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Local knowledge as a foundation for environmental peacebuilding: Interpreting Johan Galtung's theory within the environmental security framework

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ABSTRACT

Background: Environmental degradation and social inequality demonstrate that peace cannot be defined simply as the absence of war or the cessation of conflict. This paper draws on the peace theory proposed by Johan Galtung. In this context, positive peace is understood as an effort to transform structural conditions that maintain inequality, by linking environmental justice to human dignity and ecological ethics. **Method**: Using a qualitative-interpretive approach with conceptual analysis of various literature and secondary data through reports from international institutions, news, and academic journals related to environmental security issues and local community-based studies, including indigenous peoples affected by environmental change. The analysis was conducted through a synthesis of Johan Galtung's peace theory with the human security framework as developed by the United Nations Development Programme (1994), specifically on the environmental security dimension and its relationship with local knowledge systems. **Findings**: The analysis shows that local knowledge strengthens environmental security through adaptive and relational mechanisms that maintain the balance between humans and nature. Thus, local knowledge is not merely a traditional practice, but a foundation for sustainable peace that restores human dignity and its ecosystem. It also expands the human security framework with a human-centered and environmental perspective. This role is evident in the three main dimensions of human security; freedom from fear, freedom from want, and freedom to live in dignity, which are interpreted as ecological and cultural rights to live with dignity in a reciprocal relationship with nature. **Conclusion**: The integration of positive peace and human security in environmental security offers a transformative approach to environmental peacebuilding that places local knowledge in collaboration in determining policy directions and nonviolent resistance in ecological restoration. Peace is understood as a condition of political stability, and relations between people and traditions. **Novelty/Originality of this article**: The novelty of this research contributes to bridging Johan Galtung's theory of peace and environmental security to the discourse of environmental peacebuilding through the lens of local knowledge epistemology, by offering a conceptual framework that places local knowledge as a core element in sustainable peacebuilding. It proposes a conceptual framework that places local knowledge as a core element in building sustainable peace.

KEYWORDS: environmental peacebuilding; environmental security; human security; local knowledge; peace.

1. Introduction

Environmental degradation and social injustice demonstrate that peace cannot be understood merely as the absence of war. The peace framework proposed by Johan Galtung

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has evolved through intensive interactions in which its components mutually shape and reinforce one another (Webel & Galtung, 2007). Galtung conceptualizes peace through two key notions: negative peace and positive peace. In discussing peace as a fundamental humanitarian ideal, Galtung (1996) defines negative peace as the absence of war or overt conflict. However, as noted by Reines and Conti in Agency of Peacebuilding (2021), such conditions frequently prove insufficient, as they leave unresolved the long-term consequences of protracted conflict, the burdens of which are often borne by subsequent generations. In this sense, negative peace reveals its fragility by merely postponing violence rather than eliminating or preventing its underlying causes.

Reflecting on these limitations, Johan Galtung further elaborates the concept of positive peace, which he defines as the negation of structural violence arising from social systems that sustain inequality. Such conditions are often legitimized through cultural violence, whereby structural violence comes to be perceived as normal or inevitable. This dynamic is illustrated by Berg et al. (2025), for instance, in cases of environmental crises resulting from land-use conversion for infrastructure projects that marginalize local communities and reduce rural populations' access to natural resources, thereby constituting a form of structural violence. Meanwhile, development narratives that appear progressive may, in fact, reproduce environmental injustice through unequal access to resources (Zimmermann & Lee, 2021), exemplifying cultural violence by rendering exploitative practices seemingly unavoidable. These practices, in turn, can give rise to direct violence actions that benefit one party over another, clearly delineating perpetrators and victims, and resulting in physical or psychological harm. Direct violence privileges one party as the "winner," the sole legitimate beneficiary, thereby reinforcing the existing legitimacy of cultural violence (Galtung, 1996; Sunarto et al., 2021).

Thus, peace in its fullest sense refers to the absence of injustice, the equitable enjoyment of well-being, and the de-escalation of conflict with or without the presence of an "enemy" peace for the sake of peace itself, serving as a means of ethical transformation at both individual and collective levels (Webel & Galtung, 2007). The positive peace framework creates analytical space to recognize that threats to peace also stem from inequality and social vulnerability that erode human dignity. When examined more closely within local contexts, such as Indigenous communities in Indonesia, this issue becomes particularly salient, as these communities frequently bear the brunt of environmental degradation and social inequality resulting from development policies (Setiawan et al., 2025).

The normalization of natural resource exploitation in the name of economic growth reflects a form of cultural violence. Ecological change poses significant risks to human survival (Eklöw et al., 2022), rendering this issue a critical locus for understanding how peace necessitates transformative change toward more just socio-cultural structures. In this regard, the concept of positive peace advances peace as a condition in which its conceptual foundations are coherently aligned with the human security paradigm. Rather than prioritizing the protection of state sovereignty alone, human security gains relevance by placing human well-being at the core of security concerns. This shift is further driven by the reality that individuals increasingly lose access to dignified, prosperous, and equitable lives due to multiple, overlapping challenges that shape human existence (UNDP, 2025). The turn toward human security thus marks a significant transition away from state-centric approaches toward a people-centered focus (Ştefanachi, 2021).

