Pitt Policy Journal

15th Edition
Spring 2024

Letter from the Editors

Dear Reader,

We are excited to present the 15th Edition of the Pitt Policy Journal. This year, we have been fortunate to collaborate with an incredible team of authors and editors to produce this Journal. We would like to extend our thanks to everyone who submitted work to the Journal, and encourage others to share any future research with us in the coming years. PPJ prides itself in sharing the leading-edge policy research of University of Pittsburgh students, and we hope to continue to expand its contents to feature research of an even wider range of related disciplines.

We would like to thank our Editorial Board, composed of student volunteers at the Graduate School of Public and International Affairs at the University of Pittsburgh. The Editorial Board is the heart and soul of PPJ, working directly with authors to refine the pieces that make up the foundation of the Journal. Their immeasurable work and passion are the reason this edition exists.

We would also like to extend a special thank you to our Faculty Editors: Dr. Jeremy Weber, Dr. Ryan Grauer, Dr. Mindy Haas, and Dr. Kevin Ashley for ceding their time and expertise to strengthen these student research efforts. Thank you to GSPIA Dean Dr. Carissa Slotterback and to our faculty advisor Dr. Erica Owen, who have both been committed champions of Pitt Policy Journal and have provided invaluable support. To our readers, we hope you enjoy and learn something from the following articles, just as we have throughout the editorial and production processes. For the past fifteen years, the Pitt Policy Journal showcased the ambitious research of students who are destined to be the changemakers of the future. We look forward to the road ahead and are excited to usher in a new era of the Pitt Policy Journal.

Best Wishes,

Kathleen Brett & Catie Creiman, Editors in Chief, 2023-2024

Notes on Pitt Policy Journal

Vision

A world where humanity's greatest challenges are addressed by the most rigorous, innovative, interdisciplinary, evidence-based policy solutions grounded in the best practices of social science research and strengthened by the richness and diversity of epistemologies, theories, and methods.

Mission

Building a respected and reputable platform for the production, display, and dissemination of original, diverse, and exemplary social policy research to encourage creative solutions to major problems and challenges in domestic, international, and foreign policy that seek to improve the lives of ordinary people around the globe.

Goals & Objectives

- To increase the public visibility and professional reputation of the PPJ through greater external outreach and involvement of reputable scholars;

- To support the production of graduate student research to generate fresh solutions to tough social policy questions;

- To bolster collaboration between established scholars, aspiring scholars, and experienced practitioners in rethinking major social policy issues;

- To foster and advance ongoing scholarly debate on a variety of social policy topics that seeks to improve the lives of ordinary people.

Support

Pitt Policy Journal is sponsored by the Fund for Student Initiatives, launched in the fall of 2008. We are grateful for the ongoing support of the GSPIA community, including Dean Carissa Slotterback, faculty, staff, and students.

Selection Information

We welcome submissions that explore diverse policy areas and provide insightful perspectives on domestic and global political, economic, and security matters. Our staff prioritizes the selection of quality, thoughtful scholarship that has practical implications for local and national policy makers. All submissions are reviewed anonymously by the Editorial Board, which selects the best among each pool of submissions for publication.

Disclaimer

The views expressed in the Pitt Policy Journal do not necessarily represent the opinions of our editorial staff, GSPIA, or the University of Pittsburgh. While each selected entry undergoes a rigorous editing process, contributing authors are ultimately responsible for the accuracy and integrity of their work.

Design and Printing

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Recommendations for Further
Assistance to Afghanistan

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by Aakriti Bikash Kumar, MPIA 2024

Graduate School of Public and International Affairs, University of Pittsburgh

Executive Summary

This policy memorandum cautions against increasing USAID's direct humanitarian assistance beyond the already committed $55 million for relief efforts in Afghanistan, following an earthquake on June 22, 2022 (USAID, 2022). It further discourages the provision of direct development aid through USAID's existing programs in Afghanistan. Instead, it advocates for an alternative approach of indirect support involving the establishment of, "...independent service authorities," through collaboration among donors, not-for-profit organizations, and civil society. This revised aid strategy aligns with U.S. foreign policy objectives regarding regional stability and achieving long-term, sustainable progress across Afghanistan's economy, governance, and security.

Background and Problem Definition

The conclusion of the U.S. military presence in Afghanistan on August 30, 2021, marked the end of a two-decade-long war. The removal of U.S. troops resulted in a Taliban resurgence and their control of the country.

