



MICHIGAN FOREIGN POLICY REVIEW

Volume 10 | Issue 2



Dear Reader,

The Executive Board of the Michigan Foreign Policy Council (MFPC) is pleased to present the twentieth edition of the Michigan Foreign Policy Review. It is a testament to the hard work of our researchers, editors, senior analysts and policy proposal authors that we have reached such a significant milestone. This landmark edition features a range of fascinating foreign policy topics, including a comparison of the effects of major railways on intra-African trade in Ethiopia and Tanzania, a study into how emerging drone technology shapes the ongoing Russian-Ukrainian conflict, and a policy proposal dictating a structured public health response to lasting consequences of Agent Orange in Vietnam.

MFPC consistently prioritizes curiosity and diversity of thought. We encourage researchers to pursue their interests through research while supporting their academic and professional development along the way. As we reflect on the past semester, we are proud of the measures we have taken to support our members in their respective journeys. In addition to the research opportunities we offer, we have expanded our mentorship program and have hosted methodological and professional development workshops for members who wish to grow in their abilities. In turn, our members continue to achieve great honors on campus, in their own communities, and beyond.

This journal showcases the unwavering commitment, dedication, and passion of our members, and we are confident that it represents just the first step for students who will shape the future of foreign policy. We hope these pages inspire curiosity, challenge previously held notions, and foster lively conversations.

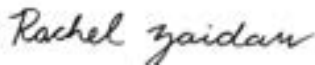
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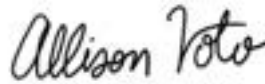
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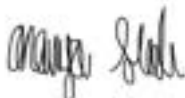
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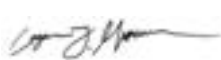
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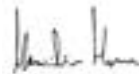
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Xi Jinping's Anti-Corruption Purges Show no Signs of Slowing

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30 Years Since Dayton: Bosnia and Herzegovina's Weakening Political Systems Raise Concerns for the Future of the Country

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Japan is Back: Takaichi Steps into the Balance-of-Power Game

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Aral Sea Today



Mining the Unknown: The Politics of the Deep Sea

RESEARCH PAPERS

Same Steel, Different Outcomes: A Comparative Study of the Addis Ababa-Djibouti Railway and the Tanzania-Zambia Railway

Joanne Koulet-Vickot, Andrea Demelas, Arjun Patel, Mahek Verma

Our research compares the impact of the Addis Ababa-Djibouti Railway (ADR) on Ethiopia's intra-African trade and the impact of the Tanzania-Zambia Railway (TAZARA) on Zambia's intra-African trade from 2016 to 2024 to determine why the railways achieved different levels of success. Our research seeks to quantify the impact of the railways on their respective countries by examining trade flows and the political and material factors that shaped their outcomes. To effectively compare the railways, we limit the timeframe from 2011 to 2024 and use 2016 as an analytical split, largely because the ADR was officially inaugurated in 2016. We analyze trade intensity metrics, including export and import volumes, export-to-GDP ratio, and container port traffic. Additionally, we analyze the railways' infrastructure and financing, management of the railways, supplemental infrastructural projects that supported the railways, Ethiopia's and Zambia's level of dependence on the railways, and export-import material. We conclude that several factors contributed to the immediate superior outcome of the ADR on Ethiopia's intra-African trade, including Ethiopia's higher level of dependence on it, gradual management of the ADR, modern infrastructure, and a more diversified export-import profile with lower shipping costs. However, several research constraints, including data availability and confounding variables, make it difficult to isolate the factors and their impact.

Introduction

The three decades after World War II were characterized by a wave of decolonization that swept across the African continent. At the time, most African countries were extremely underdeveloped, and their economies were still controlled by former colonial powers. The desire for development and full economic sovereignty shaped the actions of African policymakers. Zambia became independent from Great Britain in 1964. One year later, Rhodesian white settlers declared independence and founded what is presently known as Zimbabwe (Makoni, 1972). Zambia's trade routes towards the south were significantly disrupted by reciprocal sanctions with Rhodesia, while Tanzania appeared as a more reliable partner. The United Republic of Tanzania gained independence from Great Britain in 1961 and had access to the sea through the port of Dar es Salaam. The railway was then designed and built as an opportunity for economic development for the two new countries sharing a common interest. The Tanzania-Zambia Railway aimed for regional integration, mobility, and trade, but it also had some additional unintended effects, such as the creation of vibrant local economies around the train stations (Monson, 2005).

The context surrounding the construction of the ADR is similar. Ethiopia is the world's most populous landlocked country. Even before the railway, the country had been pursuing economic growth through infrastructure projects and urbanization (Zhongyuan, 2025). In 2014, Djibouti proposed Vision 2035, aiming to become a regional shipping hub. Since Djibouti provided Ethiopia access to the sea, the two countries already had a close economic relationship, and the railway was viewed as an essential link. Additionally, their exports were limited and mainly consisted of agricultural products and primary industrial goods (Zhongyuan, 2025).

The ADR and the TAZARA were constructed during different eras and for fundamentally different

reasons, which can help explain the disparate impacts on intra-African trade post-2016. The ADR's construction occurred from 2011 to 2016, and it became operational in 2017. Since Ethiopia is landlocked, it requires access to maritime trade routes; so, the ADR was laid out to connect inland production centers to the Port of Djibouti. This was meant to help reduce transportation costs and times for moving agricultural and manufactured goods out of the country. On the other hand, the TAZARA was started in 1970 and finished in 1975, during the Cold War era. Zambia is also a landlocked country and heavily relies on the export of minerals such as copper. The government wanted a route connecting it to the sea that avoided Apartheid South Africa and white-minority-ruled Rhodesia, now Zimbabwe, which controlled most of Zambia's potential trade routes pre-TAZARA. As such, the TAZARA was built to support Zambia's geopolitical sovereignty, while the ADR was built for economic efficiency in Ethiopia.

China played a significant role in financing, building, and supporting the ADR and the TAZARA. In each project, China provided substantial loans (World Bank / Global Infrastructure Hub, 2020), along with technical expertise in railway design and organization, construction labor, and workforce training (Bovenizer, 2024). Completed in 1975, the TAZARA was one of China's earliest large-scale foreign aid projects, perceived as a symbol of political solidarity and economic cooperation, particularly in the post-colonial context of the region (Bovenizer, 2024). The ADR reflects a more recent phase of Chinese infrastructure investment, under its Belt and Road Initiative, which is helping to modernize transportation and strengthen economic ties across Africa.

We analyze six factors that shaped the different outcomes of the railways: physical infrastructure, economic dependence, trade patterns, supplemental infrastructural projects, financing, and management. By physical infrastructure, we refer to the tangible components of the rails, including electrification and volume carrying capacity,

which determine efficiency and reliability. Economic dependence captures the degree in which economies depend on the railway for trade, revenue, and market access. The materials imported and exported indicate the types of goods and services transported along the railway, assessing its effect on different industries. Supplemental infrastructural projects included related development initiatives that enhanced the railway's effectiveness. Financing refers to how the railways were funded, while management concerns the operation, oversight, and technical administration of the railways. Together, these factors capture the structural and contextual circumstances that influence the success of large-scale infrastructure projects.

The projection figures for the Addis-Ababa Djibouti Railway, when compared to an accounting rate of return of 12 per cent per year, yielded an 18.9% Economic Internal Rate of Return, well above the expected figures (Mohapatra, 2017). As such, the project was expected to be massively profitable and achieved a Net Present Value (NPV) of all cost streams of 6831.30 million United States Dollars (Mohapatra, 2017). Additionally, the project anticipated a 5% average annual increase in wage rate and high-skilled employment in Ethiopia, owing to necessary construction and necessary maintenance following the railway's construction (Mohapatra, 2017). There were no similarly listed projection values for the TAZARA line.

Review of the Literature

Railways as Systems: From Infrastructure to Trade Outcomes

Railways have increasingly evolved into complex systems that facilitate trade, rather than infrastructure. Rail lines are constructed to support freight movement and regional connectivity, but their economic effects are dependent on how successfully infrastructure is translated into reliable services. Mdoe et al. (2025) argued that operational inefficiencies such as delays, congestion, and inefficient wagon usage created rail systems that are unreliable freight corridors, regardless of capital investment. This analysis shifted the focus towards performance conditions and away from infrastructure provisions. Further, Mdoe et al. (2025) noted that scheduling inefficiencies, slow cargo handling, and slow wagon turnaround times reduced the competitiveness of a specific railway. These operational constraints are significant in cross-border railways, where delays accumulate across different regions and reduce efficiency.

Similarly, operational reliability is shaped by the safety standards of a railway. Studies on the Tanzania-Zambia Railway (TAZARA) highlighted frequent disruptions caused by derailments, track failures, landslides, and damage to bridges (Kumwembe, 2025). These disruptions consistently delayed passenger and freight operations, causing financial losses for the railway (Kumwembe, 2025). The implementation of safety policies had direct and indirect effects on the performance of a railway. Improved safety standards reduced accidents and

increased customer trust and satisfaction; however, these standards needed significant resource allocation, which limited short-term productivity (Kumwembe, 2025).

Beyond operations and safety, railway governance is a key factor shaping performance. Li and Wang (2025) looked at Chinese-sponsored railways in Africa and found that post-construction outcomes are heavily influenced by political incentives. Instead of prioritizing local commercial performance, Chinese-sponsored enterprises, like the ADR and the TAZARA, engaged in "reputational governance," emphasizing symbolic successes, political loyalty, and narrative alignment with domestic Chinese audiences. Variations in political power also influence how operational decisions such as staffing, maintenance, investment, and responsiveness to disruptions are managed. As a result, railways are positioned within a broader geopolitical context, where the outcomes of local trade and economies are mediated by the actions of foreign operators (Li & Wang, 2025).

The Addis Ababa-Djibouti Railway (ADR) *Rationale and financial considerations behind the railway*

The existing research on Ethiopia's economy, prior to the construction of the ADR, demonstrated its necessity and the historical context leading up to its construction and expansion. Despite Ethiopia's low factor prices for goods, such as t-shirts produced for nearly a third of China's, Ethiopia's lack of sea access increased the costs of exports, causing their sale price to resemble China's (Pearson, 2018). Thus, Djibouti became a prime destination for a railway because it had a port, which Ethiopia had access to. Before the opening of the ADR in 2016, the Port of Djibouti accounted for 90% of Ethiopian trade, despite Ethiopian trade firms having to use a road corridor in order to access it (World Bank / Global Infrastructure Hub, 2020). Given its landlocked status, Ethiopia required access to a water port to cut costs to its primary global trading partners, notably Saudi Arabia and the United States for exports and China and India for imports (World Bank, 2023). For this reason, research from the China Africa Research Initiative (Chen, 2021) labeled the ADR as the centerpiece of the 10-year 2020 projection Second Growth and Transportation Plan (GTP II), which aimed to achieve an 11% average annual growth rate by 2020 (Federal Democratic Republic of Ethiopia, 2016).

Political factors affecting the railway

Several political factors hinder Ethiopia's ability to produce a successful economic policy. Since 2018, when Prime Minister Abiy Ahmed rose to power, there have been human rights abuses by governmental powers, inter-communal and inter-religious violence, and border disputes that have hindered economic growth (Ralph Bunche Institute for International Studies, 2025). From 2018 to 2024, the Ethiopian National Defense Forces (ENDF) and the Oromo Liberation Army (OLA) killed thousands of civilians and displaced over 3.3 million people. Additionally, there has been ongoing conflict between the ENDF and the Tigray

Defense Forces (TDF) in a regional dispute, where the ENDF has committed a disproportionate amount of war and human rights crimes (Ralph Bunche Institute for International Studies, 2025; Al Jazeera, 2024). Domestically, Ethiopia faces several political challenges, including unclear policies, weak institutions, limited transparency, and low public participation in democratic processes (Fufa, 2024). Between 2018 and 2022, political violence had negative consequences on Ethiopia's foreign direct investment and foreign aid inflows, which could have hindered the effectiveness of railways in boosting the state's economic outcomes (Ashine, 2024). Furthermore, recent empirical research (Ayal et al., 2024) links political instability to weak institutions, corruption, and inefficiency. Ultimately, this limits a country's ability to demonstrate sustainable economic growth and attract investors.

Economic viability, logistics, and performance

Existing research on the ADR has focused on its financial structure, logistical performance, and its effects on regional integration, namely in East Africa. Early scholarship anticipated transformative regional impacts from the ADR. Before the railway became operational, Gudeta (2015) conducted a cost-benefit and economic viability analysis, which concluded that the railway would generate strong economic returns, promote industrialization, and position Ethiopia as a regional transport hub and international transport corridor. While Gudeta (2015) was clear and systematic, helping establish a strong theoretical foundation, it was largely predictive and lacked hindsight. This existing research did not measure trade outcomes, left unanswered whether the projected benefits materialized, and lacked the comparative analysis we can now offer as researchers in 2026. With the added benefit of writing after the railway's inauguration in 2016, Mohapatra (2017) analyzed the logistics of the railway. Likewise, using a quantitative approach, Mohapatra (2017) examined the ADR's technical efficiency and benefits, such as its terrain adaptation and long-term fuel savings and foreign exchange gains. Mohapatra (2017) corroborated Gudeta's (2015) findings, concluding that the railway was economically viable, particularly when considering long-term efficiency and macroeconomic benefits. Mohapatra (2017) strengthened the understanding of the economic feasibility of the railway, but did not focus on its trade effects. The research assumed that the railway's economic viability and projected gains would lead directly to an increase in intra-African trade, a hypothesis our research tests.

Similarly, Kumar (2022) examined the logistical performance of the railway with a qualitative approach. Kumar (2022) concluded that the railway boosted Ethiopia's economy by supporting its external trade, sharply reducing transportation costs and time, consolidating economic ties with Djibouti, connecting distant cities to the main port corridor, and supporting export-oriented industrialization through, for instance, foreign direct investment. However, Kumar (2022) broadened the analysis to include Chinese involvement, namely in the project's financing, risk

allocation, and concessional loans. Kumar (2022) argued that these governance and financing structures were strong determinants of the railway's effective performance. Kumar (2022) suggested that the impact of the railway depended not only on physical construction, but on financing and governance mechanisms. As with other existing literature, Kumar (2022) only analyzed the investment project exclusively and did not directly measure intra-African trade outcomes, which our research will build upon. Similarly, Zhongyuan (2025) and Mormul (2016) had hindsight on the railway but largely focused on the regional effects of the railway. Using qualitative analyses, both scholars argued that the railway improved transportation infrastructure, industrialization, domestic production, and trade volume in Ethiopia and Djibouti, while improving interstate cooperation between the two states. Mormul (2016) further contended that the ADR would improve intra-African trade by enabling the prospect of a future trans-continental East-West African railway network. Both Zhongyuan (2025) and Mormul (2016) recognized the importance of infrastructure as a tool of regional diplomacy and connectivity; however, neither empirically measured the railway's impact on Ethiopia's intra-African trade flows. Likewise, they did not compare the railway to another infrastructure project to isolate what exactly promoted Ethiopia's greater success in intra-African trade, which our research addresses.

The Tanzania-Zambia Railway (TAZARA)

Rationale and financial considerations behind the railway

Before 1965, Zambia heavily relied on Rhodesia, South Africa, and former Portuguese colonies for its exports, especially copper (Makoni, 1972). After Rhodesia's Unilateral Declaration of Independence (UDI), Tanzania had to reroute its transport links (Makoni, 1972). The chances of Rhodesian railways being subject to guerrilla attacks were not remote, so Zambia advanced requests to the World Bank and Western countries to finance a new railway project, connecting the country with the Tanzanian seaport at Dar es Salaam. The World Bank rejected the railway project, proposing more investments in the Zambia-Tanzania highway instead (Obed, 2022); however, this highway held the issue of frequent congestion that made it difficult to operate. Tanzanian President Nyerere visited China multiple times to lobby for the project, which the Chinese government agreed to finance in 1965 (Enuka & Uchechukwigwe, 2012). The Chinese offered a £169 million interest-free loan, despite still being a developing country and lacking the advanced technology to build the railway. 10,000 Chinese workers and about 50,000 host country workers are estimated to have worked on the project (Makoni, 1972). Makoni (1972) used a net present value approach to compare the Chinese interest-free loan with a hypothetical Western loan assigned a typical 6% interest rate. The Western loan was more favorable in terms of employment and income generation during the construction period alone (Makoni, 1972). Nevertheless, considering the liabilities Zambia would face and the political considerations

of international investment, the Chinese loan appeared to be preferable (Makoni, 1972). Since then, China has maintained an interest in the railway. The TAZARA was, in fact, one of the first infrastructure projects financed by China, leading the way for their 2013 Belt and Road Initiative (BRI). China still imports 64% of copper overseas, and Zambia, rich in copper, is of particular strategic interest (Nurdun, 2025). It is in this light that the current talks of renovation and new Chinese investments in the Tanzania-Zambia railway can be understood (Nurdun, 2025).

Economic viability, logistics, and performance

The existing literature does not always agree on whether the Tanzania-Zambia railway was a success for the two countries, with different metrics yielding different results. Between 2010 and 2014, the railway moved 1,065,891 tons of freight, corresponding to 45% of its potential capacity (Obed, 2022). The railway was suffering from direct competition from the highway; however, the high reliance on the roads is draining the nation's economy through frequent reconstruction expenditures and the loss of labor due to traffic accidents. Obed (2022) conducted a survey among 100 staff of the Tanzania-Zambia Railway to verify his findings. The personnel believed that the railway could significantly impact Zambia's economic growth; however, the sample also confirmed that the current use of the railway was below its potential.

Other research considered different factors of success and failure. The railway indeed seems to have a significant impact on the lives of ordinary Tanzanians and Zambians. The TAZARA supported a thriving entrepreneurial economy along the railway in Tanzania (Monson, 2005). Merchants sell agricultural products at train stations and platforms, while others profit by buying products in the rural areas and reselling them in Dar es Salaam or other major cities. Chinese workers have also transferred knowledge and technological skills. Approximately 2,000 Tanzanians have been trained in technology and railway management, and a smaller number were sent to study at the Northern Jiaotong University in Beijing (Enuka & Uchechukwige, 2012). Such a labor-intensive project allowed local workers to gain expertise from Chinese engineers, thus contributing to the development of human capital.

Gaps and Research Contribution

Across these studies, a consensus exists that railways are increasingly conceptualized as complex systems whose economic effects depend not only on physical infrastructure but also on operational efficiency, governance structures, safety standards, and broader political contexts. However, two important gaps remain in the existing research. First, it largely focuses on economic feasibility and developmental impact without directly measuring intra-African trade. Second, the studies tend to analyze each railway in isolation, limiting the ability to explain why similar infrastructure investments

might produce different trade effects. By systematically comparing the impact of the ADR and the TAZARA on intra-African trade, our research addresses these gaps.

Methodology

This study employs a mixed-methods, but largely qualitative, design to examine the impact of the ADR and the TAZARA on intra-African trade from 2016 to 2025. The primary focus of this research is to assess the differences in impact on intra-African trade and identify the factors that likely contributed to such disparities.

The first aim of our study is to quantify the impact of the ADR on Ethiopia's intra-African trade and the TAZARA on Tanzania's intra-African trade. We first analyze each country's economic growth before and after 2016, specifically its export-import volume and trade growth rates, using trade data from UN Comtrade and macroeconomic indicators from the World Bank. Analyzing their export-import volume and trade growth rates helps us assess whether the commissioning and operationalization of each railway coincided with measurable shifts in trade patterns, particularly in trade across Africa and in global trade. By comparing pre- and post-2016 data, we can identify setbacks, improvements, or stagnations in intra-African trade flows and determine whether those trends correlate with the improvements in or establishment of each railway. Analyzing their respective trade growth rates, including the export-to-GDP ratio and container port traffic, also helps us identify any statistically significant impact of the railway system. The export-to-GDP ratio captures the openness to international markets. Similarly, the container port traffic serves as a proxy for exposure to international markets, specifically under the assumption that most maritime exports are directed toward extra-African countries. However, since trade values are also shaped by confounding factors such as commodity price fluctuations, exchange-rate movements, supply and demand shocks during the COVID-19 pandemic, and political instability, we do not treat pre- and post-2016 changes as evidence of a causal effect of the railways. We interpret these trends with additional qualitative evidence to distinguish the railway's likely contribution from broader macroeconomic and political developments. Additionally, to assess economic growth since 2016, we analyze railway productivity metrics, including revenue, service scope, freight volume, passenger numbers, transit times, and service frequency. These factors allow us to evaluate not only whether intra-African trade increased, but also whether the railways became operationally efficient after 2016. In particular, freight volume is important because it indicates the railway's significance in facilitating cross-border trade. Frequent service and lower transit times could indicate reduced transportation costs and improved trade facilitation. Revenue generation indicates whether the railway was commercially viable or relied on state subsidies, which predict its long-term economic impact. Finally, a wider scope of service (i.e., goods transported) and higher passenger numbers

indicate improved cost efficiency and transportation reliability. Incorporating these productivity metrics helps us examine the performance of each railway and its impact. Likewise, by standardizing these metrics for both railways, we create concrete points of comparison between the two countries and systematically identify which railway project had more intra-African trade despite similar infrastructure investments.

The second aim of our methodology is to identify and explain the country or region-specific factors, including political, economic, infrastructural, or societal ones, that likely shaped the outcomes of the respective railways. More specifically, our study analyzes the physical infrastructure of the railways, level of economic dependence on the railway, the materials imported and exported, and supplemental infrastructural projects that were implemented and worked in conjunction with the railways. We also examined the financing and management structures that contextualized the situation in which the railways operated. We chose these factors because large-scale transportation infrastructure does not operate in isolation; instead, it is impacted by the political economy and institutional capacity in which it is integrated. By examining these contextual variables alongside quantitative trade indicators, we can move beyond correlation and better identify causal relationships.

Results and Findings

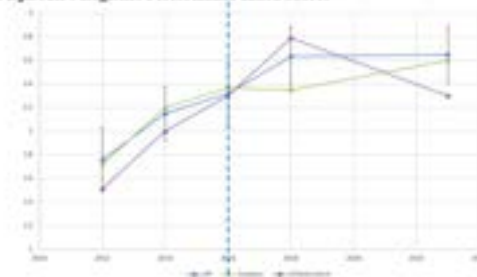
Addis Ababa-Djibouti Railway (ADR) Trade Growth/Efficiency Metrics for Ethiopia and Djibouti

This section distills metrics that indicate the efficiency and growth of trade over time for Djibouti and Ethiopia. It is divided into two subsections, one analyzing Djibouti's Logistics Performance Index Scores and the other focusing on the growth of both countries' Trade Openness Ratio scores.

The Logistics Performance Index is a tool to help countries identify the challenges they face in their logistics performance. It underscores the efficiency of trade in 139 countries, ranks them based on their scores, and has sub-indexes measuring aspects of trade efficiency such as Customs and Infrastructure. Each Index is rated on a scale of 1 to 5. Customs scores measure the efficiency of customs clearance processes, including speed, simplicity, and predictability of formalities. Infrastructure scores measure the capacity of transport-related infrastructure, including ports, railroads, roads, and information technology. Ethiopia has been excluded since 2016, preventing a proper analysis of how the railway system influenced its efficiency; thus, only Djibouti's LPI is analyzed.

Figure 1: Djibouti's Logistics Performance Index Scores

Figure 1: Djibouti's Logistics Performance Index Scores



Notes: Figures report Logistics Performance Index (LPI), Customs, and Infrastructure scores. Each index is scored from 1-5. Each LPI score contains a confidence interval based on a Margin of Error calculated by the World Bank. Source: Adjusted from World Bank, World Development Indicators (Indicators: LP.LPI.TIME.XQ, LP.LPI.CUST.XQ, LP.LPI.INFR.XQ). Accessed March 8, 2026.

The lack of overlap in the confidence intervals of LPI from 2012 to 2014 and 2018 to 2023 indicates a statistically significant increase in trade efficiency during that time. The critical increase in LPI occurred predominantly between 2016 and 2018, demonstrating that the railway was correlated with the stated increase in LPI and trade efficiency. As such, Djibouti's LPI increased from being 154th in the world in 2012 (out of 155) to 79th out of 140 countries in 2023 (World Bank Group, 2023). The most extreme benefit demonstrated in the LPI adjacent indexes was from the Customs score. The railroad construction and any adjacent projects pursued contributed to the efficiency, speed, and predictability of customs, causing Djibouti's score to increase from 154th to 74th (World Bank Group, 2023).

The ADR influenced the increase in the infrastructure index, since it directly reflects transport-related infrastructure. This would have occurred implicitly through any tangential projects Djibouti pursued (see "Supplemental Projects" section) and explicitly through the actual construction of the ADR. Such contributions led to Djibouti's infrastructure increasing from 154th in the world to 108th (World Bank Group, 2023). The Trade Openness ratio is a measure of exports and imports, divided by the country's GDP.

Table 1: Trade Openness Data

Year	Ethiopia Trade Openness (%)	Djibouti Trade Openness (%)
2011	48.2329354	-
2012	45.3979042	-
2013	41.4717871	347.720317
2014	40.7410841	298.564536
2015	39.6561241	268.363456
2016	34.8990211	213.071999
2017	31.1036495	305.967966
2018	31.199369	300.398901
2019	28.8152939	320.93923
2020	24.0061143	225.744871
2021	24.3450575	263.477729
2022	26.5954997	302.285409
2023	20.5982015	285.902044
2024	17.4004359	241.237463

Notes: World Bank, World Development Indicators (Indicator ID: NE.TRD.GNFS.ZS). Accessed March 8, 2026.

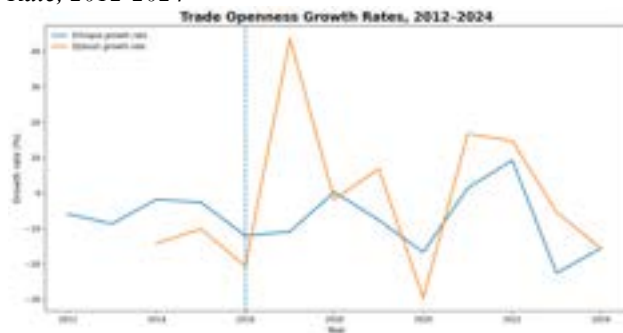
By analyzing the annual growth of the trade openness, we can determine if Djibouti and Ethiopia continued to integrate their economies into the world at a quicker or slower pace following the construction of the ADR.

Table 2: Trade Openness Growth Rate Data

Year	Ethiopia Growth Rate (%)	Djibouti Growth Rate
2012	-5.8777912	-
2013	-8.6482343	-
2014	-1.7619278	-14.136586
2015	-2.6630612	-10.115428

2016	-11.995885	-20.603199
2017	-10.875295	43.5983932
2018	0.30774358	-1.8201467
2019	-7.6414207	6.83768476
2020	-16.689677	-29.661179
2021	1.41190332	16.7148238
2022	9.24393888	14.7290174
2023	-22.550049	-5.4198334
2024	-15.52449	-15.622337

Notes: World Bank, World Development Indicators (Indicator ID: NE.TRD.GNFS.ZS). Accessed March 8, 2026.

Figure 2: Ethiopia and Djibouti Trade Openness Growth Rate, 2012-2024

Notes: Adjusted from World Bank, World Development Indicators (Indicator ID: NE.TRD.GNFS.ZS). Accessed March 8, 2026.

Ethiopia displays a decrease in Trade Openness Growth Rate over time, indicating that global integration slowed down following the construction of the ADR. Prior to the ADR's construction, Ethiopia's openness decreased by an average of 6.2% per year; whereas, following the construction, the openness metric indicates an average of 7.8% decay per year. Conversely, Djibouti's Trade Openness Growth Rate drastically increases following the construction of the ADR. In the years prior (2014-2016), Djibouti displayed an average decay of 14.9% per year; whereas, from 2017 to 2024 the data shows an average growth rate of 3.7% per year. There is an especially notable spike in 2017, immediately following the construction of the railway, and an extreme drop in openness growth in 2020. Both countries show significant volatility, which is natural for developing countries with political instability.

Trade Intensity Metrics for Ethiopia and Djibouti

This section highlights the trade intensity for Ethiopia and Djibouti, measured through Export to GDP Ratio and Container Port Traffic.

Table 3: Period averages of Export to GDP Ratio for Ethiopia and Djibouti for 2011-2015 and 2016-2024

Country	2011-2015	2016-2024
Djibouti	153.23%	141.1%
Ethiopia	45.15%	49.2%

Notes: Figures are the average exports of goods and services as a share of GDP (percent) over a time period. Δ is the difference between period averages in percentage points. Djibouti's export to GDP ratio has only been counted from 2013 onward. Source: World Bank, World Development Indicators (Indicator ID: NE.EXP.GNFS.ZS). Accessed March 8, 2026.

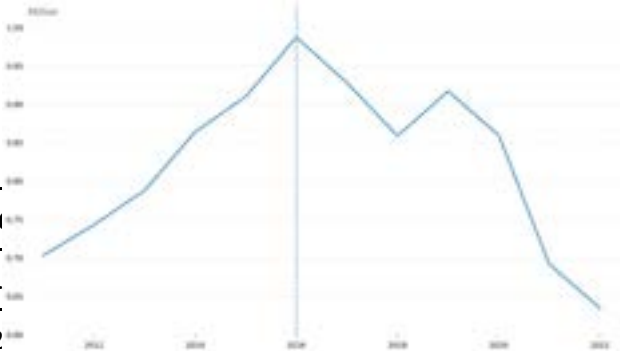
This table indicates a statistically significant difference between the two countries' export-to-GDP ratios and the way that they changed over time. Djibouti consistently shows export to GDP levels of over 150% prior to the ADR's construction in 2016, decreasing to around 140% from 2016 to 2024. Conversely, Ethiopia's export-to-GDP ratio remains below 50% throughout the examination period, although it increases from ~45% to ~49% following the construction of the ADR.

Figure 3: Exports-to-GDP ratio in Ethiopia and Djibouti (% , 2011–2024)



The following subsection focuses on container port traffic, which can only be analyzed for Djibouti, since Ethiopia is a landlocked state without a port.

Figure 4: Container port traffic (TEU), Djibouti, 2011-2022



Notes: Units are 20 foot equivalent units (TEU). Source: World Bank, World Development Indicators (Indicator ID: IS.SHP.GOOD.TU). Accessed March 8, 2026.

Djibouti's port traffic had consistently increased prior to the ADR's construction in 2016. In that period, port traffic increased from about 294,000 TEU in 2007 to 910,000 in 2015. Djibouti's port traffic peaked in 2016 at 954,000 TEU, before steadily decreasing to 635,000 TEU in 2022.

Export-Import Volume data between Ethiopia and Djibouti

Using data from the United Nations Commodity Trade Statistics Database, this section describes the bilateral trade flows between Ethiopia and Djibouti by analyzing annual trade values, imports, and exports, quantified in United States dollars. Since the Addis Ababa-Djibouti Railway was established in 2016 and became operational in 2018, the period from 2011 to 2023 is selected to capture both pre-railway and post-railway trade dynamics. The years prior to 2016 provide a baseline for trade patterns before the infrastructure development, while the years following 2018 allow for observation of potential changes in trade flows associated with the railway's operation. Data was not recorded for any trade flow in 2024; hence, it is excluded from the table. Similarly, data was not recorded for Djibouti's exports to Ethiopia and imports from Ethiopia from 2011 to 2017; hence, it is also excluded from the table.

Table 4: Ethiopia-Djibouti bilateral trade flows (annual averages)

Flow	2011-2017	2018-2023	Δ	$\Delta\%$
Ethiopian exports to Djibouti	0.37	138.35	+137.98	37291.89
Ethiopia imports from Djibouti	50.67	99.57	+48.9	96.51

Djiboutian exports to Ethiopia	-	131.17	-	-
Djibouti imports from Ethiopia	-	3713.83	-	-

Notes: Figure reports annual trade flow averages in millions USD for 2011–2017 and 2018–2023. Δ and $\Delta\%$ denote the difference between the two periods averages. Source: United Nations, UN Comtrade Database. Accessed March 8, 2026.

The table demonstrates that trade flow values increased from 2011 to 2017 and from 2018 to 2023. While data is missing in Djibouti's exports and imports between 2011 and 2017, from the table we can infer that their flows likely increased as well. Ethiopian exports to Djibouti demonstrate the largest increase, a 37291.89% increase in millions of USD. These comparisons are purely descriptive, intending to show that the ADR likely contributed to the increase in trade flow between Ethiopia and Djibouti.

Tanzania-Zambia Railway (TAZARA) **Trade Growth/Efficiency Metrics for Tanzania and Zambia**

This section analyses trade growth and efficiency for Tanzania and Zambia in two subsections: one analyzing Logistics Performance Index Scores and the other focusing on the Trade Openness Ratio scores of each country. The LPI scores show trade efficiency across Tanzania and Zambia on a scale of 1 to 5, also showing customs performance and infrastructure quality levels.

Table 5: Tanzania and Zambia LPI Scores

Year	Tanzania LPI	Zambia LPI	Tanzania Customs	Zambia Customs	Tanzania Infrastructure	Zambia Infrastructure
2012	2.37	2.28	2.08	2.10	2.35	2.15
2014	2.41	2.37	2.23	2.23	2.44	2.29
2016	2.53	2.40	2.38	2.29	2.62	2.34
2018	2.61	2.48	2.44	2.36	2.78	2.43

Notes: World Bank, World Development Indicators (Indicator ID: LP.LPI.OVRL.XQ, LP.LPI.CUST.XQ, LP.LPI.INFR.XQ)

Tanzania has consistent improvement in logistics performance between 2012 and 2018, with both customs and infrastructure also showing steady improvement. Stronger port operations and related road networks likely contributed to this rise by improving faster cargo handling and more predictable clearance processes. Zambia shows slightly smaller gains over the same period of time, with the largest difference from Tanzania being in infrastructure. This demonstrates the structural constraints of the TAZARA as freight transportation was being shifted more towards road transportation and alternative export corridors. With Zambia being landlocked and relying on external transport networks, the TAZARA's constraints limited their efficiency growth. Because LPI data is only reported for specific years and stopped being available after 2018 for these countries, these changes cannot be interpreted as continuous trends, so the LPI scores only provide limited evidence on changes in trade efficiency.

Table 6: Trade Openness Data

Year	Tanzania Trade Openness (%)	Zambia Trade Openness (%)
2011	56.17	72.80
2012	54.37	75.37
2013	48.63	80.46
2014	45.36	76.19
2015	40.76	79.87
2016	35.42	73.96
2017	33.11	71.59
2018	32.64	74.89
2019	33.02	68.79
2020	27.96	79.21
2021	29.92	86.21

2022	35.00	69.30
2023	38.21	78.24
2024	41.51	62.53

Notes: Trade Openness is calculated as (Exports + Imports) / GDP. Source: World Bank, World Development Indicators (NE.TRD.GNFS.ZS)

Table 7: Trade Openness Growth Rate

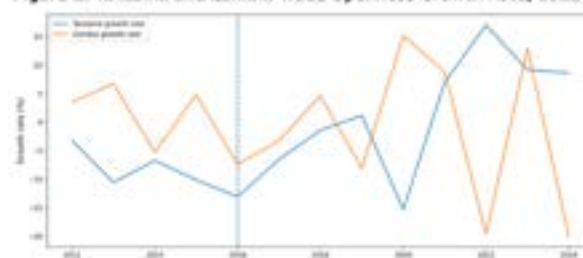
Year	Tanzania Growth Rate (%)	Zambia Growth Rate (%)
2012	-3.20	3.53
2013	-10.55	6.75
2014	-6.74	-5.30
2015	-10.14	4.82
2016	-13.09	-7.40
2017	-6.52	-3.21
2018	-1.42	4.61
2019	1.15	-8.14
2020	-15.31	15.14
2021	6.98	8.84
2022	17.01	-19.62
2023	9.17	12.91

2024	8.64	-20.07
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Notes: Growth rates represent YoY percentage change. Source: World Bank, World Development Indicators (NE.TRD.GNFS.ZS)

Figure 5: Tanzania and Zambia Trade Openness Growth Rate, 2012–2024

Figure 2: Tanzania and Zambia Trade Openness Growth Rate, 2012–2024



Notes: Adjusted from World Bank, World Development Indicators (Indicator ID: NE.TRD.GNFS.ZS)

Tanzania shows a decline in trade openness from 2012 to 2018, slightly recovering from 2019 to 2024, indicating less integration in global trade during the period of decline, but only showing a 15% decline over the entire measured period. Zambia has consistently high levels of trade openness from 2012 to 2024, typically ranging around 60% to 85%, but the level of openness is highly volatile, with large changes in growth rate almost every year, including a sharp increase in 2020, followed by a sharp decline in 2022 and 2024. The high level of openness reflects strong integration into international trade, and the volatility can likely be explained by a high dependence on commodity exports, primarily copper, whose price fluctuations could cause high volatility.

Trade Intensity Metrics for Tanzania and Zambia

This section analyzes two indicators that help contextualize changes in Tanzania's and Zambia's trade performance over time: the export-to-GDP ratio and container port traffic.

The export-to-GDP ratio captures the overall openness to international markets. The container port traffic is used as a proxy for exposure to maritime trade flows, assumed to be primarily oriented toward extra-African markets. For comparability with the Ethiopia–Djibouti Railway case, we summarize trends using the same period split (2011–2015 and 2016–2024).

The following table summarizes the average exports of goods and services as a share of GDP for Tanzania and Zambia, comparing 2011 to 2015 with 2016 to 2024.

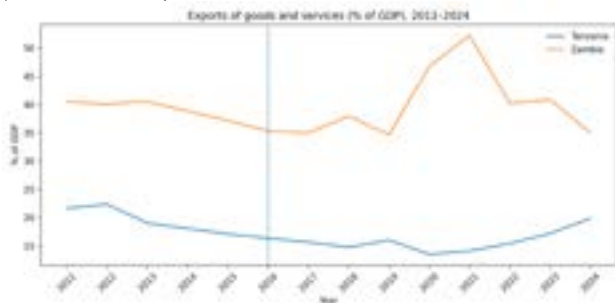
Table 8: Exports-to-GDP ratio in Tanzania and Zambia (period averages)

Country	2011-2015	2016-2024	Δ
Tanzania	19.64%	15.87%	-3.77
Zambia	39.40%	39.76%	+0.36

Notes: Figures are exports of goods and services as a share of GDP (percent). Δ is the difference between period averages in percentage points. Source: World Bank, World Development Indicators (indicator NE.EXP.GNFS.ZS). Accessed March 8, 2026.

The table illustrates a significant difference between the two countries. Zambia consistently reports export levels corresponding to around 40% of GDP or more. Tanzania instead remains below 25% throughout the examination period. Zambia's average remains roughly constant between the two periods, while Tanzania's ratio displays a moderate decline of 3.77 percentage points.

Figure 6: Exports-to-GDP ratio in Tanzania and Zambia (% , 2011–2024)



Notes: The dashed line marks the 2016 split used for comparability with the Ethiopia–Djibouti case. Source: Adapted from World Bank, World Development Indicators (NE.EXP.GNFS.ZS). Accessed March 8, 2026.

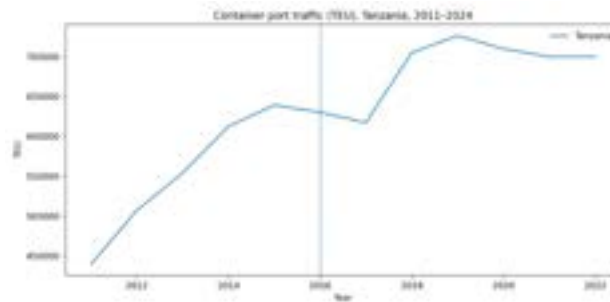
The figure displays a notable gap between Tanzania and Zambia's export-to-GDP ratio. Tanzania's ratio never exceeds 25% during the examination period, while Zambia's exports consistently account for more than 35% of its GDP. Tanzania's ratio slowly declined between 2012 and 2020. Eventually, it rose, although it did not reach the 2012 level. Instead, Zambia shows a more volatile ratio. Interestingly, Zambia's exports-to-GDP sharply increased during the COVID-19 pandemic.

However, the export-to-GDP ratio responds to variations in both export values and GDP. Hence, any increase in such a ratio that emerges from the figure could be interpreted either as a rise in exports or as a decline in GDP.

The next subsection examines container port traffic and proxy maritime trade exposure. Container port traffic is analyzed for Tanzania only, because Zambia is landlocked and does not operate a seaport. The measure captures the total number of containers handled at national ports in a year, reported in twenty-foot equivalent units (TEU). It is

utilized as a proxy for Tanzania's exposure to maritime trade flows. Since maritime shipments are primarily oriented toward extra-African markets, changes in container port traffic can help assess broader shifts in trade orientation across time.

Figure 7: Container port traffic (TEU), Tanzania, 2011–2022



Notes: The dashed line marks the 2016 split used for comparability with the Ethiopia–Djibouti case. Source: Adapted from World Bank, World Development Indicators (IS.SHP.GOOD.TU). Accessed March 8, 2026.

Tanzania's port traffic steadily increased throughout the period. Average container port traffic increased from ~550,474 TEU (between 2011 and 2015) to ~684,157 TEU (between 2016 and 2022). Despite a moderate decline in 2015, the indicator rose and stabilized from 2020 at around 700,000 TEU. As a proxy for maritime trade exposure, this pattern suggests increasing engagement with extra-African trade partners, though it does not imply causality.

Export-Import Volume data between Tanzania and Zambia

This section describes the bilateral trade flows of goods between Tanzania and Zambia, using annual trade values in current USD (UN Comtrade). The timeframe 2011–2015 is used as a baseline and compared to the period 2016–2024. Since the Tanzania–Zambia Railway opened in 1975, the split in 2016 is used only to align the comparison with the Ethiopia–Djibouti Railway case, which was built in 2016. The following table synthesizes the annual averages of bilateral trade flows of goods between the two countries.

Table 9: Tanzania–Zambia bilateral trade flows (annual averages)

Flow	2011-2015	2016-2024	Δ	$\Delta\%$
Tanzania exports to Zambia	82.65	97.00	+14.35	17.36%

Tanzania imports from Zambia	51.12	73.48	+22.36	43.74%
Zambia exports to Tanzania	65.86	109.44	+43.58	66.17%
Zambia imports from Tanzania	69.46	186.34	+116.88	168.27%

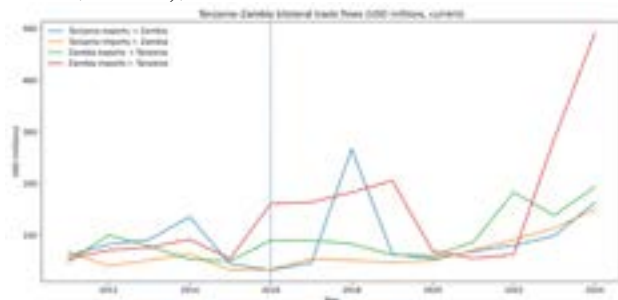
Notes: Figures report period averages in USD million for 2011–2015 and 2016–2024. Δ and $\Delta\%$ denote the difference between the two period averages.

Source: United Nations, UN Comtrade Database. Accessed March 8, 2026.

The table indicates that the trade value increased from the 2011–2015 period to the 2016–2024 period across all four flows. Zambia’s imports from Tanzania experienced the largest increase, growing from \$69.46 million to \$186.34 million (168.27% increase). Tanzania exports to Zambia instead show the most moderate increase (17.36%).

These comparisons are merely descriptive and do not indicate a specific causal relationship between the railways and the trade flows. Several factors and variables may have caused the increase in trade values between the two countries. Values reported by exporting and importing countries often differ in the UN Comtrade database due to differences in reporting, timing, and classification methods across customs authorities.

Figure 8: Tanzania–Zambia bilateral trade flows (USD million, current), 2011–2024



Notes: The dashed line marks the 2016 split used to align comparisons with the Ethiopia–Djibouti case. It does not represent the construction date of the Tanzania–Zambia Railway. Source: Adapted from United Nations, UN Comtrade Database. Accessed March 8, 2026.

The figure shows significant volatility in all four trade flows between Tanzania and Zambia. For instance, Tanzania’s exports to Zambia spiked in 2018, rising from \$46.01 million to \$266.90 million. The decline in trade flows around 2020 coincides with the COVID-19 pandemic. They eventually rose starting in 2022. Zambia’s imports

from Tanzania increased in 2015, declined during the pandemic, and then spiked again in 2023. The figure, therefore, does not display any linear or predictable pattern.

Influential Factors

Financing Structure

The financing structure is relevant in assessing the railways’ outcome. It determines the project’s debt burden and repayment pressure. In turn, this may influence how quickly the railways must generate revenue and how much funding is available for regular maintenance and improvements.

The ADR’s financing structure combines government funding with large external loans (World Bank / Global Infrastructure Hub, 2020). The total cost of the project was \$5.09 billion. The Governments of Ethiopia and Djibouti covered 30% and own the railway, while the remaining 70% was financed through concessional loans offered by China Exim Bank, the China Development Bank, and the Industrial and Commercial Bank of China (World Bank / Global Infrastructure Hub, 2020). Both governments purchased credit guarantee insurance for these loans. The project faced financial risk because repayments were due in US dollars, while the costs and revenues were primarily in Ethiopian Birr; traffic volumes were also below forecasts. As a response, Chinese banks agreed to extend the repayment period from 15 years to 30 years (World Bank / Global Infrastructure Hub, 2020). This financing structure implies substantial dependency on external debt. In addition, the project’s scheme was highly sensitive to traffic volumes. With low revenues or a weakening local currency (against the loan currency), it becomes harder to repay without cutting spending. Finally, a tight budget postpones maintenance and renewals, which reduces service quality and, consequently, overall demand.

The Tanzania–Zambia Railway was financed through a £169 million interest-free loan from the People’s Republic of China (Makoni, 1972). In July 1970, the Tanzanian–Zambian–Chinese Tripartite Agreement was signed in Beijing. The loan was divided between the two countries, and construction began in October 1970. The first repayment was due in 1983, and successive repayments were spread across a period of 30 years (Makoni, 1972). Each country would pay approximately £2,766,760 annually in third-party currency or in export proceeds to China. The agreement also specified the cost structure of the project. Fifty-two percent of the costs were for local expenses (including wages), while the remaining 48% covered equipment (Makoni, 1972). Since the loan was interest-free and repayments were spread over 30 years, the project’s financing implies lower repayment pressure than a standard loan. A first repayment, set for 1983, also reduced immediate pressure to raise revenues from the railway. Moreover, repayments could be made from export proceeds to China. Therefore, the countries could use the money they already earn in foreign currency from sales abroad, rather than converting scarce domestic funds into foreign exchange.

Management Structure

Between 2018 and 2024, the ADR was operated by the Chinese state-owned enterprises China Civil Engineering Construction Corporation (CCECC) and the China Railway Engineering Corporation. Their management focused on establishing operational systems, maintaining infrastructure, and transferring technical knowledge to Ethiopian and Djiboutian staff (Bovenizer, 2024). In May 2024, operational control was transferred to the Ethiopia-Djibouti Railway Share Company (EDR) after several years of training local personnel in railway operations, maintenance, and safety management, suggesting a deliberate strategy to build local capacity and ensure long-term sustainability of the railway (Bovenizer, 2024). In contrast, the TAZARA Railway has a different governance model. Since its establishment, the railway has been jointly managed by Tanzania and Zambia through a multilayered institutional body: the Council of Ministers, Board of Directors, and an Executive Management Committee (Tanzania-Zambia Railway Authority).

Supplemental Projects

In Ethiopia and Djibouti, trade efficiency was boosted not only through the ADR but through supplemental projects that each state pursued following the construction of the ADR. In 2017, Djibouti and China inaugurated a \$590 million multipurpose port to accommodate all modes of cargo transportation (Larsen, 2025). This port was specifically designed to handle bulk imports, such as fertilizer and grain, that had previously caused major congestion within the Port of Djibouti (Larsen, 2025). This port was linked to the Port of Djibouti through the Doraleh Container Terminal, which had significant increases in port traffic and trade productivity even prior to 2016, and has continuously focused on connecting trade between Djibouti and Ethiopia (Larsen, 2025). Since the Chinese Multi-Purpose port in Djibouti and the Doraleh Container Terminal were both constructed to alleviate the mass trading traffic from Ethiopia to Djibouti, both likely supplement the ADR in enhancing trade flows between the two countries.

Regarding the TAZARA line, parallels can be drawn between Tanzania's Dar es Salaam Port and Djibouti's Doraleh Container Terminal; however, the two lines differ because the ADR was constructed in 2016, whereas the TAZARA had already existed, but began a process of mass revitalization instead. Under the Dar es Salaam Maritime Gateway Project, which was partly financed by the World Bank International Development Association (IDA) and the Tanzanian government, dock berths have been deepened to 14.5 meters, allowing larger vessels to dock with heavier loads (Sebastian, 2026). As a result, Tanzania's Dar es Salaam Port has a 30% increase in incoming cargo and a 56% decrease in operating costs, leading to profit margins increasing from 66 to 78% (Sebastian, 2026). Additionally, in 2024, China, Zambia, and Tanzania signed a Memorandum of Understanding that agreed to rehabilitate and modernize the TAZARA (Geraud

& Byamungu, 2025). One year later, China signed a \$1.4 billion investment deal. In it, the China Civil Engineering Construction Corporation (CCECC) set out to upgrade aging infrastructure (Geraud & Byamungu, 2025). Though the deal was financed through equity, granting CCECC 30 years of management of the railway, Tanzania and Zambia both aimed for smoother trade flows as a result of the investment project (Geraud & Byamungu, 2025). While these results have not likely materialized, such revitalizations could improve the TAZARA's efficiency and trade productivity.

Economic Dependence

Ethiopia is highly dependent on the Addis-Ababa Djibouti transport corridor. Approximately 95% of the country's total imports and exports pass through the Port of Djibouti, which the railway connects to (Imi et al., 2019). The ADR significantly supports Ethiopia's trade by efficiently moving large volumes of goods. Historically, approximately 50,000 tons of coffee and vegetables were exported, and about 5,000 tons of fertilizer were imported, accounting for roughly 40% of total rail freight traffic (Imi et al., 2019). The railway is also significantly more cost-efficient than road transport through the corridor, with freight rates ranging from 2.9-3.5 USD cents per ton kilometer compared to road vehicle operating costs at 8-10 USD cents per ton kilometer (Imi et al., 2019), further reinforcing Ethiopia's reliance on the rail link for international and regional trade.

Djibouti's economy relies heavily on international and regional trade due to its strategic position between the Red Sea, the Middle East, and Africa. A significant part of Djibouti's trade activity is supported by the ADR, which strengthens port and transit cargo operations, providing key sources of income and employment for the country (World Bank / Global Infrastructure Hub, 2020). Djibouti's economy is largely service-based, with the service sector accounting for 76% of GDP in 2019 and transportation forming the largest part of that (World Bank / Global Infrastructure Hub, 2020). Public investment in rail and port infrastructure helped drive annual GDP growth by about 5.9%, and port services alone generate roughly 80% of Djibouti's national income, reflecting the country's high dependence on efficient cargo transport (Seid, 2025). The majority of Djibouti's transport traffic comes from Ethiopia, whose foreign trade cargo volume through Djibouti reached 9.5 million tons in 2025 (Seid, 2025). Ethiopia's reliance on Djibouti's port infrastructure, supported by the ADR, results in annual port fee payments estimated at \$1.5-2 billion USD, highlighting the importance of the railway and its related transit services to Djibouti's economy, namely its trade revenue and economic growth.

Historically, Zambia has relied on the TAZARA because its economy is strongly tied to the mining industry and, as a landlocked country, it requires reliable transport routes to the sea to import heavy mining equipment and export metals (Kamukwamba, 2020). When the TAZARA became operational in 1976, it effectively held a monopoly over railway freight to and from Zambia, partly because

regional road networks and transport infrastructure were weak, and many Southern African ports were controlled by hostile minority white regimes (Kamukwamba, 2020). During the 1970s and 1980s, the railway carried a significant share of Zambia's copper exports and mining inputs, reaching a peak of about 1.27 million tons of cargo in 1977-78 (Stremple, 2025). However, Zambia's dependence on the TAZARA declined since the late 1980s as political changes in Southern Africa opened alternative trade routes and economic liberalization increased competition from road transport and other rail corridors (Stremple, 2025). By 1993-94, the TAZARA's traffic had fallen to around 1.1 million tons, representing only 41% of market share, and average annual traffic later dropped to 600,000 tons (Kamukwamba, 2020). Despite the decline in usage, Zambia still relies somewhat on the TAZARA, particularly since it offers the shortest route from Zambia to the coast via the port at Dar es Salaam, and continues to be used by mining companies seeking less congested coastal ports (Kamukwamba, 2020).

Tanzania relies on the TAZARA because of its crucial role in transportation, trade, and regional development. The railway connects Zambia to Tanzania's largest and busiest port, Dar es Salaam, enabling trade to regional and international markets (Siria, 2022). By improving trade and commerce, the TAZARA creates job opportunities and supports the development of key agricultural areas such as the Kilombero Valley and the Rufiji basins in southern Tanzania (Siria, 2022). Additionally, the railway encourages the growth of towns and cities like Morogoro, Mbeya, Songwe, and Njombe, as settler migration along the railway opens new economic opportunities and gives rural towns access to multiple revenue streams by serving as a conduit for their goods (Siria, 2022). The TAZARA also expands tourism by providing access to destinations like Udzungwa Mountains National Park (Siria, 2022). Furthermore, for many passengers, it remains an affordable, efficient, and reliable means of travel (Siria, 2022). Moreover, the railway plays a key role in maintaining strong bilateral relations between Tanzania and Zambia (Siria, 2022). However, the TAZARA faces pressing issues, particularly increasing competition from other modes of transport, which threatens its continued dominance in regional transport (Siria, 2022).

Physical Infrastructure

The Addis Ababa-Djibouti Railway (ADR) is a modern railway built in 2017, and as such was designed for high-speed freight transport and large cargo volumes (World Bank Group, 2017). Because of this, it has faster transit times, is more reliable, and has lower per-unit transportation costs when compared to traditional railway systems (African Development Bank Group, 2019). Improvements in transportation infrastructure significantly increase trade capacity by lowering logistical costs and improving efficiency (African Export-Import Bank, 2025). This is shown in the visible increase in Ethiopia-Djibouti trade flow after the railway became operational, especially in the substantial increase in Ethiopian exports to Djibouti (Table

4). On the other hand, the TAZARA has had challenges in maintaining its infrastructure. Its old tracks, limited investment in maintenance, and decreasing operational efficiency have lowered freight capacity and increased the amount of delays (Melhuish, 2013). Outdated infrastructure constrains the trade-enhancing capabilities of railway systems (Bouraima et al., 2023). This makes rail transport by the TAZARA a seemingly worse option than road transport. As a result of this, even though it is a direct corridor from Zambia and the Dar es Salaam port, the TAZARA has not generated the same increases in trade as the ADR.

Material Imports and Exports

Ethiopia's mix of exports has become more diversified with time, including agricultural products like coffee, oilseeds, and livestock products, in addition to manufactured products like textiles and apparel (World Bank Group, 2017). Products like these are time-sensitive, which makes transportation cost, speed, and reliability important for a method of transportation to stay competitive. Therefore, reduced transit times, better predictability of trains, or other infrastructure improvements have a large impact on trade flow in these areas. These goods are also often part of regional trade within Africa because of geographic proximity and lower shipping costs. By linking Ethiopia's inland production centers to the port of Djibouti (African Development Bank Group, 2021), the ADR supports better transportation of both finished and unprocessed goods. Ethiopia's economy relies on exports to both regional and global markets (World Bank Group, 2017), and the increase in Ethiopian exports to Djibouti after 2016 (Table 4) demonstrates how the railway was aligned with this economic strategy.

On the other hand, Zambia exports mostly copper and other mineral products (World Bank Group, 2018). These products are high-cost to extract and high-value (World Bank Group, 2018), but they do not have the same time constraints as the products Ethiopia exports (Limão & Venables, 2001). As such, transport speed is less important in trade. Minerals are also traded more globally, outside of Africa (UN Trade & Development, 2019), so the trade of these goods will not translate to an increase in regional railway trade (UN Trade & Development, 2019), like the TAZARA facilitates.

Discussion

Trade Trends of the Addis Ababa-Djibouti Railway (ADR)

Djibouti has a higher Logistics Performance Index from 2018 to 2023 compared to 2012 to 2014 (World Bank Group, 2007). The index indicates steady growth from 2012 to 2023, and suggests that Djibouti had the most efficient trade functions, customs, and infrastructure years after the ADR was constructed (World Bank Group, 2007). Although supplemental projects to the ADR may have contributed to the increase, the largest increase was shown from 2016 to

2018 (World Bank Group, 2007), the period immediately following the construction of the ADR. The railway explicitly increases in the Logistics Performance Index and the Infrastructure scores, and implicitly increases in the Customs score (World Bank Group, 2007), owing to the increase in efficiency and speed of trade customs.

While data is ever-shifting, Ethiopia's Trade Openness Growth Rate decreases slightly following the construction of the ADR, and Djibouti's Trade Openness Growth Rate increases significantly (Figure 2). This may imply that Ethiopian exports were in high global demand, increasing port traffic in the Port of Djibouti, but imports to Ethiopia were low, as Trade Openness is defined by exports plus imports, divided by GDP.

During the same period, Ethiopia's trade intensity metrics (export-to-GDP ratio) increases (Table 3), confirming that imports contributed to Ethiopia's decrease in Trade Openness (Figure 2). Djibouti's trade intensity decreases, indicating that its exports increased; however, its imports decrease after the ADR was constructed (Table 3). Port traffic in Djibouti peaked in 2016, beginning to decrease immediately following the ADR's construction, and never returning to pre-ADR levels (Figure 4).

The export-import data between Ethiopia and Djibouti indicate that bilateral trade flows rose substantially beginning in 2018 (Table 4). Ethiopian exports to Djibouti grew dramatically, rising by 37291.89%, between the periods of 2011 to 2017 and 2018 to 2023 (Table 4). In contrast, Ethiopia's imports from Djibouti also increased, but at a more moderate rate of 96.51% over the same time frame (Table 4). Given that the ADR became operational in 2018 and is closely integrated with Ethiopia's trade system, this suggests that the railway enhanced Ethiopia's capacity to engage in intra-African trade, particularly along this key bilateral corridor.

Trade Trends of the Tanzania-Zambia Railway (TAZARA)

The Tanzania-Zambia Railway began operating in 1976. Therefore, we cannot interpret any changes in the examined figures after 2016 as influenced by the railway. However, using 2016 as the analytical split allows us to establish a comparison between the TAZARA and the ADR. Evidence shows that bilateral trade flows between Tanzania and Zambia increased on average 168.27% when comparing the 2016-2025 timeframe with the 2011-2015 timeframe, with the most moderate change still amounting to a 17.36% increase (Table 9). Nevertheless, these figures were subject to high volatility and do not follow any particular or predictable pattern. Spikes and declines even occur during the full examination period. Despite our results, we cannot attribute this increase to the railway or to any other specific factor, since there were likely other confounding variables, including changes in commodity prices, shifts in global demand, evolving trade policies in the region, and broader macroeconomic conditions, among others. As a result, while our framework provides a useful foundation, the absence of a clear causal link limits a firm conclusion.

Influential factors

Financing Structure

Despite being similar infrastructure projects, the two railways differ substantially in their financing structure. The ADR is highly dependent on external debt and sensitive to traffic volumes (World Bank / Global Infrastructure Hub, 2020), consequently pressuring the project to quickly turn profitable. The Tanzania-Zambia Railway is instead financed through an interest-free Chinese loan (Makoni, 1972). Moreover, the repayments are planned in a concessional way for the two African countries and spread across a long period of time (Makoni, 1972). This difference in short-term revenue pressure across the two railways may have been a key differential factor.

Management Structure

The governance structure of the two railways further explains why the ADR has a greater impact on Ethiopia's intra-African trade than the TAZARA has on Zambia's. The eventual transfer of control and management of the ADR in 2024 to the Ethiopia-Djibouti Railway Share Company (Bovenizer, 2024) reflects a deliberate strategy to build local capacity and ensure long-term sustainability, reinforcing the railway's reliability and its central role in trade. In contrast, the TAZARA has been jointly managed by Tanzania and Zambia since its inception (Tanzania-Zambia Railway Authority). Although this arrangement promotes bilateral cooperation, it may also contribute to slower decision-making and operational inefficiencies. Furthermore, as argued by Tchawe (2019), infrastructure alone is insufficient to guarantee success; effective outcomes depend on capacity building through the transfer of skills and knowledge. In the case of the ADR, governance emphasizes technical training and knowledge transfer, whereas the TAZARA shows less evidence of sustained capacity-building mechanisms. This difference likely contributes to their different levels of success in facilitating intra-African trade. Therefore, institutional effectiveness and capacity-building strategies, demonstrated through governance structures, are key factors for explaining the different impacts of the railways despite similar infrastructure investments.

Supplemental Projects

The projects had similar supplemental projects intended to magnify the effects of the railways. Djibouti and China expanded the Doraleh Container Terminal, which consisted of all of Djibouti's ports (Larsen, 2025). This project made cargo transportation across the Port of Djibouti more seamless, especially when handling bulk imports — a primary issue of the Port of Djibouti (Larsen, 2025). Tanzania implemented a similar reform to magnify the impact of the TAZARA project by building the Dar es Salaam Port, which deepened dock berths to 14.5 feet, allowing larger vessels with larger loads to dock (Sebastian, 2026). Tanzania and China are also planning to rehabilitate and modernize the TAZARA, aiming for smoother trade flows (Geraud & Byamungu, 2025). While this project is

ongoing, it may spur future growth in trade and export volume in Tanzania.

Economic Dependence

Ethiopia's high level of economic dependence on the ADR indicates that the railway has a critical impact on Ethiopia's intra-African trade. The ADR supports nearly all of the country's external trade flows, with about 95% of imports and exports passing through Djibouti (Iimi et al., 2019). Evidence further suggests that the ADR substantially reduces trade costs (Iimi et al., 2019) while improving efficiency and increasing trade volumes (Iimi et al., 2019), effectively anchoring a large share of Ethiopia's trade to a single corridor. As a result, the ADR has become irreplaceable and functions as the backbone of Ethiopia's trade system, playing a central role in facilitating its intra-African trade. In contrast, the TAZARA has gradually played a more limited role in Zambia's intra-African trade. Although the TAZARA initially contributed significantly to Zambia's intra-African trade, particularly by supporting its mining industry (Kamukwamba, 2020), its early success can largely be attributed to the TAZARA's previous monopoly over regional railway freight and transportation (Stremple, 2025). With the emergence of alternative trade routes and increased competition, the TAZARA's importance has fallen. For example, its market share fell to around 41% (Kamukwamba, 2020, marking a significant weakening of its original strategic necessity and relevance. It suggests that the TAZARA now has a more moderate, declining, and supplementary impact on Zambia's intra-African trade. Overall, the differing levels of dependence on these railways demonstrate that it is not infrastructure investment alone that determines impact, but rather the degree of dependency and extent of competition in each country's trade system.

Physical Infrastructure

The differences between the ADR and the TAZARA trade flows are affected by the differences in their infrastructure quality. The ADR's modern, well-maintained structure makes it faster and more reliable, keeping it competitive for firms to use to move their products. On the other hand, the TAZARA's older infrastructure reduces its reliability and efficiency, making it slower and less competitive for firms to use for intra-African trade over other forms of transportation. The evidence suggests that the ADR has more trade flows because it has better railway infrastructure than the TAZARA.

Material Imports and Exports

The type of goods Ethiopia exports, namely agricultural and manufactured products, makes the ADR a superior option for firms over other modes of transportation. For example, coffee, livestock products, textiles, and apparel are better suited to freight travel in intra-African trade. In Zambia, on the other hand, exports are mostly copper and mineral products, whose transport methods do not align with railways. Exporters are less likely to use the TAZARA for these products, weakening its trade flows compared to the

ADR. This suggests that export materials do explain some differences in the impact of the railways.

Limitations

Our study faced several challenges that affected the scope and depth of the analysis. Primarily, time constraints posed a challenge, as the research was conducted within a single academic semester, limiting the depth of our analysis. Another key limitation was the timeframe during which the two railways were examined. TAZARA opened in 1975, while the ADR opened in 2018. Our analysis focused on data from 2011-2024 to capture impacts of the ADR; however, this approach did not capture the short-run consequences that followed the construction of TAZARA in the 1970s.

Our study also encountered several data-related obstacles. Trade data from the UN Comtrade Database has discrepancies between reporting countries based on different standards, timing, and classification methods. For example, Tanzania's export volumes to Zambia did not match Zambia's import volumes from Tanzania. Furthermore, political violence and geopolitical factors may have influenced export-import volumes and trade intensity during the study period, confounding the direct effect of the railways. Missing data also created an obstacle. There was less available information on Djibouti's exports to and imports from Ethiopia than Ethiopia's data, making it difficult to confirm ADR-related trends. Similarly, attempts to compare productivity were limited because no shared metrics were available. This may have reflected structural differences between the rail systems beyond their age (the older TAZARA has less consistent historical data than the ADR).

Further research could thus improve our research in numerous ways. One improvement would be to isolate the heterogeneous regional effects of the railways by comparing locations along the railway corridors with more remote regions. Additionally, obtaining more primary data directly from the railway management would strengthen future analyses. Although we tried to contact the railway authorities during this study in order to get primary data on the railways, the available contact information was outdated. Thus, future researchers would benefit from on-site inquiries or doing more research into the organizations responsible for managing these railways.

Conclusion

Following the colonial period, Sub-Saharan African countries underwent an economic transformation to support their broader development. Large infrastructure projects created opportunities for employment and attracted investments. Railways, in particular, enabled interconnection between different African countries for the movement of people and goods. The two railways we examined in our research fit in this broader context of economic development. However, despite their similarities, the

TAZARA and the ADR did not produce the same effects in their respective countries.

Broadly speaking, our study discovers that multiple factors drive the stronger short-term impact of the ADR on Ethiopia's intra-African trade; however, limitations in the study, including restricted data availability and the presence of many confounding variables, notably differing time periods, make it challenging to clearly isolate and measure the effect of each factor.

Ethiopia's high level of dependence on the ADR for exports lead to a more significant impact on trade flows than the TAZARA's impact on Zambia's trade. Additionally, the ADR has transitioned into control by the Ethiopia-Djibouti Railway Share Company, which allows for quicker operations than the TAZARA's joint ownership by Tanzania and Zambia, which at times causes operational gridlock. Additionally, the ADR's increasingly diverse and time-sensitive exports lead the railway to boost trade flows; whereas, the TAZARA's high-value and less time-sensitive export-import profile limit the railway's impact on improving the country's trade flows. Although the two railways share similar infrastructure and additional project strategies, the aforementioned factors affect the greater relative success of the ADR compared to the TAZARA.

Past literature supports our conclusion that the TAZARA's weak trade impact is due to poor system performance. Obed (2022) found that the TAZARA operated at only about 45% capacity and was underutilized, reinforcing our conclusion that the railway's limited and declining role in Zambia's trade flows contributes to its weaker impact on intra-African trade. Similarly, Mdoe et al. (2025) argued that operational efficiencies could undermine railway performance regardless of infrastructure investment. It directly explains why we find that the TAZARA, despite existing infrastructure and performance, produces less stable or attributable trade gains. Furthermore, past literature predicted our results, specifically that better governance and capacity-building mechanisms create a stronger impact on trade. Li and Wang (2025) demonstrated that railway outcomes depend on political incentives and governance structures, not just the existence of infrastructure. Thus, Li and Wang (2025) help explain why the ADR, in having evolving governance and eventual local control, performs better than the TAZARA. From an economic standpoint, Kumar (2022) argued that financing structures and governance mechanisms are key determinants of a railway's effectiveness. It supports our finding that the railways' different financing models create different performance pressures and outcomes. Moreover, some literature supported our key insight that railways operate within larger economic and political systems, which affect their long-term relevance and significance. Monson (2005) reported that the TAZARA had localized benefits in supporting economies along the route; however, she neglected to mention any sustained macro-level development.

Although most existing literature supports our results, there are some discrepancies. Gudeta (2015) and Mohapatra (2017) predicted that the ADR would have stronger economic and trade benefits based on cost-benefit and efficiency analyses. While our findings partially support their claims by showing that trade gains did occur, the gains were not automatic or even, instead suggesting that trade gains depend on additional factors and conditions.

Given our findings on the differing success of the ADR and TAZARA railways, future research could compare other railways built around the same time as either the ADR or the TAZARA, or for a similar purpose. Comparing either to railways developed in the same time period would help isolate the effects of modern versus older management practices and infrastructure on each. It would also separate the influence of project design and governance from the broader economic and geographic factors shaping their outcomes on trade.

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A New Age of Data Privacy: Japan's Pioneer Approach to Data Commerce

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Our research examines the efficacies of the European Union (EU) and Japan's respective data privacy policies since 2019. Focusing on the mutual adequacy decision and the comparison of Japan's policy to Western norms, our research utilizes a qualitative approach. We utilized primary sources including government documents and reports, self-reports of data privacy infringements, and technical reports to conduct a comparative analysis of the EU's and Japan's domestic and international data privacy protection. We concluded that Japan's protection of data privacy departs from the historically Western prioritization of individual rights and democratic accountability. Conversely, we concluded Japan approaches data privacy using a common standard of protection across data types rather than regulating data protection according to handlers and data content. As a result, Japan's data privacy policies offer an alternate mode of data protection and as such, we can expect increased international data commerce competition.

Introduction

In 2019, the European Union (EU) released a decision of mutual adequacy concerning Japan's Data Free Flow with Trust concept establishing an understanding that the EU and Japan respectively protected the data privacy of their citizens at an equal level. This was the first time that the EU had ever released a statement of mutual adequacy to a state outside of EU membership. Although the language in Japan's Data Free Flow with Trust concept was vague, this declaration by the EU strengthened international commerce and relations between the U.S., Japan, and member states of the EU. Japan's statement, however, was in fact a concept, and not legislation or policy. Thus, as this concept was put into practice, the resulting legislation and policy came under scrutiny on the international stage as it was compared to the standards of the EU. Much of this scrutiny was surrounding the efficacy of Japan's policies as it pertained to protecting citizens' data. The primary critics of this issue were concerned about the use of Japanese citizens' data, who had access to it, and how it could be used. A number of variables were involved in this question including data processing corporations such as Palantir. Palantir is a commercial entity that analyzes large-scale data by collecting personal information to create comprehensive profiles and timelines of individuals' lives. Additionally, we also considered the modes by which data processing and commerce were conducted amongst the EU, Japan, and the U.S..

Because of the declaration of mutual adequacy, this matter became incredibly important on the international stage in an increasingly digital world. With data commerce at the forefront of international commerce and the global economy at a turning point—toward the processing of and the trade of data—it became important to understand the new concept for data protection that Japan was offering, particularly to developing states. Efficacy of data protection, in this sense, refers to the level of privacy afforded the individuals from which the data is extracted and the level of regulation exercised concerning that data and what it can be used for. In order to produce a comparative analysis of these two bodies, a number of questions needed to be answered. At what scale were each of them allowing their citizens' data to be sold, to whom were they allowed to sell it, was there sufficient regulation for the use of that data once it was processed, who was processing it, and what were the

priorities enumerated by the domestic legislation and policies of each?

Our team moved forward with the understanding and expectation that the Japanese model of data protection would likely depart from a Western westernized model embodied by the EU. This Western westernized model would likely prioritize capitalist policies and tools, allowing for the sale of domestic and private data at higher rates and frequencies and lower states of regulation than the Japanese model. In turn, the Japanese model would work to provide the utmost privacy for their citizens, while balancing the need to compete in data commerce on the international scale. In the following paper, a comparative analysis of these bodies is described, in which privacy violations, government policies and regulations, and a corporate understanding of the use of data by the EU and Japan demonstrate the distinct differences between their priorities and the modes by which they are enumerated through policy and effect.

Review of the Literature

International Data Privacy Agreements

The literature surrounding the international landscape of data privacy has largely been focused on the interactions between the European Union (EU) and the U.S. Both of these entities are commonly regarded as the leading actors in international commerce, including where the trade of data is concerned. Authors Litt, Monroe-Sheridan, Wang, Dale, and Aizawa (2024) point to Japan as a recent example of data-privacy legislation-building, all acknowledging the recent work that Japan has been doing to construct a new model for protecting domestic privacy while engaging in international commerce.

Authors Litt, Monroe-Sheridan, and the Office of the United States Trade Representative all agree that Japan's recent introduction to the international data privacy scene has been positively received. Heralding Japan's Data Free Flow with Trust concept as an excellent example of data-trading done responsibly—and offering the EU's declaration of adequacy as evidence of this claim—these pieces argue that Japan's recent international relationships concerning data privacy and commerce are some of the most thorough and diligently negotiated trade agreements in this field (United States Trade Representative, 2019.). Litt and Monroe-Sheridan, specifically, emphasize the importance of

Japan's Data Free Flow with Trust concept in strengthening the relationships between the EU, the U.S., and Japan. This assertion is supported through their inclusion that this concept works to protect the domestic data privacy of all involved parties to any international data exchange (Litt, D., & Monroe-Sheridan, A. 2022).

Writing for the *Frontiers in Sociology* Journal, authors Dale and Aizawa focus their research differently, however. Acknowledging the declaration of adequacy from the EU concerning Japan's Data Free Flow with Trust concept, and the U.S. rigorous attempts at developing strong international relationships with Japan concerning data commerce, these scholars point to concerns about human rights and democracy as the primary roadblocks to strong digital trade policies between these three entities (Dale & Aizawa, 2024). In practice, this threat originates from the data localization measures, or the lack thereof. These policies are intended to protect domestic data privacy by ensuring that all data consolidation is conducted within that country's sovereign jurisdiction, thereby ensuring the data's integrity and protection. Dale and Aizawa point to a stark lack of data localization measures in Japan's international digital trade policies, and emphasize the risk of human rights and data abuses that this absence could impose upon involved parties. Flora Wang submitted a similar analysis of Japan's policies to the Harvard Journal of Law and Technology, explaining this absence in terms of Eastern versus Western trade and protection norms. Wang asserts that Japan is increasingly likely to carve out a path in digital trade legislation which departs from a Western design that prioritizes the individual's data privacy and ensures vertical recourse in a democratic sense (Wang, 2020).