The United Nations Development Programme (UNDP), in the Human Development Report (1994), identified environmental security as a distinct dimension alongside other categories, including economic security, food security, health security, personal security, community security, and political security. Environmental security refers to the protection of individuals from threats arising from natural disasters and environmental degradation, while emphasizing that environmental crises may generate conflict. Within this framework, security is prioritized as a set of fundamental rights belonging to individuals and groups (Swain et al., 2023; Comerford & Fearnside, 2022). In pursuing such protection, patterns of local knowledge emerge as ways of understanding the environment by promoting balanced

environmental development within communities as a form of protected public freedom (Naheed & Shooshtarian, 2022). It is within this context that interpretations of peace and security must engage with the epistemic resources of communities themselves namely, local knowledge that records intergenerational ecological experience. Local knowledge refers to systems of local and traditional ecological knowledge comprising adaptive bodies of knowledge, beliefs, and practices that have been culturally transmitted across generations through human–nature relations. Such knowledge is often associated with Indigenous communities located at the margins, with limited access to mainstream economic growth (Hanazaki, 2024). While much of the human security literature has emphasized political and economic dimensions, this study seeks to expand the framework by situating local knowledge within environmental security. Accordingly, this article offers a novel approach that conceptualizes human security not merely as protection from threats, but as an ethical relationship between humans and nature rooted in local wisdom (Breed et al., 2022).

The authors identify local knowledge as operating within domains of lived experience and relationality, enabling the interpretation of marginalized environmental crises. Environmental crises driven by development and climate change exacerbate social tensions and heighten the risk of conflict, particularly in regions dependent on natural resources especially when adaptation and mitigation policies fail to account for local contexts. This observation is reflected in various approaches and pathways that integrate environmental issue management with conflict prevention, mitigation, resolution, and post-conflict recovery (Ide, 2021; Swain et al., 2023). From this perspective, local knowledge can be understood through an environmental security lens as a practice of ecological protection and relational sustainability (Webel & Galtung, 2007), an area that remains underexplored. This exploration aligns with the three core pillars of human security: freedom from fear, freedom from want, and freedom to live in dignity. Freedom from fear concerns liberation from anxiety and insecurity and is closely related to the freedom to express local knowledge, revealing freedom as a form of social protection that sustains human–nature harmony (Masferrer, 2023). Through local knowledge, communities are better equipped to confront climate change. Local knowledge functions as a repository that restores human–nature relationships, as communities that lose the space to express their environmental relations also lose social mechanisms for maintaining ecological balance. In this sense, local knowledge constitutes a form of nonviolent resistance while strengthening empathy and a sense of belonging toward land and fellow beings amid external interventions that fail to uphold principles of justice (Sanz & Rodríguez-Labajos, 2021; Mikkonen & Raatikainen, 2024). Meanwhile, freedom from want emphasizes the fulfillment of basic human needs in a sustainable manner, recognizing that well-being depends not only on economic conditions but also on ecological sustainability. Local knowledge thus serves as a critical source of environmental security, as it embodies principles of care and reciprocal ethics between humans and nature (Fatharini et al., 2024). Through local knowledge, communities assert their right to environments that sustain life, reframing freedom from want as not merely a matter of material needs but also of ecological and cultural rights to live well in balance with nature. Finally, freedom to live in dignity underscores every individual's right to live with respect within social and ecological life. Dignity entails not only protection from environmental degradation, but also recognition of cultural rights to maintain spiritual, historical, and symbolic relationships with nature (Yellow Cloud & Redvers, 2023).

This article seeks to integrate Johan Galtung's peace theory into the human security framework through the lens of environmental security, which is understood as a medium of peace that does not merely respond reactively to socio-environmental crises, but is grounded in local knowledge embedded in communities' everyday practices. This approach introduces a novel contribution by integrating local knowledge as a core component of environmental peacebuilding. Such an understanding is crucial, as it demonstrates how local knowledge supports environmental security in addressing socio-environmental crises arising from development pressures.

2. Methods

This study employs a qualitative–descriptive approach, strengthened by a conceptual analysis method. It examines Johan Galtung's peace theory and the human security framework through the perspective of environmental security, while extending the analysis to the context of local knowledge. The conceptual analysis is conducted by critically reviewing key literature on peace and environmental security and subsequently relating it to recent findings on local knowledge, Indigenous communities, and environmental sustainability. The primary objective of this study is to understand the contribution of local knowledge in strengthening the foundations of peace and environmental security. The research is exploratory–analytical in nature, focusing on ideas and practices that reveal the interconnections among peace, human security, and ecological awareness. The research proceeds through the following stages: (1) tracing the theoretical frameworks of peace and environmental security; (2) identifying the impacts of structural and cultural violence on environmental security; (3) analyzing the relevance of local knowledge within environmental security; and (4) identifying the role of local knowledge as a form of environmental peacebuilding.

Research rigor is ensured through source and theoretical triangulation by comparing analytical outcomes derived from diverse academic literature, policy reports, and documented practices of local knowledge. Secondary data are obtained from reports issued by international organizations, news sources, and peer-reviewed academic journals addressing environmental security and community-based studies, including those focusing on Indigenous societies. Validity is further strengthened by ensuring that all interpretative findings are grounded in Johan Galtung's theoretical framework and the core principles of human security, particularly environmental security. Throughout the analytical process, the study respects the values, symbols, and practices of Indigenous communities as legitimate sources of knowledge. Terminology is employed interpretatively to emphasize the social and ecological meanings embedded within communities, without claiming authority over them. Ultimately, this research seeks to position local knowledge as a public epistemic domain that enriches discourses on peace and sustainability.