Present-day Afghanistan grapples with two challenges: a failed state and an internationally unrecognized ('illegitimate') regime. While the Taliban's actions contributed to the state's breakdown, international policies have also played a significant role. The imposition of stringent sanctions on the Afghan regime by the U.S. and EU, driven by an ideological aversion to the Taliban, exacerbated pre-existing issues which led to state failure. The complex situation in Afghanistan arises from a combination of factors, including the loss of an entire generation of administrative talent and expertise during the war, making it difficult to rebuild the national civil service and private sector. During the governmental transition period, the Taliban lacked adequate resources, assets, and international support or a diaspora to provide financial backing, compounding governance challenges inherent in Afghanistan's geographical, ethnic, and climatic conditions. However, despite governance challenges, the current regime remains firmly in power due to a lack of internal political processes for a transition, a hesitance for foreign intervention, and the absence of a credible domestic rival to challenge the Taliban.

Considering the secret nature of the Taliban regime, addressing the inherent issues within the regime threatening Afghanistan's reconstruction mission is critical. The most recent quarterly report by the Special Inspector General for Afghanistan Reconstruction (SIGAR) emphasizes that, "Corruption is a key obstacle to success and in Afghanistan (it) undermined the U.S. mission by enabling predatory behavior, exacerbating local conflict, and channeling support directly to the insurgency" (SIGAR, 2023, pg. 9). During the war, The U.S. failed to understand intricate Afghan political networks, rushed spending, and provided inadequate oversight which fueled endemic corruption that exacerbated the ongoing conflict and political destabilization.

Policy Recommendation

The influx of aid into Afghanistan exceeded the country's ability to manage it, fueling corruption, dependency and ultimately hindering growth. Instead of a direct massive aid effort by the U.S., a more viable approach involves supporting a neutral-led aid consortium with clear conditions and

focusing on flexible development inputs.

Between 2002 and 2015, an influx of U.S. and foreign aid into Afghanistan surpassed the country's institutional and administrative capabilities. At its peak, U.S. reconstruction assistance exceeded 100 percent of Afghanistan's GDP, more than double the estimated absorptive capacity (SIGAR, 2023, pg. 162-163). This financial surge, coupled with the Afghan government's limited spending capacity and inadequate oversight by donors, amplified corruption opportunities. According to the World Bank, aid flows in Afghanistan declined from approximately 100 percent of GDP in 2009 to 42.9 percent of GDP in 2020 (World Bank, 2021: p. 4), though are still high compared to the 16 percent of GDP threshold beyond which aid becomes ineffective due to diminishing returns (Collier, 2007, pg. 100). Paradoxically, humanitarian or emergency aid inadvertently alleviates the political burden on recipient governments, reducing their political accountability due to the relaxation of the need for the government to appease its tax base (Qian, 2015, pg. 282). As a result, aid fosters a detrimental cycle of dependency and pervasive corruption, severely hindering growth and perpetuating underdevelopment in the poorest aid-dependent countries (Moyo, 2010, pg. 49).

It is crucial to acknowledge the substantial limitations of the U.S. in playing a credible role. Despite its financial influence, the U.S. has been a primary adversary of the Taliban for two decades. This antagonistic history, conflicting values, diverse strategic priorities, and challenges garnering significant domestic political support make a massive aid effort to Afghanistan unlikely to gain traction. Direct U.S.-led external aid efforts could inadvertently alienate the Taliban, trigger competition with neighboring powers such as Russia and China, and face sustainability challenges due to a lack of support from Congress and the American public.

A more viable approach would be supporting an aid consortium led by a relatively neutral entity possessing expertise in humanitarian aid and development. This consortium would comprise "individual service authorities" or a collaborative effort involving various international donor states, non-profit organizations, and civil society in Afghanistan (Collier, 2007,

pg. 119). In this role, the U.S. can collaborate with other donor nations to link external aid to clear conditions that mandate effective and flexible humanitarian and development activities while mitigating Taliban domestic extremism. Quiet collaboration with other donors to uphold genuine conditionality without dominating the effort is essential. This approach additionally emphasizes prioritizing inputs over outputs, avoiding the pitfalls of results-oriented thinking and lending-size fallacies often seen in aid agencies (Collier, 2007, pg. 117; Moyo, 2010, pg. 54-55).

Economic Growth

USAID initiatives aimed to bolster exports, but sudden fund influxes risk undermining long-term economic reform, necessitating a shift towards infrastructure enhancement and flexible funding mechanisms to foster economic growth and increase accountability through a participating middle class.

