

Environmental Issues as Strategic Communication Tools: The Dynamics of Korean Peninsula Conflict Related to Environmental Issues

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Abstract

Political dynamics between South Korea and North Korea is caused by differences in ideology: South Korea adheres to liberal democracy, while North Korea follows Juche ideology. The political policies of both countries agree on this situation. South Korea cooperates with the United States and Japan in military exercises that have a negative impact on the environment, while North Korea focuses on developing nuclear weapons, which increases political tensions and also has a negative impact on the Korean Peninsula's environment. This research aims to understand how political dynamics between South Korea and North Korea affects the environment on the Korean Peninsula. This research uses a qualitative approach with case studies and analyzes this situation through the concept of political dynamics and environmental security theory. The results show that this dynamics is caused by the political policies of both countries: North Korea which continues to test nuclear weapons and South Korea which continues to conduct military exercises with the US and Japan. The impacts include environmental degradation, greenhouse gas emissions, forest destruction, soil air pollution, decreased agricultural yields, population displacement, and damage to marine and land ecosystems.

Keywords: Political Dynamics, Military Training, Environment, Nuclear

Abstrak

Dinamika politik antara Korea Selatan dan Korea Utara disebabkan oleh perbedaan ideologi: Korea Selatan menganut demokrasi liberal, sedangkan Korea Utara mengikuti ideologi Juche. Kebijakan politik kedua negara sepakat dengan situasi ini. Korea Selatan bekerja sama dengan Amerika Serikat dan Jepang dalam latihan militer yang berdampak negatif terhadap lingkungan, sedangkan Korea Utara fokus pada pengembangan senjata nuklir, yang meningkatkan ketegangan politik dan juga berdampak negatif terhadap lingkungan Semenanjung Korea. Penelitian ini bertujuan untuk memahami bagaimana dinamika politik antara Korea Selatan dan Korea Utara mempengaruhi lingkungan di Semenanjung Korea. Penelitian ini menggunakan pendekatan kualitatif dengan studi kasus dan menganalisis situasi ini melalui konsep dinamika politik dan teori keamanan lingkungan. Hasil penelitian menunjukkan bahwa dinamika ini disebabkan oleh kebijakan politik kedua negara: Korea Utara yang terus menguji coba senjata nuklir dan Korea Selatan yang terus melakukan latihan militer dengan AS dan Jepang. Dampaknya antara lain degradasi lingkungan, emisi gas rumah kaca, kerusakan hutan, polusi udara tanah, penurunan hasil pertanian, perpindahan penduduk, dan kerusakan ekosistem laut dan darat.

Kata kunci: Dinamika Politik, Pelatihan Militer, Lingkungan, Nuklir

INTRODUCTION

The political dynamics between South Korea (ROK) and North Korea (ROK) is rooted in deep ideological differences and a long history of confrontation. South Korea is a liberal democracy close to the United States, while North Korea adheres to the Juche ideology, a form of communism that emphasizes independence and independence. Political dynamics on the Korean Peninsula was exacerbated by North Korea's nuclear weapons tests and South Korean military exercises, which had negative impacts on the environment, such as environmental degradation, greenhouse gas emissions, forest destruction, and groundwater poisoning and others. This incident was triggered by ideological differences between the two countries.

Based on the implementation of South Korea's political policy, South Korea chose to implement its political policy to conduct military exercises and form the Trilateral Military Alliance with the US and Japan (Bermudez, 2023) while North Korea implemented its political policy to develop its nuclear and ballistic missiles (Missile Defense Project, 2022). The consequences of this political policy resulted in political dynamics between South Korea and North Korea, which of course had an impact on environmental sustainability on the Korean Peninsula. The main factors that fuel political tensions between the two countries include:

- **Nuclear and Biological Weapons:** North Korea has an ongoing nuclear weapons development program, which is frequently tested and attracts international condemnation. This is exacerbated by concerns about the possibility of developing biological weapons (Besheer, 2023).
- **Communication Uncertainty:** There is a lack of stable communication between the North Korean and United States governments, which often affects relations between South Korea and North Korea. **Differences in Perception and Miscalculation:** There are differences in perception and interpretation of the political and military situation that can lead to miscalculation and confrontation (Ardiani, 2020).
- **Provocative Policies:** North Korea often takes steps that are considered provocative by South Korea and its allies, such as missile launches and nuclear weapons tests where since October

2006, North Korea has conducted numerous ballistic missile tests (Council on Foreign Relations, 2022).

- **Military Cooperation:** South Korea closely cooperates with the United States and Japan in military exercises, which are often seen as threats by North Korea and exacerbate tensions (CNN Indonesia, 2024).
- **Efforts to Expand and Enhance Military Capabilities:** North Korea continues to seek to expand and enhance its military capabilities, exacerbated by its controversial nuclear weapons program and missile tests (Haryono, 2023).