3. Results and Discussion

3.1 Theories of peace and environmental security

All aspects of human life are implicated as universal objectives of peace. Peace constitutes a fundamental human aspiration that requires sustained dedication and collective struggle across all levels of society to be realized under diverse circumstances (Kapadia, 2024). In situations of conflict, peace does not automatically entail the cessation of physical violence; rather, it extends to the restoration of social relationships, justice, and reconciliation, which enable societies to coexist harmoniously. Without a deep understanding of the root causes of conflict and the interactions unfolding among individuals, peace efforts tend to remain temporary and fragile, particularly in post-conflict contexts. In post-conflict situations, societies often confront conditions of unstable peace. Johan Galtung argues that peace must achieve sustainability, a premise closely linked to his conceptual distinction between negative peace and positive peace. The theory of positive peace provides an opportunity to reconceptualize peace within the framework of human security, which subsequently intersects with environmental concerns through environmental security. However, prior to elaborating on this interconnection, it is essential to examine the emergence of negative peace and its inherent limitations. The concept of negative peace arose from efforts to halt war and direct violence, nevertheless, its analytical value remains limited because it conflates disparate conditions ranging from rivalry to close political relations while measuring peace solely through the absence of overt conflict and disregarding its positive dimensions (Galtung, 1969; Bayerlein et al., 2024). Consequently, negative peace serves as an initial milestone in humanitarian efforts to mark the end of

bloodshed. In this sense, peace is assessed primarily through the absence of open conflict, namely the cessation of war.

As a starting point, negative peace remains significant; however, it leaves a profound gap insofar as it fails to address the root causes of violence. Although conflict may subside, underlying inequalities ranging from economic disparities to environmental degradation often persist beneath the surface. This condition demonstrates that conflict must be carefully managed to prevent consequences such as the depoliticization of conflict, displacement, discrimination, and even environmental degradation (Krampe et al., 2024). Peace achieved in this manner merely postpones violence rather than dismantling its structural foundations. Therefore, assessing peace requires continuous and longitudinal evaluation through indirect indicators, such as conditions emerging from interactions among multiple systems including social, economic, infrastructural, and environmental domains operating within uncertain and complex dynamics (Amadei, 2020). On this basis, positive peace evolves as a framework that situates peace as a process of social and ethical transformation, drawing attention to forms of violence that are not always visible, such as land dispossession, ecosystem degradation, and the erosion of meaning in human–nature relations. In this context, positive peace does not end with efforts to halt conflict, as is the case with negative peace, but instead calls for reconciliation among humans, society, and the environment.

Furthermore, in line with this perspective, bottom-up approaches within positive peace seek to uncover sources of structural violence concealed behind narratives of development and progress. As illustrated by cases in the Global South, such as Colombia and Uganda two countries widely recognized for their high levels of biodiversity formal peace agreements have been signed to bring an end to prolonged civil wars. However, a critical gap emerged during the early integration of environmental issues, as natural resources such as forests were appropriated and controlled by armed groups wielding power, while concerns deemed non-essential were marginalized within peace process planning (Zelli & Krause, 2025). Consequently, the unintended outcomes of conservation policies in these contexts offer concrete evidence of the need for careful and context-sensitive engagement with human security. Environmental issues affect not only ecological stability but also the security of human life in everyday contexts, including access to resources, justice, and local identity. These challenges can be understood as threats to human life itself, as they directly intersect with basic human needs. As such, security approaches must extend beyond territorial protection toward existential protection that is, human security.

From a broader perspective, the human security approach further expands this scope by asserting that security should be measured not only by state stability, but also by the well-being of individuals and communities. Positive peace and human security both place human beings at the center, assessing peace not through political calm alone, but through the sustainability of dignified life. Human security has been explicitly articulated as the recognition of human rights across seven dimensions economic, food, health, personal, community, political, and environmental security (UNDP, 1994). This framework clearly emphasizes that threats are interconnected in their impacts on human life, particularly within the environmental domain, which directly intersects with everyday human existence. Consequently, these issues form the analytical foundation for understanding environmental security. Environmental security highlights that conflicts related to natural resources have the potential to intensify over time as a result of degradation, ecosystem destruction, and environmental hazards. At the same time, it underscores that sustainable human security is fundamentally rooted in the natural systems that sustain life (Swain et al., 2023). Environmental challenges including climate change, competition over natural resources, and environmental degradation are therefore inseparable from environmental security. In this sense, environmental security functions as an integrative medium through which positive peace is linked to structural transformation toward just human–nature relations as a core dimension of human security. This approach provides an operational framework for addressing the direct impacts of environmental threats on human life and dignity. Within this context, policy responses are required to address the symptoms of ecological conflict by

fostering socio-ecological resilience to ensure long-term sustainability. Ultimately, environmental security constitutes an effort to protect natural resources while simultaneously safeguarding human survival within interdependent life systems. This approach represents a transformative shift that moves beyond an exclusively anthropocentric orientation toward an ecocentric perspective, enabling the realization of positive peace a condition in which human well-being and ecosystem continuity coexist in harmony. To further examine how structures of violence operate within environmental security, the following section discusses structural and cultural violence.

