

Environmental Peacebuilding in East Asia: ASEAN's Role in Facilitating Inter-Korean Environmental Cooperation

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Abstract. This paper explores the potential of environmental peacebuilding as a strategic approach to mitigating long-standing tensions on the Korean Peninsula through the facilitative role of ASEAN (Association of Southeast Asian Nations). Drawing on institutional analysis and document-based qualitative research, the study examines how ASEAN's regional mechanism, particularly the ASEAN Regional Forum (ARF), the East Asia Summit (EAS), and various technical platforms—can support inter-Korean environmental cooperation in areas such as biodiversity conservation, transboundary air pollution monitoring, and disaster risk reduction. The study underscores the unique position of ASEAN as a neutral convener with a track record in non-traditional security diplomacy and soft power mediation. Using the theoretical framework of environmental peacebuilding, the research identifies how low-politics ecological issues can function as environmental cooperation as confidence-building measures (CBMs), facilitating dialogue and collaboration in a politically sensitive context. Case studies such as the Demilitarized Zone (DMZ) biodiversity corridor, cooperative air quality monitoring influenced by China's industrial emissions, and disaster management training under AADMER (ASEAN Agreement on Disaster Management and Emergency Response) illustrate concrete opportunities for ASEAN-led intervention. Furthermore, the study highlights the importance of Track 1.5 diplomacy, technical capacity-building platforms such as AWGESC (ASEAN Working Group on Environmentally Sustainable Cities), and ASEAN's multilateral legitimacy in promoting trust-based engagement. Despite persisting institutional and geopolitical constraints, the research concludes that ASEAN's inclusive diplomacy, emphasis on consensus, and flexible multilateralism position it effective to facilitate environmental cooperation as a steppingstone toward durable peace on the Korean Peninsula. By integrating environmental security into regional diplomacy, ASEAN not only broadens the discourse on peacebuilding but also reinforces its strategic role in East Asian security architecture.

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1 Introduction

The Korean Peninsula remains a focal point of geopolitical tension in East Asia, shaped by decades of ideological division, militarization, and intermittent diplomacy. Amid these security dilemmas, new frameworks for confidence-building have gained traction among scholars and policymakers. Environmental peace building, the process of fostering cooperation and reducing tensions through joint environmental management—has emerged as a particularly promising approach.

In East Asia, where environmental degradation transcends political borders, ecological interdependence could serve as a pragmatic entry point for dialogue. Issues such as transboundary river pollution, deforestation, biodiversity loss, and disaster risks (e.g., typhoons, flooding) affect both North and South Korea, and by extension the broader region. This paper explores how ASEAN-led platforms, particularly the ASEAN Regional Forum (ARF) and East Asia Summit (EAS), can be leveraged to advance inter-Korean environmental cooperation as a form of peacebuilding.

While the European Union and the United Nations have traditionally taken the lead in peace and security frameworks, ASEAN's role as a convenor of East Asian dialogue has steadily expanded. ASEAN's diplomatic capital, derived from its norms of non-interference, consensus-building, and flexible multilateralism, offers a distinct model of soft power engagement. Given its inclusive platform and relationships with both Koreas, ASEAN is well-positioned to mediate environmental cooperation projects, even in the absence of formal peace agreements.

This paper is guided by two main research questions: (1) How can environmental cooperation contribute to confidence-building between North and South Korea? (2) What role can ASEAN, through its regional forums, play in facilitating such cooperation? The paper draws upon the theoretical foundations of environmental peacebuilding and soft diplomacy, while using ASEAN-led mechanisms as a practical case of regional engagement.

2 Research method

This study employs a qualitative document analysis method, focusing on ASEAN-led policy frameworks, regional declarations, and relevant inter-Korean environmental agreements. Primary data sources include ARF Chair Statements (2010–2024), EAS Outcome Documents, ASEAN Ministerial Statements on Environment and Disaster Management, as well as reports from UNESCAP and UNEP related to the Korean Peninsula.

Secondary sources include peer-reviewed articles on environmental peacebuilding, ASEAN diplomacy, and Korean regional relations. The analysis is structured thematically around three categories: (1) ASEAN diplomatic mechanisms and North-South Korea engagement; (2) historical and ongoing environmental cooperation projects on the Peninsula; (3) the strategic potential of ASEAN-led environmental initiatives as CBMs.