The above authors examine the current environment of international digital trade as Japan makes its debut. Litt, Monroe-Sheridan, and the Office of the United States Trade Representative agree that Japan's apparent, albeit vague, concept of the free flow of data internationally is leading to a new age in digital trade characterized by increases in domestically available jobs and knowledge-sharing among involved parties. John Dale and Nobuhiro Aizawa are less optimistic, pointing to a few key characteristics in Japanese digital trade legislation which could seriously impede the human and privacy rights of the domestic populations of those involved states. Flora Wang contextualizes their perspective in an analysis of Eastern versus Western values, pointing to the Western prioritization of individual data privacy and the preservation of democratic ideals. Our paper aims to examine the differences in these policy perspectives and how they were effectuated, focusing on written and ratified international agreements and how protection of data privacy and the augmentation of international digital trade were conducted within their frameworks.

Respective use of data between the EU and Japan

At the national level, the Japanese government has primary responsibility for ensuring that personal information is properly protected across the country, both within government and in the private sector. Chapter Three of the

Act on Protection of Personal Information (APPI) outlines the burdens on national and local governments, as well as businesses, to ensure that citizens' data remains protected. All complaints related to personal information, particularly disputes between individuals and businesses, are relayed to the government, who must establish a system to resolve such complaints (Personal Information Protection Commission art. 8-11, 202). Chapter Four pertains to the best practices that businesses underneath Japanese jurisdiction must abide by. The APPI protects data in any "personal information database," which is defined as any systematically organized collection of personal information that can be searched, typically by computer. To have access to such databases, businesses must state the purpose for collecting personal information and are prohibited from using the data beyond that purpose without obtaining prior consent from the individual. As soon as the information is no longer needed or obsolete, businesses are obligated to purge the data from their systems. Japan's national privacy law also generally prohibits businesses from providing personal data to third parties (Personal Information Protection Commission art. 16-27, 2021).

These policies align closely with the EU's General Data Protection Regulation (GDPR). For businesses to use personal data, the company must prove that there is legal basis and necessity to obtain and utilize such information. Following this, necessity can be proven only if the "personal data will be processed solely for archiving purposes in the public interest, scientific or historical research purposes" (GDPR, 2016). The text of the EU's data privacy legislation establishes a significantly higher regulatory threshold compared to Japan. The use of data for public interest instead of private innovation is much more emphasized as well.

Despite the seemingly higher standard corporations in the EU must meet, the influence of data corporations is present in both Japan and the EU. In Japan, Palantir was deployed to "integrate dispersed evacuee data, and manage personal information." The collection of data from Japanese citizens resulted in three projects during the immediate aftermath of the disaster: The Disaster Victim Database, The Common Operating Picture (COP), and Dynamic Evacuee Tracking and Management. These projects resulted in tracking the locations of victims, collection of environmental data, and a "dynamic access control system that manages evacuees as they move across municipalities," respectively (Palantir, 2025). Japanese insurance conglomerate SOMPO and Palantir signed a deal in 2020 where they launched the Real Data Platform for Security, Health, and Wellbeing initiative to improve healthcare service in Japan. Palantir will pull data that consists of care plans, training programs, and supplies from more than 60,000 elder care facilities to assist with the project's goal of creating "connected infrastructure" and to "streamline supply chains" (Gordon, 2025).

Similarly, Palantir has integrated itself into the EU's information networks. The European Border Surveillance System (Eurosur) collects biometric data with the help of contractor Palantir to store in the European

Asylum Dactyloscopy Database (Eurodac) (Newlove-Eriksson, 2023). In Germany, Palantir is used to advance public health through contributing to hessenDATA, a network designed to detect crime. Concern about state surveillance has been raised over the initiative's plans to integrate social media data into hessenDATA (Ulbricht et al, 2024).

Surveillance Data

As surveillance becomes increasingly embedded within daily lives and supplement societal systems such as policing and governance, the distinction between protected personal data and operation data becomes difficult to identify. In both the EU and Japan, what classifies as surveillance data includes biometrics, geolocation, behavioral metadata, transaction history, and facial recognition. Despite these similarities, the differences in regulation and practical use of this data are significantly different.

Kaigo and Pang (2022) reveal that Japan is pushing an initiative to integrate large-scale data collection within daily urban life to create "smart cities." This entails the usage of sensors, cameras, and real-time human tracking to improve quality of life through analyzing collected data to optimize travel, environmental conditions, and public safety. Although Japan's Act on the Protection of Personal Information (APPI) contains regulatory conditions, Kaigo and Pang emphasize the lack of consistency between national and local implementation and enforcement of such regulations. In addition, citizens are rarely consulted for approval. As a result, there is significant misalignment between citizen, local government, and national government opinion on how surveillance data should be retained, repurposed, or shared.

When comparing the EU with Japan, Wang and Naiki's (2026) analysis of facial recognition technology (FRT) in smart cities highlights the developing legislative differences between the two. Their research finds that, unlike the EU, Japan does not regard biometric data to the same level of sensitivity that the EU's GDPR framework does. In the EU, facial recognition and biometrics require explicit legal bases and purposes for use. In contrast, Japan allows mass-scale FRT systems, and particularly in public security contexts, with significantly fewer restrictions. Thus, the literature suggests that while the EU prioritizes building limitations on scaling up surveillance, Japan acts upon a philosophy of flexibility and embraces technological surveillance into private life.

A significant portion of all data, however, is collected through corporate surveillance systems such as Palantir and Oracle. A recent analysis of Palantir by Iliadis and Acker (2022), finds that Palantir aggregates and cross-references massive datasets of data for purposes such as law enforcement, governmental intelligence, and, more broadly, "crisis management." The research demonstrates that Palantir's surveillance power stems from its ability to contextualize the data they have, assign it to individuals, and stream it into predictive systems which estimate an individual's behavior or characteristics. An interview with

Palantir leadership in 2022 by Aoyama from the Asahi Shimbun reinforces this idea upon other previous literature discussed. Palantir representatives claimed their presence and co-ordination with the Japanese government as a measure to secure safety and support democracy. While technology does provide the benefits of imposing order during some situations, their costly implementation and far-reaching capabilities incentivize users to embrace a permanent surveillance system, which some are concerned will violate personal privacy.

Gooding's 2022 report on Oracle's recently resolved class-action lawsuit provides a retrospective view of how such data collection concerns were validated. Oracle was found to have compiled detailed digital dossiers of people worldwide that included geolocation movement patterns, transaction histories, and political alignments. This case highlights the extent to which Oracle had previously collected and aggregated data for many years. Although this lawsuit originates in the U.S., Oracle operates internationally. Japan's lack of digital privacy laws increases the likelihood that this data processing may happen within their borders, in contrast to the EU's strict regulations.

Together, the literature discussed suggests that while both the EU and Japan have recently expanded surveillance efforts, each have significantly diverged in how they regulate such. The EU focuses on individual privacy and consent while Japan actively seeks to integrate data collection further for reasons of economic, security, and intelligence advantages. The long-term effects of either approach is uncertain but current literature shows that Japan is building the base to support their addition to a worldwide data integration platform.

Core Differences

Legal responsibility has long been intertwined with data privacy and its relationship to artificial intelligence. Many countries, Japan in particular, have had a difficult time figuring out how to navigate these challenges on a global scale.

Shimpo's (2020) argument was that the majority of privacy risks are caused by Artificial Intelligence (AI) and Internet of Things (IoT)-focused data collection, with an emphasis on the importance of procedural and ethical steps to ensure balanced data usage. Though unable to access the full review, the section being discussed did an excellent job of providing the viewpoint for why it's crucial to understand national and global legal tools to protect individual privacy. Miyashita (2021) was able to build further on this foundation and examine broader philosophical factors. This article praised Japan's approach to data protection as "human-centered" and emphasized the importance of consent and human dignity when creating data-protection laws. In particular, blackboxing (a system that obscures algorithmic decision-making from users) was an example not only of why regulations need to be enacted, but also of how human autonomy is at risk as well. When individuals are unknowingly victims of data theft, it threatens their ability to make decisions regarding privacy, as what they are comfortable with may be beyond their control. Pardiek

(2024), however, focuses more on the litigation aspect of Japanese privacy laws and how exactly courts have chosen to respond to data breaches. One significant aspect of these legal proceedings is that even without financial damage caused by said breach, victims are often paid reparations due to simple consent violations. However, despite Japanese protections being good in theory, in practice they typically lack practical enforcement, as Pardiek explained in greater depth. The final article, Okuno and Okuno (2025), looks at a more corporate-focused approach and how already existing businesses should operate AI services whilst mitigating risk. The authors make a point to emphasize the failure of corporations to keep up with the rapid technological changes and what legal measures need to be taken to ensure future success. The proposed solution involves companies updating their legal policies to ensure AI causes minimum harm.

Taken together, these sources work together to showcase the different elements of Japan's approach to AI and data privacy regulations. Each article examines a different facet of the argument; from legal frameworks to human dignity, there is a wide range of factors to take into consideration.

Methodology

This study utilizes a qualitative approach in examining the trends in data protection and commerce following the European Union's release of a decision of adequacy concerning Japan's method of data protection internationally and domestically since 2019, the year of the United Nation's deliberation and decision. We use a qualitative approach to this analysis because of the lack of available data in this area of research given the involvement of private corporations, numerous national banking systems, and the involvement of domestic and private data. Our independent variable is the efficacy of Western data privacy protection methods versus the method that Japan has pioneered. Our dependent variables are multidimensional indicators of data privacy including international data privacy agreements, publicly known and respective use of data between the European Union and Japan, known uses of surveillance data, and human rights infringements respectively.

Our data collection combines the use of primary sources such as self reports of data privacy violations and human rights infringements as well as government documents and reports, secondary and tertiary sources including analyses and research done on these privacy mechanisms, and technical reports surrounding data privacy methodologies and measures from any involved data maintenance companies. We will utilize a discourse analysis for governmental documents and reports of infringements, and we will use comparative analyses regarding the respective efficacies of each protection method. More effective data protection in this case is indicated by fewer and less extensive reports of data privacy breaches and misuses. We seek to provide a concrete comparative

understanding of current methods of data protection and commerce.

Results and Findings

International Data Privacy Agreements

The landscape of data protection and commerce has long been dominated by the legislative and normative expectations of entities like the U.S. and the European Union (EU). For much of modern history, if a state could not satisfy the requirements of these two entities, their ability to trade data internationally was severely limited. This relationship has shifted, however, since Japan's entry into this international landscape. In 2019, the EU released its first ever mutual adequacy decision regarding a non-member state after over 300 hours of dialogue concerning Japan's Data Free Flow with Trust concept (Horibe, 2020). Since then, the international data commerce environment has shifted dramatically, opening up the possibility that states around the world now have the opportunity to depart from the westernized mode of data protection as they develop their international commerce schemes and, instead, follow in Japan's footsteps (Horibe, 2020).

At the outset of this international commerce trend, it was generally agreed that the Data Free Flow with Trust Concept was, while vague, the beginning of diligently negotiated and thorough agreements (United States Trade Representative, 2019) which would set the stage for stronger relationships between the EU, the U.S., and Japan (Litt, D., & Monroe-Sheridan, A. 2022). The strongest evidence to this claim was the Data Free Flow with Trust Concept's intentions to and method for protecting the privacy of the domestic data of all involved states. In other words, Japan would work to construct a system that didn't prioritize one party's data protection over another. That aforementioned vagueness, however, has resulted in concerns relating to the manner in which Japan is achieving this. Authors Dale and Aizawa were among the first to point to the democratic and human rights risks involved in the Data Free Flow with Trust Concept, focusing primarily on the lack of data localization priorities enumerated within the framework (Dale & Aizawa, 2024). These measures are intended to ensure that the privacy of individuals' data is protected by their own state to begin with; in other words, the processing of citizens' data should be performed domestically rather than internationally so that a deeply rooted interest in privacy can be ensured. This also provides security to the state, affording them the opportunity to protect their citizens' data in a manner which honors their priorities and values.

This model of data protection is, according to Flora Wang with the Harvard Journal of Law and Technology, an intrinsically western one which prioritizes the privacy of the individual rather than the ability of the state to utilize the data to the fullest extent. In her analysis of the Data Free Flow with Trust Concept, Wang emphasizes an expected lack of data localization measures in the legislations and agreements following the mutual adequacy agreement, thus departing from the westernized model of data protecting and

debuting an eastern one which would prioritize state continuity and the availability of robust information (Wang, 2020). In the years following, this potential threat to the privacy of citizens of involved states has become significantly more real.

The central component of this issue, although there has been improvement in the ability of international actors to collaborate (APEC, 2024), is that Japan's departure from the western model imposes significantly fewer restrictions on who is handling and processing citizen's data (Igaya, 2025). The reason for this is that the domestic legislation that has been implemented in Japan, such as the Act on the Protection of Personal Information, thrust the responsibility for regulating data privacy upon what it terms the Business Handling Personal Information (BHPI) (Igaya, 2025). This, in turn, decentralizes the protection of data and diminishes the accountability applied to the process. Because the protection of data privacy is disseminated to corporations and businesses, not only does the state not have any direct contact with the process, the businesses involved find themselves overwhelmed and unable to uphold all requirements for data protection (Igaya, 2025). Thus, under the APPI and in conjunction with the mutual adequacy decision, it is common for the data of citizens belonging to states conducting international commerce with Japan to be handled by multiple operators. This method, chosen for the sake of commerce with little regard for the individual, departs from the citizen-centric models of the U.S. and the EU.

The EU & Japan's Use of Data

The quick brown fox jumps over the lazy dog. The quick

Two main differences exist between Japanese and the European Union (EU) data protection legislation: the Act on the Protection of Personal Information (APPI) and General Data Protection Regulation (GDPR), respectively.

The first point of contention is their difference in classifying protected information. In both pieces of legislation, the term "identifiable" is used when considering if data should be protected. The APPI has a notably higher standard for identifiability because they require the data to be "attributable to the information to a specified living individual," meaning that if, for example, a search history is linked with an anonymous individual whose name is never exposed, then the data does not fall under the APPI's classification of personal data that ought to be protected. The GDPR, however, uses the opposite framework. The GDPR believes the identifiability criterion is met when someone can be distinguished by their data. In this case, the search history of an anonymous person would be considered identifiable and therefore classified as protected information because the person is still being tracked and recognized by their data, even if their true identity remains hidden (Seiichi and Osamu, 2025).

The second disagreement lies in the responsibilities the APPI and GDPR impose on businesses that handle personal information. The APPI places emphasis on regulating businesses handling personal information (BHPI),

whereas the GDPR emphasizes what they call the controller, which is a "person who determines the purposes and means of processing personal data" (Seiichi and Osamu, 2025). Under the APPI, businesses must state the purpose for collecting personal information and are prohibited from using the data beyond that purpose without obtaining prior consent from the individual. As soon as the information is no longer needed or obsolete, businesses are obligated to purge the data from their systems. Japan's national privacy law also generally prohibits businesses from providing personal data to third parties (Personal Information Protection Commission art. 16-27, 2021).

The GDPR's priorities, instead, stresses *who* handles the personal information being processed, which is why the standard for controllers having access to personal information requires the controller to be essential to the purpose and means of processing the information. Furthermore, for businesses and/or the controller to use personal data, they must prove that there is legal basis and necessity to obtain and utilize such information. Following this, necessity can be proven only if the "personal data will be processed solely for archiving purposes in the public interest, scientific or historical research purposes" (General Data Protection Regulation art. 5, 2016). The text of the EU's data privacy legislation establishes a significantly higher regulatory threshold compared to Japan. Essentially, the APPI grapples with how personal data is handled whereas the GDPR emphasizes vetting who has control over the data (Seiichi and Osamu, 2025).

In practice, the influence of data corporations is present in both Japan and the EU. In Japan, Palantir was deployed to "integrate dispersed evacuee data, and manage personal information." The collection of data from Japanese citizens resulted in three projects during the immediate aftermath of the disaster: The Disaster Victim Database, The Common Operating Picture (COP), and Dynamic Evacuee Tracking and Management. These projects resulted in tracking the locations of victims, collection of environmental data, and a "dynamic access control system that manages evacuees as they move across municipalities," respectively (Palantir, 2025). Japanese insurance conglomerate SOMPO and Palantir signed a deal in 2020 where they launched the Real Data Platform for Security, Health, and Wellbeing initiative to improve healthcare service in Japan. Palantir will pull data that consists of care plans, training programs, and supplies from more than 60,000 elder care facilities to assist with the project's goal of creating "connected infrastructure" and to "streamline supply chains" (Gordon, 2025).

Similarly, Palantir has integrated itself into the EU's information networks. The European Border Surveillance System (Eurosur) collects biometric data with the help of contractor Palantir to store in the European Asylum Dactyloscopy Database (Eurodac) (Newlove-Eriksson, 2023). In Germany, Palantir is used to advance public health through contributing to hessenDATA, a network designed to detect crime. Concern about state surveillance has been raised over the initiative's plans to

integrate social media data into hessenDATA (Ulbricht et al, 2024).

Legal Protections

As an overview of the findings from our qualitative comparison showcase, there are several key varieties between data protection policies in the European Union (EU) and nonwestern countries such as Japan. These differences relate to the implementation and specific processes of data privacy within different legal realms. Using policy reports, government documents, and expert opinions, it's been recognized that the EU and Japan have continuously diverged from a unified approach to this issue. Even though the European Commission 2019 decision to recognize Japan's data-protection framework seemed like a step in the right direction, it has become clear that there is no unification between the two bodies. Japan's approach is primarily regulated by the Act on the Protection of Personal Information (APPI), which highlights the necessity of working with corporations to ensure data protection. Comparatively, the EU's regulatory structure is called the General Data Protection Regulation (GDPR), and focuses on ensuring that legal rights are enforceable in cases of data breaches and other privacy invasions. The difference between these two frameworks suggest more broadly that the EU and Japan have different approaches to maintaining data security. With the EU more heavily focusing on the framing of privacy laws and how they correlate with human rights, and Japanese policy revolving around digital commerce, artificial intelligence, and the role corporations play in maintaining data privacy. Broadly speaking, the findings reveal that both approaches care about maintaining trust in their data-collecting systems but how they go about doing so gives insight into which tactics are most effective.

A huge point of contention that emerged after the analysis of the privacy frameworks, was the different philosophical beliefs that stood at the heart of each approach. Japanese academics frame Japan's approach as "human-centered" and emphasize how dignity, consent, and holding bad actors accountable are crucial elements of their strategy (Miyashita 2021). There are currently ongoing discussions about emerging technology such as artificial intelligence, and how those forces impact larger algorithmic processes and user autonomy. Compared to the Japanese approach, the EU prioritizes more of an institutionally-based system of enforcing data protections. Largely through the GDPR, there are strict guidelines and regulations regarding who has access to data and the right to erasure. This in turn allows individuals to challenge organizations directly if they believe their privacy has been breached. This differs from Japan's APPI because that framework requires a lot more corporate accountability than legal challenges brought on by individuals. This all comes together to highlight how the EU has a more rights-based regulatory system compared to Japan's which is mostly human-centered privacy protections.

The continued analysis also revealed that there are several differences regarding how these two governance systems enforce their privacy protections. Pardiek writes that

Japanese privacy laws are considered theoretically strong but lack practical enforcement (Pardiek, 2024). Further examination of how privacy cases are conducted and reported on support this observation. Within EU member states, enforcement of data protection laws are often delegated to independent organizations in charge of monitoring and bringing justice during breaches. In other words, there are specific people tasked with the job of imposing fines and holding those accountable who enact the privacy violation. This type of enforcement leads to many investigations with high-profile actors and corporations facing real penalties for failing to comply with data protection laws. Comparatively, in Japan the main ways of enforcement are through the Personal Information Protection Commission. This organization has historically focused more so on creating recommendations rather than punitive actions, a softer approach than the EU. In the cases of lawsuits found against a corporation involving a privacy breach, Japanese courts typically award damages to the victims. However, these cases often receive very little publicity and the enforcement actions tend to cater more towards what is simpler for the corporation to enact than what is appropriate. This difference between how Japan and the EU enforce their data regulations suggest that even though both frameworks are effective, there are certain players that benefit more from one system than the other. Japan prioritizes cooperation with the private sector whereas the EU focuses on deterrence measures.

Another finding that proves to be important when discussing this topic is the relationship between regulations and the ever growing challenges brought forth by advancing technologies (artificial intelligence, data-analytic improvements, etc). As discussed in the literature, there is a big debate surrounding whether AI is a threat or tool to the data protection industry. One journal described how AI-driven data collection significantly expands the ability of corporations to collect personal information (Shimpo, 2020). The Japanese approach has been to require companies to implement ethical guidelines and policies that update how the internal governance system works in response to evolving technology. Compared to the human-rights centered approach, corporate-orientated responses prioritize transparency, internal mechanisms, and having strong risk-management strategies (Okuno & Okuno, 2025). This stark difference in responses to more advanced technology highlights the key distinction between Japan and the EU: morality versus punishment.

Through comparative analysis, further divergence is revealed between the two approaches regarding the scope under which they function. For instance, the EU has one of the most restrictive frameworks for data transfers that occur across borders. This is in part because the EU is not one country but rather a collection of nations. As such, it logically follows that strong security measures between states are crucial. In 2019, a decision was made to allow data transfers between the EU and Japan, paving the way for further alignment in privacy protection across different regions. However, there has been friction since Japan tends to be more lenient when data transfers among different

countries are being discussed. The EU continually has stricter safeguards in place to ensure that other jurisdictions do not compromise the integrity of their regulations, where Japan typically allows for more free movement of data among different countries.

All in all, these findings showcase the most stark differences between the EU and Japan's respective models for protecting data within their jurisdictions. The GDPR, which is utilized by the EU, appears to be more effective at establishing strong institutional protections that enshrine individual rights through enforceable legal rights. The Japanese approach is more focused on considering ethical and human rights considerations and providing an outlet for those to be at the forefront of data protection. This strategy allows for greater flexibility for victims to craft their narrative in a more pathos-centred way, however, it raises challenges for how the government is supposed to enforce these laws. The difference in how these two bodies choose to address the growing problem of data encroachment showcases that there are numerous ways to address this issue and no exact answer, as different techniques will work differently within other cultures, places, and intricacies of the law.

Surveillance Data

Based on an overview of the years following the EU's 2019 adequacy decision, it can be suggested its implementation has created significant differences between European and Japanese approaches to surveillance data.

At first, surveillance regulation between these two nations had shared relatively common goals. Now however, these two nations have developed their own individual and fundamentally distinct philosophies. One, based upon emphasis on an individual's right to privacy, and the other, based upon the state's and corporation's right to collect personal data. Understanding Japan's smart city infrastructure, their legislative treatment of facial recognition systems, and partnerships with surveillance contractors, reveals how their divergence from Western norms is implementing surveillance as an integral part of Japanese society.

Japan's investments focused on developing smart cities is a clear example of how their philosophy of allowing the state to collect personal data is developing away from Western philosophy. Kaigo and Pang (2022) research a national initiative where sensors, cameras, and real-time human tracking systems are being embedded into urban infrastructure with the purpose of optimizing public safety, mobility, and environmental conditions. The "Woven City" project near Mt. Fuji is the initiative's landmark goal, supported jointly by Japanese legislators and private corporations. This project is meant to be used as a living policy lab, to test how surveillance technologies would supplement daily activities for citizens living in large urban environments. The technology used in this city is not unique, however, the methods in which it is being implemented is significantly different from how the EU approaches the same

digital systems. Kaigo and Pang (2022) have found that citizen approval and consultation has been mostly ignored from the designing of these systems. Instead, government and corporate interests take priority in development. This contrasts significantly with how citizens in the EU have significant power in guiding implementations. In Japan, the result of their practices is an urban infrastructure where mass data collection precedes public deliberation about its ethical use. This issue becomes increasingly difficult for citizens themselves to navigate as Kaigo and Pang (2022) identify numerous inconsistencies between national and local enforcement of Japan's Act on the Protection of Personal Information (APPI). This suggests that regulatory protections nominally in place create a significantly more complex and confusing environment for citizens to navigate. Japan's COVID-19 response demonstrated the issues with this inconsistency when surveillance technologies deployed during the pandemic created intense criticism for allowing data privacy breaches where existing laws were meant to protect. Japan's national policy to push development of technology rather than consolidation of protective standards have been a large factor in the resulting gap in regulatory protections.

Regulatory inconsistency is especially prevalent within Japanese facial recognition surveillance (FRS). Wang and Naiki's (2026) analysis of FRS implementation in smart cities demonstrates a clear distinction between legislative decisions of the EU and Japan. In the EU, the GDPR classifies biometric data as a special category of personal data, requiring explicit legal authorization, documentation, and an approved purpose before any sort of FRS can be lawfully deployed within cities. This produces significant institutional disagreements between the EU and Japan around the scaling of FRS systems. The EU's GDPR functions as a structural barrier to entry deterrent of mass surveillance. In contrast, Japan's APPI does not assign to biometric data in the same way, and Wang and Naiki (2026) find that Japan not only allows for mass-scale FRS, but particularly for use in unregulated public policing. The mismatch in regulatory impacts, Wang and Naiki (2026) argue, suggests that the EU is focused on regulating ceilings in surveillance expansion while Japan is building the institutional infrastructure to develop it on a large scale.

This pattern manifests itself in many more contexts, especially in deals with large corporations. As previous sections on data use have established, Palantir embeds itself deeply in both Japanese and EU information networks. Iliadis and Acker's (2022) comprehensive analysis of Palantir's surveillance platform provides the context for understanding the privacy implications of their presence. Their research finds that Palantir's technical strength lies in organizing and cross-referencing massive datasets drawn from law enforcement agencies, government intelligence operations, and corporate partners, with the results being used to generate predictive assessments of individual behavior and risk. Iliadis and Acker (2022) describe this as a form of immense intellectual power, through an algorithm that assigns meaning to data points, seemingly unrelated, to each other, changing how personal information is developed

into security assessments. In Japan, Palantir's potential has few restraints. The interview done by Aoyama (2022) with Palantir representatives in Japan noted claims that their coordination with the Japanese government is done out of a measure to secure safety and support democracy. While this perspective of surveillance infrastructure as a tool for democracy has supported Japan's current goals, Iliadis and Acker (2022) warn that the true implementation has extremely far-reaching capabilities to create powerful incentives for governments to embrace permanent surveillance.

As noted earlier however, Palantir also serves as a contractor for the European Border Surveillance System (Eurosur), collecting biometric data for storage in the European Asylum Dactyloscopy Database (Eurodac), and contributes to hessenDATA, a German crime detection network whose planned integration of social media data has drawn sustained criticism from privacy advocates (Newlove-Eriksson, 2023; Ulbricht et al., 2024). Even within the EU's GDPR regulations, use for large-scale data aggregation by private surveillance contractors has also been welcomed. The difference here is that the GDPR still emphasizes the exposure of wrong-doing for both firms and governments that violate its provisions. This is a deterrent that has no equivalent in Japan's current environment. As previous sections establish: the EU's model routes accountability through independent supervisory bodies empowered to impose significant financial penalties, while Japan's model routes accountability through the Personal Information Protection Commission, which has historically favored guidance and recommendation over punitive action.

Overall, the EU's data privacy laws, best represented by the GDPR's rights-based foundation and its independent enforcement mechanisms, demonstrate meaningful institutional barriers to surveillance expansion, even if those barriers are imperfect in practice. The 2019 adequacy decision, however, signaled a moment of convergence between these two models, but the surveillance data examined here suggests that structural differences in the legislative environment over years have also suggested the limits of that convergence. Japan has not moved toward the EU's model of individual rights as their philosophy of data protection. In fact, it has moved the opposite direction, towards developing a model in which data protection is used as a service for national technological ambition, a plan with significant implications for the privacy rights of Japanese citizens and for the integrity of the international foundation for data collection that the adequacy decision was designed to underpin.

Discussion

International Data Privacy Agreements

The decision of mutual adequacy from the European Union (EU) was a landmark decision in the history of international data commerce. It had never before been decided that a non-member state of the EU utilized sufficient protections for international citizens' data and therefore would be permitted to conduct international trade of that data virtually unimpeded. This decision, however, may have

been made too hastily. It is important to note that the adequacy decision was released following the Data Free Flow with Trust *Concept*, not concerning any true matter of legislation. While acknowledgements were made immediately following the decision that the DFFTC was vague and did not represent the actual mechanisms by which data privacy would be maintained, the departure from Western modes of protection for data privacy was largely unexpected on the international scene. At first glance, the DFFTC looked to mirror the values put forth by the EU and the U.S., but, in application, Japan's legislation does not support citizens' data privacy as comprehensively as hoped. Japan's model leaves room for abuse and oversight of these processes in its decision to thrust the responsibility of data processing onto the businesses which handle it. This is a clear prioritization of commerce over individual data privacy rights, and sets citizens up to be unaware of who has their data, who is adequately protecting it, and what those actors are doing with it.

Japan & EU Respective Use of Data

Japan's data privacy framework under the APPI and the European Union's (EU's) GDPR reveals a divergence in how personal data is defined and regulated. The GDPR adopts a broader and more protective interpretation of identifiability, classifying data as personal even when individuals are only indirectly identifiable through patterns or behavioral tracking. In contrast, Japan requires data to be directly linked to a person's identity. This distinction means that anonymous data, such as search histories, are outside of Japan's scope of protection unlike the EU.

A second fundamental difference lies in Japan and the EU's regulatory focus. Japan places greater emphasis on how businesses handle personal data, whereas the EU is preoccupied with limiting who controls data and whether or not access to personal data is justified. The GDPR imposes stricter obligations by requiring businesses to prove that access to personal data is legally necessary while the APPI primarily ensures that businesses do not leak personal data to third parties.

These differing priorities likely shape how effective each policy is at protecting personal data. In Japan's case, large-scale data initiatives, such as Japan's connection with Palantir's disaster relief systems, can aggregate, collect, and process information without much protest from the general public. Much of the data collected by these initiatives, such as Palantir's Disaster Victim Database, is also not subject to scrutiny under the APPI because the data is anonymous and does not clearly link back to individuals. Meanwhile, in the EU, similar uses of data (e.g., Eurosur and Germany's hessenDATA) have triggered significant public concern and regulatory scrutiny, particularly regarding biometric and social media data integration.

Legal Protections

There are several key differences between the European Union (EU) and Japan, and how each country handles data privacy, particularly in regards to enforcement practices, philosophical frameworks, and corporate accountability. . Through analyzing specific responses, enforcement tactics, and data transfers beyond borders, it is clear that both institutions take the issue seriously, but go about the approach in different ways. These differences are in large part due to the philosophical and institutional factors that as a whole have broader implications, especially after the 2019 adequacy decision that had major impacts in the world of data privacy, resulting in more distinct differences between the two entities.

The most noticeable contrast between the two stemmed from the philosophical divide that manages which approach each decided to take. Japan largely prioritizes human rights and takes “a human approach”, whereas the EU is focused more on legal protections. While these two approaches may not seem very distinct, they show up in the policy that is then created through these specific lenses. For instance, in one work of literature, Miyashita (2021) praised Japan’s ability to center consent within their APPI, something that is not seen at federal levels very often within any country. However, it further discussed flaws that are seen regarding heavy reliance on corporate accountability rather than personalized legal pathways when individuals have issues they would like addressed. One author in particular found this worth critique. Pardiek (2024) brought the gap in ability to take action in practice rather than in theory to attention in his article. He discussed that while Japanese courts often did award damages to victims of privacy breaches, they tended to favor corporations, and the cases very rarely received media attention. This dichotomy of opinions suggests the struggle that comes with focusing on human philosophy when trying to pass legal legislation.

Comparatively, the EU more heavily prioritizes deterrence of data breaches through aligning their legal guidelines with specific restrictions. For example, there were independent data protection authorities whose job was to investigate violation claims and enact important restrictions that discourage breaches. This led to the GDPR having more credibility as an actual tool of regulation rather than just a symbolic one. Wang’s (2020) argument was further reinforced by this finding as it proved that Western frameworks are more likely to use vertical and democratic features within their legal system.

However, existing literature complicated the framing of each governance and how the role of corporate actors influences each system. Both Okuno and Okuno (2025) and Shimpō (2020) heavily discuss the challenge of regulating AI-centered data collection in Japan when there is no internal governance focused on that sole project. However, there the EU faced similar challenges despite having “better” internal governance structures. Neither system was entirely effective, and both struggled to keep up with the rapidly advancing technology. This supports the argument that the divide between how the EU and Japan

choose to combat data breaches is not as simple as weak versus strong, but rather a display of tension between technological advancements and personal rights.

Surveillance Data

Through the presented results and findings, it can be suggested that the EU and Japan have, in the years after the 2019 adequacy decision, developed very different methods in protecting individual privacy within expanding surveillance infrastructure within the two regions. Although the adequacy decision was an attempt to create a standard for data protection, there are only points of alignment between the two regions in which a proper full convergence of regulation has not been achieved. The divergence is not a failure of implementation, but fundamentally different interpretations of what data privacy protection is meant to be used for.

To begin, Japan has recently been pursuing smart city development. These cities allow the use of facial recognition and biometric identification for enforcement purposes. This infrastructure treats Japanese surveillance as a public good and is very lightly constrained by any laws. This is relevant when discussing APPI’s inconsistent national and local implementation of tech regulation, documented by Kaigo and Pang (2022), and the treatment of biometric data as insensitive data, identified by Wang and Naiki (2026). These two regulation quirks are consistent with a broader philosophy that prioritizes the acceleration of technological and economic efficiency development over individual privacy and rights that would often slow such activity down. This philosophy, however, has shown to create a multitude of consequences. In an environment where multinational data corporations like Palantir and Oracle operate with limited regulation to hold them accountable for actions, their implementation of data tracking algorithms provide significant intelligence information to third parties.

The EU, in contrast, focuses on a rights-first data protection law with significant enforcement capacity. This results in very different outcomes despite using a similar guide for data privacy. The GDPR’s classification of biometric data marks all such data as sensitive, and requires explicit legal documentation and authorization to access and collect. This includes limiting the deployment of many surveillance tracking technologies. Violation of these laws lead to heavy penalties and fines, which are enforced through independent supervisory bodies to limit political leverage for any one party associated with such technology. The Oracle litigation in European jurisdictions and the condemnation of Palantir’s HessenDATA involvement both demonstrate how data surveillance laws create pressure for accountability even against powerful corporations. The EU’s laws, however, do not exist without its contradictions. Across Europe, the accelerated expansion of private surveillance contracts has expanded, and laws have not yet been put into place to properly enforce such.

Overall, this discussion of data surveillance can attest that the efficacy of data privacy protection in the surveillance domain is primarily a function of enforcement architecture rather than legislative intent. Although Japan carries many aspirational principles, it has not yet created the proper mechanisms to regulate those ambitions to meet citizen approval and protect privacy rights. The EU's approach, in contrast, has, but also carries significant contradictions. Within the context of surveillance data, the EU's data protection has significantly outperformed that of Japan's following the 2019 adequacy decision. This finding provides vital implications for the integrity of international data collection advancing into a new age.

Limitations

Although our research provides a comprehensive and predictive understanding of the direction that data privacy policies have taken since the debut of Japan as a leader in this field, a number of aspects have limited our ability to construct a complete understanding of the implications of the current data privacy and commerce environment internationally. First, the inherent limitations of acquiring data *from* or *concerning* private data consolidation, analysis, or integration corporations limits our ability to fully understand the day-to-day implications of the failures of both the EU's and Japan's data protection policies.

Secondly, the understanding of discrepancies and misalignments between Japan's national data protection laws and local or regional implementation of those laws is well-founded. It was, however, difficult to gain a complete understanding of how pervasively those discrepancies are affecting the day-to-day lives of citizens and whether that data is being misused by the majority of corporations today. This is largely because of the recency of Japan's data-privacy legislation development and the sensitivity of that data, especially where active or recent investigations are concerned.

Similarly, as a result of the very recent development of these data privacy policies on behalf of Japan, there are few ratified agreements with which to conduct the analysis. Much of this relationship will be analyzed through the analysis of future agreements, scholarship concerning Japan's international relationships surrounding data privacy and commerce since this declaration of approval, and analyses of third party policy trends.

Lastly, the rapid development of AI technologies utilized in both security and commercial sectors limits the ability to capture an entirely comprehensive view of the direction that Japan's recent data protection efforts will lead other nations and whether that direction will pioneer an approach to AI use or operate largely within the same AI model that the EU does.

Conclusion

Following the mutual adequacy decision afforded to the Japanese Data Free Flow with Trust concept by the European Union, there was hope for a more collaborative and consistent mode of data protection world wide. The possibility of pervasive international data commerce which offered consistent and uniform protection for civilian data no matter the handler or country that was using became a reality, and the United States and the EU both began working to strengthen their relationships with Japan in this new age. However, as legislation was implemented domestically in Japan, that possibility has waned. Their prioritization of commerce over protection, loose definition of what constitutes identifying data, and vague legislation surrounding who handles that data and how has led to suspicions and concerns for citizen privacy internationally. Moving forward, international actors should proceed with caution, and understand that—while a mutual adequacy decision was afforded to Japan—that decision does not necessarily reflect equal protection for citizens' data.

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Proliferation of Drone-Enabled Warfare in the Russo-Ukrainian Conflict and Its Influence on National Defense Planning in both States from 2019 to 2026

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Our research examines how the proliferation of drone-enabled warfare and Unmanned Aerial Vehicles (UAVs) in the Russo-Ukrainian conflict has influenced national defense planning in both states since 2019. We focused on production and technological innovations in the domestic and international spheres and how this proliferation has shaped military spending, foreign aid packages, drone utilization, and overall reliance on UAVs for defense strategy. To understand the impact on Ukrainian and Russian planning, we analyzed metrics such as drone production quantities, components of foreign aid packages, military debt records, and defense budget expenditures. We concluded that both Russia and Ukraine have adopted drones as a crucial component of their defense planning, with Ukraine emphasizing technological innovation and mass production and Russia focusing on institutional development to create dedicated drone units. As a result, our research indicates that drone warfare has transformed into a major component of international conflicts, foreshadowing its implementation and expansion in future conflicts.

Introduction

In 2022, Russia invaded Ukraine as part of a special military operation. In doing so, Russia not only changed the history of both nations but also unintentionally altered the future of Unmanned Aerial Vehicles (UAVs), forcing the two nations to adapt rapidly. Russia's invasion of Ukraine has led to four years of conflict between the two countries. In 2014, Russia invaded and claimed the Ukrainian territory of Crimea, but direct combat increased significantly with the invasion eight years later. Ukraine has been receiving military aid from foreign countries, including all NATO member countries, with the United States being the largest contributor. Hundreds of thousands have died on both sides, but Russia has only been able to occupy and claim the regions of Donetsk, Kherson, Luhansk, and Zaporizhzhia. If this alone were not a large threat to Ukraine, one of its biggest aid contributors, the United States, has indicated it would like to reduce support. Ukraine faces a dire need for a means of defense, and one potential solution is the deployment of UAVs in combat.

Since 2019, advances in UAV technology, particularly in autonomy, swarm coordination, and scalability at lower cost, have shifted drone warfare from a one-sided tool in asymmetric military action to an essential component of modern conflict (Kuzio, 2024). In the Russo-Ukrainian war, both nations have expanded drone capabilities and production, integrating AI-enabled systems and deploying them at large scale, fundamentally shifting military strategy (Anokhin, 2026). This pivot is significant because drones have enabled reconnaissance and precision-strike capabilities while reducing costs and reliance on expensive military personnel or assets. The increase in the deployment and capacity of UAVs also suggests a strategic and structural shift in warfare towards mechanized and autonomous systems, where the capacity to develop and adapt materials plays a larger role than sheer military might.

We examined Ukraine's and Russia's military strategies separately, as each has distinct objectives and access to different drones. However, we kept in mind that these strategies were formed in response to the other's actions. Drone technology is also developing separately from the Russo-Ukrainian war, but not independently. By examining developments in these three topics from 2019 to

2026, we identified strengths, weaknesses, and trends in both sides' military strategies. This study showcases the importance of drones in modern warfare and their increasingly significant role in the Russo-Ukrainian conflict.

Review of the Literature

Introduction

The Russo-Ukrainian conflict has given rise to a new scale of deployment for drone-enabled warfare, fundamentally shifting defense planning of the two states by reducing the cost of precision strikes, expanding reconnaissance, and developing new coordinated operations. Military innovation scholars have long argued that emerging technologies alter defense planning by affecting the costs, risks, and effectiveness of waging war (Saylor, 2024). Recent literature shows that the use of UAVs has increased the lethality, coordination, and effectiveness of ground operations, with quantitative studies showing a correlation between drone use and vehicle losses (Mittal & Goetz, 2025). At a strategic level, both states have adjusted their defense plans to respond to these changes. Russia has expanded its reliance on these drones and established dedicated structures to enable large-scale drop operations (McDermott, 2025). Ukraine, on the other hand, has focused on innovation, civilian-supported detection networks, and attempts to secure large-scale, cost-effective drone capabilities (Rieznik et al., 2025). Major drone strikes on Russian air assets illustrate how systems can be inexpensive and impose high costs on traditional platforms, which only increases the demand for Unmanned Aerial Vehicles and counter-UAV strategies (Dempsey, 2025). Despite the growing body of research, the existing literature focuses on tactical battlefield effects or individual national strategies in isolation. Most contemporary sources rely heavily on qualitative reports, open-source intelligence, and policy analysis. There is a lack of scholarship on a systematic comparison of how the proliferation of drone-enabled warfare has influenced defense planning in both Russia and Ukraine over time. This literature review thus aims to evaluate current explorations of the proliferation of drone-enabled warfare since 2019 and its effects on defense planning in both Russia and Ukraine.

Proliferation of UAVs in the Current Conflict

Existing research on the use of UAVs and their technological capabilities indicates the extent to which drone technology has matured and adapted to modern warfare, while also existing as an emerging and changing technology. Historical accounts of Unmanned Aerial Systems in warfare and defense missions often portray drones as support for ground combat and other military strategies, but the narrative is shifting.

Since the beginning of drone use in warfare in 1917, there has been a struggle to determine international norms and policies regarding how to monitor their capabilities and how to manage UAV proliferation. During President George W. Bush's presidency, the use of drones for combatant strikes was generally constricted, with the U.S. only conducting around 57 drone strikes. These numbers increased significantly as President Obama pushed a more aggressive agenda for UAV usage in counterterrorism efforts abroad, as his administration conducted 563 drone strikes during his two terms (Purkiss & Serle, 2017). With a main focus of drone warfare being their use in long, dangerous aircraft missions, they stayed a military tool at best, not an entire defense strategy itself. A common use of unmanned drones in defense missions was for reconnaissance or surveillance services, especially with the use of cameras and recording devices to send collected information back to military bases. However, with the current conflict between Ukraine and Russia, the technological capabilities and utilization of such drones are increasing.

Today, both Ukrainian and Russian defense strategies rely heavily on drone services.

For Russia, research suggests that slow advances and unexpected Ukrainian resistance have made drones a necessary tool and a resource they have to strategically deploy at different fronts, making UAVs a vital part of their offensive strategy (Young et al., 2026). For Ukraine, drones have become a key player in defensive policies and counteroffensive attacks. The ability of UAVs to locate and attack aircraft bases, and their use in stealth missions, has been a focus of Ukrainian strategy. Specifically under Operation Spiderweb, researchers recognized the importance of Ukrainian drone warfare in acting out direct strikes on Russian aircraft, as well as determining Russian capabilities and base locations (Dempsey, 2025). One important use for both Russian and Ukrainian drone warfare has been each country's ability to control drones at long distances in real time (Young et al., 2026). UAVs can be used for direct hits, surveillance missions, and other long-distance tasks such as aid delivery for soldiers. This has allowed Russia to operate in distant Ukrainian territory while mitigating the risk of losing personnel. It has also allowed Ukraine to carry out strikes on Russian military bases without risking soldier casualties in certain situations. Furthermore, Russia has utilized drones connected with Starlink terminals that allow them to fly at low altitudes and resist Ukrainian electronic warfare (Young et al., 2026). According to existing research, this has been a key part of Russian strategy and has resulted in Ukraine partnering with SpaceX to combat Russian-operated drones in Ukrainian airspace.

In addition to the existing uses of UAVs in both countries' military strategies, new capabilities and innovations for drone warfare are being studied. Russia has tested new technologies in Polish airspace, as it plans on expanding its UAV capabilities (Rieznik et al., 2025). On the Ukrainian side, recent developments with the artificial intelligence company Auterion include a deal that gives Ukraine AI-driven drones (Auterion, 2025). This represents an expansion of AI into the Russo-Ukrainian conflict and drone warfare in general.

Impact on Ukrainian Defense Strategy

Concurrent research on Ukrainian defense strategy and the use of UAV technologies has showcased the emerging importance of autonomous vehicles in modern warfare. Through technological operations and political strategies, Ukraine has adopted these technologies offensively, yet has simultaneously attempted to shield itself from high-tech Russian counterparts.

Today, Ukraine continues to increase its stockpile of UAV technologies following the success of its offensive campaigns, most notably Operation Spiderweb. On June 1st 2026, Ukraine launched an aggressive UAV attack against Russian bomber fleet airbases in an operation titled Operation Spiderweb (Dempsey, 2025). The covert assault simultaneously launched 117 Ukrainian-made quadcopter drones, targeting four Russian airbases deep inside Russia. The advance damaged or destroyed 41 Russian aircraft, valued at approximately \$7 billion (Lawless, 2025). Following the success of Operation Spiderweb, autonomous aerial system contractor Auterion issued a press release on July 28, 2025, announcing a contract to provide 33,000 Skynode Drone Strike Kits to Ukraine (Auterion, 2025). These Skynode Drone Strike Kits provide previously manual drones with the capability to utilize AI-driven targeting, mirroring the technology responsible for the success of Operation Spiderweb. Because of the autonomous aerial systems' impact on the Russo-Ukrainian war, Ukraine has continued to pour spending into essential autonomous drone technology that not only combats Russian forces within Ukraine but also enables offensive strikes against military resources with Russia.

Addressing Russia's emerging autonomous weapons systems and its superior war output, Ukraine has implemented defensive strategies to neutralize Russian technologies and bridge the gap between the Russian and Ukrainian militaries. The Ukrainian Intelligence Service has utilized public internet access to report the designs of Russian military technologies, including Unmanned Aerial Systems (Вельш, 2026). The site, named War Sanctions, houses the schematics of all known Russian military technologies, including manufacturers and components. Since Ukraine lacks Russia's long-term resources, rather than creating new technologies to counter Russian devices, Ukraine can effectively force Russia to allocate its resources to develop new military equipment. This allows Ukraine to fight against Russia's emerging technologies without the immense spending that would normally be required.

Additionally, backed by the United Kingdom and Latvia, Ukraine has continued to expand its drone production through the Ukrainian Drone Coalition. This multilateral initiative, launched in 2024 by the United Kingdom and Latvia, aims to fund, produce, and supply Ukraine with Unmanned Aerial Vehicles to strengthen its military capacity (Hodunova, 2025). Latvia's contribution showcases the increased concern of Eastern Bloc countries about Russia's advancements and military campaign. Because of the current Russian military strategy, Latvia recognizes its unique opportunity to prevent a Russian-controlled Ukraine and future invasion into Latvia. Toms Rostoks from the Latvian National Defence Academy, Centre for Security and Strategic Research, and Kate Elizabete Kanasta from the University of Latvia state that "Latvia has tried to punch above its weight in terms of arms supplies to Ukraine," which showcases the existential threat against Latvia (Rostoks & Kanasta, 2023).

Impact on Russian Defense Strategy

Russia has similarly been evolving its defense strategy and drone technology during the conflict. Russia has historically focused on asymmetrical evolution, where instead of matching its opponents' strengths in warfare, Russia develops in a different direction, where it can more easily gain an advantage. However, Ukraine's highly effective drone strikes can't be ignored by Russia in favor of different war strategies and logistics. Thus, Russia is choosing to effectively copy the strategies used by Ukraine, which suffered fewer vehicle and drone losses in the early stages of combat (Mittal & Goetz, 2025).

Prior to the 2022 invasion, Russia's military was known for its hybrid warfare strategy, which employed both cyberattacks and information operations as well as traditional attacks (Fabian, 2019). Innovation is essential to this strategy, with the goal of superior technology paralyzing enemies. Russia's early nuclear research and subsequent stockpiling were examples of this. Hierarchy is also essential, with a strong central power and little decision making by people in the lower ranks (Covington, 2016). This was effective due to Russia's history with external conflicts, where responding to attacks and defense were less crucial.

Since the 2022 invasion, Russia has generally worked not to match Ukraine and its allies in strategy, but to develop asymmetrically, focusing on its own strengths (Covington, 2016). Drone warfare is an exception to this. Russia created the Unmanned Systems Forces, a new branch of the Russian Military, less than a year after Ukraine announced its own new drone branch (TASS, 2025). This move shows how Russia reacts when in a more defensive position, as the creation of the USF was largely considered a reaction to Ukraine's Operation Spiderweb (McDermott, 2025). With combat occurring mostly in Ukrainian territory, drones are one of the few weapons with the range to strike unexpected Russian bases. Responding to these drone attacks thus becomes a primary focus of defense operations.

Additionally, Russia is responding to drone attacks with logistical changes. Russia's centralized military struggles to respond to fast, untraditional drone attacks (Ito, 2025). Russia is again choosing to copy aspects of Ukraine's

drone defense strategy, such as incorporating civilian reporters and allowing for more flexibility in the chain of command (Covington, 2016).

Based on existing research, scholars agree Russia's primary weaknesses when compared to Ukraine are inferior drone warfare capabilities and its rigid military hierarchy. There is also scholarly agreement that typically, Russia focuses development on areas in which it is already strong. However, this is due to historical and cultural factors that may or may not be applicable to the current war in Ukraine, and little research has factored in the recent developments of drone warfare.

Conclusion

The existing literature shows that the proliferation of UAV technologies in the Russo-Ukrainian conflict has shifted the purpose of drones from playing a supportive role to becoming a central component of national defense strategy. In Ukraine, the present research highlights a strategy built on technological innovation, decentralized production, and civilian-based detection networks, coupled with large-scale procurement plans for cost-effective, autonomous drone systems. These attempts have enabled Ukraine to mount defensive and offensive operations previously inconceivable, negating any conventional warfare disadvantage it might have had. In contrast, research shows that Russia has taken a more reactive approach, with the effectiveness of Ukrainian drones causing a shift in Russia's defense planning to rely more on autonomous systems. This has resulted in the creation of dedicated autonomous forces, new logistic networks, new command structures, and counter-UAV defense mechanisms. Much of the current research remains fragmented or focuses solely on one country, causing the need for a systematic comparative analysis of drone-enabled warfare in reshaping defense strategy.

Methodology

Our paper aims to understand the relationship between drone-enabled warfare and changes in defense strategies among Russian and Ukrainian forces. Our research specifically focuses on enhanced drone technology capacities and their impact on developing conflict planning in Ukraine and Russia from 2019 to 2026. This time frame allows for an exploration of drone warfare prior to Russia's invasion in 2022, as well as the impacts in the ongoing conflict. We conducted an analysis of press releases issued by involved technological firms such as SpaceX and Auterion to grasp the scope of UAV capabilities and current innovative processes. Subsequently, we synthesized data including drone strikes, production metrics, and UAV losses from text analysis of Ukrainian drone footage, as well as qualitative reports from Ukrainian intelligence units and defense budget records. These findings will help to understand the extent of drone warfare within the current conflict and UAV utilization by both actors. We conclude our analysis by examining

changes in defense policy and strategic planning by Ukrainian and Russian forces in response to drone warfare and proliferation. We determine these modifications and their relation to UAV enhancements by inspecting Ukrainian intelligence records of Russian drone technologies, Russian government reports regarding new defense projects and developments, as well as business agreements between third-party companies and the involved actors.

The first section of the paper seeks to establish a foundation of previous and current drone utilization in warfare, as well as the enhanced capacities of UAV technology over the timeframe of the war. Our research pursues a distinction between previous demonstrations of drone warfare and those characterizing the current conflict. This is achieved through the examination of reports of previous and ongoing military operations involving UAV technologies, such as Operation Spiderweb and Russia's new military branch, the Unmanned Systems Forces. These reports provide accounts of the war, including strategic plans, the number of drone strikes, and metrics regarding the destruction of opposing aircraft units. This information ties in to the broader impact of drone usage on both sides. Additionally, we use press releases from technological firms involved in the innovative processes of implementing new capabilities for UAVs. These help to develop an understanding of ongoing innovative processes relating to drone capabilities, including their capacity to fly unmanned at long distances, provide reconnaissance, and use AI-powered steering. Such accounts further encapsulate the impact of UAVs in the current development of the war, as we establish a link between UAV innovation and proliferation with defense planning and general reliance on drone warfare.

The second section focuses on Ukrainian defense strategy and its response to increasing drone usage in the conflict. We aim to determine if there is an expansion of UAV utilization in their military strategy through the increase in reported drone strikes, as well as reliance on UAV technology in carrying out their larger attacks. We seek to establish this reliance through a quantitative analysis of the number of drone strikes, as well as examining the various forms of drone usage within Ukrainian military operations, including reconnaissance missions, aid deliveries, and direct strikes.

The final section addresses the impact of drone warfare on Russian defense strategy. In particular, this section aims to determine if the Russian defense planning was developed by copying the Ukrainian strategy, including drone capabilities, military branches, and usage in conducting direct strikes. Through an analysis of Ukrainian intelligence records of Russian aircraft systems, we plan to develop an understanding of Russian UAV capabilities and their connection to similar Ukrainian systems.

Results and Findings

Introduction

This section examines the ever-increasing role of drone-enabled warfare within the ongoing Russo-Ukrainian conflict and the methods in which the technological

proliferation of Unmanned Aerial Vehicles has increasingly shaped the planning of defense and strategic operations on both sides. First, this section will outline broader developments in drone warfare in the context of the current conflict, focusing on technological and operational aspects and the international perspective on the subject. Then, it examines the methods in which Ukraine has adjusted its defense planning, namely in the production, deployment, and employment of strategic relations to help its military objectives. Lastly, it examines how Russia has evolved its military strategy and response, including institutional adjustments and an increased reliance on unmanned systems. Altogether, the analysis aims to provide a detailed overview of the available evidence demonstrating the growing strategic importance of drone technologies in the military operations and defense planning of both nations.

The Expansion of Drone Warfare in the Current Conflict

Since 2019, drone warfare has taken a new role in international conflicts. Despite historical utilization of UAVs in various wars and counterterrorism efforts, innovations have enhanced drone capabilities, making them a crucial aspect of modern warfare. Particularly in the Russo-Ukrainian conflict, the two states' reliance on UAVs for reconnaissance missions, aid deliveries, and direct aerial strikes has shaped their defense strategies and revealed developmental steps for future implementations of drones in combat.

Before the current conflict, wars involving UAVs consisted of one-sided drone utilization. Countries and international organizations primarily used drones when conducting strikes on non-state actors, such as NATO's attacks on Azerbaijani and Armenian combatants (Kuzio, 2024). In these conflicts, non-state actors were largely unable to sustain efficient technological production to make UAVs a central player in defense strategy (Kuzio, 2024). The greater international perception of drone warfare prior to the current conflict was fairly timid (Purkiss & Serle, 2017). However, there existed signs that enhanced UAV systems could become major contributors to future combat. In 2016, the US began testing Perdix drones, utilized as a fleet of drones flying in a shared formation guided by artificial intelligence technology (Kallenborn, 2021). Similar enhanced capabilities aligned with the Russo-Ukrainian conflict, allowing for strengthened drone capabilities and a larger implementation of UAVs in constructing defense strategies on both sides.

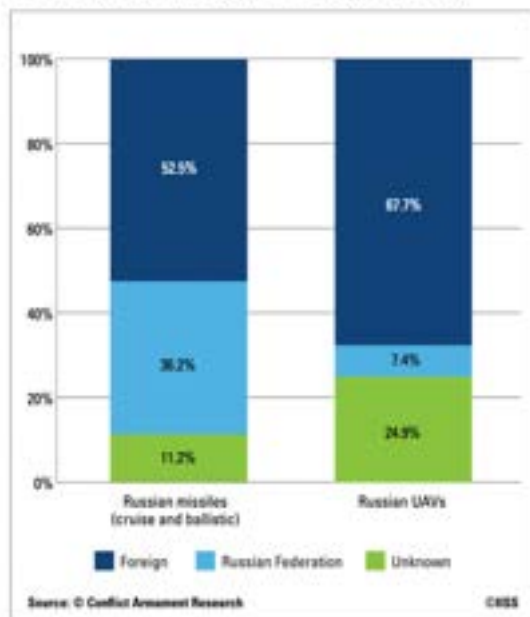
Since the beginning of the conflict, the capabilities of UAVs for Ukrainian and Russian forces have significantly increased. Innovative developments in drones have enhanced their range and tracking ability. The number of Shahed-type drones being produced and deployed by Russian forces has expanded, with an estimated number of 32,200 Shahed-type UAV strikes in 2025 (Anokhin, 2026). These drones are one-way attack UAVs equipped with GPS signalling. Similarly, Russian defense forces conducted deals with technological companies, such as SpaceX, to enhance drone capabilities in rural areas distant from Russian-controlled land. Using Starlink terminals, Russian forces produced drones capable of flying at low altitudes, being controlled in real time, and

resisting Ukrainian electronic warfare, such as the scrambling of attack drones (Young et al., 2026). Ukraine has made similar technological expansions by partnering with the artificial intelligence company Auterion to produce AI-driven drones (Auterion, 2025). These drones have made long-distance missions more reliable and more automated. Ukraine has also utilized TB2 twin-boom model drones, which can be used as reconnaissance and kamikaze UAVs (Warpower: Ukraine, 2026).

Both Ukraine and Russia have expanded their fleets of UAVs. Ukraine removed various mechanisms of drone maintenance and contract approval to allow for more efficient production by private manufacturers (Kuzio, 2024). Ukraine's overall production of UAVs has increased, with a recorded number of 2.2 million produced in 2024 (Niecypor & Matuszak, 2025). In 2025, this number surged to around 3 million drones (Crebo-Rediker, 2026).

For both Russia and Ukraine, foreign imports of commercial drones and drone components have made up a large percentage of their overall production. Figure 1 illustrates the 67.7% of Russian drone components that originate from foreign countries (Hayes, 2025).

Figure 1: Origins of components documented by CAR in Russian missiles and UAVs between February 2022 and April 2025 (Hayes, 2025)



On the other hand, in 2024, Latvia and the United Kingdom jointly created an international organization titled the “Drone Coalition” as an institution dedicated to supporting Ukraine through drone imports and funding for UAV manufacturing (Australian Government Department of Defence, 2024). Based on foreign import records, the Drone Coalition gave 20 million pounds worth of joint funding to purchase UAV technologies in 2025. The member states of the 18-country coalition also contributed individual aid packages. These included a €100 million military aid package from Estonia, as well as a €150 million aid package to support the 2025 “Drone Line” project, which synthesized a systemic

strategy of increasing UAV production and foreign investment (Elias, 2025; Digital State UA, 2026). Such foreign aid packages include UAVs equipped for various purposes.

Developments in Ukrainian Defense Strategy

Throughout the development of the Russo-Ukrainian conflict, the emergence and usage of UAV technology have greatly affected the military and defensive strategy of Ukraine. Amongst its technological advancements and political initiatives, Ukraine has successfully integrated these revolutionary technologies to engage in preemptive warfare against Russian advancements and preventative strikes against Russian bases via Operation Spiderweb.

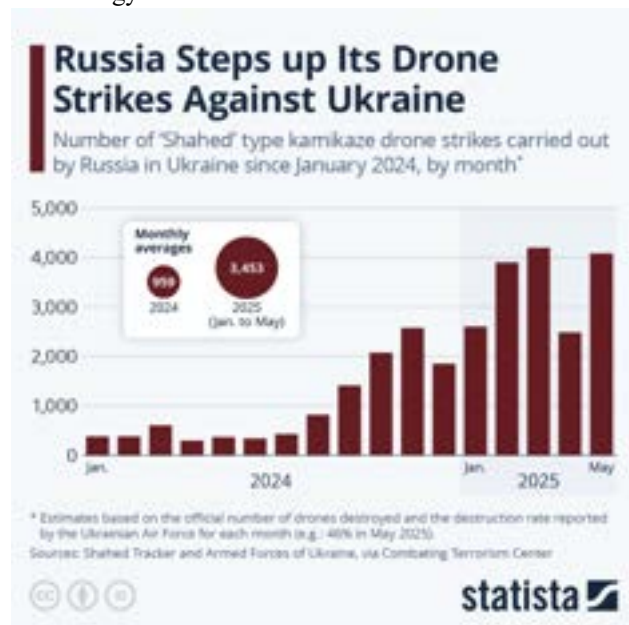
The Ukrainian government has actively utilized FPV drones in attempts to preemptively prevent further Russian advancement into Ukrainian territory. Since 2023, Ukraine has utilized FPV drones rather than miniature anti-tank missiles against Russian forces due to their effectiveness against troop concentrations and armored vehicles (Fried, 2025). Additionally, unlike traditional anti-tank missiles, UAVs can be produced by the tens of thousands each month for a fraction of the cost with greater benefits, sitting at roughly \$350–\$5,800 per unit (Fried, 2025). For comparison, the typical price of an anti-tank missile such as the FGM-148 Javelin from the US Army costs \$197,884 per shot (Hambling, 2022).

Ukrainian defense strategy has incorporated preventative warfare through an aggressive UAV attack against bomber fleet airbases within Russia. Known as Operation Spiderweb, this covert assault launched 117 Ukrainian-made quadcopter drones against four Russian airbases (Dempsey, 2025). The raid was an immense success, which further emphasized the importance of UAV technology in Ukrainian defense policy.

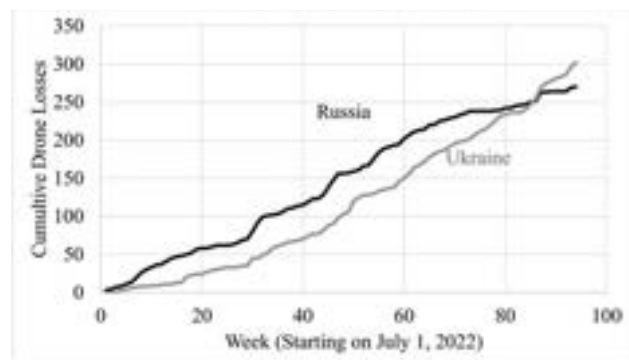
Amidst the dual success of drone technology for Ukraine's defensive and aggressive military strategy, Ukraine has increased their research and development into and supply of UAV technologies. Following the success of Operation Spiderweb, Ukraine announced a military contract with Auterion to provide 33,000 Skynode Drone Strike Kits, showcasing an increase in their UAV arsenal and commitment to this emerging technology (Auterion, 2025). Furthermore, Ukraine has increased its drone stockpile through the Ukrainian Drone Coalition, an agreement launched in 2024 by the United Kingdom and Latvia to fund, produce, and supply Ukraine with UAVs (Hodunova, 2025). This, yet again, emphasizes the efforts of the Ukrainian government to explore further expansion of resources into Unmanned Aerial Vehicles because of their effectiveness in ongoing conflict with Russia. Overall, 200,000 drones were delivered to Ukrainian troops each month in 2025 from an initial 20,000 a month in 2024 (Fried, 2025). At a time when drones are responsible for 75% of combat losses for both Russia and Ukraine (Fried, 2025), the Ukrainian government recognizes the importance of UAV technology and has shifted its military strategy and government spending accordingly.

However, Ukraine still needs more affordable and easily implementable technologies to counteract superior Russian aerial systems such as the Shahed-136, an Iranian long-range “Kamikaze Drone,” produced domestically in Russia and commonly called the Geran-2 (Jones et al., 2023). Its usage has continually increased throughout the war, going from roughly 400 kamikaze drone strikes by Russia in January 2024 to over 4000 in May 2025 (Fleck, 2025). Figure 2 showcases the increase in kamikaze drone strikes carried out by Russia within Ukraine from January 2024 to May 2025 (Fleck, 2025).

While these offensive and defensive strategies may have been effective temporarily in halting Russian advancement, Russian forces have still seized roughly 4,831 square kilometers of Ukrainian land in 2025 (Olmstead et al., 2025). Ultimately, there is evidence that the Russo-Ukrainian War will be determined by which nation can effectively develop and deploy UAV technology into its military arsenal and strategy.



Developments in Russian Defense Strategy



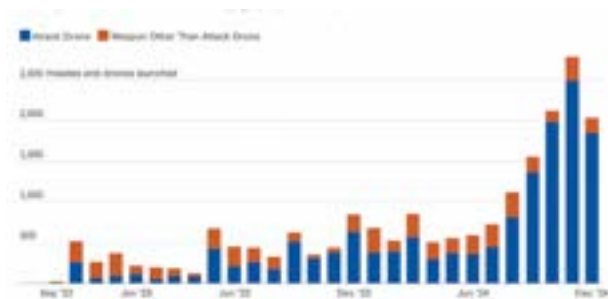
At the beginning of the war, Russia seemed the weaker party in drone warfare, suffering more drone losses (see Figure 3.1) and failing to anticipate and prevent Operation Spiderweb, a widely-publicized Ukrainian drone strike. Despite early expectations that Russia would be unable

to adapt, Russia increased its drone usage by imitating Ukraine’s drone development and improving its command structure. Russia initially lost more drones, but it also suffered greater losses in most areas, not just drones, due to being the invading party. Drones were unique because a statistical analysis found a negative correlation between Ukrainian drone losses and Russian vehicle losses, but not vice versa (Mittal & Goetz, 2025). This means Ukrainian drones have been one of the most effective methods of destroying Russian vehicles, but Russia can replace broken drones with other, just as effective, methods it possesses.

Russia initially relied on its larger military size and budget as its advantage (Massicot, 2023), but the prolonged war demonstrated weaknesses in this initial belief. When the State Armament Program was adjusted for 2020-2027, the goals were reduced from adding high-cost weapons to improving internal command systems and increasing research and development (Connolly & Boulegue, 2018). The budget, when adjusted for inflation, was also less than the 2011-2020 budget. This indicates Russia recognized its internal problems and that its large military budget was not as beneficial as intended. There has been evidence that the military has become less rigid and slower as a result, such as the “Voentekh” project, which sees new technology tested directly on the battlefield (Andreika, 2025). The aim is for an increased trust in the military to run these tests and more flexibility in how the tests are run to allow new technology to be implemented faster than before.

The focus on improving logistics has also led to more flexibility within the Russian military than initially expected, allowing it to rapidly adapt Ukrainian tactics that the Russian military sees as effective. When Ukraine began mass-producing FPV drones in August 2023, Russia quickly began mass-producing them as well, after seeing how the cheap precision drones were lethal against its own troops (Andreika, 2025). The speed at which Russia was able to increase usage of these drones, as shown in Figure 3.2, indicates more change and input from people in the field with hands-on experience utilizing these drones. Russian civilians were earlier than even the government itself to push drone development in a bottom-up approach, through volunteer organizations aimed at making their own UAVs (Chavez & Swed, 2023).

Beyond the effectiveness of drones, Russia has started to increase reliance on them due to an artillery shortage and heavy losses of more expensive aircraft early in the conflict (See Figure 3.2, Brands, 2024). Similarly to Ukraine, Russia relies heavily on other countries for its supply, especially Shahed drones from Iran (Szondy, 2022) and UAV components and assembly in China (Masiakin, 2025).



Conclusion

The evidence shows the growing significance of the use of drones in the current conflict and their expanding presence across both militaries. While the drones have been deployed for reconnaissance, technological developments have also enabled them to conduct targeted strikes and coordinated operations. Both Russia and Ukraine have adopted these advancements in their military operations; however, Ukraine has placed greater emphasis on technological innovation and production, whereas Russia has focused on institutional measures, such as the creation of drone operations.

Discussion

Drone Warfare in the Current Conflict

In the first section, we looked at the contrast between drone proliferation and enhanced capabilities in the current conflict compared to previous UAV warfare. More specifically, we researched the expansion of drone fleets for the Russian and Ukrainian militaries, as well as increased production and innovation in new drone technologies on the domestic and foreign front.

We found a distinction between prior drone utilization in warfare and the current UAV defense methods in the Russo-Ukrainian conflict. Due to previous uses against non-state actors, drone warfare was predominantly utilized as a defensive tool. Lack of manufacturing resources and technological capabilities of non-state actors restricted general use, limiting drone warfare as a central strategic defense plan in previous international conflicts. This indicates a connection between production capacity and enhanced drone technologies, with the development of modern drone warfare that we observe in the ongoing conflict in Ukraine and Russia.

Our research indicated a large expansion in drone technology capabilities, such as range and tracking enhancement, as well as GPS signalling capacity. Our findings show that innovative technologies have been used for low-altitude reconnaissance missions and have aided in evading electronic warfare methods traditionally used as counter-defense strategies against drones. By surpassing defense system technologies, UAVs have become a critical tool in military advancements, positioning drones as a central player in both Ukrainian and Russian defense strategies. Furthermore, through established links with AI companies, Ukrainian and Russian drones have made improvements in long-distance mission utilization. Our findings indicate a

transition to reliance on drones for long-range strikes, decreasing risk, and minimizing human casualties.

Beyond innovative drone capabilities, our research expanded into the production metrics and the increase in overall manufacturing during the war. We found records of an increase in drone production since the start of the war for Ukrainian drone fleets, as well as foreign aid packages to both Ukraine and Russia. Such aid packages helped fund manufacturing efforts and directly supplied the states with drone components. The increase in domestic production established drones as a growing factor in both sides' defense strategies. Furthermore, imports of UAV technology and funding indicate concrete national desires to obtain drone technology as the conflict played out, as both sides' international allies supported their war effort in this manner. Figure 1 shows that 67% of Russian UAV components come from foreign origins, indicating the extent of foreign intervention in developing the current state of drone warfare.

The overall impact of increased production, foreign investment, and technological innovations in UAV technology has been a broader shift toward drone warfare and UAV reliance in the Russo-Ukrainian conflict. As one of the first wars involving two sides equipped with technological capabilities sufficient to support a drone-centered defense strategy, the Russo-Ukrainian conflict could point to a broader global shift toward cyber warfare in the future.

Impact on Ukrainian Defense Planning

We explored the adapted Ukrainian defense strategy amidst the rise of Unmanned Aerial Vehicles and their battlefield implications in the current Russo-Ukrainian conflict. Specifically, whilst examining Ukrainian military policy, we've established the efficiency of UAVs compared to previous defense technologies, the success of UAV integration into Ukrainian warfare, and the rapid expansion into drone technologies by the Ukrainian government. For these reasons, UAV technology has been vital to Ukrainian defense strategy to engage in preemptive warfare against Russian advancements and preventative strikes against Russian bases.

Our research into the advantages of drone technology showcased the efficiency of UAVs in a warfare setting because of their accessibility, low cost, and unpredictability. Amidst the Russo-Ukrainian conflict, drone usage has dramatically increased. Programs such as the Ukrainian Drone Coalition, supported by the United Kingdom and Latvia, and government contracts between Ukraine and Auterion illustrate the accessibility of UAV technology to the Ukrainian military.

These programs also establish the immense demand for UAVs in the Russo-Ukrainian warzone because of their low cost compared to previously utilized technology. Past weapon systems, such as the anti-tank missile FGM-148 Javelin, were utilized prior to the proliferation of drone technology. But, because of drones' cost efficiency, Ukraine is able to counteract Russian advancement without utilizing a large portion of the already depleted defense budget.

Furthermore, UAV technology enables an unpredictable element of warfare through its speed, precision, and extreme functionality. Through Operation Spiderweb, Ukraine launched a covert assault with 117 Ukrainian-made quadcopter drones against four Russian airbases. This was an extremely successful preventative strike against Russian resources because of the speed and precision of these Ukrainian-made quadcopter drones. Furthermore, these UAV technologies have been utilized as a preemptive warfare against Russian advancements. These drones have caused three in every four combat losses, ranging from soldiers to tanks. The versatility of UAV technology in the Russo-Ukrainian conflict has been remarkable, ranging from surveillance to small-scale explosives to disabling heavy vehicles. Overall, Ukraine's warfare success depends on unpredictability against a more resourced Russian military. By utilizing unpredictable drones, Ukraine can and has leveled the playing field in their conflict.

In short, UAV technology has been essential to Ukrainian defense strategy to repel Russian advancements into Ukraine and compete in an ongoing conflict against Russia because of its accessibility to the Ukrainian government, cheap production cost, and versatility in a warzone. The Russo-Ukrainian conflict will determine the future of Unmanned Aerial Systems and their impact in national security.

Impact on Russian Defense Planning

In the third section, we examined how Russia's invasion strategies have been impacted by using drone-enabled warfare. By analyzing Russia's military budget, departments, and statistics on military vehicles, drones, and personnel losses on both sides, we found that Russia has been increasingly focusing on drone development and strengthening logistics to utilize drones. Our findings indicated not just the current state of Russian drone warfare, but also identified trends and likely future goals of the Russian military, as its new programs and drones are implemented and experimented with.

Our findings contradicted Covington, who predicted that Russia would focus on research in technologies other than drones owing to Ukraine's clear investment in this area. Most of these articles were written in the early stages of combat or used only data from previous conflicts. Instead, our findings suggest that Russia's strategies are changing as the war in Ukraine drags on longer than initially expected.

Regarding drone development, Russia's new program focused on drone research, Voentekh, indicates it is competing directly with Ukraine to make drones cheaper and more effective. The statistics on drone losses in Figure 3.1 show after November 2023, Ukraine started losing drones at a faster rate than Russia, which had not previously been the case. Russia might now have stronger drone warfare at the current time, but both parties are still advancing in drone warfare. Even without changes in drone strategy, Russia will eventually gain an advantage from being less impacted by drone losses. Russia is more evenly spread among drones,

missiles, and other weapons, and can use alternatives to drones for reconnaissance and attacking, while Ukraine has started to lose drones at a faster rate than Russia.

This competition for drone superiority is not confined solely to Ukraine and Russia, but also to the allies participating in drone manufacturing. Given our research, we predict that China and Iran will also be advancing their drone programs in the upcoming years as Russian demand grows.