3.2 Theories of peace and environmental security

To achieve harmony between humans and ecosystems, it is necessary to examine potential sources of conflict as a reference point toward genuine peace, in which human beings live securely and free from violence. Within this context, structural and cultural violence operate within socio-ecological systems through unequal access to resources and the legitimization of dominant development discourses. Issues of distributive justice and ecosystem continuity have become pervasive in an era of development that neglects environmental sustainability, as environmental change has increasingly permeated socio-ecological orders. This dynamic reveals how social systems comprising human actors, power relations, economic structures, and policies and ecological systems encompassing nature, resources, and ecosystems are mutually entangled in configurations of power and resource access. Consequently, sustainability-related challenges must be analyzed at their structural roots to fundamentally reassess human–nature interactions amid environmental change (Jahel & Lambin, 2024). Environmental changes such as declining coastal fisheries productivity, shoreline erosion, land degradation, and deforestation have effectively reconfigured power relations by determining who gains access to resources and who is marginalized. While ecological scholarship has often treated social and economic status as external background conditions within ecosystem dynamics, internal social conditions also play a crucial role in bridging social sciences concerned with practices and social behavior and ecosystem processes. Accordingly, the socio-ecological perspective emphasizes the reciprocal relationship between humans and nature in the context of security under systemic change, highlighting how inequalities in access to natural resources, decision-making processes, and the distribution of ecological benefits exacerbate vulnerability (Liu et al., 2023; Manyani et al., 2024). More broadly, socio-ecological vulnerability extends beyond resource distribution to encompass social structures and public policies that shape power relations over living spaces (Chola et al., 2024). In line with this argument, socio-ecological inequality constitutes a form of structural violence. In Galtung's terminology, structural violence refers to systemic and cumulative forms of harm that undermine conditions of peace. It is deemed "structural" because it emerges through economic policies and spatial planning regimes that commodify the environment while marginalizing spaces of life. As demonstrated by Langemeyer et al. (2025) in urban contexts, environmental and social vulnerabilities tend to co-occur in areas characterized by weak spatial planning, such as peripheral regions, zones with limited public access, and ecosystems that are particularly susceptible to degradation. Such outcomes are often produced by top-down policy approaches that intensify environmental pressures and exacerbate social inequalities through socio-ecological disruption, disproportionately burdening historically marginalized groups, including Indigenous communities, who simultaneously face reduced adaptive capacity. Consequently, structural violence becomes rendered invisible through its legitimization under narratives of modernization, regional development, or "green" tourism, despite their profound social and ecological consequences that remain insufficiently recognized and safeguarded within frameworks of harmony.

Regrettably, these impacts manifest in severe forms of dispossession, demonstrating that structural violence does not operate in isolation but is deeply interdependent with cultural violence, which functions through dominant discourses of modernization and "green" development that obscure underlying ecological inequalities. Such inequalities are

particularly evident among populations residing in areas with limited access, low income, and livelihoods heavily dependent on natural resources. Many of these communities struggle to secure health, well-being, and environmental justice, while social classes differentiated by unequal economic privileges continue to benefit disproportionately (Panikkar et al., 2023). Within the analytical framework discussed thus far, data from Our World in Data (OWID) indicate that populations in high- and upper-middle-income regions are responsible for approximately 80% of global CO_2 emissions an amount grossly disproportionate to their share of the global population. On average, this level of emissions is more than thirty times higher than that of low-income countries (Ritchie, 2023). When considered alongside earlier discussions on social class and economic privilege, these findings illustrate how powerful groups enjoy greater access to resources and productive capacities that generate environmental harm, while marginalized groups bear the socio-ecological consequences without receiving proportional benefits or protection. Furthermore, OWID emphasizes that the conditions enabling healthy, prosperous, and educated lives are largely determined by where individuals are born and reside (Roser, 2021). This reality underscores how unequal socio-ecological structures exert tangible effects on environmental security through the perpetuation of social injustice, development practices that disregard human dignity, and persistent forms of deprivation.

Thus, structural violence is intricately interwoven with cultural violence through the legitimation of values, norms, social positions, and systems of knowledge that dominate and justify exploitative practices toward nature and specific social groups. Cultural violence functions as a moral justification that normalizes structural inequalities, rendering such injustices acceptable, rational, and even desirable. Within the framework of sustainable development, narratives of modernization and economic advancement are frequently employed as moral grounds to marginalize Indigenous communities in the name of efficiency and productivity, while disregarding their living spaces and long-standing ecological relationships. In a socio-ecological context, cultural violence operates through modes of thinking, symbols, and discourses that normalize inequality via modernization scripts, capitalist logics, and technocratic rationality. Consequently, local knowledge systems are positioned as inferior, unscientific, and obstructive to economic efficiency such as the use of Indigenous calendrical systems, customary institutions, and locally grounded resource governance leading to the systematic exclusion of these communities from decision-making processes (Fitzpatrick, 2021; Galtung, 1990; Ghofur, 2024). Galtung (1996) explicitly asserts that cultural violence provides moral legitimacy to structural violence, ultimately making it appear normal and even desirable. This condition demonstrates that marginalization signifies not only the loss of economic and political access but also the erosion of space as a vital medium for maintaining socio-ecological balance. In this sense, structural violence not only degrades ecosystems but simultaneously weakens the cultural foundations through which societies cultivate peace and sustainability.

The realization of peace and environmental sustainability is inseparable from the concept of environmental security. The impacts of structural and cultural violence on environmental security emerge from analyses of diverse socio-ecological contexts such as forests, coastal zones, and urban areas as well as from the plurality of ways in which humans interpret, utilize, and govern their surrounding environments while building peace across political boundaries and within long-term perspectives that provide a so-called “neutral” space (Le Billon et al., 2023). Within this “neutral” space, relations of power, policies, and social practices should ideally cultivate attentiveness to ecological vulnerabilities that vary across contexts, yet frequently generate environmental injustice and insecurity that directly affect human dignity. Issues of security and justice within sustainable peace require environmental security to be understood as an expanded concept that goes beyond mere environmental protection toward an examination of how environmental change occurs, how access to resources is distributed, and how power relations interact to shape human and socio-ecological security. In line with this argument, Crockford (2023) finds that environmental security is also influenced by shifts in external skepticism toward power relations and their associated environmental worldviews. To further comprehend

environmental security, social constructions arising from ways of interpreting nature cannot be regarded as ecologically neutral conditions; rather, they are the outcomes of ongoing social processes negotiated among development interests, cultural values, and socially embedded forms of knowledge (Loos et al., 2023).