Historically, Afghanistan emphasized trade and subsistence agriculture over a strong export economy, relying on niche products like Karakul hides, raisins, dried fruits, and carpets, as well as specific markets such as pomegranates in Russia and asafetida resin in India (Mines, 2010, pg. 296). However, isolation resulting from three decades of occupation and civil war led to the disappearance of these markets as much of the trading class went into exile, and talent was lost over generations. USAID's Office of Livelihoods (OLH) supported economic growth activities in Afghanistan, with estimated aid exceeding $152 million. Among these, the most significant initiative, the five-year, $105.7 million Afghanistan Competitiveness of Export-Oriented Business Activity (ACEBA), aimed to bolster export-oriented businesses by providing technical assistance and grants to small and medium enterprises (SIGAR, 2023, pg. 54). Since the Taliban takeover, ACEBA has shifted priorities to livelihood support, domestic production activities, and humanitarian goods and services.

Sudden influxes of additional funds, whether from export booms or aid, divert focus from the critical decisions integral to long-term economic reform. Aid triggers a phenomena known as the Dutch Disease, reducing the international competitiveness of domestically-produced goods and hin-

dering the growth of labor-intensive export activities crucial for diversification in economically challenged regions like Afghanistan (Collier, 2007, pg. 121). The World Bank's Afghanistan Development Update reports a severe 20.7 percent GDP contraction in 2021, followed by a further 6.2 percent contraction in 2022, with significant losses across all subsectors of the services sector (World Bank,2023, pg. 18). Funds labeled "reconstruction" for nation-building and supporting the Afghan government were primarily utilized for operating expenses and construction, deviating from their intended purpose. The allocation included impractical and overly ambitious projects, such as envisioning a new Silk Road.

Furthermore, this funding had minimal, if any, significant impact on the Afghan economy, military, or unsuccessful civil initiatives like "counternarcotics." Moreover, the import of technical assistance and project selection was supply-driven rather than demand-driven (Collier, 2007, pg. 115). Donor-funded projects often involve complex subcontracting layers, with bidding mainly happening outside Afghanistan. Local companies faced impediments to participation due to unfamiliar procurement processes and language barriers. Consequently, international contractors often lacking an understanding of the local context, in turn, subcontracted local firms for a minimal fee (as low as 20 percent), leading to excessive overhead costs (Zazai, 2023, pg. 22-23).

In light of these challenges, a shift in focus is imperative—from capacity-building to infrastructure enhancement, such as improving infrastructure that can endure beyond the short-term impacts of the Dutch Disease. Strengthening technocrats and institutions is vital, and those striving for stability need flexibility in their funding. Hence, the implementation of independent service authorities is critical. These entities can leverage their expertise and grass-roots reach to adopt a flexible and immediate-response approach, dispersing funds to different economic sectors based on need rather than adhering to rigid pipeline projects that ultimately create opportunities for extorting bribes and diverting funds (Moyo, 2010, pg. 51). This targeted approach can stimulate the growth of an active and participating middle class, often overlooked by aid agencies and the Taliban government, and contribute to increased accountability.

Political Action and Governance

Aid dependence in Afghanistan resulted in skewed income distribution and inadequate governance, necessitating independent service authorities and community-based development programs to ensure aid benefits the masses and enhances accountability while countering corruption.

In aid-dependent contexts, allocating budget support or direct aid results in less-educated and unprincipled individuals occupying civil service roles. In contrast, principled individuals opt for the private sector or seek opportunities abroad (Moyo, 2010, pg. 50-51). Governments in these settings prioritize tax collection by establishing independent revenue authorities for efficiency. Nevertheless, service delivery remains stagnant mainly because they gain more from taxes than directly providing essential services (Collier, 2007, pg. 120). During Afghanistan's transition, income distribution became skewed heavily in favor of officials, the military, contractors, and a select group of elites, leading to inadequate civil governance and corruption. Numerous U.S. development and reconstruction projects faltered due to their inability to address transparency and corruption issues, exacerbated by an inefficient interplay of the central government and various regional power brokers (SIGAR, 2023, pg. 162).

In addition to the necessity for flexible technical assistance, there is a critical need for civil society oversight, including both public and private actors as well as NGOs. This cadre will conduct comprehensive field research to understand the competitive environment within Afghanistan, develop effective strategies to navigate this environment, drive economic and social improvements with a positive political impact, and establish relationships of mutual trust and confidence with local leaders. These relationships can drive community-based development programs, offering a shared pathway to implement foreign aid through monitored local institutions. Prioritizing independent service authorities helps surmount the challenges posed by aid-for-policy agreements, where citizens of the recipient country are often the losers, as their leaders prioritize private gains for a select group of supporters or elites, neglecting good policy for the masses (de Mesquita, 2016, pg. 323). Establishing a recognizable independent service author-

ity could enhance the regime's accountability by preventing constituents from incorrectly attributing successful aid programs to the Taliban regime (Qian, 2015, pg. 304).

