deforestation directly threatens water availability and soil stability (Long et al., 2025).

In semi-arid and karst regions, the protection of trees is closely tied to water security, as vegetation cover plays a crucial role in groundwater recharge and erosion control. Grassroots movements that focus on reforestation often do so with an implicit understanding of these ecological linkages, even when such knowledge is not articulated in scientific terms. Community-led initiatives demonstrate that sustainable water management cannot be separated from forest conservation, highlighting the importance of holistic ecological practices grounded in local experience.

The success of community-based environmental management is closely linked to social capital and collective action. Trust, shared norms, and participatory decision-making enable communities to coordinate labor, enforce informal rules, and adapt to environmental change. The literature emphasizes that these social dimensions are as critical as technical interventions in determining long-term sustainability. Where social cohesion is strong, communities are better able to resist external pressures that threaten ecological balance, including commercial exploitation and unsustainable development projects.

Recent scholarship also highlights that grassroots movements operate within broader governance networks that connect local actors with NGOs, researchers, and government institutions. Rather than existing in isolation, grassroots initiatives often engage in multi-level interactions that shape environmental governance outcomes. Research on grassroots global governance illustrates how local watershed management practices can influence policy discourses beyond the local level through networks of knowledge exchange and advocacy, while global environmental norms are adapted to local contexts through community agency (Kauffman, 2017).

This networked perspective challenges the dichotomy between bottom-up and top-down governance. Grassroots movements can translate local practices into broader policy frameworks, while external support can enhance local capacity when it respects community autonomy. However, the literature also cautions that such interactions may generate tensions related to power, control, and cultural integrity. Maintaining the balance between external collaboration and local ownership remains a central challenge for grassroots environmental movements.

An emerging strand of literature connects grassroots environmental action with ethical frameworks, particularly the ethics of care. In this study, however, the ethics of care is not positioned as the primary analytical framework, but as a complementary perspective that enriches the political ecology approach. While political ecology serves as the main framework to examine power relations in environmental governance, the ethics of care helps illuminate the moral dimensions of grassroots action such as relational responsibility, intergenerational concern, and affective attachment

to land and water. By integrating these perspectives, the research moves beyond structural analysis of power to capture how environmental governance is simultaneously shaped by political-economic forces and culturally embedded ethical commitments.

This perspective emphasizes relational responsibility, empathy, and attentiveness to vulnerability in environmental decision-making. Environmental degradation is viewed not only as a technical failure but as a breakdown in care relationships between humans, communities, and ecosystems. Grassroots environmental practices such as tree planting and water protection are thus interpreted as acts of care that prioritize long-term well-being over short-term gains (Ma'rief, 2025).

The ethics of care framework is especially relevant in contexts where tradition and spirituality shape human–nature relations. Environmental action motivated by care reinforces collective responsibility and moral legitimacy, strengthening community commitment to conservation. This ethical dimension helps explain why grassroots movements persist despite limited resources, as their motivation extends beyond material incentives to include moral obligations toward future generations and the natural environment.

Despite the extensive literature on grassroots environmental movements, several gaps remain. First, limited studies examine how cultural philosophy and Traditional Ecological Knowledge are actively reconstructed as contemporary governance frameworks rather than treated as static heritage. Second, the interaction between grassroots mobilization and hybrid political authority structures such as the Sultanate-based governance system in Yogyakarta remains underexplored. Third, insufficient attention has been given to how these movements negotiate market-driven pressures, particularly resource extraction and commercial agriculture, within ecologically vulnerable regions.

Much of the existing scholarship focuses on Latin America or other regions of the Global South, with relatively limited attention to Java's karst landscapes and water-scarce regions. Beyond this geographical imbalance, a more significant conceptual gap persists: existing studies often conceptualize grassroots environmental movements either through resistance politics or participatory governance frameworks, but rarely integrate cultural cosmology and Traditional Ecological Knowledge as constitutive elements of ecological governance theory. Consequently, the literature has not adequately theorized how cosmological values in Javanese contexts such as those embedded in karst and drought-prone environments operate not merely as cultural background, but as structuring principles of governance practice. Addressing this gap enables a more nuanced understanding of how ecological vulnerability, cultural philosophy, and hybrid political authority interact in shaping community-based environmental governance.