Political dynamics on the Korean Peninsula, especially between South and North Korea, affects environmental protection and sustainable development efforts. This conflict is largely caused by ideological differences, with South Korea embracing democracy and liberalism, while North Korea follows the Juche ideology that emphasizes independence and anti-foreign interests (Abidin, 2020). This dynamics is also caused by sharp social and economic divisions between the two countries. Prolonged military conflict makes matters worse. South Korea cooperates with the United States in military training and developing missile defense systems, while North Korea continues to enhance its nuclear program and cooperates with Russia. These tensions have a negative impact on the environment, including air, water, and ocean pollution. For example, North Korea's missile launches into the East Sea have caused ecological damage and worsened relations with South Korea (Wright, 2022).

Since 2006, North Korea has conducted numerous ballistic missile tests, including launches into Japan's Exclusive Economic Zone (EEZ), posing a threat to the safety of fishermen and the marine environment (Paramitha and Puspoayu, 2024). In addition, the Punggye-ri nuclear test site, although closed in 2018, shows possible new activity based on recent satellite imagery (Bermudez, 2023). A nuclear test on Mount Mantap in 2017 caused extensive landslides and seismic shaking that was felt in China, and shifted the mountain peak by 3.5 meters (Wright, 2022).

North Korea's efforts to develop ballistic missiles and nuclear weapons, despite international sanctions, continue with heavy investment in these technologies (Missile Defense Project, 2022). In response to these political policies, South Korea has increased military cooperation with the United States and Japan, and strengthened its national missile defense (CNN

Indonesia, 2024). However, the presence of foreign military bases has an impact on the environment through forest destruction, decreased soil fertility, and groundwater pollution (McFarlane and Volcovici, 2023).

The Securitization Theory of the Copenhagen School assumes that security issues, including the environment, are presented as existential threats, justifying extraordinary measures. In the context of the Korean Peninsula, political dynamics has caused serious environmental damage and should be viewed as a security threat (Stritzel, 2014). Military activities and nuclear tests increase the risk of pollution that can affect human health and ecosystems (Právělie, 2014; Walsh, 2022).

The environmental peacebuilding paradigm offers a solution by focusing on environmental cooperation to reduce tensions and build trust. Joint environmental projects can help ease conflicts and support reunification (Dresse *et al.*, 2019). To address this problem, a commitment from both parties is needed to start a serious dialogue and cooperation on environmental issues. This study aims to explore how political dynamics between South and North Korea affects environmental sustainability on the Korean Peninsula. The study shows that political tensions and military conflicts have a significant impact on environmental damage, and require effective strategies and policies for mitigation and sustainable development.

Against this backdrop, it is clear that political dynamics between North and South Korea has a significant impact on security and environmental sustainability on the Korean Peninsula. North Korea continues to develop its nuclear program, which has caused tensions with South Korea. North Korea's ballistic missile and nuclear weapons tests have raised concerns about security and the environment. On the other hand, South Korea, which is cooperating with the US and Japan, has also experienced negative environmental impacts from military bases and political dynamics. Therefore, the research question raised is "How does political dynamics between South and North Korea affect environmental sustainability on the Korean Peninsula?"

LITERATUR REVIEW

In this study, support from related studies is needed to examine political dynamics on the Korean Peninsula. After the research was conducted, the researcher found several relevant studies

regarding the relationship between political dynamics between South Korea and North Korea and its impact on the environment of the Korean Peninsula.

The first literature review, namely the research conducted by JeongWon Bourdais Park and Brian Bridges in their study "Ecology, security and international action: beyond sanctions on North Korea" in 2021 (Park and Bridges, 2021), provides an in-depth analysis of various aspects of the relationship between armed conflict, environmental protection, and the limitations of international efforts currently implemented in North Korea. This study uses a conceptual approach that includes fragile states, armed conflict, and environmental protection, and involves multilateral actors in environmental security in North Korea. Using the theory of UN environmental intervention, state crisis, and the influence of the economy on the environment, this study applies the methods of political risk analysis, structural analysis, and analysis of the history of reform in North Korea and neighboring countries.

The findings show that international efforts implemented in North Korea are ineffective in addressing environmental and humanitarian degradation, which has an impact on a negative cycle of isolation, poverty, and worsening environmental damage. Therefore, this study recommends a more integrated approach to addressing environmental, humanitarian, and economic issues in North Korea. This includes integrating environmental factors into development assistance, natural and human-made disaster management, and providing ecological exemptions in economic sanctions.