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Battle Beyond Earth: American
Commercial Space in the Face of
Russia Satellite Threats

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by Kathleen Brett, MPIA 2024

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Background

Konstantin Voronstov, Deputy Head of the UN Russian Delegation, stated that Western satellite usage intended to assist Ukraine is a threat to Russia, greatly impacting U.S. commercial space actors. This statement, made at a UN Arms Control Panel eight months after the Russian invasion of Ukraine, highlighted the possibility of retaliatory strikes by Russia against their adversarial government-based and commercial satellites. As the world enters an unprecedented space age of commercial actor dominance, satellites like SpaceX's Starlink Constellation and Maxar's imaging satellite fleet are continuously criticized by Russia for their aid to Ukraine through broadcast transmission and GPS navigation. These commercial satellites engage in evidence collection of Russian war crimes in Ukraine through military movement tracking, threatening Russian aggressors. Russia possesses counter-space weapons, demonstrated by their engagement in space warfighting through using the Nudol Anti-Satellite Missile to remove a defunct Kosmos 1408 Satellite (Bingen et al., 2022; Fidler, 2018; The Economist, 2023; Center for Strategic and International Studies, 2020; Spoehr, 2022; The White House, 2021).

These actions marked uncharted territory of the defense requirements of commercial space actors, creating a pressing need for allies of Ukraine, like the U.S., to address this threat. Although the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies is the sturdiest framework for outlining space policy, this document fails to holistically tackle the issue of threats against commercial space actors. This problem is urgent as Russian threats create a new danger to commercial satellites (UN General Assembly, 1967; Bingen et al., 2022; Fidler, 2018).

Objectives

The Biden Administration's 2022 National Security Strategy outlines the U.S. objectives thoroughly. The U.S. is at the helm of the international community in space. While it is incredibly challenging for the U.S. to remain the most-developed space power, partnerships with entities like the European Space Agency remain important to U.S. space dominance. Partnerships in the space domain ensure continued stability, safety, and security for the U.S. in space. The U.S. aims to create norms regarding space arms control, along with establishing regulations and policies concerning commercial space actors. The U.S. expressed increased support for Ukraine in the conflict against Russia, with a goal of maintaining support for Ukraine through meaningful actions is evident within policy creation and implementation (The White House, 2022; The White House, 2023; The White House, 2021).

Policy Alternatives

Policy Alternative #1: Maintain the Status Quo

The first policy option consists of status quo maintenance of the relationship between the U.S. government and commercial space actors. U.S. maintenance of the status quo reinforces the country's desire to establish norms and regulation of commercial actors. Within the U.S., the number of commercial satellites rose since 2018, without established measures to

protect commercial satellites if attacked in a warzone. This became a more prominent reality as the war in Ukraine broke out in 2022. The majority of the legalities for commercial satellites, such as licensing, occur within the Federal Aviation Administration, National Oceanic and Atmospheric Administration, and Federal Commutations Commission. However, the safety of commercial satellites and defense strategy, if satellites are attacked, was not thoroughly developed. The current relationship between the U.S. government and the private space sector is lenient compared to other countries. Through the maintenance of the status quo within the current relationship between the U.S. government and commercial actors, lines remain blurred for Biden Administration action if U.S. commercial satellites are attacked by Russia (International Trade Administration, n.d.; Federation of American Scientists, 2023).

While the government likely has private plans for addressing this issue, no formal framework was established publicly. However, the current measures in place serve as a thinly veiled means to regulate the commercial space industry without a written protection guarantee for the U.S.-based commercial satellites, placed under the umbrella of general Russian threats. The present loose framework between the government and private space actors in the U.S. demonstrates a lack of clarity for their future relationship (The White House, 2022; International Trade Administration, n.d.).

Immediate Support Policy Alternative #2: Creation of the Commercial Space Actors Protection Act

This policy option provides a well-crafted governmental framework through the creation of the Commercial Space Actors Protection Act. This act outlines measures taken by the U.S. government if U.S. commercial satellites like SpaceX's Starlink Constellation were attacked by Russia in Ukraine. This act will include elaboration on retaliation principles by U.S. by military forces if a commercial satellite belonging to a U.S. private actor is attacked within a warzone. Presently, there are no formal protection guarantees for commercial satellites by the U.S., thus this act serves

as a framework to combat any potential Russian attacks. This act would be presented in a bill, moved through Congress, and signed by the President; this process would hopefully occur swiftly to protect U.S. commercial satellite assets from being attacked (Keating, 2022; The Economist, 2023).