Building on this, the methodological framework is further anchored in environmental peacebuilding theory, which conceptualizes shared ecological challenges as entry points for cooperation and trust-building among adversaries. Dresse et al. (2019) identify four mechanisms of environmental peacebuilding—conflict prevention, trust-building, interdependence, and institution-building—that directly inform this study's thematic coding [1]. In practice, ASEAN's policy documents are analyzed not only for their substantive content, but also for how they reflect these environmental peacebuilding dynamics. This theoretical grounding ensures that the research design remains consistent with qualitative document analysis while strengthening its analytical depth.

3 Results and Discussions

This section discusses the core findings of the study, highlighting three interrelated areas where environmental cooperation between North and South Korea remains both possible and strategically valuable. These areas—namely biodiversity conservation within the Demilitarized Zone (DMZ), transboundary air quality monitoring, and disaster risk reduction—offer varying degrees of past precedent, technical potential, and political feasibility. Despite persistent inter-Korean tensions, these sectors reveal openings for low-politics cooperation that can be facilitated by regional frameworks such as ASEAN. Through an integrated analysis of empirical cases and institutional mechanisms, this section explores how environmental diplomacy can serve as an entry point for building mutual trust, fostering joint responsibility, and promoting regional stability.

3.1 Existing and Potential Areas of Inter-Korean Environmental Cooperation

Despite the diplomatic gridlock, North and South Korea have intermittently cooperated on environmental issues. Past initiatives include reforestation projects in North Korea funded by South Korean NGOs (e.g., Green Asia Network), joint flood management along the Imjin River, and shared early warning systems for natural disasters. However, these projects are often halted by political tensions and lack institutional sustainability. Areas with high potential for renewed collaboration include the following.

3.1.1 DMZ Biodiversity Conservation

The Demilitarized Zone (DMZ), stretching along the border between North and South Korea, is a unique area that has unintentionally transformed into a natural sanctuary due to its isolation from human activity since 1953. Since the end of the Korean War, there has been no large-scale development or exploitation in the area, making it one of the most pristine ecosystems in East Asia. This condition has allowed thousands of species of flora and fauna to flourish, including endangered species such as the red-crowned crane and the Amur leopard, establishing the DMZ as a biodiversity hotspot of immense ecological and strategic importance. Overall, the DMZ serves as a habitat for over 5,000 species of flora and fauna, including 106 species categorized as endangered, further underscoring its status as a critically important biodiversity hotspot [2]. Beyond its intrinsic conservation value, the DMZ also holds significant economic potential. Based on a contingent valuation approach, the conservation value of the DMZ is estimated to range between US\$264 million and US\$602 million, primarily through the potential for ecotourism and ecosystem services provided by its rich biodiversity [3]. However, the realization of this economic potential is also influenced by South Korea's domestic political dynamics, particularly the rising polarization under the Yoon Suk-yeol administration, which has been seen to limit the government's capacity to address strategic issues [4].

Although political tensions between the Koreas have often posed obstacles, history records several early initiatives of scientific cooperation in the area. For instance, a joint ecological survey project involving South Korea and the United States in the 1960s demonstrates that conservation efforts in the DMZ can serve as a form of cross-border science diplomacy, albeit within a context fraught with cultural and political sensitivities [5]. Today, new ideas are emerging to develop the DMZ as a scientific innovation zone that not only promotes environmental preservation but also serves as a symbol of peace and shared economic progress. This reflects a multi-dimensional approach that links conservation with sustainable development and political reconciliation [6]. In this context, ASEAN can play a strategic role as a facilitator of trilateral cooperation involving North Korea, South Korea,

and a neutral third party by leveraging its collective experience in transboundary biodiversity conservation. Through the ASEAN Centre for Biodiversity, the region has demonstrated institutional capacity in addressing shared environmental issues, as seen in successful conservation projects such as the Pha Taem Protected Forest Complex involving Thailand, Laos, and Cambodia [7]. Additionally, ASEAN's experience in promoting biodiversity governance beyond national jurisdictions—such as within the framework of Biodiversity Beyond National Jurisdiction (BBNJ)—provides an important precedent that regional organizations can support conservation in politically sensitive and contested areas [8]. By employing an environmental peacebuilding approach, ASEAN can not only assist in formulating technical and policy cooperation frameworks between North and South Korea but also offer a neutral platform that fosters long-term confidence-building in this tension-prone region.