This study also emphasizes the importance of considering legal and ethical aspects in dealing with environmental issues in conflict zones. This study makes an important contribution to understanding the relationship between armed conflict, humanitarian issues, and the environment in North Korea. However, its weakness is the lack of concrete solutions for environmental protection in the context of armed conflict. Nevertheless, this study provides an in-depth understanding of the impact of armed conflict on the environment in the Korean Peninsula and provides specific recommendations for environmental protection in situations of armed conflict in North Korea.

This study is different from studies that focus on the impact of political dynamics between South and North Korea on environmental sustainability in the Korean Peninsula. While Park and

Bridges' study examines the impact of armed conflict and environmental protection efforts, other studies are more oriented towards analyzing the impact of political dynamics that often leads to armed conflict and environmental damage.

The second literature review titled “Estimating Willingness to Pay for the Development of a Peace Park Using CVM: The Case of the Korean Demilitarized Zone” by James W. Mjelde, Hyesun Kim, Tae-Kyun Kim, and Choong-Ki Lee in 2017 focused on assessing the willingness of the South Korean public to pay for the development of a Peace Park in the Korean Demilitarized Zone (DMZ) (Mjelde *et al.*, 2017). This study used the Contingent Valuation Method (CVM) and explored factors that influence public decisions, including optimism towards Korean unification and patriotism.

The results showed that the average South Korean public was willing to pay \$49.03 per household per year for the project. The proposed recommendations emphasize the importance of considering psychological and geopolitical aspects in planning environmental conservation and peace projects. In addition, this study shows the importance of political support from the public in the development of the Peace Park and its implications for peace and unification efforts on the Korean Peninsula.

This study also examines how political dynamics between South and North Korea affects environmental sustainability on the Korean Peninsula. For example, this study mentions that the Kaesong industrial complex, which is a collaborative project between South and North Korea, is considered by South Korea as a possible source of funding for North Korea to develop its nuclear program.

This shows how political dynamics can affect the development plan of the DMZ Peace Park and other peace efforts. This study is relevant as a reference in the context of understanding the Korean public's response to the willingness to pay for the construction of the DMZ Peace Park, which is different from other studies that focus more on the impact of environmental damage caused by political dynamics between South and North Korea.

The third literature review entitled “Differential effects of patriotism and support on post-development visit intention: the Korean DMZ Peace Park” by Hyesun Kim, Yeongbae Choe, and Choong-Ki Lee in 2019 focused on the influence of patriotism and support of the South Korean

public on their interest in visiting the planned DMZ Peace Park (Kim, Choe and Lee, 2019). This study also explored the role of attitudes and subjective norms of residents in determining their visit intention to the peace park after the construction was completed. In addition, this study considered the distance of residents' residences from the peace park location as a factor influencing attitudes and visit intentions. The theory used as the basis for this study is the Theory of Planned Behavior (TPB). The data collection method used was an online survey, and data analysis was carried out using the SEM lavaan software package in the R 3.4.1 environment.

The results showed that patriotism and public support had a significant effect on attitudes, subjective norms, behavioral control, and visit intention to the peace park. The recommendation from this study is the importance of gaining broad support from the public in the development of the Korean DMZ Peace Park. In addition, this study also emphasizes the importance of considering factors such as patriotism and distance of residents' residence in planning marketing and promotion strategies to increase public support for tourism development. The criticism given to this study is the possibility that the characteristics of the sample used may limit the generalizability of the results, so it is recommended to conduct re-measurements with a more representative sample to obtain stronger conclusions.

This paper provides useful information on the impact of political dynamics between South and North Korea on the environment, focusing on the plan to build the Korean DMZ Peace Park proposed by the South Korean government. This study distinguishes itself from other studies that focus more on the impact of environmental damage caused by political dynamics between South and North Korea.

The fourth literature review entitled "Engaging North Korea: environmental cooperation in peacebuilding" by Annie Young Song and Justin V. Hastings in 2020 analyzes environmental cooperation between North and South Korea amid political tensions (Song and Hastings, 2020). They apply the concept of environmental peacebuilding, highlighting the important role of non-state actors in promoting peace through international environmental cooperation. The research method includes literature analysis and case studies on environmental cooperation in conflict countries.

This study shows that environmental collaboration can support peace efforts, especially in the context of North and South Korea. Recommendations involve non-governmental organizations to facilitate this cooperation, although criticism may arise regarding the limitations of empirical data. This study is relevant because it highlights the impact of political dynamics between South and North Korea on environmental cooperation, with an emphasis on North Korea's internal reasons for accepting cooperation, such as forestry programs to overcome drought and famine.

The fifth literature review entitled "Security Issues on the Korean Peninsula and Parliamentary Peace Efforts" by Simela Victor Muhamad in 2016, focuses on security issues on the Korean Peninsula which are prone to conflict and have not found a stable peaceful solution (Muhamad, 2016). The main issues raised are the tensions between North and South Korea, as well as international concerns over North Korea's nuclear program.