Additionally, the consequences against Russia would increase, as a Russian attack on a U.S. commercial satellite warrants retaliation by the U.S.through this act. Despite the increase in the U.S. government bipartisan divide, the ability to defend the nation would overrule petty issues to stop the act's passage. Unfortunately, this act is more likely to pass in the aftermath of commercial satellite destruction, based on past patterns of Congressional action. Despite possible drawbacks, this policy option remains a strong course of action while upholding U.S. values. Through this policy option, safety, stability, and security are ensured in space, simply provided with a more concrete foundation for action. Through this act the U.S. serves as a norm creator in space. The U.S. would only act if a commercial actor was directly attacked, therefore this last-resort act serves as a safety net, protecting U.S. commercial space actors. Overall, the Commercial Space Actors Protection Act is the best course of action for the U.S. government to take in the wake of Russian threats against U.S. commercial space actors (Keating, 2022; The White House, 2022).

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Policy on Spotted Lanternfly
Invasion in Pennsylvania

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by Payton Brooks, MPA 2024

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To: Pennsylvania Department of Agriculture

Summary

Since 2014, the invasive Spotted Lanterfly (SLF) has spread across Pennsylvania, destroying various native trees and crops, causing millions in damages. Given the increasing severity of destruction caused by the SLF due to their rapid reproduction, new policy measures are essential to prevent further agricultural and ecological damages. This species, originating from China, harms and kills crops and plants by feeding on them, leaving behind a residue that attracts mold and other insects (Animal and Plant Inspection Service, 2023). Current state and federal policies are ineffective in stopping this bug from spreading in Pennsylvania and to other states over the past decade.

Currently, Pennsylvania identifies quarantine zones where the SLF exists and monitors these zones in terms of movement and the existence of SLF populations. However, a new policy taking a more proactive, aggressive approach is necessary to mitigate the damages to crops caused by the invasive species. This policy primarily focuses on targeting and destroying the SLF's host plant, the tree-of-heaven.

This would initiate a larger information campaign that combines actions by both the state and civilians. The two-pronged approach aims to combine government action against the hosting trees with a civic engagement plan that informs citizens of the dangers of the SLF and the importance of exterminating them. The financial cost of implementing this large-scale policy would see high initial costs and then lowered maintenance over time, particularly when compared to the previous and existing high costs of damages. This policy will have positive outcomes if it efficiently reduces the number of Pennsylvania counties that are considered quarantine zones. This success will be signified by a decrease in the number of counties in the afflicted quarantine zones.

Problem Identification

The Spotted Lanternfly (Lycorma delicatula) is an invasive species harmful both ecologically and economically (Appendix A). The SLF feeds on plants like apple trees, hops, or grape vines, destroying the leaves and vines in the process. Additionally, they secrete a substance attractive to other insects and sooty mold. Since the first sighting in Pennsylvania in 2014, these pests have spread to 51 of 67 counties in the state and 14 additional U.S. states (Appendix B). If the spread continues throughout the state, financial damage may reach between $324 million to $550 million per year due to the harm caused to crops in Pennsylvania alone (Harper et al., n.d.).

The current policy designates areas with identified SLFs as quarantine zones. The transportation of SLF is prohibited in these zones, and when accidentally transported, the state monitors their migration. Businesses and individuals are responsible for removing the adult SLF and their egg masses when transported or spotted. However, this policy failed to prevent the expansion of SLF despite the regulations. Therefore, a more aggressive strategy is necessary to prevent more agricultural damage.

Problem Alternatives

The Pennsylvania Department of Agriculture (PDA) and the U.S. Department of Agriculture (USDA) are the primary agencies responsible for ad-

dressing this problem. All of the proceeding options have monetary costs associated with them. However, so long as this is lower than the projected $324-550 million in annual losses caused by the SLF, the investment in the reduction of growth in SLF populations is justifiable by the state. Otherwise, continuing to allow the spread of the species with limited preventative action causes immense economic and ecological damages. Public approval is critical in recommending policy alternatives because current and future policies rely heavily on the support and actions of civilians. To garner public support, amplifying these annual and cumulative crop damages and effects on employment through the information campaign will highlight the need to eradicate the existing swarm while also reducing their ability to reproduce.