Additionally, many studies examine either tradition-based practices or ecological interventions separately, without sufficiently exploring how these dimensions interact within grassroots movements. The Gunungkidul context provides a valuable case for addressing these gaps by examining how traditional values and ecological work are intertwined in sustaining trees and water.

By situating grassroots movements in Gunungkidul within broader debates on environmental governance, political ecology, and ethics of care, this study contributes to a more nuanced understanding of how local communities navigate ecological vulnerability. This research adopts political ecology as the primary analytical framework to examine power relations in resource control, land governance, and market-driven extraction. Environmental governance is used to conceptualize how grassroots actors construct alternative decision-making practices, while the ethics of care functions as a complementary lens to interpret the moral and relational dimensions embedded in their actions. Through this layered framework, the analysis investigates (1) how structural power asymmetries shape environmental pressures in Gunungkidul, (2) how grassroots movements reinterpret cultural philosophy and Traditional Ecological Knowledge as governance strategies, and (3) how ethical commitments reinforce collective ecological action. It

demonstrates that the persistence of trees and water is not solely the result of technical conservation efforts but emerges from the dynamic interaction between tradition, collective action, and everyday ecological work rooted in local moral worlds.

RESEARCH METHODS

This study examines grassroots initiatives dedicated to safeguarding trees and water resources in Gunungkidul, Indonesia, using a qualitative research design with a netnographic (digital ethnography) approach. Netnography is particularly suitable for analyzing how social movements construct meanings, communicate environmental concerns, and mobilize collective action through digital platforms. By focusing on online narratives and documents, this approach allows the study to capture how grassroots environmental initiatives are represented and articulated within the digital public sphere.

The research focuses on three grassroots initiatives: Resan Gunungkidul, Daksina Arga, and Sanggar Lumbung Kawruh. These initiatives were selected using purposive sampling based on two main criteria. First, each movement demonstrates consistent engagement in environmental activities related to tree planting, water conservation, and ecological education in Gunungkidul. Second, these initiatives maintain relatively strong digital visibility through online publications, news coverage, and social media activity, which makes them suitable cases for netnographic analysis. Their presence in digital media enables the researcher to trace narratives, representations, and discursive constructions of grassroots environmental action.

Data were collected from publicly accessible online materials published between Januari 2020 and May 2024. The dataset includes online news reports, community publications, press releases, organizational statements, blog posts, and social media content produced by the selected initiatives. These sources provide insights into how grassroots actors frame environmental issues, communicate their activities, and engage with broader environmental discourses. Social media posts, in particular, serve as important material for understanding how movements mobilize public participation, disseminate ecological knowledge, and construct collective identities in digital spaces.

In addition to movement-generated documents, this research also reviews relevant government policies, regulations, and planning documents related to environmental management in Gunungkidul. These materials help situate grassroots initiatives within the broader institutional framework of environmental governance and provide a comparative perspective on how issues such as water scarcity, deforestation, and land use are formally addressed by the state.

Academic literature also forms an important component of the data corpus. Scholarly works on environmental governance, grassroots environmental movements, and Traditional Ecological Knowledge (TEK) are systematically reviewed to build a conceptual framework for analysis. These sources provide theoretical insights for interpreting how local knowledge systems and cultural values influence community-based environmental practices.

Data analysis was conducted through manual qualitative coding. All collected documents were first organized and read iteratively to identify recurring narratives and key themes. The coding process involved several stages. The first stage consisted of open coding, in which significant statements and recurring patterns related to environmental motivations, community strategies, cultural values, and ecological challenges were identified. The second stage involved axial coding, where these initial codes were grouped into broader analytical categories such as environmental motivations, conservation practices, cultural narratives, and governance interactions. Finally, selective coding was used to synthesize these categories into core themes that explain how grassroots movements reinterpret cultural philosophy and Traditional Ecological Knowledge as foundations for ecological action.