3.1.2 Air Quality and Dust Monitoring

Transboundary air pollution is a serious environmental issue that directly affects public health and ecosystem stability in both North and South Korea. This problem primarily originates from industrial emissions in China—particularly from the regions of Beijing, Hebei, Tianjin, and Shandong—which, aided by seasonal winds and certain atmospheric conditions, are carried across the Yellow Sea to the Korean Peninsula. The main pollutants transported include fine particulate matter (PM_{2.5}), ozone, and organochlorine pesticides, all of which significantly impact air quality in the recipient regions. Studies show that up to 70% of the annual PM_{2.5} concentration in South Korea can be attributed to transboundary sources, with the remainder stemming from domestic emissions [9]. This issue is exacerbated by anthropogenic global warming, which increases atmospheric stability and extends the residence time of pollutants in the lower troposphere, thereby enhancing the likelihood of cross-border transmission. This situation has serious health implications. According to the State of Global Air 2020 report, approximately 18,000 deaths occur annually in South Korea due to long-term exposure to air pollution [6].

In this context, monitoring systems are crucial for accurately understanding the sources and pathways of pollutant movement. South Korea has developed an advanced system combining ground-based observations, remote sensing data from satellites such as GOCI, and air back-trajectory analysis to trace the origins of pollution and its impact on domestic areas. One significant study, the KORUS-AQ campaign conducted jointly with the United States, confirmed that air pollution in South Korea results from the interaction between local emissions and transboundary influences, with pollutant convergence worsening air quality particularly during spring and winter seasons [10]. In contrast, North Korea continues to face major challenges in building air monitoring capacity due to limitations in technology, infrastructure, and political isolation, resulting in a stark imbalance in air quality management across the region. According to a recent study by Jun and Gu (2023), approximately 38–70% of PM_{2.5} pollutants detected in South Korea originate from transboundary sources, especially eastern China. PM_{2.5} concentrations have even reached 237 µg/m³ during spring and winter, far exceeding the World Health Organization's safe limits. Therefore, it is vital to adopt a collaborative approach that enables both countries to engage in science-based cooperation on politically neutral environmental issues. One regional cooperation model that can serve as a reference is the ASEAN Haze Monitoring System (AHMS), which has successfully facilitated the monitoring and mitigation of forest fires and transboundary haze pollution in Southeast Asia. This system utilizes MODIS satellite technology and ground-based data to detect hotspots, estimate haze movement, and issue real-time early warnings across national borders, allowing member states to respond more quickly and based on scientific evidence [11]. If this system could be adapted to the Korean Peninsula, it would

not only improve the regional air monitoring system in a more equitable and comprehensive manner but also open up pathways for technocratic diplomacy between North and South Korea through environmentally focused cooperation that is relatively neutral and non-confrontational. By framing transboundary air pollution as a shared challenge and science as a bridge for collaboration, both countries could develop a new model of environmental peacebuilding—one that is particularly relevant in a region still shadowed by geopolitical tensions such as the Korean Peninsula.

3.1.3 Disaster Risk Reduction

In the context of disaster risk reduction in East Asia, expanding cross-regional cooperation has become a vital strategy to enhance regional capacity in facing increasingly complex and frequent natural disasters. One potential form of collaboration is the expansion of joint training under the framework of the ASEAN Agreement on Disaster Management and Emergency Response (AADMER), a legally binding regional agreement designed to coordinate disaster response among ASEAN member states. In practice, AADMER emphasizes not only rapid disaster response but also prioritizes capacity building, joint exercises, the development of standard operating procedures (SOPs), and the harmonization of emergency assistance mechanisms among member countries [12]. In this regard, involving South Korea as a strategic partner in AADMER's joint training represents a highly promising opportunity. In 2022 alone, Southeast Asia experienced 1.169 disaster events, affecting more than 10 million people, highlighting the critical importance of regional cooperation in disaster preparedness. Furthermore, Korea could make meaningful contributions to initiatives such as ARCH (ASEAN Regional Capacity on Disaster Health Management), which has supported the development of regional collaboration mechanisms in health response during disasters [13]. Korea's participation would not only enhance human and technological resources in regional training efforts but also align with the ASEAN Vision 2025 on Disaster Management, which aspires to position ASEAN as a global leader in disaster management [14]. Furthermore, Korea could make meaningful contributions to initiatives such as ARCH (ASEAN Regional Capacity on Disaster Health Management), which has supported the development of regional collaboration mechanisms in health response during disasters [15].