These alternatives generally involve attacks on the flies themselves in addition to the pre-existing quarantine. This may include trucks spraying pesticides onto highways surrounded by affected trees, PDA and USDA officials investigating and exterminating areas with reported sightings, or introducing more species that are predators. If these alternatives fail to address how tree-of-heaven and the SLF co-exist, this will cause significant harm. These options will not achieve longitudinal success in the prevention and growth of the SLF over time because they only achieve minor or temporary relief.

Pesticides along highly trafficked areas would successfully disrupt the insects' transport, but they do not reach further than that exposed forestry region. This method is only useful supplementally to other programs. Pesticides can negatively affect soil and other species and are difficult to limit to a specific geographic area. This goes against the goal of protecting native wildlife and the agricultural industry in the state. Alternatively, exterminating areas with reported sightings of SLF with pesticides could be effective, but it would not assure that the population would not return or that the eggs would not survive.

The efforts of citizens individually killing thousands of insects are not an efficient or effective solution due to the time limitations and monetary costs associated. Hiring people to respond to sightings of thousands of SLF across the state would be largely unfeasible. Without an effective method

to destroy the bugs, the location and destruction of all eggs is impossible. Introducing a predator would be ineffective and costly because many natural predators, such as chickens and yellowjackets, already exist in SLF quarantine areas and cannot reduce populations in a controlled or targeted manner. It takes years of studies and preparation before it is possible to introduce predators to invasive species, which is not a practical option given the large scale on which insects reproduce.

 Instead, the state should focus on the means the SLF uses to survive: the tree-of-heaven (Ailanthus altissima), (Appendix C). This tree is an invasive species with extensive root systems that can harm native plants and pose a threat to public infrastructure such as sewers or pavements when their extensive root systems. Instead of relying on the extermination of just the insects, extermination of their preferred host tree will lead to a long-term reduction in the population of the SLF. The first step in this process is to evaluate how many tree-of-heaven are in Pennsylvania to determine the scope of a removal program. Identifying and adequately exterminating the tree-of-heaven is incredibly expensive. Despite this factor, this is the most effective policy to slow the growth rate of SLF. More information should be provided to the public to help them identify the tree-of-heaven, SLF, and understand the hazards of both. Instead of abandoning the current policy altogether, these policies will strengthen it and foster citizen participation and knowledge.

Recommendations

The PDA should create a strategy to exterminate the SLF's preferred host tree, the invasive and pollen-spreading tree-of-heaven due to its expansive reproductive nature. The combined eradication of the tree-of-heaven by state resources and landowners will effectively curb the growth of both it and the SLF. This makes eradicating the insects longitudinally manageable and significantly hurts their chances of overwhelming the eradication efforts. While this is an expensive endeavor, requiring state actors and citizens to pay meticulous attention to ensure that the measures are properly enacted, the result of a diminished SLF population and agricultural damage outweigh the initial cost (Jackson et al., 2020).

Pennsylvania should invest in mass removal of the tree. Otherwise, it stands to lose roughly $330 million in agriculture damages due to the SLF with the status quo policies. Removal of the tree-of-heaven must follow a seasonal schedule according to the status of the trees by homeowners, businesses, and tree removal specialists, as shown in Appendix D. This would begin in the summer with the application of provided or purchasable herbicides. Then tree removal services would remove the dead trees in the winter (Rettke, 2021). Current projections place the cost of removing the trees at up to $3,500 per acre. To compensate for the loss of trees and past logging wastes caused by the SLF, native plants and crops should be planted in the place of the tree of heaven.

The USDA should collaborate with the state to take action to help with this issue on the SLF eradication front. SLF infestations affected a large portion of the country and the USDA should help combat this by launching an information campaign. Advertising the correct identification of the SLF, their large egg masses, the types of environments they are found in, their proper disposal techniques, and the significance of their negative impacts. By providing citizens accurate information to identify the SLF and the dangers they pose, it would help eradication efforts.

The legitimacy of the WTO and its processes are crucial to maintaining stability in the international system, which benefits all countries, especially in the face of multiple crises facing the world. The United States must resolve the legitimacy crisis on multiple fronts by restoring the AB and leveraging its outsized influence to contribute to international order. This role cannot be ignored or neglected despite rising protectionist attitudes domestically. The United States
needs to take an active role in contributing to the legitimacy of international agreements rather than repeatedly undermining the commitments made under these institutions.