One of the common reasons Russia was not expected to excel in drone warfare was its rigid military structure. Such a system makes change and the granting of necessary autonomy to soldiers controlling the drones unlikely. The same reason applies: this research was based on Russia's historical strategy trends, but modern technology is changing how Russia does war. When invading another country, Russia had the disadvantage of being less familiar with the land. But when adapting drones at soldiers' request, it is likely also incorporating intel from active combat soldiers, who now know the land better than remote military personnel. Ukraine's most notable successes, like Operation Spiderweb, were fast and left little time for a response. These attacks are unlikely to be as effective in the future, now that Russia's hierarchy will allow for decisions from those under attack to be approved more quickly.

Russia's unpredictable and effective actions make it a growing threat to Ukraine. Ukraine has a smaller army size, economy, and weapon supply, with drones being its sole, but very beneficial, advantage over Russia. If this is no longer the case, which the data increasingly suggests, Russia could succeed in its invasion sooner than previously predicted. Ukraine's strategy is not evolving at the same pace, meaning foreign aid might soon be more necessary than ever.

Limitations

Despite the strengths of this study, there remain various limitations that should be considered. One general restriction was the lack of precise metrics and quantities regarding drone strikes, fleets, and trade operations. Due to the current state of the conflict and its active continuation, such data was mostly found through educated estimates from third-party sources, as the two involved actors seek to restrict intelligence collection from one another. In our results and findings, we used reported quantities to help establish the proliferation of drone warfare in the conflict, as well as enhanced UAV capabilities. Without precise data, these conclusions and their subsequent use in determining the larger impact on defense strategy are weakened. Future research can benefit from post-war data metrics and increased access to accurate information.

Our study also relied on inferential links between drone proliferation and defense policy changes throughout the conflict. While we found strong evidence to support an association between UAV enhancement and reliance and strategy on both sides, confounding variables exist. These include factors such as military spending, foreign aid, technological capacity, battlefield conditions, and manpower constraints that influence both drone advancement and the strategic reliance on drones in the Russo-Ukrainian war. Our

research attempted to account for some of these variables, such as foreign aid packages, defense spending, and geographical conditions that may have influenced a more drone-focused military strategy for both sides. However, to fully articulate the association while reckoning with these factors would take years of research and access to intimate information regarding government work on both sides of the conflict. With our limited timeframe of one semester, as well as the challenges in collecting information on a current conflict, our conclusions were restrained. Possible avenues to analyze these variables could be interviews with government officials or defector party members after the war.

Although our research was affected by these various limitations, we are confident that our findings offer a meaningful contribution to the current understanding of UAV warfare in the ongoing conflict through demonstrated proliferation and increased drone reliance in military planning.

Conclusion

The rapid proliferation of Unmanned Aerial Vehicles has transformed military strategy in the ongoing Russo-Ukrainian conflict. As previously utilized precision munitions seem increasingly inefficient due to high costs, the emergence of low-cost, mass-producible drones has fundamentally reinvented military strategy and warfare to favor these weapon systems.

Our research established that Ukraine has enjoyed success in integrating FPV drones and AI-driven systems to offset Russian arsenal superiority. This effort culminated in successful counterattacks of Russian advances and

operational strikes within Russian territory. These strikes include Operation Spiderweb, which demonstrated the viability of preventative drone warfare against Russian infrastructure. Conversely, Russia's drone strategy has changed during the course of the conflict. Russian initial stagnation changed to a rapid, state-led industrialization of UAV technology. Imitating the Ukrainian military's success, Russia has shifted towards an institutionalized attrition, utilizing Shahed-type drones to exhaust Ukrainian air defenses.

Given the development and role of UAV technology in the current Russo-Ukrainian conflict, future defense policy may utilize low-cost drone systems and shift towards more affordable, automated interceptor technologies to counter Shahed-type drones. Overall, the nations that can capitalize on the mass deployment of UAV technology will play major roles in developing the standard for the future military doctrine of UAV technology. This war represents a pivotal moment where the future military budgets of global leaders will be determined by the success of UAV technology within this ongoing conflict. If this success continues, we will see the continued growth and innovation in Unmanned Aerial Systems by the global defense powers.

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Correlational Effects of Telemedicine Expansion on Maternal Healthcare Across India

Alan Martin and Chinmayi Palya

Our research examines the association between the post-2019 expansion of telemedicine in India and trends in maternal healthcare quality and maternal mortality rates. Additionally, we explored how developments in telemedicine align with and contribute to international sustainable development goals aimed at reducing the global Maternal Mortality Ratio. To understand these relationships, we analyzed secondary data sources from government data sets on national maternal healthcare alongside measures of telemedicine development across individual Indian states, looking at the maternal mortality ratio and maternal healthcare utilization indicators. The findings indicate a positive correlation between the advancement of telemedicine and improvements in overall maternal healthcare quality. However, this study did not find a correlational relationship between the expansion of telemedicine and declining national maternal mortality rates. Notably, trends differed across the country, as certain states showed greater improvements than others. This study also finds that telemedicine failed to reduce pre-existing maternal healthcare inequities between states. The results of this study also suggest that telemedicine may contribute to broader global sustainability goals based on the correlative relationships we have identified.

Introduction

When examining priorities in global health, improving maternal healthcare outcomes is consistently among the most urgent and widely recognized goals due to its impact on broader, lifelong global well-being. The third Sustainable Development Goals (SDG), created by the World Health Organization (WHO) and the United Nations (UN), aims to “reduce the global Maternal Mortality Ratio (MMR) to fewer than 70 deaths per 100,000 live births” (United Nations, 2025). Although significant improvements to maternal healthcare have aided in progressing towards this goal, maternal mortality remains a significant challenge, especially for low and middle-income communities around the world. A large proportion of these maternal deaths stem from preventable causes such as limited healthcare infrastructure and workforce shortages. In response to these inequities, digital health technologies, such as telemedicine, have become a strategy to potentially increase access to maternal healthcare. Telemedicine refers to the use of digital technologies such as electronic information, mobile phones, and video conferencing tools to provide healthcare services remotely (Institute of Medicine (US) Committee on Evaluating Clinical Applications of Telemedicine, 1996). Telemedicine allows patients to consult healthcare providers without needing to travel in-person to clinics or hospitals, thus limiting direct physical examination and in-person clinical evaluations. In 2018, the government of India launched the Ayushman Bharat initiative, which aimed to achieve universal health coverage across India and specifically targeted SDGs (Grewal et al. 2023). A key objective of the Ayushman Bharat initiative was expanding access to telemedicine and telehealth consultations. Given this objective, India’s government has expanded telemedicine across the country through its investment in digital infrastructure. Chief among these initiatives was eSanjeevani, a national telemedicine system launched in November 2019, which connected millions of patients to digital medicine services.

Our study seeks to understand the relationship between India’s telemedicine expansion and the third sustainable development goal, which focuses on maternal healthcare and maternal mortality rates. Thus, we will

examine the effectiveness of telemedicine in improving maternal healthcare quality and maternal mortality rates in India after 2019. For the purposes of our research, maternal mortality rates are tracked through recorded Maternal Mortality Ratios (MMR). MMR is defined by the number of pregnancy-related fatalities per 100,000 live births and measures the risk of death during a mother’s gestation period, childbirth, or within 42 days after her pregnancy ends (World Health Organization). While this definition encapsulates immediate risks, our research also accounts for late deaths as a relevant factor in measuring maternal healthcare quality. A late maternal death is defined as a death more than 42 days but no more than a year after the end of a pregnancy due to obstetric causes (World Health Organization). Healthcare quality within this study is conceptualized through a maternal health lens and includes both process and outcome-based indicators. These include attendance to antenatal visits, patient satisfaction, access to care, and clinical outcomes (maternal mortality, maternal infection, postpartum hemorrhage, etc.). While traditional definitions of quality of care include availability of infrastructure and supplies and quality of in-person human care, these variables, of course, do not apply to telemedicine, which is, by its nature, digital. Moreover, maternal healthcare is examined across antenatal, postnatal, and postpartum periods. Antenatal care refers to healthcare provided during the actual ~9-month gestation period. For the purposes of study, postnatal care is defined as obstetric care provided to a mother within 45 days after the end of her pregnancy and postpartum care is defined as obstetric care provided after that 45 day period. This allows for late maternal deaths to be accounted for while aligning our study with broader evaluative frameworks of maternal mortality.

From a global health perspective, evaluating the impact of telemedicine in India on maternal health outcomes can provide valuable insights into the capability of this technology to support progress towards SDG 3.1 outlined by WHO and the UN. Exploring telemedicine as a model within the context of India’s resource-variable landscape can help generate scalable lessons for other countries facing similar healthcare access challenges while also helping inform strategic investments in digital health infrastructure broadly.

Review of the Literature

Introduction

In order to analyze telemedicine's implication on maternal healthcare quality in India, we have examined existing literature surrounding the development of telemedicine in India, the effects on maternal healthcare quality and maternal mortality, and the global implications of maternal telemedicine tactics.

Development of Telemedicine in India

Before analyzing the relationship between telemedicine expansion and maternal medicine, it is important to understand telemedicine in its broader context. Ferrer-Roca and Sosa-Iudicissa (1998), in their book *Handbook of Telemedicine*, define telemedicine as “medicine practiced at a distance.” They note that mainstream telemedicine dates back to the 1970s and 1980s, but it was until the 1990s that telemedicine networks took off—thanks largely to the internet and telemedicine's consequent availability and accessibility. Writing in 1998, Ferrer-Roca and Sosa-Iudicissa noted that telemedicine was still in its infancy and predicted it would become an “integral part of day-to-day healthcare and medical practices.”

Later research affirmed this prediction. Alenoghena et al. (2023)'s survey situates telemedicine in the context of international development and COVID-19. Through international surveys, the authors provide a comprehensive technical review of telemedicine's communication technologies, system architecture, applications, and ongoing challenges. While noting decades of technological progress, Alenoghena et al. (2023) also point to structure barriers impeding telemedicine's widespread adoption. They identify the lack of universal standards for medical data and high terrestrial infrastructure costs as the most prohibitive obstacles, particularly in developing nations. Kim and Zuckerman (2019) share similar concerns, but differ in how they evaluate the severity of said concerns in the modern age. They note that while early telemedicine was limited by infrastructure gaps in developing countries, falling information and communications technology (ICT) costs, increased international aid, and most of all expanding mobile connectivity have collectively altered these concerns. For example, commercial wireless signals now reach 90% of the world's population, and 89% of rural populations in South Africa, Mauritius, Kenya, and Malawi now have access to the Internet. With this in mind, Kim and Zuckerman (2019) identify telemedicine as integral to strengthening underfunded and underresourced public health systems around the world.

In India specifically, telemedicine's origins date back to the late 20th century, though its government did not develop major telemedicine infrastructure until the turn of the century. In 2001, the Indian Space Research Organisation (ISRO) launched its pilot telemedicine project, connecting Apollo Hospital in Chennai to a rural hospital in Andhra Pradesh (Chellaiyan et al., 2019). This project

eventually linked 45 remote hospitals across India with 15 speciality centers located primarily in metropolitan areas (Chellaiyan et al., 2019). In 2005, India's government created the National Telemedicine Task Force, which developed electronic health record standards and added the National Medical College Network and National Rural Telemedicine Network initiatives (Chellaiyan et al., 2019).

While telemedicine continued to steadily expand throughout the 2000s and 2010s, COVID-19 became a turning point in its adoption both globally and in India. Dash et al. (2021) argue that prior to the COVID-19 pandemic, the expansion of telemedicine in India was relatively uncertain due to legal constraints. Several judicial orders had imposed restrictions on the practice, including a high-profile criminal negligence ruling surrounding a telephone consultation in Maharashtra (Dash et al., 2021).

In response to public concerns, the Indian government launched eSanjeevani in November 2019 through its Digital India Initiative (Dash et al., 2021). eSanjeevani created a more structured telemedicine network which aimed to connect larger hospitals to remote primary health centres (Dash et al., 2021). While eSanjeevani, was launched in late 2019, many extensions to the program were added during 2020, especially following the global surge of COVID-19 cases and related illnesses.

Maternal Healthcare Quality and Mortality Outcomes

Existing literature surrounding maternal healthcare quality demonstrates the influence of telemedicine in India across multiple parameters. Through telemedicine platforms like eSanjeevani, the healthcare landscape in India has become substantially more accessible. Research on telemedicine and maternal healthcare quality finds improvements in patient retention and timeliness of care. However, while general scholarship around maternal healthcare quality remains robust, one challenge across all dimensions of telemedicine research is the heterogeneity in defining “healthcare quality.” This inconsistency complicates cross-study comparisons and weakens evaluation metrics that determine whether telemedicine truly improves clinical outcomes. Without this standardized definition, the literature struggles to reach a unified understanding of how telemedicine shapes healthcare quality—maternal and otherwise.

Sood et. al (2025) helps inform the scale and scope of telemedicine adoption by analyzing *eSanjeevani's* regional distribution and user demographics. While their research provides insight into telemedicine accessibility, it fails to assess its overall effect on maternal healthcare quality and mortality outcomes, despite referencing patient satisfaction as an indicator of success. Similarly, Mohapatra et al. (2023) find an overall improvement in maternal healthcare through increased antenatal visit adherence but are severely limited by a small sample size (n=80) and a lack of concrete mortality outcome data. Their study consequently leaves a gap in determining the broader effect of telemedicine on maternal healthcare quality. Singh et al. (2025) identifies similar improvements in antenatal

healthcare quality while also analyzing telemedicine's impact on maternal and fetal outcomes, as well as patient satisfaction. However, Singh et al. focuses primarily on teleconsultation's effects on fetal and maternal outcomes as opposed to mortality specifically. Our research addresses these gaps by directly examining both maternal mortality and maternal healthcare delivery at a national level following the 2019 expansion of telemedicine in India.

Beyond these studies, current research fails to adequately analyze telemedicine's effect on maternal mortality. Most existing studies employ mixed methodologies and meta-analyses that aggregate various health variables and determinants without accounting for clinical outcomes such as maternal mortality. Arshad & Chowdhury (2025) highlight this limitation, noting that although telemedicine resulted in positive outcomes for antenatal care visit retention, the available data does not allow for critical evaluation of data points focused on maternal and perinatal mortality. Arshad & Chowdhury (2025) and similar systematic reviews, such as Joshi et al. (2023), analyze the accessibility of mHealth (or mobile health) interventions, finding positive effects on healthcare delivery in resource-scarce areas. Arshad & Chowdhury (2025) also observed that telemedicine led to measurable improvements in both health-seeking behaviors and overall process-related outcomes. However, both reviews fail to directly measure or correlate telemedicine utilization with reductions in maternal mortality.

This pattern highlights a broader gap in the existing literature that demonstrates an overwhelming prioritization of process indicators such as access and overall patient satisfaction over clinical outcome indicators such as maternal mortality. This study addresses these gaps by examining the federal health policy shifts that enabled the 2019 expansion of telemedicine while evaluating its effects on maternal healthcare quality and maternal mortality outcomes.

Global Implications

The expansion of telemedicine in India after 2019 has attracted increasing attention as a potential contributor to progress toward the World Health Organization's SDG 3, which aims to reduce global maternal mortality to fewer than 70 deaths per 100,000 live births. Recent literature situates India's telemedicine expansion as a case study for low- and middle-income countries (LMICs) looking for cost-effective strategies to improve maternal healthcare access amid workforce shortages and geographic barriers.

International organizations have begun to use India's telemedicine model as a benchmark for scalable digital maternal health strategies. The World Health Organization emphasizes that telemedicine has the potential to expand access to essential health services, including maternal care, when implemented with appropriate governance, equity safeguards, and efficient integration into existing healthcare systems (WHO, 2022). While WHO has not made claims regarding cost-effectiveness, it highlights India's system-wide adoption as enabling factors for sustainable telemedicine deployment. The World Bank has,

however, stated that India's digital health implementation is a cost-effective and scalable solution for LMICs with provider shortages and low access in rural areas. World Bank analyses cite India's telemedicine expansion as evidence that digital health investments can strengthen maternal and reproductive health services without significantly increasing public health expenditures (World Bank, 2024).

India's experience has also influenced regional digital health policy development. Through engagement with the World Health Organization South-East Asia Regional Office (WHO SEARO), India has contributed implementation lessons that have impacted regional digital maternal health strategies. These include guidance on integrating telemedicine into existing public health systems, standardizing digital clinical protocols for antenatal and postnatal care, and establishing tele-referral pathways that link primary care centers with obstetric facilities. WHO SEARO technical reports highlight how India's experience with telemedicine serves as a reference point for other South-East Asian countries seeking to scale digital maternal health services while remaining equitable (WHO SEARO, 2021).

The United Nations Population Fund (UNFPA, 2021), which evaluates the use of digital health technologies in maternal care across LMICs, reports that telemedicine and other digital health platforms have improved continuity of antenatal and postnatal care, especially for rural and underserved populations.

Despite a growing body of scholarship regarding this matter, much of the existing literature focuses on process metrics. For example, much of the literature emphasizes telemedicine service utilization metrics, such as the number of antenatal care visits, teleconsultation volume, early registration rates, or referral completion, rather than measuring the outcomes. While these indicators are important to determine the accessibility and utility of telemedicine, they do not necessarily demonstrate changes in outcomes for these patients. As Kruk et al. (2018) argue in their analysis of health system quality in LMICs, improved access alone is meaningless without corresponding gains in quality of care and outcomes.

Existing scholarship and research on the telemedicine nexus in India provides comprehensive understandings of the internal mechanics of telemedicine, its development, and process indicators for maternal healthcare quality. However, several critical gaps remain within existing literature such as a lack of clinical outcome indicators and comparative global analyses and perspectives. By providing quantitative and qualitative metrics for telemedicine impact and an analysis of global implications, our research contributes to existing scholarship's understanding of telemedicine's role in achieving global health goals and standards.

Methodology

This study employs a mixed-methods design to examine changes in maternal healthcare quality and

outcomes in India before and after the 2019 expansion of telemedicine. A comparative approach was used to examine trends in maternal mortality and maternal healthcare utilization pre- and post-telemedicine expansion. Due to the study's heavy reliance on secondary data and a lack of variable manipulation, it evaluates associations between telemedicine expansion and maternal health outcomes rather than establishing direct causality.

We collected data from a variety of national news reports and government-verified sources. We gathered MMR data from the Sample Registration System (SRS) Maternal Mortality Bulletins for the time periods of 2015-2017, 2018-2020, and 2021-2023. We employed healthcare utilization indicators from multiple rounds of the National Family Health Survey (NFHS), including NFHS-1 (1992-1993), NFHS-2 (1998-1999), NFHS-3 (2005-2006), NFHS-4 (2015-2016), and NFHS-5 (2019-2020). We obtained telemedicine adoption data from reports published by news outlets as well as the Government of India on the eSanjeevani platform, including teleconsultation figures from between 2019 and 2023.

The primary variables in this study are MMRs and indicators of maternal healthcare utilization (the percentage of mothers receiving at least four antenatal care visits, full antenatal care, antenatal care in the first trimester, and no antenatal care). Together, these indicators measure maternal healthcare quality and access. We operationally defined telemedicine expansion as the period before 2018 (pre-expansion) and the period after 2019 (post-expansion).

The data analysis conducted in this study involves several components: First, we analyzed national trends in maternal mortality and healthcare utilization using longitudinal comparisons. Second, we calculated rates of change based on national statistics to assess whether the rate of improvement accelerated after the expansion of telemedicine. We computed average annual rates of change by dividing the difference in indicator values by the number of years between measurement periods, allowing us to compare rates of change before and after 2019 across intervals of different lengths. To investigate regional variation, we analyzed state-level MMR data for specific states representing both high- and low-mortality rates, including Assam, Uttar Pradesh, Bihar, Tamil Nadu, Maharashtra, and Kerala. We calculated both absolute and percentage changes in maternal mortality to compare the magnitude of improvement across states. This allowed for recognition of disparities in improvement in specific regions of India that are not apparent when solely looking at national-level data.

We used data visualization methods, including line graphs and tables, to illustrate trends in maternal mortality ratios, maternal healthcare utilization, and state-level differences. These visualizations helped to identify patterns and differences in rates of change across time and regions.

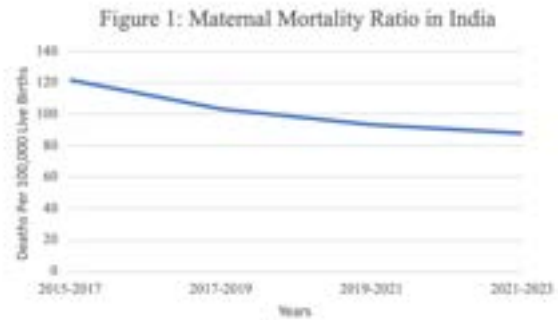
Results and Findings

Maternal Healthcare Quality and Mortality

MMR

Analysis of national maternal health data reveals a steady decline in India's Maternal Mortality Ratio (MMR) following the 2019 expansion of telemedicine services. According to data released by the Sample Registration System (SRS), the national MMR decreased from approximately 122 deaths per 100,000 live births in 2015-2017 to 103 deaths per 100,000 live births in 2017-2019 (Sample Registration System, 2025). The MMR further declined to 93 deaths per 100,000 live births in 2019-2021, and then 88 deaths per 100,000 live births in 2021-2023 (Sample Registration System, 2025). Figure 1 denotes trends over the examined intervals. This downward trend overlaps with the expansion of telemedicine platforms such as eSanjeevani, suggesting that improvements in maternal health outcomes occurred simultaneously along with digital health expansion. However, despite this decline, the rate of reduction in MMR did not increase sharply after 2019, suggesting that improvements in maternal mortality are part of a longer-term trend, and cannot necessarily be solely attributed to the expansion of telemedicine.

Figure 1: Adapted from Sample Registration System (SRS), 2025



Maternal Healthcare Utilization Indicators

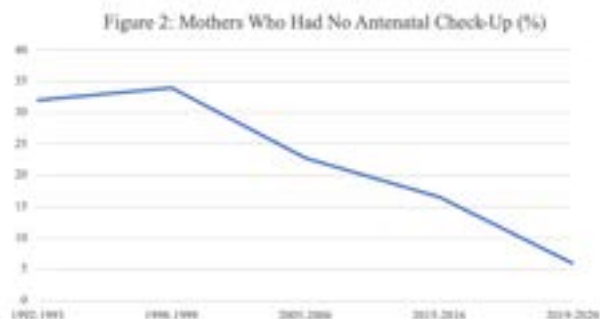
Maternal healthcare utilization indicators, which serve as a representation of healthcare quality, demonstrate more noticeable improvements post-2019. Table 1 denotes the frequency of four maternal healthcare utilization indicators across the following time intervals: 1992-1993; 1998-1999; 2005-2006; 2015-2016; 2019-2020. For comparative purposes, we use the 2015-2016 interval as a pre-telemedicine expansion parameter and the 2019-2020 interval as a post-telemedicine expansion parameter. We look to earlier time intervals in order to compare the rate of change across earlier intervals to the rate of change between 2015-2016 and 2019-2020.

Table 1: Indicators of Maternal Healthcare Utilization from 1992-1993 to 2019-2020. Adapted from Bakshi et al., 2025

Indicator	1992-1993	1998-1999	2005-2006	2015-2016	2019-2020
Mothers who had no antenatal check-up (%)	32	34	22.8	16.5	6
Mothers who had an antenatal check-up in the first trimester (%)	24.9	33.1	43.9	58.6	70
Mothers who had at least four antenatal care visits (%)	N/A	N/A	37	51.2	58.5
Mothers who had full antenatal care (%)	N/A	N/A	11.6	21	31.2

First, Figure 2 denotes the percentage of mothers who had no antenatal checkups across the observed time intervals. As reflected by Table 1 and Figure 2, the percentage of mothers who had no antenatal check-up decreased from 32% from 1992-1993 to 16.5% from 2015-2016 (pre-telemedicine expansion) to 6% 2019-2020 (post-telemedicine expansion). This is a 10.5% decrease over four years, or an average annual reduction of 2.63% per year. For comparison, the number of mothers receiving no antenatal care declined from 32% from 1992-1993 to 16.5% from 2015-2016, which is a decrease of 15.5% over 23 years and an average annual reduction of 0.67% per year. Thus, the average annual reduction is 1.96% greater for the first observation period, though the lack of data from 2017-2018 and post-2020 necessitates a certain margin for error when directly attributing the decline to telemedicine expansion.

Figure 2: Adapted from Bakshi et al., 2025



Second, Figure 3 denotes the percentage of mothers who had an antenatal check-up in the first trimester across the observed time intervals. As reflected by Table 1 and Figure 3, the percentage of mothers who had an antenatal check-up in the first trimester increased from 24.9% from 1992-1993 (pre-telemedicine expansion) to 58.6% from 2015-2016 (pre-telemedicine expansion) to 70% from 2019-2020 (post-telemedicine expansion). This is a 11.4% increase over four years, or an average annual growth of 2.85% per year. For comparison, the percentage of mothers who had an antenatal check-up in the first trimester rose from 24.9% in 1992-1993 to 58.6% in 2015-2016, which is an increase of 33.7% over 23 years and an average annual

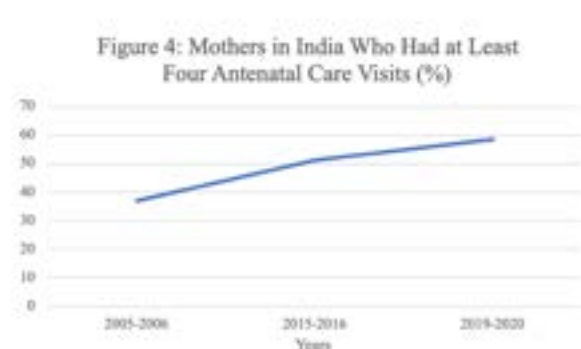
rise of 1.47% per year. Thus, the average annual growth is 1.38% greater for the first observation period, though, once again, the lack of data from 2017-2018 and post-2020 necessitates a certain margin for error when directly attributing the decline to telemedicine expansion.

Figure 3: Adapted from Bakshi et al., 2025



Third, Figure 4 denotes the percentage of mothers who had at least four antenatal care visits across the observed time intervals. As reflected by Table 1 and Figure 4, the percentage of mothers who had at least four antenatal care visits increased from 37% from 2005-2006 (pre-telemedicine expansion) to 58.5% from 2019-2020 (post-telemedicine expansion). This is a 7.3% increase over four years, or an average annual growth of 1.83% per year. For comparison, the percentage of mothers who had at least four antenatal care visits rose from 37% in 2005-2006 to 51.2% in 2015-2016, which is an increase of 14.3% over ten years and an average annual increase of 1.42% per year. Due to data availability, 2005-2006 is our starting interval for this indicator variable. In this case, the growth is 0.41% greater for the first observation period, though the lack of data from 2017-2018 and post-2020 again necessitates a certain margin for error when directly attributing the decline to telemedicine expansion.

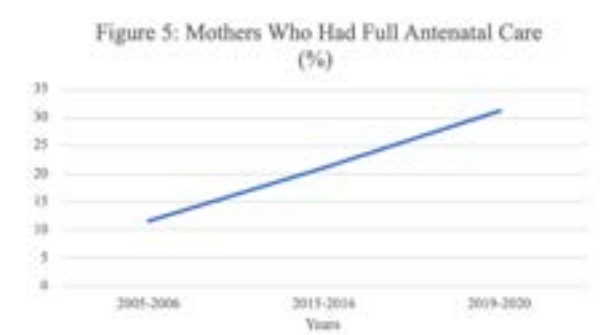
Figure 4: Adapted from Bakshi et al., 2025



Fourth, Figure 5 denotes the percentage of mothers receiving full antenatal care across the observed time intervals. As reflected by Table 1 and Figure 4, the percentage of mothers receiving full antenatal care increased from 11.6% from 2005-2006 (pre-telemedicine expansion) to 31.2% from 2019-2020 (post-telemedicine expansion). This is a 10.2% increase over four years, or an average annual

growth of 2.55% per year. For comparison, the percentage of mothers who received full antenatal care rose from 11.6% in 2005-2006 to 21% in 2015-2016, which is an increase of 9.4% over ten years and an average annual increase of 0.94% per year. Due to data availability, 2005-2006 is our starting interval for this indicator variable. In this case, the growth rate is 1.61% greater for the second observation period.

Figure 5: Adapted from Bakshi et al., 2025

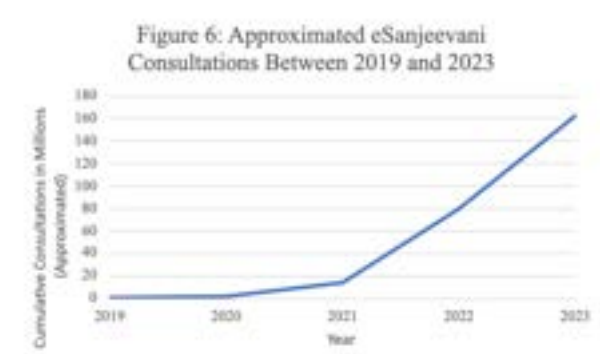


Telemedicine Expansion

Data regarding telemedicine adoption provides support and justification for these observed trends. The Government of India’s eSanjeevani platform has delivered over 163 million teleconsultations between November 2019 and September 2023, with the majority of patients being women. Figure 6 denotes the year-on-year frequency of eSanjeevani consultations from 2019-2023. Due to the absence of publicly available year-by-year datasets, the annual number teleconsultations were approximated using cumulative milestone data reported in government releases and peer-reviewed articles of the eSanjeevani platform.

Telemedicine utilization in late 2019 and 2020 was negligible, as there were fewer than one million consultations recorded during its initial phase. However, the number of teleconsultations increased to over 163 million by 2023, demonstrating exponential growth in telemedicine utilization. While one may expect a sharp increase immediately following India’s telemedicine policy rollout in 2019, it should be noted that these programs take significant time to fully implement, so incremental growth is common for the first couple of years.

Figure 6: Adapted from Sood et al., 2025; Press Trust of India, 2021



State Differences in Telemedicine Expansion

While the above analyses are true of India in its entirety, state-level maternal mortality data shows that there is substantial disparity between different regions that is not captured through national statistics. According to Sample Registration System (SRS) data, the national maternal mortality ratio for 2018-2020 was 97 deaths per 100,000 live births. However, state-level values varied widely, with 195 in Assam and only 19 in Kerala. Other states with high maternal mortality ratios include Madhya Pradesh with 173 and Uttar Pradesh with 167, while substantially lower maternal mortality ratios were observed in Maharashtra with 33, Tamil Nadu with 54, and Gujarat with 57. This demonstrates more than a tenfold difference between the states with the highest and lowest maternal mortality ratios, suggesting significant inequality in maternal healthcare quality and outcomes. Table 2 reflects these disparities.

Table 2: Maternal Mortality Ratios in Indian States from 2015-2017 to 2018-2020. Adapted from Bakshi et al., 2025; Sample Registration System (SRS), 2025

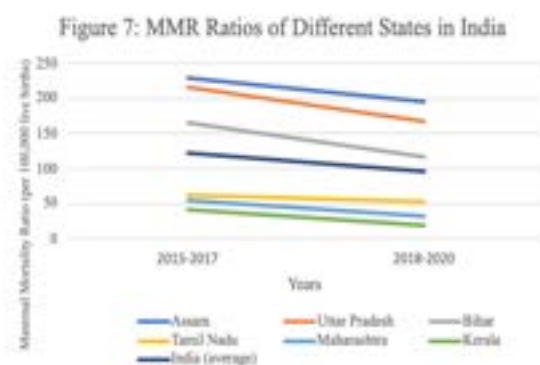
State	MMR (2015-2017)	MMR (2018-2020)
Assam	229	195
Uttar Pradesh	216	167
Bihar	165	118
Tamil Nadu	63	54
Maharashtra	55	33
Kerala	42	19
India (Average)	122	97

The disparities between states demonstrate a clear pattern: Southern and Western states consistently report lower maternal mortality ratios compared to Northern and Central states. For example, the maternal mortality ratio in Kerala, which is in Southern India, is approximately 80.41% lower than the national average, while Assam's MMR of 195 is approximately double the national average.

Trends over time also demonstrate that the magnitude of improvement differs across states. Figure 7 denotes MMR trends across Indian states across two time intervals: 2015-2017 and 2018-2020. Between 2015-2017 and 2018-2020, Uttar Pradesh's maternal mortality ratio declined from 216 to 167. This is a reduction of 49 deaths per 100,000 live births, or approximately 22.7%. Similarly, Bihar's maternal mortality ratio declined from 165 to 118. This is a reduction of 47 deaths, or approximately 28.5%. In contrast, Maharashtra's maternal mortality ratio declined from 55 to 33, a reduction of 22 deaths or a 40% decrease, while Tamil Nadu's declined from 63 to 54, which is a reduction of 9 deaths or 14.3% decrease. Assam, which had the highest MMR among major states, declined from 215 to 195 over the same period. This is a reduction of only 20 deaths, or a 9.3% decrease.

When comparing rates of improvement, it is evident that although states with larger initial MMRs, such as Uttar Pradesh and Bihar, experienced larger absolute declines, they are still insufficient to close the gap between them and lower-MMR states. Even after a decrease of 49 deaths per 100,000 live births, Uttar Pradesh's MMR remains nearly five times higher than that of Maharashtra. Maharashtra, on the other hand, achieved the largest proportional reduction of 40% despite already having a relatively low initial MMR, indicating a faster rate of improvement. Assam, in particular, demonstrates both a high initial mortality rate and slow improvement. Tamil Nadu also shows a relatively smaller proportional decline, but has a lower initial MMR level.

Figure 7: Adapted from Bakshi et al., 2025



Discussion

MMR

As telemedicine expanded over the course of 2015-2023, the overall annual MMR national average reduced by 34 deaths per 100,000 live births. This decrease coincides with the timing of expansion of telemedicine platforms such as eSanjeevani during the intervals of 2018-2020 and 2021-2023. However, despite a consistent overall reduction in the MMR, the difference in rate of reduction in the MMR pre and post telemedicine expansion was not significantly different (9.5 deaths per year pre-telemedicine expansion and 7.5 deaths per year post-telemedicine expansion until 2023). This consistent rate of reduction in the MMR suggests that improvements in maternal mortality ratio may be part of a long-term trend rather than a result of telemedicine expansion alone.

Importantly, this data aggregates state data into a national average without taking into account rate of change differences state-by-state, which obscures substantial regional variation. Further analysis found when examining regional differences in telemedicine expansion suggests that there could be a positive correlation between telemedicine expansion and MMR reduction in specific states.

State Differences in Telemedicine Expansion

The state-to-state MMR disparities suggest that improvements in maternal health outcomes are influenced by factors that differ between states, such as socioeconomic conditions and infrastructure capabilities. States with higher socioeconomic conditions and existing health systems, such as Kerala and Maharashtra, demonstrated lower mortality rates and rapid proportional improvement. This indicates that such states may be better positioned to benefit from telemedicine. Conversely, states with lower socioeconomic conditions and weaker healthcare infrastructure, such as Assam and Uttar Pradesh, continued to exhibit significantly higher mortality rates.

This pattern suggests that telemedicine does not eliminate disparities existing between these regions. Because states adopted telemedicine at varying intervals and at varying degrees relative to their ability to properly and extensively adopt telemedicine and telehealth, developed states can expect greater benefits compared to underdeveloped states. While the implementation of telemedicine correlates to improved overall maternal healthcare quality and MMR rates in said underdeveloped states, these same states had less capabilities and infrastructure to support telemedicine adoption principally. This is especially evident when analyzing Figure 7 which demonstrates a consistent downward trend in MMR across states. While telemedicine saw a significant uptake in 2021, hundreds-of-thousands of consultations had already been delivered between 2019-2020. However, the gap between states like Kerala (lower MMR pre-telemedicine) and Assam (higher MMR pre-telemedicine) remains consistent.

The persisting gap in maternal health between high- and low- performing states demonstrate that telemedicine alone, despite improving maternal healthcare significantly, is

insufficient to reduce regional disparities in outcomes. Instead, it functions as a complement to pre-existing systems, and may potentially reinforce existing inequalities if not accompanied by increased investments in underserved regions.

Maternal Healthcare Utilization Indicators

Maternal healthcare utilization was the primary benchmark used to measure changes in maternal healthcare quality. This study analyzed this benchmark across four utilization indicators: (1) Mothers who had no antenatal check-up, (2) Mothers who had an antenatal check-up in the first trimester, (3) Mothers who had at least four antenatal care visits, and (4) Mothers who had full antenatal care. While all four indicators demonstrated a rate of change that illustrates positive antenatal care visit adherence pre-telemedicine expansion, the rate of improvement increased following the rise of telemedicine.

This is especially evident in 2019-2020, when eSanjeevani consultations started rolling out. While the number of consultations stayed below 1 million this year, indicators show a positive correlation between telemedicine expansion and antenatal visit adherence in 2019-2020. The percentage of mothers who had no antenatal check-ups declined at a substantially faster rate in 2019-2020 when compared to pre-telemedicine expansion. Similarly, the proportion of mothers who had one antenatal care check-up or who had full antenatal care increased more rapidly after 2018 than in prior intervals. This reveals that 2019-2020 saw improvements in antenatal check-up rates and telemedicine expansion simultaneously. This observed acceleration in their rates of change suggest that telemedicine contributed to increased access, earlier access, and greater continuity of maternal healthcare.

These findings also suggest that telemedicine's primary impact may lie in improving healthcare utilization and access rather than directly reducing mortality outcomes. Increased adherence to antenatal care recommendations is an extremely important component of maternal healthcare quality, and may contribute to long-term improvements in clinical outcomes.

Telemedicine Expansion

The coinciding timelines of the widespread adaptation of telemedicine services and an increase in antenatal care visits suggest that digital platforms may have played a role in facilitating access to care, especially for populations with greater barriers to access. While a lack of available data on mothers in India who had full antenatal care post-2020 creates difficulty in evidencing causation, the rate of change of improvement correlates with telemedicine expansion which saw a substantial uptake in 2020. This increased accessibility may explain the observed improvements in maternal healthcare quality and overall care adherence.

While telemedicine's expansion was initially deployed in 2019, an increase in demand was seen in 2020, as shown through Figure 6. While our study did not focus on measuring pandemic effects, we acknowledge the impact of COVID-19 as a confounding variable that helped expand the usage of eSanjeevani and telehealth generally.

Global Implications

The results of this study also provide insight into the broader implications of telemedicine expansion for maternal healthcare. The target of Sustainable Development Goal 3.1 is to reduce the global mortality ratio to less than 70 deaths for 100,000 live births by 2030.

By 2023, the SRS Maternal Mortality Bulletin reports India's national maternal mortality ratio at about 88 deaths per 100,000 live births by 2023, demonstrating substantial progress towards the Sustainable Development Goal 3.1, as earlier estimates in 2018 were around 97 deaths per 100,000 live births (OFFICE OF THE REGISTRAR GENERAL, 2025). This is a 9.27% decrease in the maternal mortality ratio. Although the benchmark has not yet been met, the observed reduction reflects a significant improvement compared to before the 2019 expansion of telemedicine, and places India closer to the global goal relative to many other lower- and middle-income countries (WHO, 2025). The continued decline in maternal mortality during the period of telemedicine expansion suggests that it may have played a role in accelerating progress towards international maternal health targets.

India's model of telemedicine sets an important example for health systems in other countries as well. Many low- and middle-income countries face similar challenges in maternal healthcare, including shortages of trained professionals, lack of healthcare facilities within an accessible distance, and lack of any medical infrastructure in rural regions. Telemedicine platforms can help address these challenges by allowing primary care providers to connect their patients with specialists remotely.

Compared with telemedicine adoption in high-income countries, India's telemedicine expansion is far more integrated into the public sector and accessible to a larger portion of the population (newKerala, 2025). This is apparent when looking at the telemedicine services available in countries such as the United States and the United Kingdom, where telemedicine services expanded during the COVID-19 pandemic (OECD, 2023). In these countries, services were spread out across private healthcare systems. This means that telemedicine platforms are operated by multiple independent providers and private telehealth companies, resulting in variations in pricing and availability. This can make telehealth harder to access, particularly for lower-income populations without stable insurance coverage. By contrast, India's telemedicine platform is integrated into the public health system, allowing services to be delivered through government facilities and cater to larger segments of the population.

Limitations

While our research provides a comprehensive understanding of post-2018 telemedicine expansion effects in India on maternal healthcare quality and mortality outcomes, there were several limitations that restricted the scope and breadth of our findings. First, our research team worked under an expedited, limited timeline which constrained both the scale and scope of research. Our timeline reduced the depth of our analysis and ability to analyze telemedicine effects across multiple parameters. Our study also heavily relied on secondary data, limiting our ability to manipulate what variables were used and studied. This made it difficult for our team to establish causality and rule out confounding variables. This limitation confined our study to generating only observational and correlational findings. Another limitation our team faced was a reliance on approximated telemedicine utilization data. Because our team lacked access to detailed peer-reviewed or government backed data, we used cumulative reports to approximate our data.

Moreover, an alternative limitation is the observed decrease in the Maternal Mortality Ratio (MMR). Although there is a strong negative correlation between the reduction in MMR and expansion of telemedicine in India, this study did not involve the manipulation of variables. This means that while this study is high in external validity, it is low in internal validity and therefore cannot be used to establish causality between the two variables. Despite these limitations, our research team strived to provide a comprehensive evaluation of telemedicine's effects on maternal healthcare and mortality in India while preserving the accuracy and integrity of all data points and variables considered.

Conclusion

The importance of this study lies in its contribution to a gap in existing literature regarding the impact telemedicine has had on maternal healthcare quality and outcomes in India. By analyzing maternal healthcare quality indicators, such as antenatal care utilization and maternal healthcare outcome indicators such as maternal mortality ratios, this study provides a comprehensive assessment of telemedicine's impact thus far, as well as its potential impact in the future. This study also demonstrates the importance of context and pre-existing socioeconomic and structural factors when implementing digital health technologies. State-level disparities that persisted after the expansion of telemedicine demonstrate that telemedicine is insufficient to eliminate inequities in maternal health outcomes. Structural factors such as healthcare infrastructure and socioeconomic status significantly influence the extent to which telemedicine can be utilized. As such, telemedicine should be understood as a complementary tool, and measures to improve healthcare infrastructure and other complementary factors should be taken to close the gap in outcomes of different states and regions. Concurrently, telemedicine presents an accessible pathway for low-income regions, as the financial and operational barrier of entry is significantly

lower than that required for building and maintaining physical healthcare facilities. In this sense, the expansion of telemedicine and telehealth services has the potential to reduce healthcare inequalities broadly speaking by lowering barriers to access.

Additionally, by evaluating the effects of India's telemedicine expansion within the context of Sustainable Development Goal 3.1, this study demonstrates the importance and relevance of utilizing digital health technologies for both national health systems and global healthcare policies.

Future research should aim to build on the findings of this study by addressing its limitations, particularly a lack of causal data. To replicate and extend this research, we recommend the collection and analysis of more recent longitudinal data that includes year-by-year telemedicine utilization and maternal mortality rates at the state and national level. This would allow for analyses of greater precision and therefore more accurate correlations and causal inferences to be made. Further studies could also apply similar methodologies to other low and middle-income countries globally to provide insight regarding the generalizability of the telemedicine model used by India.

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Pakistan and India's Ongoing Border Conflict and Chinese Military Investment in Pakistan Since 2019

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Our research aims to build a broader understanding of how Pakistani-Chinese relations influenced the rate at which border conflicts occur between India and Pakistan since 2019. We particularly focused on improved military and economic relations between China and Pakistan, and how they have impacted the long-lasting tensions at the India-Pakistan border. We first analyzed the ways in which China has contributed to Pakistan's military since 2017, examining broad economic initiatives known as CPEC, among other, more particular investments, such as Pakistani purchases of Chinese submarine technology. We found periodic increases and decreases in rates of border encounters, particularly violent ones between India and Pakistan, since 2019. Finally, we compared conventional arms transfers from China to Pakistan to the number of political violence incidents in the Union Territory of Jammu and Kashmir, finding a weak overall relationship between the two variables.

Introduction

The quick brown fox jumps over the lazy dog. The quick Since the Partition of British India in 1947, border conflict between India and Pakistan has been a constant in South Asian geopolitics. Power dynamics, casualties, military strategies, and religious tensions have all fluctuated greatly during the various conflicts between India and Pakistan. In the 1970s, after the war over present-day Bangladesh, the two countries established the "Line of Control," which split Kashmir into two regions, prompting the conflict into a new era. Arms races, nuclear weapons, and decades of wars and short-lasting ceasefires occurred after this development (Global Conflict Tracker, 2026).

In 2019, the dynamics between India and Pakistan greatly intensified. This was because of an attack on a convoy of Indian paramilitary forces in the Indian-administered Kashmir by a Pakistani militant group - the deadliest attack in Kashmir in over 30 years. Conflict picked up after this incident with Indian air strikes, tens of thousands of troops deployed, and the revocation of Article 370, a provision in the Indian Constitution that gives autonomy to Jammu and Kashmir, all forcing Kashmiris to adhere to Indian property and customary law. All of these actions greatly upset Kashmiris and were also seen as a large injustice to Pakistan. Following the removal of Article 370, the people of Kashmir were detained under lockdown, censored, and subject to redrawn districts with a heavy bias to Hindu-majority areas. Since these measures, the border conflict has grown significantly more violent, with militarized responses to violence, targeted killings, surveillance, and terrorist attacks. Undoubtedly, conflict in the region has picked up since the 2019 attacks; we must examine external factors as to why this might be (Center for Preventive Action, 2026).

External factors in this recent time period are particularly important when examining the development of this conflict since 2019. One recent development that is worth exploring is the relatively recent increase in economic investments and partnerships between Pakistan and China. In 2015, as a part of China's Belt and Road Initiative, the China-Pakistan Economic Corridor (CPEC) was launched. The initiative is a 15-year, \$62 billion investment in Pakistan, including projects in the areas of its economy, energy, military, technology, and infrastructure. The

initiative is symbolic of the long-lasting strategic allyship between the two countries and aims to strengthen that relationship even further (Afzal, 2020).

Review of the Literature

The historical context in which the political and diplomatic dynamics between India have developed is particularly important when it comes to understanding the modern ties between these nations.

India and Pakistan emerged from partition in 1947 as adversaries. Divided largely by religious lines and still reeling from British colonialism, the two nations disagreed on many political issues, including the issue of territory. The First Kashmir War of 1947, fought just months after partition, was brought on by Kashmiri Muslim disapproval of the partition's boundary line in the Kashmir province (Sil, 2010). Kashmir, which was partitioned into Hindu-majority India, was and continues to be a Muslim-majority territory. Since 1947, the border conflict between India and Pakistan has governed the political dynamic between the two nations. India continues to insist that the now united provinces of Jammu and Kashmir are Indian territories, as per the partition's guidelines, and Pakistan continues to insist that the two are rightfully Pakistani territories.

In the modern era, India and Pakistan continue to fight for control over the Union Territory of Jammu and Kashmir (Nicolson, 2022). China has become a significant actor in the border conflict, specifically in their military and economic support of Pakistan and through their own territorial disputes with India. The Line of Actual Control, a twenty-two hundred mile line separating the two nations, has never been legally ratified, leading to tense military standoffs and strained diplomatic relations (USIP, 2020).

Specific Investments from China to Pakistan

First, it is important to gauge what literature exists that explores what types of investments are being sent to Pakistan from China. Several authors discuss the 2015 China-Pakistan Economic Corridor (CPEC) as a central part of China's investment strategy in South Asia and a central part of its Belt and Road Initiative (Zadi, Mukhtar, Amber, and Hashmi, 2019).

Naubahar Sharif and Athar Mansoor (2025) outline the motivations and potential gains for Pakistan from CPEC.

While many perceive the CPEC agreement as a significant force for Pakistan and its economic development, the CPEC agreement works mostly in China's favor (Sharif & Mansoor, year). The authors compare CPEC to the East India Company and point out that CPEC would allow China to have significant influence over Pakistani affairs, place naval bases in Gwadar, and overall increase Pakistan's dependence on China. From detailed interviews with relevant stakeholders, Sharif and Mansoor found that Pakistan lacks the capacity to benefit from CPEC due to its unideal governance, poor infrastructure, and ongoing corruption. However, CPEC could substantially benefit Pakistan's ability to catch up technologically and potentially harbor some economic growth (Sharif & Mansoor 2025). The literature speaks to CPEC, and its possible effects on Pakistan's economic, military, and strategic growth across multiple sectors.

Hoo Tiang Boon and Glenn K.H. Ong (2020) also comment on CPEC, but their research examines how ongoing economic struggles affect CPEC's agreement and what the Pakistan Armed Forces' (PMA) domestic dominance means for Chinese interests. The authors claim that the PMA is an essential part of protecting CPEC and has specifically been protecting Chinese workers from external threats (Boon & Ong 2020). Thus, Chinese cooperation with the PMA has been strong, and new forces have even been created to guard ongoing CPEC projects and their workers. It is projected that China's overall investment in Pakistan is over 62 billion U.S. dollars and is dispersed in economic programs, military programs, and technological developments (Boon & Ong 2020). The authors also claim that Chinese leaders are currently still focused on CPEC's efforts and placing it as a top priority of the Belt and Road initiative. Additionally, there has been significant backlash against the increasing presence of the PMA in Pakistan. However, through CPEC, the Chinese government has been able to curb the backlash and create institutional support of CPEC. The alleged benefits of increasing Chinese influence in the PMA through CPEC initiatives allow for Chinese authorities to have a direct hand in Pakistani affairs, have political backing of being a major player in the region, and successfully suppress the backlash. However, given Pakistan's poor economic conditions, there are great concerns of piling debt, poor economic returns, and increasing costs of CPEC projects (Boon & Ong 2020). This article contributes significant information about how Chinese involvement in Pakistan is evolving through worsening economic conditions in Pakistan. The article, however, does not elaborate on what specific investments and involvement China has in the PMA and the larger military.

Element Investments in Pakistan by China and Renewable Energy Development

During the evaluation of Pakistan's military relations with China, it is important to note a common trend in China's investments abroad: large-scale infrastructural projects. In particular, the China-Pakistan Economic Corridor (CPEC), the critical investments of which are

investigated by Shakeel Ahmad Ramay in *China-Pakistan Economic Corridor: A Chinese Dream Being Materialized Through Pakistan* (Ramay, 2016). The project dives deep into the original reasons for military collaboration between China and Pakistan, the most significant and relationship-spurring of which took place in the 1990s, during which China came to the aid of Pakistan after the United States had imposed sanctions on Pakistan. This is extremely helpful to our research, as it is also established in this work that economic partnerships and relationships are developed via long-term trust and cooperation, which can be noted here as what contributed to China and Pakistan's positive relationship today. The work provides a table detailing "Estimation of Local Component in CPEC", analyzing the particular categories in which China invested significantly in Pakistan. The categories include Energy, Coal, Wind, Hydel, Solar, Second Phase 645 MW, Mining Expenditure, Road, Rail, Mass Transit in Lahore, Gwadar Port, and China-Pak Fiber Optics. While all of the mentioned investments are directly related to CPEC, this information is incredibly useful as it highlights China's commitment to CPEC, highlighting amounts spent in domestic shares in billions of USD. Coal yields the highest number, at 1.8 billion USD. The work further analyzes the potential impact of Chinese investment on Pakistan's GDP. It estimates that CPEC will increase GDP growth by 1.5% in the next three years. This statistic is highly useful to our research, as it highlights the potential economic benefits of collaboration with China to Pakistan, possible explanations for arms transfers between the two nations, and further Chinese investment within the country.

China has also had a significant role in the development of Pakistan's renewable energy sector. Particularly, the development of solar energy within the country, rather than importing it. In *Potential Role of Chinese and Pakistan Leaders in Renewable Energy Transition of Pakistan*, Ubaid ur Rehman Zia (2021) explores China's role in capacity building for renewable energy development in Pakistan. Rehman Zia (2021) refers to China as the "biggest energy financier", pointing out its potential to aid other countries in their renewable energy development as well. Additionally, it highlights the role of CPEC in renewable energy development. Rehman Zia (2021) highlights how a critical aspect of CPEC is the availability of "alternate sources of energy and environment contribution...". This is very valuable to our research, as it points out how critical it is that Pakistan develops alternate energy facilities if taking part in CPEC alongside the Chinese government. Therefore, it is likely that China will undergo further investment into Pakistan's renewable energy sector to ensure the success of CPEC, Pakistan in turn undergoing further infrastructural investment. The work further goes on to point out that energy consumption in SEA countries has shown a "double trend which means a higher consumption of fossil fuels and a high dependence on imports". Again, this shows stronger evidence for further investment by China into Pakistan. With a higher dependence on imports and a stronger relationship developing between the two, it is likely that CPEC and

development of renewable energy will see further trade relations between the two nations. Rehman Zia (2021) also suggests that “Efficient utilization of centralized and decentralized distribution systems” should be developed. Once again, the author continues to suggest ways in which renewable energy development should and will require additional investment from China into Pakistani infrastructure.

History of the Border Conflict, Including China’s Role

In an effort to take an informed approach to a research question regarding the India-Pakistan border conflict, one must first try to understand the broader context of the confrontation by reviewing the literature on both the history and the current state of the conflict, including China’s influence. Manjeet S. Pardesi and Sumit Ganguly (2007), in “The Rise of India and the India-Pakistan Conflict,” explain how India and Pakistan have been at odds since the partition of British India in 1947. The article identifies two critical roots of the conflict, with the first being the opposing ideological foundations of the two nations at their respective conceptions. India’s vision for and success as a secular polity and democratic state with a strong Muslim population conflicted with the vision of Pakistan’s early leadership, who envisioned Pakistan in the eyes of a “two-nation” solution, where Pakistan stood as a Muslim state and India a Hindu state. The second was Pakistan’s iridescent claim for Kashmir, the muslim-majority state whose territory lies between India and..., whose accession into India was the result of the two nations’ first border conflict in 1947 (Pardesi and Ganguly 2007). Muhammad Zubair, Dilawar Kahn, and Asif Salim (2025) analyze the recent development of the border conflict since the Balakot airstrikes in 2019 using a qualitative study using secondary data from other journals, reports, archives, and interviews. They explain how India’s 2019 move to remove Kashmir’s governing autonomy has re-emphasized the roots of the nation’s conflicts over the border and effectively frozen all formal communication between India and Pakistan, an issue the author describes might still be rectifiable by confidence-building measures, such as military-to-military communication or third-party facilitation (Zubair, Khan, and Salim 2025). Mohd Aarif Rather (2019) analyzes China’s position in the tensions between India and Pakistan. The article argues that although China once held friendly relations with India, it allied with Pakistan in the 1960s due to a common hostility towards India, largely in part to China and India’s Sino-Indian border dispute in 1961, with India using confrontational military measures to pressure China, eventually spiraling into China’s declaration of neutrality over the border dispute of Kashmir, no longer recognizing it as part of the state of India (Rather 2019).

What becomes clear through a collective analysis of these sources is that the India-Pakistan border conflict cannot be viewed solely through the lens of current tensions; rather, it is the result of long-term tensions that have accumulated. Pardesi and Ganguly’s work shows that the ideological differences between the founding political

leadership in the two states remain a core issue in today’s conflicts, shaping how both sides reinforce disputes between the two countries. When India removed Kashmir’s autonomy in 2019, it was likely seen as a symbol of India’s secular vision over its land, signaling that the muslim-majority region would be integrated into the Indian state regardless of their religion, conflicting with the Pakistani government, which still views it as its rightful territory under its Islamic self-identity. This explains, as Zubair, Khan, and Salim (2025) continue in their analysis, why current negotiations over Kashmir are not simply a matter of territorial mediation, but long-standing and compounding fundamental differences in vision between the two countries. Finally, Rather’s (2019) paper explains the emergence of China’s role within the conflict, turning a two-sided conflict of belief into a triangular relationship built on separate conflicts and ideas of the future of the region. However, while Pardesi and Ganguly’s work, as well as Rather’s research, provide a sufficient and thorough historical analysis of the development of the border conflict and China’s relation to it, their work predates the recent surge in Chinese investment in Pakistan’s military. Moreover, while Zubair, Khan, and Salim (2025) successfully examine the modern diplomatic possibilities for the future of India-Pakistan relations, they too do not account for how Chinese support for Pakistan, politically and through military investment, has changed the dynamics of the conflict. Our paper works to build on their contributions by focusing on the recent Chinese military investment, bringing the analysis of the conflict into the context of present dynamics through a specific, data-measurable variable.

Methodology

Our paper examines the extent to which Chinese military investments in Pakistan have affected the ongoing border conflict between India and Pakistan from 2019 onwards. In order to examine the effects of Chinese investments on the border conflict, we have defined three key areas worth measuring: (1) power dynamics between India and Pakistan, (2) changes in violence and casualties from border conflicts, and (3) army strategies of Pakistan, including its movements along the border. In each category, we will determine whether Chinese investments have significant effects on the outcomes of these aforementioned areas.

The first category, power dynamics between India and Pakistan, is an important metric to define the border conflict because of its central role in military activity and strategies between the two countries. The constantly changing power dynamics between the two countries reflect the successes and failures of military investments and, more broadly, who has the upper hand in the border conflict. We will measure the power dynamics by tracking the amounts of active military personnel in each country, equipment and technological capabilities of armed forces, GDP fluctuations of each country, and nuclear warhead estimates. We will collect data from... These factors will suggest the status of power dynamics throughout the conflict.

The second category, changes in levels of violence and casualties, is an important factor to assessing the border conflict because it tracks direct military conflict between the two nations and the impact of that activity. We plan to measure violence and casualties by locating and analyzing news reports, conflict trackers, reported deaths and injuries, and reports of any direct conflict at the border. We will collect data from the Center for Strategic and International Studies, among other measures of South Asian-border clashes to determine the rates at which violent conflicts occur between India and Pakistan. We will also note violent clashes orchestrated by the Indian and Pakistani governments, as opposed to terrorist organizations operating within these countries. By measuring these factors, we will gauge the ways violence is changing at the border throughout Chinese investments to Pakistan.

The third category is a comparison of Chinese military investment in Pakistan from 2019 to 2026, and the number of political violence incidents in the Union Territory of Jammu and Kashmir in the same period. We will measure aggregate conventional arms transfers from China to Pakistan using the Stockholm International Peace Research Institute's Arms Transfers Database, excluding unfulfilled orders from our comparison. Using the Armed Conflict Location & Event Data Project (ACLED)'s Conflict Database, we measure incidents of political violence in the Union Territory, excluding incidents of mob violence. Other conflict-related incidents, including arrests, looting, and property damage, and other strategic developments, were excluded from the data analysis as they do not require conventional arms transfers. Finally, we will compare the two variables by plotting aggregate data onto a scatterplot to determine a correlation between Chinese investment and political violence events.

The measurement of each of these variables highlights how a strategic military and economic relationship impacts an already tense border relationship. By firstly analyzing the power dynamics between India and Pakistan, we provide a foundation for the already-existing, tense relationship. We further emphasize this relationship by analyzing violence and levels of causality in the region. To bring light to the role of China and its ever-growing relationship with Pakistan, we highlight the rate at which China contributes to Pakistan and how this correlates to strategic military movements along the Pakistani border with India. Through these mechanisms, we are able to accurately measure how these overall Chinese military contributions and investments impact the border conflict between India and Pakistan.

Results and Findings

Key Military Investments in Pakistan

One instance of Chinese military investments affecting power dynamics between India and Pakistan is investments into the Pakistani Navy, specifically submarine technology. In recent years, Pakistan signed a deal to buy eight submarines from China with the intent for their use in

Pakistan's Navy (Reuters, 2015). In March 2025, China finished its second submarine for the Pakistani Navy and is set to complete all eight submarines by 2028, with the first submarine to enter service in 2026 (AP News, 2025). Specifically, the submarines being exported from China to Pakistan are diesel-electric Hangor-class crafts, with half being constructed in China and the other half being constructed in Pakistan by Karachi Shipyard and Engineering Works. Pakistani Prime Minister, Nawaz Sharif, approved the deal for around \$5 billion USD (Reuters, 2015). The scope of this deal is significant for both Pakistan's military capabilities and its power dynamic with India.

Before its submarine deal with China, Pakistan's submarine capabilities were much narrower. In September 2024, Pakistan had eight submarines in its fleet, five diesel-electric attack submarines, and three mini submarines (NTI, 2024). All of these submarines were either Hashmat-class or Khalid-class and built in the 1990s and purchased from various manufacturers. Three of these submarines had air-independent propulsion enabled, allowing them to operate for weeks on end submerged underwater. On the other hand, in the latter portion of 2024, India had a considerably larger submarine fleet with 17 submarines in its fleet and two under construction (NTI, 2025). From India's submarines, 17 were diesel-electric attack submarines, one was a ballistic missile submarine, and 0 had air-independent propulsion enabled (NTI, 2025).

Another instance of military infrastructure that was exported to Pakistan from China is fighter jets and support aircraft that aim to strengthen Pakistan's air force. Recent reports indicate that China is in the process of delivering J-35 stealth fighter jets, KJ-500 airborne early warning aircraft, and HQ-19 missile-defence systems to Pakistan. These three specific aircrafts significantly increase lethality, survivability, and operational reach simultaneously and complete an ecosystem rather than simply an aircraft purchase. If the deal succeeds, then Pakistan would be the first foreign customer to buy China's stealth fighter jets (Defense Security Asia, 2026). The J-35 aircraft is a fifth-generation combat aircraft with modern stealth capabilities and is specifically designed for land-based air force operations. The jet is powered by twin engines and a single ventral internal weapons bay, which distinguishes it from other stealth aircraft like the F-35 and makes it attractive for foreign customers. It has advanced systems such as an electronically scanned radar, sensor fusion, and electronic warfare capabilities. All of these factors contribute to the jets' maximum takeoff weight and effectiveness in various mission profiles (Yelwe, 2025).

Arms Transfers

Through the SIPRI, reflecting open-source data on conventional arms transfers between states or state-sponsored or affiliated organizations, we tracked all available conventional arms transfers from China to Pakistan. More specifically, we analyzed the publicly available completed deliveries and unfulfilled orders between China and Pakistan from 2019 through 2024,

including data on weapon categories, designations, and quantity.

SIPRI's database of conventional arms transfers from China to Pakistan highlights 18 separate deliveries of weapons, varying in weapon type and quantity, from 2019 through 2024. SIPRI's database does not detail any deliveries in 2025. With the exception of 2022, Pakistan has constantly received missiles from China on a yearly basis, including surface-to-air missiles, anti-ship missiles, and land-attack missiles, totaling 1446. Of these missiles, 1267 have capabilities to strike air or land targets. The largest of such deliveries occurred in 2021, when Pakistan received 896 Chinese portable surface-to-air missiles in a single order. From 2019 through 2024, Pakistan also received nine ships, six air-search sensors, 430 armored vehicles, 26 fighter aircraft, 10 reconnaissance drones, and a surface-to-air missile air-defence system.

SIPRI's database of conventional arms transfers from China to Pakistan highlights 16 separate orders of weapons, varying in weapon type and quantity, from 2019 through 2025. Of those orders, eight have been delivered. This includes 996 missiles in 2021, 966 of which are capable of striking air or land targets; 896 Chinese portable surface-to-air missiles and 70 surface-to-air missiles from an order made from two separate orders made in 2020 and 2019. Pakistan has also made multiple missile orders that have not yet been delivered, and while the quantity of missiles is not yet available, it totals more than 600. Besides missiles, Pakistan has ordered over 95 combat aircraft and 679 tanks, none of which have yet been delivered, as well as anti-ballistic missiles and defense systems.

Data from SIPRI's Arms Transfers Database show a massive prioritization of land- and air-targeting missiles, with over 1267 delivered since 2019 and over 600 in pending orders. Moreover, Pakistan's focus on deliveries and pending orders of large amounts of combat aircraft and armored vehicles suggests a shift towards prioritizing offensive capabilities.

ACLED Political Violence Incidents

Using ACLED's aggregated dataset on conflict incidents in the Indo-Pacific, we identified 3439 unique political violence incidents in the Union Territory of Jammu and Kashmir between January 2019 and February 2026. These incidents included protests with excessive use of force against protestors (5); violence against civilians (471); battles/armed clashes (2607); and explosions or remote violence (356).

ACLED reported only 5 protests classified as "political violence" from 2019 to 2026. Because violence perpetrated by civilians does not immediately point to the use of Chinese-transferred weaponry, this paper does not include mob violence, a different form of political violence, in its findings. Additionally, explosions and remote violence decreased relatively steadily from 2019 to 2026. The highest incidence of violence against civilians occurred in 2019, with over 170 events reported in the Jammu and Kashmir region, but reports fell over the next seven years. Armed conflict made up the highest share of political violence in the

region, causing over 1500 fatalities from 2019 to 2026.

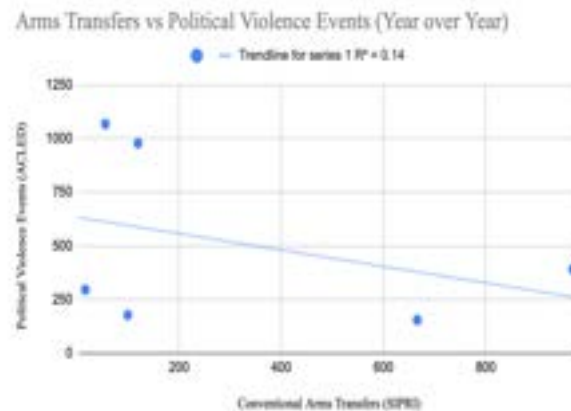
Battles peaked in 2020 with 938 violent conflicts reported.

Although 2019 and 2020 saw a high incidence of political violence events, the number of incidents dropped off sharply after 2020 (from 1061 in 2020 to 391 in 2021). After 2020, political violence incidents were far more limited, and generally decreased over time although 2025 saw a slight uptick in the number of reported incidents.

Findings

Comparing aggregate SIPRI arms transfer data to the aggregate number of political violence events year over year, we find a negative correlation ($r^2 = 0.14$) between Chinese military investment into Pakistan and the number of political violence events in the Union Territory of Jammu and Kashmir, meaning that as arms transfers increase, political violence events appear to decrease. Such a low r^2 coefficient indicates that this relationship is not strong, and that other factors may be responsible for political violence incidents in the region. Data from 2026 was excluded from this analysis, as SIPRI data is incomplete or missing for this year.

Figure 1.1. Arms Transfers vs Political Violence Events



Data from the SIPRI Arms Transfer Database show a consistent flow of Chinese weapons to Pakistan since 2019, particularly in a large and constant number of deliveries and orders of missiles capable of striking both land and air targets, as well as new air defense systems and information technology. Even without necessarily increasing direct conflict, these purchases have the capability to enhance Pakistan's ability to protect and project force, thereby impacting the current and future military balance between India and Pakistan. Furthermore, SIPRI's data shows how Pakistan, enabled in large part by China, is actively accumulating large numbers of armored vehicles, combat aircraft, and tanks, a buildup that allows Pakistan to remain on par with India's military across multiple domains. Taken together, these orders and deliveries suggest that Chinese military support has the capability to, and likely does, play a role in Pakistan's ongoing effort to sustain an active and competitive military that can maintain and control the border-conflict dynamic.

Violent and Civil Border Clashes Since 2019

Despite the increase in Pakistani-Chinese relations, through trade, strategic geographical allyship, and infrastructural development, the partnership seems to have had little correlation with violence along the Indo-Pakistani border. Periodic increases are seen in rates of violence, which tend to fall quickly. A likely factor in the increase, however, would be the revocation of Article 370 of the Indian Constitution by Prime Minister Narendra Modi in 2019 (Center for Strategic and International Studies, 2019). The Article, granting a special, autonomous status to Indian-administered Jammu and Kashmir, divided the territory into two Indian-governed “Union Territories”, Jammu and Kashmir. The term Union Territory refers to a type of territory within the nation of India, with a status similar to that of a state. The following conflicts in the coming years are often found to be correlated with the revocation of Article 370.

Since the revocation of Article 370, there have been periodic increases in the number of clashes seen along the border, in particular. Skirmishes reported from 2019-2020 note terrorist attacks, official government violations, and any other sort of border violations as a violation of the ceasefire that exists between the two nations. Notably, the 2019 Pulwama attack was an attack credited to a radical Pakistani extremist group, rather than the Pakistani government itself (US Department of State, 2019). On February 14th, 2019, an Indian convoy carrying Central Reserve Police Force Army members was attacked in a suicide bombing in Jammu and Kashmir. Killing all of the CRPF personnel present, the attack signified the additional strain between the two nations caused by terrorism. While not resulting in extremely high casualty numbers being reported for that year itself, the 2019 attack was followed by periodic increases and decreases in border conflict. Despite the opposing motives behind reporter bias and potential exaggeration, India and Pakistan each report the number of violations they claim were made by the opposing nation since the revocation of Article 370 (Latif and Adil, 2020). As of September of 2020, Pakistan had claimed 1,595 ceasefire violations, including 14 martyrdoms and serious injuries to 121 uninvolved civilians. 2021 saw a reduction in border conflict with the collaborative statement made by both India and Pakistan regarding ceasefire violations (Reuters, 2021). The two nations agreed to a strict observance of all previously made agreements regarding the 2003 ceasefire along the Line of Control, essentially agreeing to end mutual violations along the border. With political disagreements within both nations remaining high, along with peaceful protests and political demonstrations, the overall trend was a decrease in cross-border clashes for the period. The approximate reported number of clashes during this period is 670 (Observer Research Foundation, 2024).

The terrorist organizations Jaish-e-Mohammad (JeM) and Lashkar-e-Tayyba (LeT) are credited with several terrorist attacks along the border, which are in turn labeled border skirmishes or conflicts. In 2022, claiming many to have been targeting specifically Indian security forces and civilians in Jammu and Kashmir, India reported a total of

125 terror-related incidents, Kashmir witnessing 31 targeted civilian killings (US Department of State, 2022). India also reports a stark decrease seen in 2023 from the previous year, reporting 46 terror-related incidents originating from Pakistan, with a total of 14 reported targeted civilian attacks in Kashmir. However, India notes a technological advancement in the form of border interactions and conflicts noted, highlighting 119 drones shot down from Pakistan in 2023 (Manish & Singh Dyarakoti, 2025).

From 2024 onward, the trend has continued with periodic increases and decreases in violence rates. In 2024, violence continued concentrated in Kashmir, particularly as Pakistan attempted to control India's attempts to consolidate control in Kashmir (Center for Strategic and International Studies, 2019). Escalated rates of religious violence towards civilians have been noted, most recently with a militant attack on a bus of pilgrims headed to a Hindu shrine in Reasi. With 2025 came even more civilian casualties in India, with the deadliest attack since the 2008 Mumbai attack taking place in Kashmir. It may be noted that while the attack was administered by a terrorist organization operating within Pakistan, the Indian government claims the group to have been harbored by the Pakistani government itself. Pakistan denies any involvement in the attack, though a group known as the “Kashmir Resistance” has claimed responsibility.

Since this attack, border clashes have taken an increasing direction towards political arrests and religious conflicts rather than direct fire exchange at the border with Kashmir. Since 2025, India has arrested 1500 people residing in the territory of Kashmir, additionally demolishing the homes of suspected militants (Kuchay & Khandekar, 2025). All Pakistani airspace has additionally been closed to commercial Indian airlines, with a further suspension of bilateral trade (Shahzad et al., 2025). Though it appears that conflicts have taken a more civil route in recent years, tensions between the two nations remain high. The periodic nature of the escalations suggests a weaker relationship to arm sales between China and Pakistan. The primary relations between China and Pakistan are found in a previous section to be recent, economic, and military-related. Therefore, a recent trend towards civil conflict further supports this lack of correlation.

Discussion

In the first part of the Results & Findings, we examined China's role in developing the Pakistani Navy. From our findings, we learned that Chinese involvement in Pakistan's economic and military affairs has spilt over to aiding in Pakistani Naval affairs. Before the new submarine deal between Pakistan and China, India had nine more submarines than Pakistan and had the clear upper hand in submarine capability between the two countries (NTI, 2025). However, with the addition of eight new submarines to Pakistan's navy, Pakistan is no longer drastically lagging behind India in its submarine technology (Reuters, 2015). Pakistan's submarines are newer than India's fleet and are equipped with a large crew and special forces as well as

torpedoes and anti-ship missiles. The new submarines are all air-independent propulsion, making them more stealthy and effective against India's fleet. Chinese investment in these new submarines and its deal with Pakistan has made a significant change to the power dynamics between the two countries on a naval level. Additionally, we can see India respond to these advances by negotiating with countries, such as Germany, to purchase even more submarines for their fleet.

Notably, before Chinese investment in Pakistan Submarines, many of India's submarine fleets were built domestically at Mazagon Dock Ltd. in Mumbai in partnership with France's Naval Group, while Pakistan had no domestic production of submarines. Under the new deal with China, four of the eight submarines are set to be built domestically in Pakistan. Chinese investment in Pakistan's naval capabilities has not only given Pakistan a numerical boost versus India in submarine capability, but also the capability to domestically manufacture submarines and sustainably compete with India going into the future. The naval power dynamics have drastically changed with Chinese investment in Pakistan's submarine capabilities. While this gives Pakistan a significant boost in its naval capabilities, India's overall naval capabilities are still noticeably stronger, as they have significantly more patrol boats and support ships. This theme continues for the investments in new fighter jets, as Pakistan's air fleet has advanced significantly through Chinese investment and could potentially provide deterrence for Indian air-based attacks on the border.

In the second section of the Results and Findings, we concluded that border skirmishes between India and Pakistan over the past seven years have both increased and decreased at rates dependent on the time period, indicating a seeming lack of correlation with Pakistan-China relations. Though there is already near certainty at first glance that clashes will occur due to the pre-existing tensions between the two countries, occasional spurts of conflict, channeled by increased on-land border fighting, air strikes, and other ceasefire violations, drove rates of violence and its frequency up significantly. We also found that on several occasions on which Pakistan is credited with beginning the border conflict, the attacks or clashes are led by Pakistan-based terrorist organizations rather than the government itself. However, these clashes are indeed labeled as "border conflicts", resulting in a slight skew in the number of attacks engaged in or perpetrated by the Indian and Pakistani governments themselves.

In terms of the data highlighted periodic, significant dips in the number of attacks, followed often by prolonged increases. A strategically negotiated decrease in attacks was observed in 2021, following a collaborative statement by India and Pakistan calling for strict observance of all previously confirmed and historically violated ceasefire agreements (Hooda, 2025). India highlights having shot down 119 drones from Pakistan in 2023 (Manish & Singh Dyarakoti, 2025). A significant finding however, cited by the government itself, was the technological advancement of Pakistani offensive military operations. Particularly, the

weaponry itself. This coincides with the upgrade of the "All-Weather Strategic Cooperative Partnership" and the CPEC, which was agreed upon with affirmed mutual support regarding many issues, including security.