This study uses a literature study approach and data analysis from relevant reading sources, including books, journals, newspapers, other written documents, and online media. The results of the study show that parliamentary diplomacy, especially through the Asia-Pacific Parliamentary Forum (APPF), plays an important role in responding to security issues on the Korean Peninsula. The APPF has issued a resolution supporting denuclearization and peace in the region. Parliamentarians from APPF member countries are required to engage in parliamentary diplomacy to support peace efforts.

The recommendation of this study is that the APPF needs to increase parliamentary diplomacy activities, both institutionally and individually, to support peace efforts on security issues on the Korean Peninsula. This includes encouraging parliamentarians to actively promote peace efforts in international forums and forming a "diplomacy team" to communicate with the North Korean parliament. However, this study may have weaknesses. The temporal analysis may not reflect current developments or may not consider the time dynamics of the security situation on the Korean Peninsula.

Focus on government parliamentary diplomacy, civil society, and non-state actors. The implementation of the concept of "network diplomacy" may not be explained practically in the context of parliamentary diplomacy on the Korean Peninsula. This study is different from studies

that focus on the effects of environmental degradation caused by the political policies of South Korea and North Korea, which also affect political dynamics on the Korean Peninsula.

The sixth literature review entitled "Environmental degradation in the Korean Peninsula: Evidence from the environmental degradation index" by Yuanhao et al. in 2024 explores the problem of environmental degradation on the Korean Peninsula and the importance of assessing and understanding the degradation process (Yao *et al.*, 2024). This study aims to promote sustainable development in Southeast Asia. In this study, the approaches used include the use of remote sensing data and statistical analysis to develop and calculate the Environmental Degradation Index (EDI). Principal Component Analysis (PCA) and the geometric mean method were used to verify the validity of the EDI. The findings show that environmental degradation on the Korean Peninsula has increased significantly, with North Korea experiencing more extensive degradation than South Korea.

The main factors influencing environmental degradation in North Korea are the expansion of agricultural land and forest loss. The proposed recommendation is the importance of cooperation between the North and South Korean governments in the environmental field to catalyze sustainable development in the Korean Peninsula and Southeast Asia. The focus of this study is on the evaluation of environmental degradation in the Korean Peninsula and the comparison between North and South Korea during the period 2000-2022.

THEORETICAL FRAMEWORK

Korea was divided into two countries, South Korea and North Korea, due to ideological differences that sparked a civil war in 1953. Post-war, North Korea adopted a policy of nuclear development and testing, while South Korea focused on military exercises and formed an alliance with the Trilateral Military Alliance. The impact of this policy has caused environmental damage such as air and water pollution, land degradation, and deforestation on the Korean Peninsula. The impact of political dynamics between South and North Korea on environmental sustainability on the Korean Peninsula can be analyzed using the Concept of Political Dynamics by Erich Weede and the Theory of Environment and Security by Elizabeth L. Chalecki (Weede, 2001, 2003; Chalecki, 2013).

Based on the Theory of Environment by Elizabeth L. Chalecki, it states that environmental problems can trigger conflict and tension between countries or ethnic groups. In this context, the theory is used as a basis to explain that conventional security threats such as inter-state conflict and weapons of mass destruction are closely related to environmental issues. Environmental degradation that occurs due to the competition in military power between North and South Korea ultimately harms both parties. Meanwhile, the Concept of Political Dynamics by Erich Weede is also the basis for this study. This concept suggests that political dynamics can affect environmental policies and natural resource management practices, which in turn can lead to environmental degradation.

This concept can trigger efforts to find long-term solutions to political and economic problems in Korea, such as reunification and denuclearization. Environmental security theory is useful for analyzing the negative impacts of factors that threaten environmental sustainability on the Korean Peninsula and for developing sustainable environmental policies. Nuclear tests and military exercises, which are part of the policies of South and North Korea, have negative impacts such as the spread of radioactive particles, environmental degradation, air, soil, and water pollution, and threats to animal life around military bases. Therefore, it is important to consider environmental and security impacts in formulating policies related to nuclear tests and military exercises on the Korean Peninsula. It is important to underline that addressing these issues requires cooperation and environmental diplomacy to address environmental threats caused by the political policies of South and North Korea.

RESEARCH METHOD

The study began with a thorough literature review to understand all the literature related to the research topic, namely the political dynamics between South Korea and North Korea and how it affects the environment in the Korean Peninsula. This helped in developing a theoretical basis that supports the study. This study used a qualitative research method with a case study research type. This study determines a clear scope to ensure focus on a particular aspect of a broad topic.

The study used a case study type and a descriptive analysis research type to explore and describe the phenomenon in detail. This study used information from various sources such as

journals, books, research reports, and mass media as secondary data. To increase the reliability and validity of the data, the study used source triangulation (comparing information from several sources), technique triangulation (using various data collection techniques), and time triangulation (collecting data at different times).