Outreach attempts through television, social media, or other forms of advertisements and public service announcements will target local citizens with appropriate information. Combined with the aggressive efforts rec-

ommended to the state, this demonstrates a reduction in the number of reported sightings and quarantine zones in Pennsylvania, serving as a benchmark for progress on the policy. These two recommendations, combined with the existing policy, are the most effective measures to take to help the future and current welfare of the state regarding the SLF.

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Appendix

Figure 1: Image of a SLF courtesy of the Pennsylvania Department of Agriculture.

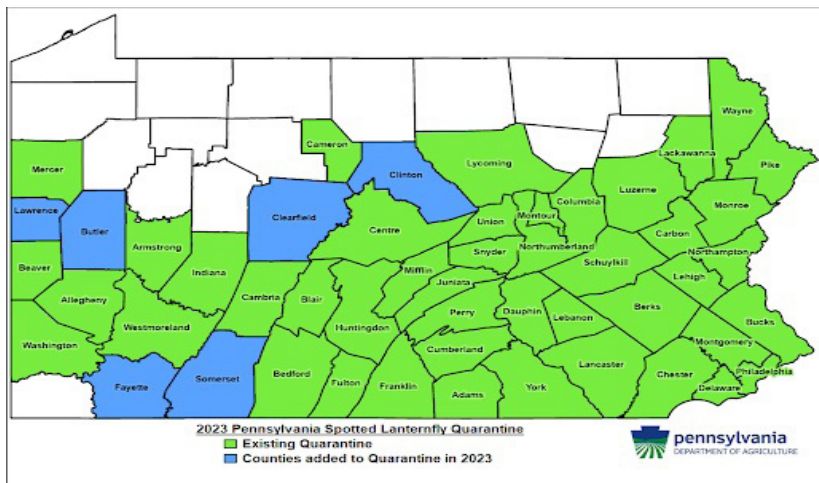

Figure 2: Map of quarantine zones in Pennsylvania as of 2023 courtesy of the Pennsylvania Department of Agriculture.

Figure 3: Important information on the habits and life cycle of the SLF courtesy of the Pennsylvania Department of Agriculture.

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Bud Break				■								
Flowering and Seed Ripening					■	■	■					
Foliar or Stem Treatment							■	■	■	■		
Cutting after Treatment	■	■	■	■							■	■

Figure 4: Tree-of-heaven eradication treatment schedule courtesy of Pennsylvania State University.

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The Sky is Not the Limit:

Lunar Policy

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Executive Summary

Over the years, scientists reported that non-radioactive helium-3 isotopes are capable of producing clean and efficient energy without the catastrophic nuclear energy risks. These risks include meltdowns and toxic waste disposal. Helium-3 is more abundant on the moon than on Earth due to the collision of solar winds with Earth's magnetic field shields. For U.S. national space and energy security measures, the U.S. must adopt a lunar policy through private and public sector funding for the development of lunar mining for helium-3. This consists of the reallocation of fiscal year (FY) budgets for the U.S. Space Force and the Department of Energy (DOE), along with the creation of a sixth sub-component, Lunar Policy, within the DOE. These policies will assist in mitigating climate disasters facilitated by oil drilling, while preserving Earth's finite resources. They also serve as a means of reducing dependency on foreign oil and energy sources, while boosting energy security through domestic energy independence.

Overview

The concept of lunar mining is more than science fiction. With recurrent climate disasters, dwindling natural resources, and catastrophic damage to ecosystems from oil spills and fracking, it is time to search for energy

resources outside of Earth. Due to Earth's shielding of solar winds by its magnetic field, many rare earth metals and minerals are found in far less abundance terrestrially than on celestial bodies that lack such a field, notably the moon. According to the European Space Agency, "...the moon has been bombarded with large quantities of helium-3 by the solar wind.… It is thought that this isotope could provide safer nuclear energy in a fusion reactor, since it is not radioactive and would not produce dangerous waste products" (European Space Agency, n.d.). Nobel Peace Prize physicist Dr. Robert Richardson has further commended the potential energetic capabilities of helium-3 (Ju, 2013). It is critical to take advantage of scientific advancements and milestones for the development of future energy sources. This means that finite resources and environmental safety on Earth are preservable if metal and mineral extraction can be successfully performed on other celestial bodies.

Actions Taken

December 20th, 2019, marked the birth of the United States Space Force (USSF), signed into law by President Trump under the U.S. Space Force Act with bipartisan support. As of 2023, this is the world's only independent space force. According to the USSF's official government website, "The U.S. Space Force protects our country and the freedom to operate in space, keeping it secure, stable and accessible for military space power and new waves of innovation" (U.S. Space Force, n.d.). These new waves of innovation include uncovering fuel sources from space that can be utilized as energy on Earth. This also includes ways of fostering innovation for protecting key critical cyber-infrastructure in space, such as satellites.