3.3 Relevance of local knowledge in environmental security

As a body of knowledge, practices, and beliefs that is adaptive and transmitted intergenerationally through the relationship between humans and the environment, local knowledge within Indigenous communities is deeply intertwined with culture and lived practices. Precisely because it is relational and continuous, local knowledge is not static; rather, it continually absorbs new elements and adapts to changing conditions. However, this dynamic character has been problematically framed through a modern epistemic separation between local and academic knowledge often dichotomized as holistic versus mechanistic which ultimately produces artificial boundaries that marginalize local knowledge systems (Selby et al., 2024).

These boundaries are also closely linked to approaches dominated by state-centric and technocratic logics, which tend to conceptualize environmental security primarily as a matter of measurable, efficient, and technology-based resource management. While technological approaches are not inherently problematic, they must be accompanied by an understanding of the environment as a relational space imbued with symbols, values, and, crucially, lived human experience. In recent years, this relational space has gained wider recognition and is no longer confined to so-called "non-material" benefits, as it largely encompasses social and cultural dimensions (Stålhammar & Thorén, 2019). These dimensions function as guiding frameworks that regulate human–nature relations, namely local knowledge systems that have enveloped communities throughout long historical trajectories, shaping everyday mechanisms such as spatial organization, agricultural systems, customary rituals in environmental governance, and even customary prohibitions. Such practices demonstrate that environmental security is not produced solely through external interventions, but rather depends fundamentally on the preservation of local knowledge in sustaining socio-ecological balance (Avilés et al., 2022). Accordingly, this balance is maintained through harmony with nature and an understanding of humans as integral to a moral order, wherein local knowledge operates as both an ethical foundation and an adaptive strategy in responding to inequality, environmental change, and long-term security. Imbalances emerge when policies or governance approaches marginalize local values that have long sustained human–nature relations. Dominant development and sustainability discourses often prioritize top-down approaches that fail to acknowledge local knowledge empirically tested within specific contexts. As a result, contemporary development programs and sustainability narratives frequently overlook or discredit local knowledge systems (Mashizi & Escobedo, 2025). In line with Galtung's (1969) argument, societies that continue to uphold maritime, agrarian, or eco-spiritual traditions are often labeled as "non-modern" and consequently excluded from decision-making processes.

Spatial planning or large-scale infrastructure projects developed on Indigenous lands through externally imposed policies without recognizing or involving local knowledge and while perpetuating environmental injustice carry a high potential for conflict. Resource-related conflicts fracture long-standing socio-natural relations and human–environmental equilibria, while simultaneously producing new forms of marginalization. As a result, Indigenous communities are often compelled to mobilize their local knowledge autonomously, operating outside and in spite of external policy frameworks that disregard their lived realities. This dynamic is evident in the Indonesian context. Barnes et al. (2023), for instance, document the experiences of Indigenous communities in the Cyclops Mountains, a protected forest area in Papua. Within their customary governance systems and traditions, these communities remain deeply dependent on natural resources that have been appropriated in the name of environmental development. Despite this, they continue to uphold customary forest management systems grounded in ecological taboos and totemic

rites ritual practices led by the ondoafi (customary leaders). Formally, however, local authorities have recognized only a limited number of communities as *desa adat* (indigenous village) integrated into national forestry schemes, without automatically granting them legitimate rights to land ownership or management. Consequently, although Indigenous communities may derive certain benefits from conservation initiatives, they simultaneously experience unequal cost distributions, heightened pressures, and reduced control over their territories. This paradox generates vulnerabilities, including restrictions on customary rights and the marginalization of local knowledge under exclusive conservation policies. Such conditions have fostered deep frustration, particularly in response to the perceived indifference of authorities toward reported violations within protected areas. Amid these unfolding conflicts, locally embedded taboos expressed through cultural practices rituals, offerings, and customary ceremonies have been mobilized as nonviolent means of articulating collective grievances. In this context, local knowledge functions as a medium of resistance and a form of reclaiming power against the arbitrary exercise of authority, serving as a confrontational yet nonviolent response (Damai Pangkal Damai, 2025). These nonviolent practices emerge precisely because customary systems of natural resource governance and the authority of traditional leaders were excluded from decision-making processes under exclusive policy regimes, which in turn exacerbated environmental injustice.

Reading this case, external actors often occupy a structurally stronger position because "development" programs fail to take local knowledge into account. As a result, local capacities are weakened in responding to development pressures, which ultimately culminate in conflict. Such dynamics run counter to the normative ideals of sustainability. Within the Sustainable Development Goals (SDGs), sustainability is ideally conceived as inclusive and adaptive, particularly under SDG 16, "Peace, Justice, and Strong Institutions," which emphasizes the promotion of peaceful and inclusive societies as a foundation for sustainable development (United Nations, n.d.). This dimension underscores that peace and sustainability can only be realized when development governance is participatory and respects epistemic diversity. The recognition of local knowledge is therefore not merely an effort to build peaceful institutions rooted in communities' own socio-ecological practices. Rather, it constitutes a strategic pathway toward achieving positive peace through institutional transformation that is more responsive to environmental vulnerability and the protection of human dignity.