3.2 ASEAN's Role in Facilitating Environmental CBMs

Environmental issues offer a rare opportunity for constructive engagement in politically sensitive regions. ASEAN, with its emphasis on consensus and regional cooperation, is well-placed to promote environment-based confidence-building measures (CBMs) that go beyond political divides. In particular, ASEAN platforms can serve both normative and practical functions by fostering dialogue, strengthening technical cooperation, and legitimizing cross-border environmental initiatives. The following analysis highlights three strategic dimensions through which ASEAN can fulfill this facilitative role:

3.2.1 Track 1.5 Diplomacy

One of the most effective strategies ASEAN can leverage to build trust and reduce political tensions in the region is through Track 1.5 diplomacy—an informal dialogue mechanism that involves both government officials (Track 1) and non-state actors such as academics, policy experts, and civil society organizations (Track 2). This mechanism is particularly relevant for geopolitically sensitive environmental issues, such as transboundary resource management, regional air pollution, or the conservation of disputed marine areas. Within this framework, ASEAN can serve as a facilitator of environmental dialogue between its member states and

external partners such as South Korea, which possesses both strategic interest and technical capacity in environmental cooperation. Through such semi-structured forums, ASEAN not only promotes the exchange of ideas and best practices but also helps mitigate political risks that often hinder formal intergovernmental cooperation. Past experiences have shown that the Track 1.5 approach holds great potential in fostering mutual understanding and trust, as demonstrated by ASEAN's implementation of Confidence-Building Measures (CBMs) in the area of non-traditional security. By engaging South Korea as a partner in Track 1.5-based environmental dialogues, ASEAN not only broadens its diplomatic reach but also strengthens its regional role as a key factor in environmental governance grounded in consensus, participation, and peace. To sustain this, ASEAN must enhance its institutional capacity to consistently organize inclusive dialogue platforms and ensure that recommendations from these forums are effectively integrated into formal regional policy frameworks.

3.2.2 Technical Capacity Building

In its efforts to promote regional stability and strengthen cross-border cooperation, ASEAN holds a strategic role in developing environmental cooperation as confidence-building measures (CBMs), including with non-member states such as North Korea. One of the most promising approaches lies in enhancing technical capacity through practical mechanisms that involve minimal political resistance. In this context, ASEAN possesses several working platforms with significant potential, one of which is the ASEAN Working Group on Environmentally Sustainable Cities (AWGESC). This platform consistently promotes the exchange of knowledge, technology, and best practices related to sustainable urban environmental governance. Through AWGESC, ASEAN has organized various workshops, technical training sessions, and pilot programs in member cities to strengthen institutional capacities in addressing environmental challenges such as waste management, greenhouse gas emissions, and climate change adaptation. If this approach were to be expanded to include North Korea—either directly or through trilateral cooperation mechanisms—ASEAN could open a channel of technocratic diplomacy that is politically neutral yet highly strategic in its functional impact. This is particularly important, given that North Korea is known to be more receptive to forms of engagement that are technical and humanitarian in nature, rather than political or multilateral dialogue. Furthermore, ASEAN has a proven track record in implementing effective capacity-building programs, such as the ASEAN Regional Capacity on Disaster Health Management (ARCH), which demonstrates how cross-country collaboration on humanitarian and technical issues can foster trust while simultaneously enhancing national capabilities [13]. A similar concept can be applied to environmental issues, focusing on technical aspects such as pollution control, water resource management, or sustainable energy systems.

Pilot projects from ASEAN cities like Surabaya, Luang Prabang, or Siem Reap could serve as adaptive models for North Korean urban contexts through incremental approaches, such as technical visits or the exchange of non-sensitive data. ASEAN has also demonstrated its capacity to build scientific and technological cooperation networks, for instance, through partnerships with China that have led to significant increases in joint publications, researcher exchanges, and funding for clean technology projects. Such collaborations not only strengthen technology transfer but also create opportunities for science diplomacy that remain free from geopolitical pressures. This model is especially suited for North Korea as part of efforts to build trust through universal and non-confrontational environmental issues.

More importantly, this approach to technical capacity-building aligns strongly with the ASEAN Way, which emphasizes consensus, inclusivity, and non-interference. ASEAN can position itself as a safe, pragmatic facilitator of technical cooperation that directly benefits sustainable development. By offering participatory space to North Korean technical actors

through environmental platforms, ASEAN indirectly reinforces its political standing as a regional actor promoting peace and stability through soft power. Initiatives like these illustrate that environmental issues can serve as a strategic entry point for fostering cross-border trust, which has often proven elusive through formal diplomatic channels. If implemented consistently and inclusively, this strategy of technical capacity-building could set a new precedent for environmental diplomacy in East Asia and strengthen ASEAN's contribution to the global sustainable development agenda.