In the third section, we looked at China's direct conventional arms transfers with Pakistan and compared them against ACLED's aggregated dataset on political violence incidents in the Union Territory of Jammu and Kashmir between January 2019 and February 2026. The data revealed the large and growing quantity of arms transfers between the two nations since 2019, particularly in missiles capable of striking the surrounding region and tanks and armored vehicles. The findings also indicated that, generally, Chinese arms transfers have directly contributed to significant changes in Pakistan's military capabilities, largely relevant in their ongoing border conflict with India. The consistent deliveries and orders of missiles, armored vehicles, and information technology suggest that Chinese military support has supported the expansion of Pakistan's capacity across multiple relevant domains, with pending orders, particularly for vehicles and aircraft, suggesting further development, and possible influence in the border conflict through impacting the Pakistan's relative capacity and preparedness compared to India in the broader context of the conflict. However, the data did not reveal a strong trend between arms transferred from China to Pakistan and political violence events in the Union Territory of Jammu and Kashmir. This finding is significant; despite a strong military partnership between the two nations, Chinese military investment does not appear to have yet made any major impact on political violence incidents in the territory.

Limitations

Despite the strength of this study, we faced several obstacles in our research. Our key limitation is the availability of data that reflects true military capabilities and strategies. While we can observe the published data regarding military capabilities, armed forces, and casualties, there is inevitably information that is not published to the public in the interest of each country's national security. Additionally, while we have acknowledged ongoing deals between India and Germany and Pakistan and China, we are unable to gather information on the details of these agreements, given that negotiations are underway.

Furthermore, our team compared the aggregated data from ACLED and SIPRI by plotting data points on a scatterplot. Although this methodology was checked by multiple sources, we must note that, as undergraduates, our team does not have extensive experience in data analysis and therefore, was not able to conduct a multivariable analysis using data software or programming languages. We were unable to control for potentially confounding variables, such as the identity of perpetrators. Our conclusion that there is no strong relationship between arms transfers and political violence events was drawn based on the r^2 coefficient of 0.14, which is considered relatively low in statistics, but debate over r^2 coefficients in social sciences may accept low coefficients like this (Peterson, 2023). Additionally, the

ACLED data, while largely robust in detail, did not offer insights into the identities of perpetrators (ie, civilian, military, Pakistani, Indian), making it difficult to determine both whether incidents were military-induced or civilian-induced and the technology involved in each recorded attack. Likewise, although ACLED's database provides an in-depth and substantive overview of all violent incidents across Jammu and Kashmir, from political to mob violence, it is likely that there are many more attacks, some relevant to our study, that went unrecorded or unreported.

Finally, our research timeline was constrained to only four months, as the Michigan Foreign Policy Council operates on a semesterly basis. Additional time to isolate confounding factors and gather additional data would have given this paper more depth in its analysis.

Conclusion

The growing relationship between Pakistan and China in the areas of shared economic and military interests has spilled over to addressing global conflicts, including the India-Pakistan border. Our findings suggest that while China has played a significant role in strengthening Pakistan's military and economy in comparison to India's, it has not necessarily caused an increase in border violence or overall conflict. The relationship between Chinese investment and conflict appears to lack a direct correlation despite having led to many potential stimulants for war, such as increased naval capacity, fighter jets, and arms transfers. Chinese investment through CPEC has clearly enhanced Pakistan's ability to keep pursuing conflict on its border with India and has reduced the infrastructure gap between the two nations. However, the increased offensive and defensive capabilities of Pakistan in recent years due to Chinese investment and ongoing Indian growth in these areas could add a layer of deterrence for both nations and thus translate to no increase in conflict. As Pakistan grows stronger militarily, India may be more hesitant to pursue more violence, risking potential backlash. We also believe that the increase in border conflicts since 2019 may be linked to political developments internally in each nation, rather than Chinese involvement in Pakistani affairs. Increasing terrorist attacks, ceasefire agreements, and other religious tensions all could have contributed to the series of conflicts since 2019. Thus, we take away that it is both important to look at domestic politics and international actors when evaluating the border conflict. One area that should be further explored is the effect Chinese investment has on Pakistan's offensive and defensive strategies. We know that China is providing investments into military infrastructure, but we are unsure if any strategies of specific interests are simultaneously being provided. Researching further into what types of strategies may be influencing Pakistan could provide evidence of a direct correlation between the outcome of the border conflict and Chinese involvement in Pakistani affairs. All in all, while we found no direct correlation, we acknowledge that our research has shown that China's military investment in Pakistan has put the country in a greater strategic position

versus India and could potentially have great effects on the border conflict in the coming years.

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The Evolution of the China-Angola Partnership: From Oil-Backed Loans to Clean Energy Transition (2002-2026)

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Our research assesses how the partnership between China and Angola, launched in the period after the end of the civil war in 2002, has boosted the development of both the oil and clean energy sectors over time. Our research focused on the initial establishment of Chinese oil-backed loans, the “Angola Model,” economic vulnerability due to the influence of oil, and the recent transition to clean energy and diversification of industries. To better understand the impact of the partnership in Angola, we examined data covering oil production, imports, exports, and refining capacity, in order to analyze a possible correlation pattern between energy production and economic performance. We also looked at other energy sources, like hydroelectric power generation. We concluded that after an initial oil-centered economy that left Angola vulnerable to market shocks, both nations have progressively refocused their cooperation on renewable energy, especially hydroelectric and solar. This study demonstrates that foreign investment can be a decisive driver of stabilization, development, and diversification in small economies.

Introduction

Angola emerged into peace in 2002, after 27 years of Civil War, marking the beginning of one of the most influential partnerships in recent African economic history. As Angola recuperated from a devastated national infrastructure and a vital need for external investment, it turned to China, igniting what has been named the “Angola Model.” This is a framework of loans where Chinese infrastructure financing was repaid through guaranteed oil exports. This arrangement placed Angola at the center of China’s economic presence in Africa.

The partnership initially produced impressive results. Chinese credit financed the building of roads, railways, hospitals, and schools, while oil revenues paid for new industrial prospects, including building a ten billion dollar liquefied natural gas plant in Soyo. However, the way this growth took place had significant risks. Angola’s economy had been completely dependent on oil extraction, which accounted for 98 percent of the country’s foreign exchange revenue. When global oil prices collapsed in 2014, the weaknesses of this model were exposed, which triggered a recession, debt accumulation, and the assistance of the International Monetary Fund in 2018.

The post-shock period led to a change in both the Angolan development strategy and the nature of the China-Angola partnership. Angola’s National Development Plan 2023-2027 and its Long-Term Vision 2050 shows an attempt to pivot towards economic diversification, with an emphasis on domestic agriculture and renewable energy. The shift aligns with an evolution in Chinese diplomatic priorities—through frameworks like the Belt and Road initiative and Forum on China-Africa Cooperation declarations, China has increasingly placed clean energy development at the center of its diplomatic model with African partners.

This paper investigates the extent to which the China-Angola partnership has shaped the development of both the oil and energy sectors since the end of the civil war. Sourcing on quantitative data tracking oil production, exports, and GDP growth alongside qualitative analysis of bilateral agreements and policy documents, we analyze four

dimensions of this relationship: how the Angola model was constructed and eventually destroyed between 2002 and 2014, the oil price shock’s aftermath from 2014 to 2017, Angola’s following diversification attempts and the evolving policies surrounding this partnership, the evolution of China’s broader framework to the Global South, and the evolution of Angola’s clean energy sector, particularly in regards to hydroelectric development. Together, these analyses present a comprehensive assessment of how one of the most influential South-South alliances of the 21st century has shaped, and been reshaped, by the global energy transition.

Review of the Literature

The Foundation of China’s Global South Strategy

Starting in the 20th century, China has seen remarkable economic development. Their position as a key player in global trade started as an optimistic estimate; however turned into an inevitability by the early 2000s. By 2002, China was already the largest recipient of non-stock foreign direct investment (FDI). While China’s economic growth was noted and studied throughout the world, its status as a global power had one more element that needed to be developed: its global diplomatic influence. Thus, China’s 21st-century foreign policy started to take shape, spearheaded by a growing influence over the Global South.

China’s approach in the Global South has been characterized by “soft power-based foreign policies,” economic cooperation framed around mutual benefit, abstention in domestic affairs, and cultural diplomacy (Ding, 2008). This stands in contrast to Western aid models, which attach governance and human rights conditions. Ding argues that Beijing drew heavily on traditional Chinese philosophies of “harmony” to construct its ideal of a “harmonious world,” presenting itself not as a sponsor but as a partner sharing a common history of colonial exploitation with developing nations (2008). This framing was especially relevant in Africa and Latin America, where frustration with Washington conditionality has been mounting.

The economics of China’s Global South strategy have been multidimensional. Breslin (2005) complicates the

picture by noting that China's own economic rise was dependent on foreign investment and transnational production networks, meaning its position in the global economy started as one of interdependence rather than pure dominance. Yet, Chinese government elites have exercised power through their decisions about integrating the Chinese economy with international markets and structuring economic partnerships with developing countries. In Africa, Brookes and Shin (2006) describe how Beijing prioritizes energy-supplying nations like Angola, Sudan, and Nigeria, combining visits from diplomats with billions in infrastructure investment, such as roads, energy, and digital infrastructure, all under a strict policy of non-interference that authoritarian governments found far more inviting than alternatives from the U.S. or E.U.

This model became coined through initiatives like the Forum on China-Africa Cooperation (FOCAC), established in 2000, and later the Belt and Road Initiative (BRI), launched in 2013, which provided a comprehensive framework for Chinese infrastructure lending and investment across the Global South. In particular, the BRI used Chinese labor, technology, and funds for the infrastructure development previously mentioned. Critics labeled this pattern "economic neo-colonialism," however, supporters view this as filling a genuine infrastructure gap left widened by Western aid institutions.

More recently, as Chinese and global investment into clean energy increases, China has expanded its Global South diplomacy into the burgeoning sector. As part of both BRI commitments and through bilateral partnerships, Beijing has financed hydro, solar, and wind projects across the Global South, positioning itself as a leader in bringing the global energy transition to developing countries. These investments advance China's diplomatic influence over the Global South while also creating export markets for Chinese renewable energy technology and equipment, an industry in which China has established a global dominance.

In all, the literature reveals a China whose diplomatic model in the Global South is neither purely altruistic nor purely extractive, but strategically nuanced to serve their long-term economic and geopolitical interests while still offering benefits for countries who choose to be in their sphere of influence. This model delivers direct implications for understanding the China-Angola partnership.

The "Angola Model" and the consolidation of the China-Angola Partnership (2002-2014)

The "Angola Model" refers to the reconstruction and development process of the oil-rich state of Angola following the 2002 Civil War (Jureńczyk, 2020). This process officially began in 2004 with a two billion dollar USD loan for domestic infrastructure financing (Corkin, 2016). The academic community has paid significant attention to the evolution of this model because it represented one of the first cases of Chinese economic statecraft. China built the project around a resource-backed loan infrastructure designed to secure a steady oil supply in

exchange for large-scale investments in Angola (Alves, 2013). Begu et al. (2018) describe the Angola Model as a win-win partnership that revitalized Angola's infrastructure after twenty-seven years of domestic conflict by leveraging the efficiency of the Chinese construction industry. The model was developed through a series of credit incentives that financed and facilitated the entry of Chinese companies into the domestic market, especially in public infrastructure sectors (Alves, 2013).

Despite widespread corruption, the project achieved a degree of success thanks to the centralized structure of Angolan institutions (Alves, 2013). Corkin (2016) argues that from the beginning of the partnership, the state initiated a process of further centralization, weakening secondary institutions while maintaining firm control over the national oil company, Sonangol. The main goal was to keep the company efficient and relatively protected from bureaucratic bodies. For example, in 2005, President Dos Santos established the National Reconstruction Office to manage Chinese credit flows outside the traditional bureaucratic framework (Corkin, 2016). Political stability also ensured continuity in foreign investment, as external actors preferred predictability over government transparency (Corkin, 2017). In 2010, Angola's new constitution further strengthened presidential authority by granting more power and autonomy to the executive while reducing institutional checks (Corkin, 2016).

However, not all scholars agree that executive aggrandizement translates into economic benefits or accelerates the achievement of the objectives set by the partnership with China. Jureńczyk (2020) argues that the absence of political alternation and an excessively powerful executive branch created a system that favored political elites and resulted in a further increase in corruption. Nevertheless, scholars such as Alves (2013) maintain that a highly centralized executive government is the institutional context in which China's economic statecraft has historically functioned most effectively, especially when compared to more liberal state models. The academic community has also highlighted the achievements of the partnership at different levels. Begu et al. (2018), for example, emphasize how the capital was used for the renovation and construction of schools, hospitals, and ambulances. In the energy sector, crude oil exports to China were directly linked to the upgrading of water infrastructure (Begu et al., 2018).

Furthermore, oil revenues were reinvested in the launch of new projects within the energy industry, such as the Liquid Natural Gas plant in Soyo valued at ten billion dollars (Corkin, 2017). The entire initial phase of the China-Angola partnership was characterized by hydrocarbon dominance, with economic growth based almost exclusively on oil revenues, and as of 2017, oil accounted for 98% of Angola's foreign exchange earnings (Corkin, 2017). Scholars such as Corkin (2016) report that many Western business groups and NGOs accused Chinese companies of operating under very low environmental standards. However, Angolan authorities consistently defended these partner firms against such accusations, even though Corkin

(2016) notes a general lack of quality certification that resulted in limited monitoring of environmental impact. Zongwe (2010) eventually argues that Angola may represent another case of the “resource curse,” in which citizens do not fully benefit from the revenues of a public resource while bearing the social and environmental costs associated with its extraction.

The 2014 Oil Price Shock and Structural Vulnerabilities

Following massive economic and industrial success from China’s financial assistance, Angola experienced a major reversal due to the oil price crash in 2014. The global demand for oil significantly decreased, negatively impacting all oil industries. The current existing research on its effect on Angola centers around its economic deterioration due to its structures and procedures. Several studies point out this event as the turning point in Angola’s economic development, as it took a great toll on the oil industry’s operations. Yoshikawa (2024) studied how the “Angolan model” contributed to the crisis’s large impact on the economy. The model describes the loans China provided Angola with, which funded infrastructure in Luanda, and required oil exported to China as repayment. Carvalho et al. (2021) explain this method as “oil-backed loans,” by which China invested in Angola’s oil industry. Yoshikawa (2024) states that this framework in practice resulted in an initial boost in Angola’s economy and oil industry, ensuring that Angola could maintain a stable partnership with China, where both parties benefited. The study, however, analyzes that the 2014 oil price crash caused an economic collapse, and the oil industry began to fall. Carvalho et al. (2021) claimed that the state’s heavy dependence on oil as the sole economic support was the primary reason for this outcome. Both studies examined the conditions of Angola’s partnership with China and found vulnerabilities in this system, concluding that it was unsustainable in fluctuating contexts and the long-term development of Angola’s oil industry.

Scholarly research also investigates the cyclical impact of Angola’s economic decline, given its structural constraints. Carvalho et al. (2021) spent much of their research on how harm to the oil industry furthers the accumulation of debt and thus builds on the inability to repay it. Yoshikawa’s (2024) supports this idea, analyzing how debt is created from lower oil prices, causing more to be exported in order to compensate for the same profit. In the study by Carvalho et al. (2021), findings showed that this debt initiated the decrease in oil production as extraction sites started running out, building on Corkin’s (2017) research. Corkin (2017) strictly focused on the economic impact of Angola’s oil crisis, finding that the situation went beyond loss in profits. Given that oil is a limited resource, the study connected how the running out of onshore oil sites made it more difficult to defeat debt accumulation. There were insufficient funds to move to offshore or underwater oil extraction, which is more costly. Yet without the newer oil, Corkin (2017) claims Angola had no means to boost the

industry, at best sustain it. When an unstable economy cannot support sector operations, the industry falls behind. Similar to the main point of Carvalho et al. (2021), the oil price crash combined with oil’s finite resource produced a cyclical debt trap, and Angola had struggled to emerge from it.

The conclusions stated in the previous studies connect the Angola model, designed by China, to far-reaching consequences, explaining the economic collapse. Carvalho et al. (2021) explore further into 2018, when Angola resorts to the International Monetary Fund for financial support to prevent continued debt and Chinese dominance. They conclude that this step aligns with their recommendation to diversify the economy through partnerships in addition to sectors.

All studies use qualitative measurements, such as interviews with state officials in Carvalho et al. (2021), analysis of prior scholarly research in Yoshikawa (2024), and statistical research in Corkin (2017). However, this existing research is primarily concerned with the structure of China’s oil-backed loans and its impact on Angola’s economy, lacking investigations into China’s active role during this time period. Therefore, our research will seek to explore China’s direct influence on Angola’s oil sector development.

Post-Shock Adjustments and Economic Diversification (2018-2025)

There is an abundance of existing literature aimed at understanding and contextualizing Angola’s economic decline and subsequent need for diversification. De Ceita (2022) analyzes the economic situation in Angola from 2016 to 2022, assessing the impact of International Monetary Fund (IMF) support on its economy. They conclude that the outcome of the IMF’s intervention has been positive, especially through “macroeconomic stability” and “external credibility” for Angola (de Ceita, 2022). This analysis contextualizes problems and recommends economic strategies moving forward for the country. This report used data from the IMF, World Bank, and government resources like the Angolan Finance Ministry, Angolan National Bank, Private Investment and Promotion of Exports Agency (AIPEX), and National Institute of Statistics. It drew conclusions from statistics gathered in the form of data on variables such as oil price, International Reserves, and Gross Domestic Product (GDP). This research is necessary because Angola experienced a recession following a decline in oil prices from 2014 to 2016, exacerbated by the COVID-19 pandemic. Angola sought help from the IMF in 2018, receiving aid in the form of a three-year Extended Fund Facility, which gives countries conditional loans with long repayment periods. This is crucial in understanding the wider global context of Angola’s recession, and how it fits into the country’s economic diversification goals.

Following the Angolan recession, lawmakers sought to prioritize development of sectors outside of oil, as outlined in the National Development Plan (NDP) 2023–2027 and the Long-Term Vision (Angola, 2050). These

sectors include agriculture and renewable energy. This diversification is crucial to the growth of the country's economy as well as its people's well-being; Angola experiences high poverty and inequality, in part due to a lack of job opportunities.

Garwi (2023) synthesizes existing literature to create a policy brief and recommendations for diversifying the Angolan economy and ensuring stable economic development. They recommend actions which encourage economic diversification, including investment incentives and private sector investment for other non-oil sectors, correcting limited infrastructure that may hinder these sectors, and promoting free trade in the region (Garwi, 2023). It also provides strategies for human capital development, including increased budget for education and healthcare, as well as the development of vocational training programs to suit market demands (Garwi, 2023). In addition, the report lists recommendations for infrastructure development, governance, and transparency. This research further puts into context the needs of Angola's economy and the progress it has made thus far.

Cabral et al., (2023) recommend agricultural cooperation development strategies between Angola and China. They conclude that Angola needs China's help to bolster its agricultural sector, and that China will be able to globalize its agricultural technology by helping Angola, making a partnership in agriculture mutually beneficial (Carbral et al., 2023). This report used the Strengths, Weaknesses, Opportunities, and Threats (SWOT) method to build a matrix and provide a necessary contextualization for the partnership. This method uses qualitative research to fill a chart with potential strengths, weaknesses, opportunities, and threats facing a project, ranking items in order of importance. Data collected was from sources such as the Food and Agriculture Organization of the United Nations, the Ministry of Finance of Angola, and the World Bank.

This research is significant because of Angola's need to diversify its economy, as well as high levels of food insecurity and child malnutrition. However, the data collected are limited in scope because agricultural development and China-Angola relations are not often the focus of statistical study, making available information somewhat limited. The authors also recommend field research in the future to further understand the realities of affected parties in China and Angola. Agriculture is a large part of the economic diversification efforts in Angola. By understanding China's role in the development of this industry, the role of the China-Angola relationship in the development of other industries can be contextualized.

The most recent World Bank Report (2025) analyzes 21st-century economic growth in Angola, providing context for economic diversification goals to aid in the NDP and long-term goals. It identifies major challenges to Angola's growth model, including: macroeconomic instability, negative productivity growth, and low or underutilized physical and human capital (World Bank, 2025). Its conclusion emphasizes the importance of a strong private sector in expanding electricity access and

renewable energy production, as well as the need for reforms across transportation infrastructure in Angola. In general, infrastructure development is crucial to the economic diversification of Angola. This report provides a comprehensive basis for understanding the economic trajectory of Angola in the 21st century and the challenges it continues to face today.

The Clean Energy Transition in Sino-Angolan Relations

Current literature regarding the expansion and specific implications of China and Angola's relationship since 2002 for the clean energy industry largely agrees that China-Angola relations have increased the prevalence of the clean energy industry. However, there is little discussion about how this relationship will continue to play out or whether the clean energy industry will continue to benefit directly from China's Angola Model.

China and Angola have each increased their involvement in the clean energy industry over the past two decades, however, in different ways. China has taken a more removed and financial standpoint in the clean energy industry, focusing on its investments and other financial methods that allow it to contribute to the clean energy industry. It should be noted that China, despite its heavy involvement in the clean energy industry, is still one of the largest producers of greenhouse gas emissions. Joanna Lewis, in her book *International Climate and Energy Engagement with China*, argues that due to its highly public intense contribution of greenhouse gas emissions, China, in recent years, has placed clean energy at the forefront of many of its global partnerships (Lewis, 2023). This prioritization has resulted in China's commitment to the clean energy market, specifically through foreign direct investment in places like Angola and its comprehensive and growing Emissions Trading System.

This integration of clean energy into diplomacy is a direct reflection of the changes mentioned by many authors, such as Jureńczyk (2020), when examining China's "Angola Model." On the other hand, existing literature explains that while China is at a more managerial and removed role in the clean energy industry, Angola has served as the primary on-the-ground producer of clean energy, with some scholars pointing to it as one of the most dominant sources of clean energy in the world. Existing literature goes further to discuss the tangible outputs of this shift in China's policy, such as Joaquim's (2024) conversation about Angola's hydropower energy industry, which has skyrocketed through the 21st century.

In most existing literature, this growth of the clean energy industry is framed as a net positive. It is an option for China to mitigate its high emissions and bring in strong capital, as well as an option for Angola to gain global dominance in clean energy production. Yet, some authors disagree, saying that the expansion of Angola's clean energy sector has complex implications for the Angolan economy. Telly and Liu (2024) argued that this growth in the economy

may lead to vulnerabilities regarding employment, while maintaining short-term capital gain.

Throughout the literature regarding clean energy's outcomes from the China and Angola partnership, there is strong evidence on the shift of diplomatic priorities—from petroleum to clean energy—and the expansion of different mechanisms, such as hydropower or the Emission Trading System, which have led to a growing clean energy industry. However, existing literature lacks a true investigation of what implications these outcomes have on the future diplomatic relations between China and Angola, specifically, whether this relationship model is favorable enough to continue indefinitely. Furthermore, this strong proof of clean energy expansion in Angola and China lacks significant discussion on how this shift to green energy has affected, and will continue to affect, both China's and Angola's economies.

Methodology

We utilized both quantitative and qualitative methods to analyze how the China-Angola joint partnership boosted the development of the oil and clean energy sectors since 2002.

For quantitative analysis, we collected publicly available annual data on Angola's annual crude oil production (in barrels per day) from the U.S. Energy Information Administration (EIA). We examined its relationship with macroeconomic performance, particularly GDP growth, using World Bank Data. These observations were primarily collected for the 2002-2014 period, which represents the first year of the China-Angola partnership. The comparison between GDP growth, crude oil production, and oil market prices aims to identify patterns of correlation, especially in key instances such as the oil market shocks in 2008 and 2014.

To contextualize our qualitative analysis, we will examine Angola's oil exports and imports in the 21st century in terajoules (TJ). We will couple this with tracking the production of renewable energy in comparison to oil. Our research will look at the evolution of renewable energy consumption in terms of the share of Angola's energy that it has made up in the 21st century. Additionally, we will collect data on Angola's hydropower electricity generation in GWh (gigawatt-hours) to contrast with oil production and observe the correlation between the development of the hydroelectric sector with different Angolan policies and outside loans for the clean energy sector.

To examine the impact of Chinese loans on Angola's oil industry's development, our research implemented a combined approach of quantitative and qualitative measurements. Development in this section was defined by three factors measured quantitatively: annual crude oil production (thousands of barrels per day), annual crude oil exports (thousands of barrels per day), and refining capacity representing technological advancements (barrels per day). To address confounding variables impacting the industry, we found qualitative evidence in academic studies

discussing maturing oil reserves and the global oil price shocks. Through these methods, we collected holistic insight into the role that China's loans played in Angola's oil industry.

Our research regarding the evolution of diplomatic energy policies between China and Angola and their impacts on clean energy in both countries is qualitative. We looked at historical government decisions and agreements before analyzing the changes in the diplomatic policies between China and Angola.

More specifically, we analyzed China's energy policies, focusing on its 5-year plans (FYP), which serve as strategic roadmaps for the country's energy initiatives. We explored how these plans have evolved over time, placing increasing emphasis on renewable energy. In addition to this, we examined agreements between China and other countries, such as the China-Angola Investment Protection Treaty, to better understand the relationship between the two nations and how the "Angola Model" has adapted to prioritize renewable energy.

By studying how the goals of these energy policies have developed and been achieved over the years, along with scholarly discussions on their projected societal impacts, our team gained insights into the intersection of diplomacy and the ongoing growth of clean energy. In order to examine the shifts in China-Africa rhetoric over time, we used qualitative policy document analysis of four FOCAC declarations (2006, 2015, 2021, 2024). Our research used declarations as the primary source base as they represent the official, consensus-level expressions of the priorities of China-Africa cooperation.

Results and Findings

South-South Cooperation Language *Evolution Across Forum on China-Africa Cooperation Declarations*

The language of South-South cooperation appears consistently across all four declarations, but its framing has shifted significantly over the past 20 years. The 2006 Beijing Action Plan establishes essential vocabulary, as it frames China-Africa cooperation through principles of "mutual benefit and win-win results" and calls for reforms that give "full consideration to the concerns of developing countries" (Chinese Ministry of Foreign Affairs, 2024). The document frames the relationship as a bilateral economic relation, with terms like trade, investment, debt relief, and infrastructure often used, and south-south solidarity seldom a rhetorical centerpiece (Chinese Ministry of Foreign Affairs, 2024).

By 2015, the Johannesburg Declaration had centralized discussions on South-South relations, explicitly positioning China-Africa cooperation as "a model manifestation" of South-South cooperation. The document asserts that "China and Africa's development strategies are complementary and characterized by mutual benefit, equality, openness, inclusiveness, accountability," which is used as evidence for "the possibilities and opportunities of solidarity, mutual support and respect among the developing countries" (Chinese Ministry of Foreign Affairs, 2015). The

optimistic language, nearly akin to the rhetoric of China's "harmonious society," shows the beginnings of South-South solidarity being primarily spotlighted regarding China-Africa relations.

The 2021 Declaration during the Forum on China-Africa Cooperation (FOCAC) in Senegal sustains this framing, referencing shared COVID-19 burdens and uniquely calling for the international community to "discard vaccine nationalism" and ensure equitable distribution (Chinese Ministry of Foreign Affairs, 2021). This squarely places China and Africa together, opposed to the perceived failings of the Global North. The declaration also formally introduces the Global Development Initiative (GDI) as the vehicle for current and future South-South development cooperation.

The 2024 Beijing Declaration delivers the clearest example of South-South cooperation being the center of discussion for China-Africa relations. In the declaration, China and Africa were framed as both the "biggest developing country and the continent home to the largest number of developing countries" that "belong to the Global South." It calls for "an equal and orderly multipolar world" and condemns "unilateral coercive measures imposed by some developed countries" (Chinese Ministry of Foreign Affairs, 2024). Notably, the 2024 document introduces language around historical justice and reparations, citing the African Union's 2024 proclamation calling for justice over "historical crimes including slave trafficking, colonialism and racial segregation" (Chinese Ministry of Foreign Affairs, 2024). This is the first time the conference has given structural weight to past injustices and incorporated it into the rhetoric of the discussions themselves. South-south cooperation in 2024 is thus framed not only as economic solidarity but as a shared postcolonial political philosophy.

Non-Interference: Consistent Principle, Evolving Function

The principle of non-interference appears in all four declarations, but its rhetorical function evolves. In 2006, it was stated transactionally that China will respect African countries' development paths and will not interfere in internal affairs (Chinese Ministry of Foreign Affairs, 2006). The 2015 and 2021 documents expand on this framework by adding affirmations on China's sovereignty over Taiwan, Hong Kong, Xinjiang, and Tibet, which have become expected in FOCAC discussions (African countries collectively align with the one-China principle in exchange for China's non-interference pledge).

By 2024, the non-interference principle will be actively referenced in discussions. The Beijing Declaration explicitly calls for ending sanctions on Eritrea, South Sudan, Sudan, and Zimbabwe, framing Western sanctions as violations of sovereignty and the right to development. It also condemns "all forms of neocolonialism and international economic exploitation" and opposes "politicization of human rights" (Chinese Ministry of Foreign Affairs, 2024). This indicates the evolution of non-interference from a passive credence to an active policy position, which China uses to delegitimize

Western conditionality in aid and trade relationships. Thus, China transformed a procedural norm into a tool for not only introducing a politically heterogeneous developing region to a distinct model of diplomatic relations but also undercutting Western efforts to ally itself with the region.

From Lending to Investment: The 2020s Shift

The financing language across the declarations shows a clear trajectory. The 2006 Action Plan is heavily focused on debt, loans, and concessional financing, where China commits to providing loans, credit, and canceling debt for poor countries (Chinese Ministry of Foreign Affairs, 2006). The 2015 and 2021 documents continue to emphasize credit lines and call for debt treatment reform, though 2021 also acknowledges China's "contribution to debt treatment of African countries" through the G20 Common Framework (Chinese Ministry of Foreign Affairs, 2021). The 2024 Beijing Declaration marks a significant pivot. While credit lines remain part of the package, namely RMB 210 billion of the RMB 360 billion total financial commitment, the document places more emphasis on direct investment. Xi Jinping's keynote during the 2024 summit specifically highlights "at least RMB70 billion yuan of investment in Africa by Chinese companies" (Jinping, X., 2024) as a distinct category. The declaration also encourages African countries to issue RMB-denominated "panda bonds" in China rather than a state-to-state loan (Chinese Ministry of Foreign Affairs, 2024). The language around Chinese enterprises investing in Africa, employing local labor, respecting local laws, and fulfilling social responsibilities is much more emphasized in 2024 than in earlier FOCAC declarations. The document also introduces an "African SMEs [Small and Medium-sized Enterprises] empowerment program" and mentions a "Special Loan for the Development of African SMEs," suggesting a shift towards private-sector-oriented models alongside large, billion-dollar infrastructure and energy commitments (Chinese Ministry of Foreign Affairs, 2024).

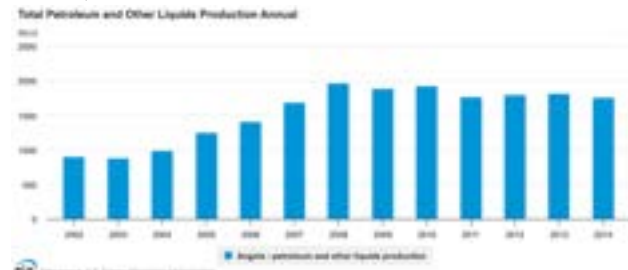
This shift aligns with the 2024 declaration's emphasis on "localized production and processing in Africa" and industrial chain cooperation, moving beyond the infrastructure-for-resources model that defined earlier China-Africa cooperation. Whether this represents genuine structural change or if the effects will only remain in the rhetoric is a question that remains to be seen.

Oil Production and Macroeconomic Performance in Angola (2002-2014)

Our research evaluates how the China-Angola partnership has shaped Angola's post-civil war economic trajectory, particularly in the energy sector. To pursue this objective, it is important to first analyze the evolution of crude oil production in Angola in relation to the beginning and continuation of the partnership with China. In this way, we can observe in a tangible manner how Chinese investments, especially in infrastructure, influenced the pace of production starting from 2004, the official date of the agreement between the two nations. In this phase, we will

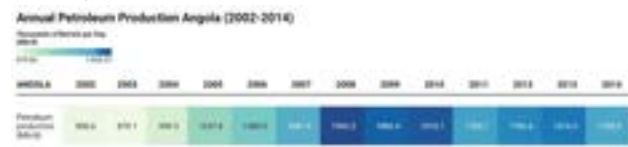
focus primarily on the period 2002–2014, that is, the years in which investments were largely concentrated in the oil sector.

Figure 1: Total Petroleum and Other Liquids Production Annual, 2002-2014



From U.S. Energy Information Administration (EIA)
<https://www.eia.gov/international/data/country/AGO/petroleum-and-other-liquids/annual-petroleum-and-other-liquids-production>

Figure 2: Total Petroleum and Other Liquids Production Annual, 2002-2014

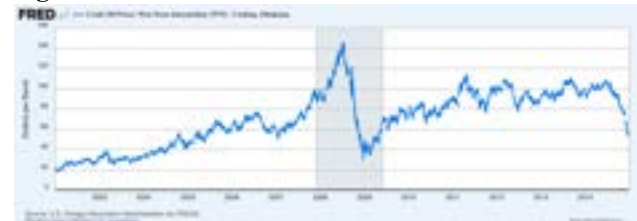


From U.S. Energy Information Administration (EIA)
<https://www.eia.gov/international/data/country/AGO/petroleum-and-other-liquids/annual-petroleum-and-other-liquids-production>

Through the data provided in Figures 1 and 2, we can observe the evolution of production during the period under examination. At the end of the civil war in 2002, crude oil production in Angola was stable at just under 900 thousand barrels per day. This pace remained largely stable, with only a slight reduction in 2003 (U.S. Energy Information Administration, 2025). The turning point occurred in 2004 when Angola established the oil-backed loan agreement with China in order to finance infrastructure, post-conflict reconstruction, and further development. Beginning in 2004, we observed an increase of about 100 thousand barrels per day (U.S. Energy Information Administration, 2025). Since Angola signed the agreement with China in March 2004, it is possible to identify a certain degree of correlation with this initial increase. In the following years, production continued to grow at a progressively stronger and more consistent pace until 2008, when output reached an average of 1,960.2 thousand barrels per day. The increase in production from 2002 to 2008 amounts to 118.72% (U.S. Energy Information Administration, 2025).

In subsequent years, crude oil production entered a phase of stabilization. This halt in growth can be attributed to the effects of the crisis in oil demand and prices during the second half of 2008. In this regard, it is important to look at Figure 3 to visualize the magnitude of this crisis.

Figure 3: WTI Crude Oil Prices, 2002-2014



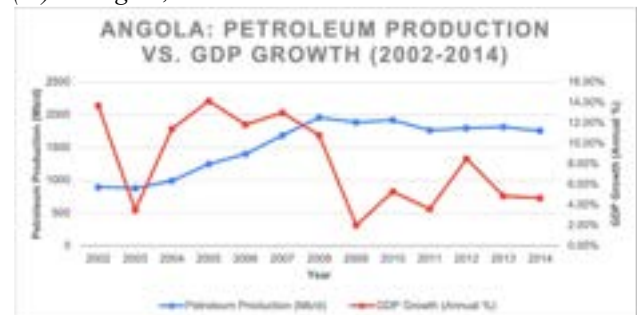
From U.S. Energy Information Administration - Federal Reserve Bank of St. Louis (FRED)
<https://fred.stlouisfed.org/series/DCOILWTICO#>

Figure 3 highlights that in 2008 there was an unusual peak in the price of oil, reaching slightly above 140 dollars per barrel (U.S. Energy Information Administration, 2026). This value resulted from a steady increase in prices during the preceding period. From July to December 2008, the price of oil per barrel collapsed to around 35 dollars (U.S. Energy Information Administration, 2026). The collapse was primarily driven by the global financial crisis, which negatively affected oil demand and slowed down international trade at every level (Mousavi, 2018). This may help explain the stabilization in the growth of Angola's crude oil production, which in the years following 2008 experienced a slight decline. A lower oil price led to reduced capital inflows and resulted in lower investment in new infrastructure and new oil fields. Additionally, the possible saturation and overexploitation of existing fields may have prevented a further increase in production. For this latter variable, an additional phase of research would be necessary.

Correlating Oil Output with GDP Growth

To further investigate the impact of the oil partnership with China on Angola's development, we examined the evolution of Angola's economy. In particular, we assessed whether a correlation exists between the trend in crude oil production and GDP growth.

Figure 4: Petroleum Production (Mb/d) and GDP Growth (%) in Angola, 2002-2014



Data from World Bank Group Data & U.S. Energy Information Administration (EIA)
<https://data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG?end=2014&locations=AO&start=2002>

<https://www.eia.gov/international/data/country/AGO/petroleum-and-other-liquids/annual-petroleum-and-other-liquids-production>

Table 1: Petroleum Production (Mb/d) and GDP Growth (%) in Angola, 2002-2014

Year	Petroleum Production (Mb/d)	GDP Growth (Annual %)
2002	896.64	13.67%
2003	879.0	3.49%
2004	990.29	11.42%
2005	1,247.49	14.15%
2006	1,400.54	11.84%
2007	1,687.45	13.00%
2008	1,960.23	10.79%
2009	1,886.36	2.00%
2010	1,918.0	5.29%
2011	1,765.13	3.59%
2012	1,796.58	8.50%
2013	1,814.17	4.88%
2014	1,755.95	4.66%

Source: World Bank Group Data (2026) & U.S. Energy Information Administration (2026) • Created with Datawrapper

Through Figure 4 and Table 1, we observed the behavior of GDP and oil production from 2002–2014. First, we noticed that throughout the entire post–civil war period, there is overall GDP growth, despite fluctuations in scale. As previously observed, during 2002 and 2003, oil production remained stable at its lowest levels within the analyzed period, amounting to just under 900 thousand barrels per day. In the same period, we observed how the trend of GDP reflects domestic developments of the time. The 13.67% spike in 2002 reflects the positive economic shift following the end of the civil war. This is also reflected in the drop in growth to 3.49% the following year (World Bank, 2026). The clear change in the trajectory of GDP growth began in 2004 when the first agreement with China was signed, and Angola saw its first boost in oil production. The most significant indication of a correlation between the two variables can be observed in the period 2004–2008. While oil production doubled (see Figure 2), the country simultaneously experienced an economic boom. GDP growth reached 14.15% in 2005, remaining consistently above 10% between 2004 and 2008 (World Bank, 2026). The correlation lies in the simultaneity of the progressive increase in production and the expansion of GDP. In addition, in Figure 3 we observe that during the same period, there was also a progressive increase in the price of oil per barrel, which raised revenues from sales and exports and generated beneficial effects for GDP.

The shift in trend, however, occurs in 2009, when a significant decline in GDP growth can be observed, falling from 10.79% in the previous year to just 2% (World Bank, 2026). This represents the lowest growth rate recorded during the period under observation. This sharp decline can be explained by the global shock to oil demand and prices in 2008, as previously described. This provides an important indication of how closely Angola’s economic performance was tied to developments in the oil sector. Observing production levels, in fact, they remain roughly the same as in the previous year. The difference, however, is that the same volume of crude oil was sold and exported at a significantly lower price, which negatively affected annual GDP performance.

From 2009 onward, GDP showed constant fluctuations while crude oil production stabilized at around 1,800 thousand barrels per day. During these years, GDP growth varied between 3.59% and 8.5% (World Bank, 2026). Such volatility in the presence of stable production led us to hypothesize that after 2008, GDP growth may no longer have been directly linked to production itself, but rather to other variables, primarily the price of oil.

Returning to Figure 3, the price of oil also fluctuated in a pattern similar to GDP growth in Angola, which may indicate this new correlation. Moreover, this pattern may be indicative of a broader issue, as it could signal a lack of diversification and productivity in the domestic economy as a whole during this period.

Chinese Loans and Oil Industry (2011-2021)

China’s oil-backed loans through the “Angolan model” played a significant role in supporting Angola’s oil industry. In this exchange, China offered loans and resources to build infrastructure in Luanda, and Angola repaid them through oil exports (Yoshikawa, 2024). This is essentially a trade of investment and resources, most effective when the deal begins. Due to corruption and little transparency of government operations, these loan processes were not properly documented. It is believed that the price of oil at the time was equivalent to the value of the oil export as repayment (Yoshikawa, 2024). In 2011, Chinese investments shifted from infrastructure towards oil industry development. The China Development Bank’s committed loans to Angola’s state-owned oil company, Sonangol, from 2011–2014 averaged \$2.0 billion USD per year, called “Sonangol Development.” The 2014 loan included a focus on refineries, showing China’s long-term interest in Angola’s oil production. In 2015, the Industrial and Commercial Bank of China committed \$200.0 million USD to “Sonangol Development” as well. Additionally, to assist with Angola’s piling debt, the China Development Bank committed \$10.0 billion USD in 2016 for “Sonangol Recapitalization” (Boston University Global Development Policy Center, 2026). China’s financial involvement in the oil industry thus took shape in oil-backed loans within the years 2011–2016, supporting the expansion of Angola’s oil production capabilities.

Figure 5: Crude Oil Production and Crude Oil Exports (TBDP), 2011-2021

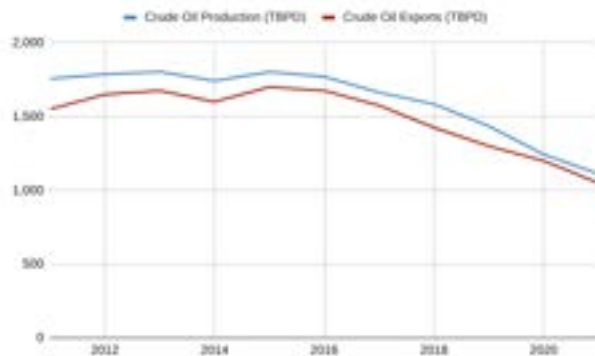


Figure 5 (CEIC Data, n.d.; U.S. Energy Information Administration, n.d.) depicts some stagnation followed by a steady decrease in the annual crude oil production and export trends during the time period of China's loans. From 2011-2017, TBDP stayed constant at 1,756. Then it started to decrease from 1,663 to 1,112 TBDP by 2021, and has remained around 1,100 TBDP since then (U.S. Energy Information Administration, n.d.). The oil exports trends appear similar to this pattern. Following 2011, the annual crude oil exports level fluctuated within around 100 TBDP until 2016. Oil exports also began to reduce from 2017-2021 from around 1,600 to 1,100 TBDP, and have stayed constant since then (CEIC Data, n.d.). The period of stagnant progress for both oil production and exports temporally corresponds with China Development Bank loans specific to "Sonangol Development."

Another key factor in the development of an oil industry is the refining capacity, or the amount of crude oil that a site is able to produce in a day. Prior to 2012, Angola's refining capacity was consistently 39,000 BPD (Angola Data Portal, n.d.). However, its refining capacity has grown to 72,000 BPD as of 2025. Despite the China Development Bank's 2014 loan commitment, including refineries, China's involvement in oil refinery development has been limited. Angola has many ongoing refinery construction projects, such as Lobito, financed by China, with the predicted potential to increase refinery capacity by 200,000 BPD (U.S. Energy Information Administration, 2025). Soyo, another site with investment from China, is also being developed and could increase Angola's refinery capacity by an additional 100,000 BPD (Corkin, 2017). During Angola's oil production and export peak, Chinese investment was not as much focused on refinery establishment as it has been in more recent years. These two projects have also yet to reach completion, so their impact is presently unknown.

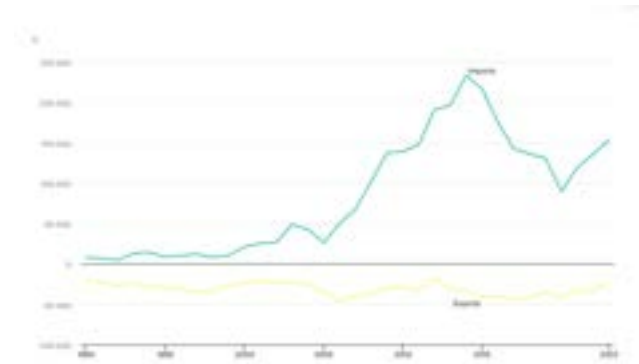
In addition to loans from China, external variables impacting the oil industry in this time frame must be considered for a holistic review. One of the most substantial factors is the global oil price shock. The first shock in 2009 left a slight impact on Angola's oil industry, yet the 2014 shock caused a more significant impact on oil production and increased prices. Angola's oil exports to China increased

afterwards to maintain the same value of the oil-backed loans (Yoshikawa, 2024). An additional variable to consider is maturing oil reserves. Most of Angola's sites are offshore, which is expensive and harder to extract from, and recently found oil reserves are much smaller than those previously used (The Shift Project, 2021). The COVID pandemic furthered the delay in finding replacements for maturing oil fields, and new sites maintained production levels rather than increasing them (U.S. Energy Information Administration, 2025). As Angola's current oil fields dry out, recovering from the price shocks became harder, and within this time period, China's participation in further oil industry development had slowed (Yoshikawa, 2024).

21st-Century Energy Diversification

To contextualize our qualitative analysis, it is necessary to provide background information on the trajectory of Angola's energy sector. This data will not only show the impact of policy in recent years, but also set up for discussion surrounding past trends in energy production, as well as imports and exports.

Figure 6: Oil products imports vs. exports, Angola, 1990-2023

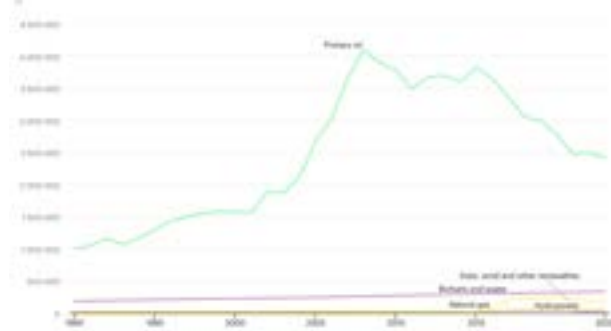


International Energy Agency (IEA)

<https://www.iea.org/data-and-statistics/data-tools/energy-statistics-data-browser?country=ANGOLA&fuel=Imports%2Fexports&indicator=SecondaryOilImportsExports>

Firstly, by tracking where Angolan oil ends up, we can more easily figure out how this production fits into specific international agreements and national policies. Figure 5 shows oil imports and exports in Angola from the years 1990 to 2023. While exports have stayed relatively stable, with a high of -17,124 TJ (terajoules) in 2012 and a low of -46,180 TJ in 2006, imports have increased over the past two decades. Oil imports stood at 25,916 TJ in 2005, but rose to 233,581 TJ in 2014 (IEA). This high was followed by a dip in imports, though they still remain substantially higher than pre-2005 levels (IEA).

Figure 7: Domestic energy production by source, Angola, 1990-2023



International Energy Agency (IEA)
<https://www.iea.org/data-and-statistics/data-tools/energy-statistics-data-browser?country=ANGOLA&fuel=Energy%20supply&indicator=DomesticProduction>

Given the implications of oil imports versus exports in Angola, it is also important to analyze the production of other types of energy. More specifically, the country's renewable energy sector has become an increasingly consequential part of the Angolan market. Thus, domestically, energy production has diversified in the 21st century. While still dominated by oil, this oil production has decreased since 2008, as seen in the above graph. Renewable energy sources have continued to increase in production, with natural gas in particular seeing a massive increase since around 2015 (IEA, 2026). Electricity production has also seen an increase in natural gas usage, but hydropower has consistently been the major contributor to electricity generation in the 21st century (IEA, 2026).

Additionally, looking at how energy consumption has evolved in terms of renewable energy sources can provide important context. In final energy consumption, modern renewables (which exclude traditional bioenergy such as burning biomass) have made up an increasing share of Angola's energy. This figure stood at 3.03% in 2002 and rose to 10.36% in 2020. On the other hand, the share of renewables, including sources such as burning biomass, has gone from 70.83% in 2002 to 60.57% in 2020. It should also be noted that the year 2020 is an outlier for these statistics; the share of renewables measured 50.74% in 2019 and 51.02% in 2021. Likewise, the share of modern renewables was around 2% higher in 2020 than in the years before and after (IEA, 2026).

Hydropower makes up a substantial part of Angola's renewable energy sector. In 2002, Angola generated 1,143 GWh (gigawatt-hours) of hydropower; in 2020, this number was 12,400 GWh. As many other figures discussed, hydropower generation had a slight outlier in the year 2020. Regardless, this figure has seen a steady increase in the 21st century. Energy generation from solar has also increased many times over, going from 19 GWh in 2021 to 400 GWh in 2023 (IEA, 2026).

Overall, this data paints a picture of the recent history and current state of Angola's energy sector. In the 21st century, it has steadily diversified, in particular through the use of hydropower. Oil production has decreased, although it has continued to be a major export for the country. Oil imports have decreased, and domestic energy consumption has seen an increasing share of modern renewables such as hydropower and solar energy. All of these figures provide an important basis for which we can analyze the political situation surrounding Angola's energy sector.

Transition to Renewables

After the civil war, Angola and China utilized the Angola model through their presence in clean energy policies and investments. One notable target under the Angola Energia 2025 programme aimed to achieve a national electrification rate of 50% by 2022 and 60% by 2025 within Angola. And in 2020, according to Lewis in *Cooperating for the Climate: Learning from International Partnerships in China's Clean Energy Sector*, "China invested U.S. \$134.8 billion in clean energy in 2020...by far the largest sum of any country in the world," making China by far the country most invested in clean energy (Lewis).

Figure 8: Clean Energy Investment: Leading Countries.
 Note: Data is for 2020.

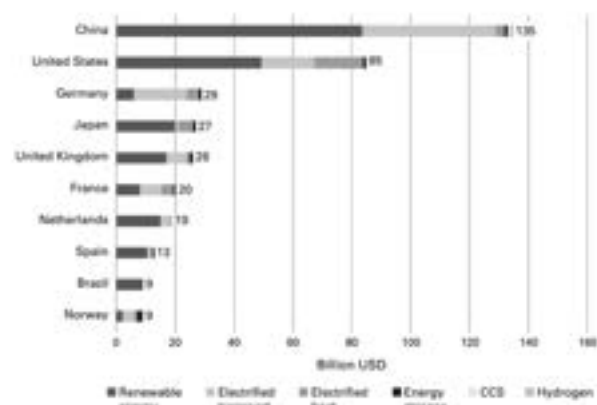


Figure 2.1
 Clean Energy Investment: Leading Countries. Note: Data are for 2020. Source: BloombergNEF, Energy Transition Investment Trends, "Executive Summary."

Cooperating for the Climate: Learning from International Partnerships in China's Clean Energy Sector (Lewis, 2023)

Dual Mandated Clean Energy Integration

The relationship between China and Angola has led to an expansion of the clean energy industry, increased clean energy targets and deals in China, and will lead to complex outcomes on the domestic development in Angola. Originally, the policy goal of the Angola Model was mainly focused on the expansion and utilization of Angola's oil reserves. However, the civil war and other domestic conflicts slowed the expansion of true growth of Angola's energy industry. Yet, once the civil war in Angola ended, the Angolan government renewed its focus on expanding the

energy industry through their partnership with China. Interestingly, as Angola expanded its clean energy efforts, including natural gas and hydroelectric power, it also expanded its petroleum production. According to the *Journal of World Energy, Law and Business*, “The post-civil war political stabilization allowed for a renewed focus on the modernization and expansion of the electrical sector in Angola.” (Joaquim, 2024).

Post civil-war, clean energy goals continued to expand in both Angola and China. The ‘Angola Energia 2025’ programme set intense goals for diversifying the different types of energy that are supplied and produced in Angola. Specifically, it shifted focus from the oil industry to various clean energy sectors as well.

These developments in the targets of Angolan clean energy were matched and went hand in hand with the development and implementation of recent Chinese clean energy targets as well. While China implemented many policies and targets focusing on expanding clean energy, one of the most notable was the Renewable Energy Law in conjunction with the 11th 5-Year Plan (2006-2010), which created a multistep mechanism for regulating renewable energy (Lewis, 2023). This policy served as a platform and foundation for the implementation of further renewable targets. Within its investments into the clean energy industry, China is also supporting the growth of the carbon trading market, also known as the Emissions Trading System, and other market devices that allow China to capitalize on the expansion of the clean energy system.

This difference between the specific energy policies of China and Angola, as well as their relationship with each other, should be noted. While both countries, post civil-war, have increased their usage of clean energy through policy targets and programs, their specific avenues of focus are different. On one hand, Angola is heavily focused on developing energy locally, hoping to meet demand with its energy. However, China is hoping to expand its investment into the clean energy industry, but isn’t necessarily focused on the on-the-ground integration and delivery of clean energy into its domestic energy supply. Within this specific difference is where the idea of partnership between Angola and China enters. China, with the primary policy goal of reaping economic benefits from clean energy globally, uses Angola as an on-site location where it may invest and continue to diversify the market mechanism they use to generate profit from electricity.

The effects of these differing, but closely tied, political goals are complex. For Angola, which houses the bulk of the actual clean energy infrastructure and facilities, it is expected that the continued expansion of the clean energy industry may have detrimental long-term effects on the local economy and quality of life. According to the *Journal of Economics and International Finance*, in Angola, “Renewable energy use will harm vulnerable employment and labor force participation rate but improve gross fixed capital formation in the short run,” proving the complexities that are brought about by the boom in clean energy growth (Telly, Liu, Zhao, Tang, & Sun). Furthermore, the effects

brought about by China’s presence in the clean energy industry may be seen through the changes in numbers. China is likely to continue increasing its investments in the clean energy sector, building on its current investment of approximately \$80 billion in renewable energy. Which will continue to bring in cash and presence for China in the growing energy sector, however it is unknown how much on-site clean energy will actually begin to be used by the vast majority of Chinese citizens as for the most part their investments will be in foreign clean energy, such as with Angola.

Ultimately, the relationship between China and Angola post civil-war led to a significant shift in focus from coal energy expansion to clean energy expansion, with China focusing on direct investments into on-site clean energy operations in countries such as Angola.

Discussion

The FOCAC Framework: Evaluating the Shift from Oil-Backed Diplomacy to Risk-Managed Green Investment

The four Forum on China-Africa Cooperation (FOCAC) declarations, from 2006 to 2024, frame a coherent and ever-changing picture regarding China’s diplomatic framework with Africa; The cooperative gradually incorporated sustainability jargon, embraced South-South solidarity as an ideological anchor, and repositioned its financial model as implicitly foreign investment-focused. This more important question is what this characterization of China-Africa relations actually represents, and what it can mean for Angola. The results suggest the answer is a middle ground between adapting the pre-existing trade model and sophisticated rhetorical rebranding.

On the topic of clean energy, the recent FOCAC commitments are real, as China has empirically ceased lending to fossil fuel projects since 2011 (Gallagher & Kamal, Boston University GDP Center, 2016). However, the motivation behind that shift is mostly due to Chinese banks growing wary of exposure to volatile commodity-dependent economies after several loans distributed to Africa in the 2010s met with troubles. Simply put, the evident policy shift is less a pre-planned green diplomacy strategy and more a response focused on risk management. Despite this, the shift is not entirely meaningless as Chinese capital is still being funneled into renewables in Africa regardless of the motivation, which still affects development in the same way.

For Angola specifically, the tension is at the forefront as Angola is a petrostate whose relationship with China is almost exclusively based on oil-backed loans, which the 2024 Beijing Declaration implicitly moves away from. The 2024 commitment to clean energy, green hydrogen, and nuclear energy sits precariously alongside Angola’s continued dependence and active investment into the oil industry. The declaration’s careful wording that countries must be free to “choose the path of energy transition in line with their respective national realities”

seems to implicitly be directed towards partners like Angola, so China can preserve its relationship without forcing a transition neither side is prepared to finance or absorb (Chinese Ministry of Foreign Affairs, 2024).

The gap between FOCAC declaration rhetoric and actual implementation is the largest limitation when analyzing future policy frameworks. The declarations are consensus documents that are produced through deliberations among 54 different countries, and they reflect aspirations among the participating parties as much as agreed-upon commitments (Chinese Ministry of Foreign Affairs, 2006). The 2024 pledge of Remnimbi (RMB) 360 billion in financial support over three years, for instance, is not formalized or verified by any participating country and rather relies on Chinese companies following through on investments in African countries based on commercial motivation rather than a mandate from the state. Prior FOCAC declarations have seen implementation fall short of the targets they declare, and outside partners have also consistently underperformed on their own commitments. Recognizing this pattern does not invalidate the declarations as data to analyze; the declarations are more useful as evidence of diplomatic priorities instead of predictors of outcomes.

In all, the FOCAC record conveys that China's South-South framework is neither simply a rhetoric employed by China to cover for unchanged economic extraction, nor is it fully a genuine transformation towards equitable, sustainable development. It is a nuanced, evolving construct that adapted through the 21st century to changing conditions and priorities while preserving the core philosophy of Chinese engagement: non-interference, commercial orientation, and resistance to external aid conditionality. For Angola, that means the relationship will continue evolving, with clean energy as an increasingly accessible industry, but the pace of that evolution will be shaped by oil prices, credit risk, and commercial negotiations rather than just by the green language that's taking place in multilateral declarations.

Extraction-based Economy Growth and the Vulnerability of the Angola Model (2002-2014)

In the results of our analysis, we found a strong link between GDP growth and oil production in Angola over the period 2002–2014. This correlation revealed important insights into the impact of the partnership with China, as well as the associated investments and strategic choices made by Angolan authorities. As also illustrated in the graphs presented (Figure 1, 2, 3, 4, and Table 1), domestic macroeconomic performance appears to be largely driven by the performance of the oil sector. This suggests that the growth observed in Angola is primarily extractive rather than transformative. The correlation between oil prices and GDP, particularly evident after 2008, highlights how other domestic productive sectors failed to develop alongside the oil industry, leaving overall growth heavily reliant on oil production. Mohammed (2018), for example, supports this argument through econometric analysis, showing that a 1%

increase in oil production is associated with a 1.02% increase in real GDP. The limited ability of economic growth to stimulate other productive sectors, therefore, reveals a strong dependence on external demand for oil, especially from China. Supporting this point, Amundsen (2014) notes that although oil accounted for nearly 60% of GDP and 95% of exports, the sector employed only 0.2% of the economically active population. This is partly explained by the fact that most oil extraction takes place in offshore blocks, effectively making the oil sector an “enclave” industry (Hammond, 2011). This dynamic reflects the presence of the “Dutch Disease,” a condition commonly observed in resource-dependent economies. In petro-states such as Angola, large revenues from the oil industry tend to appreciate the exchange rate, which in turn worsens conditions in the domestic economy (Hammond, 2011; Amundsen, 2014). In this context, domestic goods become more expensive, while other sectors such as agriculture and manufacturing face higher costs and reduced competitiveness. In Angola, this has led to a crowding out of investment from other sectors, which instead has been directed almost entirely toward the oil industry and related activities. The result is an economy in which a large share of the population remains excluded from productive processes, with approximately 70% living in poverty (Amundsen, 2014).

The vulnerability of Angola's economy becomes particularly evident during periods of crisis, as illustrated in the graphs analyzed in our findings. For instance, we observe the effects of the 2008 financial crisis. Between 2008 and 2009, oil prices dropped sharply from approximately 140 dollars to 35 dollars per barrel, resulting in a substantial decline in GDP growth from 10.79% to 2.00%. This slowdown also had significant repercussions for the partnership with China. Corkin (2016), for example, reports that as a consequence of the crisis, thousands of Chinese workers were sent back home. This occurred because a large number of infrastructure projects entered a phase of stagnation due to a lack of funding (Corkin, 2016). In particular, projects managed by entities such as the China International Fund and the Reconstruction Office experienced considerable delays (Corkin, 2016). Among the projects that were interrupted were railway developments, the rehabilitation of road infrastructure, and ultimately the new international airport in the capital, Luanda, whose opening was originally scheduled for 2012 but only took place in 2023 (Corkin, 2016). This period of stagnation clearly demonstrates how the country is highly dependent on the flow of oil revenues.

With the subsequent market shock in 2014, the Angola Model entered a phase of decline, as oil prices dropped once again and then stabilized at a relatively low level of around fifty dollars per barrel, as shown in Figure 3. In addition, it is important to consider the saturation of oil extraction due to technical and infrastructural constraints, which limited Angola's ability to further expand production (Yoshikawa, 2024). This combination exposed the country to a situation of significant economic distress. In particular,

it made it considerably more difficult for Angola to repay its debts related to Chinese financing (Corkin, 2017; Yoshikawa, 2024). Since repayments were tied to oil exports to China, the servicing of these loans was highly dependent on global oil prices. Following the 2014 price decline, Angola was forced to export larger quantities of oil to China in order to meet its repayment obligations (Yoshikawa, 2024).

Impact of Chinese Loans on Oil Sector's Sustained Production (2011-2021)

The research on China's loans to Angola also contributes to a contextual explanation for Angola's oil industry development during the oil price crashes. China committed annual loans to Angola, specifically for the state-owned oil company's development, from 2011 to 2016. This follows the first global oil price shock in 2009 and aligns with the second shock in 2014. Given that the effects of price changes take place for the following few years, China's loans to Angola align with the time that Angola was adapting to market changes. This suggests that China's financial assistance was connected to Angola's oil industry recovery. After 2009, the time of the first shock, there were no immediate changes to oil production and export levels. However, by 2011, Angola experienced a drop in both production and exports from previous years. This could likely be due to the delayed impact of the oil shock, where the effect of price increases hit in the next few years. Interestingly, there were no notable changes in oil production or exports in 2014, by the time of the second oil crash. Rather than experiencing a drop as before, both factors maintained similar levels throughout the next few years, which contradicts what is expected to occur. An explanation for this can be the loans from China compensating for potential damage. Before oil-specific Chinese loans, global fluctuations significantly impacted the domestic industry; however, it seemed relatively unaffected by global circumstances after receiving development assistance, at least in the production and export aspects. This suggests that Angola's partnership with China may have stabilized the oil industry during the price crash.

Following the oil price crash era, oil production and exports had been falling since 2017. At this time, China's loans for Sonangol development ended, and refinery expansion projects began instead. This time period corresponds with Angola's onshore oil reserves maturing, explaining the drop in production and thus limited ability to export. Ideally, refinery expansion would resolve this issue, as mentioned, China's investments in refinery development haven't finished. As extraction capabilities reduced without upstream investment to offset less production, the oil industry naturally saw a decline. From this perspective, China's involvement in Angola after 2017 no longer compensated for the external factors affecting the oil industry as it had earlier.

21st-Century Post-Price Shock Adjustments and Diversification

It is clear that Angola's energy sector, both in production and supply, has diversified over the 21st century (IEA, 2026). When put into the context of the country's stated economic growth and diversification goals, as well as the way in which China supplies economic and industrial support, it is clear why this shift has occurred.

Crude oil production domestically has decreased, shifting from a peak of around 4 million terrajoules (TJ) in 2008 to 2.2 million TJ in 2023. But this shift in production is only half of the story. Oil imports have decreased, whereas exports have remained relatively stable over the past 20 years (IEA, 2026). Given the strong correlation between oil production and economic growth in Angola over the past several decades, it makes sense that Angola would continue to rely on oil as a source of revenue. However, shifting demands for oil globally can put the country in a vulnerable position; thus, diversification in energy production makes sense (Mohammed, 2018).

While oil has continued to be exported from Angola, demand within the country's borders has shifted. Domestically, primary oil as a source of electricity generation peaked at around 4 million TJ in 2008, but by 2023 had reached around 2.4 million TJ. While oil remains the largest generator of electricity in Angola, sources such as natural gas, biofuels and waste, and hydropower have steadily climbed, in particular over the past ten years (IEA, 2026).

Sudden decreases in crude oil prices can be linked to a massive economic downturn in Angola. One example of this is the negative downturn of the national economic growth rate following the global oil price shock in 2014 (Maria, 2022). With a global energy economy that is steadily diversifying and countries that are prioritizing clean energy sources (IEA, 2025), oil-dependent economies like Angola are particularly vulnerable. Because of this, the Angolan government has also made clean energy and general diversification a priority.

As outlined in Angola Energia 2025, the Angolan government is aiming to diversify its energy production and usage. Thus, it has shifted its focus from oil to clean energy. This trend can be seen in 21st-century data, and will continue as global demand shifts as well. Given China's status as a global leader in clean energy investment, in particular within the borders of other countries (Lewis, 2023), the Angola-China partnership will likely continue to be important for both countries.

Rising Prioritization of Clean Energy in China and Angola's Policies and Investments

The relationship between China and Angola has led to a heightened emphasis on clean energy since the early 2000s, leading to significant policy commitments and further clean energy development, leading China to become one of the countries most heavily invested in clean energy infrastructure. However, our research has led us to

understand the specific levels of this clean energy development.

The growing partnership between China and Angola has led to significant developments in the clean energy sector. China has increased its financial investment, while Angola's focus has progressively shifted towards clean energy. China is taking an indirect approach to its clean energy commitment, primarily funding the on-site development of Angola's projects. This remote involvement, mainly through investments, is evident in China's extensive participation in the clean energy market. In contrast, Angola plays a more direct role in the creation of energy, having constructed much of the infrastructure and factories required to generate electricity, which is then sold off.

Limitations

We encountered several limitations in observing oil production in relation to GDP growth and oil prices. The hypothesis of a correlation is based on the analysis and comparison of trends, but it lacks a rigorous econometric verification, such as a regression analysis or a causality test. Therefore, the findings and interpretations proposed may not achieve the desired level of precision. In addition, in assessing this relationship, we did not conduct a comprehensive analysis of other relevant variables, particularly on the GDP side, such as inflation, exchange rates, and government expenditure. Another factor that was not considered is whether oil production in Angola faced structural limits or a maximum capacity, as suggested by the stabilization of output levels after 2008. This may be linked to the saturation of known reserves or their overexploitation.

Our research on China's loans and the measurement of oil development was met with various limitations. Firstly, we lacked primary sources detailing the loans, such as official government documents, notices, or corporate documents. Due to corruption and a lack of transparency within the Angolan government under President dos Santos from 2002 to 2017, we didn't have access to these documents. Although our research could've been advanced by evidence of loan conditions, providing context for how they were implemented, we referenced the Boston University database to note loan completion instead. Another limitation was how recent some of China's investments and initiatives are. Loans committed to building new refineries in Angola haven't been completed, and some haven't started. This makes it difficult to track development in Angola's oil industry, so until future progress, these investments' impact can't be fully measured.

When examining the growing emphasis on China and Angola's investment in clean energy, both through actual investments and the incorporation of clean energy into policies and government plans, our primary limitation was the uncertainty surrounding whether the increase, or any changes in the focus on clean energy, was solely driven by the relationship between China and Angola. Rather, other macro factors, such as global climate change sentiment, ESG-related priorities, or current events, may have also

contributed significantly to the increased focus on clean energy. However, we are uncertain about the extent to which these factors influenced the changes in China-Angola's prioritization of clean energy.

The quantitative examination of Angolan clean energy and oil production is limited to what data is available. For example, the economic downturn in Angola has been *associated* with global oil price shocks, but it cannot be said for certain that other factors did not contribute to these trends. Furthermore, as Angola focuses more on clean energy production, its economic outlook will shift from being dependent on oil to relying more on a form of energy that has far less history in the global economy. China's investment in clean energy will likewise face similar uncertainties. Because of this, it is difficult to predict the specific trajectory of these investments due to a lack of precedent.

Conclusion

As the global stage has begun to prioritize sustainable energy initiatives, developed countries play a significant role in assisting underdeveloped countries with their transition. Throughout the past few decades, Angola saw distinct patterns in its energy industry, and the country's partnership with China demonstrates the nuanced impact of foreign financial assistance in sustainable development. Angola's oil industry post-civil war started off economically strong; however, the country itself remained severely underdeveloped. Although the oil price shocks took a large hit on Angola's economy, revealing its heavy dependency on the oil sector alone, Chinese loans showed how foreign aid could offset potentially worsened conditions. This conclusion indicates the ability of developed states to mitigate other states' issues in development. We then found a turning point in this partnership: the end of China's loans for oil development, coupled with oil reserve maturity and halted refinery expansion, which resulted in Angola's focus towards alternative energy, an attempt to diversify industrial sectors, and develop sustainably. Meanwhile, China's role in this transition shifted from investment in the oil industry to clean energy through infrastructure projects. The change in China's initiatives with Angola further demonstrates the potential of foreign aid in sustainable transitions. However, the limited research on these new investments' impacts leaves this claim to be further examined. Furthermore, per the Angolan model, the gains from China's investment have yet to compensate for the debt-trap Angola has been experiencing in the past two decades. Thus, the benefit of a development-based international partnership is ultimately dependent on the methods of investment.

As China looks toward increased foreign investment, key lessons can be learned from its 21st-century investment in Angola— in particular, that it can play a powerful role in stabilizing smaller economies such as Angola in times of economic turmoil. From these economic hardships emerged a path toward increased clean energy production in Angola. As the Angolan transition into clean energy continues, and as China's investment role in this

transition plays out, it has the potential to become a blueprint for foreign investment into sustainable development worldwide.

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New Myanmar, Same Mistakes: A Comparative Analysis of the 1988 and 2021 Military Coups

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The 1988 and 2021 Myanmar military coups ultimately led to political fallout and human rights abuses, establishing a need for international intervention that was met with different standards for intervention across the two conflicts. The following comparative analysis was primarily concentrated on the physical integrity rights and civil rights violations by the military-led government. Furthermore, it examines the response by the international community to the changing government and rapidly increasing refugee crisis. To better understand the connection between the military's response and human rights violations, a qualitative and quantitative approach was used to analyze the economic state leading up to the coup and the treatment of ethnic minorities by the state, as well as power dynamics within Myanmar at the time. The research revealed significant similarities between the human rights violations that align with many proposed theories on state repression. However, there remain some key differences between the two events due to the economic situation and position of the junta at the time of the coups. Additionally, the differing international responses between the 1988 and 2021 coups demonstrate how humanitarian doctrines have changed throughout the years. These striking similarities, as well as the stark differences, between Myanmar's 1988 and 2021 coups have made it an ideal case study for continuing research on military takeovers and providing a lens with which to examine the contemporary political society in Myanmar.

Introduction

On February 1st, 2021, the military forces of Myanmar, referred to as the Tatmadaw, staged a coup against the democratically elected president Aung San Suu Kyi, upsetting five years of rebuilding democratic governance and struggle for free, fair elections. Almost 33 years prior to the 2021 coup, Myanmar experienced a similar takeover by the Tatmadaw that established an authoritative military government, the State Law and Order Restoration Council (SLORC). Despite pushback from the public and calls for international leaders to cease military action, both coups saw the Tatmadaw win the struggle for state control. In both conflicts, the military used excessive force to remain in power, disrupting economic and political institutions. However similar the approach to violence may be, the Tatmadaw's targets varied. In 1988, the military primarily targeted students and civilians who continued to protest after they took control of the government, and in 2021, the military persecuted Rohingya Muslims, an ethnic minority in Myanmar. In each conflict, the tactics taken by the military created a dire humanitarian crisis, prompting organizations and states to intervene in humanistic and political ways to put an end to the crisis. Who chose to intervene, their motivations, and what aid, if any, was provided to refugees in Myanmar differed across conflicts. Despite the change over time in available resources and information, it is important to recognize the fault lines in how the international community approaches intervention, so as not to leave civilians unprotected in the case of future conflicts.

Global conflict resolution is sometimes viewed as a responsibility of international actors, and for some states, a direct requirement of their participation in a formalized international community. Many states and international organizations do not implement progress plans or initiate timely steps toward stopping the ongoing crisis or bringing about effective change, despite global intervention in times of crisis being thought of as the standard. For example, after the 1988 coup, there was a considerable lack of resources

readily available to humanitarian organizations, as well as a lack of response strategy precedents for state governments. Three decades later, the 2021 coup added to an already disadvantaged governmental system that needed a source of stability in order to bring back democratic long-term stability. There was hope within Myanmar and the international community that, in between the two most recent coups in Myanmar, methods for global mobilization had improved and would be more effective at protecting victims and survivors of a militaristic takeover.

In comparing the 1988 and 2021 coups in Myanmar, this paper examines to what extent the human rights violations and political fallout of Myanmar's 2021 military coup resemble those following the 1988 coup, and how the international response to the resulting humanitarian crisis shifted between the two events. Subsequent sections will cover a historical comparative analysis of each conflict and an analysis of methods for global intervention. This paper will conclude with an evaluation of the actions leading to a difference in quality of global intervention in order to further research regarding the necessary factors for effective international intervention.

Review of the Literature

The Patterns of Repression: 1988 Coup in Myanmar

Much research has been conducted on why states repress, how they get away with repression, and how the international community responds to authoritarian governments. There have been many key theories developed in the 2000s as research into repression has increased, but there still remains a need to expand the scope of these papers and topics. Additionally, there is no universal consensus over why states repress. However, these research papers provide a basis for examining the actions and human rights violations of the Myanmar military during both their 1988 and 2021 coup d'états.

There have been many developments in research to explain potential reasons for state repression and how they get away with it. When faced with threats to the status quo, state authorities will often employ repressive tactics to eliminate the behavioral threat (Davenport, 2007). Davenport (2007), a trusted expert on state repression and political scientist at the University of Michigan, coined this the Law of Coercive Responsiveness, and it provides a lens to examine the 1988 state crackdown on protests and the subsequent military coup. Adding to this, there has been additional development recently to the theory that repression works to maintain power, but not at moderate levels (Zhukov, 2023). Zhukov (2023) argues that in the case of only moderate levels of repression, oppositional activity will increase. However, a threshold of violence exists, whereby opposition will all but cease to exist if repression increases above this level (Zhukov, 2023). According to some scholarly research, states are successfully able to succeed in increasing repression by manipulating the flow of information, standards for evaluation, or the consequences (Mitchell, 2012). Mitchell's theories provide additional support and nuance to the previously mentioned theories by Zhukov (2023) and Davenport (2007), and they provide an additional connection between the two coups that we can explore.