The perspective of positive peace emphasizes the eradication of structural and cultural violence within environmental security as a foundation for ecological justice. This perspective calls for the reconstruction of local values as ethical instruments that enable communities to negotiate environmental change without sacrificing their cultural dignity. Within this framework, ecological reconciliation necessitates recognition of the value systems and epistemic dimensions of local knowledge that have long governed the balance of human–nature relations. Restoring these knowledge dimensions constitutes a crucial basis for peaceful and sustainable development approaches. Accordingly, just and sustainable environmental development can be initiated from conditions of peace through bottom-up approaches to environmental governance (Simangan et al., 2022). Such bottom-up approaches are often rooted in traditional ecological knowledge systems that have long regulated human–environment interactions, where local knowledge encounters and negotiates with modernity.

Conversely, local knowledge functions as a form of non-formal ecological security system. A study by Dawson et al. (2024) demonstrates how the Dai communities in Yunnan, Western China, have preserved their forests for generations through a synthesis of polytheistic beliefs and Buddhism. Their conservation practices are grounded in a locally embedded network known as the Stone Forest Shilin, mediated through customary institutions in which local knowledge plays a central role, while external institutions tend to engage in reciprocal knowledge-sharing to ensure intergenerational transmission. Within such early-warning mechanisms, local knowledge enables communities to detect and respond to climate variability, manage water resources, and sustain food systems across

generations. In this sense, local knowledge constitutes a form of social architecture and cultural value system that underpins environmental security by addressing socio-ecological inequalities. However, when hybridization occurs through top-down arrangements in which external knowledge systems fail to recognize or incorporate local knowledge, communities risk losing intergenerationally tested practices that are integral to their cultural autonomy, particularly when external knowledge is positioned as inherently "more authoritative" (Chola, Nshimbi, & Phiri, 2024). Such processes may also shift orientations from relational to individualistic modes of engagement, thereby fracturing ecological solidarity. Communities that were once relational and collectively responsible for their environments may be reoriented toward individualism. This shift generates new forms of violence through subtle symbolic practices, wherein nature is reduced to a mere resource rather than recognized as a life partner. Here, nature is understood as a relational entity one with which humans share reciprocal obligations that must be nurtured and respected in ways analogous to human relationships. When such relational ethics erode, the adaptive capacity of Indigenous communities to climate change and ecological imbalance may be significantly diminished. Accordingly, approaches to addressing environmental injustice must be grounded in attitudes that respect local knowledge as living traditions and as foundations for collaborative governance, alongside broader efforts to advance justice-oriented environmental governance frameworks (Brondízio et al., 2021).

Through a living local knowledge approach, spaces of resistance emerge that symbolically confront environmental insecurity. Local knowledge enables communities to rediscover a language of peace one that reaffirms the authentic relationship between humans and nature. This language of peace restores empathy and shared narratives of sustainability, grounded in local knowledge as a form of collective cultural wealth. Communities develop an acute awareness of their interdependence with nature within socio-ecological systems through direct engagement in local knowledge practices that address and mitigate environmental challenges. Such engagement is also reflected in development pathways that advocate reciprocal relationships between humans and nature, alongside the recognition of rights essential to achieving human dignity. This form of collaboration constitutes the foundation of environmental peacebuilding, wherein local knowledge operates not merely as a mechanism for ecosystem conservation. Rather, it actively restores peaceful human–environment relations through non-violent means and calls for recognition by stakeholders, who must critically re-engage with local knowledge as a legitimate and indispensable basis for environmental governance a point that will be elaborated further in the subsequent discussion.

3.4 The role of local knowledge in environmental peacebuilding

The ecological restoration paradigm is closely intertwined with environmental peacebuilding, emphasizing that environmental protection cannot be separated from efforts to build social justice and peaceful relations. Peace, according to the foundational ideas articulated by Johan Galtung, is realized when structural and cultural violence against both humans and ecosystems is transformed into relationships that are just, mutually supportive, free from domination, and no longer marked by conflict or merely negative peace. At this juncture, environmental security functions as a pillar of positive peace and as a conceptual bridge between the human security framework and ecological sustainability, wherein social practices, public policies, and local knowledge operate in concert to address socio-ecological inequalities. Building on the relevance of local knowledge within environmental security, this section further examines how local knowledge assumes a critical role in fostering environmental peacebuilding. Environmental peacebuilding constitutes a set of efforts that connect environmental risks arising from conflict with environmental opportunities for peace. It also encompasses peace negotiations and collective action aimed at achieving shared interests through integrative pathways of environmental governance that support conflict prevention, resolution, mitigation, and post-conflict recovery, while sustaining inclusive diversity in natural resource management (Ide et al., 2021; Krampe et al., 2021).

This discussion resonates with SDG 16: Peace, Justice, and Strong Institutions. The report Global Progress Report on Sustainable Development Goal 16 Indicators: A Wake-up Call for Action on Peace, Justice and Inclusion (2023) underscores that violence constitutes a major challenge to sustainability; within this challenge, peace, justice, and good governance enable social and environmental development to flourish. At the same time, the report highlights that development trajectories that neglect socio-ecological dimensions tend to reinforce cycles of structural violence, particularly when Indigenous peoples are excluded from decision-making processes. It is within this context that local knowledge ultimately plays a pivotal role as the foundation of environmental peacebuilding serving as a social mechanism for maintaining balance, preventing or halting conflict, and restoring human–nature relations. Local knowledge thus articulates peace not merely as a political settlement, but as a form of relational harmony.