To enhance the reliability and credibility of the findings, the study applies several qualitative rigor strategies. Data triangulation is conducted by comparing multiple sources, including grassroots

publications, online media reports, government documents, and academic literature. This cross-source comparison helps reduce interpretive bias and strengthen analytical validity. In addition, theoretical triangulation is applied by interpreting findings through the combined lenses of environmental governance and TEK frameworks.

Ethical considerations are carefully addressed in this digital ethnographic research. The study relies exclusively on publicly accessible online materials and does not access private digital spaces or restricted content. Although the data are publicly available, the research maintains ethical sensitivity by avoiding unnecessary disclosure of personal identifiers, particularly when referencing individual social media users. When quoting digital content, contextual integrity is preserved to prevent misrepresentation of community narratives.

Through this qualitative and document-based methodology, the study seeks to generate a rigorous and contextualized understanding of how grassroots environmental movements in Gunungkidul mobilize cultural values, knowledge systems, and digital communication to address ecological challenges related to trees and water resources (Bernard, 2017).

RESULT AND DISCUSSION

Landscape of the environment problem in Gunungkidul

Gunungkidul, characterized by its dominant karst topography, presents a structurally fragile socio-ecological system in which trees and water are materially and hydrologically interconnected. The porous limestone landscape limits surface water retention, making vegetation cover crucial for regulating infiltration, reducing runoff, and sustaining groundwater reserves. Consequently, deforestation, water scarcity, and land degradation are not isolated environmental problems but mutually reinforcing ecological processes that intensify vulnerability and directly affect agrarian livelihoods and local resilience (Wacano et al., 2021).

These structural-ecological constraints constitute the material foundation from which grassroots environmental movements emerge. Community-based initiatives focused on tree planting, spring protection, and collective water management can be understood as adaptive and political responses to chronic resource scarcity shaped by the karst environment. Rather than merely addressing environmental symptoms, these movements reconfigure local governance practices, mobilize communal labor, and reactivate traditional ecological knowledge as part of a broader strategy of socio-ecological restoration. In this sense, the environmental challenges of Gunungkidul are not simply contextual background; they actively shape the motivations, organizational strategies, and collective identities of grassroots actors engaged in environmental protection and sustainability advocacy.

Deforestation is a severe problem in Gunungkidul, significantly impacting the region's ecology and economy. The once lush forest cover has been steadily declining due to various factors, including agricultural expansion because the growing population has led to increased demand for farmland and resulting in the conversion of forest areas into agricultural land, Illegal timber harvesting is a persistent issue that contributing to deforestation and habitat loss, and the karst topography because Gunungkidul's unique geological features that characterized by porous limestone formations and make the region particularly vulnerable to deforestation as the trees help to stabilize the soil.

Gunungkidul is predominantly forested, with a mix of community and state-owned woodlands. In fact, over half of Yogyakarta's community forests are located in Gunungkidul, covering approximately 42,570 hectares. While most of Gunungkidul's forests are designated for timber production, there are also smaller areas dedicated to conservation and protection. These forests play a crucial role in preventing land degradation, a significant issue in Gunungkidul. By reducing the extent of critical land, which amounted to 13,673.62 hectares in 2015, forests contribute to the region's economic growth and community well-being. Moreover, they are essential for maintaining the ecosystem's hydrological balance (Arida, 2022).

Gunungkidul also grappling another problem a severe water scarcity crisis. The region's unique karst geology, characterized by porous limestone formations, makes groundwater storage and management challenging. Gunungkidul Regency, a region within the Yogyakarta also endures a persistent struggle against severe droughts. This recurring phenomenon casts a long shadow over the lives of its residents, jeopardizing their well-being and economic prosperity.