In data analysis, the study organized data, grouped it, synthesized information, identified patterns, and highlighted important information to conclude relationships and concepts in the data collected. The validity and reliability of the data were tested through a series of steps to ensure validity and reliability. Before drawing final conclusions, the researcher re-examined the collected data to ensure its validity, and to verify that the conclusions drawn show the impact of political dynamics between South and North Korea on environmental sustainability on the Korean Peninsula. With this approach, the study aims to produce valid and reliable findings regarding the impact of these policies on the environment.

The focus of this study is on the effects of environmental damage caused by the political policies of South and North Korea, and how political dynamics between the two can affect environmental sustainability on the Korean Peninsula. This study also highlights the need to consider ecological concerns in planning actions such as sanctions, aid, and humanitarian exceptions.

This study uses a qualitative approach with data collection techniques through official news reports and document studies to explore and describe the phenomenon in detail. The aim is to understand and reduce the negative impacts of political conflict on the environment and to design and implement more effective environmental policies.

RESULT AND DISCUSSION

Comparison of Political Ideologies of South Korea and North Korea.

South Korea and North Korea have fundamental differences in terms of the implementation of ideology, which is reflected in their systems of government, economy, and social policies. South Korea follows a representative democracy with a free market economy. The country has developed into a stable democracy with a strong economic system, known as the "K-Model" or "Korean Model," which combines elements of capitalism and state intervention to encourage economic

growth (Kurata, 2019). South Korea has political freedom and freedom of speech, as well as competitive elections and various political parties. On the other hand, North Korea is known as a country that implements a very different political system, namely a system known as "Juche," which claims to be the original form of socialism. Juche teaches that North Korea must be independent and not dependent on other countries, both in terms of ideology and economy (Kurata, 2019).

North Korea is a communist country with a state-dominated economy and tight control over society and the media. The country is known for its repressive political system and lack of civil liberties. Economically, South Korea has achieved the status of a developed country with a high per capita income and sophisticated industries. North Korea, on the other hand, suffers from chronic economic crises and is dependent on international aid to meet the basic needs of its population. Socially, South Korea has a more open and globally integrated society, with policies that support human rights and individual freedoms. North Korea, on the other hand, is known for its highly controlled system, with the government closely monitoring its citizens' private lives and limiting contact with the outside world.

Overall, a comparison between South and North Korea shows a clear contrast in the implementation of ideology, with South Korea tending more towards a democratic system and a free market economy, while North Korea tends more towards an authoritarian political system and a state-dominated economy. The implementation of political policy in North Korea is based on a highly centralized and authoritarian political system, known as "Juche" or "National Wealth." This system was established by the founder of North Korea, Kim Il-sung, and has been maintained by the Kim family dynasty. North Korea has a highly centralized government, with political power concentrated in the hands of the Kim family and the Korean Workers' Party (KWP). The KWP is the only legal political party in the country, controlling all aspects of political and social life (Kurata, 2019).

The implementation of political policies in North Korea is often associated with a cult of personality of the country's leaders (Kurata, 2019). Kim Il-sung, Kim Jong-il, and Kim Jong-un, respectively, are revered as divine leaders and Juche advocates. Policies are often promoted as part of their worldview and are closely followed by the public. The North Korean government

maintains tight control over information and media to ensure that the population follows official policies and is not exposed to outside ideas that could endanger political stability. The internet and social media are extremely limited, and are only available to a small elite, with the primary purpose of monitoring and influencing public opinion (BBC Indonesia, 2018).

North Korea's foreign policy is also often guided by the goal of ensuring national security and independence, as well as to deal with pressure from other countries such as the United States and South Korea. North Korea's nuclear weapons program is part of their national defense strategy, which is considered important to prevent external intervention (Kurata, 2019). Overall, the implementation of political policy in North Korea is characterized by tight control by the government, with little room for civil liberties and political expression that does not align with the official line. This results in a system that is very inflexible and difficult to adapt to internal or external changes. The implementation of political policy in South Korea is carried out within the framework of a stable and developing representative democracy.

South Korea is a country with a multiparty system, competitive elections, and a separation of executive, legislative, and judicial powers where political parties compete in general elections to win seats in the National Assembly. General elections and presidential elections are held periodically and are considered important processes to ensure political legitimacy and representation. South Korea has a strong tradition of civil liberties, including freedom of speech and freedom of the press. The media is free to report news and criticize the government, which helps ensure transparency and accountability (Haggard and You, 2015). South Korea has an active, diplomacy-oriented foreign policy to maintain good relations with other countries and ensure national security. South Korea's defense policy is also important to counter threats from North Korea and to maintain strategic relations with the United States (Lee and Lee, 2020).