Disagreement exists as to the extent to which existing theories on state repression apply to all situations and how free they are from bias. Both Davenport & Ball (2002) and Hill (2016) tackle the issue of bias when examining human rights and creating theories. Media sources from a country tend to have an urban bias, human rights organizations like Amnesty International have a bias towards events with a large number of violations in one moment, and interviews have a rural and recency bias (Davenport & Ball, 2002). Thus, research papers that rely on any one of these media for part of their research have to be wary of these media biases. This is something we will also have to keep in mind when researching the similarities and differences between human rights violations between the 1988 and the 2021 coups. Additionally, in much/some of the research, a contradiction also appears over the definition of democracy. Democracy, a key definition for the basis of many research papers, overlaps significantly with personal integrity abuses (Hill, 2016). To be a democracy in most definitions of the word, a country has to respect the right to physical integrity. This makes the distinction and correlation between respect for human rights and the type of regime difficult. Finally, in a slight contradiction to Davenport (2007), Ritter (2014) found that an increase in job security decreases the likelihood that oppression occurs in the first place, but increases the severity of violations when they do occur. This adds a different dimension to Davenport's Law of Coercive Responsiveness and highlights the complexity that exists in measuring human rights violations. One would assume repression increases as income for the masses and political power increase, but Ritter (2014) found that this was not the case. The measurement of human rights

violations is constantly evolving as the geopolitical environment changes.

Looking specifically at human rights violations by the authoritarian Myanmar government in the wake of the 1988 coup, sources and their validity become varied. Generally, the most comprehensive records of human rights violations in the late 1980s are the State Department reports published by the U.S. government and reports from Amnesty International. It is agreed upon by scholars and NGOs that economic challenges in 1987 led to widespread student protests that culminated in the 8888 Uprising in August of 1988 (U.S. State Department, 1988). In the aftermath of the military coup in September, the Myanmar government repressed freedom of speech and the press as both became virtually nonexistent and entirely state-run (U.S. State Department, 1989). Amnesty International's 1988 report also makes specific reference to the use of widespread propaganda against ethnic minorities that the government used to justify the torture and killings of minority populations. However, disagreement appears on the validity of these sources in accurately describing the human rights situation in Myanmar. Research has shown in the 2000s that reports published can be biased and influenced by the standards at the time to best get media attention (Buzzi, 2016). A paper in 2001 found that the U.S. State Department reports are not free from bias, with reports being more lenient on countries the US has strategic interests in and harsher on leftist regimes (Poe et al., 2001). Overall, while Amnesty International and the State Department provide valuable information as to general information on human rights violations, they cannot be viewed as entirely holistic sources.

Examining the 1988 and 2021 coups with these theories in mind creates a new perspective on why these coups happened, and our paper contributes to this discussion by adding additional nuance about how similar the processes of the military and the human rights violations were between the decades. Amongst previous literature, there has yet to be an analysis of the similarities and differences between the violations committed between the 1988 and 2021 coups. Many highlight just one type of violation (such as torture) and potential causes for that coup. Our paper will be able to fill a gap in the literature, establishing how state repression in the country might have changed since 1988 and if there has been continuity according to the above theories.

The 2021 Coup and Its Fallout

Recent literature on the 2021 Myanmar coup, in which the Tatmadaw overthrew the democratically elected Aung San Suu Kyi, demonstrates the vast societal impacts the coup has had on the population of Myanmar. The motives of the Tatmadaw have yet to be explicitly confirmed, but it continued to lose power and support against democratic reforms across Myanmar, threatening the longstanding military-owned monopolies that have funded generals and their associates (Thang, 2023). Thang (2023) emphasizes that the Tatmadaw attempted to slow democratic reforms in Myanmar through various means, but that the

2017 campaign against the Rohingya Muslims of Myanmar dramatically altered Myanmar's political trajectory. The Tatmadaw's operation against the Rohingya people has killed thousands of Rohingya Muslims, in addition to burnings, drownings, and mass rapes throughout the country, with the Tatmadaw's intentions again not explicitly confirmed. Thang (2023) argues that Tatmadaw's campaign against the Rohingya Muslims, a minority, aimed to promote ethno-religious divides among the citizens of Myanmar and gain more influence in politics. Thang's argument is supported by Bi's (2018) argument that states being the most vulnerable minority population in Myanmar, Rohingya Muslims were a convenient scapegoat for the Tatmadaw's nationalistic goals. Furthermore, a 2024 Amnesty International report has shown that since consolidating political control, the Tatmadaw has continued to persecute the Rohingya people as part of their nationalistic agenda.

Much literature has examined the severity of the impacts of Myanmar's Tatmadaw coup on the civilian populations of Myanmar. A 2023 journal article published in the *Archives of Public Health* in 2023 by Tual Shawn Khai describes the vulnerability of internally displaced people (IDPs) in Myanmar following the 2021 military coup. After conducting in-depth qualitative telephone interviews with 17 IDPs, Khai found that IDPs in Myanmar experience daily anxiety and fear that negatively impacts their mental and physical well-being (2023). Moreover, his research demonstrated that many IDPs have been displaced from their homes in poor conditions following armed military conflicts, reporting higher rates of malaria and dengue fever (Khai, 2023). Tual Shawn Khai et al. (2025) further investigated the impacts of the coup and pandemic combination on vulnerable populations in Myanmar in *Disability and Society*. They found that the political turmoil caused by the 2021 coup and pandemic has halted all progress toward implementing policies aimed at supporting vulnerable people in Myanmar, especially those with disabilities, and that these groups are also more prone to human rights violations (Khai et al., 2025). Data from the United Nations Office of the High Commissioner for Human Rights (2025) supports this claim, reporting that rural populations already struggling because of the coup have been further harmed by the Tatmadaw's efforts to destroy agricultural equipment and contaminate farmland.

Furthermore, Rohini J. Haar et al. (2024) published a paper in *Conflict and Health*, which has emphasized the unique challenges faced by healthcare workers in Myanmar who seek to serve the suffering populations detailed above. Haar et al. employed purposive sampling to recruit healthcare workers in Myanmar who are directly affiliated with the Myanmar Civil Disobedience Movement (CDM), a widespread movement in Myanmar that aims to resist the military junta and provide resources to populations in dire need. Their research revealed that healthcare workers, as individuals, are specifically targeted by the Tatmadaw's campaign, as well as medical facilities and transportation services (Haar et al., 2024). The targeting of healthcare workers contributes to a lack of aid being distributed to a

population with urgent needs, in addition to fostering the same disparate mental and physical health conditions experienced by IDPs identified by Khai (2023) among healthcare workers involved in the CDM in Myanmar (Haar et al., 2024).

The 2021 coup has affected other spheres of Myanmar, such as the educational and economic sectors. A 2022 paper published in *Education Sciences* by Khaing Htut, Marie Lall, and Camille Howson discusses the tensions between the higher education sector and the Tatmadaw. Since many of the protestors are members of the health and education sectors of Myanmar, the education system has experienced long-term closures and severe academic repression as a result of the coup (Htut et al., 2022). Furthermore, Myanmar's economic sector has also been damaged by the 2021 Tatmadaw coup. In 2025, Richard Takhun published a paper in the *Journal of Southeast Asian Economies* examining the economic costs of Myanmar's 2021 coup on civilian populations. He found that the coup had contributed to reduced income, skyrocketing inflation, rising commodity prices, and other economic hardships. He found that rural villagers, average citizens, and vulnerable populations have been particularly hurt by the economic crisis from the coup (Takhun, 2025), echoing the political impacts detailed above.

The following research analyzes the political, social, and economic impacts of the 2021 Myanmar coup on its civilian populations, as outlined by the researchers above. More specifically, it seeks to investigate the effects of the 2021 coup on human rights violations and political fallout that current literature is beginning to discuss as well. What the following study does differently from these researchers, however, is to conduct a comparative analysis between the 1988 and 2021 Myanmar coups to determine the overlapping impacts of coups in Myanmar throughout its history.

Theoretical Framework of Humanitarian Intervention

In the current literature, several theories have been put forth as to what could prompt a humanitarian response by either an international organization or a political actor. One foundational study in humanitarian intervention theory argues that states will either choose to intervene to punish those who have violated international law, in order to preserve the sanctity of global governing norms, or to act as protectors of foreign nationals who have suffered abuse from their state (Criddle, 2015). One area this theory lacks is the acknowledgement that some states may use humanitarian intervention as a self-serving political tool to boost their perception on the international stage (Chandler, 2001). The justification for intervention serves as an examination of when, how, and why members of the international community choose to interact. In addition, as humanitarian crises grow in scale and frequency, the resources needed to provide for victims and survivors grow, as does the need for states and international organizations to give more to help victims and survivors. The subsequent section on the humanitarian response to the fallout of the 1988 and 2021

coups in Myanmar compares the substantive actions taken by international organizations and state actors to alleviate the resulting humanitarian crisis in 1988 and 2021.

The moral approach to intervention has been led by the U.N. and international NGOs (INGOs) alike, to which scholarship has found to be both an extreme motivator, but with varied outcomes. Across different U.N. agencies, a humanitarian approach that is both steeped in moral obligation and limits military action is favored. The U.N. Refugee Agency outlines purposeful intervention as “principled humanitarianism,” which requires actors involved in relief efforts, to the best of their ability, to protect and assist affected peoples without political or other associated identity motivations (UN Refugee Agency, 2026). The theoretical framework guiding this principle, and general U.N. member intervention, is founded on the Responsibility to Protect Doctrine (R2P). The R2P doctrine follows a moral framework, such as principled humanitarianism, urging the international community to act through humanitarian and peaceful means to protect the people of other nations from crimes against humanity (UNGA, 2005). Another way to describe the morality of humanitarian intervention is as front-end work to stop human rights violations. Instead of the international community being a last resort to intervention, organizations must decide who is to intervene and how they will intervene for a response to achieve substantive outcomes (Criddle, 2015). Although the morality, or front-end, approach is not always done promptly, costing the lives of victims that could be saved. In the case of the 2021 coup in Myanmar, early warning events were reported to the U.N. as early as 2017, but the Security Council could not unanimously agree to justify intervention via the R2P doctrine (Hassan, 2022). In the following section, a comparative analysis details the ways in which the U.N. has been constrained by its own framework and its subsequent inability to act promptly when presented with humanitarian crises.

Within the literature and guiding principles of INGOs, most believe in a moral obligation to humanity as a reason to act (International Committee of the Red Cross, n.d.; Amnesty International, 2003). Scholars note that INGOs have felt pressure to align with state values in order to receive state resources, but this ultimately led to a separation from working with the state, as organizations felt their neutrality was compromised (Chandler, 2001). Notably, the International Committee of the Red Cross (ICRC) has discussed its emphasis on neutrality, making clear to those that seek the support of the ICRC that they are not responsible for states' actions, and retain the sole authority to decide when and if they intervene (Harroff-Tavel, 2005). Methods such as conducting research, mobilization, and advocacy are favored by some INGOs, with recommendations for international and state policy, making up a substantive portion of their impact (Amnesty International USA, n.d.). Further research into the effectiveness of recommendations from INGOs is necessary to examine whether humanitarian crises can be helped from the aforementioned methods alone. Subsequent sections of

this study differ from previous scholarship on moral obligation by investigating ways in which the U.N. and INGOs are allowed to act from a neutral and from a moral standpoint, as they are restrained by legal measures and resources.

The theory mentioned above, stating the international community may act as “punishers” of other states that go against international law when intervening in humanitarian crises, is less popular in formal justification, but implicitly noted when individual states choose to intervene. Individual states can be put in compromising situations when they are expected to take action because of their perceived power or available resources. Certain world powers, like the U.S. and the U.K., are looked to for guidance regarding when to intervene and are often pushed to take the first step because of their substantial military resources and international influence (O’Hanlon, 2000). Where the expectation of intervention may become harmful is when a humanitarian crisis is used as a tool to justify a political move. In the past, states have been seen to use language that paints their actions as protectors against totalitarianism in order to provide a reason for intervening in a crisis, when in actuality their method for intervention is a declaration of war (Quandt, 2011). This research shows the ways in which state actors have pursued humanitarian aid for non-humanitarian purposes, so as to provide insight into the varying effectiveness of different approaches to humanitarian intervention. An analysis of the methods and motivations by INGOs, state actors, and the U.N. across conflicts in Myanmar is necessary to demonstrate the lack of non-political intent and the ways in which states can improve their methods for intervention and the betterment of victims and survivors.

The Political Response to the 2021 Coup

Myanmar attracted attention from nations around the world following its period of democratization beginning in 2010 and the subsequent military coup in 2021 (Han, 2021). Two scholars, an anthropologist and a political scientist, describe the responses of the U.S. and China to the regime changes in Myanmar (King, 2022; Han, 2021). The U.S. greeted the 2010 shift in governance with optimism. President Barack Obama visited in 2012 and 2014, seeking to normalize relations with Myanmar and counter China’s influence. Han (2021) argued that increased interest from the U.S. showed that Myanmar had an important place in the competition between China and the U.S. China, for its part, had invested significantly in Myanmar’s economy as part of the Belt and Road Initiative and continues to be Myanmar’s largest trading partner (King, 2022). While Han (2021) focuses on China’s relationship with Myanmar in the context of competition with the U.S., King (2022) focuses more on China’s economic interests in Myanmar. However, both sources agree that Myanmar is an extremely important country for the strategic and economic interests of the U.S. and China. Further research should explore the role that Myanmar now has in U.S.-China competition under the leadership of the military junta.

In addition to China, other nations, especially Myanmar's neighbors, have a continued interest in the conflict due to a variety of cross-border issues. Lilly (2021) argues that civil war within Myanmar is a possible outcome due to the lack of an effective international response to the coup thus far, combined with widespread armed resistance to the military junta within Myanmar. Additionally, nations such as India are concerned about Myanmar's stability due to the possibility of a refugee crisis, as well as other issues, such as the spread of COVID-19 and cross-border organized crime (King, 2022). Khai (2024) explains how India responded to the increased number of refugees from the Rohingya conflict. Specifically, India's federal government designated the refugees as "illegal migrants" and attempted to return them to Myanmar (Khai, 2024). Other papers, such as Faye (2021), focused on the fate of refugees in countries such as Thailand, which has hosted 120,000 refugees. This number includes the Rohingya people among other ethnic groups. However, Thailand's government is concerned about whether stateless Rohingya people could support insurgent movements in Thailand (Faye, 2021). Although there is extensive research examining how neighboring countries respond to the influx of refugees from Myanmar from a domestic policy perspective, this research does not focus heavily on how the refugee issue affects Myanmar's relationship with its neighbors. The lack of focus on Myanmar's relationship with its neighbors makes it difficult to determine the political implications of the refugee crisis. Future research should examine the response of neighboring countries to Myanmar's refugee crisis in order to formulate a nuanced perspective on how nations have responded to the crisis in Myanmar.

The Association of Southeast Asian Nations (ASEAN), of which Myanmar is a part, has a crucial role in responding to political instability and human rights violations in Myanmar. Scholarly opinion on the effectiveness of ASEAN post-2021 is mixed. One paper states that ASEAN's response to Myanmar's political turmoil has been significant, given that ASEAN typically does not interfere in the affairs of its member states (Manurung, 2021). However, other scholars have pointed out that ASEAN invited leaders of the junta to attend a summit in April 2021 (Lilly, 2021). Further research explains that ASEAN nations are diverse and have different priorities, thus leading to a mixed response following the coup. Ganesan (2024) divides the ASEAN countries into maritime and mainland countries and observes that maritime ASEAN countries, excluding Brunei, are democratic, while Southeast Asian mainland countries are not. For example, Thailand, one of the countries that did not immediately condemn Myanmar's military coup, experienced two military coups in recent decades (King, 2022). While the methodology of dividing ASEAN countries into maritime and mainland countries may partially explain why some nations were quicker to condemn the coup than others, it does not completely explain the diverse responses of Southeast Asian countries (King, 2022). The generalization of maritime versus mainland countries does not apply in the

case of Brunei, which is a monarchy. Additionally, Ganesan's methodology puts the focus on the responses of individual ASEAN member states and does not recognize the procedural rules that govern how ASEAN operates as an international organization; studying how international organizations responded to crises in Myanmar is a main focus of this paper.

Besides ASEAN, the other international organization widely called upon to intervene is the United Nations (U.N.). One article argues that the U.N. should join forces with ASEAN in order to provide humanitarian assistance in Myanmar and create a monitoring system for future human rights violations (Lilly, 2021). Other papers examine the capabilities of the U.N. from a legal perspective. One paper observed that the 2021 Myanmar coup and subsequent actions of the junta violated a variety of U.N. conventions, including the Universal Declaration of Human Rights (UDHR) and the International Covenant on Civil and Political Rights (ICCPR) (Al Murkarramah, 2021). Despite these legal standards, the U.N. Security Council stopped short of condemning the coup outright because Russia and China blocked such harsh language (King, 2022). In fact, Russia and China sent arms to Myanmar's military (King, 2022). In addition to the scholarship focusing on U.N. humanitarian and legal capabilities, other research has highlighted how the situation in Myanmar, with respect to the military junta and the actions against the Rohingya people, mirrors botched U.N. responses to previous genocides in Bosnia and Rwanda (Al Murkarramah, 2021; Han, 2021). Although examining past U.N. failures places the situation in Myanmar in a broader historical context, it fails to provide specific reasoning for why the U.N. has been slow to respond to post-2021 human rights violations in Myanmar. The following research will focus on how structural mechanisms of the U.N. enable member states to ignore the human rights situation in Myanmar, providing a more thorough explanation of the lackluster international response.

Methodology

This study utilized a quantitative and qualitative analysis of human rights violations in Myanmar between 1988 and the 2021 coups. For this study, the definition of human rights is defined in conjunction with the Universal Declaration of Human Rights (UDHR). The UDHR (1948) protects individuals regardless of race, sex, language, religion, political opinion, social group, or other birth status from ill treatment by others or the state. Mistreatment is defined as an action that goes against an individual's ability to live freely and exercise their individual rights (United Nations General Assembly, 1948). The UDHR definition provides a basis for contextualizing the human rights situation in Myanmar and analyzing the international response towards violations in the aftermath of the 1988 and 2021 coups. The specific human rights violations examined are physical integrity rights, defined as government-imposed torture, extrajudicial killing, unjust imprisonment, and other

violations of bodily integrity (Cope et al., 2018). The timeline of comparison will cover human rights violations leading up to and immediately following the 1988 and 2021 coups. A significant portion of this study will analyze allegations of genocide and ethnic cleansing against multiple ethnic minorities. As is established by the Genocide Convention, genocide is defined as an intention to erase the culture of and physically eradicate members of a religious, national, ethnic, or racial group (United Nations General Assembly, 1948).

Quantitatively, this research primarily tracks refugee populations and aid assistance to the country between the two time periods, graphing aid by the international community following both the 1988 and 2021 coups, comparing monetary contributions and overall response. Graphing refugee populations and monetary contributions across both conflicts will allow for an examination of how the standards of human rights may have changed in the three decades following 1988. Additionally, graphing refugee populations fleeing to neighboring countries in 2021 using numbers from prior research papers and NGO reports will be used to compare neighboring countries' responses to the coup.

Qualitatively, this research investigates domestic and international policies following the 1988 and 2021 coups, comparing the conflicts across time periods. These policies include, but are not limited to, laws passed by the Myanmar government in the aftermath of the coup, UN resolutions, and the ASEAN organization's official responses. Through an analysis of the aforementioned documents, the differences between the controlling government in Myanmar and the international community can be examined for continuity. The similarity, validity, and continuity of various human rights doctrines will add to this discussion. Overall, a qualitative and quantitative approach will provide a roadmap to examining whether there are similarities between the two coups and how the international community's response has developed over time.

Results and Findings

Roadmap

The results and findings are structured chronologically. The first section will examine how Myanmar repressed its population in the years preceding and following the 1988 coup, including why and how the military overthrew the government. Following this will be a qualitative analysis of the 2021 coup and the political and economic situation in Myanmar in the years after. Within both these years, an emphasis is placed on how human rights violations resulting from both coups led to a change in the humanitarian and political crisis in Myanmar. Two subsequent sections will detail the political and humanitarian response to the resulting crisis in Myanmar.

Repression in 1988

Leading up to the 1988 coup, political authority in Myanmar had remained largely concentrated in the hands of

the military government for over 20 years. In 1962, General Ne Win took command of the government in a coup following antagonism between the ethnic majority in Myanmar, the Bamar, and the Chinese and Indian minority populations that controlled state industries (U.S. State Department, 1987). In 1974, he created the Burma Socialist Program Party (BSPP) through a constitutional amendment, making it the sole party in government. Even after stepping down as President in 1981, Ne Win remained *de facto* ruler of Myanmar by restricting the position of Chancellor to the BSPP until July 23, 1988 (Milbrandt, 2012). Political continuity gave the BSPP broad powers with little impunity. They enforced their will upon the people and limited rights for the population, especially ethnic minorities. Ne Win undertook a program to cleanse the Irrawaddy Delta of the Karen ethnic minority population and "turn it white" in 1971, viewing them as insurgents (Milbrandt, 2012, p. 69). Using minority populations as scapegoats remained a constant in BSPP policy up until the 1980s. In 1982, the government passed the Burma Citizenship Law, which created multiple categories of citizenship and made it more difficult for people to be granted citizenship (BSPP, 1982). The Council of State had the power to decide which ethnic groups were citizens under the law. Those not seen as full citizens, called naturalised or associate citizens, had limited rights of political participation (Brett & Hlaing, 2020). The 1982 Citizenship Law justified the government's actions against ethnic minorities and the clashes that would occur in 1988.

With a consistent policy, the authoritarian government restricted political and civil rights for the Burmese population, even with small signs of reform in 1987. In the prior years to the 1988 coup, physical integrity rights were routinely violated. Executions were largely confined to solely insurgent supporters, many of whom were ethnic minorities, but torture was commonplace in prisons, and reports of detainee deaths expanded compared to prior years (U.S. State Department, 1986). The lack of physical integrity rights was matched by the lack of civil rights. In theory, the 1974 Constitution protected freedom of speech, the assembly, and the press, but in practice, it was entirely state-owned. It was mandated that the government approve anything by any radio, journalist, or one of the six national newspapers (U.S. State Department 1985). However, before 1988, there was a movement towards slight increases in civil rights. The BSPP maintained a policy of religious toleration, even with general discrimination towards Muslims, and there were attempts to include women more in political life (U.S. State Department, 1987). Progress towards reform was reversed towards the end of 1987 when economic turmoil struck, and tensions grew.

Throughout President Ne Win's 20 years of rule, he maintained an economic policy of socialism. This economic system was heavily embedded in the economic and political life in Myanmar. It was connected with nationalism and seen as a link between the economy and Buddhism (Aung-Thwin & Myint-U, 1992). However, the BSPP could never make an effective socialist system work with the ethnic divisions and authoritarian government. In 1987, it demonetized the currency and was forced to seek status with the UN as a Least

Developed Country for debt relief (Guyon, 1992). This economic turmoil led to demonstrations and widespread violence as citizens called for reform. In the summer of 1988, students began an uprising calling for the BSPP regime to step aside in favor of a democratically elected government, and they were soon joined by other civilians (Milbrandt, 2012). This culminated in the largest uprising seen in Myanmar on August 8, 1988—later dubbed the 8888 Uprising (Milbrandt, 2012). The military met these protests with unprecedented violence. Civilian deaths reached well into the thousands as troops killed people in their homes, attacked hospital staff treating the wounded, imprisoned students, and tortured protestors (Guyon, 1992). The U.S. State Department estimates between 842 and 1664 people went missing in 1988 alone (1988). Ne Win and the BSPP stepped down from power in July and made concessions to the protestors by installing a civilian as head of government, but this concession did not stop the protestors (Guyon, 1992). Eventually, on September 18, the military seized control of the makeshift government in a coup and created the State Law and Order Restoration Council (SLORC) to maintain power (U.S. State Department, 1988). This transition once again involved the massacring of unarmed civilians, notably students and monks.

The immense civil and physical integrity rights violations during the 1988 coup continued into 1989 and 1990. It is estimated that at least 3000 students and civilians died during the 8888 Uprising, with the number potentially as large as 10,000 (Human Rights Watch, 1989). Promises of reform by the SLORC were not met. The SLORC declared martial law for all of 1989, revoked pre-trial rights as protestors faced military tribunals, gave students returning home the death sentence, utilized torture, and suspended all media sources (U.S. State Department, 1989). They employed an immense campaign of propaganda, blamed ethnic minorities for the violence during the coup, and restricted the rights of Buddhist Monks to assemble due to their prominence in previous protests. The SLORC's promised democratic election in 1990 was limited after opposition leader of the National League for Democracy (NLD), Aung San Suu Kyi, was put under house arrest on July 20th, 1989 (Guyon, 1992). Public gatherings of five or more people were soon banned too, to prevent potential opposition to meeting before the elections (Guyon, 1992). Despite repression, the SLORC let the democratic elections in 1990 proceed as promised. They faced a stunning defeat by the NLD as the NLD secured 392 of the government's 485 seats; however, they ignored the results by claiming election fraud, arresting opposition leaders, and continuing to govern Myanmar (Bradley, 2007). Throughout the 1990s, the SLORC continued to rule the country through silencing opposition and restricting rights.

However, in a marked shift from previous economic policy, the SLORC took steps to grow the economy and open it up to the private sector. The government passed the State-Owned Economic Enterprise Law in 1989 to create provisions for private sector involvement in previously thought of public sector domains (Cook & Minogue, 1993). Additionally, they passed the Private Industrial Enterprise Law a year later,

outlining rules private sector entrepreneurs would have to follow (Cook & Minogue, 1993). The SLORC was slowly making efforts to transition the economy from a government-owned system to a market economy. These attempts to liberalize the economy led to "immediate gains in economic performance" and real GDP expanding quickly (International Monetary Fund, 1999, p. 6). Despite the continued suppression of the population, real attempts were made to push for economic growth in the years following the coup.

Repression in 2021

In 2021, the Tatmadaw launched a coup against the previously elected Aung San Suu Kyi. Myanmar's Tatmadaw had been rapidly losing power amidst widespread democratic reforms throughout the country. The 2021 election came after a decade of Myanmar's attempts to transition to democracy. The 2010 election saw the movement to a nominally elected civilian government in 2011 that promoted democratic reforms and an expansion of political freedoms (Stokke & Aung, 2020). Recognizing that the long-standing military-owned monopolies that funded the generals and their associates were being threatened, the Tatmadaw decided to launch a coup (Thang, 2023). Five years later, the Tatmadaw's coup resulted in a democratic breakdown, economic collapse, widespread international condemnation, and severe humanitarian concerns.

Following the coup, protests immediately broke out (Council on Foreign Relations, 2026). In response, an opposition group of Myanmar's ousted officials, minority ethnic groups, and demonstrators formed the National Unity Government (NUG) in April 2021 (Council on Foreign Relations, 2026). Not long after, the NUG coalition formed an armed wing, the People's Defense Forces (PDF), to fight the Tatmadaw and restore democracy. Rebel ethnic groups throughout Myanmar have also come together to defend against the Tatmadaw. In October of 2023, a coalition of three armed ethnic groups, the Arakan Army, the Myanmar National Democratic Alliance, and the Ta'ang National Liberation Army, launched a coordinated offense against the Tatmadaw. Since then, these rebel groups, as well as the NUG and the PDF, have fought against the Tatmadaw, resulting in political fragmentation, democratic breakdown, and instability throughout Myanmar (Council on Foreign Relations, 2026).

Beginning in 2017, the Tatmadaw launched a brutal operation against the minority Rohingya Muslims in Myanmar; this operation included but was not limited to killings, mass rapes, burnings, and drownings of thousands of Rohingya Muslims (Thang, 2023). According to the U.N., since the Tatmadaw launched its campaign against the Rohingya in 2017, more than 10,000 Rohingya men, women, and children have been murdered, over 300 villages have been burned to the ground, and 700,000 individuals have been forced to flee to Bangladesh and other surrounding countries to escape religious persecution (Thang, 2023).

Though heavily targeted, Rohingya Muslims are not the only population in Myanmar that has experienced extreme political violence by the Tatmadaw. As rebel groups in

Myanmar continue to fight back against the Tatmadaw, the military's campaign has grown increasingly more brutal. Military air strikes have targeted religious buildings, schools, hospitals, and places with high numbers of internally displaced persons (IDPs) (Amnesty International, 2025). Furthermore, civilians engaging in political protest, as well as non-participating civilians who live in areas with high levels of political engagement, have been arbitrarily held without charge in detention centers (Human Rights Watch, 2021).

Myanmar also has a high population of IDPs who are particularly vulnerable to the Tatmadaw's actions. Following armed conflicts between rebel groups and the Tatmadaw, IDPs have reported extreme levels of daily anxiety, as well as negative physical health. IDPs in Myanmar experience significantly higher rates of disease, such as malaria and dengue fever, than non-displaced citizens (Khai, 2023). Additionally, healthcare workers in Myanmar have experienced unique challenges and unprecedented injustice since the 2021 coup, particularly those associated with the Myanmar Civil Disobedience Movement (CDM), a movement in Myanmar that seeks to resist the military junta and provide resources to those in desperate need. Healthcare workers associated with the CDM have been relentlessly targeted by the Tatmadaw. These workers are victims in many killings and experiencing disruptions to medical facilities and transportation services (Haar et al., 2024). This prevents the provision of aid throughout the country, as well as directly harms healthcare workers on Myanmar's frontline.

Furthermore, the military takeover has led to significant food and resource insecurity. Since the 2021 coup, food prices have risen to more than four times their pre-2021 rates, and since 2025, the cost of a basic food basket has risen by 50% (World Food Program USA, n.d.). Over 15.2 million Myanmar civilians are experiencing extreme hunger. In response to territorial loss to Myanmar's various armed rebel groups, the Tatmadaw has vastly restricted access to humanitarian aid and trade routes, as well as launched widespread attacks to destroy agricultural equipment and efforts to contaminate civilian farmland (The Office of the United Nations High Commissioner for Human Rights, 2025). As the Tatmadaw continues its offensive, inflation and commodity prices continue to skyrocket, and income falls (Takhun, 2025).

The abrupt suspension of international humanitarian aid, especially aid from the U.S., has significantly hurt Myanmar civilians (Human Rights Watch, 2026). The U.S. has historically been one of the most important providers of international support to Myanmar. In 2024, the U.S. provided Myanmar with almost \$250 million for emergency food assistance, vaccinations, and other methods of humanitarian aid (Foreign Aid Assistance, 2024). However, in January of 2025, U.S. President Donald Trump halted all aid to Myanmar with an executive order pausing foreign aid for a minimum 90-day review period (The White House, 2025). Despite Myanmar's 7.9 magnitude earthquake in April of 2025, U.S. aid to Myanmar is reported at only \$77 million for the 2025 fiscal year, an approximately 70% decrease (Foreign Aid Assistance, 2025). The 2021 Tatmadaw coup has had severe

implications for the country, ultimately contributing to democratic breakdown, a collapsing economy, strict international condemnation, and humanitarian concerns regarding Myanmar's civilian population. Minority groups in Myanmar, particularly its Rohingya Muslim population, have been targeted by the Tatmadaw, with thousands being killed, disappeared, or fleeing to neighboring countries (Thang, 2023). Military air strikes have destroyed crucial elements of Myanmar's infrastructure, such as its schools, hospitals, and religious centers (Amnesty International, 2025). The military takeover, as well as the suspension of international humanitarian aid from major donors such as the U.S., has resulted in food and resource insecurity across the country (World Food Program USA, n.d., Human Rights Watch, 2026). The future of Myanmar post-coup is uncertain, but today, the population continues to struggle as a result of the Tatmadaw's actions.

Humanitarian Responses to the 1988 and 2021 Coups

In February 1988, the Tatmadaw orchestrated a coup against the controlling government, the BSPP, creating a liminal stage in Myanmar's society marked by social and political problems and an emerging humanitarian emergency. The global response to the humanitarian crises varied among INGOs, state actors, and the U.N. who were unprepared to address the urgent needs of victims and survivors in Myanmar. Over 30 years later, a similar conflict befell Myanmar when another military coup led again by the Tatmadaw, seized power from the democratically elected head of state. The Tatmadaw formed the SLORC to lead the government, a decision that demanded immediate humanitarian intervention as human rights violations mounted.

After claims of human rights violations made it to the world stage in 1988, state actors approached humanitarian intervention by targeting the base of SLORC. After the SLORC removed the former government, the state lost funding from its biggest international donors to its economic, state, and welfare development. In September 1988, Japan, West Germany, and the U.S. suspended all economic aid to Myanmar, once reports of civilian massacres and a breakdown of democratic institutions reached their states (Human Rights Watch, 1990). On the horizon of the political and social failings in Myanmar, one global organization, the World Bank, chose to proactively distance itself from the new government by ceasing all direct aid payments to Myanmar in July 1987 (*World Bank Cuts of Myanmar*, 1998). The overall effect of the reduced inflow of aid can be measured by the loss of Myanmar's Official Development Aid (ODA) funding, the sum of loans and grants given by members and non-members of the ODA committee. From 1988 to 1989 there was a staggering dip in the amount of ODA provided to Myanmar from 1988 to 1989 (Figure 1). In 1988, Myanmar received approximately \$400 million USD in ODA, which dropped to approximately \$150 million USD in 1989 (World Bank, 2025). However, in the years following 1988, some states and the World Bank reinstated their aid programs to Myanmar. In

an effort to develop Myanmar's economy and push the state back toward democracy, Japan reinstated some of their \$300 million USD aid program in February 1989 (Human Rights Watch, 1990). This was followed by the World Bank stating in September 1989 that they had an "active policy dialogue and significant operational activity" in Myanmar (World Bank, 1989). However, ODA remained below pre-1989 levels for the next 18 years, with only small increases periodically, as shown in Figure 1 (World Bank, 2025).

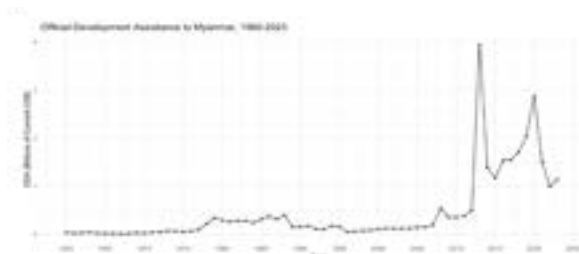


Figure 1: Official Development Assistance given to Myanmar, 1960-2023. Adapted from Net Official Development Received (Current US\$) by the World Bank 2025

The U.N.'s response to the 1988 coup came much later. In the early 1990s, U.N. member states petitioned for action from U.N. agencies in the direct aftermath of the crisis. In 1989, at the Third Committee of the U.N. General Assembly, U.S. Ambassador Thomas Pickering denounced the SLORC's actions and expressed doubts about their ability to maintain a fair and just government. At the same committee meeting, Pickering directly called on the UNHCR to approach the U.S. for support in allowing for a special rapporteur on Burma to consider intervention in the ongoing human rights abuses (Human Rights Watch, 1990). Following Pickering's recommendations, the U.N. released a resolution concerning the situation in Myanmar in 1991, stating that the government of Myanmar should take steps to reimplement the democratic process and expressing concern with information the U.N. had received about human rights abuses. In the conclusion of this resolution, the U.N. decided to continue to consider the situation in Myanmar at a later session, with no direct calls for involvement at the 1991 session (UNGA, 1991). However, the U.N. eventually did adopt Pickering's recommendation in 1992 by nominating a special rapporteur to establish direct contact between the government and people of Myanmar to gain a comprehensive view of human rights abuses (Office of the High Commissioner of Human Rights, 1992).

In the aftermath of the 1988 coup, many INGOs focused on issuing recommendations for how to relieve the humanitarian crisis and end human rights abuses, lacking the vast resources and recognition they receive today. In 1988, Amnesty International issued an end-of-year report condemning the actions of the SLORC and calling for greater oversight within the national government by instituting a restructuring plan (Amnesty International, 1988). In an effort to receive a response to these recommendations, Amnesty International contacted local and national Myanmar officials and reached out to Myanmar's diplomats (Amnesty International, 1988). The ICRC provided some resources to

survivors in Myanmar in conjunction with the UN Children's Fund, delivering 100 tons of medical supplies to reach underfunded hospitals and clinics (Copson, 1988). In 1988, the head of delegation in New Delhi for the ICRC, Jean-Michel Monod, commented that ICRC supplies reached 35 hospitals, intended to last for at least two months and to reach a substantial number of Myanmar citizens (Monod, 1988).

After the 2021 coup in Myanmar, the response by political actors was mixed between directly providing resources for both sides in the conflict and attempts to remain neutral. The European Union (EU) took decisive action to implement an arms embargo on Myanmar in 2021. Russia, China, Singapore, India, and Thailand were among the states that did not impose an arms embargo and instead collectively contributed over \$1 billion USD in arms deals (Tinmaung, 2024). Before the events in October 2021, the U.S. had redirected \$42.4 million USD of its FY 2020 USAID budget away from work that directly supports the government of Myanmar. The U.S. chose to instead funnel \$69 million USD from USAID to food safety and healthcare programs, and any additional programs falling under efforts to "promote peace and reconciliation" (Bureau of East Asian and Pacific Affairs, 2021). In terms of public denunciation, the G7 foreign ministers were among the most prominent political figures to issue a public statement, only two days after the February 1st coup. The foreign ministers issued a joint statement calling for the Tatmendaw to immediately reinstate the democratic process and allow "unrestricted humanitarian access" to the G7 nations to assist victims of the military's policies and actions (Foreign, Commonwealth & Development Office, 2021).

A year after the events on February 1st, the UN Office for Humanitarian Affairs (OCHA) took decisive action by issuing a Humanitarian Response Plan (HRP) in January 2022 to address the ongoing humanitarian crisis in Myanmar. The agency had requested \$826 million from its donors to provide education, food security, healthcare, nutrition, protection, shelter, and water (OCHA, 2022). In 2022, OCHA received approximately \$842 million from non-governmental organizations, with their main contributors being multi-donor trust funds, private donors, and the European Union (U.N. System Chief Executives Board for Coordination, n.d.). However, this sum was to be divided among various OCHA projects, and was not specifically allocated for the purpose of humanitarian relief in Myanmar. OCHA collected a separate sum from U.N. member states consisting of \$28.7 million to finance humanitarian projects led by U.N. agencies, INGOs, and national NGOs (OCHA, 2023). The lack of funds, along with rising prices of necessities, hindered the implementation of the U.N.'s 2022 HRP (Berkley Journal of International Law, 2022).

Only two months after the coup in 2021, Amnesty International stated its recommendations for improvement in Myanmar's internal affairs and actions by the Tatmendaw they felt constituted human rights violations (Amnesty International, 2021). In addition, the ICRC issued a statement one month after the coup in February, calling for minimal military force to be used and extreme protection to be

exercised regarding healthcare workers and civilian protestors. In conjunction with the Myanmar Red Cross Society, the ICRC reported dispatching 1,500 volunteers and 120 ambulances across the state to provide first aid. On March 4, 2021, the ICRC reported 509 people as either treated or transferred to receive additional medical treatment (International Committee of the Red Cross, 2021). In addition to issuing recommendations by INGOs, \$791,849 was donated to the Myanmar HRP in 2021 by Save the Children, Rahma International Society, and Trocaire, covering civilian protection, food security, and healthcare costs (OCHA, 2021). Each organization is internationally focused, but Trocaire differentiates itself from the others in being founded by the Irish Catholic church and having an expansive religious history as a humanitarian aid organization.

Across both coups in 1988 and 2021 the need for international intervention was necessary to support the basic needs of survivors and re-establish a democratic presence in Myanmar. INGOs, state actors, and the U.N. approached intervention in different ways based on their available resources and understanding of the needs of the victims and survivors. The collective response generated by the international community lacked a cohesive approach, resulting in an uneven distribution of humanitarian aid to victims and survivors and increasing the time to develop long-term stability.

Political Responses to the 1988 and 2021 Coups

In the months following the 2021 coup in Myanmar, the U.N. passed a resolution condemning the coup and the subsequent human rights violations. The resolution received 119 yes votes, 1 no vote, and 36 abstentions (UNGA, 2021). The U.S. voted yes, in keeping with its record of supporting Myanmar's elected civilian government, while China and Russia, who supply arms to Myanmar's military junta, abstained from the vote (King, 2022; UNGA, 2021). Bangladesh and India also abstained (UNGA, 2021). Votes among ASEAN nations were split: Brunei, Cambodia, Laos, and Thailand abstained. In contrast, Indonesia, Malaysia, Myanmar, the Philippines, Singapore, and Vietnam voted yes (UNGA, 2021).

There are several existing U.N. conventions that are applicable to the situation in Myanmar. The 1951 U.N. Convention Relating to the Status of Refugees defined refugees as individuals who experience persecution and are either stateless or not protected by their home countries (Khali, 2024; Mahmood et al., 2017). The 1951 Refugee Convention requires that host countries provide basic services to refugees and that host countries not return refugees to places where they could face danger. Another U.N. doctrine is R2P, adopted in 2005, which requires action from the international community if a state cannot protect its own people. Past uses of this doctrine, such as intervention in Libya, have weakened its legitimacy because many countries viewed this intervention as regime change, despite its ostensible purpose of protecting civilians (Lilly, 2021).

Among individual countries, policies towards Rohingya refugees vary. One country that has accepted many

Rohingya refugees over the years is India. However, India has not ratified the 1951 Refugee Convention. Additionally, there are significant differences between the two main states in India that accept Rohingya refugees. The Manipur state has repatriated refugees, while the Mizoram state is more tolerant. This may be because the refugees coming to Mizoram have ethnic ties with the current residents (Khali, 2024). Another non-ASEAN country that has accepted many Rohingya and Myanmar refugees is Bangladesh. The refugee crisis was especially serious in 1992, when 250,000 Myanmar refugees fled the country for Bangladesh (Faye, 2021). However, 192,000 of these 250,000 were repatriated because Bangladesh, like India, has not signed the 1951 Refugee Convention (Faye, 2021). Bangladesh considers the refugees to be economic migrants (Faye, 2021). The U.N. High Commissioner for Refugees (UNHCR), which establishes guidelines regarding the minimum conditions for refugee camps, has raised concerns regarding a lack of water. However, the UNHCR has done little to address these concerns (Faye, 2021). Acts of repatriation in the 1970s and 1980s also violated UNHCR guidelines because the refugees were not consulted about their future (Faye, 2021). Additionally, there was an attempt to force repatriation by failing to provide the refugees with food and water (Faye, 2021).

Number of Refugees in India, Bangladesh, Malaysia, and Thailand from 2023-2025

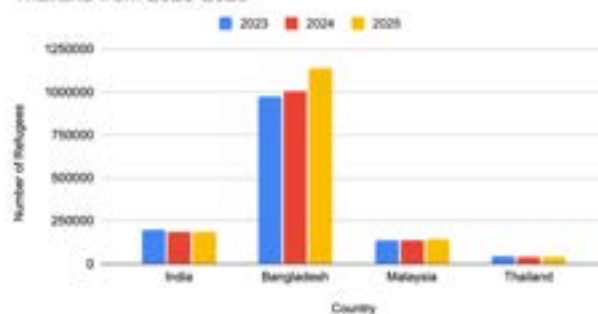


Figure 2: Number of Refugees in India, Bangladesh, Malaysia, and Thailand from 2023-2025. Source: UNHCR Global Website, Annex 2

ASEAN countries have also accepted many refugees from Myanmar. ASEAN countries Malaysia and Thailand have accepted far fewer refugees than non-ASEAN countries Bangladesh and India (Fig. 2). Both Thailand and Malaysia are concerned about the possibility of domestic instability if they accept too many Rohingya refugees. Thailand is especially concerned about insurgency (Faye, 2021). Despite Malaysia's history of not ratifying human rights protocols, they have accepted a significant number of refugees (Faye, 2021). The response of ASEAN as a whole to the Myanmar crisis is limited due to concerns about violating Myanmar's sovereignty and interfering in its internal affairs. ASEAN has a strict non-interference principle in which member states do not interfere with the internal affairs of other member states (King, 2022). Even so, individual member states have condemned the violence in Myanmar (Arifin, 2021). ASEAN

has agreed to the R2P Doctrine that prioritizes the enforcement of human rights. However, ASEAN's interpretation of this doctrine stipulates that it must not contradict the non-interference principle outlined in the ASEAN charter (Arfin, 2022). Despite the stipulations of the ASEAN charter, the U.N. has redefined this concept of sovereignty with doctrines like R2P, making ASEAN's philosophy seem outdated (Arfin, 2021). Additionally, the ASEAN Intergovernmental Commission on Human Rights (AICHR) is not independent enough from ASEAN to function effectively and does not have significant enforcement authority (Arfin, 2021). Solutions to the crisis in Myanmar are limited because individual states, such as Thailand, India, and Malaysia, do not want to commit resources to accepting refugees. International organizations like ASEAN are also hesitant to intervene due to concerns over sovereignty, even in serious situations of genocide and crimes against humanity.

Discussion

Similarities Between the 1988 and 2021 Coups

Across the 1988 and 2021 coups in Myanmar, there is a considerable breakdown of democratic institutions, severe repression, and extreme humanitarian concerns. The likeness between the 1988 and 2021 coups provides insight into significant events in Myanmar's history that have harmed the country's economy, political institutions, and most importantly, its civilian population. Furthermore, the similarities between the two conflicts offer insight into the underlying political factors that have contributed to coups in Myanmar. The analysis of the 1988 and 2021 coups can offer a new perspective on how governments in general, but more specifically, Myanmar, face democratic breakdown and human rights violations in the aftermath of coups. Additionally, this paper demonstrates common factors and characteristics of military coups across time periods.

Both the 1988 and 2021 coups led to intense democratic breakdown in Myanmar, with the immediate effects being incredibly similar. Before each of these events, the Tatmadaw had been losing power amidst pressures to democratize and provide greater protection for civil liberties within the country. In response to these pressures, the Tatmadaw launched coups in both 1988 and 2021, regaining control over spheres where they had lost ground and murdering thousands of civilians (Milbrandt, 2012; Thang, 2023). Both of these events support Davenport's (2007) Law of Coercive Responsiveness, which predicts that states will respond to threats to power with violence. In both events, the Tatmadaw risked losing authority over the government. The temporary loss of power prompted the Tatmadaw to take any actions possible to regain control, and this included increasing repressive actions. By providing support for the Law of Coercive Responsiveness, Myanmar becomes a perfect case study for examining when states decide to repress and why actors within states may decide to enact a coup. Myanmar follows a key pattern of repression, and this pattern can be used to predict when Myanmar might be at risk of another coup d'état.

Moreover, before each of Myanmar's coups, the Tatmadaw launched attacks against minority groups within the country and caused severe humanitarian concerns. This continuity informs acts against ethnic minority populations and attempts to limit civil rights that may follow in future coups. Leading up to the 1988 coup, the Tatmadaw, under the leadership of military commander Ne Win, launched a campaign of ethnic cleansing against the religious minority Karen population in the Irrawaddy Delta (Milbrandt, 2012). Similarly, in 2017, the Tatmadaw began its genocide against the minority Rohingya Muslim population in Myanmar (Bi, 2018). In both military coups, civilian rights were entirely limited, with all media sources suspended in 1988 and civilian buildings being targeted in 2021 (Guyon, 1992; Amnesty International, 2024). The significant crackdown on human rights in the country following 1988 demonstrates how human rights post-2021 may develop. In the decade following 1988, civil and political liberties were at an all-time low. However, there were economic concessions and a few political ones in the 1990s that served as a roadmap for development within Myanmar after 2021. Additionally, the continuity of human rights abuses in the immediate aftermaths of both coups demonstrates that, even with shifts in technologies and time, certain aspects of repression remain common with coups.

Differences Between the 1988 and 2021 Coups

The 1988 and 2021 coups, while similar in many respects, have notable differences with regard to the economic policies and technologies utilized at the time. Additionally, the political situation in Myanmar during the coups differed because of the position of the military. These differences can inform how coups in other countries may shift due to technologies or economic development across time periods and show the evolution of repression by the Myanmar junta.

One of the biggest differences is the position of the military in the government at the time of these coups. Leading up to 1988, the military had a dominant position in the government as part of the BSPP under Chancellor Ne Win (U.S. State Department, 1985). While they did briefly lose power in July 1988, leading up to the 8888 Uprising, their period without large influence in the government was only two months. However, as previously mentioned, the 2021 election came after a decade of Myanmar's attempts to transition to democracy. While both coups came at a time when the military's position was threatened in the country, the relative positions were markedly different. This fact adds an interesting dimension to this analysis because of the different timelines. When faced with losing power in 1988, the military overthrew the government only two months after a threat to their position. In the 2021 coup, though, it took over a decade of a democratic transition. Davenport's (2007) Law of Coercive Responsiveness would have suggested that the Tatmadaw would have increased repression in 2010 in response to threats to power to avoid losing it. However, his law only applies to 1988. This difference shows the evolution of repression and motivations

for when actors decide to overthrow governments. With new technologies, new accountability standards, and new interactions between states, there is an extended timeline for overthrowing a government.

An additional contrast between the two time periods was the economic situation in Myanmar following the coups. The early 1990s saw a shift in the economic system within the country as the SLORC took steps to open up the economy to privatization and investment. In contrast to this, the 2021 coup destroyed economic progress that had been made as prices skyrocketed (World Food Program USA, n.d.). In 1988, the economy was on the downswing, a factor that contributed to student protests for democracy, but the years following the coup saw a dramatic economic upswing. The 2021 coup saw the opposite as economic growth was reversed in the post-coup years. The economy is a critical difference between the two events. Myanmar provides evidence as to the importance of the economy in a country's stability, no matter the regime type. However, this calls into question how the Tatmadaw will continue to handle the economy post-2021 and Zhukov's (2023) paper on a threshold of violence. If the pattern of 1988 holds, a failing economy will promote protests from the masses and calls for democratization, and the military will again face a threat to power. This will only happen, though, if the Tatmadaw hasn't increased repression to the point that protesting is impossible in practice. The economic evolution between the two coups and the lack of widespread protest following 2021 suggest that the military government has been successful at reaching this threshold for repression in a way they were not in 1988.

There are additional small ways the two coups differ from each other. For example, military and software technologies have shifted over the three decades between the events. While the 1988 coup primarily saw the use of tanks and guns, the Tatmadaw was able to take advantage of its airspace supremacy in the 2020s with air strikes (Amnesty International, 2025). Military advancements in the 21st century made it easier for the Tatmadaw to overthrow the government with less personal loss of life within the military. Besides military technologies, general advancements in software have shifted how the country interacts with the outside world and how the government interacts with its citizens. An additional, smaller difference is policies against ethnic minority populations. Before 1988, while there were policies of ethnic and religious discrimination, they were still largely allowed to exist in the country peacefully, and religion remained a non-factor in discriminatory policies (U.S. State Department, 1986). In contrast, the 2010s saw a drastic shift in policy, especially with regard to religion. This is significant because, with the change in military and surveillance technology, it is easier than ever to track ethnic minority populations and execute genocidal policies. As the technology shifted, so too did military policies.

While the 1988 and 2021 coups have many similarities between them, they also have significant differences that can aid in the continued examination of

global coups and the international human rights regime. For instance, how will technological advancements continue to change the interactions between the state, its citizens, and the international community? Thirty years ago, it would have been difficult to anticipate that technology would develop this rapidly. New technologies can play a role in state repression, but also make monitoring human rights violations easier. An additional factor to consider is how and when people decide to overthrow the government. Is there a threshold to when a coup becomes inevitable, and does this threshold change depending on who is overthrowing the government? Overall, the differences between the 1988 and 2021 Myanmar military coups provide a baseline for continued research on coups in general, how state repression may evolve, and a lens through which to observe how the country may continue to develop.

Comparative Analysis of Humanitarian Responses

The prior sections demonstrate that INGOs, state actors, and the U.N. approached humanitarian intervention following the 1988 crisis in two ways: reducing foreign aid to Myanmar's national government and delivering recommendations for SLROC's next political steps. Attempts at humanitarian intervention by the international community were made, mainly after the initial civilian attacks. The efforts of state actors focused on constraining SLROC, primarily through reducing investment into their economy and general state development (Human Rights Watch, 1990). Similar moves were taken by the World Bank, which demonstrated substantive declines in overall investment in the region (World Bank, 2025). As indicated in the former section on the humanitarian responses, a minor improvement in methods for intervention was made by state actors in the 2021 coup, as states combined constricting measures, with aid focused on food safety and healthcare for victims and survivors in Myanmar (Tinmaung, 2024; Bureau of East Asian and Pacific Affairs, 2021). An unwelcome change was the support for the military government in 2021 by China and Russia, who directly contributed funds to increasing the militaristic capacity of the SLROC (Tinmaung, 2024). Over time, general improvements in the speed and accuracy of states becoming informed about humanitarian crises, as well as improvements in available resources, could have contributed to the increased involvement of the international community in 2021. The 'negative' intervention, or the actions taken by states that have exacerbated the humanitarian crisis, reveals the imperfect system for intervention.

The type of intervention from the U.N. and INGOs can be generalized by symbolic measures and advocacy efforts that aim to push the military forces in Myanmar to adopt their recommendations. These findings illustrate the change in efficiency between the U.N.'s response in 1988 and 2021. In the aftermath of the 1988 coup, the only recommendations issued by the U.N. were years after official documents detailing human rights abuses surfaced (Human Rights Watch, 1990; Office of the High

Commissioner of Human Rights, 1992). In 2021, the U.N. streamlined its timeline for intervention by implementing an HRP in January 2022, only months following the 2021 coup. The U.N. 2022 HRP for Myanmar detailed the most urgent sectors, requiring assistance and a general overview of how they planned to accommodate the needs of victims and survivors (OCHA, 2022). This move came in tandem with pushing funds directly to finance crisis management, accessing private donors, and donations from different states (UN System Chief Executive Board for Coordination, 2022). In comparing the response to the 1988 and 2021 coups in Myanmar, there is a clear improvement in response by the U.N., not only from their efficiency in implementation, but also from their diversification in the ways U.N. agencies delivered aid to victims and survivors in Myanmar.

Across both conflicts, INGOs favored issuing recommendations for how they believed the new government in Myanmar should conduct itself. These efforts were combined with funding and on-the-ground involvement to alleviate the humanitarian crisis. For example, the ICRC delivered healthcare and first aid services in both conflicts within months of the military takeover (Monod, 1988; Amnesty International, 2021). In 2021, there was a more substantial contribution by various INGOs, and a greater diversity of the areas where they chose to invest (OCHA, 2021). Over time, INGOs have committed to providing both substantive resource-based humanitarian aid and issuing international calls to stop human rights abuses. After the 2021 coup, a more global movement to intervene occurred, but there is no observable complete shift in approach from actions taken in the late 1980s. INGOs have the benefit of increased resources and viability in the 21st century, but their core values and approach have remained consistent across conflicts.

Comparative Analysis of Political Responses

Key players in the international response to the 2021 coup in Myanmar include the U.N., powerful countries like the U.S. and China, and NGOs such as Amnesty International. Similar players responded to the 1988 coup. However, the international landscape is fundamentally different from 1988 in several ways due to shifting foreign aid, power competition, and international legal protocols. The response to Myanmar's 2021 coup may help to predict the international response to future events in Myanmar.

Throughout the past several decades, countries have rewarded Myanmar for democratization and punished the country for human rights violations. Myanmar also drew international criticism for its increased repression of the Rohingya people beginning in 2015 (Han, 2021). The international actions towards Myanmar indicate the international community's concern for human rights in both 1988 and 2021. However, the events of 2021 indicate that the international community's concern was not sufficient to stop the coup.

Human rights violations are not the only determinant of the international response to Myanmar's actions. During Myanmar's period of democratization, it

received increased attention from the U.S. and China due to competition between the two countries, a dynamic that is more prevalent than in previous eras (Han, 2021). China has invested significantly in the country as part of the Belt Road Initiative and is its largest trading partner (Han, 2021). Therefore, Myanmar gained a position of strategic and economic importance on the global stage. The ramifications of U.S.-China competition in Myanmar provide a broader perspective on the 1988 and 2021 coups by examining the international community's response to Myanmar in the period between the coups.

In 1988 and 2021, the actions of Myanmar's government caused a major human rights and refugee crisis that required action from neighboring states and international organizations. The U.N. currently has specialized agencies, such as OCHA, to address such crises. Because these agencies were created after 1988, they had the opportunity to learn from the international response to the 1988 coup and apply these insights to the response to the coup in 2021 (OCHA, 2022). International organizations can provide a more effective response to future crisis situations by learning from experience. International legal frameworks are also influential in determining how the international community responds to crisis situations. One of these frameworks was the 1951 Refugee Convention (UNHCR). However, only some ASEAN countries were signatories to this convention (UNHCR, 1951). Additionally, variation existed within ASEAN in terms of which countries supported a U.N. resolution condemning the coup in 2021. The amount of variation among ASEAN nations was an unexpected factor in the coup response. The mixed response of ASEAN nations on something so simple as a UN resolution condemning the coup reveals the difficulty of coordinating an international response due to disagreements among nations with diverse goals and priorities. Another legal framework is the R2P Doctrine, which seeks to establish a global definition of sovereignty that accounts for human rights. Due to its universality, the R2P Doctrine has significance beyond the situation in Myanmar. Countries that have sought to incorporate this doctrine within existing legal frameworks, such as the ASEAN charter, provide a window into how nations will respond to similar crises moving forward (Afrin, 2021). Disagreements over sovereignty reveal that the situation in Myanmar has significance for the international community's understanding of sovereignty in future conflicts.

While the human rights violations and limited international response between the two time periods are very similar, the specific legal frameworks and power dynamics that existed in 1988 were different from those that existed in 2021. The events leading up to the 2021 coup and the response to it were heavily defined by U.S.-China competition and global controversy surrounding the R2P Doctrine. Disagreement between countries over how to balance principles of sovereignty with addressing human rights violations led to a slow international response.

Limitations

While conducting this study to compare the human rights violations and political fallout of the 1988 and 2021 Myanmar coups, there were several limitations. The primary limitation identified was accessing archived political material about the 1988 coup. Due to the lack of digitized records from the 1988 coup, extensive data about the number of forced deportations from Myanmar to other countries, specific human rights violations, and international responses was not publicly accessible. Regarding the 2021 coup, information is still emerging about its long-term effects; at the time of this paper's publication, the armed struggle that broke out after the coup is ongoing, and it has been only five years since the coup began. This resulted in difficulties studying the effects of the 2021 coup on Myanmar's society, such as height stunting, literacy rates, and widespread trauma. Furthermore, due to the significant political instability in Myanmar today, there is a lack of public opinion survey data to encapsulate the effects of the 2021 coup on Myanmar's civilian population. Due to time constraints and limited resources, this resulted in the inability to conduct a wider examination on the political and humanitarian fallout post 1988 and 2021 coup in Myanmar. In acknowledgment of these limitations, this study provides valuable insight into the political situation in Myanmar, as well as international humanitarian intervention, which will be valuable to policy discourse moving forward.

Conclusion

The similarities between the 1988 and 2021 coups in Myanmar reveal the extent of repression, the role of international organizations, and tensions between the military and the elected civilian government. The key differences in economic and political conditions, ethnic discrimination, and international legal protocols, extrapolate the severity of each conflict. Following the examination of both conflicts, the political and economic conditions in Myanmar were found to be worse in 1988 compared to 2021 due to the failure of the socialist economic system. In addition, the Tatmandaw had a prominent position in the government for decades prior to the 1988 coup, allowing them to re-take control of the government quickly, despite facing structural instability a few months before the coup. In contrast, in 2021, the Tatmandaw staged a coup at a time when they had little political power after a decade of progress towards democratization, which had hindered their ability to regain a prominent position in the national government.

As a result of this study, the 1988 coup in Myanmar was found to support evidence that states rely on repressive tactics to quell discontent and maintain power. The findings have provided further evidence that justifies the purpose of the R2P doctrine in a theoretical capacity. However, by

examining the practical implications and limitations of the R2P doctrine, this study demonstrates the failings of available avenues for international intervention in humanitarian crises, such as the 1998 and 2021 coups in Myanmar. By controlling for geographic location, rather than time period, this study examines how the international community has been unable to provide adequate assistance to crises, even with a framework of political structure and societal needs.

Due to the recency of the 2021 coup, future research into the economic, societal, and humanitarian repercussions will play a key role in advancing understandings of the most recent conflict. It is unclear if the economy will make a recovery following the coup, as well as how foreign aid will affect Myanmar going forward. Amidst the freeze on foreign aid from the U.S., a major contributor to global aid, it will be essential to examine the implications of this on Myanmar's ability to rebuild politically and economically after the 2021 coup. The fallout from the 1988 and 2021 coups in Myanmar builds the foundation for future research as the repercussions of the 2021 coup become clearer, while allowing for an introspective look into how the international community can utilize frameworks from previous conflicts to address future humanitarian crises.

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From Integration to Securitization: The Syrian Civil War, Securitization and the Divergence of Turkey-NATO Threat Prioritization

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The Syrian Civil War had significant influence on the transformation of Turkish national security policy, shifting it from an integration-focused framework to a more assertive and securitized approach. While Turkey previously implemented a “zero-problems-with-neighbors” doctrine, the onset of the Syrian Civil War and the subsequent rise of Kurdish groups affiliated with the PKK resulted in a decisive policy and discursive shift, reframing Syria as a direct threat to territorial integrity and national security. This paper examines how this shift is articulated across domestic and international contexts, and the extent to which it reveals a divergence in threat prioritization between Turkey and NATO. Using process tracing and Comparative Discourse Analysis of official NATO and Turkish Ministry of Foreign Affairs statements (2012-2019), the study identifies a transition from early convergence to sustained divergence in security framing. While NATO emphasizes multilateralism and regional stability, Turkey increasingly prioritizes sovereignty and unilateral action. Overall, the findings show that the Syrian Civil War reshaped Turkish security policy and threat perception, contributing to increasing tensions within the NATO-Turkish relationship.

Introduction

Prior to the Syrian Civil War, Turkish foreign policy from 2002 to 2011 was defined by a strategy of regional integration, the “zero problems with neighbors” strategy. Although Syria had historically been perceived as a threat, it became a strategic partner in Turkey’s mission to expand its influence in the Middle East. Owing to its strategic geographic location and NATO membership, Turkey positioned itself as a bridge between the East and the West, operating within a broadly NATO-aligned, multilateral framework centered on cooperation and stability.

The outbreak of the Syrian Civil War marked a turning point. As the conflict intensified, Turkey’s security environment was progressively but fundamentally reshaped. The expansion of PKK-affiliated groups, the increase in refugee flows into Turkey, and the rise of Kurdish autonomy near the southern border reframed Syria as an immediate national security threat. In response to this, Turkey adopted a more securitized and militarized security framework, prioritizing cross-border intervention, border security, and national security interests. While NATO continued to emphasize regional stability, collective defense, and diplomatic conflict resolution, Turkey focused on sovereignty, self-defense, and unilateral action.

While existing scholarship explains why Turkey’s policy shifted after the Syrian Civil War, less attention has been given to how these changes were framed and what that reveals about evolving differences between Turkey and NATO. Even when responding to the same events, they diverged in their definition, prioritization, and justification of threats. This suggests that the shift did not simply reflect policy responses to material security threats, but also about how threats were understood and communicated. Looking at framing helps show how Turkey and NATO could appear aligned in some moments, while still maintaining deeper divergences in threat prioritization.

This paper examines how the Syrian Civil War transformed Turkish national security policy and how this

transformation is reflected in evolving convergence and divergence. It combines process tracing and Comparative Discourse Analysis of official NATO and Turkish Ministry of Foreign Affairs statements, alongside domestic media sources, to trace shifts in threat framing over time. This shows how Turkey’s move from a NATO-aligned diplomatic approach to a more securitized and independent strategy corresponds with a growing divergence in alliance-based threat perception. It will first examine Turkish policy before the Syrian Civil War, then the shift after 2011, and finally compare how these changes were framed across different actors.

Review of the Literature

Turkish National Security Policy on Syria and the MENA Region Prior to the 2011 Syrian Civil War

Before the onset of the Syrian Civil War in 2011, scholars characterized Turkish-Syrian relations as being in a continuous state of tension until 1998. Hale (2019) argues that the main sources of tension were the annexation of the Alexandretta province by the Syrian resistance, the distribution of water flow from the Euphrates River, and Syrian support for the Kurdistan Workers’ Party (PKK). Due to its support of the PKK, which conducted military attacks against Turkey from Syrian military bases, Syria posed a direct threat to Turkish national security. Consequent military pressure from Turkey led Syrian President Hafez al-Assad to end support for the PKK. Through the signing of an agreement to end Syria’s support for the PKK and the expulsion of PKK leader Abdullah Ocalan, Turkish-Syrian tensions were eased.

After 1998, Syria and Turkey developed a cooperative partnership. Altunışık & Tür (2006) explain how negotiations around security, economics, and culture transformed the formerly hostile dynamic into a collaborative one. They suggest that this transformation can be partly explained by regional and global factors, which strengthened common interests and threats. Examples of such pressures include the political instability resulting from

the U.S. invasion of Iraq and U.S. pressure on Syria, both of which pushed Syria and Turkey to strengthen relations. (Altunışık & Tür, 2006). D'Alema (2017) and Hale (2019) extend this analysis, exploring how, following these geopolitical developments, the Justice and Development Party (AKP) made significant adjustments to Turkish foreign policy, shifting from its traditional defensive stance. Between 2002 and 2011, Turkey adopted a “zero problems with neighbours” approach to foreign policy, emphasizing improving relations within the Middle East, including strengthening relations with Syria, expanding trade and economic interdependence, and positioning Turkey as a regional bridge between the East and West (D'Alema, 2017; Hale, 2019). Consequently, at the time, Turkey saw Syria as a strategic partner, not a security threat.

Existing literature further establishes that the strengthening of Turkish-Syrian relations, rather than being simply reactive, was part of a larger movement in Turkey's regional ambitions. For Turkey, improving relations with Syria was a crucial step towards strengthening its position in the Middle East. To promote this, Turkey aimed at establishing a security community within the Middle East through the facilitation of peace agreements (D'Alema, 2017). Accordingly, they acted as a facilitator in conversations between Syria and Israel during the six-day war regarding control of the Golan Heights, a strategically essential plateau located in Southwest Syria. Additionally, Turkey prioritized increased military cooperation with Syria, involving the exchange of military personnel, invitations for monitoring war games, and training military personnel.

Beyond this military-security dimension, Turkey also prioritized economic security and integration as a part of the “zero problems with neighbours” foreign policy strategy. Altunışık & Tür (2006) emphasizes economic cooperation between the two states, through the opening of border centers designed to facilitate trade between Turkey and Syria. D'Alema (2017) and Hale (2019) further note that an accord was signed that removed visa requirements for travel between the two states, and Turkey supported joint infrastructure projects (Altunışık & Tür, 2006; D'Alema, 2017; Hale, 2019).

During this period, Turkey is seen as positioning itself as a soft power focused on regional cooperation, economic integration, and diplomacy. However, Altunışık & Tür (2006) highlight that despite this progress, Turkey's ability to strengthen ties with Syria was constrained. Turkey's deep-rooted reliance on the United States' support and its European Union accession process meant that it had to balance its regional initiatives with those of its Western alliances (Altunışık & Tür, 2006). Even further, the onset of civil war in Syria disrupted the trajectory of peaceful relations between Turkey and Syria, with Syria once again positioned as a national security threat due to the collapse of border security and rise of Kurdish militia groups (Altunışık & Tür, 2006; D'Alema, 2017; Hale, 2019). After 2011, Turkish security policy thus shifted from cooperation towards securitization and military intervention.

Changes in Turkish National Security Policy During and Immediately Following the Syrian Civil War

The Syrian Civil War represents a decisive turning point in Turkish national security and foreign policy. Beginning in 2011, Turkey's national security doctrine shifted from diplomatic engagement and regional integration under the “zero problems” framework toward securitization, border, and cross-border intervention. Although scholars agree that the conflict catalyzed this transformation, they differ on whether it reflects rational adaptation to material threats, regional ambition and miscalculation, structural regional change, or domestic political realignment.

Ayata (2014), Wei (2019), and Barkey (2021) identify the Syrian Civil War as the moment that shifted Turkey's diplomatic strategy. Wei (2019) interprets this shift primarily through a security lens, arguing that refugee flows, the rise of Kurdish autonomy along Turkey's southern border, and growing instability reframed Syria as an immediate national security threat. From this perspective, Turkey's move toward military intervention appears as a rational recalibration in response to material threats. This intervention included cross-border military operations such as Operations Euphrates Shield in 2016, Operation Olive Branch in 2018, and Operation Peace Spring in 2019, which aimed to push back Kurdish forces and secure Turkey's southern border. Ayata (2014) emphasizes Turkey's regional ambition and political miscalculation. She argues that Turkey viewed the Arab uprisings as an opportunity to expand its influence and supported regime change in Syria under the assumption that Bashar Al-Assad, the president of Syria, would fall. When this expectation failed, Turkey's policy appeared inconsistent and left it more diplomatically isolated. Unlike Wei's security-driven explanation, Ayata (2014) suggests the shift reflected overestimation of Turkey's regional leverage.

Barkey (2021) offers a broader structural explanation, situating Turkey's policy transformation within the destabilization of the regional order. She contends that the Arab uprisings undermined the assumptions supporting the “zero problems” doctrine, making soft-power diplomacy insufficient in an increasingly unstable environment. Prior to the war, Turkey's “zero problems with neighbors” strategy reflected soft power through its emphasis on diplomacy, economic integration, and regional cooperation, particularly in its improved relations with Syria and other Middle Eastern states. Rather than attributing the shift to miscalculation or immediate threat alone, Barkey frames it as an adaptive response to systemic regional change. In the years following 2011, Turkey's Syria policy shifted decisively toward securitization and intervention. Rather than prioritizing economic cooperation and diplomatic engagement, Turkey focused on border security, military operations in northern Syria, and containing Kurdish armed groups. The refugee crisis and ongoing instability reinforced the framing of Syria as a direct national security concern. Intervention increasingly replaced mediation as the dominant policy tool. For Wei (2019), this transformation

represents a rational response to escalating threats. Ayata (2014), however, interprets it as the outcome of Turkey's earlier miscalculation and overambition. Barkey (2021) situates the shift within a broader pattern of regional instability that rendered Turkey's soft-power strategy unsustainable.

Kohei (2016) examines how the Syrian Civil War transformed Turkish national security doctrine and broader governance by challenging Turkey's role as a stable regional actor that helped buffer surrounding conflicts. Kohei argues that as the violence escalated along its southern border, Turkey shifted from a buffer state maintaining a balanced posture to a more interventionist and security-driven approach. The onset of the war eroded Turkey's prior border regime, which had been characterized by relatively flexible cross-border flows and a strategic balancing of regional relationships resulting from the "zero problems with neighbours" policy framework. This prompted the reframing of the southern border as an immediate national security threat, leading to its fortification, the securitization of migration, and the expansion of cross-border military operations. Unlike Wei (2019), who frames this shift primarily as a response to material security threats, and Ayata (2014), who emphasizes political miscalculation, Kohei (2016) highlights how changes in border governance and spatial control reshaped Turkey's security doctrine. Rather than merely reacting to instability, Turkey adopted a more proactive strategy centered on preemptive containment.

Kohei further situates these changes within domestic political developments, particularly the post-2015 domestic security climate in Turkey, marked by the consolidation of executive power and renewed conflict with Kurdish actors. This reinforced a narrative linking external instability to internal existential threats. Border security thus became intertwined with regime security, contributing to a national security policy recalibration that prioritized counterterrorism, demographic control, and territorial control. Kohei therefore clarifies how the Syrian Civil War shifted Turkish threat prioritization, elevating border insecurity and non-state actors over broader alliance-centered threat frameworks, and helping explain subsequent divergences from NATO security narratives.

Kösebalaban (2020) also identifies the Syrian Civil War as a decisive turning point in the resecuritization of Turkish national security policy. Kösebalaban states that, particularly post-2015, Turkey shifted from its integration foreign policy orientation towards one dominated by hard security concerns. While Turkey initially supported opposition movements in the war and framed the conflict through a democratic transformation lens, the protracted nature of the war led to security spillovers. The inflow of refugees from the war and the erosion of Syrian state authority along Turkey's border elevated national defense priorities. Most importantly, the territorial expansion of Kurdish groups affiliated with the PKK reactivated longstanding fears of separatism and territorial

fragmentation, returning the Kurdish question to the center of Turkish threat perception.

This securitized shift was further reinforced by domestic political developments. The 2016 coup attempt, subsequent state of emergency, and transition to an executive presidential system consolidated nationalist political coalitions, particularly the AKP–MHP alliance between the Justice and Development Party (AKP) and the Nationalist Movement Party (MHP). This institutional realignment incentivized a harder security discourse rooted in a revived "culture of insecurity," historically associated with fears of territorial disintegration. This transformation manifested in cross-border military interventions designed to prevent the emergence of a Kurdish autonomous corridor in northern Syria. It also reshaped Turkey's alliance patterns, straining relations with Western partners over their cooperation with Syrian Kurdish forces while encouraging tactical cooperation with Russia. This realignment underscored how threat prioritization, specifically Kurdish separatism, superseded earlier commitments to Western-aligned regional policy (Kösebalaban, 2020).

Taken together, this scholarship identifies the Syrian Civil War as the decisive catalyst in the transformation of Turkish national security policy. Whether interpreted as a rational response to material threats, the result of regional overreach and miscalculation, an adaptive response to systemic instability, or the product of domestic political consolidation and renewed insecurity, the literature converges on one central point: 2011 reordered Turkish threat prioritization. Border insecurity, refugee flows, and especially Kurdish territorial expansion displaced earlier diplomatic and alliance-centered frameworks. As securitization deepened, intervention replaced mediation, and national defense priorities increasingly superseded commitments to integrationist or Western-aligned strategies. This body of work therefore, clarifies how the Syrian Civil War not only reshaped Turkey's regional posture but also redefined the hierarchy of threats guiding Turkish decision-making, laying the groundwork for subsequent tensions within NATO.