3.2.3 Multilateral Legitimacy

In the context of security and environmental dynamics in East Asia, ASEAN holds strategic potential to play a central role in facilitating environment-based confidence-building measures (CBMs). ASEAN's uniqueness lies in its dual capacity: as a normative actor that shapes collective behavior through the adoption of international principles, and as a practical actor that facilitates concrete cross-border projects. ASEAN's legitimacy as a neutral regional mediator is further reinforced by its history of engagement in sensitive issues involving major powers and non-traditional actors.

Practically speaking, ASEAN has also developed various environmental cooperation platforms that are directly relevant to CBMs. This project not only focuses on the conservation of marine ecosystems but also provides an informal forum that brings together scientists, technical officials, and diplomats to constructively discuss shared interests. In addition, ASEAN promotes the integration of environmental policies into the framework of regional economic cooperation, such as the ASEAN Economic Community, to ensure that economic growth aligns with ecological sustainability. Through this approach, ASEAN demonstrates its ability not only as a normative forum but also as a responsive regional public policy platform capable of addressing cross-sectoral challenges.

Furthermore, the consensus-based strategy known as the ASEAN Way has served as an essential foundation for collectively managing environmental issues. This is particularly important in creating an inclusive space for all members to participate in environmental cooperation and can serve as a model of technical collaboration that is relevant for expansion to broader regions, including the Korean Peninsula. Given its experience, normative approach, and institutional flexibility, ASEAN has a unique capacity to facilitate environmental cooperation as CBMs in complex regions like East Asia. ASEAN's engagement in technical cooperation with North Korea through environmental channels would not only enhance inter-state trust but could also expand ASEAN's positive influence in maintaining regional peace through progressive ecological diplomacy.

The ARF has already issued statements supporting environmental cooperation as a peace measure. EAS meetings have discussed regional sustainability, opening room for Korean environmental dialogue. Through these mechanisms, ASEAN can act as both convener and norm entrepreneur.

4 Conclusion

The ongoing geopolitical division of the Korean Peninsula presents formidable challenges for sustained peacebuilding. However, the findings of this study demonstrate that environmental cooperation offers a compelling, pragmatic pathway to foster inter-Korean trust and regional stability. ASEAN, as a trusted regional actor with inclusive norms and neutral convening capacity, is well-positioned to facilitate this form of engagement. Environmental peacebuilding, anchored in shared ecological vulnerabilities and cross-border sustainability goals provides an entry point for dialogue that sidesteps contentious political narratives. Three sectors biodiversity conservation in the DMZ, transboundary air pollution

monitoring, and joint disaster risk reduction emerge as strategic domains where cooperation can thrive. Each of these areas holds the dual benefit of being politically neutral and technically necessary, opening space for collaboration even during times of diplomatic impasse. ASEAN's experience in managing environmental issues with sensitive political dimensions, such as haze pollution, biodiversity governance, and disaster response, equips it with practical tools and institutional capital to mediate such efforts.

The study underscores the value of Track 1.5 diplomacy as a bridge between formal government engagement and civil society participation. This semi-institutional format is particularly apt for promoting environmental dialogues involving both Koreas without requiring full diplomatic normalization. Additionally, ASEAN's platforms for technical capacity building such as AWGESC and ARCH offer replicable models that could be adapted to North Korea's developmental context in a non-confrontational manner. Moreover, ASEAN's multilateral legitimacy, shaped by its consensus-based processes and track record in convening diverse stakeholders, bolsters its potential role as a facilitator of environmental cooperation as confidence-building measures (CBMs). Through mechanisms like the ARF and EAS, ASEAN can promote a normative agenda that integrates environmental security into broader regional peace strategies.

Nonetheless, challenges persist. These include institutional inertia within ASEAN, the volatility of North Korean engagement, and the overarching influence of major powers such as China and the United States. Moreover, technical asymmetries between the Koreas, limited data transparency, and the fragility of past cooperative efforts indicate that any future initiative will require sustained commitment, adaptive frameworks, and careful trust-building over time. In conclusion, ASEAN's role in environmental peacebuilding on the Korean Peninsula is not merely aspirational but operationally feasible when grounded in strategic issue framing, functional cooperation, and inclusive diplomacy. By emphasizing low-politics issues that have high regional impact, ASEAN can extend its influence from economic integration to peace diplomacy. The environmental sector—owing to its shared challenges and opportunities for non-zero-sum collaboration—emerges as a powerful medium through which peace can be cultivated. ASEAN's leadership in this space may not only contribute to inter-Korean reconciliation but also reposition the organization as a norm-setting actor in the evolving security and ecological governance architecture of East Asia.

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