Political Dynamics on the Korean Peninsula

South Korea and North Korea have a highly competitive and often confrontational relationship, rooted in differences in political systems, ideologies, and demands for legitimacy for leadership over all of Korea. South Korea is a constitutional democracy with an advanced market economy, while North Korea is a communist state ruled by the Kim dynasty, which implements a

highly closed planned economy. South Korea's political policy is oriented towards diplomacy and strong defense, with the aim of ensuring regional stability and national security. South Korea seeks to manage the threat from North Korea through a combination of diplomacy, strong defense, and international cooperation, including through the US-ROK Alliance (Lee and Lee, 2020).

North Korea, on the other hand, uses often provocative and aggressive political policies to achieve its goals (Lee and Lee, 2020). Pyongyang claims to be the legitimate successor to the Korean nation and seeks to force South Korea and the US to recognize North Korea's legitimacy and national interests. North Korea has also developed and demonstrated nuclear weapons as a means of deterrence, suppressing US influence in South Korea, and promoting North Korea's national interests. Interactions between the two Koreas have often resulted in tension and political dynamics on the Korean peninsula. North Korea has used missile tests and bellicose rhetoric to influence South Korea and the US, which have often responded with military exercises and international sanctions. This creates a dynamic that is prone to escalation and could undermine regional stability.

South Korea has sought to mitigate this dynamics by strengthening relations with international stakeholders, including China and Russia, to manage the North Korean nuclear threat and promote the denuclearization process. South Korea has also made significant investments in conventional defenses to counter North Korean power and to ensure readiness for potential threats (Lee and Lee, 2020).

North Korea views nuclear weapons as key to its national security and the survival of the Kim regime. Its nuclear strategy is designed to ensure that North Korea has a powerful tool to deter external attacks, particularly from the United States and South Korea. By developing and demonstrating nuclear capabilities, North Korea hopes to create a credible deterrence against any perceived threat. This allows North Korea to reduce the likelihood of a military attack by demonstrating the ability to respond devastatingly (Lee and Lee, 2020).

In addition to its deterrence function, North Korea also sees nuclear weapons as a tool to influence international negotiations and to obtain compensation or economic assistance from other countries in exchange for restrictions or reductions in its nuclear program. North Korea also links its nuclear program to the Juche ideology, which emphasizes self-reliance and national strength.

Nuclear weapons are introduced as a symbol of North Korea's strength and progress in the international world. North Korea understands that the regional and global strategic environment can change, and thus, the role of nuclear weapons in its national security policy must also adapt (Lee and Lee, 2020). Therefore, North Korea uses a dynamic nuclear strategy that can be adjusted to changing situations. South Korea faces a direct threat from North Korea, which has an aggressive nuclear and ballistic weapons program. North Korea has conducted repeated weapons tests and often threatens South Korea and other countries in the region (Wright, 2022).

Therefore, South Korea needs a strong defense system and regular military exercises to prepare for potential confrontation. South Korea and the US have a strong defense alliance that began with the Korean War (1950-1953). This alliance commits the US to help defend South Korea from aggression, while South Korea receives security and protection from US nuclear weapons. Joint military exercises between South Korea and the US are part of this commitment to ensure war readiness and effective cooperation (Council on Foreign Relations, 2022). The US is an important strategic partner for South Korea in countering North Korea's expansionist aspirations and in maintaining regional stability. The US presence in the region also helps counterbalance China's growing influence. South Korea has limited resources and population compared to North Korea. Therefore, forming alliances with other countries gives South Korea access to additional resources and military power needed to counter North Korea (Kurata, 2019).

It is no wonder that South Korea takes a proactive approach to national security by implementing advanced military exercises and defense strategies. This allows South Korea to better prepare itself for possible threats or attacks. Overall, South Korea's decision to implement military exercises and form alliances with the US and Japan is the result of careful strategic calculations and efforts to ensure national security and regional stability.

External Interests on the Korean Peninsula

Environmental security on the Korean Peninsula is a complex and important issue, given that South Korea and North Korea have very different political and security situations. South Korea, with its active and participatory democracy, has succeeded in developing a professional civil society. However, the country faces significant threats from North Korea, which has controversial nuclear and missile programs. North Korea claims that no nuclear devices have left

the Korean Peninsula and emphasizes that denuclearization of the Korean Peninsula was the last wish of Kim Il-sung, the country's founder. This shows North Korea's efforts to reduce international attention to its nuclear program, even though the program remains a major source of tension in the region.

In the context of state strategic communication, environmental and climate change issues are not merely positioned as technical ecological issues, but are also utilized as diplomatic instruments to shape perceptions, gain legitimacy, and open up space for international engagement. North Korea frames climate change as a non-confrontational agenda in its external communications, particularly through participation in global climate forums, ratification of environmental treaties, and the narrative of ecological vulnerability conveyed to the international community. This framing allows the North Korean regime to present itself as a responsible and cooperative actor, while simultaneously blurring the country's image, which has long been associated with nuclear and military security issues (Scartozzi & Kang, 2023).