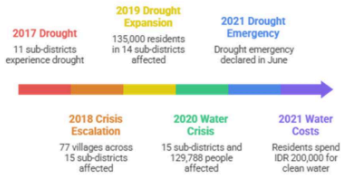

Figure 1. Gunungkidul Drought Crisis Progression
Source: Researcher Processed (2024)

Data from various sources paints in 2017, official reports from the Regional Disaster Management Agency (BPBD) documented 11 sub-districts experiencing drought and desperately requiring water assistance (Hadi, 2017). The following year, 2018, witnessed an escalation of the crisis. The reach of water scarcity extended to 77 villages across 15 sub-districts, impacting a staggering 132,491 individuals struggling to access clean water (Hardiyanto, 2018). The year 2019 offered no respite. The drought's footprint expanded further, affecting a staggering 135,000 residents spread across 14 sub-districts (Prima, 2019). This trend of intensifying drought continued into the following years. In 2020, 15 sub-districts, or roughly 129,788 people, grappled with the water crisis (Chairunnisa, 2020). The situation reached a critical juncture in 2021 when a drought emergency was declared in June, with 16 sub-districts falling prey to the relentless aridity (Kurniawan, 2021). News reports from Kompas.com highlighted the stark reality faced by residents – the need to spend a significant sum, around IDR 200,000, to secure clean water during the dry season (Yuwono, 2021).

The consequences of these recurring droughts are far-reaching and deeply concerning. The most immediate impact is a crippling water scarcity during the dry season, severely impacting daily life and essential activities. This scarcity extends beyond domestic needs, affecting the productivity of natural resources within the region. Agricultural output suffers, leading to a decline in income for local communities (Suryanti, 2010). This creates a vicious cycle, as reduced income limits the resources available to invest in water conservation measures, potentially exacerbating the drought's impact in the future. The situation in Gunungkidul Regency underscores the urgent need for sustainable solutions to address the water crisis. Effective water management strategies and investment in drought-resistant agricultural practices are crucial steps towards building resilience and safeguarding the livelihoods of its residents.

This water scarcity also impacted to the access of clean water. Coupled with the increasing demand for water due to population growth and economic development, has exacerbated the problem. Access to clean water is a fundamental human right, yet it remains a distant reality for many in Gunungkidul. The daily struggle to secure this essential resource places a disproportionate burden. They often spend hours each day trekking to distant water sources and carrying heavy loads back to their homes. This arduous task significantly impacts their lives, limiting their opportunities for education, employment, and other essential activities. Beyond the individual hardships, the water crisis in Gunungkidul has broader implications for the community. The time spent collecting water diverts valuable human resources from productive activities, hindering economic development. Additionally, the lack of access to clean water contributes to poor hygiene and sanitation conditions, increasing the risk of waterborne diseases. These interconnected challenges highlight the urgent need for sustainable solutions to address water scarcity in Gunungkidul.

Addressing these challenges requires a multi-pronged approach. Sustainable forest management practices, including reforestation initiatives and

combating illegal logging, are crucial for restoring ecological balance and promoting water security. Implementing water-saving technologies and infrastructure projects are essential to manage water resources effectively. Additionally, fostering community involvement in conservation and water management efforts is vital for long-term success.

The Grassroot Movements: Tradition and Ecological Work for the Existence of Trees and Water

The Gunungkidul karst region is facing a growing environmental crisis, intensified by development and mining activities. The most apparent issue is the recurring water shortage in areas like Rongkop, Tepus, and Panggang during the dry season. This environmental degradation is exacerbated by a local identity crisis, where many residents feel disconnected from and unaccountable for their surroundings.

In response, the Resan Community is working to revitalize a sense of belonging among Gunungkidul residents through local customs and wisdom. This grassroots movement aims to foster environmental stewardship among community members. Rooted in spirituality and ecological awareness, the Resan Community believes that strengthening local identity is crucial for preserving the environment as a shared living space. The Resan Community derives its name from the Javanese word "reksa," meaning "guardian", reflecting the group's normative commitment to safeguarding local ecological resources, particularly trees and water sources, as part of a collective stewardship ethic rather than merely a symbolic identity. This self-appointed role reflects their commitment to protecting Gunungkidul's environment. The name also embodies their focus on cultivating and nurturing trees, particularly large, water-conserving species like banyan, rain trees, and tamarind. Unlike commercial tree plantations, Resan's approach prioritizes long-term ecological benefits over immediate economic gain (Adam & Smith, 2023).