Framing of Changing National Security Positions: Comparison between NATO, Turkish Government, and Mainstream and Domestic Media

Current scholarship on Turkey-NATO relations examines how alliance membership shapes Turkish threat perception and prioritization. At the same time, it shows how domestic politics, regional dynamics, and strained relations can push Turkish policy and messaging towards strategic autonomy. Threat prioritization refers to how the Turkish government determines which threats are framed as important, both to allies and domestic audiences. This process can be observed in the framing of official statements and communications, while secondary sources provide historical context and explain why these changes occur over time. This section draws on three key sources, each representing a distinct lens for understanding Turkish-NATO relations and threat prioritization: identity and

ontological security, post-Cold War alliance dynamics and shifts due to geography, and domestic crisis framing in a time of rising populism.

Akgül-Açıkmeşe & Aksu (2025) apply an ontological security lens to examine how Turkey's transatlantic identity has been shaped through its NATO membership. This perspective highlights the ways states seek continuity and consistency through identity. They argue that while NATO provides Turkey with identity security, the security is consistently challenged by conflicts with alliance members, through actions like the purchase of a Russian missile defense system. Such actions intensify Turkey's insecurities within NATO, while simultaneously reinforcing its need to remain in the alliance. Linking identity security to state behavior, the ontological security framework explains Turkey's seemingly contradictory national security approach. Adopting this, Akgül-Açıkmeşe and Aksu argue that while Turkey may view staying in NATO as necessary to maintain a stable identity, they can at the same time seek broader independence and strategic autonomy in national security policy. The missile defense purchase, therefore, reflects an effort to assert a distinct national security identity alongside NATO, illustrating how security dilemmas within the alliance can shape threat prioritization.

Oğuzlu (2025) complements this analysis by examining Turkey's changing role within NATO amid shifting global geopolitics and domestic political transformations, arguing that its post-Cold War position has been increasingly complicated. First, following the collapse of the USSR, collaboration became more interest-based than identity-based, as assumptions of shared security goals and values were increasingly called into question. Second, Turkey recognized the strategic significance of its geographic location as a buffer state between the Middle East and Europe, as well as its critical location between two important seas. This unique positioning has meant that Turkey's security priorities have not always aligned with those of the broader NATO alliance. Buhari-Gülmez (2020) reinforces this point, arguing that while divergent priorities and threat perception have strained the US-Turkey alliance, transactional interdependence and Turkey's deep embeddedness in Western systems have prevented a full break.

Since the end of the Cold War, NATO has struggled to define common security threats, as the entity it was created to oppose no longer exists. Within this increasingly ill-defined strategic environment, Turkey has operated on the premise that its distinct foreign policy interests should not be subordinated to NATO's transformation, making it easier to assert its own positions within the alliance. Oğuzlu thus situates the deterioration of Turkey-NATO relations within the post-Cold War period, illustrating how regional threat perception and the pursuit of strategic autonomy shaped Turkish security prioritization within NATO frameworks.

Understanding Turkey's threat prioritization also requires examining how these priorities are communicated to domestic and international audiences, since domestic

dynamics shape the framing of security threats. This is particularly evident during the Syrian Civil War, when Turkey's position as a buffer state produced distinct framing for domestic audiences versus NATO allies. Işeri & Ersoy (2021) analyze how mainstream media outlets responded to the crisis amid a domestic resurgence of populism, analyzing 2,166 examples of news coverage from the opposition *Kemalist Sözcü*, moderate *Hürriyet*, and pro-government *Sabah*. They find that crisis coverage produced a "rally-around-the-flag" effect, converging on narratives that amplified populist AKP discourse and contributed to democratic backsliding. Işeri and Ersoy also show how anti-Western foreign policy discourse functioned as "a rhetorical gadget over contested Turkish identity." Their analysis provides insight into how the Syrian Civil War was framed domestically and provides a useful point of comparison with Turkey's framing of the crisis to NATO allies.

Together, these sources provide insight into the interplay between Turkey's national security decision-making and its NATO membership. Akgül-Açıkmeşe & Aksu (2025) show why Turkey is simultaneously drawn towards strategic autonomy and toward NATO. Oğuzlu explains why post-Cold War shifts have complicated Turkey-NATO threat alignment. Işeri & Ersoy (2021) demonstrate how crisis framing and anti-Western rhetoric during a period of rising populism can consolidate domestic narratives into a story that may not match messaging to NATO allies. Turkey's geography and unique political and ethnic composition make it notably distinct from most members of NATO, and as a result, each of these lenses is critical in understanding Turkish decision-making on national security issues.

Comparing NATO and Turkish Security Policy related to Syria

Scholarship on Turkish national security policy examines how participation in international alliances, particularly NATO, has shaped policymaking in identifying and addressing non-state threats. Much of this literature focuses on the post-Cold War period, emphasizing counterterrorism and regional conflicts over traditional interstate disputes. NATO's shift in threat prioritization has coincided with significant transformations in Turkey's domestic political landscape following the AKP's rise to power in 2002, developments that have significantly shaped analyses of Turkish security policy. Comparing NATO and Turkish approaches to Syria and the broader Middle East provides a useful lens for identifying areas of convergence and difference. This section draws on three sources that, taken together, offer a comprehensive understanding of Turkish-NATO relations and policy development. These include: NATO's post-Cold War transformation, the evolution of Turkish foreign policy under AKP leadership, and empirical assessments of Turkey's counterterrorism methods.

Aziz (2023) analyzes NATO strategic documents and secondary scholarship exploration to understand how NATO's ideological transformation altered Turkey's

position in the alliance. Aziz argues that these changes, which have shifted NATO's focus to counterterrorism, regional conflicts, and global stability, have established Turkey as a key member in the partnership. While he attributes this positive shift to Turkey's strategic geographic location, Armultu also argues that this has been the cause of major tension. The research particularly highlights disagreements over threat prioritization and collaborative efforts against terrorism as a source of the increasing tensions.

Understanding Turkish foreign policy is essential to assessing how NATO membership influences national security decision-making. Lami (2018), analysing government documents and literature on Turkish foreign policy and international relations theory, argues that shifts in Turkey's approach can be attributed to significant regional and international developments, including the 2011 Syrian Civil War, the refugee crisis, and the broader war on terror. In response to these pressures, Turkey adopted a harder, more self-interest-driven foreign policy, focusing less on international alliance frameworks.

Analyzing Turkish foreign policy under AKP, Lami's findings significantly overlap with Aziz's by directly explaining the policy transformations that increasingly diverged from NATO's. Together, these sources clarify the drivers of Turkey's evolving approach during the AKP era. However, though this approach effectively traces policy change, it doesn't directly address how alliance frameworks have shaped threat prioritization, but instead offers evidence of divergence that requires further analysis.

Kim & Yun (2008) provide more concrete evidence of Turkish counter terrorism measures through case studies of Turkish response to the PKK. Using policy evaluation, historical analysis, and incident-based datasets, they assess the effectiveness of Turkish counterterrorism efforts. This study is incredibly valuable because examining the policies implemented against the PKK clarifies which non-state threats Turkish policymakers prioritized. Kim and Yun conclude that Turkey was increasingly effective in its counterterrorism efforts, attributing this to the extensive use of military force and imposition of emergency rule. However, while their findings offer strong empirical evidence, their reliance on incident-based data on terrorism limits provides raw facts but does not include what influenced such decisions.

Taken together, these sources link Turkish security policymaking with their participation in NATO. Aziz shows how NATO's post-Cold War shift towards counterterrorism and regional stability has both elevated Turkey's strategic importance in the alliance and been a source for rising tensions. Lami demonstrates how the AKP's foreign policy reorientation towards greater strategic autonomy intensified these tensions amid emerging regional security challenges. Kim and Yun extend this analysis by illustrating how shifting security priorities have translated into domestic counterterrorism efforts. Together, these sources show how alliance expectations, regional instability, and domestic

threats intersect in shaping how Turkish policymakers identify and prioritize security concerns.

Intervention

Current scholarship provides strong explanations for Turkey's shift from integration to hard securitization, but limited attention is paid to the role played by the interaction of the NATO-Turkey relationship and the onset of the Syrian Civil War in this transformation. While existing studies examine the roles of changes in the Turkish government, developments in the regional security environment and NATO's strategic evolution, the ways NATO membership has influenced Turkey's threat prioritization has not been adequately addressed. Moreover, there is limited comparison of the ways in which security policy is framed across domestic and alliance contexts, thus leaving the relationship between domestic political narratives and external alliance messaging underexamined. This paper addresses these gaps by combining process tracing with Comparative Discourse Analysis (CDA) to examine both policy change and its framing, to show how divergence in threat prioritization between Turkey and NATO emerges and is communicated over time. Thus, it provides a more integrated account of how alliance commitments and domestic politics jointly shape Turkish foreign policy.

Methodology

For this study, we integrated process tracing and comparative discourse analysis to examine Turkish national security policy from 2002 to the present. Using process tracing, we looked at how the onset of the Syrian Civil War in 2011 transformed Turkish national security policy from regional integration to securitization. Then, using comparative discourse analysis, we examined the extent to which domestic and international framing of these policy changes showed a divergence between Turkey and the NATO alliance. Using both primary and secondary sources, the heavily qualitative nature of this study allowed us to undertake an in-depth analysis of how and why threat prioritizations changed. This was crucial to allowing us to focus on the underlying political, ontological, and policy-driven motivations of the shift, rather than simply identifying statistical trends, which usually work to establish that a shift has taken place.

We drew on two main categories of sources: official governmental and institutional sources, and media and scholarly data. The official statements included NATO and Turkish Ministry of Foreign Affairs (MFA) statements and press releases regarding Patriot Missile Deployment in 2012. These functioned as primary source evidence, which allowed us to compare international and official state messaging securitization shifts and the Syrian crisis. To complement this, we further utilized empirical findings from Iseri and Ersoy (2021), who analyzed 2166 news articles from newspapers *Sözcü*, *Hürriyet*, and *Sabah*. Using this, we were able to analyze domestic framing of the Syrian Crisis without needing original coding. Furthermore, Hale (2019),

D'Alema (2017), and Altunışık & Tür (2006) provided the necessary historical context needed to trace the evolution of Turkish national security policy from 2002 to the present, thus instantiating and explaining the shift following the onset of the war.

To assess how the Syrian Civil War resulted in the transformation of Turkish national security policy, we used process tracing to follow the historical evolution of post-2002 Turkish security policy, identifying 2011 as a decisive turning point. Through process tracing, we were able to establish a policy shift, systematically comparing the pre-2011 “zero problems with neighbors doctrine” to the post-2011 era defined by securitization and military intervention. Secondly, we used it to establish a causal link between the security policy shifts and the Syrian Civil War. We achieved this by using the literature to trace how material security threats, such as refugee inflows from the war, led to an adjustment from soft-power diplomacy to hard securitization.

By applying comparative discourse analysis, we were further able to examine the extent to which domestic and international framings of these policy changes revealed a divergence in threat prioritization between Turkey and NATO. Firstly, by comparing MFA and NATO official statements between 2012 and 2019 in response to the Syrian Civil War, we were able to identify divergences in security discourse at the international level and the official state level. These extent of alignment and divergence were coded as: convergence, weak divergence, moderate divergence, and strong divergence. While convergence indicates strong alignment in the discourse and tone of official statements, divergence indicates misalignment in tone, content, rhetorical strategies and overall security priorities. The strength of divergence was determined by the number of issues the actors were misaligned on, the extent of tonal and other discursive differences and in instances of strong divergence, differences in threat definition and strategy. Further, by coding dominant themes and phrases from official statements, we were able to assess the extent of divergences. Secondly, by using data from Iseri & Ersoy (2021), we focused on analyzing security discourse at the domestic level. They identify a “rally-around-the-flag” effect, where populist discourse and anti-Western rhetoric were used by domestic media to frame the Syrian conflict as an existential threat to Turkish national identity. This allowed us to further validate findings from the international-domestic level analysis.

Finally, we grounded the study in two main theoretical frameworks, which were identified in the literature review. Using the ontological security framework, we were able to explain the seemingly contradictory behavior reflected in Turkey's continued NATO membership and its simultaneous pursuit of strategic autonomy, often in ways that undermined NATO's broader goals. Then, using the securitization framework, we examined how the 2011 Syrian Civil War catalyzed the transformation of Turkish security policy from a diplomatic to a hard-security approach. This allowed us to examine how

policymakers transitioned from a period of regional integration to one where refugee flows and Kurdish autonomy were framed as existential threats, thus justifying direct military intervention. This was crucial to demonstrating how Turkish internal threat prioritization superseded its alignment with NATO's strategic objectives.

Results and Findings

Evolution in Turkish National Security Policy in the Context of the Syrian Civil War

The transformation of Turkish national security policy in response to the Syrian Civil War reflects a shift from cooperative regional engagement to a securitized framework shaped by systemic pressures emanating from broader regional and international systems, along with domestic politics. Prior to the Syrian Civil War, Turkish-Syrian relations had already begun to improve, driven by converging threat perceptions and broader regional dynamics. Significant regional and international conflicts impacting this bilateral relationship include US policy towards regime change placing pressures on Syria, along with the Iraq War of 2003, which pushed the parties closer together as they shared common interests and threats. Alongside these regional and international conflicts, domestic facts related to Kurdish nationalism raised security concerns. Therefore, the interpretation of shared threats and the policy responses they resulted in were ultimately shaped by domestic concerns (Altunışık and Tür, 2006).

The onset of the Syrian Civil War intensified national security threats, leading to a shift from regime-change focused strategy towards one increasingly driven by national security concerns. This shift was reflected in the adoption of anti-Kurdish rhetoric, the launch of the Operation Euphrates Shield, and a broader emphasis on territorial control and cross-border military intervention. The large inflows of refugees, the rise of ISIS and the growing influence of Kurdish militias with perceived connections to the PKK along Turkey's southern border collectively contributed to the securitization of Turkish policy (D'Alema, 2017).

This securitized shift was also reflected in a shift in security discourse. Following the Syrian Civil War, Turkey's engagement with Syria moved from a framework of cooperation and diplomacy to threat construction, with diplomacy giving way to securitization (Wei, 2019). At the same time, regional instability due to the war, the rise of Kurdish autonomy near Turkey's southern border and increasing influence of PKK-linked groups, rendered earlier diplomatic frameworks rendered soft power diplomacy under the “zero problems with neighbors” framework unsustainable (Barkey, 2021). Therefore, Turkey's move towards hard securitization and prioritization of national security can not only be understood as the product of intentional strategy, but also as a reaction to larger regional transformations.

Further, this policy shift was not entirely strategically consistent. While influenced by security threats, overreach and miscalculation in relation to strategy with Syria significantly contributed to the strategic shift following the

war. Miscalculations regarding the trajectory of the Assad regime and their overestimation of their regional power contributed to a more inconsistent and reactive policy approach (Ayata, 2015). As a result, Turkey moved from a successful regional actor to a more isolated player and a loss of credibility and influence in the region.

Finally, this securitized turn also entailed a reorientation of Turkey's broader foreign policy alignment. While Turkey typically upholds a NATO-aligned framework in their approach to foreign policy, they shifted to an approach prioritizing immediate national security threats following the war. This framework is more closely aligned with the Russian foreign policy approach than that of the US, reflecting both Russia's re-emergence as a key regional actor and the relative decline of US influence (Hale, 2019). This further emphasizes the extent to which the Syrian conflict reshaped Turkey's security policy.

Comparing NATO and Turkish Security Policy related to Syria and the MENA region

Even as the onset of the Syrian Civil War signaled a decisive shift towards securitization in Turkish policy, this evolution did not result in the complete abandonment of diplomatic or alliance-based frameworks. Instead, Turkish security policy evolved through the interaction of competing commitments, including national security imperatives, domestic political considerations and NATO obligations. This resulted in a hybrid approach that combines elements of securitization with diplomatic approach to policy.

This is rooted in the broader evolution of Turkey's post-Cold War relationship with NATO. As shared threats and values became less clearly defined following the collapse of the USSR, an interest-based approach towards collaboration began to supersede identity-based one. At the same time, Turkey's strategic geographic location as a buffer between the Middle East and Europe, and between the Black and Mediterranean seas, has further contributed to divergences in threat perceptions between Turkey and the alliance (Oğuzlu, 2025). Consequently, Turkey has increasingly sought strategic autonomy from NATO, even when remaining formally embedded within NATO structures.

These divergences became even more pronounced in the context of the Syrian Civil War. While NATO has continued to prioritize multilateralism and collective defense following the Cold War, Turkey has prioritized unilateral action over alliance concerns in response to perceived national security threats. This includes a willingness to undertake independent military operations and to pursue policies that at times conflict with alliance preference, such as the purchase of a Russian missile defense system (Armutlu, 2023; Lami, 2018). Such divergences have become a source of tension and intra-alliance conflicts, particularly as Turkey's security priorities, such as countering Kurdish groups, do not always align with those of other member states (Lami, 2018).

However, Turkey's pursuit of strategic autonomy has not translated into a full departure from NATO. Instead,

their relationship is characterized by a persistent tension between divergence and interdependence. Turkey's membership in NATO continued to provide identity security, even as intra-alliance conflicts such as disputes constantly challenge this relationship. This is evident in the controversy around Turkey's purchase of a Russian missile defense system. While these tensions increase insecurity within the alliance, they simultaneously reinforce Turkey's need to remain in NATO (Akgül-Açıkmeşe & Aksu, 2025). This creates a dynamic in which divergence in threat prioritization coexists with continued institutional attachment.

Therefore, while the Syrian Civil War accelerated Turkey's shift towards a securitized and nationally-oriented security policy, NATO commitments remained an important, though complicating, factor. The result of these competing tensions is thus an increasingly strained alignment between NATO and Turkey, characterized by competing strategic logics.

Framing of Changing National Security Positions: Comparison between NATO, Turkish Government, and Mainstream and Domestic Media

To trace and substantiate these shifts in Turkish security policy, it is necessary to examine how they are framed across domestic and international contexts. The framing of security policy for domestic audiences provides insight into the role of domestic politics and national security concerns, while international framing, particularly communications with NATO, allows us to instantiate the role of domestic concerns and reveals how these policies are positioned, justified, and negotiated within an alliance context.

A Comparative Discourse Analysis (CDA) of statements and press releases from NATO and Turkey's Ministry of Foreign Affairs (MFA) identifies key points of tension, as well as moments in which Turkish security concerns and domestic politics took precedence over alliance commitments. The temporal dimension of this analysis further supports the identification of the Syrian Civil War, and specifically its escalation around 2012, as the pivotal point leading to these shifts.

The findings from this CDA indicate a gradual but cumulative shift from convergence to divergence in the framing of security threats between NATO and Turkey over time. While early responses to the Syrian Civil War were strongly aligned in tone and threat perception and policy framing, this alignment weakened progressively, giving way to increasingly divergent and at times competing framings. These divergences are evident both in the identification and prioritization of threats, and in the rhetorical strategies used to justify policy responses. This can be seen in Turkey's growing emphasis on sovereignty, domestic security and independent action.

As shown in Table 1, which systematically traces NATO-Turkey discourse across key events from 2012 to 2019, the relationship evolves from strong convergence to strong and sustained divergence. In 2012, NATO and Turkey exhibited strong convergence in the context of the Patriot

Missile deployment, where both actors emphasized defense, de-escalation, and regional security. However, even within the same year, early signs of divergence begin to emerge. This can be seen in the response to the shooting down of a Turkish aircraft. While Turkey emphasized the direct national security threat and the right to self-defense, NATO framing was more passive and lacked the framing of national or regional security. Though both saw Syria as responsible for the situation, Turkey's emphasis on self-defense signaled a shift away from alliance-centered security logic. Where NATO maintained an alliance-oriented framing, while Turkey adopted a more restrained and legally framed response.

By 2015, the divergence strengthened. In the contexts of Russian involvement and ISIS-related conflicts, NATO consistently framed threats in terms of regional stability and alliance security, while Turkey increasingly emphasized direct national security threats and violations of territorial sovereignty. While Turkey saw the ISIS-related attacks as an immediate national security threat and discussed their ongoing military operations as necessary, NATO prioritized counterterrorism framing and the need for ongoing solidarity. Similar divergence during the Russian violation of Turkish airspace. Even as there was alignment on the severity of Russia's offense, NATO discussed Russia's actions in terms of broader regional stability and alliance security, while Turkey emphasized violations of sovereignty and the immediacy of action.

This divergence intensifies during Turkish military operations in Syria, including Operation Euphrates Shield in 2016, Operation Olive Branch in 2018, and Operation Peace Spring in 2019. In these instances, Turkey's discourse becomes more assertive and security-driven, while NATO maintains a more cautious and diplomatically balanced framing.

Table 1: Evolution of NATO-Turkey Threat Framing and Alignment (2012-2019)

Patriot Missile Deployment, 2012	Convergence or Divergence:	Convergence
	Strength:	Strong
	NATO:	• Strong solidarity • Strong condemnation • Threat deterrence • Defense • De-escalation • Direct military aid

		• Regional stability • Regional security • Peaceful solution
	Turkey:	• National security threat • Defense • De-escalation • Regional security • "Our country" • Peaceful solution

Shooting down of Turkish aircraft by Syria, 2012	Convergence or Divergence:	Divergence
	Strength:	Weak
	NATO:	• Strong condemnation • Strong solidarity • Great concern • NATO regional security
	Turkey:	• Diplomatic solution • Legal justification • Operational justification (self-defense of sovereignty) • Procedural transparency • Alliance consultation and collective defense framing

Russian airspace violations over Turkey	Convergence or Divergence:	Divergence
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linked to Syria operations, 2015	Strength:	Moderate
	NATO:	• NATO regional security • Turkish domestic security threat • Strong solidarity • Strong condemnation (Russia) • Violation of international law (Syria) • Russian involvement • Peaceful solution
	Turkey:	• National security threat • Violation of sovereignty • Strong condemnation • Threat deterrence

NATO Emergency Meeting on the Turkey-ISIS Border Conflict, 2015	Convergence or Divergence:	Divergence
	Strength:	Moderate
	NATO:	• Strong condemnation • Terrorism • Condolences • Strong solidarity • NATO regional security • Direct Turkish security threat

	Turkey:	• Direct domestic security threat • Terrorism • Operations by Turkish armed forces • Compliance with international law
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Operation Euphrates Shield, 2016	Convergence or Divergence:	Divergence
	Strength:	Strong
	NATO:	• Strong condemnation (Russia) • Turkish national security • De-escalation • Peaceful political solution • Threat deterrence (Russia) • NATO regional security • Shift in strategic balance • Support for US military presence
	Turkey:	• Terrorism • Persistence against Syrian threat • Territorial integrity • Right to self-defense • Support for US military presence

Operation Olive Branch, 2018	Convergence or Divergence:	Divergence
	Strength:	Strong
	NATO:	• Strong solidarity • Turkish strategic importance • Continued security cooperation • Regional stability (Middle Eastern) • Terrorism • Strategic geographic location • NATO regional security • Peaceful political solution • Threats to international security
	Turkey:	• Threat to Turkish national security • Defensive • Immediate border threat • Independent strategic decision

Operation Peace Spring, 2019	Convergence or Divergence:	Divergence
	Strength:	Strong

	NATO:	• Strong solidarity • Turkish strategic importance in alliance • Alliance reassurance and collective defense commitment • Turkish importance to NATO and counterterrorism efforts • Turkish strategic geographic location • Regional stability (Middle Eastern) • Turkish direct national security threat • Legitimation of security concern while urging restraint • Peaceful political solution • Soft condemnation of Turkish-Russian partnership under sovereignty acknowledgement • Realignment toward alliance defense systems
	Turkey:	From NATO-Turkish Joint Press Release: • Misinformation (on previous NATO-Turkish operations; YPG and PYD) • Political legitimation of Operation Peace Spring with delegitimization of Kurdish YPG, PYD and PKK • Moral inconsistency framing • Counterterrorism legitimacy claim • Security-driven unilateralism/ autonomous security enforcement

		• Necessity under allied inaction • Compliance with international law • Critique of inconsistent threat classification and counterterrorism standards (of YPG/PYD) • Proximity based security justification • Acknowledgement of NATO defense support • Limits of allied security guarantees From MFA press release: • Direct national security threat • Border security and counterterrorism justification • Compliance with international law • Assertion of right to self-defense • Misinformation about civilian targeting • Strong condemnation of PYD/YPG as PKK offshoots • Commitment to preservation of Syrian territorial integrity and political unity • Critique of inconsistent threat classification and counterterrorism standards (of YPG/PYD) • Political legitimization of Operation Peace Spring with delegitimization of PYD/YPG • Appeal for allied support
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Table 2 identifies differences in tone, audience, and rhetorical strategies across NATO and Turkish

communications, therefore further disaggregating these differences. While NATO discourse remains consistently supportive, reassuring, and diplomatically cautious, Turkey's discourse is more assertive and defensive. This shift is accompanied by an increased emphasis on legal justification, self-defense, and the assertion of operational legitimacy, especially in relation to counterterrorism efforts.

Table 2: *Comparative Discourse Analysis of NATO and Turkish Communications: Tone, Audience, and Rhetorical Strategies*

Event , Year	Source	Tone	Audience	Key moves/ Rhetorical Strategies
Patriot Missile Deployment , June 2012	NATO	• Supportive • Defensive • Cooperative • Reassuring	• Turkey • NATO Allies • International community	• Operational and defensive support • Strong alliance solidarity • Defensive-only framing • Emphasis on conflict deescalation and peaceful solution • Emphasis on stability • No overt criticism of Syria or

				other actors
	Turkish MF A	• Supportive Legitimizing • Cooperative • Assertive	• Domestic NATO • International community	• Legal justification • Defensive-only framing • Alliance reassurance • Operational justification
Shooting down of Turkish aircraft by Syria, December 2012	NATO	• Condemnation • Supportive • Reassuring	• Turkey NATO allies • International community	• Strong alliance solidarity • Moral condemnation (of Syria) • Reassurance (Turkey and allies) • Legal framing

			ty	
	Turkish MF A	• Assertive • Defensive • Reactive • Legalistic	• Syria • Domestic audience • NATO • International community	• Legal justification • Operational justification (self-defense of sovereignty) • Procedural transparency • Alliance consultation and collective defense framing
NATO Emergency Meeting on the Turkey-ISIS Border Conflict, July 2015	NATO	• Condemnation • Supportive • Reassure	• Turkey NATO allies • International	• Strong alliance solidarity • Moral condemnation of terrorism • Reassurance (to Turkey and

		ing	ional community	other allies) • Global framing of terrorism threat • Deterrent signal to ISIS
	Turkish MFA	• Assertive • Defensive	• Domestic • NATO • UN and International organizations	• Legal justification (self-defense against terrorism) • Operational transparency • Active and proactive security measures • Alliance coordination (plus with other international institutions) • Moral framing

Russian airspace violations over Turkey linked to Syria operations, October 2015	NATO	• Condemnatory • Supportive • Cautionary	• Turkey • NATO allies • Russia • International community	• Strong alliance solidarity • Condemnation (Syrian violation of international law; Russia) • Threat deterrence (against Russia) • Reassurance (Turkey) • Peaceful diplomatic solution
	Turkish MFA	• Assertive • Defensive • Procedural/legalistic	• Domestic • Russia • NATO • US • France	• Legal justification (direct defense of territorial integrity and sovereignty) • Condemnation (Syria) • Diplomatic

			• n c e • It al y • U K	• frame work • Allian ce coordi nation • Threat deterr ence
Opera tion Euphr ates Shiel d, Augu st 2016	NA TO	• C au tio na ry • B al an ce d • Di pl o m a ti c	• T ur k e y • N A T O al li es • R u s s i a • In te rn a ti o n al c o m m u ni ty	• Stron g alian ce solida rity • Opera tion legiti ma tio n throug h emph asis on alian ce norms and coope ration • Indire ct endor semen t of Turkis h unilat eral action • De- escala tion, restrai nt and politic al soluti on to confli ct • Attrib ution

				of blame to Russi a for violati on of Turkis h and NAT O airspa ce
	Tur kis h MF A	• A ss ert iv e • D ef en si ve • Cr iti cal • R ea cti on ar y	• D o m es ti c • N A T O Al li es • U S • S yr ia	• Legal justifi cation of operat ion (count erterr orism) • Right to self- defens e to legiti mize milita ry action • Emph asis on alian ce norms • Conde mnati on of incons istent threat and terrori sm identif icatio n by US and allies

				• PYD/YPG/DAES H framed as direct national security threats • Operational transparency • Domestic audience reassurance (Emphasis on protection of citizens)			• T	• Stron • Assert • Emph
Operation Olive Branch, March 2018	NATO	• Diplomatic • Supportive	• NATO allies • International community • Global	• Strong alliance solidarity • Alliance reassurance • Turkish strategic importance in NATO • Links Turkish security threat			• NATO allies • Domestic • Inte	• s to broader NATO missions • Strong condemnation of chemical weapon use (Syria) • Assertion of normative commitments (against chemical weapons) • Emphasis on peaceful diplomatic solution
	Turkish MFA	• Assertive • Defensive • Reactive					• NATO allies • Domestic • Inte	From Press Release and Statement: • Legitimation of Operation Olive Branch through terrorist

			• International community • U.S. • Europe	framing of YPG, PYD and PKK • Domestic audience reassurance (Emphasis on protection of citizens) • Assertion of independence in operational decisions • Signals NATO and US cooperation • Operational transparency and adherence to agreements • Emphasis on adherence to international norms
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				• Call for solidarity from EU-NATO allies to support antiterrorism efforts
Operation Peace Spring, October 2019	NATO	• Diplomatic • Reassurance - focused • Cautionary	• International community / observers • NATO allies • Turkey	• Alliance reassurance • Strong alliance solidarity • Conditional support • Diplomatic caution • Operational cooperation emphasis
	Turkish	• Assert	• Domestics	• Operational legitimacy

	MF A	iv e • D ef en si ve • Se lf- le git im izi ng	ti c • N A T O al li es • In te rn at io n al c o m m u ni ty	n (civili an protec tion, only targeti ng PYD/ YPD) • Legal Justifi cation (UN Chart er refere nces) • Appea l to intern ationa l norms • Assert ion of sovere ignty • Deleg itimiza tion of critics • Self- defens e justifi cation
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These differences in rhetorical strategy are further reflected in the ways in which the Syrian Civil War was framed for domestic audiences. The framing of the Syrian Civil War for domestic audiences was shaped by populist AKP discourse. Mainstream media coverage converged around government-aligned narratives, producing a “rally-around-the-flag” effect. This led to framing of the conflict by mainstream media outlets to reinforce official positions. Anti-western rhetoric also played an important role, weaponizing the struggle for Turkish national identity and framing Western actors as hostile forces (İşeri & Ersoy, 2021). This supported attempts to construct a cohesive national identity during the conflict, and legitimized AKP messaging and the government’s securitized policy approach.

This inward-facing framing helps explain the assertive and security-driven tone observed in Turkish MFA communications shown in the CDA. The emphasis on national unity and external threat reflects the prioritization of domestic security concerns identified in Turkish external messaging. At the same time, this contrasts with NATO’s more consistent emphasis on multilateralism and stability.

When contrasted with Turkey’s external messaging to NATO allies, a gap becomes evident between inward populist rhetoric and outward alliance management on Syrian Civil War policy. This divergence suggests that Turkish threat prioritization is shaped both by security concerns, and domestic political imperatives. These distinct framings provide further evidence of the growing misalignment between Turkey and NATO in interpreting security threats arising from the Syrian Civil War.

Ultimately, the growing divergence between Turkey and NATO reflects a process of securitization in which threat perceptions, priorities, and responses are articulated through competing discourses. As Turkish security discourse prioritizes sovereignty, immediacy, and direct threat, the resulting divergence with NATO’s multilateral and stability-oriented framing show an emerging tension within the alliance that is both strategic and discursive.

Discussion

These findings identify patterns of both divergence and a significant transformation in the underlying logic of Turkish security policy, indicating a decisive shift from regional integration towards a framework of hard securitization. Prior to the Syrian Civil War, Turkish foreign policy was primarily characterized by soft-power diplomacy and the “zero-problems-with-neighbors” doctrine. However, as a result of the instability emerging from the conflict, seen through increasing refugee flows and the consolidation of Kurdish militias, the sustainability of this approach progressively diminished.

Within this context, assertions of Kurdish autonomy re-emerge as key points in Turkish threat perception. As Kurdish militias expanded their presence along Turkey’s southern border, Turkish security discourse framed these groups as extensions of the PKK rather than as localized actors, and thus as existential threats to territorial integrity and national identity. Identifying this reframing allows us to explain the Turkish transition from reactive security measures to more proactive and preemptive measures. Military operations such as Euphrates Shield, Olive Branch and Peace Spring therefore emerge as responses to instability and, more importantly, as the emergence of a broader securitization framework in Turkish security, centered on threat neutralization and border fortification.

The Comparative Discourse Analysis (CDA) findings also reveal that this transformation takes place alongside a progressive divergence between Turkish national security priorities and NATO’s multilateral framework. While earlier cases, such as the 2012 Patriot Missile Deployment, reflect strong convergence in both threat

perception and policy response, subsequent developments show progressive and sustained divergence. This divergence is driven by competing strategic logics between Turkey and NATO. On one hand, NATO continues to frame the Syrian Civil War and articulate threats in terms of regional stability, collective defense, and diplomatic conflict resolution, thus maintaining commitment to multilateral coordination and restraint. However, Turkish discourse centers on unilateral action and the assertion of autonomy.

This divergence is especially visible in the growing gap in threat prioritization. While NATO maintains a primary focus on counterterrorism and actors such as ISIS, Turkish discourse frames the PYD/YPG as direct national security threats, repeatedly contesting their treatment by NATO allies as legitimate partners in counterterrorism efforts. The resulting tensions are therefore rooted in policy disagreement, as well as the boundaries of legitimate threat classification itself. Turkish contestation of inconsistency in alliance threat classification, therefore, reflects an attempt to both challenge and reshape these boundaries, leading to deeper discursive and policy divergence.

The CDA findings highlight further divergences in domestic and international framing strategies. The convergence of mainstream media framing with official discourse, reinforcing and amplifying securitized narratives, contributes to a cohesive threat narrative and bolsters populist rhetoric. The consequent “rally-around-the-flag” effect produced by this framing reinforces national unity and consolidates domestic support while legitimizing assertive policy responses. However, internationally, Turkey adopts a more legalistic tone, emphasizing sovereignty, self-defense, and adherence to international law and norms. This suggests that Turkish security policy operates in two distinct but interconnected domains, where domestic politics and external legitimacy doubly shape security discourse and policy.

Altogether, these dynamics suggest a hybridization in Turkish security logic and policy. Through the ontological security lens, Turkey’s maintenance of its NATO membership reflects the continuing importance of alliance-based defense. At the same time, through the securitization framework, Turkey’s implementation of securitized policy indicates an impulse to operate outside of multilateral consensus when national security is perceived to be threatened.

Limitations

While the combined use of process tracing and comparative discourse analysis allowed our research to capture both the evolution of Turkish security policy and the ways in which it is framed across domestic and international contexts, it also introduced methodological and practical limitations. As such, our research acknowledges the various structural constraints that shape its scope and depth. The first of these limitations was the conceptual challenge of treating Turkey and NATO as monolithic entities, when in actuality, they consisted of competing institutions, factions and bureaucracies with divergent interests. Since these actors

have incentives to misrepresent their motivations in order to maintain ambiguity, official statements cannot always be taken at face value, limiting our analysis to inference from observations. These challenges are further reinforced by methodological limitations, including language and translation barriers, as well as practical limitations related to time and research capacity. The following section outlines these limitations, highlighting how they condition the conclusions that can be drawn about shifts in Turkish threat prioritization and its divergence from the NATO alliance.

Analyzing the shifting intentions of a state actor, or multistate actor in the case of NATO, is inherently difficult because the designations “Turkey” and “NATO” are themselves simplifications. States contain competing institutions, factions, and bureaucracies with divergent interests. Even in cases where interests are shared, contrasting ideas on how to achieve an end can also lead to fragmentation. “Turkey’s perspective” is a simplification; different actors within the state hold different goals and motivations at different times. Thus, our research can only give substance to the dominant underlying feeling or perspective, whatever it may be.

Additionally, state actors have a strong incentive to misrepresent their motivations to domestic and international audiences and aim to keep some level of uncertainty around their actions. Therefore, official statements cannot be taken at face value as a reflection of an actor’s strategic thinking. Their analytic value is limited purely to observing changes in messaging, which are likely deliberate and could be reflective of deeper strategic thinking. Essentially, our analysis is limited to inferring intent from observable actions like policy shifts, diplomatic realignments, and military actions. Behavioral evidence reveals patterns, but cannot fully capture the internal reasoning or factional perspectives around those patterns.

Relatedly, translation and language limitations imposed further limitations on our comparative analysis of official statements. This paper compares and contrasts official statements on the same events from both the Turkish Ministry of Foreign Affairs (MFA) and NATO. While NATO statements and documents are primarily written in English, official documents released by the MFA are issued in Turkish. Because none of our group members speaks Turkish, the MFA documents that we compared to NATO ones were translated into English. This could have unintentionally led to more accurate analyses of NATO documents because translations can skew wording, tone, and political nuance which could have led to slight misinterpretations of MFA documents.

The limited time frame for our research also constrained its scope. Due to the research members’ constraints as undergraduates and the shortened one-semester timeline, our paper is limited in both scope and depth. Although we used a standardized codebook to analyze primary sources and identify divergent framings between NATO and Turkey, time constraints limited the range of sources we could analyze and the extent to which we could reduce variability. Without these time constraints, our group would be able to

conduct a broader search for sources and an in-depth analysis to reduce variability.

Finally, the time and capacity constraints also limited our ability to obtain quantitative data. Acquiring large amounts of quantitative data is both time and labor intensive, posing challenges to our ability to collect quantitative data. On top of this, the collection and interpretation of quantitative data can be quite laborious. As students, we were restricted in the amount of labor we were able to commit to collecting quantitative data, given other responsibilities. While some quantitative data was able to be collected through coding primary sources, some difficulties were encountered, such as ambiguity, subjectiveness, and standardization. As a result, the research remains primarily qualitative, with quantitative components being mainly supplementary.

Conclusion

This study demonstrates that the Syrian Civil War marked a decisive turning point in Turkish national security policy, shifting it from a NATO-aligned framework and one focused on regional integration toward one characterized by securitization and the prioritization of unilateral action. Through process tracing, the findings show that “zero problems with neighbors” became more difficult to sustain as progression of the conflict introduced new threats, which Turkey increasingly framed as direct threats to its territorial integrity.

The Comparative Discourse Analysis (CDA) further indicates that this policy shift was accompanied by a

growing divergence between Turkey and NATO. While early responses to the Syrian conflict reflected convergence, later cases reveal strong divergence in threat prioritization and framing. This divergence is further reflected by differences in threat classification, such as Turkish framing of the PYD/YPG as direct national security threats while NATO maintained broader counterterrorism rhetoric. This tension suggests that divergence is not only present in security policy preferences, but also in threat perception and prioritization within the alliance.

The paper also highlights differences between domestic and international framing of Turkish security policy, especially in the context of the Syrian Civil War. While the Syrian Civil War is framed domestically through a securitized narrative, emphasizing national unity and sovereignty threats, Turkey’s international framing is more legalistic, and emphasizes the right to self-defense and autonomous action. This variation indicates that while Turkish security policy is shaped strongly by external pressures, domestic political considerations play a significant role.

In sum, this study suggests that the Turkey-NATO relationship has overall become more hybrid. While institutional attachment and cooperation persist for ontological security and defense guarantees, Turkey continues to pursue an autonomous security that challenges and diverges from NATO’s multilateralism. The result is therefore a substantial transformation in threat prioritization and definition, which may permanently redefine Turkey’s role within the alliance.

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POLICY PROPOSALS

Managing Trade Concentration and Economic Tensions with a Regional Cooperation and Diversification Strategy for South Korea's Semiconductor Industry

Michael Park

Since the 1980s, semiconductor technology has become a key part of South Korea's economy, establishing the country as a global leader in semiconductors, especially in memory chip manufacturing. Despite quick economic growth driven by an export-oriented strategy, that very approach has made South Korea's semiconductor industry and overall economy susceptible to external economic shocks. This paper combines a qualitative review of recent policy developments with a quantitative single-factor analysis of variance (ANOVA) evaluation of concentration patterns in memory chip exports and imports from 2014 to 2025. The findings show significant differences in trade concentration across foreign countries, demonstrating the South Korean semiconductor industry's heavy reliance on China for exports and on Japan and the U.S. for imports, highlighting vulnerability in both demand and supply chains. The paper proposes a Regional Semiconductor Resilience and Diversification Framework that strengthens Japan-South Korea trade coordination, promotes export diversification with select ASEAN economies, and establishes a trade concentration monitoring mechanism to reduce dependence on exports and imports. The proposal seeks to balance such structural exposure and foreign dependency through institutionalized coordination and diversification measures, as well as to embed concentration-monitoring mechanisms into

Introduction

Semiconductor technology has become a symbol of economic prosperity, conflict, diplomatic tensions, and national security in the past decade. Although the importance of semiconductor technology has long been established and it has been vital to the development of modern technology, its significance has shifted from a mere technological marvel to a core element of recent diplomatic, geopolitical, and economic tensions. Semiconductors, particularly in memory chips such as DRAM (dynamic random-access memory) and NAND flash (which store and process digital information in devices ranging from smartphones to data centers), have formed the backbone of South Korea's modern economy. South Korea is one of many countries that has established its global status as an economically powerful and technologically advanced nation in the semiconductor industry. Its development as a global leader in memory chip production has played a crucial role in its significant economic growth over the last sixty years.

However, South Korea's expertise, innovation, and growth in memory chip production depend heavily on economic relations with key foreign countries. China is a major export destination, and the U.S. and Japan are critical suppliers of semiconductor manufacturing equipment and wafers, photoresists, and specialty etching gases, which are upstream materials critical for the memory chip production process (Jeong, 2024; KITA, 2026). With semiconductor technology at the center of escalating economic tensions between China and the U.S. and serving as a tool for diplomatic strategies, South Korea's heavy reliance on a small number of downstream markets and upstream suppliers exposes its memory chip industry, as well as its broader export-driven economy, to export controls and external policy shocks. Given the unpredictability of international economic and diplomatic relations, particularly those affecting semiconductor supply chains, a policy framework that strengthens diversification, supply chain coordination, and trade risk management is necessary to

better protect South Korea's long-term economic stability and diplomatic flexibility.

Policy Definition

South Korea's semiconductor industry, particularly its specialization in memory chip production, has become a central pillar of the national economy. Beginning in the 1980s and accelerating in the early 2000s, South Korea pursued an export-oriented industrial development model that led to technological innovation and integration into global technology markets. Early cooperation with Japanese companies such as Toshiba facilitated the domestic development of semiconductor capabilities (Hwang & Yoon, 2025). Large chaebol-led firms—a Korean term for large family-led conglomerates—such as SK Hynix, focused on global competitiveness in two kinds of memory chips: DRAM, a type of high-performance memory chip that relies on a power source to retain memory, and NAND, a type of memory chip used for long-term storage (Micron, 2026). As a result, semiconductors became one of South Korea's most important export sectors, accounting for 20.7% of all exports in 2023 (Jeong, 2024), making it a global leader in the industry today.

However, this export-driven growth model also created structural vulnerability by fostering a high dependence on foreign suppliers of critical components and materials for industrial production. Heo & Kim (2025) note that South Korea's semiconductor industry and production depend significantly on imported materials and foreign equipment, reflecting the industry's highly global nature. Jeong (2024) further notes that, in South Korea's semiconductor manufacturing and materials sector, approximately 34% of Korean items are more than 70% dependent on imports, underscoring Korea's reliance on imports for semiconductor production. While such interdependence maximizes efficiency and, therefore, competitiveness on a global scale, it exposes the South Korean semiconductor industry and the broader economy to

global supply chain disruptions and external political shocks.

These dependencies became increasingly problematic as geopolitical conditions shifted in the mid-2010s. Amicable relations among China, South Korea, and the U.S. throughout the 1990s facilitated mutual economic growth in South Korea and China (Piao & Li, 2025). China emerged as South Korea's largest trading partner, accounting for 35.8% of Korean semiconductor exports in 2023 (Jeong, 2024) and roughly 40% of all Korean exports in 2024 (Heo & Kim, 2025), while the U.S. remained its primary security partner against North Korea. This dual alignment allowed South Korea to pursue a hedging strategy—maintaining close security ties with the U.S. while deepening economic ties with China. However, the escalation of the U.S.-China trade war and the resulting increase in political tensions between the U.S. and China generated indirect but significant spillover effects for South Korea, given its deep integration with both countries. As tariffs and trade restrictions reduced Chinese production and exports of goods that use South Korean intermediate goods, particularly memory chips, Korean intermediate-good exports to China were adversely affected, given their role in Chinese manufacturing (Heo & Kim, 2025). South Korea's dependence on foreign markets, especially China, became evident when South Korean semiconductor exports dropped 14% in October 2022 following U.S. export controls on China, including a 32% drop in memory semiconductor exports, a subset of the semiconductor industry (Kim & Cho, 2024). Given that semiconductor exports are such an integral part of the South Korean economy, a sharp decline in exports highlights the economy's susceptibility to external economic conflicts due to its heavy dependence on a single foreign market.

Japan is another country deeply economically involved with South Korea and its semiconductor industry, being a party in sourcing material required for memory chip and semiconductor-based production processes in South Korea. Historical tensions between the two countries also pose risks of economic shocks. In 2019, a major economic conflict began between the two countries over lingering anger stemming from Japanese colonial rule in South Korea from 1910 to 1945, which led to Japanese export restrictions on upstream materials critical to South Korean memory chip manufacturing (Maizland, 2019).

As U.S.-China tensions continue to rise, South Korea has increasingly emphasized domestic capacity expansion and strategic policy support for its semiconductor industry, specifically. In 2022, the South Korean government passed the Act on Special Measures to Strengthen and Protect the Competitiveness of National High-Tech Strategic Industries, which selects tech-based industries deemed important for economic development—such as DRAM, NAND, and flash memory production—and provides incentives to support companies, including research and development (R&D) and reducing production barriers (Hwang & Yoon, 2025). That same year, the government also passed the Act on Restriction of Special Taxation, which provides tax credits for semiconductor companies and

larger tax benefits for companies that invest in national semiconductor facilities and research and development programs (Hwang & Yoon, 2025). These pieces of legislation are among the ways the South Korean government is using domestic policies to support its semiconductor industry in navigating the evolving, unpredictable risks posed by the ongoing economic and political tensions between China and the U.S.

Broader literature suggests that national-level responses face inherent limitations in their effectiveness in navigating the risks posed by external political tensions. Shin & Shin (2021) emphasize that South Korea remains embedded in global supply chains, characterized by reliance on foreign equipment suppliers and dependence on external markets for materials and components, with multiple foreign actors involved, such as Japan, China, and the U.S. Domestic policy incentives and production expansion do not directly address dependence on foreign materials and equipment for semiconductor production, nor do they mitigate risks arising from foreign trade and political tensions. Furthermore, the strategic choices of the previous administration led by now-impeached President Yoon Suk-Yeol from 2022 to 2024 have complicated South Korea's hedging strategy. According to Heo & Kim (2025), the Yoon administration moved away from the long-standing hedging approach and toward closer alignment with the U.S. Such a shift may make returning to the previously held hedging strategy difficult due to increased pressure from Washington, D.C., to maintain a stronger alignment with the U.S., potentially limiting South Korea's flexibility in managing economic ties with China.

Taken together, the heavy reliance on foreign materials, geopolitical pressures, and policy constraints form the core of South Korea's limited semiconductor policy problem. The country's semiconductor success has deepened interdependence, leaving the industry vulnerable to external pressures that domestic policy cannot fully mitigate. Existing policies have primarily focused on domestic capacity expansion through tax incentives and subsidies for high-tech industries, but they do not address structural concentration in export markets or upstream materials sourcing. The policy gap lies in the absence of frameworks or policies to mitigate economic shocks arising from external concentration and to manage trade concentration and supply chain vulnerability. This paper aims to address this gap by proposing a policy focused on reinforcing economic security and mitigating vulnerability through an economic diversification framework.

Causes and Origins

South Korea's semiconductor industry must be understood within the broader context of the country's export-driven developmental state model that emerged in the aftermath of the Korean War. In the early 1960s, South Korea, devastated by the war and characterized by low productivity and limited industrial capabilities, adopted an aggressive industrialization strategy centered on state-led planning and export promotion (Bu, 2023). Through a series

of Five-Year Plans beginning in 1962, the government prioritized infrastructure development, heavy industry, and export competitiveness, emphasizing government coordination with large chaebols and integration into global markets (Bu, 2023). Emphasis on exports became the core mechanism of economic expansion, linking domestic industrial upgrading to international demand.

By the late 1970s and early 1980s, South Korea began transitioning from light manufacturing to technologically intensive sectors, which ultimately laid the foundation for a semiconductor industry (Sayakina, 2024). Initially, semiconductor activity in South Korea consisted primarily of assembly operations for foreign firms from the 1960s through the 1970s, including Toshiba, Signetics, Motorola, and Fairchild, which established production plants in the country (Sayakina, 2024). In the early 1980s, major chaebols such as Samsung, Hyundai, and Goldstar entered the semiconductor market and invested in very-large-scale integration (VLSI) technology, which is the practical application of semiconductors that enables memory chip and microprocessor production, and wafer fabrication facilities, which print the complex patterns onto semiconductors needed for its function (Byun, 1994). During this initial phase, the Korean semiconductor industry grew at an annual rate of 25.5% between 1984 and 1992, and semiconductor exports grew at an annual rate of 23.6% (Byun, 1994). Such growth resulted from advances in semiconductor knowledge and manufacturing, with the South Korean semiconductor industry embedded in sustained government-led industrial policy, export-oriented development strategies, and South Korea's broader state-coordinated industrial growth. By 1991, South Korea had progressed from simple assembly to mass production of DRAM chips, with rapid increases in production, expertise, and exports (Byun, 1994).

This rapid expansion of the Korean semiconductor industry through the 1990s, driven by a core focus on exports and globalization, was also significantly aided by government policy. As the Korean economic growth model included coordination between the government and large chaebols in sectors such as infrastructure and manufacturing, the same can be said of the semiconductor industry. The government has provided numerous subsidies to semiconductor firms, demonstrating that it has regarded the semiconductor industry as one of the nation's strategic industries and has supported R&D and workforce training that individual firms could not afford (Byun, 1994). The Ministry of Science and Technology emphasized promoting basic research and played a critical role in mediating collaborative efforts among private firms, leading initiatives to raise funds for joint R&D programs, including those of participating firms (Byun, 1994). With favorable government policy, the rapid growth of South Korea's semiconductor industry has led to its overall share in the global semiconductor market reaching 20% in 2022 (Sayakina, 2024).

Importantly, South Korea's semiconductor development was deeply embedded in global interdependence from its inception. Its success depended on stable trade relations and access to supply chains to source

materials and resources for its semiconductor production. By the 2010s, this interdependence overlapped with intensifying geopolitical tension between the U.S. and China. As Sayakina (2024) notes, semiconductors have transitioned from being treated primarily as a commercial good to being framed as a strategic technology central to national security, highlighting the increased connection between semiconductor technology and geopolitical relations. The introduction of the U.S. CHIPS and Science Act in 2022, which encouraged domestic production of semiconductors in the U.S. and imposed strict export controls on Chinese semiconductor-based technologies, highlighted how semiconductor supply chains could be "weaponized" amid geopolitical tensions (Sayakina, 2024). These measures pressure South Korean firms with operations in China to comply with U.S. export regulations, thus restricting their ability to export advanced semiconductor equipment and chips to China. Given that South Korea's semiconductor industry relies heavily on both countries, it has been exposed to spillover effects as a major exporter to both, resulting from external geopolitical tensions (Kim & Cho, 2024), highlighting the vulnerability of the Korean semiconductor industry amid such tensions.

Impacted Parties and Actors

Republic of Korea

The Republic of Korea is the primary actor affected by the lack of a semiconductor policy that provides diversification measures to mitigate the vulnerability arising from its heavy dependence on foreign markets for its semiconductor industry. South Korea's semiconductor industry—particularly its dominance in memory chips such as DRAM and NAND—constitutes a foundational pillar of its export-driven growth model and of its position as a global semiconductor powerhouse. Since the 1980s, the Korean government has pursued industrial upgrading through coordinating state support, chaebol investment and development, and integration into global value chains (Byun, 1994; Hwang & Yoon, 2025). Over time, semiconductors became one of the country's most important export sectors, contributing significantly to its economic growth and technological competitiveness.

However, South Korea's semiconductor success is deeply intertwined with foreign markets, heavy reliance on foreign materials and equipment for semiconductor production, and external geopolitical conditions. Korean firms depend on imported manufacturing equipment and materials, particularly from the U.S. and Japan

(Shin & Shin, 2021), while exporting a large share of intermediate semiconductor goods to China and the U.S. (Heo & Kim, 2025). This interdependence exposes South Korea to external economic and political shocks that extend beyond the direct control of domestic policy aimed at supporting the national semiconductor industry. Furthermore, South Korea's dependence on foreign goods and its geopolitical position limit the effectiveness of domestic policy in helping its semiconductor industry navigate intensifying external geopolitical tensions between the U.S. and China. Policy decisions to pursue regional cooperation or maintain a primarily national strategy directly affect its economic stability, diplomatic posture, relations with other countries, and long-term industrial competitiveness.

Ministry of Trade, Industry, and Resources (MOTIR)

South Korea's Ministry of Trade, Industry, and Resources (MOTIR), formerly the Ministry of Trade, Industry, and Energy, is the primary state actor responsible for economic policy, strategy, and trade governance, especially with the industrial sector. It designs subsidy programs, oversees export regulations, facilitates economic negotiations and agreements, and administers policies surrounding the semiconductor industry. Given the lack of a South Korean semiconductor policy to mitigate external shocks stemming from heavy dependence on foreign markets, MOTIR faces the challenge of balancing economic security with geopolitical flexibility while ensuring continued economic growth in South Korea. It must navigate relationships with China as a major export partner, the U.S. as a security ally, and other suppliers and export destinations through its domestic economic policies and incentives. The MOTIR's role is to manage exposure and highlight vulnerabilities while maintaining South Korea's economic competitiveness and diplomatic flexibility (Ministry of Trade, Industry, and Resources [MOTIR], n.d.).

Major Semiconductor Firms

Semiconductor firms, especially memory manufacturers, such as Samsung Electronics and SK Hynix, are the most directly exposed domestic actors in South Korea. These firms are drivers of the Korean semiconductor industry and play a significant role in semiconductor exports and imports, which ultimately accounted for 20% of all South Korean exports and 16.5% of imports in 2023 (Jeong, 2024). As a result, these firms also depend heavily on foreign markets for export revenue and on foreign suppliers for advanced materials and equipment that are crucial for their memory chip production processes. Their production networks are global, with substantial ties to China, Japan, and the U.S., which is reflected in South Korea's significant

reliance on those countries for semiconductor exports and imports. While this framework has enabled efficiency and technological advancement in semiconductor development, it leaves firms vulnerable to regulatory shifts, export controls, and geopolitical tensions beyond their control. These companies would be incentivized to seek stability and predictability in their global supply chains, both downstream and upstream, without altering profitable trade relationships.

United States of America

The U.S. has played a direct foundational role in South Korea's modern political and security development, while indirectly shaping its economy as an ally and security guarantor. Following the armistice agreement that ended the fighting of the Korean War in 1953, the U.S.-Republic of Korea Mutual Defense Treaty established a formal military alliance, under which the U.S. continues to provide extended deterrence against North Korea in conjunction with the Korean Army (U.S. Department of State, 1953). Security coordination and constant monitoring of North Korea remains central to South Korean security and foreign policy relations with the U.S. This alliance shapes broader diplomatic, strategic, and economic decisions for South Korea.

Beyond security ties, the U.S. holds a dominant position in the modern semiconductor industry. Historically, U.S. firms provided technological assistance and laid the foundation for the Korean semiconductor industry (Sayakina, 2024). In recent years, however, intensifying trade and, thus, political tensions between the U.S. and China have led to a degree of weaponization of global supply chains, which implies semiconductors as strategic technologies essential to national security (Sayakina, 2024). Export controls targeting Chinese firms and domestic industrial legislation, such as the 2022 CHIPS and Science Act, reflect this shift and highlight the U.S. motivation to preserve technological power. These measures affect the exports of the Korean semiconductor industry, as it is integrated into a supply chain in which China and the U.S. account for a large share of Korean semiconductor exports (Heo & Kim, 2025). As geopolitical rivalry with China intensifies, the U.S. government may pressure South Korea to abandon its hedging strategy of maintaining a balanced relationship between the U.S. and China, thereby jeopardizing the economic integrity of the Korean semiconductor industry and deepening economic ties with China. The U.S. thus influences South Korea's industrial planning, economic strategy, and diplomatic alignment decisions, which define the constraints within which domestic Korean policy aids its semiconductor industry.

People's Republic of China

China is a major economic partner for South Korea and a major destination for Korean semiconductor exports, which are used as intermediate goods in the production of Chinese technology. Since the establishment of diplomatic relations in 1992, economic ties between South Korea and

China have expanded, contributing to growth in trade and production cooperation, with China accounting for 35.8% of Korean semiconductor exports in 2023 (Piao & Li, 2025; Jeong, 2024). China is both a market for Korean semiconductor products and a manufacturing location for certain companies. This economic integration supported South Korea's export-driven growth strategy and reinforced economic interdependence.

However, South Korea's economic position has become increasingly complex amid intensifying U.S.-China tensions. U.S. export restrictions targeting the development of Chinese technology affect Korean semiconductor production operations that use U.S. equipment in Chinese markets, as Korean companies are limited in their ability to source necessary equipment (Piao and Li, 2025). In addition, China's motivation to achieve self-sufficiency in semiconductor production creates uncertainty for foreign companies with operations in the country. Furthermore, prior episodes of economic retaliation demonstrate the potential for political disputes, especially involving the U.S., given its ongoing trade conflict with China, to disrupt economic relations and highlight China's incentive to maintain influence in the region. For example, in 2016, China imposed economic sanctions on South Korea after the deployment of a U.S.-led missile defense system, known as THAAD, due to concerns about its long-range capabilities and proximity to the Korean peninsula (Piao & Li, 2025). These developments led to strategic and economic uncertainty for South Korea. This episode highlights the real possibility of Chinese economic responses that could hurt the South Korean economy—especially the semiconductor industry, given the high dependence of the South Korean semiconductor industry on Chinese markets—as well as the sensitive geopolitics and diplomatic relations that South Korea must navigate. Any regional semiconductor cooperation initiative must consider China's market size and production capabilities, as they are central to the regional semiconductor ecosystem.

Japan

Japan plays an important role in the semiconductor supply chain due to its production of chemicals, components, and manufacturing equipment. Although South Korea has developed advanced fabrication capabilities, it remains dependent on foundational foreign chemicals and raw resources for critical production processes, many of which originate from Japan (Shin & Shin, 2021). Although the value of these Japanese imports is small, at \$33.6 million per month, the semiconductor exports dependent on these goods are worth \$8.4 billion per month (Ezell, 2020), highlighting the critical importance of these imports. In addition, in 2019, a South Korea-Japan trade conflict—originating in disputes surrounding the Korean demand for restitution regarding the Japanese colonial rule over South Korea in the early 20th century—placed restrictions on Japanese exports of these goods to South Korea, and had the

potential to shrink the Korean economy by 2.6% in 2020 had such restrictions persisted (Ezell, 2020). This revealed the vulnerability of Korean production to supply chain disruptions and highlighted the strategic importance of upstream dependencies, as well as Japan's strategic influence in semiconductor supply chains. Japan's influence in the semiconductor ecosystem, which is small in monetary terms but critical to the supply chain, places Japan in a position of supply-chain leverage and as a potential partner in multilateral semiconductor agreements that could influence the global semiconductor market.

Methodology

This proposal examines quantitative and qualitative data to analyze how South Korea's semiconductor policy has evolved in response to rising global demand for semiconductor-based technologies and the intensification of the U.S.-China geopolitical and economic rivalry. It also evaluates the strategic adjustments in Korean semiconductor policy necessary to enhance economic resilience and geopolitical flexibility. For the purposes of this methodology, semiconductor policy refers to the set of government measures aimed at sustaining the competitiveness and security of South Korea's semiconductor industry, including subsidies, tax incentives, R&D funding, export control decisions, and participation in international semiconductor market coordination initiatives. To determine potential policies to reinforce South Korea's semiconductor industry, the proposal combines qualitative historical policy analysis with quantitative analysis of trade and supply chain indicators in the semiconductor sector.

The qualitative analysis examines the development of South Korea's export-oriented economic model, particularly for the semiconductor industry, through key political and economic developments from 2016 onwards. These events include the deployment of the THAAD missile defense system in 2016, the escalation of the U.S.-China trade war beginning in 2018, the expansion of U.S. semiconductor export controls through the 2022 CHIPS Act, and South Korea's high-tech strategic industry legislation in 2022. Official Korean government trade reports are analyzed alongside peer-reviewed academic literature. This helps identify connections between external geopolitical shocks and domestic semiconductor-related policy adjustments, examining whether they prioritize domestic capacity expansion, address upstream supply-chain dependencies, or include alliance-based frameworks.

The quantitative analysis examines measurable indicators of structural vulnerability between 2015 and 2025, covering the pre-escalation period of U.S.-China trade conflicts (2014-2018) and the post-escalation period (2018-2025). Indicators include measuring trade export concentration ratios and import dependency in semiconductor manufacturing equipment and materials. ANOVA tests are used to compare export diversification and dependency across key partner countries (China, the U.S., Japan, and select ASEAN countries). This quantitative analysis of these indicators allows for a clear comparison of

the structural exposure and dependency of South Korea's semiconductor market.

Policy Recommendation

Policy Statement

South Korea's semiconductor industry is the product of an economic growth model driven by export-oriented development. However, this model has generated a heavy structural dependence on select foreign countries and markets to maintain a high level of production. Heavy dependence on foreign markets carries the risk of shocks arising from economic and geopolitical tensions. While it is difficult for an economy built on export-driven growth to fundamentally reduce its reliance on foreign markets for economic development, as is the case for South Korea, adopting a cooperative approach with regional partners can help mitigate the effects of economic shocks stemming from heavy dependence on select foreign countries.

This proposed policy is a Regional Semiconductor Resilience and Diversification Framework (RSRDF), and the central objective is to reduce structural concentration—a reliance on a small number of countries—in both semiconductor exports and manufacturing input imports, thereby strengthening long-term economic resilience in South Korea. The policy framework includes three key components: (1) institutionalizing structured semiconductor trade coordination with Japan in order to reinforce economic security in sourcing upstream materials and mitigate vulnerabilities with heavy import concentration, (2) strategically diversifying export and import markets through deeper engagement with select ASEAN (Association of Southeast Nations) economies to provide a further hedge against potential economic shocks and resulting vulnerabilities South Korea faces due to heavy export concentration with China, and (3) a semiconductor trade concentration monitoring system to embed governance and incentives with the goals of the framework. This three-stage approach allows the Korean government to at least address the vulnerabilities arising from its current levels of trade concentration in a single foreign country, and to include incentive measures to achieve these goals.

1. Japan-South Korea Semiconductor Trade Coordination Agreement

South Korea and Japan will formalize a bilateral Semiconductor Resources Coordination Agreement under the authority of South Korea's Ministry of Trade, Industry, and Resources (MOTIR) and Japan's Ministry of Economy, Trade, and Industry (METI). The agreement will include a consultation mechanism requiring a 60-day notification period before the imposition of export controls or regulatory measures affecting semiconductor manufacturing materials and fabrication inputs, such as boules and wafers. This notification period would provide sufficient time for both governments to form a regulatory review committee, including trade officials, economic analysts, and industry representatives, to assess the economic impacts of potential

export controls and regulatory measures before they take effect.

In addition, the agreement establishes a five-year public-private joint research and development fund focused on strengthening the technological complementarity between Japanese upstream materials producers (who produce key components of memory chips, such as wafers and boules, and their components, such as photoresists and specialty etching gases) and Korean memory fabrication firms. The program would prioritize wafer-fabrication optimization and the compatibility of advanced materials with Korean DRAM and NAND production processes. The fund would be jointly financed by Korea's MOTIR and Japan's METI, with matching contributions from participating firms in both countries, such as memory chip producers like Samsung Electronics and SK Hynix from South Korea, and upstream materials producers such as Shin-Etsu Chemical and Tokyo Ohka Kogyo from Japan.

Under this program, Japanese upstream materials products will focus on materials innovation and the development of new fabrication inputs to adapt to next-generation memory chips. Korean memory fabrication firms will test new materials and optimize their capabilities with advanced chip models. By collaborating and integrating upstream material design with downstream fabrication application, the fund institutionalizes cross-border technological coordination rather than depending on transactional trade relationships.

A bilateral emergency supply protocol will also be implemented to provide regulatory flexibility and coordination in the event of an external trade disruption or supply chain shock affecting the semiconductor production supply chain in both countries. At the government level, MOTIR and METI will establish a response protocol to expedite export licensing, allowing critical materials to be delivered to Korean firms. South Korea will reciprocate by prioritizing expedited customs clearance and logistics support for Japanese upstream suppliers if downstream fabrication components are disrupted. Regulatory reviews that typically would take longer will be processed within a shortened emergency window of five to ten days. Together, these measures institutionalize upstream supply sustainability.

2. ASEAN Semiconductor Export and Import Diversification

South Korea will expand semiconductor trade and investment ties with select ASEAN economies that already play a major role in its upstream supply chain, materials imports, and final memory chips exports. These countries are Vietnam, Singapore, the Philippines, Malaysia, Indonesia, and Thailand, for this policy, because they play established roles in the downstream semiconductor supply chain, such as assembly, packaging, and electronics manufacturing, as well as select roles in upstream materials production.

The MOTIR, in coordination with the Korea Development Bank (KDB)—a state-owned bank aimed at encouraging South Korea’s industrial development—will provide subsidies and credit guarantees on loans to Korean semiconductor firms expanding operations into designated ASEAN markets. The initiative reallocates a portion of current support packages for the high-tech industry toward diversification objectives. In 2025, the South Korean government increased its semiconductor package to \$23 billion to support high-tech sectors amid rising global trade tensions, including funding subsidies and low-interest loans for semiconductor materials producers (Choi, 2025). The initiative reallocates a portion of current high-tech industry support packages toward diversification objectives, providing subsidies and credit guarantees for loans not only to domestic producers of materials but also to reduce investment risk for firms expanding into designated ASEAN markets.

Eligible firms, as demonstrated by a reduction in trade concentration with a single export partner beyond current thresholds through expansion, may receive subsidies to cover operational costs—including establishing and expanding assembly, packaging, and intermediate materials-processing operations. Currently, firms receive tax cuts of 20% to 30% for supporting domestic production, depending on firm size (United Nations Trade and Development [UNCTAD], 2025), so eligible firms seeking to expand beyond domestic reach may receive subsidies covering up to 30% of their operations. In addition, KDB will provide loan guarantees covering up to 65% of overseas investment financing costs, lowering investment costs. These subsidies and credit guarantees aim to reduce investment risk and encourage firms to diversify operations rather than remain concentrated in a single market.

In addition, this component of the policy framework will encourage diversification in upstream supply chain materials acquisitions for semiconductor production by supporting long-term sourcing agreements with ASEAN-based suppliers of those goods (including wafers, boules, and intermediate inputs), particularly in advanced hubs such as Singapore. These agreements will include multi-year commitments from Korean firms, providing ASEAN suppliers with guaranteed demand volumes and stability. In return, Korean firms will secure priority allocation during supply disruptions. By offering predictable demand, technological collaboration, and regulatory facilitation, this arrangement ensures that ASEAN-based suppliers and customers benefit from deeper integration into South Korea’s semiconductor ecosystem as it continues to develop domestically.

3. Semiconductor Trade Concentration Monitoring Mechanism

South Korea will establish a Semiconductor Trade Concentration Monitoring Mechanism under the MOTIR, administered by a Concentration Assessment Division within the MOTIR, to institutionalize oversight of export

destination concentration and upstream materials import dependency as it pertains to the semiconductor industry and the materials required for memory chip production in South Korea. Predefined concentration benchmarks, determined based on rolling three-year averages of the countries with the highest import and export concentration, will be established for both the export concentration of memory chips and the import concentration of intermediary semiconductor parts to set annual diversification targets. If thresholds are exceeded, an automatic diversification review will be triggered.

The MOTIR will be responsible for calculating concentration ratios and publishing concentration reports, determining whether benchmarks are being upheld or breached. Korean semiconductor firms such as Samsung Electronics and SK Hynix will provide relevant sourcing data, and if thresholds are exceeded, will be required to submit diversification plans to maintain eligibility for state subsidies, tax incentives, and credit guarantees. Administrative funding for the mechanism will come from the MOTIR’s existing budget for the semiconductor industry strategy.

The mechanism allows the South Korean semiconductor industry, its economy, and its firms to identify emerging vulnerabilities and gradually encourage diversification, rather than reacting to geopolitical shocks following disruptions to trade flows. For firms, the mechanism increases transparency while preserving operational flexibility and incentivizing them to seek subsidies, tax credits, and other financial support from the government. Embedding diversification benchmarks into governance provides another incentive to reduce overdependence on a single market or supplier, while reinforcing economic resilience.

Policy Analysis

Strengths

The proposed Regional Semiconductor Resilience and Diversification Framework directly addresses export market concentration in South Korea’s semiconductor-related exports, as memory chip exports are heavily weighted toward a small number of foreign markets. A single-factor analysis of variance (ANOVA) was conducted to test whether the South Korean mean memory chip export share differed significantly across major trading partners—China and Hong Kong, Taiwan, Japan, the U.S., and select ASEAN economies between 2014 and 2025 (Figure 1).

	China/HK	Taiwan	USA	Japan	ASEAN
2025	44.23%	24.35%	0.70%	0.64%	24.71%
2024	54.56%	17.09%	1.37%	0.64%	21.23%
2023	57.65%	10.43%	0.83%	1.33%	24.01%
2022	58.47%	10.45%	1.14%	0.84%	24.51%
2021	64.60%	9.22%	1.29%	0.89%	20.43%
2020	66.07%	7.10%	1.45%	0.77%	20.92%
2019	67.27%	5.12%	1.59%	0.92%	20.71%
2018	70.88%	5.60%	1.33%	0.78%	18.04%
2017	70.28%	4.68%	0.67%	0.98%	20.07%
2016	67.92%	5.81%	0.91%	1.84%	20.27%
2015	68.88%	5.65%	0.94%	2.12%	19.47%
2014	64.34%	7.15%	1.20%	2.11%	21.22%

Figure 1. % Share of South Korean memory chip exports between China/HK, Taiwan, USA, Japan, ASEAN, 2014-2025 (KITA, 2026)

The results demonstrated a statistically significant ($p=7.28E-40 < 0.05$) difference in South Korean memory chip export shares across major trading partners (Fig. 2), with China and Hong Kong accounting for a disproportionately large share relative to other countries, around 44% in 2025 (Figure 1).

ANOVA Summary						
Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	3.198887	4	0.7996722	397.20285	7.28E-40	2.5396886
Within Groups	0.1107042	55	0.0020128			
Total	3.309592	59				

Figure 2. ANOVA test summary, South Korean memory chip export shares

The statistically significant difference confirmed South Korea's heavy dependence on a single market for memory chip exports. The ASEAN Diversification initiative further enhances resilience by integrating South Korea more deeply into regional assembly, packaging, and intermediate production networks. Rather than distancing from major partners, the framework focuses on the redistribution of trade exposure with other markets, particularly ASEAN. By institutionalizing diversification through ASEAN integration and structured regional coordination, the framework reduces reliance on a single downstream market while preserving geopolitical stability.

Second, the framework also addresses demand-side vulnerability, reducing upstream material vulnerability and reinforcing economic security. Another single-factor ANOVA was conducted to test whether the South Korean percentage import share of resources required for memory chip production, specifically boules and wafers, differed across the same major trading partners listed above (Figure 3).

	China/HK	Taiwan	USA	Japan	ASEAN
2025	1.55%	1.47%	18.61%	23.07%	18.11%
2024	2.18%	3.04%	19.63%	22.68%	17.60%
2023	1.22%	1.73%	22.39%	20.54%	16.66%
2022	1.46%	2.45%	26.10%	25.25%	13.69%
2021	0.98%	1.23%	26.89%	24.49%	13.71%
2020	1.11%	1.90%	26.83%	27.23%	11.32%
2019	1.57%	1.62%	30.65%	31.81%	9.79%
2018	1.18%	0.86%	25.03%	34.41%	10.05%
2017	0.78%	4.69%	26.82%	35.05%	12.49%
2016	1.11%	4.40%	27.36%	36.79%	8.87%
2015	2.60%	2.38%	30.68%	29.29%	7.12%
2014	3.81%	0.87%	32.98%	27.93%	5.28%

Figure 3. % Share of South Korean imports of resources required for semiconductor production (boules, wafers) between China/HK, Taiwan, USA, Japan, ASEAN, 2014-2025 (KITA, 2026)

The results demonstrated a statistically significant ($p=1.248E-28 < 0.05$) difference in South Korean memory chip production input import shares across major trading partners between 2014 and 2025 (Figure 4), particularly a high reliance on Japan and the U.S., accounting for 23.07% and 18.61% of the shares, respectively (Figure 3).

ANOVA Summary						
Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	0.77457783	4	0.1936443	146.397992	1.248E-28	2.5396886
Within Groups	0.072749879	55	0.0013233			
Total	0.8473276	59				

Figure 4. ANOVA test summary, South Korean imports of boules and wafers (KITA, 2026)

The institutionalized Japan-South Korea Semiconductor Trade Coordination Agreement would strengthen predictability in material supply. The agreement adds further upstream security in the memory chip supply chain for South Korea, without significantly disrupting its upstream dependency on the U.S., further providing additional economic security without decoupling from the U.S. dependency, which otherwise could translate into diplomatic imbalances between China and the U.S. By reinforcing technological complementarity, with Japan in advanced materials production and South Korea in memory fabrication, the policy stabilizes a critical segment of the memory chip supply chain while maintaining production efficiency.

Finally, the framework institutionalizes long-term structural risk management through the concentration monitoring mechanism. Rather than reacting to trade disruptions after they occur and leave an impact on the South Korean economy, the mechanism establishes benchmarks and rolling assessments to identify emerging vulnerabilities. The statistical evidence of import and export concentration from the ANOVA tests highlights the need for institutional oversight and governance. Given rising economic tensions between the U.S. and China, and South Korea's heavy reliance on both nations for imports and exports, South Korea is susceptible to economic shocks on both the import and export sides. The framework is designed to hedge against such risks, and by linking diversification benchmarks to governance and eligibility for state incentives, the monitoring mechanism creates a long-term

risk-management system that aligns semiconductor policy with economic security.