The local knowledge–based approach to environmental peacebuilding constitutes a nonviolent (non-violence) pathway, as briefly outlined earlier in Section 3.3. Nonviolence represents a core element in building and sustaining peace. Within the 2030 Agenda for Sustainable Development, the United Nations explicitly emphasizes the close and mutually reinforcing relationship between environmental protection and peace. This interconnection calls for transformative, courageous, and collaborative action that rejects war and militarism, aiming instead to liberate humanity from the tyranny of injustice caused by environmental depletion through nonviolent means. Such nonviolent practices function as forms of reclaiming power in the face of arbitrary authority, serving as confrontational stances without resorting to violence (Branagan, 2022; Damai Pangkal Damai, 2025). These orientations are also evident when revisiting Mahatma Gandhi's concept of Satyagraha, defined as "holding firmly to the force of truth," which functioned as both a method of conflict resolution and a transformative struggle through nonviolence against exploitation, dictatorship, and injustice in early twentieth-century Champaran (Ojha, n.d.; Nangia, 2025). Similarly, Pope Francis has asserted, "Let us make nonviolence a guide for our actions both in daily life and in international relations." He argues that a culture of nonviolence must be further cultivated as states and citizens increasingly refrain from the use of weapons, affirming that violence is not a solution and that responding to violence with greater violence only deepens injustice. Instead, he calls for pathways that more firmly uphold justice and restore the Earth, thereby enabling the realization of genuine peace (Bo, 2025).

Thus, realizing genuine peace requires sustained efforts to build peace through nonviolent means. Environmental peacebuilding recognizes nonviolence as embedded within local knowledge, insofar as it offers grounded methods for understanding and addressing socio-ecological challenges through governance practices, knowledge-building processes, and environmental monitoring, while simultaneously enabling forms of resistance to environmental injustice within and alongside development trajectories (Brondízio et al., 2021). Given that socio-ecological systems are not inherently free from inequalities that generate injustice, these systems also erode the affective dimensions that sustain human–nature relations. Such affective dimensions encompass the loss of a sense of belonging, empathy, and symbolic meaning attached to the environment experienced by both internal actors (local communities) and external actors (policy stakeholders). These erosions give rise to subtle forms of violence that, while often invisible, exert profound impacts on the very foundations of peace.

In the context of peace, local knowledge serves a function far beyond cultural expression or aesthetic value; it operates as an infrastructure of meaning, formed through networks of emotion and significance that enable the reconstitution of ecological awareness within socio-ecological system dynamics. In this sense, local knowledge becomes an integral component of reconciliation between humans and nature within shared living spaces (Masterson et al., 2019). Such shared spaces generate multiple forms of human–nature interaction that cultivate diverse emotional experiences and a strong sense of belonging (Otamendi-Urroz et al., 2023). Consequently, when territories are subjected to external interventions or when local knowledge is excluded from decision-making processes, these disruptions often precipitate conflict. This dynamic is further substantiated by recent

research by Maleku (2025), which demonstrates that Indigenous peoples, Black communities, and societies in the Global South are frequently marginalized through the imposition of Western epistemologies that frame informality in ways that silence local knowledge and cultural practices. These conditions reveal not only persistent discrimination but also the breadth of development-driven pressures, exclusionary governance, and the systematic underrepresentation of communities in policy implementation. Such processes generate epistemic injustice, whereby policy interventions exacerbate vulnerability and inequality. Epistemic injustice emerges through the exclusion and marginalization of individuals or communities whose knowledge and lived experience are devalued or dismissed due to entrenched stereotypes, despite their capacity as legitimate knowers and practitioners.

As a result, when development planning and implementation proceed without the meaningful involvement of local knowledge in decision-making processes, policies risk reproducing epistemic injustice, namely the exclusion and marginalization of local knowledge capacities. Such exclusion can trigger socio-ecological conflict and structurally intensify environmental vulnerability (Kennedy et al., 2023). This outcome is particularly paradoxical given that communities especially Indigenous peoples have been formally acknowledged since the Earth Summit (1992) within international climate policy frameworks for the integration of local knowledge into national and subnational adaptation strategies. In practice, however, this recognition has not been adequately translated into effective implementation. Similarly, the United Nations has repeatedly affirmed that Indigenous peoples play a critical role in development processes and sustainable development initiatives, as well as in global climate change frameworks (Byskov & Hyams, 2022). Reflecting on this gap, although Indigenous rights have been internationally recognized through United Nations declarations and reinforced at regional levels, as well as embedded within national regulatory frameworks governing Indigenous communities, these rights ultimately require concrete guarantees through participatory and collaborative mechanisms (Zurba & Papadopoulos, 2021). In this context, local knowledge as previously discussed also functions as a nonviolent response to the injustices experienced by affected communities. Conflicts that emerge under such conditions increasingly resemble forms of organized violence, disrupting the survival and continuity of communities whose livelihoods and resilience fundamentally depend on local knowledge as their primary ecological and cultural anchor.

Through local knowledge and its relevance to environmental peacebuilding, several methods within the 198 Methods of Nonviolent Action outlined in Damai Pangkal Damai (2020) are particularly pertinent, namely #19 Wearing of Symbols, #20 Prayers and Worship, #73 Policy of Austerity, #197 Work-on without Collaboration, and #183 Nonviolent Land Seizure (Petz et al., 2020). In the context of #19 Wearing of Symbols and #20 Prayers and Worship, these practices are interpreted as forms of ecological affirmation articulated through spiritual and symbolic expressions. Communities employ customary symbols, indigenous rituals, offerings, and similar practices not merely as acts of reverence toward nature, but more profoundly as media for conveying nonviolent messages grounded in the belief that their right to life and their ecological rights are inseparable. Furthermore, #73 Policy of Austerity and #197 Work-on without Collaboration can be understood as strategies of disengagement and self-restraint in response to external regulatory frameworks, functioning as forms of civil disobedience against exploitative practices. Communities withdraw from imposed participatory structures, cease engagement, and instead reorient themselves toward reliance on local knowledge systems. This reflects the agency of communities in determining development trajectories and even exercising control over resources in accordance with their own ecological ethical principles. Within #183 Nonviolent Land Seizure, ecological rights are conceptualized through the construction of cultural and spiritual relationships with living spaces, emphasizing the restoration of balance in human–nature relations. These methods find resonance beyond the cases discussed in the previous subsection, including contexts such as Kenya, where the Pokot community draws upon cosmological knowledge concerning territorial boundaries and