Operating informally and without a rigid organizational structure, the Resan Community exemplifies informal governance and non-institutionalized environmental politics. Rather than functioning as a formally registered organization with bureaucratic hierarchies, the group relies on voluntary participation, flexible coordination, and relational networks. This organizational fluidity allows it to collaborate with like-minded individuals and collectives through seed exchange initiatives, community planting events, and locally driven conservation actions. In this sense, environmental engagement is enacted through civic practice rather than formal policy channels.

A strong sense of local identity constitutes the normative core of the movement, attracting participants from diverse social and religious backgrounds. This inclusiveness reflects a form of grassroots environmental politics grounded not in partisan alignment but in shared territorial attachment and ecological responsibility toward Gunungkidul. Their collective action demonstrates how environmental governance can emerge outside state-centric or market-based institutional frameworks.

Beyond tree planting and maintenance, the Resan Community advances a holistic socio-ecological vision for Gunungkidul's future. Their initiatives seek to revitalize local wisdom related to water management, land use, and ecosystem stewardship. A key dimension of this effort is the documentation and preservation of oral histories and traditional ecological knowledge (TEK). By recording stories, songs, and embodied environmental practices, the community strengthens cultural continuity while generating locally embedded sustainability strategies. This knowledge not only reinforces collective identity but also functions as an adaptive resource for building resilience to environmental change (Assalimi & Yuanjaya, 2023)

Furthermore, the Resan Community is actively involved in community empowerment and education. They organize workshops, training programs, and educational events to raise awareness about environmental issues and promote sustainable lifestyles. By involving local people in decision-making processes and capacity building, they foster a sense of ownership and responsibility

for the environment. The Resan Community's efforts have garnered attention and support from various sectors. Collaborations with government agencies, academic institutions, and other NGOs have been instrumental in expanding their impact. Their work serves as an inspiration for other communities facing similar environmental challenges, demonstrating the power of grassroots initiatives in driving positive change (Martias, 2024).

Another community is Daksina Arga. The Daksina Arga Community stands as a testament to the power of community-led environmental conservation. Rooted in the rich tapestry of Javanese culture, the community has successfully merged tradition with modernity to address the pressing ecological challenges facing Gunungkidul. Through their *Nandur Banyu* (Planting Water) initiative, they have demonstrated an unwavering commitment to restoring the region's natural balance (Irawan, 2024). Central to the community's approach is the integration of mocopat, a traditional art form, into their conservation efforts. Mocopat serves as a powerful medium for disseminating environmental messages, making complex ecological concepts accessible to the broader community. By weaving environmental themes into the fabric of local culture, the Daksina Arga Community has fostered a deep-rooted connection between residents and their natural surroundings.

Beyond tree planting, the community's holistic approach encompasses a wide range of activities. Water resource conservation is a critical component of their work, recognizing the intricate relationship between forests and water availability. By implementing rainwater harvesting systems and promoting sustainable water use practices, the community has contributed to improving water security in the region. Moreover, the Daksina Arga Community places a strong emphasis on education and empowerment. Through workshops, training programs, and community outreach initiatives, they have successfully raised awareness about environmental issues and inspired individuals to become active participants in conservation efforts. By building capacity within the community, the Daksina Arga Community has ensured the sustainability of their work and fostered a sense of ownership among residents.

The challenges faced by the Daksina Arga Community are not insignificant. Resource constraints, climate change, and shifting societal priorities pose ongoing threats to their efforts. However, through resilience, innovation, and collaboration, the community has demonstrated its ability to adapt and overcome obstacles. Their unwavering commitment to their mission serves as an inspiration to others, proving that even small-scale initiatives can have a profound impact on the environment.

Another community in Gunungkidul that addresses the problem of trees and water is an unique educational initiative has taken root. Lumbung Kawruh, a community-led learning space, has emerged as a beacon of hope, offering an alternative approach to education for the youth of Dusun Ngurak-Urak. This informal learning hub, established in 2014, fosters a culture of lifelong learning and community engagement, diverging from traditional classroom settings.