Weaknesses

Despite its strengths, the proposed framework faces structural and geopolitical limitations. First, export diversification may expose South Korea to economic retaliation from China. Since China remains South Korea's largest semiconductor export market, accounting for 44% of its memory chip exports (KITA, 2026), China may interpret a redistribution of trade exposure as an alignment with the U.S., given South Korea's security ties with the U.S. Given prior episodes of economic pressure from China—for example, when China responded with economic pressure to the installation of THAAD, a U.S.-led missile defense system in South Korea, which China interpreted as a strategic diplomatic repositioning—retaliatory measures cannot be entirely ruled out (Piao & Li, 2025).

Second, upstream coordination with Japan may be constrained due to historical disputes that have, in the past, spilled over into economic and diplomatic relations between Japan and South Korea. In 2019, a major economic conflict began between the two countries over lingering anger stemming from Japanese colonial rule in South Korea from 1910 to 1945, which led to Japanese export restrictions on upstream materials critical to South Korean memory chip manufacturing (Maizland, 2019). Such episodes of discord between the two countries, sparked by historical conflicts, can periodically strain bilateral relations, limiting the upstream materials security provided by the Japan-South Korea Semiconductor Trade Coordination Agreement.

Policy Alternatives

Maintaining Domestic Semiconductor Funding for Expansion Mechanisms

Alternatively, South Korea can continue prioritizing domestic semiconductor expansion in manufacturing and development capabilities through semiconductor industry-focused funding stimulus packages that include subsidies, targeted tax incentives, and public R&D funding, as it has done previously (Hwang & Yoon, 2025; White, 2023). With the MOTIR, the government would continue allocating funding through established semiconductor industry support programs, reinforcing investments in fabrication capacity and memory chip development and innovation. This approach would benefit major memory production firms and advanced manufacturing facilities operating domestically within South Korea. The policy would keep focus primarily on strengthening internal resilience and technological leadership rather than restructuring external trade relationships and managing supply chain uncertainty. By expanding domestic fabrication capabilities, advancing innovation, and reinforcing domestic production facilities, South Korea can enhance its global competitiveness in the production of high-quality advanced semiconductor products.

While this strategy strengthens internal technological advancement and long-term innovation capacity, it does not reduce structural export or import concentration, nor does it address the South Korean semiconductor-manufacturing industry's dependence on foreign markets. Upstream material reliance, particularly for specialized wafers, chemicals, and other resources crucial to manufacturing processes in South Korea, would continue to depend on foreign suppliers. This approach would leave exposure to geopolitical and trade shocks largely unchanged, meaning structural vulnerabilities remain unmitigated.

Deepened U.S. Alignment Under CHIPS Coordination

Another alternative would be to formalize deeper strategic alignment with the U.S. through a CHIPS Act Coordination Framework. With this approach, South Korea would negotiate a structured cooperation agreement with the U.S. and its Department of Commerce that aligns South Korean semiconductor firms with the incentives and goals of the CHIPS Act, which aims to expand domestic semiconductor research and innovation in the U.S. (Kurilla, 2024). This could include harmonizing export controls on advanced semiconductor equipment and technology to ease access between the two countries, as well as Korean firms, and formal information-sharing mechanisms based on comparative advantage in the semiconductor production process. This approach would prioritize integration into U.S. semiconductor objectives to secure a supply stream of upstream manufacturing products, as the U.S. accounted for nearly 20% of the materials imported to South Korea for semiconductor manufacturing in 2025 (KITA, 2026). This policy would also strengthen technological collaboration with U.S.-based semiconductor firms and harmonize export control policies.

While closer U.S. alignment could strengthen upstream technological security, it carries significant economic and geopolitical risks. A substantial portion of South Korean memory chip production is conducted in China, with 40% of Samsung's NAND chips and 50% of SK Hynix's DRAM chips produced there (Kim, 2023). China also remains the largest export market for Korean semiconductor products, accounting for 44% of semiconductor-related Korean exports in 2025 (KITA, 2026). Deeper alignment with U.S. export controls and strategic restrictions would lead to restructuring operations tied to Chinese production networks, given the high levels of economic and political tension between China and the U.S. Such a shift in economic alignment would result not only in high adjustment costs but also an increase in the risk of economic retaliation from China. Ultimately, the approach may amplify downstream vulnerability by politicizing trade relations with the Chinese market.

Policy Recommendation

Although multiple policy approaches exist to address South Korea's semiconductor vulnerabilities, the Regional Semiconductor Cooperation Framework provides the most balanced solution. By combining Japan-South Korea upstream materials coordination, ASEAN-based diversification of export and processing relations, and a formal concentration-monitoring mechanism, the policy directly targets both export destination concentration and upstream import dependence. The Japan-South Korea semiconductor trade agreement stabilizes a large part of South Korea's critical materials supply chains through emergency protocols and consultation requirements, reducing exposure and risk to sudden economic shocks. The ASEAN semiconductor export and import diversification component redistributes downstream production and sourcing networks across regional partners, reducing reliance on any single export market. The monitoring mechanism creates a risk management framework in governance, ensuring that export and import concentration is continuously evaluated rather than addressed only during crises. Together, these components strengthen economic security while maintaining geopolitical flexibility.

In contrast, a continuation of the domestic semiconductor funding for expansion mechanisms would strengthen fabrication capacity, quantity, and innovation, but would leave concentration in exports and imports with foreign markets largely unchanged. While increased subsidies, tax breaks, and R&D investments may enhance competitiveness, they do not address the underlying exposure to concentrated foreign markets or politically sensitive supply chains. As a result, the vulnerability of the Korean semiconductor industry and its external trade concentration would remain despite improved domestic capacity.

Similarly, deeper U.S. alignment under a CHIPS Act coordination framework may improve technological coordination and security in upstream material sourcing and advanced equipment, but it risks disrupting production networks and economic relations deeply embedded in China. Given that a substantial portion of Korean semiconductor production and export revenue remains reliant on Chinese markets, a sharp shift in alignment could heighten the risk of economic retaliation from China, especially considering rising economic tensions between the U.S. and China. Rather than reducing vulnerability, a U.S.-leaning approach may create tensions beyond economics by embedding South Korea politically within a single geopolitical party.

As a result, the Regional Semiconductor Resilience and Diversification Framework provides the most balanced and sustainable solution. In an increasingly unstable and fragmented global economic environment, long-term competitiveness and resilience depend not only on production capacity but also on balancing external relations, especially for South Korea's semiconductor industry. The proposed framework balances diversification, supply chain security, and geopolitical flexibility, making it a sustainable policy strategy for reinforcing South Korea's semiconductor industry.

Conclusion

Reinforcing South Korea's economic security as it navigates geopolitical and economic tensions will require strategic maintenance and development of economic relationships with regional partners to diversify its economic relations. The quantitative findings from the ANOVA test demonstrate the statistically significant differences in export and import concentration, showing South Korea's heavy economic reliance on select countries, particularly China, Japan, and the U.S. As a result of this reliance, the Regional Semiconductor Cooperation Framework outlines a balanced approach by coordinating with regional partners, including research and development initiatives with Japan and deeper economic relations with select ASEAN countries, to further diversify South Korea's economy in the semiconductor industry. These findings align with the view that its current approach to economic resilience in its semiconductor policy, focusing on increasing domestic capacity, may not be able to offset potential external economic shocks.

There is further room to study the potential diplomatic impacts this framework could have, especially with China and the U.S., accounting for the different economic and diplomatic conflicts and resolutions that may arise. With the constant fluctuation and unpredictability of economic relations, resilience in high-tech sectors, especially pertaining to semiconductor technology, depends not only on innovation but also on diversification and institutional coordination. As global semiconductor supply chains become increasingly politicized, structural resilience will become important in sustaining long-term economic stability and geopolitical flexibility.

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A Clean Path Forward: Deep-Sea Mining Governance in Norway

Jackson Jonker

This paper examines the policy fragmentation of deep-sea mining governance in the Arctic state of Norway, where a 2025 government decision to halt all exploration licenses until 2029 has created a policy vacuum driven by Arctic resource competition, the global energy transition, and tensions between sovereign rights and environmental obligations. Key actors shaping this vacuum include the European Union, looking to expand their critical mineral supply chains; the London Metal Exchange, a key market force in the sourcing and processing standards in the EU; the Arctic Council, which coordinates cooperative governance and scientific agreements; and the Norwegian government, which is attempting to balance resource nationalism with environmental pressures. Using legal analysis of International and Domestic laws and regulations, this paper proposes a three-phase framework that conditions exploration on three factors: compliance with the London Metal Exchange sourcing standards, joint scientific programs with the Arctic Council, and integration into European Union mineral supply chains under the Critical Raw Minerals Act. While the policy faces some challenges due to its dependence on European Union processing and domestic pressures, its phased design offers a more sustainable and legally defensible solution to the tension between resource nationalism and environmental stewardship within Norway. The proposal emphasizes international legitimacy and market access as key tools in transforming uncertainty into a structured framework for responsible mineral extraction.

Introduction

Over the past decade, the Arctic has undergone a significant transformation as climate change has led to a decline in sea ice, opening up new maritime spaces to explore mineral deposits rich in cobalt and other rare earth elements, such as yttrium and neodymium, essential for a green transition. While Arctic coastal states, including Russia, Denmark, Canada, and the U.S., have maintained their sovereign rights over continental shelves for decades, the global energy transition and an increase in demand for critical minerals have created debates surrounding these resources. Under the United Nations Convention on the Law of the Sea (UNCLOS), the Arctic nations of Norway, Russia, Canada, Denmark, and the United States possess the sovereign right to exploit natural resources within their exclusive economic zones. However, these rights come into conflict with environmental obligations, creating a legal and political dilemma that each Arctic state must navigate.

Norway, as the first European country to propose commercial deep-sea mining, positioned itself as a leader in the offshore mineral industry when it opened 281,000 square kilometers of its Arctic continental shelf for mineral exploration. However, this decision came with widespread backlash from environmental organizations and international legal experts, leading to a decision by the newly elected government to halt deep-sea mining licenses until 2029. This policy vacuum does not just threaten Norway's first-mover advantage in the critical minerals market, but also has the risk of losing domestic industrial actors and the economic benefits associated with it to competing nations like China, which currently dominates the global rare earth processing.

This proposal examines the regulatory fragmentation of deep-sea mining governance among Arctic states and presents a different approach based on international legitimacy and market integration. It proposes a three-phase conditional licensing framework for Norwegian seabed mining that aligns exploration with international markets and environmental review under the Critical Raw

Minerals Act (CRMA). By using a conditional licensing system, the framework offers a structured pathway that would help fill Norway's current policy vacuum.

Compliance verification under the London Metal Exchange (LME) and independent scientific review of pilot projects will be used to evaluate whether the framework balances sovereign resource development with environmental obligations.

This proposal explores how Norway can adopt a condition licensing framework to exercise its expanded autonomous authority over seabed resources while strengthening international safeguards and resisting a regulatory race to the bottom that would undermine Arctic cooperation. By focusing on phased development, this proposal offers a framework that manages the tension between resource nationalism and environmental regulation, resisting the fragmentation of Arctic governance and instead investing in the region's long-term stability.

Policy Motivation

Problem Definition

The global transition to renewable energy and advanced technologies has caused a surge in demand for critical minerals. The Arctic has become a consequential region for mineral exploration, which is going through physical and geopolitical transformation due to climate change. Within their extensive maritime jurisdictions, the Arctic states of Norway, Russia, Canada, Denmark, and the U.S. control vast seabed deposits rich in cobalt and rare earth elements such as yttrium (Nedelciu, 2025). However, states regulate resource extraction through differing national regulatory policies for environmental protection and economic development. As these states exercise their expanding sovereign authority in the Arctic, where melting ice cover is creating the possibility of year-round extraction, a critical dilemma emerges for Norway: how to implement concrete international obligations that accommodate sovereign economic practices while preserving the offshore

ecosystem. Especially after the government's 2025 decision to halt all deep-sea mining licenses until at least 2029, which created a policy vacuum that other nations and global powers are eager to fill (Office of the United Nations High Commissioner for Human Rights, 2025).

Deep-sea mining creates severe risks to the fragile Arctic environment. International environmental organizations have been strong opponents of exploration and extraction in the Arctic and have used legal challenges to slow the progress of any sort of solution between the Government of Norway and mineral companies. Looking to establish itself as a global seabed mining leader and reduce European dependence on the Chinese-dominated industry of critical minerals, Norway initially adopted a proactive and industry-friendly mining framework in January 2024, which approved the first commercial-scale exploration of Norwegian waters. (Ministry of Energy, 2024a). However, following widespread backlash from environmental advocacy organizations, the Norwegian Environment Agency, and international environmental legal experts, Norway reversed course in December 2025, halting all licenses until at least 2029 (Office of the United Nations High Commissioner for Human Rights, 2025).

Different regulations have become tools for economic gain, influencing investment patterns and using the critical minerals as diplomatic leverage. The European Union's (EU) CRMA, which establishes a binding goal that no single third country can supply more than 65 percent of the EU's consumption of any strategic raw material, has intensified pressure on Norway to become a reliable supplier of critical minerals to European markets (European Commission, 2024). However, Norway's moratorium complicates the formation of a unified regional position, creating vulnerabilities that external actors such as China can exploit. China currently controls 70 percent of global rare earth extraction and 90 percent of processing capacity, and has shown a willingness to use this dominance, especially when it imposed export restrictions in 2010, which led to drastic global price increases and supply shortages (National Minerals Information Center, 2024). As Norway delays, China is actively pursuing bilateral mining partnerships with other Arctic states, threatening to transform the Arctic and the EU from a region of cooperation into a strategic competition over resources that could potentially hurt European actors and the overall transition to green energy.

At the same time, the retreat of sea ice is granting Norway and other Arctic states expanded autonomous authority over new maritime spaces and resources. With authority, these countries carry the responsibility of environmental protection. While the Norwegian government has reversed course on deep-sea exploration for the moment, the policy vacuum has created questions around what specific international safeguards Norway can implement through multilateral frameworks such as the Arctic Council or the EU's Strategic Project designation process to ensure that its expanded autonomous authority does not lead to unsustainable development and environmental degradation (European Commission, 2024). This policy proposal

addresses this problem by examining Norway's regulatory fragmentation and proposing a conditional licensing framework that balances sovereign resource rights with international environmental obligations and market access requirements.

Causes and Origins

The history of the current debate surrounding Norway's Arctic deep-sea mining ambitions is best explained within the context of (1) the centuries-long history of natural resource exploitation which established precedents for international competition over Arctic resources, (2) the modern global energy transition and surging demand for critical minerals, and (3) the international legal framework governing rights to deep-sea beds, creating tensions between sovereign authority and collective ocean stewardship.

The historical roots of Arctic resource competition date back to the 17th century when European powers engaged in hunting expeditions across Scandinavia and surrounding waters. A recent study by the Swedish Polar Research group documented how natural resources in the Arctic have driven geopolitical competition and industrial settlement patterns between 1600 and the present (Avango et al., 2007). During the 20th century, coal mining operations established by Norwegian, Dutch, Russian, and U.S. companies demonstrated how resource extraction could serve both commercial interests and national strategic objectives. Competing national interests over Arctic resources has laid the framework for contemporary disputes over seabed mineral rights.

By the 21st century, despite Norway's longstanding reputation for environmental governance and its responsible resource management, the country is confronted with a growing policy dilemma over the extraction of deep-sea critical minerals in Arctic waters. While Norway's maritime industries have historically operated within a system of international cooperation and environmental protection, the problem of the global energy transition and surging demand for critical minerals has created pressures to exploit seabed deposits that are rich in cobalt and other rare earth elements, like yttrium, which are essential for green technologies. In January 2024, the Norwegian Parliament voted to open 281,000 square kilometres of its Arctic continental shelf for mineral exploration, positioning Norway as the first European state to pursue deep-sea commercial exploration. This decision was driven by two factors: to diversify its markets beyond oil and gas and to become a major supplier of cobalt to the EU (Ministry of Energy, 2024a).

This legislation, however, received significant criticism from international legal experts, like the WWF-Norway, and domestic pressures to protect marine biodiversity in Norwegian waters. Article 77 of the UNCLOS says, "The coastal State exercises over the continental shelf sovereign rights for the purpose of exploring it and exploiting its natural resources," but these rights exist in tension with obligations to protect the marine environment under Article 192 (United Nations, 1982, p. 49). In 2025, due to these growing pressures, Norway's newly elected government agreed to stop all deep-sea

mining licenses until 2029 (Office of the United Nations High Commissioner for Human Rights, 2025). This domestic pivot creates a policy vacuum that other Arctic nations and global powers are willing to fill, raising questions about what international safeguards must be implemented to ensure market stability in Norway, while still allowing for autonomous authority.

The policy dilemma is accelerated by a concerning geopolitical trend of increasing strategic competition over critical mineral supply chains. This trend is driven by the EU's urgent need to reduce its dependence on Chinese suppliers of rare earth elements. The EU CRMA establishes a binding goal that no single third country can supply more than 65 percent of the EU's consumption of any strategic raw material, directly targeting China's near-monopoly position (European Commission, 2024). China controls approximately 70 percent of global rare earth extraction and 85 percent of processing capacity, creating a vulnerability that the EU is looking to address (European Commission, 2024).

Motivations of Parties and Actors

European Union

The quick The EU is a political and economic union of 27 member states, governed by jointly established institutions including the European Parliament, European Commission, and the European Council. Its membership extends to over 447 million citizens, making it one of the world's largest economic blocs by GDP and population (European Union, 2026). The EU's role in the deep seabed mining industry involves combining legislation, coordinating trade policy, and setting regulatory standards by representing member states in international negotiations across issues ranging from environmental protection to resource security (European Union, 2025). The EU is an important actor as its market size and regulatory reach enable it to set standards that often become de facto global norms through the “Brussels Effect”—the phenomenon where non-EU states set similar regulatory standards to access the wealth and financial markets that the EU provides—allowing EU regulations to spread well beyond its boundaries (Bradford, 2020).

The EU's interest in Norwegian seabed mining stems from its strategic objective to diversify mineral supplies and reduce dependence on non-European suppliers like China. The CRMA establishes a framework limiting the EU's consumption of strategic raw minerals originating from foreign nations and directly targeting the Chinese influence on EU markets or rare earth minerals (European Commission, 2024). This legislative framework prioritizes sourcing from within the EU and from trusted partners like Norway, who benefit from close regulatory alignment within a single market through the free trade agreement between the twenty-seven EU states and three non-EU states known as the European Economic Area Agreement, granting countries like Norway access to the EU's internal market (European Commission, n.d.). The EU has demonstrated its interest by

designating multiple projects as strategic projects under the CRMA, allowing Norwegian mining firms access to accelerated permitting and EU funding (Ministry of Trade, Industry and Fisheries, 2025). Norway's high environmental standards and regulatory governance make it an ideal partner for the EU as it looks to build secure supply chains protected from geopolitical volatility and export controls.

Norwegian Mining Companies

Norwegian mining companies are commercial enterprises engaged in the exploration, extraction, processing, and sale of mineral resources, which serve as a critical link between industrial supply chains and mineral extraction. These firms shape regulatory outcomes through formal consultation processes and strategic economics, including mineral market and environmental analysis. These firms range from small exploration companies focused on identifying deposits, as they do not have the technological capital capacity to extract at large scales, to multinational corporations that operate integrated global supply chains across the world. Green Minerals AS, a publicly traded company pursuing deep-sea minerals, illustrates how industry actors influence policy. Following the Norwegian government's decision in 2025 to delay licensing, the company warned that inaction would cause increased political risk and create significant economic uncertainty for the cobalt industry (Green Minerals AS, 2025). Mining companies, like Green Minerals AS, provided consultation on proposed legislation and advocated for stable governmental regulations in the future (Norsk Industri, 2025).

Norwegian mining companies affect regulatory development through multiple channels while acknowledging policy uncertainty. The Norwegian Minerals Act (Prop. 71 L), which was proposed in early 2025 to modernize regulation of mineral activity, shows industry influence through increased coordination between mining companies and government agencies, as well as greater consideration for the EU CRMA (Sandvik & Øren, 2025). In response to licensing delays, Green Minerals has announced that it would shift focus towards exploration and extraction in the Pacific, signaling that regulatory uncertainty may drive investment elsewhere and creating sustained pressure on Norwegian authorities (Green Minerals AS, 2025). Through formal consultations and public advocacy, Norwegian mining companies function as active participants in policy formation and mineral development timelines.

The Arctic Council

The Arctic Council is a high-level intergovernmental forum established in 1996 by the Ottawa Declaration to promote cooperation and interaction among Arctic states on issues like sustainable development and

environmental protection. Its members include eight Arctic nations (Canada, Denmark, Finland, Iceland, Norway, Sweden, Russia, and the U.S.), along with six permanent organizations that represent the rights of Indigenous peoples (Arctic Council Secretariat, n.d.b). The Council's role involves producing policy recommendations and facilitating consensus-based discourse rather than negotiating legally binding agreements. The Arctic Council provides a primary platform for addressing rapidly transforming Arctic conditions, including resource development that carries global implications.

The Arctic Council serves as a crucial forum for developing governance that informs national resource extraction policies in the region. Academic analysis examining the Arctic Council's approach to deep-sea mining reveals that it generally adopts a positive stance toward sovereignty within domestic waters, although there is variation in how member states prioritize and implement these values (United Nations Permanent Forum on Indigenous Issues, 2018). The Council has facilitated the negotiation of three legally binding agreements among Arctic states. In the first agreement in 2011, the Agreement on Cooperation on Aeronautical and Maritime Search and Rescue in the Arctic, the Council coordinates life-saving international search and rescue coverage across the vast and remote Arctic region (Agreement on Cooperation on Aeronautical and Maritime Search and Rescue in the Arctic, 2011). The second, the 2013 Agreement on Cooperation on Marine Oil Pollution Preparedness and Response, requires parties to maintain national systems for responding to oil spills, which strengthens assistance in environmental disasters. The third in 2017, the Agreement on Enhancing International Arctic Scientific Cooperation, creating easier access for environmental and marine scientists, as well as increasing transparency of data across borders (Farrell, 2017). These negotiations establish precedents for cooperative governance among Arctic Council members that have the possibility to extend to seabed mining operations. The UN Permanent Forum on Indigenous Issues has repeatedly recommended that the Arctic Council adopt a long-term strategy for resource extraction that specifically calls for Indigenous discussion in environmental assessments related to deep-sea mining (United Nations Permanent Forum on Indigenous Issues, 2018). While the Council shapes political discussions and establishes expectations, whether these expectations are met depends on the willingness of each individual Arctic nation to implement these non-binding agreements. Norway's recent decision to postpone deep-sea mining licenses demonstrates that the Council's influence over domestic policy can produce outcomes even without formal enforcement powers.

The Norwegian Government

The Norwegian government refers to the executive branch of the Kingdom of Norway, operating as a constitutional monarchy with a parliamentary system (Seabed Mineral Law, 2019). The government is led by the Prime Minister, Jonas Gahr Støre, and comprises multiple ministries, including the Ministry of Energy, which has

authority over seabed mineral extraction through management of licensing and terms of trade (Ministry of Energy, 2024b). The government's role includes proposing legislation for offshore mining and representing Norway in international negotiations around resource development and environmental protection. The Seabed Minerals Act of 2019 gives the Norwegian government, and more specifically, the Ministry of Energy, management over natural resources off the shore of Norway's coast (International Union for Conservation of Nature [IUCN], 2019).

The Norwegian government's approach to deep-sea mining is complicated due to the competing objectives of political parties in Norway. In January 2024, the Norwegian Parliament opened 281,000 square kilometers of Norwegian territory for mineral exploration, positioning Norway as the first European country to allow commercial deep-sea mining (Ministry of Energy, 2024a). The government framed this as a strategic opportunity to secure cobalt, which is essential for the renewable energy transition. However, in December 2025, after budget negotiations with opposition parties, the newly elected Labour government halted licenses for deep-sea mining until 2029 (Office of the United Nations High Commissioner for Human Rights, 2025). The Prime Minister, Jonas Gahr Støre, framed this decision as a postponement and not a ban, emphasizing the need for further research before moving forward. The government's policy reflects tension between resource nationalism and environmental control. The Ministry of Energy has emphasized a step-by-step approach to responsible management, as there is still limited knowledge about deep-sea ecosystems (Norwegian Offshore Directorate, 2024a). This strategy requires production plans to document that their work will have no significant negative impacts on biodiversity, reflecting UNCLOS Article 192 obligations to protect the marine environment, even as it looks to new industries to replace the oil and gas revenues (United Nations, 1982).

Norwegian Offshore Directorate

The Norwegian Offshore Directorate is a state-level, public administrative body that reports to the Norwegian Ministry of Energy. Founded in 1972 as the Norwegian Petroleum Directorate, the agency changed names to reflect expanded responsibilities and include offshore wind and deep-sea minerals (Reed, 2024). The Directorate's primary goal is to contribute towards creating a safe and clean society from activities on the Norwegian continental shelf, taking into account the environment and safety standards. The Directorate is important because it serves as the primary resource for offshore activity in Norway and provides the technical support for decision-making on seabed mineral management (Norwegian Offshore Directorate, 2024a).

The Norwegian Offshore Directorate's interest in seabed mineral mapping originates from governmental responsibility to manage seabed mineral resources on the Norwegian continental shelf under the Seabed Minerals Act of 2019 (IUCN, 2019). Since 2017, the Directorate has mapped most commercially available mineral deposits

within the Norwegian economic zone and conducts its mapping using three methods: ship-based multibeam echo sounders, autonomous underwater vehicles, and remotely operated vehicles for physical sampling and environmental data collection (Ocean News & Technology, 2024). The Norwegian government has proposed allocating an additional 150 million NOK (about 15 million USD) to the Directorate to continue resource and environmental mapping, along with environmental data collection in collaboration with international organizations like the Arctic Council (Ministry of Energy, 2024b). By providing this technical expertise and resource assessment throughout all three phases of the conditional licensing framework, the Directorate will serve as a vital tool in reducing bureaucratic and independent research costs while continuing to ensure that deep-sea mineral development proceeds with careful attention to environmental concerns.

Methodology

This research will use a qualitative case study approach and legal analysis to examine how Norway's evolving regulatory regime for Arctic seabed mining has influenced its strategic autonomy and to identify potential international safeguards for market stability. Norway serves as a critical case study due to its role as the first European country to propose commercial deep-sea mining and backlash from within its own government, providing a unique relationship between resource nationalism and environmental pressures.

The research design integrates two methods of analysis. First, the study will conduct a legal analysis of international and domestic agreements. This includes Norway's obligations under the UNCLOS Articles 192 and 206 regarding marine environmental protection and international law that limits its sovereign resource rights under Articles 77 and 193. Also, including the EU CRMA, to assess the economic feasibility of building out mineral supply chains between Norway and the EU. This legal analysis will help assess whether recent developments in international law require adjustments in Norwegian governance. The study will examine how environmental groups and international organizations interpreted UNCLOS Articles in imposing environmental obligations that can limit Norway's sovereign resource rights, and to what extent these state rights can be limited by obligations outlined in international treaties. Second, the study will engage with qualitative policy analysis of domestic laws, specifically the initial moratorium on deep-sea licensing, and international agreements around environmental and economic concerns to understand the political and economic factors shaping Norway's decisions. This involves analyzing laws proposed and passed by the Norwegian Parliament to understand its rationale behind the initial moratorium and its passive stance on deep-sea mineral extraction, which has a direct effect on key actors identified in this research.

Sources comprise of laws and regulations from domestic and international institutions from across the Marine Arctic Policy sphere, including official government

publications from Norway and EU institutions, and non-governmental organisations such as the Arctic Council and the International Seabed Authority. The study draws on analyses of non-state actors to highlight the international recognition of the tension surrounding deep-sea mining in the Arctic. This approach ensures a comprehensive understanding of the legal, political, and economic factors of Norway's seabed mining dilemma. By comparing legal analysis with stakeholder perspectives and policy outcomes, the study aims to generate findings that will contribute to broader debates around how Arctic nations can exercise their autonomous authority while implementing international safeguards to protect future generations.

Policy Recommendation

Policy Statement

The Norwegian government must establish a conditional licensing framework for deep-sea mineral extraction that phases in development while remaining aligned with the international market and environmental standards. This framework would create a three-phase structure that is designed to balance the sovereign resource rights of Norway with obligations of the international community, facilitating market access and protecting offshore ecosystems. Directly impacted by this framework would be Norwegian mining companies, which would gain a clear compliance roadmap for mineral exploration and production, as well as EU-based mineral processing and refiners who would secure long-term supply chain agreements. Environmental organizations and scientific institutions would also be directly involved in ecological reporting of the effects of deep-sea mineral extraction to reassure legal groups, like the Arctic Council, of the low risk of environmental damage. Indirectly impacted would be local communities in the Arctic regions, whose environmental concerns would be addressed through joint scientific programs and independent review. The framework would be implemented by the Norwegian Ministry of Energy, with the Norwegian Environment Agency providing scientific aid and the proposed Seabed Minerals Authority managing and monitoring licensing and compliance. In response to this framework, industry actors will shift to investment in compliance measures, knowing that the phase one requirements, such as the LME certification and the Organization of Economic Cooperation and Development (OECD) Due Diligence, are prerequisites for exploration licenses. Mining companies must implement the OECD Due Diligence Guidance for responsible supply chains of minerals from conflict-affected and high-risk areas, which establishes a five-step framework requiring companies to establish strong management systems, identify and assess supply chain risks, and design risk mitigation strategies. Environmental organizations would likely see this framework as an improvement over accelerated licensing, as they can spend two to three years conducting independent environmental impact research to ensure low ecological harm (World Wide Fund for Nature [WWF], 2024).

The first phase, within a two to three year time frame, would grant exploration licenses to companies that demonstrate compliance with the LME's responsible sourcing standards. The three core pillars of the sourcing standards include: (1) OECD Due Diligence guidance for responsible supply chains of minerals in high-risk areas, (2) ISO 14001 certification to reduce environmental footprint, and (3) ISO 45001 certification to comply with workplace safety guidelines (Organisation for Economic Co-operation and Development, n.d.). The licenses would allow exclusive rights to search for a map of mineral deposits within a defined area of the Norwegian continental shelf, while continuing to comply with all legal standards of the LME. During this phase, the framework mandates joint scientific programs to operate as a formal collaboration between the Norwegian Offshore Directorate, licensed mining companies and with the Arctic Council to map deep-sea ecosystems in licensed areas in direct response to the UNCLOS Article 192 "States have the obligation to protect and preserve the marine environment" (United Nations, 1982, p. 100). To address Article 192 the joint scientific programs would be legally binding protocols for data collection and shared mapping modeled on the 2017 Agreement on Enhancing International Arctic Scientific Cooperation, which requires: (1) access by scientists to Arctic research areas, infrastructure, and logistical services, and (2) Share samples and equipment across borders for research purposes (U.S. Arctic Research Commission, 2017).

The Norwegian Offshore Directorate, spending nearly two decades mapping seabed mineral data to identify rare earth deposits, would provide expertise and resource assessment throughout this phase, in conjunction with the Ministry of Energy (Norwegian Offshore Directorate, 2024b). Phase one also addresses criticism from UN experts by aligning with Article 206:

"When States have reasonable grounds for believing that planned activities under their jurisdiction or control may cause substantial pollution of or significant and harmful changes to the marine environment, they shall, as far as practicable, assess the potential effects of such activities on the marine environment and shall communicate reports of the results," (United Nations, 1982, p. 102).

This provision establishes a conditional legal obligation. Consequently, a state looking to avoid its assessment obligations could argue that scientific uncertainty about deep-sea ecosystems means it lacks grounds to believe that harm will occur. However, Article 206 has been interpreted to mean that the duty to assess potential environmental impacts applies even in situations of scientific uncertainty.

The second phase, which would begin directly following the completion of the first phase and take two years, the Norwegian government will authorize pilot extraction projects. These projects would be limited to companies that have completed phase one requirements and have secured agreements with EU-based mineral processors and refiners, through aligning with Norwegian offshore

mineral extraction with the EU CRMA framework, designating strategic projects for expedited licensing and reduced administrative barriers for extraction permits (European Commission, 2024). Under Article 6(1) of the CRMA, a project must satisfy four criteria to receive Strategic Project designation: (1) meaningful contribution to EU supply security, (2) technical feasibility and capability of being implemented within a reasonable timeframe, (3) implementation in a sustainable manner to protect the environment and local communities, and (4) mutually beneficial for the EU and third countries, like Norway (European Commission, 2024). The requirement ensures that extracted minerals enter verified supply chains. It also guarantees that EU-based refineries and processing facilities have capacity for an influx of Norwegian minerals before full-scale commercial operations begin, while still complying with other international environmental obligations.

The third phase, beginning directly after the completion of phase two, would permit full commercial production. Pilot projects must demonstrate environmental safety, which would be verified through independent scientific organizations like the International Union for Conservation of Nature, who is the world's largest and most inclusive environmental decision-making forum, with over 1,400 member organizations representing more than 160 states. The EU must also confirm the integration of Norwegian seabed minerals into the CMRA strategic project designations that were outlined in phase two. This condition creates mutually beneficial terms; Norway gains market access through preferential EU treatment, while the EU gains a diversified mineral supply from a trusted partner meeting environmental standards that conform to international regulations.

This policy challenges the status quo by rejecting the previous Norwegian government's accelerated licensing decision and the current government's indefinite moratorium on offshore mining. Following Norway's 2025 decision to halt deep-sea mining licenses until at least 2029, the region faced a policy vacuum that has created uncertainty for investment into the mineral industry and risked shifting Norwegian mineral development to other regions (Norwegian Offshore Directorate, 2024b). This framework provides a structured pathway that is necessary to transform the current delay into active participation for future extraction in a responsible manner. Rather than treating seabed mining as a domestic decision, the policy links licensing to international market standards and environmental regulations, which favorably position Norwegian minerals in markets that are increasingly demanding responsible sourcing.

Policy Analysis

Strengths

The conditional licensing framework addresses the policy vacuum created by Norway's 2025 decision to halt deep-sea mining licenses. It is effective because it (1) establishes clear, phased requirements that align with

international standards, this framework transforms the current delay into active, structured preparation, all while maintaining a precautionary approach that advocates for environmental demand (2) mandate joint scientific programs and an independent review of pilot projects into licensing decisions, and (3) incorporates a step-by-step approach that is consistent with previous Norwegian projects relating to natural resources.

By conditioning extraction on compliance with LME sourcing standards, the policy leverages established market governance mechanisms rather than creating new bureaucratic structures. This approach is cost effective because economic market review would be done before leasing mining licenses, ensuring that Norwegian minerals meet international market standards before commercial extraction begins. Since 2019, the LME has maintained policies that require all listed commercial companies to implement OECD guidance, demonstrating that pathways for market-ready compliance already exist. A conditional licensing framework ensures that Norwegian minerals enter verified supply chains with demonstrated capacity to process and refine critical elements, limiting the cost for new, domestic infrastructure.

The framework builds upon Norway's existing offshore technology capacity, developed through decades of the oil and gas industry. This includes using existing ports and deep-sea technologies to dig beneath the ocean floor. The structure of the policy will utilize existing Norwegian Offshore Directorate data, which identifies significant deposits of critical minerals, reducing bureaucratic and independent research costs. That technical foundation, along with established regulatory institutions and industry expertise, positions Norway competitively to mine seabed minerals and gives the country a better scientific understanding and operational safety relative to other regions that lack significant offshore experience.

Another strength is that the conditional framework aligns Norway with the EU CRMA framework, positioning Norwegian seabed minerals for strategic status and benefits associated with using minerals in compliance with the EU CRMA. By aligning with existing EU regulations, Norwegian mining companies will have easier access to financing mining operations as well as mineral markets that are willing to accept Norwegian critical minerals, as they will be verified under LME sourcing standards. Norway will gain strategic access to EU preferential treatment while keeping domestic sovereign rights. This is because Norwegian regulations and laws are already very similar to those of the EU, if not stronger. While maintaining sovereign rights over its regulations, Norway still gains access to investment opportunities and an attractive market for the critical minerals.

Weaknesses

Despite its strengths, the conditional licensing framework presents a few limitations: (1) the dependency on EU partners for market access, and (2) domestic and international political pressures may stall any agreements. Despite these weaknesses, a conditional licensing program is

the best policy to address the problem because it transforms Norway's current policy vacuum into a structured roadmap to address the concerns previously listed, instead of indefinite delay.

One weakness is that Phase two depends entirely on EU partners to agree to process Norwegian seabed minerals, creating vulnerability to external decision-making timelines that are beyond the control of the Norwegian government. While the CRMA encourages strategic partnerships with other states, the European Commission has designated only thirteen non-EU strategic projects, none of which are located in Norway (Maczkovics et al., 2025). Competition for this specific designation will only intensify as other resource-rich states, like Canada and Australia, look to expand their partnerships beyond the U.S. and toward preferential access to EU markets. Phase two has the potential to become a bottleneck for Norwegian minerals if European institutions remain hesitant due to environmental or political concerns, regardless of Norwegian regulatory systems.

A second weakness is that political opposition from the Socialist Left Party (SV) presents challenges to any licensing framework, regardless of the safeguards implemented. Environmental organizations, like WWF-Norway who promote sustainable ocean management, opposed Norway's original licensing decisions. In 2024, it pursued litigation challenging the legal basis of these original licensing decisions under Norwegian law and other international conventions. Any future licensing framework must overcome some legal and political backlash from the SV and the WWF-Norway; however, significant scientific research and independent assessments, that is outlined under phase one, may create a framework built on credibility and ease legal challenges. Although these scientific and political concerns will not disappear merely because a conditional framework is established, the conditional licensing framework can help by ensuring that environmental assessments are conducted by internationally recognized bodies and market access concerns are met through extensive economic cooperation with the EU and legal obligations.

Policy Alternatives

Extended Moratorium Through 2035 with International Negotiation

The first alternative to the proposed conditional licensing framework would maintain Norway's current moratorium on deep-sea mining licenses until at least 2035. During this extended 10-year cycle, the Norwegian government would pursue binding international agreements with the Arctic Council and the United Nations. Additionally, Norway would invest more money into researching the effects of deep-sea mineral exploration on local ecosystems and developing safe and affordable extraction technologies to reduce environmental impact. The extended moratorium would allow Norway time to negotiate governance standards with other Arctic nations and potential consumer markets, such as the EU or green tech companies. Under this approach, commercial extraction would be

authorized by the Norwegian government only after mining companies establish an international governance framework and conduct independent scientific research showing environmental safeguards can be maintained. This alternative aligns with institutions that have advised a precautionary approach to deep-sea exploration, which UN experts have recently cited as consistent with states' obligations under international law to protect the marine environment (Office of the United Nations High Commissioner for Human Rights, 2025). These UN experts include the UN Secretary-General's Scientific Advisory Board, which published a scientific report warning that rapid deep-sea mining could have long-lasting, irreversible effects, like complete loss of habitat for hundreds of marine species (United Nations Secretary-General's Scientific Advisory Board, 2025). This alternative is relevant given the Norwegian Environment Agency's conclusion that the government's initial impact assessment lacked sufficient evidence for decision-making (WWF, 2024). Additionally, this approach responds to calls from other environmental organizations and the European Parliament for an international moratorium on deep-sea mining until adequate governance mechanisms are in place.

However, the extended moratorium alternative contains significant weaknesses that would limit its practicality. First, it assumes that international consensus can be achieved within a decade, which is optimistic given the Arctic Council's suspension of formal cooperation following geopolitical tensions and the divided nature of international seabed governance (Dyck, 2024). Second, this approach provides no clear pathway for industry investment, potentially driving Norwegian mining companies to pursue other mineral investments outside of domestic waters. Companies like Green Minerals AS have already signaled interest in foreign mineral investment, stating that the current moratorium "undermines the willingness to invest in new industrial activities in Norway," (Green Minerals AS, 2025, p.1). Additionally, industry representatives have warned that extended uncertainty surrounding investment in the mining industry may create a scenario where mining companies will turn to other international projects as they wait for more predictable political conditions in Norway (Deshayes, 2025). Third, this alternative fails to address the EU's urgent demand for diversified critical mineral supply under the CRMA, potentially pushing European buyers towards less responsible suppliers, such as China (European Commission, 2024). Right now, the EU heavily relies on a small number of countries for minerals essential for the green transition. The CRMA has set binding limits on the amount of minerals that the EU can purchase from a single supplier. Delaying Norwegian exploration will almost guarantee that the EU will struggle to secure the supply of strategic raw minerals by the end of the decade.

Accelerated National Licensing with EU Agreements

The second alternative would completely abandon the current moratorium and pursue rapid licensing of deep-

sea exploration and extraction under Norwegian authority while negotiating bilateral agreements with (1) the EU for market access and (2) individual EU member states for processing deals. Under this approach, the Norwegian government would authorize the first exploration licenses within one to two years, with the potential for commercial extraction to begin in 2028. Environmental oversight would be done through Norwegian domestic institutions, rather than compliance with international standards. Norway's Climate Change Act demonstrates its commitment to legally enforceable environmental standards that extend beyond EU requirements. This alternative maximizes Norwegian sovereignty, a strong advantage in an emerging industry. By moving quickly, Norwegian companies could capture EU market share before international competitors establish operations in other regions. Additionally, bilateral negotiations would allow for flexible arrangements tailored to specific mineral types and different processing partnerships, rather than requiring compliance with international standards.

Despite these potential advantages, an accelerated national licensing program presents weaknesses that undermine the feasibility of such a fast-paced policy approach. Most significantly, this alternative ignores the environmental and political opposition that produced the 2025 moratorium. The Norwegian government's original licensing decision faced massive criticism from the Norwegian Environmental Agency, international organizations like the UN, and environmental organizations, like the WWF-Norway (which filed a lawsuit challenging the government's decision to open the seabed for mining in 2024) (WWF, 2024). The Norwegian Environmental Agency stated that their own strategic impact assessment did not meet minimum legal requirements under the Seabed Minerals Act, potentially leaving the government open to additional legal challenges (WWF, 2024). This vulnerability would continue under an accelerated licensing program, consequently halting mining operations indefinitely. Accelerated national licensing would also fail to address obligations under UNCLOS. UN agencies, such as the International Court of Justice, have emphasized that Norway's decision to postpone licensing aligns with the country's obligation under international law to protect the environment and the climate system (Office of the United Nations High Commissioner for Human Rights, 2025). Research projects funded by the EU are currently evaluating how deep-sea mining aligns with international obligations under UNCLOS, finding that coastal states' sovereign rights may be limited by obligations not to disrupt the high seas freedoms and in conserving biodiversity (European Commission, 2025). Moving forward without addressing these legal requirements would risk international backlash and grow the potential for legal challenges from multiple parties.

Policy Recommendation

The proposed conditional licensing framework represents the optimal approach to the policy vacuum created by the Norwegian government's December 2025 decision to postpone licensing for deep-sea extraction until at least 2029 (Office of the United Nations High Commissioner for Human Rights, 2025). The three-phase policy framework would quell concerns from both environmental organizations and international legal experts because it turns the current policy vacuum into active participation rather than an indefinite delay, while still adhering to international law and regional cooperation. Representatives for Norwegian mineral companies have warned that extended uncertainty created by the policy vacuum may force them to pursue mineral exploration projects elsewhere. By establishing clear, phased requirements with a defined timeline and conditions, this policy would give Norwegian mining companies a roadmap for compliance rather than leaving them in the dark when it comes to their ability to pursue deep-sea licensing.

The conditional licensing framework would build international legitimacy by creating a licensing system that is conditioned upon the completion of phase one compliance with environmental and LME standards. By requiring these standards before exploration begins, the policy would ensure that the Norwegian mining companies meet global responsible sourcing expectations. The Arctic Council, as the most important multilateral forum for issues in the region, has a history of facilitating legally binding agreements among the Arctic states, including cooperating on search and rescue missions, reducing oil pollution, and enhancing scientific research (Arctic Council Secretariat, n.d.a). Because the Council has international recognition, it would be able to facilitate negotiations surrounding deep-sea exploration and environmental regulations in Norway. Joint scientific programs under phase one rules would directly respond to obligations under UNCLOS Articles 192, 193, and 206 to address criticism from UN experts (United Nations, 1982, p. 100, 104).

Phase two of the policy solves the market access problem rooted in heavy regulation and trade barriers that have historically left behind mining companies by requiring Norwegian minerals to enter EU-controlled supply chains with a demonstrated processing capacity before full commercial production starts. Phase two allows for pilot extraction on the condition of securing agreements with EU-based processors and refiners, ensuring that minerals enter supply chains that are transparent about existing capacity. Phase two directly aligns with the EU CRMA, which designates strategic projects for streamlined permitting, with extraction permits lasting 27 months, and enhanced access to financing through the European Investment Bank and other domestic investors (European Commission, 2024). The European Commission has confirmed that the CRMA includes provisions to increase exploration of critical materials within the EU, with selected strategic projects across the continent already benefiting from streamlined permitting procedures (European Commission, 2024). By requiring EU processing partnerships before commercial production, the policy guarantees that Norwegian minerals

are not extracted in isolation but rather integrated into the European supply chain infrastructure.

Finally, the policy responds directly to environmental opposition by addressing the criticism that previous government assessments lacked sufficient scientific evidence to proceed with exploration. For example, the Norwegian Environmental Agency concluded that the government's impact assessment did not meet minimum legal requirements under the Seabed Mineral Act (WWF, 2024). Further, environmental organizations, including WWF-Norway, filed lawsuits challenging the original licensing decision, arguing that the licensing decision relied on inadequate environmental evaluation and violated domestic and international law (WWF, 2024). The conditional licensing framework, including joint scientific programs and bilateral mining partnerships with Arctic Council members and independent environmental organizations, responds directly to these concerns. The Arctic Council's working groups have produced assessments of climate change and environmental conditions in the Arctic that are recognized internationally (Ministry of Foreign Affairs, 2025). By embedding scientific review within the licensing process and requiring collaboration with international groups, this policy ensures that Norway meets international standards rather than relying just on domestic assessments that have been subject to legal challenges.

Conclusion

Addressing the regulatory fragmentation of deep-sea mining requires a key shift from a reactionary policy stance to structured frameworks that address the tension between resource nationalism and environmental regulation. The three-phase conditional licensing framework proposed in this paper presents a viable alternative to both an accelerated licensing timeline and the indefinite moratorium. By conditioning exploration on compliance with international sourcing standards, requiring joint scientific programs, and linking commercial production with EU critical mineral supply chains, this framework promotes long-term stability for Norway and environmental protection of ecosystems that may be affected by deep-sea mineral extraction. Conditional approaches are more likely to balance sovereign resource rights with international obligations than unilateral decisions that bypass environmental concerns. In contrast to the fragmented approaches currently shaping Arctic seabed governance, a conditional framework that uses existing international institutions and market mechanisms would reduce regulatory uncertainty and help to create cooperative governance.

While the conditional licensing policy will not resolve all structural challenges facing Arctic deep-sea mining, like geopolitical tensions that disrupt Arctic Council cooperation, it aims to transform regulatory vacuums into a structured system. Future research should explore how this framework can be adapted across other Arctic States with differing regulatory systems, and how the long-term environmental impacts of pilot extraction projects can be measured through joint scientific programs. This paper aims

to highlight that alternatives to the current fragmentation of Arctic seabed governance exist, and states do not need to give up environmental protection or international cooperation for resource development. If governments are able to prioritize conditional licensing and integration with established market governance, they can pursue the critical

minerals necessary for the ongoing renewable energy transition without joining a regulatory race to the bottom.

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Barriers to Recognition: Rebuilding Vietnam's Agent Orange Response Around the Household

Kayla Võ

More than fifty years after the U.S. military deployed approximately 72 million liters of herbicide across southern Vietnam, the consequences of that campaign remain embedded in Vietnam's environment and communities. Agent Orange, contaminated with the highly toxic and persistent compound 2,3,7,8-tetrachlorodibenzo-*p*-dioxin (TCDD), has produced long-term and intergenerational health harms in Vietnamese civilian populations—including elevated rates of cancer, congenital disabilities, and chronic illness—while the institutional response has remained disconnected between hotspot remediation, disability recognition, and medical assessment programs that operate without a coordinated household-level pathway connecting them. This proposal examines that governance failure and recommends an integrated screening, referral, and household risk-management framework grounded in Vietnam's existing health and administrative institutions. The framework introduces presumptive eligibility to reduce evidentiary barriers for likely affected households, a standardized tiered referral pathway embedded in Vietnam's public health infrastructure, targeted household environmental and food-system testing for higher-risk communes, and a registry and longitudinal monitoring function to generate the public health data Vietnam currently lacks. Through analysis of the policy's institutional fit, the populations it reaches, and its comparative advantages over expanded stipend reform and accelerated hotspot remediation, this proposal argues that this framework represents the most feasible response to the structural absence at the center of Vietnam's Agent Orange response.

Introduction

The herbicide campaign conducted by U.S. forces across southern Vietnam between 1961 and 1971 is among the most consequential and least resolved environmental and public health legacies of the twentieth century.

Approximately 72 million liters of herbicide were deployed across an estimated five million acres of forest and cropland, exposing millions of Vietnamese civilians to dioxin contamination through direct spraying, environmental persistence, and food-chain bioaccumulation pathways that continue to operate today (Office 33, 2013; Stellman et al., 2003a). Among the herbicides used was Agent Orange—a mixture of two synthetic herbicides, 2,4-dichlorophenoxyacetic acid (2,4-D) and 2,4,5-trichlorophenoxyacetic acid (2,4,5-T), whose manufacturing process produced dioxin as a contaminant, most critically 2,3,7,8-tetrachlorodibenzo-*p*-dioxin, or TCDD. Dioxin is a broad term for a class of chemically related persistent organic pollutants; TCDD is the most toxic variant and the compound most associated with the long-term health consequences of the Agent Orange campaign. The health consequences—cancers, metabolic and immune disorders, reproductive harms, and severe congenital disabilities spanning multiple generations—have been documented extensively, yet the institutional response in Vietnam has remained structurally insufficient for the scale of ongoing harm (Hammond & Đặng, 2023; Dũng, 2023).

Agent Orange is not a historical problem that has been resolved over time. It is a present-day public health and governance failure. Dioxin persists in soils and sediments at former airbase “hotspots”—sites where wartime herbicide storage, handling, and spraying left concentrated residual contamination—at concentrations that can exceed international safety standards by thousands of times, and it continues to reach households through food-chain pathways—particularly in communities dependent on locally

raised fish, poultry, and livestock in contaminated areas (Dwernychuk et al., 2002; Pham et al., 2015; World Health Organization, 2023). At the same time, the institutions responsible for recognizing and supporting affected civilians have not kept pace with the extent of the harm or the ways it continues to manifest. Vietnam's formal recognition system requires evidentiary documentation that many affected households—especially those in rural areas, hotspot-adjacent communities, and intergenerational families—cannot realistically assemble decades after exposure. Hotspot remediation has proceeded at select sites but has not been systematically linked to civilian health surveillance or household follow-up. Disability assistance has reached many certified households but leaves a large gray zone of plausibly affected families unrecognized and unsupported.

This proposal addresses that governance failure directly. It argues that the central problem is not the absence of any response, but the absence of a coordinated pathway through which likely affected households can be identified, clinically assessed, formally reviewed, and monitored over time, and it proposes a framework designed to build that pathway within the institutions that already exist to deliver it.

Policy Motivation

The quick brown fox jumps over the lazy dog. The quick brown fox jumps over the lazy dog. The quick brown fox jumps over the lazy dog. The quick brown fox jumps over the lazy dog. The quick brown fox jumps over the lazy dog. The quick brown fox jumps over the lazy dog. The quick brown fox jumps over the lazy dog. The quick brown fox jumps over the lazy dog.

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Problem Definition

More than 50 years after Agent Orange spraying ended, Vietnamese civilians—especially those in southern Vietnam—continue to experience measurable health harms and uneven access to durable support. Although herbicide spraying ended in 1971, the harms it produced remain embedded in Vietnam’s environment, people, and institutions. Dioxin contamination persists in environmental media and in human bodies, while decades of institutional and geopolitical constraints have limited the meaningful recognition of civilian harm and hindered the development of an adequate response.

Agent Orange-related harm persists not only because wartime spraying created broad civilian exposure across villages, farmland, and logistical corridors in southern Vietnam, but also because some former military airbases in the south—especially Biên Hòa and Phù Cát in the southeast and central highlands regions and Đà Nẵng on the central coast—became long-term reservoirs of exceptionally high residual dioxin contamination. These sites have been identified as major dioxin hotspots, where very high concentrations have been documented decades after the war in local soils and sediments (Office 33, 2013; Dwernychuk et al., 2002). Independent research by Hatfield Consultants and Dr. Arnold Schechter identified an estimated 10 and 50 additional contaminated sites associated with wartime herbicide storage, handling, and spraying across Vietnam, with contamination levels at some locations exceeding international safety standards by tens or even thousands of times (Dwernychuk et al., 2002; VAVA, 2024). From these contaminated areas, dioxin can continue to reach individuals through environmental pathways—such as contact with contaminated soil and sediment or remobilization through erosion and flooding into waterways—as well as through food-chain pathways via bioaccumulation in animal fat and aquatic systems (World Health Organization, 2023).

Once absorbed, TCDD is eliminated very slowly: dioxin’s half-life in the human body is estimated at roughly seven to 11 years, and even after more than 30 years, measurable levels can remain (Pirkle et al., 1989; Schechter et al., 1995; Scialli et al., 2015). This persistence is especially dangerous because TCDD is highly toxic and carcinogenic and is associated with chronic and intergenerational harms, including cancer, reproductive and developmental issues, and disabling conditions (Sorg, 2014; Vuong, 2022; Ngoc et al., 2019). Although evidence links exposure to long-term and intergenerational disease and disability, including elevated risks across numerous cancers, metabolic and immune disorders, and congenital anomalies, civilian harms have frequently remained under-recognized internationally and unevenly addressed within Vietnam’s institutional response (Duong, Pham, & Polachek, 2022; U.S. Department of Veterans Affairs, 2025; Frumkin, 2003).

The burden of exposure and long-term harm has also been unevenly distributed. Exposure intensity and residual contamination were often greatest in heavily sprayed districts and around former airbase hotspots, leaving

households in these areas—particularly those dependent on locally sourced food systems—more vulnerable to sustained exposure risk. At the same time, rural and lower-income families more broadly have often encountered greater barriers to diagnosis, certification, and long-term care (Düng, 2023).

Today, the primary formal mechanism for recognizing and supporting affected civilians operates through Vietnam’s social protection system, particularly programs administered by the Việt Nam Ministry of Labor, Invalids, and Social Affairs (MoLISA), which provide allowances and benefits to individuals that are officially certified as victims of toxic chemical exposure (Embassy of the Socialist Republic of Việt Nam in the United States of America, 2001). Recognition depends on written documentation and medical confirmation of qualifying conditions. Yet, establishing exposure-linked harm at the individual level has proved difficult decades after the war because contemporaneous exposure was not systematically recorded, exposure was often ecological rather than individually documented, many associated conditions have mixed etiologies, contamination occurred through environmental and food-system pathways rather than a single event, and many linked conditions emerge only after long latency periods (National Academies of Sciences, Engineering, and Medicine, 1999; National Academies of Sciences, Engineering, and Medicine, 2018; World Health Organization, 2023). As a result, many Vietnamese civilians, especially those in rural or historically sprayed areas, face substantial challenges in meeting the evidentiary requirements for formal recognition and support.

Vietnam has also partnered with international actors to remediate heavily contaminated airbase hotspots, but these efforts have remained site-specific and have not operated as integrated public health interventions. Although substantial funding was allocated to Agent Orange and dioxin-related assistance between 2007 and 2021, only a limited share supported environmental remediation at the major hotspots of Đà Nẵng and Biên Hòa (Congressional Research Service, 2021). Remediation programs focused primarily on containing and treating highly contaminated soils and sediments through excavation of hotspot material, thermal treatment, secure waste disposal, and barriers intended to prevent further spread from former storage and handling areas. At the same time, Vietnamese reporting has continued to document substantial residual dioxin contamination in and around some affected areas even after remediation phases were completed, underscoring both the scale and persistence of dioxin contamination (VAVA, 2024).

Vietnam has not lacked a response altogether. Rather, support for affected civilians has often been delivered through a patchwork of preferential benefits for some certified victims and families, broader disability and social assistance programs, provincial implementation, and donor or NGO-supported services rather than through a unified exposure-informed public health system (Hammond & Đặng, 2023).

Yet, Vietnam's response has remained geographically bounded and infrastructure-focused: they have not systematically addressed diffuse contamination in surrounding agricultural land or food systems, nor have they established long-term health surveillance for nearby populations. Without a comprehensive national exposure registry or longitudinal monitoring capacity, many exposure-related disabilities remain under-documented, while support continues to be delivered through fragmented administrative and project-based channels rather than through coordinated national surveillance and care (National Statistics Office of Việt Nam, 2019; Congressional Research Service, 2021). Recent disruptions to the United States Agency for International Development (USAID)-funded remediation and disability programs in 2025 further underscored how dependent parts of the response remain on external, project-based support (Rising & Ghosal, 2025). Remediation has advanced at select sites, but the institutions responsible for long-term civilian health have not developed at a comparable pace, leaving long-term care and monitoring misaligned with the scale of harm.

Causes and Origins

The present-day problem originated in the incorporation of herbicides into U.S. military operations in southern Vietnam during the early 1960s. In 1961, South Vietnamese President Ngô Đình Diệm requested U.S. support for aerial herbicide spraying, and in December of that year, U.S. President Kennedy authorized the use of herbicides in Vietnam (Buckingham, 1982; Institute of Medicine, 1994). In the beginning of 1962, the first U.S. Air Force Operation Ranch Hand missions were flown over South Vietnam (Institute of Medicine, 1994). Between 1961 and 1971, U.S. forces carried out extensive herbicide spraying across Vietnam to strip forest cover, destroy food crops, and reduce the tactical advantages provided by dense vegetation during the war. Estimates commonly cited in literature put the total amount deployed at roughly 72 million liters, with the campaign affecting approximately 5 million acres of forest and cropland (World Bank, 2009; Frumkin, 2003; Zierler, 2011). Although South Vietnam was the primary site of large-scale herbicide operations from 1962 to 1971, smaller cross-border spraying also occurred in Laos and, more limitedly, Cambodia, especially in areas tied to infiltration routes and border sanctuaries (Institute of Medicine, 1994; Stellman et al., 2003a; Zierler, 2011; Olson & Speidel, 2023).

Herbicidal warfare in Vietnam thus emerged when agricultural herbicides were repurposed for U.S.–South Vietnamese counterinsurgency objectives (Buckingham, 1982). More specifically, U.S. strategy aimed to expose opposition movement, disrupt infiltration and territorial control, and undermine the self-sufficient economic base believed to sustain the National Liberation Front and Liberation Army operations, particularly in remote areas beyond effective U.S.–South Vietnamese control, including logistics corridors, base areas, training zones, and concealed storage sites (Office 33, 2013). The campaign thus treated

vegetation, waterways, and agricultural land as part of the battlespace. Because these targets overlapped with inhabited villages and civilian subsistence environments, the effects of spraying were not confined to isolated military space. Known as Operation Ranch Hand, this herbicidal warfare program reshaped local environments and undermined the material conditions of civilian survival across large stretches of the Vietnamese countryside.

One of the herbicides deployed was Agent Orange, which was contaminated with dioxin compounds, the most toxic of which was TCDD (Sorg, 2014; World Health Organization, 2023). More than fifty years after spraying ceased, TCDD continues to persist in soils and sediments at former storage and handling sites and moves through food systems via bioaccumulation, meaning that the health risks produced by the campaign have outlasted the war itself by decades and continue to affect communities today (Pham et al., 2015; Zierler, 2011).

Early-phase spraying, roughly from 1961 to 1965, involved herbicide variants such as Agent Purple and Agent Pink that contained substantially higher levels of dioxin contamination than later formulations, increasing the risk of intense dioxin deposition in affected areas (Stellman et al., 2003a). Although these agents were used in smaller quantities, later reconstruction suggests they may have accounted for a disproportionately large share of total dioxin dispersed in Vietnam (Stellman et al., 2003a). Throughout the war, spraying was also often deliberate and spatially concentrated, following roads, canals, rail lines, waterways, and other logistical corridors rather than being distributed randomly across the landscape (Stellman et al., 2003a, 2003b). Because these corridors also structured civilian settlement, subsistence, and movement, the geography of spraying increased the likelihood that contamination would extend beyond narrowly defined combat areas and into populated rural environments to a greater extent than early assessments recognized. Office 33 (2013) later reported that 3,181 villages were directly sprayed and another 1,430 villages were reportedly sprayed but could not be fully assessed, with total exposed populations estimated at 2.1 to 4.8 million people.

By the mid-1960s, the herbicide campaign in Vietnam was already generating growing controversy over toxicity, exposure, and who counted as affected (Institute of Medicine, 1994). Much of the earliest documented organized opposition emerged through U.S. scientific institutions. In 1964, the Federation of American Scientists argued that herbicide use in Vietnam was indiscriminate and blurred the line between combatants and civilians. In 1966 and 1967, the American Association for the Advancement of Science called for further study, and more than 5,000 scientists petitioned President Johnson to end the program. The international legality of herbicide use in Vietnam was also disputed during the war, though not under a clear, universally accepted prohibition specific to herbicidal warfare; instead, contemporaries argued over whether existing rules on poison, chemical warfare, and environmental harm applied to the U.S. campaign (Zierler,

2011). These concerns were increasingly informed by evidence gathered in South Vietnam, and later widened into a broader transnational issue as other countries with troops involved in the war, including Australia, New Zealand, and South Korea, confronted herbicide-related concerns of their own (Institute of Medicine, 1994).

At the same time, toxicological evidence was shifting. A National Cancer Institute–contracted Bionetics study begun in 1965 and released publicly in 1969 reported development and reproductive harms in tests involving 2,4,5-T, one of the herbicidal components used in Agent Orange, while other observers documented reports of stillbirths and birth defects in Vietnamese populations possibly linked to herbicide exposure (Institute of Medicine, 1994). These developments helped drive congressional concern as the first hearings on herbicides in Vietnam were held in 1970. Later that year, Congress passed Public Law 91-441, directing the Department of Defense (DoD) to contract with the NAS to study the ecological and physiological dangers of the defoliation program (Institute of Medicine, 1994,). Questions about harm and exposure had already become a matter of political and scientific concern before spraying ended in 1971.

Even so, the evidentiary basis for identifying who had been exposed remained weak. Early reviews were constrained by incomplete operational records and limited methods for reconstructing where spraying occurred and whom it affected. Later reconstructions showed that herbicide operations tracked infrastructure corridors, waterways, and inhabited rural areas more closely than earlier accounts had captured (Institute of Medicine, 1994,; Office 33, 2013; Stellman et al., 2003a, 2003b). As a result, the geography of exposure in Vietnam was broader than policymakers and researchers were able to capture at the time, making many affected civilian populations difficult to identify within official exposure assessments.

After the Vietnam War ended in 1975, the conditions needed for a robust civilian accountability response were largely absent. Vietnam was rebuilding after decades of war under severe economic and political constraints, while Cold War dynamics and the absence of formal ties with the U.S. limited the external channels through which wartime harms could be addressed. After 1975, the U.S. extended to all of Vietnam the trade embargo that had already been imposed on North Vietnam during the war, and it remained in place until 1994. Together with unresolved postwar political tensions, the embargo delayed normalization between the two countries, which only began to accelerate in the early 1990s. U.S. President Clinton lifted the embargo in 1994, and formal diplomatic relations were established in 1995 (Clinton, 1994; Congressional Research Service, 2021; U.S. Mission Vietnam, 2024; Castelli, 1995).

Although Vietnam began investigating the consequences of chemical warfare through the 10-80 Committee in 1980, domestic laboratory capacity remained limited for years, and many samples initially had to be analyzed abroad. Significant domestic dioxin-testing capacity did not emerge until 1995. In 1999, the central

government created the Office of the National Steering Committee on Overcoming Consequences of Agent Orange/Dioxin in Vietnam—a coordinating body referred to across different sources by slightly different institutional labels, including National Steering Committee 33, Office 33, and the Office of the Standing Board. This paper will refer to it by Office 33 throughout. Larger investigations expanded only gradually from the mid-1990s onward and especially after 2006, when Office 33 and international partners began more extensive hotspot assessments. Advocacy structures such as VAVA, a national association established to represent affected civilians, aggregate victims' claims, and sustain public pressure for broader recognition and support, were not established until 2003 (Office 33, 2013; Congressional Research Service, 2021; United Nations Development Programme Viet Nam, 2014; USIP, 2023; VAVA, 2024; Than et al., 2022).

Even the U.S. did not formally recognize Agent Orange harms to its own veterans in clear statutory form until the Agent Orange Act of 1991, which established presumptive service connection for certain herbicide-related diseases after more than a decade of political and scientific dispute (U.S. Department of Veterans Affairs, 2025). Vietnamese civilians, however, were never incorporated into a comparable bilateral system of exposure-based recognition. As bilateral relations normalized, Agent Orange increasingly shifted from a primarily adversarial question of wartime accountability to a domain of pragmatic cooperation. Within this framework, interventions that were visible, fundable, and administratively measurable—especially hotspot remediation and disability services—were more readily supported than nationwide exposure surveillance, registry-building, or coordinated long-term care.

In this cooperative framework, health and disability assistance was routed largely through Vietnam's broader disability and social protection system. This included general disability benefits such as monthly stipends, health insurance, residential social protection, and community-based rehabilitation, while later U.S.-supported programs in heavily sprayed provinces also often served persons with disabilities “regardless of cause” through rehabilitation, social services, assistive devices, and livelihood support (World Bank Group, 2019; World Bank, 2020; USAID & Office of the Standing Board for the National Steering Committee, 2019; Hammond & Đặng, 2023). Although this approach expanded some services, it did not systematically identify, register, or monitor exposure-linked health effects over time, and broader assessments of Vietnam's health system have continued to note uneven integration of care and limits in long-term coordination capacity (Teo & Dao, 2020; World Bank Group, 2024).

At the same time, bilateral and international cooperation increasingly centered on hotspot remediation. Between 2007 and 2021, Congress appropriated about \$381.4 million for Agent Orange and dioxin-related assistance in Vietnam, but much of the environmental funding was concentrated on hotspot remediation rather than

on nationwide civilian health monitoring (Congressional Research Service, 2021). At Đà Nẵng, the two governments completed cleanup of roughly 90,000 cubic meters of contaminated soil and 60,000 cubic meters of lower-risk material at an estimated cost of \$116 million, while Biên Hòa proved far larger, with almost 500,000 cubic meters of contaminated soil and sediment requiring treatment or containment (Congressional Research Service, 2021; Office 33, 2013; Hatfield Consultants, 2015). Evaluations of these projects found that they reduced immediate environmental risk and produced measurable benefits for nearby communities, but they were geographically bounded, and in some cases, reliant on interim containment measures rather than constituting a fully integrated long-term national public health response (Boivin & Tran Minh, 2015; United Nations Development Programme Viet Nam, 2015; Office 33, 2013).

From the perspective of affected civilians, the result was a fragmented support landscape. No single part of this system—preferential benefits, disability assistance, provincial implementation, or donor-supported services—produced a durable mechanism for recognizing, tracking, and treating exposure-linked harm (Dũng, 2023; Hammond & Đăng, 2023; VAVA, 2024). Vietnamese reporting and victim-advocacy services have continued to emphasize the persistence of intergenerational health concerns and the need for more systematic health screening, treatment pathways, and sustained support for households living with long-term exposure-related disability (Tập chí Điện tử Da Cam Việt Nam, 2022c, 2022d, 2024; Tập chí Điện tử Da Cam Việt Nam, 2025a).

These historical dynamics help explain why Vietnam's current response remains fragmented. Delayed recognition, contested knowledge, postwar geopolitical constraints, and later project-based cooperation produced a system in which civilian health data remain limited, eligibility pathways remain uneven and difficult to navigate. This proposal addresses those structural gaps by strengthening durable civilian systems of recognition, monitoring, and care.

Impacted Parties and Motivations

Vietnamese Civilians

Treated as expendable in war and insufficiently recognized afterward, Vietnamese people are the core affected population the system is meant to serve but does not fully address. Exposure risk, administrative access, and care burden vary sharply across (1) hotspot-adjacent communities living near former airbases, (2) communities in heavily sprayed rural districts/corridors, and (3) intergenerational families raising children with complex disabilities. Mapping this internal variation is essential because it determines whose harms are legitimized, which households have access to screening and benefits, and who is left to absorb dioxin-related costs through unpaid and unaddressed care and informal coping. Across all three groups, gender and socioeconomic position operate both as pre-existing determinants of access and as downstream consequences of

underrecognition, as long-term illness and disability intensify household economic strain and psychosocial burden (Dũng, 2023; Hammond & Đăng, 2023; National Statistics Office of Viet Nam, 2019). As the primary stakeholders, affected civilians have strong interests in lower evidentiary barriers, more proactive enrollment, long-term treatment and rehabilitation, and support that reduces unpaid caregiving and income loss.

Hotspot-Adjacent Communities

Hotspot-adjacent communities live near former storage and handling sites, often at or around airbases, where contamination is geographically concentrated and repeatedly documented at extreme levels in soil and sediment (Office 33, 2013; Hatfield Consultants, 2009). Because the evidence of localized contamination is abnormally clear and persistent, these sites are frequently prioritized, making containment and remediation technically and administratively feasible in ways that are harder to replicate in dispersed rural settings (Office 33, 2013; Boivin & Tran Minh, 2015).

A Lưôi District demonstrates how wartime military geography produced localized contamination that remains policy-relevant decades later. The district was strategically important during the war, heavily sprayed, and included the A So airbase (Dwernychuk et al., 2002). Repeated surveys over multiple years identified the airfield area as a hotspot, which prompted local authorities to relocate households and administrative offices away from the most contaminated zone and to establish physical barriers intended to prevent routine human and livestock activity. However, later government inspection continued to detect elevated residues in surface soils, indicating that hotspot risk can persist even after containment measures and partial remediation. This pattern shows that hotspot management is necessary but cannot, on its own, fully eliminate environmental risk.

But the limits of hotspot management are not only environmental. Even when access to contaminated zones is restricted and remediation proceeds, hotspot-adjacent communities are not consistently or systematically routed into food-chain monitoring or longitudinal health surveillance, nor are they directly connected to benefits and services through proactive enrollment (United Nations Development Programme Viet Nam, 2015; Boivin & Tran Minh, 2015). Environmental cleanup has not generally functioned as an entry point into durable civilian systems that identify affected households, connect them to state benefits, and support long-term care. This produces a persistent cleanup–recovery gap in which environmental risk may be reduced while households continue to absorb long-term costs through unpaid care, foregone income, and sustained poverty risk.

Heavily Sprayed Rural Districts/Corridors

In heavily sprayed rural districts and corridor communities—communities located along roads, waterways, and other logistical routes heavily targeted during the war—exposure was geographically widespread rather than

concentrated at a small number of remediated sites. This dispersed exposure makes administrative recognition more difficult because there is no bounded hotspot that automatically triggers remediation or sustained follow-up, even when disability and chronic illness are widespread across households. Therefore, household burdens become especially pronounced in these rural settings, where access to services and financial resources is more limited, and the practical costs of disability are absorbed directly into daily livelihood systems (Dũng, 2023). Disability and chronic illness constrain income-generating activity while simultaneously increasing care demands and recurring health expenses, tightening the margin of survival over time. For this reason, major assessments define “people affected by Agent Orange” to include both victims and their families, reflecting that families are inseparable from the lived impacts of disability (Dũng, 2023). These pressures are intensified in rural areas where poverty rates are higher and service capacity is weaker, so families face longer travel, fewer specialized options, and greater opportunity costs when seeking diagnosis or treatment. Over time, limited access deepens financial stress, which in turn further restricts care-seeking, producing durable household vulnerability (Dũng, 2023).

Three types of narratives illustrate how dispersed exposure produces and sustains rural precarity through reduced earning capacity, unpaid caregiving, and recurring medical costs. Nguyễn Thị Hồng Tâm describes leaving paid work to provide full-time care for an adult daughter with significant disabilities, relying on a precarious household business and modest state support while admitting she is “scared to think about tomorrow” as caregiving demands persist (VAVA, 2024). Võ Thị Kim Tuyền, a second-generation victim with mobility impairment, shows how disability intersects with rural informality; her household depends on lottery-ticket sales that collapse with weather and shocks, leaving the family unable to stabilize caregiving and child-rearing even with a disability stipend (VAVA, 2024). A caregiver account from Nam Định conveys acute time deprivation, describing days that stretch from morning into night, around the constant demands of caring for a child with complex needs (VAVA, 2024).

Broader evidence demonstrates that these accounts are indicative of systemic dynamics rather than individual anomalies. The 2016 National Survey on People with Disabilities in Vietnam finds that households with disabilities are about twice as likely to experience multidimensional poverty as households without disabilities, with the greatest deprivations in education, sanitation, and housing quality; these deprivations are more severe in rural areas than in urban areas (National Statistics Office of Viet Nam, 2019). In corridor communities, poverty operates as a channel through which dispersed exposure solidifies into long-term inequality. Limited resources constrain travel for care, recurring treatment, and sustained rehabilitation or schooling, reinforcing disadvantage over time. These communities are also shaped by the administrative limits of victim identification. Large-scale enumeration is difficult,

and certification depends on documentation and contested causal standards, placing many households in a gray zone where need is evident but formal status remains uncertain (Dũng, 2023). While gendered caregiving and psychosocial strain intersect with these pressures, the underlying pattern is institutional as dispersed exposure combined with weak monitoring and eligibility systems leaves rural households carrying prolonged care and income losses without a reliable linkage to durable support (Hammond & Đặng, 2023). What these conditions reveal is that the problem is not simply whether support exists in principle, but whether dispersed harm can be recognized and addressed without prolonged delay, opaque bureaucracy, or evidentiary burdens that many families cannot realistically meet. In heavily sprayed rural districts and corridor communities, long-term survival often depends on whether systems can reach households living far from specialized services and respond to the realities of chronic illness, disability, and caregiving under conditions of rural scarcity. When they cannot, families are left to manage long-term needs largely on their own, while navigating distance from care, unstable incomes, intensive caregiving demands, and weak access to formal support.