The security situation on the Korean Peninsula is influenced by various internal and external factors. Internally, relations between South Korea and North Korea play a significant role, while externally, global powers such as the United States, China, and Japan contribute. South Korea seeks to maintain security and stability by promoting democracy, a free market economy, and multicultural values, as well as developing a multilateral security framework in East Asia. Major countries such as the United States, Japan, and China have significant roles in this conflict. The United States, as an ally of South Korea, has been involved in negotiations with North Korea regarding nuclear weapons and has sought to maintain regional stability through missile defense (Lee, 2023). Japan, which borders North Korea, feels threatened by North Korea's military advances and has strengthened defense cooperation with the United States and increased regional security in response to the threat (Lee, 2023).

China, as North Korea's main neighbor, plays a more complex role. Although China does not support North Korea's nuclear program, it seeks to avoid conflict that could disrupt regional stability and China's economy. China is active in regional negotiations such as the Six Party Talks, acting as a mediator to encourage North Korea to abandon its nuclear program and maintain stability in the East Asian region (Lee, 2023). The involvement of external countries such as the

United States, Russia (formerly the Soviet Union), Japan, and China influences the dynamics of the conflict between South Korea and North Korea. The United States, for example, has increased its missile defense system in response to threats from North Korea, which has caused tensions with China.

Russia, as a long-standing ally of North Korea, also plays a role in the conflict, while Japan is involved in joint military exercises with its allies in waters near China. China responded to the United States' deployment of the THAAD missile defense system in South Korea as an attempt to limit China's influence in the region (Ekmektsioglou and Lee, 2022). Overall, the involvement of global powers in the Korean Peninsula conflict creates complex dynamics, exacerbating tensions and affecting stability and security in the region.

Impact of political dynamics between South and North Korea on environmental sustainability on the Korean Peninsula.

The unstable political situation on the Korean Peninsula has serious impacts on the natural environment. Political tensions and armed conflict between South and North Korea have caused various environmental problems such as degradation, ecosystem damage, and loss of biodiversity. For example, in North Korea, uncontrolled deforestation and land extraction for agriculture have caused severe environmental damage. In addition, political tensions have hampered conservation efforts, including the establishment of nature parks in the Demilitarized Zone (DMZ), which have become difficult due to the conflict between the two countries.

Military exercises on the Korean Peninsula, such as explosions, weapons use, and noise pollution, damage marine ecosystems by disrupting coral reef habitats and contaminating water with explosives and heavy metals. Noise pollution from sonar affects marine mammals such as whales and dolphins, disrupting their behavior and potentially causing mass deaths. Nuclear tests have also damaged marine ecosystems with radiation affecting the genetics of marine organisms, the food chain, and habitats such as coral reefs (Lawrence *et al.*, 2015).

The presence of US military bases in South Korea has resulted in water, air, and soil pollution, with contamination detected in areas such as Yongsan Garrison and Camp Kim. This pollution includes hazardous chemicals such as benzene and toluene, and although the South

Korean government has attempted to clean up and seek compensation, the USFK has refused to collaborate in pollution investigations (HAN and BAE, 2015).

Large-scale conflicts often result in habitat destruction as military activities damage ecosystems and threaten plant and animal species. The Korean Demilitarized Zone, established after the Korean War and not originally designated for conservation, is now an important conservation area with 1,597 plant species, 201 bird species, 52 mammal species, and 106 fish species. However, economic pressures and large-scale conflicts can damage these ecosystems and threaten the endangered species that live there (Mjelde *et al.*, 2017).

Radar satellite observations of North Korea's 2017 nuclear test at Mount Mantap showed significant deformation, such as area collapse, compaction, and landslides. Synthetic Aperture Radar Interferometry (InSAR) and Offset Tracking (OT) techniques with a multi-kernel approach were used to measure vertical and horizontal changes. The results showed that explosions and landslides caused horizontal deformation, while collapse and compaction caused vertical deformation. The nuclear test also generated an artificial earthquake with a magnitude of 6.1, the largest since 2006, resulting in environmental damage, infrastructure dynamics, and security risks (Baek, Jung and Kim, 2020).

Research on the impact of nuclear tests in Punggye-ri shows a decrease in forest area and land degradation along with the implementation of nuclear tests. Each nuclear test, from the first to the sixth, contributed to significant deforestation and environmental damage (Kim, 2016). In addition, conflicts can cause environmental pollution through the use of toxic weapons and the uncontrolled exploitation of natural resources such as oil and gas. In unstable political situations, conservation is often not a priority, resulting in illegal logging, illegal hunting, and other damage. Pollution can also increase, threatening human health and ecosystems (Mjelde *et al.*, 2017).