Lumbung Kawruh champions a holistic approach to education, emphasizing experiential learning and collaborative knowledge sharing. Its open and inclusive environment mirrors the community's aspirations for growth. By cultivating a love for inquiry and exploration, the initiative empowers individuals to become active participants in their own learning journeys. Recognizing the interconnectedness of education, environment, and community well-being, Lumbung Kawruh has the potential to catalyze sustainable development in Gunungkidul. By integrating environmental education into its curriculum, the community can cultivate a deeper understanding of the region's ecological challenges. Initiatives such as tree planting, water conservation, and organic farming can be seamlessly integrated into the learning process, fostering a sense of environmental stewardship (Padmaratri, 2022).

Furthermore, Lumbung Kawruh can serve as a platform for knowledge exchange, bridging the gap between local farmers, environmental experts, and young learners. By fostering collaboration and

sharing best practices, the community can develop sustainable agricultural models that address the region's pressing water scarcity issues. Ultimately, Lumbung Kawruh exemplifies how education can be a catalyst for positive change in rural communities. By combining learning with environmental stewardship, the initiative creates a powerful model for sustainable development (Kelurahan Petir, 2021).

The interconnected challenges of deforestation, water scarcity, and social inequality in Gunungkidul underscore the urgent need for innovative and community-driven solutions. The emergence of community-based initiatives such as Resan Community, Lumbung Kawruh, and Daksina Arga offers a glimmer of hope. These organizations, rooted in local wisdom and cultural values, have demonstrated the power of collective action in addressing complex environmental and social issues.

By integrating environmental stewardship with education, community empowerment, and cultural preservation, these initiatives have created a holistic approach to sustainable development. Their success highlights the importance of bottom-up approaches and the potential of local communities to drive positive change. As Gunungkidul continues to face environmental pressures, the lessons learned from these community-led initiatives can serve as a blueprint for other regions seeking to build resilient and equitable societies. By fostering collaboration, knowledge sharing, and capacity building, it is possible to overcome the challenges posed by deforestation, water scarcity, and social inequality. Ultimately, the future of Gunungkidul lies in the hands of its people. By investing in community-driven solutions and empowering local communities, we can create a sustainable and prosperous future for generations to come.

CONCLUSION

Gunungkidul's environmental challenges, particularly deforestation and water scarcity, have created conditions that require localized responses to ecological vulnerability. This study examined how grassroots movements contribute to safeguarding trees and water resources in Gunungkidul and how these initiatives communicate environmental action within digital public spaces. Using a netnographic approach, the research analyzed online narratives, digital publications, and media representations to understand how grassroots environmental movements articulate ecological concerns and mobilize collective action.

The findings show that initiatives such as the Resan Community, Daksina Arga, and Sanggar Lumbung Kawruh play important roles not only in implementing environmental practices but also in shaping digital narratives of ecological stewardship. Through online news, social media posts, and digital community publications, these movements frame environmental protection as both a cultural responsibility and a collective civic action. Digital platforms function as spaces for documenting conservation activities, disseminating environmental values, and strengthening networks among community members and wider audiences.

From a theoretical perspective, the study contributes to discussions on grassroots environmentalism and environmental governance by demonstrating how digital communication extends community-based ecological action. Grassroots actors use digital platforms to construct narratives, share Traditional Ecological Knowledge (TEK), and mobilize broader participation. Through online storytelling and documentation, cultural values such as *Hamemayu Hayuning Bawana* are translated into public environmental discourse.

Each movement demonstrates distinct strategies in combining environmental action with digital communication. The Resan Community documents conservation activities to encourage community participation. Daksina Arga integrates cultural expression, particularly mocopat, to communicate environmental values online. Sanggar Lumbung Kawruh functions as a knowledge hub that shares environmental education and community learning through digital platforms.

Overall, these movements operate within hybrid socio-digital spaces where ecological

practices are reinforced by digital storytelling and knowledge sharing. By linking cultural values, Traditional Ecological Knowledge, and digital communication, grassroots initiatives in Gunungkidul transform local traditions into adaptive strategies for addressing contemporary environmental challenges.

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