Intergenerational Families

Unlike hotspot-adjacent communities, where contamination is spatially concentrated and legible in environmental data, and rural corridor communities, where access constraints predominate, intergenerational families confront the most acute recognition and eligibility barriers (Dũng, 2023; Hammond & Đặng, 2023). Harms that manifest in children and grandchildren cannot demonstrate direct wartime exposure and are often difficult to recognize within existing monitoring or enrollment systems (USIP, 2023; Hammond & Đặng, 2023).

Intergenerationally affected families are the children, grandchildren, and even great-grandchildren of people who were exposed during the war, but who themselves have no direct war-era exposure to document. As the U.S. Institute of Peace (2023) notes, recognition shifts in these cases from claims of direct exposure to the presence of severe, often multi-system disabilities emerging across later generations. Although need is unmistakable within the household, eligibility systems structured around documentary proof of wartime exposure struggle to classify or consistently recognize them.

For many such households, the central barrier is not the absence of disability or need, but the difficulty of having that need recognized within existing certification systems. Exposure-based frameworks shift the evidentiary burden onto later-generation households, who must piece together family medical histories and disability determinations, while also navigating uncertainty about which conditions qualify and how causality is assessed (Dũng, 2023). That evidentiary burden shapes whether families are able to be connected to benefits and services or remain in a gray zone where disability is treated as ordinary misfortune rather than exposure-related harm (Hammond & Đặng, 2023). The result is not simply undercounting, but uneven access to

financial stipends and long-term support in intergenerational households whose needs are often severe, continuous, and difficult to fit within systems built around direct wartime exposure.

The implications of this recognition gap become visible in the lived realities of long-term caregiving. One account documented by the Vietnam Association for Victims of Agent Orange follows Phạm Thị Dứt, a single mother caring for her adult daughter with cerebral palsy after her husband left the household; the narrative centers not only on economic strain but on shrinking support networks and uncertainty about continuity of care (VAVA, 2024). A second narrative highlights anticipatory anxiety: Ngô Thị Cẩm Hồng describes wanting above all for her daughter to have enough security and independence to live when her parents are no longer able to care for her (VAVA, 2024). These accounts extend beyond poverty; they demonstrate what happens when severe disability endures across decades without consistent connections to systems that anticipate caregiver aging, provide supported employment, offer respite, or ensure long-term service coverage (VAVA, 2024; Hammond & Đặng, 2023).

Drawing on research with 252 affected families, the Center for Gender, Family and Environment in Development compiled case materials summarizing reported congenital conditions by category and sex (Dũng, 2023; Hammond & Đặng, 2023). The resulting table highlights the concentration of severe, multi-system disabilities in later generations.

Type of birth defect	Male	Female	Total
Brain	68	50	118
Paralysis	18	13	31
Epileptic	3	3	6
Tumor	But	2	2
Heart	2	1	3
Ear malformations	1	2	3
Cleft palate	2	3	5
Allergies, acne, sores	10	12	22
Spinal deformities	But	2	2
Anal and genital malformations, urinary tract infections	2	1	3
Joint	1	But	1
Swollen lymph nodes all over the body	1	But	1
Laryngeal cancer	1	But	1
Limb deformities	19	16	35
Deaf and mute	4	8	12
Blind	2	3	5
Total	136	116	252

(Source: Author's statistics compiled from CGED research documents)

Figure 1: Reported Congenital Conditions Among 252 Agent Orange-Affected Families, by Category and Sex
Note. Based on case materials compiled by the Center for Gender, Family and Environment in Development from research with 252 affected families; discussed in Dũng (2023) and Hammond and Đặng (2023).

Under fragmented monitoring and non-automatic enrollment systems, certification does not operate as a one-time gateway to support so much as a recurring administrative obstacle. For intergenerational families managing profound and lifelong disability, the burden of proving eligibility unfolds alongside escalating caregiving demands rather than easing them (Dũng, 2023). What these families need, therefore, is not merely abstract acknowledgment of severe disability, but systems that can recognize later-generation need without unworkable evidentiary burdens and respond to lifelong care requirements, caregiver aging, and continuity of support over time. Otherwise, households confronting enduring disability are treated as if they are facing an isolated or private hardship rather than a sustained need for public recognition and care.

Gendered and Psychosocial Burden

Rather than identifying a separate group defined by exposure geography or lineage, this section highlights a cross-cutting social mechanism that shapes recognition and long-run household functioning across all affected populations: stigma, gendered caregiving, and limited psychosocial support.

Psychosocial harm is one of the ways through which exposure-linked disability becomes embedded in everyday life. Testimonies show that distress is produced not only by impairment itself but also by the ways disability is interpreted, judged, and managed in everyday social settings, particularly where formal mental health infrastructure is limited. The U.S. Institute of Peace (2023) notes that in some Vietnamese communities, disability may be understood through ideas of fate or karma. For some families, these frameworks provide coherence in the face of suffering; Trần Thị Ánh describes her son's condition as a "misfortune" written into destiny, while others recount being told their children's disabilities stem from ancestral wrongdoing. Võ Thị Kim Tuyền similarly explains her impairment as determined by God and something she has had to accept (VAVA, 2024).

These interpretations can shape how families engage with institutions. When disability is framed in spiritual or moral terms, families may be less likely to pursue difficult certification pathways or seek recognition through formal institutions and more likely to manage care privately (Hammond & Đặng, 2023). At the same time, stigma narrows social networks that often function as informal safety nets and discourages disclosure of disability or exposure histories. This dynamic is reinforced in peer environments as children with disabilities report bullying and exclusion, with effects ranging from diminished self-confidence to suicidal ideation (Hammond & Đặng, 2023). Tuyền recounts being mocked at school and contemplating death before her parents intervened. In this way, psychosocial harm does not remain separate from material deprivation; it affects future social participation, willingness to seek formal support, and uneven access to services.

For caregivers, these pressures accumulate as sustained strain. Daily care is carried out under economic insecurity and is often accompanied by persistent anxiety about what will happen to their children when they age or die, a concern repeatedly visible in household narratives and family-level assessments (Dũng, 2023; VAVA, 2024). This fear reflects the absence of durable systems that ensure continuity of care and respite. Even where limited support exists, responsibility remains concentrated within the household, producing instability rather than long-term security.

These burdens are also concentrated along gendered patterns. Women disproportionately assume primary caregiving roles while also managing domestic labor, and social norms that tie women's status to bearing "healthy" children can translate disability into maternal blame. Reproductive trauma and, in some cases, spousal abandonment further constrain women's economic options and documentation capacity. Gender thus functions as a structural pathway through which societal infrastructure gaps become lived constraints.

Household engagement with formal systems is shaped not only by rules of eligibility but also by the social and emotional conditions under which care is carried out. Stigma, exhaustion, and unequal caregiving burdens can narrow the space families have to pursue recognition, making informal coping more likely and sustained institutional engagement harder to maintain.

Vietnamese Government

The Vietnamese government is not a single actor but a layered administrative system in which central ministries, coordinating bodies, and provincial authorities shape Agent Orange policy through different forms of authority over recognition, assessment, implementation, and service delivery. The Ministry of Labour, Invalids and Social Affairs (MoLISA), the Ministry of Health, National Steering Committee 33, and Provincial People's Committees do not occupy the same position in the system, yet together they determine how harm is classified, which claims become legible to the state, and whether affected families are actually connected to benefits, care, and remediation-linked support. Distinguishing among these institutions is essential because the limits of the current response arise not only from resource constraints but also from the fragmented distribution of responsibility across welfare administration, medical certification, environmental governance, and provincial implementation. These institutions are shaped by recurring pressures of administrative feasibility, fiscal constraint, political legitimacy, and the need to manage a war legacy that remains both domestically significant and internationally visible (Boivin & Tran Minh, 2015; Dũng, 2023; Hammond & Đặng, 2023).

Ministry of Labour, Invalids and Social Affairs (MoLISA)

A central implementing actor in Vietnam's state response to Agent Orange-related disability is MoLISA. MoLISA sits at the intersection of recognition and resource

allocation because it administers monthly stipends and associated social supports under Vietnam's Agent Orange-linked benefits architecture while also implementing broader disability social protection programs for individuals certified as severely or particularly severely disabled (Hammond & Đặng, 2023). Because of this, MoLISA serves as a primary administrative institution through which exposure-related disability and some forms of intergenerational harm are formally recognized and linked to material support, largely through provincial implementation and standardized assessment procedures.

MoLISA's relevance to the policy problem is structural. The certification regime governing Agent Orange-linked recognition relies on defined exposure pathways and qualifying illness or disability categories and extends recognition to some descendants of exposed individuals who present associated conditions, particularly congenital outcomes (Hammond & Đặng, 2023). In practice, this means eligibility is not merely medical but administrative: formal status depends on documentation, standardized medical assessment, and the ability to satisfy categorical thresholds embedded in the certification process (VAVA, 2024). Once certification is granted, MoLISA administers monthly stipends for certified beneficiaries. USIP reports that more than 350,000 Vietnamese receive the monthly allowance under the Agent Orange program and specifies stipend levels for children certified as having "severe" or "particularly severe" disabilities (Hammond & Đặng, 2023). In parallel, MoLISA's disability benefits program is limited to those certified as "severely or particularly severely disabled," which USIP reports encompasses roughly 30% of people with disabilities in Vietnam; as of September 2023, payments ranged from 1,233,000 dong per month for children certified as having a severe disability to 2,055,000 dong for those certified as having a particularly severe disability, alongside a caregiver stipend of about 353,000 dong; set against Vietnam's 2024 average monthly worker income of 7.7 million dong, these amounts represent only a modest contribution relative to the likely costs of long-term disability care (Hammond & Đặng, 2023).

These institutional features intersect directly with the gaps this proposal addresses. When certification depends on documentation and qualifying categories, dispersed rural exposure and intergenerational disability can produce a persistent gray zone in which household need is evident but formal status and benefits remain difficult to secure or unevenly accessible across provinces (VAVA, 2024). This challenge is reinforced by the political geography of remediation. Vietnam's official and donor-facing remediation architecture has often centered around bounded hotspots at former airbases, which are legible targets for cleanup and monitoring, while dispersed exposure across rural districts and corridor communities is harder to define as a bounded administrative object (Office 33, 2013). Over time, that uneven legibility shapes the distribution of institutional attention, documentation capacity, and access to

care—especially for households whose exposure history is diffuse rather than tied to a single remediated site.

The administrative design also shapes how burdens are distributed after recognition is granted. USIP emphasizes that even when households receive stipends and associated disability benefits, those payments offset only a small portion of the actual costs of long-term care. Families still face substantial out-of-pocket burdens, including transportation costs for reaching provincial or metropolitan medical centers, which means that formal recognition does not eliminate the financial pressures of disability care (Hammond & Đặng, 2023). This gap between recognized need and benefit adequacy increases the political and administrative pressure placed on MoLISA as both steward of a national social protection system and the gatekeeping institution that determines who is formally acknowledged.

MoLISA's motivations and constraints are therefore central to the design of any feasible intervention. As the administrator of large-scale stipend and disability benefit programs, it has strong interests in fiscal sustainability, administrative feasibility, and manageable caseloads as eligibility definitions shift (Hammond & Đặng, 2023). Its behavior is also shaped by a bureaucratic preference for standardized assessment, categorical clarity, and province-level implementability, because recognition must be translated into rules that can be applied across a large and uneven administrative system. At the same time, MoLISA operates within a politically salient domain of postwar governance, where certification is tied not only to social protection but also to formal state recognition, making institutional legitimacy a significant concern. These pressures help explain why MoLISA is likely to favor reforms that remain administratively legible, fiscally bounded, and compatible with existing certification structures rather than open-ended expansions that are difficult to verify or finance.

MoLISA can influence the problem through its authority over certification rules, qualifying categories, benefit design, payment administration, provincial implementation, and inter-agency coordination. For that reason, any reform that seeks to expand presumptive eligibility, integrate registries, reduce documentation barriers, or better align benefits with household costs must be designed around MoLISA's institutional authority and its incentives to preserve both administrative order and political legitimacy (Hammond & Đặng, 2023).

Ministry of Health

The Vietnamese Ministry of Health (MOH) is a central institutional actor in any Agent Orange policy response because it shapes how exposure-related harm is medically recognized and managed through the state. Its role extends beyond general public health administration: the ministry helps define which conditions are formally assessed, how screening and diagnosis are structured, and what forms of follow-up care are feasible through the public health system. MOH-linked guidance and assessment procedures already reflect a wide range of screening needs

associated with Agent Orange and dioxin exposure, including hematologic, hepatic, metabolic, endocrine, oncological, reproductive, genetic, prenatal, and newborn testing (Tạp chí Điện tử Da Cam Việt Nam, 2022d). This makes the MOH relevant not only as a provider and coordinator of care, but also as the institution that determines how scientific evidence is operationalized into routine screening, diagnosis, referral, and long-term health management.

The ministry is involved because the consequences of Agent Orange remain, in significant part, a problem of public health governance. Research and official discussion point to persistent bodily burdens, hotspot-linked exposure pathways, and long-term health harms, while Vietnamese screening guidance also treats the burden as extending beyond acute illness to chronic disease management, reproductive health, and monitoring across an individual's life (Schechter et al., 1995; Dwernychuk et al., 2002; Hatfield Consultants, 2009; Duong et al., 2022; Tạp chí Điện tử Da Cam Việt Nam, 2024). Because these harms often require repeated screening, specialist referral, and long-term follow-up, they fall directly within the MOH's institutional mandate. MOH participation is therefore necessary for any credible exposure registry, standardized screening pathway across provinces, or durable system of long-term monitoring for exposed individuals and their descendants.

The ministry's behavior is shaped by a mix of professional, bureaucratic, and political considerations. First, it has reason to preserve clinical credibility by grounding decisions in standardized criteria and medical assessment procedures. This is especially important because Agent Orange remains politically sensitive, which incentivizes the MOH to present health determinations as clinically and administratively grounded rather than politically discretionary. Joint MOH–MoLISA guidance standardizes how relevant diseases, deformities, and birth defects are examined and assessed within the certification process (VAVA, 2024). Second, the ministry operates under real capacity and financing constraints. Broader reporting on Vietnam's health system points to uneven infrastructure, competing priorities, and financing pressures, which helps explain why the MOH would favor approaches that can be integrated into district and provincial networks rather than relying entirely on high-cost specialist interventions (Organisation for Economic Co-operation and Development, 2025; World Health Organization, 2016). That practical orientation is also visible in Vietnamese screening guidance, which distinguishes between tests that can be performed at primary and district facilities and those requiring better-equipped specialized centers (Tạp chí Điện tử Da Cam Việt Nam, 2022d).

These incentives shape how the MOH influences the problem. The ministry can expand or narrow recognition by affecting which conditions are formally assessed, which tests are standardized, how referral pathways are structured, and how public-health data are generated and used. Because Agent Orange-related harm is often difficult to establish with absolute causal certainty at the individual level, MOH

standards also influence whether exposed people become medically legible within the health system or remain in a gray zone between environmental history and medical proof. In that sense, the ministry helps structure not just the state's medical response, but also the terms under which the problem is known and acted upon.

National Steering Committee 33

Office 33 functions as a central state coordinating mechanism for addressing the toxic chemical consequences of war, particularly in coordinating environmental remediation and interministerial governance related to Agent Orange. This body coordinates ministries, engages external partners, and directs attention toward priority contamination sites and long-term recovery programs (Office 33, 2013; USAID & Office of the Standing Board for the National Steering Committee, 2019; Congressional Research Service, 2021). Its importance lies less in direct household service delivery than in its ability to make a technically complex and politically sensitive legacy issue administratively governable. In practice, this means identifying and prioritizing dioxin hotspots, coordinating technical assessments and remediation planning, and serving as a key interface between Vietnamese agencies and foreign donors or implementing partners (Hatfield Consultants, 2009; Ministry of Natural Resources and Environment, 2013; Office 33, 2013).

This actor is especially relevant because Agent Orange's legacy is not only a humanitarian and health issue, but also a problem of environmental governance, state coordination, and evidentiary prioritization. Former airbases remained major dioxin hotspots, and contamination has continued to be detected in some affected areas, even as the broader geography of herbicide exposure extended well beyond these bounded sites (Dwernychuk et al., 2002; Hatfield Consultants, 2009; Office 33, 2013; Stellman et al., 2003; Young et al., 2004). Therefore, the committee helps determine how the state defines the problem for official response—what is measured, which sites are prioritized, where remediation finance is directed, and how environmental intervention is sequenced. Its behavior is shaped by the need to preserve centralized coordination across environment, health, disability policy, war-related social policy, and foreign assistance; to maintain technical credibility in a scientifically complex and politically visible field; to demonstrate visible state capacity at high-profile sites such as Đà Nẵng or Biên Hòa; and to manage the issue within a diplomatic context in which cooperation has generally been framed around humanitarian recovery, remediation, and disability support rather than legal blame or reparations (Congressional Research Service, 2021; Hatfield Consultants, 2009; Boivin & Tran Minh, 2015; United Nations Development Programme Viet Nam, 2015; U.S. Department of State, 2008; U.S. Embassy & Consulate in Việt Nam, 2023).

Because its authority lies primarily in coordination rather than direct service provision, Office 33 influences the problem most strongly at the level of what becomes

governable, measurable, and fundable. It can identify and sequence priority hotspots, align ministries and provincial actors around implementation plans, structure donor engagement, and shape the official framing of the issue through state-authored reports and planning documents (Ministry of Natural Resources and Environment, 2013; Office 33, 2013; Hatfield Consultants, 2009; USAID & Office of the Standing Board for the National Steering Committee, 2019). That institutional position gives it a strong interest in visible progress, coherent national coordination, and sustained domestic and international support for Vietnam's postwar recovery agenda. It is therefore likely to favor reforms that strengthen remediation credibility, improve interministerial integration, and expand durable monitoring and recovery capacity, while remaining cautious about reforms that are politically inflammatory, difficult to operationalize, or likely to disrupt diplomatic cooperation (Boivin & Tran Minh, 2015; Congressional Research Service, 2021).

Provincial People's Committees

Provincial Vietnamese governments are indispensable implementation actors in Vietnam's Agent Orange and dioxin policy system because they translate national standards into actual recognition, assessment, and service delivery. Although central ministries define the overall framework, recognition does not occur automatically at the national level; affected individuals must be documented, medically assessed, and processed through provincial and city-level administrative structures (Embassy of the Socialist Republic of Vietnam in the United States of America, 2001). Official reporting indicates that local labor, war 'invalids,' and social welfare services are responsible for completing dossiers, while provincial and city medical boards determine the extent of impairment using standards issued jointly by the health and labor ministries. Provincial administration, therefore, functions as a key gatekeeping layer in determining whether affected individuals are formally recognized and linked to support (Embassy of the Socialist Republic of Vietnam in the United States of America, 2001; VAVA, 2024).

Because the scale and character of harm differ across localities, provinces face different combinations of implementation burden, population need, and administrative demand. Provincial governments are the level of the state that must adapt nationally standardized rules to place-specific patterns of harm and need. U.S.-Vietnam cooperation has likewise been organized through support for persons with disabilities in provinces sprayed with Agent Orange, underscoring that provinces are not simply passive recipients of central policy but major sites of implementation and coordination (USAID & Office of the Standing Board for the National Steering Committee, 2019; Hammond, 2023).

Their role is fundamentally administrative, coordinating, and distributive. Provincial People's Committees, DOLISA offices, health departments, and associated medical assessment structures help assemble

dossiers, coordinate examinations, and connect households to disability-related and social support services within their jurisdictions (VAVA, 2024; Embassy of the Socialist Republic of Việt Nam in the United States of America, 2001). In heavily affected provinces, local authorities also coordinate with national bodies and external partners in local disability and recovery programming tied to sprayed areas and hotspot remediation (Boivin & Tran Minh, 2015; USAID & Office of the Standing Board for the National Steering Committee, 2019).

Provincial governments' interests are shaped primarily by administrative burden and fiscal constraint. Agent Orange-related harms continue to generate local demands related to disability, caregiving, livelihoods, and intergenerational vulnerability, creating pressure on provincial systems in affected communities (Dũng, 2023; Hammond & Đặng, 2023). Those demands are layered onto a broader disability-policy environment in which persons with disabilities already face unequal access to health care, education, employment, and other services, placing substantial pressure on local institutions with limited resources (National Statistics Office of Viet Nam, 2019; UN Viet Nam, 2022). Provincial authorities have reason to be cautious about reforms that widen eligibility or create new obligations without corresponding fiscal transfers, staffing, or technical support, because such reforms increase both workload and budgetary exposure at the local level.

Provincial offices affect how inclusive or restrictive policy becomes in practice through dossier requirements, the accessibility of certification pathways, the thoroughness of review, and the consistency of outreach. Because implementation runs through provincial administrations, access may depend not only on national criteria but also on local administrative capacity, coordination, and procedural practice (UN Việt Nam, 2022). Provincial variation can thus determine whether national policy is implemented consistently or unevenly across localities.

United States Government

The U.S. response to Agent Orange has emerged through institutions that do not share a single mandate or policy logic. Rather than reflecting a coherent reparative framework, it has been shaped by the interaction of aid administration, congressional authority, and technically delimited forms of remediation. Reading USAID, Congress, and the Department of Defense separately is, therefore, essential to understanding why Agent Orange has been addressed unevenly across environmental cleanup, disability assistance, and broader questions of postwar responsibility and bilateral cooperation (Congressional Research Service, 2021; Hammond & Đặng, 2023; U.S. Department of State, 2008).

United States Agency for International Development (USAID)

USAID was a major channel through which the U.S. addressed the contemporary consequences of Agent Orange in Vietnam, primarily through disability assistance,

rehabilitation, hotspot remediation, and development programming rather than individualized exposure compensation. Its role was not to certify Agent Orange victims under Vietnamese law or to operate a U.S.-style presumptive compensation system. Instead, U.S. assistance was structured around support for persons with disabilities in heavily sprayed provinces, including rehabilitation, caregiver support, community-based services, and social inclusion programming (Đặng, 2023). The 2019 memorandum of intent between USAID and the Vietnamese national steering structure explicitly focused on support for persons with disabilities in provinces sprayed with Agent Orange (USAID & Office of the Standing Board for the National Steering Committee, 2019). Earlier U.S. government statements likewise emphasized humanitarian cooperation, disability support, and environmental remediation rather than reparations (U.S. Department of State, 2008). USAID also supported major war-legacy remediation efforts, including dioxin cleanup work at Biên Hòa (Rising & Ghosal, 2025).

USAID's interests and motivations are best understood as a combination of developmental pragmatism, diplomatic constraint, and political risk management. The agency operated under pressure to deliver visible humanitarian benefits while remaining within the boundaries of U.S.-Vietnam diplomatic cooperation (Hammond & Đặng, 2023). Its "regardless of cause" model allowed it to fund services for vulnerable populations in heavily sprayed areas without taking on the politically sensitive task of distinguishing who was and was not an "Agent Orange victim" in a legally meaningful sense (Hammond & Đặng, 2023). This approach also aligned with a broader framework of U.S.-Vietnam war-legacy cooperation centered on humanitarian recovery, disability inclusion, and joint remediation rather than adversarial blame (USAID & Office of the Standing Board for the National Steering Committee, 2019).

Those motivations shaped the kinds of programs USAID supported. USIP's review shows that USAID-funded programming emphasized rehabilitation services, caregiver training, peer counseling, policy implementation, access to public services and transportation, and disability rights and social inclusion, while livelihood and income-generation support occupied a smaller place in the portfolio (Hammond & Đặng, 2023). USAID, therefore, influenced the issue not only through the scale of funding it provided, but also through the needs it prioritized. It helped build civilian-facing systems for disability and rehabilitation, supported implementing partners and local organizations, and sustained a service-delivery model centered on function, inclusion, and care rather than exposure tracing or direct income compensation (Hammond & Đặng, 2023; USAID & Office of the Standing Board for the National Steering Committee, 2019). On the environmental side, its support for cleanup at major hotspots tied disability assistance to geographically bounded remediation projects (Congressional Research Service, 2021; Rising & Ghosal, 2025).

USAID's tools for influence were substantial. It controlled grant structures, selected implementing partners, set program priorities, and used monitoring and evaluation frameworks to define what counted as success. Because war-legacy cooperation depended heavily on external finance and bilateral coordination, USAID had significant leverage over which provinces received resources and which forms of assistance were emphasized, whether disability services, social inclusion, caregiver support, or remediation-linked programming (Hammond & Đặng, 2023; Congressional Research Service, 2021). In this sense, USAID helped shape not only the scale of assistance but also the conceptual boundaries of what U.S. assistance was for.

This model became less stable in 2025. In March, 2025, the State Department announced that remaining USAID functions would be transferred to the Department by July 1, while other functions would be discontinued. Reporting that same month also found that aid restructuring and stop-work orders disrupted war-legacy programming in Vietnam, including dioxin cleanup at Biên Hòa and disability-related assistance, even though some work later resumed (Rising & Ghosal, 2025). U.S. policy significantly weakened the institutional capacity and predictability of the civilian assistance model. That weakening introduced greater uncertainty into the continuity of long-term disability services, the reliability of local implementation partnerships, and the durability of civilian-facing investments over time.

Congress

Congress is another central actor in the Agent Orange policy landscape because it controls appropriations, defines eligible uses of funding, and imposes reporting and oversight requirements on U.S. assistance to Vietnam. Although it does not directly implement remediation or disability programs, it determines whether those programs exist, how large they are, and which activities and beneficiaries they cover. As Hammond and Đặng (2023) enumerate, congressional appropriations helped convert Agent Orange from a diplomatic deadlock into a practical area of U.S.-Vietnam cooperation. Over time, Congress refined appropriations language from general support for remediation and health programming to more specific references to disabilities that "may be related" to Agent Orange and dioxin exposure (Congressional Research Service, 2021; Hammond & Đặng, 2023).

Congress is involved because Agent Orange remains entangled with humanitarian need, the unresolved legacies of war, and the broader politics of U.S.-Vietnam relations. It has played a key role in defining the terms on which the U.S. is willing to act. The contrast between domestic and international policy is especially revealing: although the U.S. developed a presumptive compensation framework for its own veterans, it did not extend a parallel system to Vietnamese civilians. Congress is, therefore, especially important because it has been able to authorize limited forms of assistance without fully adopting a liability-based approach (U.S. Department of Veterans Affairs, 2011, 2025; Hammond & Đặng, 2023). In this way, Agent Orange

confronts Congress as both a foreign policy issue and a politically fraught question of how the U.S. addresses the enduring consequences of war.

Congress's behavior has been shaped by the need to respond to Agent Orange in ways that are responsive to humanitarian concern, compatible with bilateral diplomacy, and limited in political exposure. Support for related assistance has often been linked to postwar reconciliation and bilateral stabilization, while some members of Congress have framed such action as a moral responsibility as well as a diplomatic necessity (U.S. Department of State, 2008; Hammond & Đặng, 2023). Yet Congress has generally avoided language that would imply explicit legal liability, preferring bounded and monitorable projects over open-ended reparative commitments (Congressional Research Service, 2021; Hammond & Đặng, 2023). That caution reflects not only fiscal concerns but also the influence of domestic constituencies and a broader reluctance to establish international compensation precedents (Committee to Evaluate the Potential Exposure of Agent Orange/TCDD Residue and Level of Risk of Adverse Health Effects for Aircrew of Post-Vietnam C-123 Aircraft, 2015).

Congress influences the problem through appropriations, statutory and committee language, reporting requirements, and oversight. These tools shape not only how much the U.S. does, but also what kind of response it undertakes, including whether assistance is directed toward remediation, disability services, or geographically targeted support in heavily sprayed provinces, and how expansively beneficiaries are defined (Congressional Research Service, 2021; Hammond & Đặng, 2023). Because Agent Orange remains a symbolically powerful legacy of the Vietnam War, congressional decisions also help determine whether the U.S. response is understood primarily as environmental cleanup, humanitarian disability assistance, diplomatic reconciliation, or some combination thereof. Therefore, Congress is a key actor in setting the political boundaries of U.S. action on Agent Orange in Vietnam (Congressional Research Service, 2021; Hammond & Đặng, 2023; U.S. Department of State, 2008).

Department of Defense

The U.S. Department of Defense (DoD) is relevant because it links the historical production of the Agent Orange problem to one of the principal forms of contemporary U.S. response. During the Vietnam War, DoD was part of the state apparatus that oversaw the deployment, storage, and operational use of herbicides, making it institutionally connected to the origins of the problem (Stellman et al., 2003; Young et al., 2004; Zierler, 2011). In the present, however, its role is considerably narrower and more technical. DoD has been involved primarily in environmental remediation at former U.S. military sites where dioxin contamination remained concentrated, especially Da Nang and Biên Hòa, and it has shaped how contaminated soil and sediment are assessed, contained, treated, and monitored through technical standards, engineering expertise, and contracted cleanup operations

(Congressional Research Service, 2021; Hammond & Đặng, 2023; Hatfield Consultants, 2009; Boivin & Tran Minh, 2015). The problem, therefore, reaches DoD both as a legacy of past military action and as an ongoing matter of remediation, risk management, and bilateral credibility.

DoD's behavior is shaped less by humanitarian or compensatory aims than by an institutional preference for forms of action that are technically bounded, operationally defined, and politically sustainable. Cleanup at former military installations can be organized as a visible and measurable engineering task, making it easier to pursue than open-ended commitments tied to civilian health, disability compensation, or long-term public health monitoring (Hatfield Consultants, 2009; Ministry of Natural Resources and Environment, 2013; Office 33, 2013). This orientation also helps contain broader questions of liability, since remediation can be framed as addressing environmental contamination without fully conceding responsibility for the long-term and intergenerational harms experienced by Vietnamese civilians (Hammond & Đặng, 2023; U.S. Department of State, 2008). As a result, DoD influences the problem chiefly by directing expertise, contracts, standards, and resources toward site-based cleanup rather than toward civilian care systems. Its importance to this policy space lies in both its capacity and its limits: it can materially reduce contamination at major hotspots, but it is not institutionally structured to lead a broader response to the human consequences of Agent Orange.

International Donors

Agent Orange policy is shaped not only by domestic institutions and the U.S. government, but also by external donors that influence what kinds of reforms can be funded, scaled, and sustained. The World Bank and bilateral donors play different roles within this space, but both affect whether support is directed toward institutional reform, humanitarian assistance, environmental remediation, or longer-term health and social protection. Treating them as distinct actors matters because the boundaries of the response are shaped as much by donor priorities and development logics as by the scale of need itself. Their engagement is generally conditioned by political caution, demands for measurable results, and the need to fit Agent Orange-related interventions within broader development and diplomatic frameworks (Boivin & Tran Minh, 2015; Do, 2009; Hammond & Đặng, 2023).

World Bank

The World Bank is a relevant actor because it could support Agent Orange-related reform through the kinds of institutional capacity-building on which large-scale reform depends. Its relevance lies in its ability to finance administrative restructuring, advise on social protection and health-system design, generate economic and epidemiological analysis, and convene state actors around reforms that can be implemented at scale. In Vietnam, the World Bank has supported broader efforts to strengthen social assistance systems, articulated a long-term policy

vision for social protection, and backed health-sector management tools and service-delivery reforms. It has also contributed to the knowledge base surrounding Agent Orange through research on the long-term health effects of war exposure, including work on cancer prevalence and conflict-related risk (Do, 2009; World Bank, 2019; World Bank, 2020; World Bank, 2024). For that reason, reforms such as exposure registries, longitudinal monitoring, or more integrated disability-service delivery fall within the kinds of administrative and data-intensive interventions the World Bank is institutionally equipped to support.

The World Bank's behavior is likely to be shaped by political caution, a preference for measurable development outcomes, and an emphasis on interventions that appear scalable and fiscally sustainable. Unlike advocacy organizations, it is more likely to frame the problem in terms of institutional performance, poverty reduction, service delivery, and administrative effectiveness than in terms of historical liability or moral redress. That orientation makes it well-positioned to support reforms such as registry development, integrated social protection delivery, stronger disability inclusion, or improved health-information systems, while making it less likely to foreground exposure-based accountability as a legal or ethical claim in itself. In practice, the World Bank could influence the issue through development financing, technical assistance, economic modeling, and policy advice, thereby shaping which responses are treated as feasible, cost-effective, and administratively sustainable. Its relevance to this policy space, therefore, lies in both its capacity and its limits: it could help build the public-health and social-protection infrastructure needed for broader reform, even as its development-oriented framework may privilege system efficiency over explicit recognition of Agent Orange responsibility (Boivin & Tran Minh, 2015; Do, 2009).

Bilateral Donors

The Agent Orange response has also been shaped by bilateral partners beyond the U.S., particularly through technical cooperation, scientific collaboration, and targeted humanitarian assistance (Boivin & Tran Minh, 2015; Tạp chí Điện tử Da Cam Việt Nam, 2025b). Their role has typically not been to build a comprehensive national entitlement system, but to support bounded interventions such as research partnerships, environmental cooperation, rehabilitation initiatives, and targeted assistance to affected communities (Boivin & Tran Minh, 2015; Hammond & Đặng, 2023). Long-running collaboration through the Vietnam–Russia Tropical Center, for example, has helped sustain scientific and epidemiological research on dioxin-affected areas and thereby contributed to a significant non-U.S. evidence base on long-term harm in Vietnam (Tạp chí Điện tử Da Cam Việt Nam, 2025a). More recent cooperation with Belgium points in a similar direction, as support has been framed through humanitarian and environmental partnership rather than through explicit liability or reparations discourse—reflecting the same broader pattern of technically specific, diplomatically bounded engagement

that has characterized multilateral involvement in Vietnam's Agent Orange response more broadly (Tạp chí Điện tử Da Cam Việt Nam, 2025b). Bilateral donors, therefore, do not control the core architecture of Vietnamese policy, but they add resources, expertise, and international legitimacy to selected parts of the response (Boivin & Tran Minh, 2015).

Bilateral donors' behavior is often shaped by diplomatic caution and by a preference for interventions that can be framed as technically specific, humanitarian, or development-oriented. In Vietnam, this has made bilateral partners more likely to support scientific cooperation, environmental remediation, disability inclusion, and other bounded forms of assistance than programs centered on liability or broad exposure-based accountability (Boivin & Tran Minh, 2015; Hammond & Đặng, 2023; Tạp chí Điện tử Da Cam Việt Nam, 2025a, 2025b). Their influence usually operates through grants, technical agreements, pilot projects, and research partnerships, which can expand the resource base and demonstrate useful models, but often do so through project-based support rather than permanent national systems (Boivin & Tran Minh, 2015; Dũng, 2023).

Non-Governmental Actors

Beyond state institutions and formal donors, non-governmental actors help shape the Agent Orange response by representing affected communities, providing support at the local level, and sustaining public attention to needs that official systems do not fully meet. VAVA and international NGOs occupy different positions in this space, but together they affect how harm is understood, which forms of suffering remain visible, and what kinds of assistance reach families outside formal administrative channels. Separating these actors is important because their influence does not rest on budgetary or regulatory authority, but on their ability to mobilize claims, support research, build partnerships, and respond to unmet needs in more flexible ways. Their work is shaped by humanitarian commitments, organizational limits, donor pressures, and the political conditions under which advocacy and service provision can operate in Vietnam (Dũng, 2023; Hammond & Đặng, 2023).

Vietnam Association for Victims of Agent Orange/Dioxin (VAVA)

VAVA is the principal organized civilian association representing people affected by Agent Orange in Vietnam, and its importance lies in its position between affected communities, state institutions, and the broader public sphere. Its activities extend beyond symbolic advocacy to include public education, charitable assistance, limited service coordination, and cooperation with research and humanitarian initiatives. Through affiliated bodies such as the Vietnam Fund for Victims of Agent Orange/Dioxin and provincial- and city-level associations, VAVA has helped aggregate victims' claims, channel material support, and sustain public attention to the issue. It has also participated in practical care-oriented activities, including training related to detoxification steam therapy, programming through victim-protection centers, and

guidance for provincial detoxification and rehabilitation centers operating under local association structures (Bùi, 2022; Tạp chí Điện tử Da Cam Việt Nam, 2022b). VAVA has also engaged in research and public dialogue with domestic and international organizations working on investigation, care, and assistance for Vietnamese victims (Đình Trọng, 2022). VAVA has served as one of the few organized actors able to translate dispersed suffering into a sustained collective claim on the state and on public memory.

VAVA's role is defined by the continuing gap between the scale of harm experienced by affected communities and the limits of existing recognition and support. Its efforts are oriented toward broader recognition, stronger material and social assistance, and greater responsibility toward affected people, while also insisting that Agent Orange be understood as a continuing question of historical injustice rather than only as a matter of disability or poverty policy. Because it works within Vietnam's political system, its influence is exercised largely through coordination with state institutions, affiliated local associations, charitable and service-linked initiatives, public communication, and cooperation with researchers and other organizations. These channels allow VAVA to consolidate victims' claims across localities, shape public understanding of the issue, and sustain pressure for a more expansive response. At the same time, the limits visible in its own activities—including staffing shortages, weak electronic medical-record systems, inadequate equipment, and unstable funding in centers associated with provincial associations—underscore both the scale of unmet need and the constraints under which it operates (Dũng, 2023; Hammond & Đặng, 2023; Tạp chí Điện tử Da Cam Việt Nam, 2022b, 2022c). VAVA's importance thus lies in its position as the main organized intermediary through which affected communities can press for broader recognition, more durable support, and a policy response that keeps Agent Orange in view as an unresolved public issue.

International NGOs

International NGOs are significant actors in the Agent Orange policy space because they often work closest to affected households while operating alongside, rather than replacing, Vietnamese actors such as VAVA and local authorities. In Vietnam, they have commonly partnered with local authorities and Vietnamese organizations to provide rehabilitation, caregiver support, livelihood assistance, housing adaptation, educational support, and other forms of community-based aid, particularly in heavily sprayed provinces (Hammond & Đặng, 2023; Dũng, 2023). Their involvement reflects the fact that Agent Orange-related harm is not limited to medical treatment alone, but also includes long-term caregiving burdens, inaccessible living environments, income loss, and social exclusion. The problem therefore reaches these organizations as both a humanitarian and disability-inclusion issue, and it gives them a role in addressing forms of need that are often

diffuse, household-based, and poorly met through existing systems.

Their behavior is shaped by a combination of humanitarian commitments, disability-rights frameworks, donor priorities, and the political limits of operating in Vietnam. Some approach the issue primarily through rehabilitation and care, while others emphasize accessibility, participation, and social inclusion; those differences influence the kinds of reforms they are most likely to support (Hammond & Đặng, 2023). Because they depend on grants and project cycles, they are also influenced by the need to produce measurable outcomes and to work through forms of intervention that remain administratively and politically feasible. Their tools are, therefore, practical rather than regulatory: they can deliver services, test pilot models, support research, and help shape local agendas through partnerships and demonstration projects. USIP's research shows that international and nongovernmental organizations have often provided more flexible and family-centered forms of support than many formal state programs, while other partnerships have extended into technical and remediation-related cooperation as well (Hammond & Đặng, 2023; Tạp chí Điện tử Da Cam Việt Nam, 2022a; Bui, 2022). For that reason, international NGOs have clear incentives to influence the issue: they can alleviate suffering, improve local quality of life, and demonstrate workable approaches to care and inclusion. At the same time, their influence remains structurally limited. They do not control national eligibility rules, compensation systems, or long-term surveillance infrastructure, and their interventions are usually shaped by project timelines and donor priorities rather than by authority to redesign the broader policy system (Boivin & Tran Minh, 2015; Hammond & Đặng, 2023; Dũng, 2023).

Methodology

This proposal employs a qualitative research design to examine the long-term health and governance consequences of Agent Orange exposure among the Vietnamese civilian populations. Rather than seeking to establish definitive causal identification through statistical analysis, a task constrained by the absence of systematic longitudinal civilian exposure data, the study evaluates patterns of harm and institutional response through the triangulation of multiple independent lines of qualitative evidence to assess the extent to which exposure intensity is systematically associated with adverse health outcomes, informing the appropriate scale of the policy response. The independent variable is historical herbicide exposure intensity, measured through U.S. military spray records, documented dioxin "hotspot" classifications, and geographic concentration of heavily sprayed corridors between 1961 and 1971. The dependent variables are multidimensional indicators of long-term health burden and institutional capacity, including disability prevalence, chronic disease incidence, birth defect rates, and regional disparities in healthcare access.

This quantitative component draws on document review of Vietnamese government policy, U.S. congressional appropriations, World Bank and UN development reports, NGO assessments, and academic scholarship. Testimonies and case studies are analyzed to assess documentation barriers, compensation eligibility constraints, and disproportionate caregiving burdens resulting from long-term disability. By triangulating epidemiological indicators, spatial patterns, and institutional policy analysis, this methodology evaluates whether independent lines of evidence point to similar structural conclusions. The synthesis of these findings informs policy recommendations aimed at strengthening civilian health monitoring systems, improving documentation mechanisms, and institutionalizing long-term accountability frameworks.

Policy Recommendation

Policy Statement

This proposal establishes a framework for Agent Orange screening, referral, and household risk management grounded in Vietnam's existing health and administrative institutions. Rather than creating new administrative infrastructure, it repairs a specific coordination failure: the absence of a pathway through which likely affected households can be identified, clinically assessed, formally reviewed, and monitored over time. The framework operates through four integrated components: (1) a presumptive eligibility mechanism that reduces entry-level evidentiary barriers; (2) a standardized, tiered screening and referral pathway embedded in Vietnam's existing public health infrastructure; (3) targeted household environmental and food-system testing for households in defined higher-risk situations; and (4) a registry and longitudinal monitoring function that generates the data needed for sustained surveillance and policy review. The policy is designed to reach residents of high-risk communes and hotspot-adjacent areas, households in heavily sprayed rural districts and corridor communities facing greater barriers to specialist care; intergenerational families with suspected exposure-related disability across generations; and households in risk zones dependent on locally sourced food systems, including self-produced fish, poultry, and livestock.

Component One: Presumptive Eligibility

The first component of this framework is presumptive eligibility. Presumptive eligibility functions as the system's intake mechanism. Households meeting one or more defined criteria would be permitted to enter clinical screening and formal review without first satisfying the full evidentiary documentation requirements that currently govern access to MoLISA's certification process. Presumptive eligibility does not confer automatic compensation, guarantee formal recognition, or replace existing medical assessment procedures; its function is strictly to remove the initial documentation burden as a condition of entry into the system.

Eligibility would be defined at the national level by the MOH and Office 33, with provincial adaptation permitted within nationally established bounds. The following categories would qualify a household for presumptive entry:

- Documented or verifiable residence, at any point between 1961 and 1975, in a commune identified in the national herbicide-spraying database as having been directly or probably sprayed, including the approximately 3,181 villages identified as directly sprayed and 1,430 assessed as probably sprayed in the Office 33 national inventory (Office 33, 2013)
- Current or prior residence within a defined radius of a designated dioxin hotspot, proposed at 10 kilometers at a starting threshold to reflect hotspot studies commonly defining exposed populations as living within approximately 10 kilometers of contaminated airbases, including former airbases and additional contaminated sites identified in independent assessments (Dwernychuk et al., 2002; Hatfield Consultants, 2009; Nishijo et al., 2022; Tran et al., 2023).
- Presence of one or more conditions in a household member appearing on the MOH and MoLISA's jointly standardized list of Agent Orange-associated diseases, deformities, or birth defects, as established in existing joint guidance (VAVA, 2024)
- Multi-generational presentation of qualifying conditions within a single household, suspected exposure-related illness or disability affecting more than one generation, reflecting documented intergenerational transmission mechanisms (National Academies of Sciences, Engineering, and Medicine, 2018; Ngoc et al., 2019)
- Household reliance on locally sourced food systems within a designated risk zone, including self-produced fish, poultry, duck, or livestock raised in or directly adjacent to contaminated ponds, waterways, soils, or other environments linked to a designated dioxin hotspot, consistent with documented food-chain bioaccumulation pathways (Pham et al., 2015; World Health Organization, 2023)

The use of presumptive eligibility as a system-entry mechanism has precedent in Agent Orange policy. The U.S. established a presumptive service connection framework for its own veterans under the Agent Orange Act of 1991, under which veterans who served in defined locations during defined periods and who develop one of a list of associated conditions are presumed to have been exposed without requiring individual-level proof of contact (U.S. Department of Veterans Affairs, 2025). Vietnamese civilians were never incorporated into a comparable framework, despite facing exposure through the same campaign. This proposal adapts the underlying logic of presumptive eligibility, using geographic and temporal service history as a proxy for individual exposure, to the Vietnamese civilian context, grounding eligibility criteria in spraying geography, hotspot

proximity, condition presentation, and food-system risk rather than military service records.

Priority Zone Classification

Presumptive eligibility criteria alone do not determine how implementation resources are sequenced across a geographically uneven landscape. A commune adjacent to Biên Hòa, with high aquaculture dependence and no district hospital within 30 kilometers, presents a fundamentally different risk and access profile than a peri-urban commune on the edge of a mapped spray zone with a provincial hospital nearby; yet, both might technically qualify under the same eligibility criteria. To make presumptive eligibility administratively usable, the policy would include a composite priority index that classifies districts according to relative exposure risk, livelihood vulnerability, and barriers to specialist care. To translate those criteria into a rational allocation of system resources, the policy includes a composite priority index that scores districts across four indicators: proximity to a designated hotspot or heavily sprayed zone, rurality, reliance on agriculture or aquaculture as a proxy for food-chain exposure risk, and distance to a provincial hospital as a measure of practical access to specialist care. The resulting score determines whether a commune is designated Tier 1, Tier 2, or Tier 3, and therefore, which combination of presumptive eligibility, mobile specialist outreach, and trigger-based household testing applies.

Distance to a designated hotspot or heavily sprayed zone would be weighted most heavily because of its direct relationship to documented contamination risk. Districts within 10 kilometers of a designated hotspot would receive 3 points, those within 10 to 25 kilometers of a hotspot or located in a mapped, heavily sprayed area would receive 2 points, and those outside both categories would receive 0. Rurality would be scored at 2 for highly rural districts or districts, 1 for mixed settings, and 0 for urban or peri-urban areas. Reliance on agriculture or aquaculture, used here as a proxy for food-system exposure risk, would be scored at 2 for high dependence, 1 for moderate dependence, and 0 for low dependence. Distance to a provincial hospital, as a proxy for practical access to specialist care, would be scored at 3 for districts located more than 30 kilometers from a provincial facility, 2 for those located 15 to 30 kilometers away, and 0 for those within 15 kilometers.

The maximum possible score would be 10. Districts scoring 8 to 10 would be classified as Tier 1, indicating the strongest overlap of plausible exposure risk, livelihood vulnerability, and weak access to care. These districts would be prioritized for presumptive eligibility, trigger-based household environmental and food-system testing, and mobile specialist outreach. Districts scoring 4 to 7 would be classified as Tier 2 and would receive presumptive eligibility and the full referral pathway, but with less intensive outreach prioritization. Districts scoring below 4 would be classified as Tier 3 and would remain within the standard referral system, though without the same level of presumptive prioritization or targeted testing. These

thresholds should be treated as provisional and subject to technical review and provincial refinement during the pilot phase.

Component Two: Standardized Tiered Screening and Referral Pathway

Once a household enters the system through presumptive eligibility, cases move through a four-tier screening and referral pathway embedded in Vietnam's existing public health structure. This pathway is not new infrastructure but a standardized protocol layered into pre-existing institutions operating under two distinct but complementary authorities: commune and ward health stations, district health centers, and provincial hospitals, which fall under MOH oversight, and MoLISA's formal recognition process, which governs benefit determination at the final tier. The clinical standards applied throughout the pathway—including the conditions list used at intake and the diagnostic criteria applied at the provincial specialist level—are drawn from joint MOH–MoLISA guidance that already governs how qualifying diseases, deformities, and birth defects are examined and assessed within the existing certification process (VAVA, 2024).

Tier One: Commune and Ward Health Stations

Commune and ward health stations serve as the initial point of contact. Their role is intake, basic screening, triage, and documentation—not diagnosis. Health workers at this level conduct intake through routine facility contact and targeted community outreach, using standardized paper-based or mixed paper-digital intake forms adapted to local capacity. Intake documentation would capture current and historical place of residence, including any residence in sprayed communes or hotspot-adjacent zones; household food production and sourcing practices; self-reported or clinician-observed systems and conditions on the jointly standardized MOH–MoLISA list; family medical history, including multi-generational conditions; and prior formal recognition or benefit status.

Following intake, health workers determine one of three triage outcomes: (a) case can be managed or monitored at the local level; (b) case should be referred for priority district-level review; or (c) case requires immediate referral for urgent clinical care. Cases are referred upward when a presenting condition is severe or unstable; when the relationship between symptoms and possible exposure cannot be assessed confidently at the local level; when records are incomplete, internally contradictory, or absent; or when symptoms appear plausibly exposure-related but cannot be resolved through local screening.

Tier Two: District Health Centers

District health centers function as the intermediate review and coordination layer. Their responsibilities are: reviewing commune-submitted cases for completeness and consistency with standardized referral criteria; applying district-level screening criteria to determine whether a case can be managed locally or requires referral to provincial

specialist units; coordinating scheduled visits from provincial specialist teams; and connecting individuals who do not clearly fit the Agent Orange pathway to routine care or general social support services, so that households failing to meet specialist referral criteria are not simply dropped from the system.

Tier Three: Provincial Agent Orange Clinic Units

Dedicated Agent Orange clinic units embedded within selected provincial hospitals serve as specialist hubs. These are not entirely new facilities but designated clinical functions within existing provincial hospitals—staffed with trained personnel and equipped with diagnostic tools identified in MOH screening guidance as requiring specialist-level capacity (Tạp chí Điện tử Da Cam Việt Nam, 2022d). Their functions include: assessing complex or clinically uncertain cases referred from the district level; confirming diagnoses that cannot be resolved at lower tiers; creating individualized follow-up plans in coordination with district and commune providers; managing referrals for rehabilitation, counseling, specialist treatment, and formal MoLISA review; maintaining facility-level case registries and reporting to the national registry; identifying patterns and trends across referred cases; and providing supervision and clinical training to district and commune-level personnel.

Provincial Agent Orange clinic units would be designated in provinces meeting one or more of the following criteria: presence of a designated dioxin hotspot within provincial boundaries; classification as a heavily sprayed province in the Office 33 national inventory; or documented concentration of Agent Orange-related disability claims in MoLISA's provincial caseload data (Office 33, 2013; Congressional Research Service, 2021).

Tier Four: Formal Recognition via MoLISA

Cases meeting recognition criteria at the provincial unit level are forwarded to MoLISA's existing formal certification and benefit process. The health system determines medical eligibility through structured, standardized clinical assessment; MoLISA determines cash-benefit qualification and administers stipends for eligible certified households. These functions remain institutionally distinct: the health system produces standardized clinical evidence, and MoLISA applies it to benefit determination through established procedures (Hammond & Đặng, 2023).

Tier Five: Rural and Urban Adaptation

In rural areas, the pathway is supplemented by scheduled mobile specialist outreach from provincial units to district facilities, including periodic specialist review days for pre-screened cases, follow-up visits for registered households, and standardized training for district clinicians on Agent Orange screening and referral protocols. In urban areas, the pathway operates primarily through ward-level commune health stations, district health centers, and provincial hospital referral systems, with scheduled facility-based follow-up as the standard mode of continuity. Phone-

based contact functions as a supplementary coordination and reminder tool in both settings, not as the primary medium of case management.

Component Three: Targeted Household Environmental and Food-System Testing

The third component establishes a targeted, trigger-based mechanism for household environmental and food-system testing in cases where contamination pathways are plausible but unconfirmed. This is not a program of universal household testing. The MOH, in coordination with the Ministry of Natural Resources and Environment and provincial governments, identifies a defined set of priority risk zones and the criteria under which environmental or food-system testing may be initiated. Testing is triggered when a household meets two or more of the following conditions:

- Current residence in a commune designated as a priority risk zone based on spraying history, proximity to hotspot sediment dispersal areas, or confirmed prior contamination in environmental surveys
- Household food production practices involving self-raised fish, ducks, poultry, or livestock kept on or adjacent to potentially contaminated land or water, consistent with documented dioxin bioaccumulation pathways through aquatic and terrestrial food chains (Pham et al., 2015; World Health Organization, 2023)
- Presence of multiple suspected exposure-related conditions within one household, including across generations
- Prior surveillance flags raised by commune or district health workers through the screening pathway

When triggers are met, authorized environmental health teams collect soil, sediment, or food samples as appropriate; results are shared with the household and with the health system; and the household is referred into the medical pathway. Where contamination is confirmed, repeat environmental and food-system testing is scheduled at defined intervals, and the household's status within the screening pathway is flagged for priority follow-up (Office 33, 2013; United Nations Development Programme Viet Nam, 2015).

Component Four: Registry and Longitudinal Monitoring

The fourth component establishes a registry and longitudinal monitoring function to support long-term system operation and generate public health data for ongoing policy review. Registry functions are maintained at two levels. Provincial Agent Orange clinic units maintain facility-level case registries covering screened cases, diagnoses, referral outcomes, and follow-up plans. The Ministry of Health maintains a national-level aggregate

registry drawing on provincial reporting, enabling cross-provincial trend analysis, policy monitoring, and periodic evidence review. Registry data would be used to: identify geographic concentrations of unmet need; assess whether presumptive eligibility criteria are appropriately calibrated; inform periodic review of the MOH–MoLISA jointly standardized conditions list; and generate public health reporting that supports domestic policy review and engagement with international partners and donors (National Statistics Office of Việt Nam, 2019; Congressional Research Service, 2021). Data privacy protections are embedded in registry design, and registry participation is not itself a condition of access to screening or referral.

Implementation

MOH serves as the national policy lead, responsible for defining intake criteria, standardized screening and referral protocols, registry expectations, and quality-assurance mechanisms across all four components. Provincial Departments of Health and selected provincial hospitals are the primary implementing bodies, responsible for establishing and staffing Agent Orange clinic units, coordinating district-level review, and maintaining facility-level registries. District health centers and commune and ward health stations carry out frontline intake, screening, and coordination, forming the system's primary point of contact with affected households. MoLISA retains authority over formal recognition and stipend eligibility for cases proceeding to that stage, preserving its existing gatekeeping function within the social protection system. Office 33 and the Ministry of Natural Resources and Environment coordinate environmental and food-system testing functions under Component Three, including the designation of priority risk zones and oversight of sample collection and laboratory referral. VAVA and provincial victim associations support community outreach, household identification, and representation of affected families within the health system, drawing on their existing networks in heavily affected provinces. International NGOs and technical partners assist with training, pilot implementation, and capacity building during initial rollout, particularly in provinces where health system capacity requires supplementary support before full implementation can proceed.

Funding

The framework's funding requirements span four areas: health worker training at commune, district, and provincial levels; establishment and equipping of provincial Agent Orange clinic units within selected provincial hospitals consistent with MOH specialist-tier screening guidance (Tập chí Điện tử Da Cam Việt Nam, 2022d); development and maintenance of registry and reporting infrastructure; and targeted household environmental and food-system testing operations in priority risk zones.

Because the framework builds on existing institutions, core recurring functions, such as health worker salaries, facility operations, and provincial administration,

can largely be absorbed within national and provincial public health budgets through reallocation rather than entirely new expenditure. More technically intensive components, including environmental testing, registry development, and specialist outreach in underserved rural areas, are appropriate targets for co-financing through external assistance. War-legacy and environmental health funding streams have historically supported comparable interventions, and bilateral donors and multilateral partners have demonstrated willingness to fund technically specific, institutionally grounded components of the Agent Orange response (Congressional Research Service, 2021; Boivin & Tran Minh, 2015; Tạp chí Điện tử Da Cam Việt Nam, 2025b). However, the 2025 disruption of USAID-linked programs, including dioxin cleanup at Biên Hoà and disability-related assistance, underscores the risk of relying on external financing for core system functions and reinforces the importance of embedding primary operations within domestic budget structures.

Policy Analysis

Strengths

Addresses the Core Institutional Gap

Vietnam's Agent Orange response has not failed due to lack of activity; hotspot cleanup has proceeded at Đà Nẵng and Biên Hòa, MoLISA administers stipends to more than 350,000 certified beneficiaries, and the MOH has developed joint guidance on qualifying conditions (Hammond & Đặng, 2023; Congressional Research Service, 2021). What has consistently been missing is the institutional linkage among these efforts. Consider a household living adjacent to a remediated airbase in a heavily sprayed commune, dependent on self-raised fish from a pond situated on potentially contaminated land, and caring for a child and grandchild both presenting with conditions on the standardized qualifying list. In such a case, environmental contamination history, food-system exposure risk, clinical presentation, and intergenerational disability all point toward Agent Orange-related harm, yet no single institutional pathway exists through which those converging indicators are systematically recognized, assessed, and acted upon together. Environmental remediation has focused on the airbase itself, MoLISA administers benefits only after formal certification, and the Ministry of Health establishes screening standards, but none of these functions is designed to identify and assess affected households proactively. The burden of connecting them, therefore, falls on families that may lack the documentation, administrative literacy, proximity to specialist care, or financial resources needed to navigate multiple systems at once (Hammond & Đặng, 2023; Dũng, 2023; VAVA, 2024). The result is a structural absence at the center of the entire response, where no single institution is able to recognize the household living with decades of accumulated harm in its entirety as the primary unit of concern.

This proposal fills that gap directly, and it is a gap that no existing intervention has been designed to fill.

Expanded hotspot remediation reduces environmental contamination at bounded sites but does not connect affected households to clinical screening or formal review. Increased MoLISA stipend levels would improve benefit adequacy for already-certified households but would do nothing for the households currently unable to enter the certification process. Broader disability programming, as USAID's "regardless of cause" model demonstrated, can expand service access without ever systematically identifying or tracking exposure-linked harm (Hammond & Đặng, 2023). This proposal is distinct because it targets the governance failure that sits between these interventions, the absence of a household-level pathway, rather than deepening any single component of a system that is already fragmented (Dũng, 2023; VAVA, 2024).

Fits the Institutional Logic of Vietnamese Actors

Reforms that ignore the incentive structures of their implementing actors tend to produce formal compliance without substantive change. This proposal is designed around the institutional logic of the actors it depends on, and that alignment is what makes the reform viable in a context where central ministries, provincial governments, and coordinating bodies each have distinct interests that a poorly designed intervention could easily antagonize. In this proposal, The MOH is given the lead on medically defensible criteria, standardized screening, referral protocols, and registry design—matching the MOH's existing institutional role in translating scientific evidence into routine clinical practice and surveillance, and preserving the ministry's interest in presenting health determinations as clinically grounded rather than politically discretionary, a concern that is especially salient given Agent Orange's continued political sensitivity (Tạp chí Điện tử Da Cam Việt Nam, 2022d). MoLISA would retain full authority over formal recognition and benefit determination, meaning the proposal does not threaten its gatekeeping function or create automatic expansions of its certified beneficiary caseload; this is critical given that MoLISA's behavior is shaped by strong interests in fiscal sustainability, categorical clarity, and administrative feasibility.

Reduces Evidentiary Barriers Without Expanding Fiscal Exposure

The evidentiary requirements embedded in Vietnam's current certification regime have functioned as de facto exclusion barriers for a large share of potentially affected households. Because individual-level exposure was never systematically recorded, many associated conditions involve mixed etiologies and long latency periods. Contamination spreads through diffuse environmental and food-system pathways that are difficult to reconstruct decades later; the evidentiary framework was built around assumptions that do not hold for civilian populations at this distance from wartime exposure (Hammond & Đặng, 2023). What distinguishes this proposal's approach from a simple eligibility expansion is that presumptive eligibility is bounded and operationalized rather than open-ended. Entry

into the screening pathway is governed by defined geographic, epidemiological, and food-system criteria, grounded in the Office 33 spraying inventory, independent hotspot assessments, the jointly standardized MOH–MoLISA conditions list, and documented bioaccumulation pathways, rather than by self-declaration or categorical expansion of the certified beneficiary pool (Office 33, 2013; Dwernychuk et al., 2002; VAVA, 2024; Pham et al., 2015). The composite scoring system operationalizes these criteria into a measurable priority classification, making the eligibility determination transparent, technically defensible, and resistant to arbitrary application across provinces. This is precisely the kind of administratively legible, fiscally bounded reform that MoLISA and provincial governments are most likely to find acceptable, and it has a direct precedent in the U.S. veterans’ system, where presumptive service connection has been implemented through defined geographic and temporal criteria without producing open-ended compensation liability (U.S. Department of Veterans Affairs, 2025).

Reaches Households Most Systematically Excluded

The households this proposal is designed to reach are not randomly distributed; they are concentrated among rural families in heavily sprayed districts and corridor communities, intergenerational households whose descendants cannot demonstrate direct wartime exposure, and food-system-dependent households whose sustained exposure risk operates through pathways the current system does not track. These are also the households facing the greatest barriers to navigating the existing certification process: higher poverty rates, longer distances to specialist care, greater opportunity costs of pursuing documentation, and weaker access to the administrative support needed to assemble dossiers. The tiered pathway addresses this in a way that no current intervention does, by anchoring the system’s front end at commune health stations already present in rural communities and supplementing rural tiers with mobile specialist outreach determined by the composite priority score.

Generates the Data Infrastructure Vietnam Currently Lacks

Without a registry or longitudinal monitoring capacity, exposure-related disabilities remain under-documented, the cumulative scale of harm cannot be assessed across provinces, and there is no systematic basis for evaluating whether interventions are working or for recalibrating eligibility criteria as evidence evolves (National Statistics Office of Việt Nam, 2019; Congressional Research Service, 2021). The current system produces case-level certification decisions without generating any aggregate surveillance capacity—meaning that fifty years after spraying ended, Vietnam still lacks the population-level data needed to fully understand what it is responding to. The registry and monitoring function embedded in this proposal changes that by maintaining facility-level registries at provincial Agent Orange clinic units and aggregating them into a national-level database, generating cross-provincial

trend data, supporting periodic review of the MOH–MoLISA conditions list, and producing the evidence base needed to engage bilateral donors and multilateral partners in sustained, evidence-driven cooperation. This capacity would compound over time as continued registry operation produces stronger longitudinal data and a firmer evidentiary basis for future policy refinement. No current intervention produces this kind of durable public health knowledge infrastructure as a byproduct of its core operations.

Weaknesses

Improves Access Without Solving Post-Recognition Support

A limitation of the proposal is that it improves entry into Vietnam’s recognition and support system without directly reforming the adequacy of the benefits and services available to Vietnamese citizens after recognition. Sustained caregiving support, rehabilitation services, transport assistance, and income protection for households managing long-term and often lifelong disability remain insufficient under the current system, and this framework does not by itself resolve those downstream shortfalls. Vietnam’s disability stipends currently offset only a modest share of actual care costs, leaving substantial out-of-pocket burdens even for certified households (Hammond & Dăng, 2023). For many intergenerational families managing profound and permanent disability, the gap between formal recognition and meaningful material support remains one of the central realities of life.

However, that limitation reflects the proposal’s targeted purpose and its long-term trajectory. This framework is designed to address the prior institutional failure that prevents many affected households from entering screening, formal review, and follow-up at all—and in doing so, it creates the conditions under which more comprehensive downstream support becomes both more achievable and harder to defer. Households cannot benefit from stipends, rehabilitation programs, or caregiver support if they are excluded before the system formally recognizes them. By reducing evidentiary barriers and creating a clearer pathway into assessment and certification, the proposal addresses a necessary precondition for broader reform: a recognized caseload, a functioning referral infrastructure, and the longitudinal data needed to make the case for expanded post-recognition support on an evidence base that currently does not exist. The short-term limitation is real, but the framework is explicitly designed so that what it builds—institutional capacity, registry data, and a population of formally recognized households—becomes the foundation on which stronger downstream support can be constructed over time.

Places New Demands on Uneven Provincial Systems

A further limitation of the proposal is that it places new demands on provincial and district health systems whose administrative capacity, staffing, and fiscal resources remain uneven across localities. The proposal assigns these systems substantial implementation responsibilities, including intake, screening, follow-up, reporting, and, in some cases, coordination of household environmental testing, within a

governance context marked by significant variation in provincial capacity and health-system performance (Organisation for Economic Co-operation and Development, 2025; World Health Organization, 2016). The broader literature on Vietnam's health governance consistently identifies provincial disparities in administrative capacity, staffing, and fiscal resources as major drivers of uneven policy implementation. Agent Orange programming has reflected these same patterns, with access to certification and services differing considerably by province depending not only on national criteria but also on local administrative practice (Hammond & Đặng, 2023; VAVA, 2024). The proposal seeks to mitigate that risk through a phased rollout model that conditions provincial participation on the receipt of a defined financing package covering staff training, registry administration, outreach, referral coordination, and testing logistics, so that no province assumes new responsibilities without corresponding resources.

High-burden provinces would be prioritized in the initial phase, and reporting requirements would be limited to a short standardized dataset during pilot implementation in order to avoid overburdening local systems at the outset. These design features do not remove provincial capacity constraints, but they do make them more manageable and establish a sequenced expansion model in which implementation deepens as capacity is demonstrated rather than presumed.

Component Three is Technically Valuable but Vulnerable

A further limitation concerns the household environmental and food-system testing component, which fills an important gap in the broader response by linking food-chain contamination pathways to household clinical referral, but is also the component most vulnerable to resource constraints during implementation. Rigorous dioxin testing requires high-resolution gas chromatography and mass spectrometry equipment that most local health systems do not possess, as well as trained personnel for sample collection, transport, laboratory analysis, retesting, and results interpretation (Dwernychuk et al., 2002; Hatfield Consultants, 2009). These constraints cannot be overcome through phased rollout or staff training alone, since they depend on sustained investment in laboratory infrastructure that has historically relied on external technical and financial support.

The proposal addresses this limitation through a trigger-based design and centralized laboratory model, restricting testing to a defined set of priority districts and households with specific risk indicators rather than attempting universal coverage, and routing samples through a small number of specialized facilities with confirmatory analysis centralized at national or partner-supported laboratories. This design keeps the component feasible within realistic resource constraints. Even so, a residual implementation risk remains, which is, namely, that households meeting trigger criteria may still face delays in actual testing when laboratory capacity is limited. Bilateral technical partners, the Vietnam–Russia Tropical Center, and MOH-linked laboratory networks may be well positioned to help reduce that constraint through

targeted cooperation agreements, even if such support falls outside the proposal's immediate scope (Tạp chí Điện tử Da Cam Việt Nam, 2025a).

Policy Alternatives

Expanded Cash Assistance and Stipend Reform

One alternative to the proposed framework would concentrate resources on expanding monthly cash assistance and stipend levels for households already formally certified under Vietnam's Agent Orange recognition system—deepening material support for the population currently inside the system rather than reforming the identification and referral pathway that precedes it. As currently structured, MoLISA's monthly payments fall substantially short of the actual costs of long-term disability care (Hammond & Đặng, 2023). A stipend expansion policy would address this gap directly, increasing benefit levels for certified beneficiaries and potentially extending eligibility to a broader category of severely disabled households in heavily sprayed provinces through existing MoLISA administrative channels.

This alternative has clear political and administrative appeal. It operates within existing certification and benefit-administration structures, requires no new institutional infrastructure, and is framed as disability and social protection support rather than exposure-specific reform, making it more straightforward to implement and less likely to generate resistance from MoLISA or provincial governments. However, its central weakness is that it addresses what already certified households receive without addressing the identification and access failures that prevent many affected households from reaching certification in the first place. More than 50 years after spraying ended, many plausibly affected households remain in a gray zone in which need is evident but formal status remains inaccessible, and expanded stipends would do nothing for households unable to meet the evidentiary threshold required to enter the system at all. The population benefiting from this alternative would therefore remain limited to the existing certified caseload, leaving hotspot-adjacent families, food-system-dependent households, and intergenerational cases without recognized status largely untouched. Stipend reform would be a valuable complement to the proposed framework and could materially improve conditions for already certified households, but as a standalone alternative, it addresses the downstream consequences of a broken identification system without repairing the system itself.

Accelerated Hotspot Remediation

A second alternative would concentrate resources on identifying, containing, and remediating remaining dioxin hotspots and contaminated sites. This would leave disability recognition and household medical follow-up largely unchanged while prioritizing the environmental contamination that underlies ongoing exposure risk. This approach has a strong track record of international support and technical feasibility. Remediation at Đà Nẵng and Biên Hòa demonstrated that hotspot cleanup is technically legible, administratively concrete, and capable of attracting sustained

bilateral cooperation; of the roughly \$384.1 million for Agent Orange-related assistance between 2007 and 2021, much of it was directed toward environmental remediation at these sites (Congressional Research Service, 2021). Accelerating and expanding that effort to address the estimated 10 to 50 additional contaminated sites identified in independent assessments would directly reduce environmental contamination where unresolved hotspot risks remain, and it would do so through a mode of intervention that has proven politically acceptable to both governments.

The weakness of this alternative is that environmental cleanup alone does not create a durable civilian response. As the experience at Đà Nẵng and A Lưới demonstrates, remediation can reduce contamination at bounded sites without systematically routing nearby households into health screening, food-system monitoring, or formal recognition processes—leaving a persistent gap between site management and civilian follow-up (Boivin & Tran Minh, 2015; United Nations Development Programme Viet Nam, 2015). Exposure can also persist beyond remediated airbase boundaries through surrounding food systems, meaning that a household relying on locally raised fish or livestock near a remediated site may face continued dioxin risk through bioaccumulation pathways that soil cleanup does not address (Pham et al., 2015; World Health Organization, 2023). Remediation-focused alternatives are also structurally vulnerable to the instability of external financing. Accelerated hotspot remediation is an important and necessary component of Vietnam's broader Agent Orange response, but as a standalone alternative, it addresses the environmental dimension of a problem whose civilian health consequences require a separate and coordinated institutional response.

Policy Recommendation

While multiple plausible approaches to the Agent Orange problem in Vietnam exist, the most effective policy is a coordinated framework for screening, referral, and household risk management that links presumptive eligibility, tiered clinical review, and targeted household follow-up within existing Vietnamese institutions. Where prior and alternative solutions have addressed individual dimensions of the problem—improving benefits for already-certified households, or reducing contamination at bounded sites—they have done so without resolving the underlying structural barriers that prevent many affected households from entering the system in the first place. This framework is the strongest response because it addresses the central governance failure that neither alternative resolves on its own: the absence of a coordinated civilian pathway connecting environmental exposure history, clinical assessment, formal recognition, and long-term monitoring at the household level.

Expanded cash assistance and stipend reform would materially improve conditions for already-certified households, and stronger post-recognition support is, in fact, a necessary complement to this proposal. But stipend reform is bound by the population that has already cleared the evidentiary and administrative barriers to formal

recognition—it addresses what the system delivers without repairing who the system reaches. Households in hotspot-adjacent areas, families dependent on local food systems, and intergenerational cases with plausible but difficult-to-document exposure histories would remain outside its reach entirely.

Accelerated hotspot remediation is similarly important but insufficient as a standalone response. Cleanup directly reduces contamination at bounded sites, and this proposal is formally linked to that effort; when a site is designated, adjacent communes are automatically prioritized for presumptive screening and trigger-based household testing. However, remediation does not generate screening mechanisms, referral pathways, or monitoring capacity for surrounding civilian populations, and it is structurally vulnerable to shifts in donor priorities as the 2025 USAID disruptions made clear (Rising & Ghosal, 2025). The proposed framework is not a substitute for remediation, but a means of ensuring that environmental intervention is connected to a durable civilian health response.

The proposal is not without its constraints. It does not reform post-recognition benefit adequacy, and its implementation will depend on uneven provincial capacity, and Component Three will require sustained technical support to function as intended. But those limits define its boundaries rather than undermine its direction. The framework targets the specific institutional failure on which broader reform depends: the absence of a household-level pathway that connects what Vietnam's response has had but in pieces. Presumptive eligibility reduces the evidentiary burden that has functioned for decades as a front-end exclusion barrier. The referral pathway builds on institutions that already exist rather than requiring the creation of a wholly new administrative system. The priority classification model allows the policy to be implemented in phased form, directing the most intensive combination of screening, outreach, and household follow-up toward districts facing the greatest overlap of plausible exposure risk, food-system vulnerability, and weak access to specialist care. The registry and monitoring functions, in turn, create a public health knowledge base that Vietnam currently lacks and that future refinements in eligibility, service provision, and donor engagement will require. And the framework incorporates rather than displaces the alternatives—households cannot benefit from stronger stipends if they are excluded before recognition, and environmental cleanup cannot fully protect populations if no institutional pathway exists to identify and follow those living with the consequences of exposure. What distinguishes this proposal from every prior and alternative intervention is what it builds over time: a recognized caseload, a functioning referral infrastructure, and the longitudinal data needed to make the case for the broader reforms that fifty years of fragmented response have deferred. The central question is no longer simply whether contamination remains or whether some benefits exist. It is whether the state has a coherent way of finding affected households, recognizing their needs, and responding to them

over time—and that is what this framework is designed to deliver.

Conclusion

Addressing the long-term civilian consequences of Agent Orange has long been a weakness in Vietnam's postwar institutional response. Efforts to support affected households have been hindered by evidentiary barriers that many families cannot realistically meet, a recognition system that was not designed to see dispersed or intergenerational harm, and a disconnected landscape in which different types of assistance have operated without a coordinated pathway connecting them. This proposal addresses those shortcomings by recommending a framework grounded in Vietnam's existing institutions.

Future research should focus on empirical validation of the composite priority scoring thresholds through pilot data, the feasibility of expanded dioxin laboratory capacity across Vietnamese provinces, longitudinal investigation into intergenerational health outcomes in civilian populations, and whether households that enter the screening pathway but do not receive formal

certification are being adequately connected to general health and social services. The framework proposed here can serve as a model for addressing war-legacy public health problems in which harm is diffuse, intergenerational, and institutionally under-recognized—demonstrating that a coordinated civilian response is achievable within existing health infrastructure without requiring open-ended fiscal commitments or new administrative systems. As other countries confront similar legacies of conflict-related environmental and health harms, Vietnam's experience building this kind of household-centered pathway could serve as a meaningful precedent for what a durable and individually grounded response can look like.

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