identity. In this worldview, natural resources are associated with specific deities, informing climate crisis strategies that involve allowing rival groups to raid livestock and encroach upon forests, with the expectation of ancestral retribution (Tarusarira, 2022). Similarly, among the Ammatoa community in South Sulawesi, Indonesia, local environmental conservation knowledge is derived from *Pasang ri Kajang* (Messages from Kajang) and the principle of tallasa tamase-mase as a way of life. These values function as guiding norms that prohibit excessive forest exploitation and promote self-restraint amid climate crises and exploitative development pressures. Collectively, these cases demonstrate that local knowledge operates through adaptive and deeply relational mechanisms.

Furthermore, after examining the case studies and their alignment with the aforementioned methods, it becomes increasingly evident that within local knowledge systems, communities do not interact with nature merely as a resource, but as an integral component of a moral and emotional order that shapes collective identity. Affective relationships constitute a crucial foundation of environmental peacebuilding, as the human–nature relationship is deeply intertwined, and ecological peace cannot be sustained in the absence of emotional attachment to the land collectively inhabited. These attachments contribute foundational value systems that extend beyond perceptions of nature itself; when this affective dimension is absent, peace is reduced to administrative projects detached from what is understood as "the true meaning of life" safeguarded by humans particularly Indigenous communities (Yoshida et al., 2022). Local knowledge thus functions as a source of identity-based strength for each region that preserves it. Beyond serving as a repertoire of nonviolent practices, local knowledge should also be recognized as a safe space for collaboration. Simultaneously, within the human security framework, the role of local knowledge in environmental peacebuilding reflects the three freedoms articulated by the United Nations Development Programme (UNDP). Culturally grounded nonviolent practices are expected to prevent conflict and generate a sense of security as an expression of freedom from fear. This sense of security is further realized through the adaptive mechanisms of local knowledge that protect both nature and communities, ensuring equitable access and participation, thereby reinforcing freedom from want. Meanwhile, freedom to live in dignity manifests through the recognition of communities' cultural rights to live in harmony with nature and tradition. In practice, local knowledge regulates everyday life, particularly among Indigenous communities, through customary prohibitions on logging in ancestral forests, equitable systems of harvest-sharing, and ritual practices that honor land and water.

Thus, in practice, local knowledge also restores collective narratives of human–nature relations through rituals, language, and cultural representations that reaffirm ecological responsibility. The wide range of practices discussed demonstrates that local knowledge embodies its own peacebuilding logic: not merely negotiation between conflicting parties, but the restoration of balance between humans and nature, between humans and their belief systems, and among humans themselves when taken as a guiding framework. Moreover, within the policy context, the recognition of local knowledge opens pathways for hybrid forms of governance, in which formal state authority and customary institutions operate collaboratively rather than competitively. Such collaboration represents a form of epistemic transformation that goes beyond political compromise; rather than the state merely governing society, the state learns from society. This configuration strengthens positive peace by dismantling structural violence in the form of epistemic exclusion, while simultaneously reaffirming communities' rights to participate in shaping the direction of ecological development.

Therefore, local knowledge also functions as an epistemic bridge within environmental peacebuilding. It introduces a paradigm of peace that does not stop at human relations but instead embraces the entire web of life. In this sense, Johan Galtung's theory of peace gains renewed relevance, where positive peace is understood not merely as the absence of violence among humans, but as reconciliation with nature as a fellow moral subject.

4. Conclusions

This study demonstrates that local knowledge serves as an epistemic foundation for environmental peacebuilding by bridging Johan Galtung's peace theory, the human security paradigm, and environmental security practices. The analysis reveals that structural and cultural violence against both humans and the environment emerges from social systems that normalize exploitation, thereby marginalizing local values that sustain social–ecological balance. In this context, positive peace is not merely understood as the absence of conflict, but as an ethical transformation that calls for reconciliation among humans, nature, and culturally embedded local knowledge. Local knowledge, as a living cultural system, has demonstrated adaptive capacities in mediating human-nature relations through nonviolent social, spiritual, and symbolic mechanisms. Accordingly, this research proposes a new conceptual framework that repositions environmental security as a peacebuilding practice rooted in social-ecological relationships and respect for epistemic plurality. Restoring human-nature connectedness through the integration of local knowledge into environmental security frameworks requires policymakers to meaningfully realize the principles of freedom from fear, freedom from want, and freedom to live in dignity, as articulated by UNDP, while simultaneously enabling active community participation. Thus, genuine peace cannot be achieved solely through formal policy instruments, but through recognition of knowledge systems that are lived, practiced, and transmitted across generations. A truly sustainable approach to peacebuilding must therefore be grounded in local knowledge, which affirms that development and lasting peace require an ecocentric paradigm alongside anthropocentric perspectives. This necessitates the integration of scientific knowledge, state policies, and local community governance as epistemic bridges rather than competing systems. Ultimately, recognizing and engaging local knowledge is not merely an adaptive strategy for addressing environmental crises, but an ethical imperative to advance social–ecological justice and strengthen the foundations of sustainable peace.

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