In North Korea, political dynamics resulted in a decline in forest area from approximately 70% to 40% between 1990 and 2016. This deforestation leads to soil erosion, flooding, and decreased water quality, which impact neighboring countries and regional ecosystems. Flooding caused by deforestation affects food security and public health, and drives migration to neighboring countries, increasing pressure on resources in those countries (Park and Bridges, 2021). Political dynamics also hinders international assistance needed to address environmental

and humanitarian issues. Political isolation reduces regional and international cooperation, exacerbates existing environmental degradation, and perpetuates the cycle of degradation. Overall, political dynamics on the Korean Peninsula has a significant impact on the environment and public well-being, with international assistance often ineffective in addressing these issues (Park and Bridges, 2021).

The results of the study show that political dynamics on the Korean Peninsula is the result of the South-North Korean political policies, where North Korea conducted nuclear weapons tests and South Korea conducted military exercises with the US and Japan. This has resulted in negative impacts on the environment, such as environmental degradation, greenhouse gas emissions, forest destruction, groundwater poisoning, decreased agricultural production, population displacement, and damage to marine and land ecosystems. This political tension not only increases the risk of military conflict but also has a negative impact on environmental sustainability on the Korean Peninsula.

Nuclear weapons tests and military exercises can result in environmental degradation, greenhouse gas emissions, forest destruction, groundwater poisoning, and damage to marine and land ecosystems. Irreversible environmental conditions and worsening humanitarian crises mutually affect and threaten society as a whole (Park and Bridges, 2021) so it is very important to propose ways to incorporate environmental aspects into international security actions that interact with problematic countries such as North Korea.

Political dynamics between South Korea and North Korea significantly affects environmental sustainability on the Korean Peninsula. This study suggests that the ongoing political and military tensions between the two countries have resulted in various negative impacts on the environment. Political policies implemented by North Korea, such as uncontrolled exploitation of natural resources and deforestation, as well as South Korean military exercises, have caused serious environmental degradation, Greenhouse Gas Emissions, Air Pollution, Declining Agricultural Production and Damage to Marine and Land Ecosystems.

Therefore, in terms of political and security conditions in this region, it must be well understood in order to develop effective strategies and policies to address environmental issues and promote sustainable development. Political dynamics and military confrontation can cause

negative impacts such as water, sea and air pollution, which require cooperation between countries. For example, the firing of a ballistic missile by North Korea into the sea, even though it does not directly hit South Korea, can increase tensions and hinder important diplomatic efforts and environmental cooperation.

Environmental cooperation is not only an effort to protect the environment but also a gradual trust-building mechanism that can reduce threat perceptions and improve communication between parties. Small-scale projects, such as joint reforestation and biodiversity conservation programs in the DMZ, have strategic value because they can create positive spillovers to other areas of cooperation. This is in line with cross-border water resources cooperation, which demonstrates that technical collaboration in the water sector is often used as an initial entry point to build trust in conflict areas, before evolving into broader political cooperation. Thus, environmental cooperation on the Korean Peninsula can be understood as a confidence-building measure that not only has ecological impacts but also contributes to long-term stability and political tension reduction (Motylińska, 2021).

Based on the Environmental Peacebuilding approach, it focuses on joint solutions and mutual benefits to reduce confrontation and build trust between the two countries. By making the environment an area of cooperation, the two Koreas can carry out joint projects that are not only beneficial to the environment but can also help reduce tensions and promote reunification. To implement this approach, both sides need to take concrete steps and commit to starting serious environmental dialogue and cooperation. Small successful projects can build trust and develop into broader cooperation. The current political and security dynamics has North and South Korea competing to improve their security capabilities, which has negative impacts on the environment.

CONCLUSION

The political dynamics between South and North Korea have been shown to significantly impact environmental sustainability on the Korean Peninsula. The differences in ideology and security policy orientation between the two countries have fostered a pattern of interaction dominated by the logic of military confrontation, ultimately making the environment an indirect victim of political rivalry. North Korea's policy of focusing on nuclear weapons development and

testing, and South Korea's response through intensive military exercises with the United States and Japan, have contributed to environmental degradation, including air, land, and water pollution, damage to terrestrial and marine ecosystems, deforestation, and increased greenhouse gas emissions.

This demonstrates that environmental issues on the Korean Peninsula cannot be separated from the context of regional security and politics. From an environmental security perspective, military and nuclear activities not only increase the risk of armed conflict but also pose long-term threats to ecological sustainability and human well-being. Environmental damage from nuclear tests, pollution from military bases, and disruption of marine ecosystems from missile launches demonstrate that unstable political dynamics narrow the space for sustainable environmental management and hinder cross-border cooperation.

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