The utilization of the moon as an extraction point for energy resources piques not only the interest of the U.S., but that of other countries as well. India, which has recently completed its first successful moon launch, has indicated interest in mining the lunar surface (European Space Agency, n.d.). China also demonstrated its interest in lunar mining publicly (Reuters).

China and Russia are further exploring the possibility of a joint Rus-

sian-China crewed mission fully equipped with a lunar base. NASA has called this global focus on moon mining a lunar gold rush (Faulconbridge, 2023). Private enterprises expressed interest in lunar extraction, including Shackleton Energy Company, which envisions providing propellant for missions throughout our solar system using lunar water (European Space Agency, n.d.).

Policy Options

Keeping the USSF mission statement in mind, fostering new waves of innovation must be emphasized in the realm of energy security with critical infrastructure protection towards these tools for energy in space. To assist in mitigating climate disasters and natural energy source depletion, while also decreasing outsourced energy dependence, it is time to utilize rapid technological advancements to uncover resources outside of Earth. The first step is to utilize space operations for lunar mining.

1. Increase USSF research funding and lunar extraction technology through military budget allocation.

Pros: More research (75 percent of USSF FY budget) includes greater capabilities for space-military testing and utilization of trial-and-error experiments for developing successful lunar extraction technologies such as military-grade lunar mining equipment and transportation systems for Helium-3. USSF would be responsible for securing and protecting lunar mining and extraction facilities. USSF's expertise in space situational awareness can be leveraged to monitor and track space debris, ensuring the safety of lunar mining operations. This is crucial to avoiding satellite collisions and space debris.

Cons: Military funding allocation towards protecting satellite and space technologies from cyber-attacks and other forms of interference in other network infrastructures not deemed as relevant to lunar extraction may be diminished

2. Increase funding and grant writing for Geospace Technologies (or other multinational corporations), the leading global corporation for intelli-

gence in vibrational technology solutions.

Pros: Assuming the adoption of policy option one, the private and public sectors should collaborate simultaneously to foster rapid technological growth and increase energy security through the public good of renewable energy. If enacted, the USSF can continue their priority focus of training resilient space-combat troop training for current goals, maintaining research at about 60 percent of its budget. This would mean current efforts on developments such as combating cybercrime against particular space infrastructures can remain unchanged.

Cons: This policy is extremely expensive, as it falls outside of the existing budget appropriations for military funding. This requires a long-term government-sponsored investment with little short-term gains to produce usable energy as a public good. The multinational corporations could also share and reveal space interests to foreign governments and adversaries with competing interests.

3. Allocate more funding out of the DOE's budget, requiring a percentage of funding celestial energy initiatives beyond Earth, making Lunar Policy its sub-componet.

Pros: The DOE can make significant advances towards shifting long-term energy sources to be both renewable and non-radioactive. This would be safer for developmental research since non-radioactive helium-3 from lunar mining poses less of a catastrophic risk from human error or miscalculation than radioactive nuclear energy. The U.S. would rely less on foreign sources of energy and oil.

Cons: The DOE may impede immediate developments to nuclear and solar energy capabilities since there will be a major shift in funding and prioritization.

Policy Recommendations

A combination of these policies is critical to the political, strategic, security, and financial interests of the U.S.

1. Increase in USSF research funding and lunar technology.

According to the Department of Defense (DoD), "The U.S. Space Force's $30 billion budget request for Fiscal Year 2024 is about $3.9 billion over what was enacted for the service in FY2023." More than 60 percent of the Space Force budget, about $19.2 billion worth, is aimed at research, development, testing and evaluation (Lopez, 2023). However, it is more beneficial for U.S. national security and human security interests to shift the funding focus even more on research and testing to actually be able to tangibly create the lunar mining extraction technology, rather than towards training for space troops to solely prevent cybercrime. It is necessary to raise research funds from 60 percent to 75 percent, ensuring rapid development and rigorous experimental testing of new technologies for lunar extraction with focuses also on lunar infrastructure protection. A potential downside to this shift in allocation is that there may be less funding to help protect satellites and other space technologies from cyber-attacks that would not fall under lunar extraction technology. This is because funding for space resilient combat troops includes cyber defense skills training for on-orbit satellites, which could be hindered as a result of a decline in overall prioritization (Rivezzo, 2023).

2. Increase in funding and grant writing of Geospace Technologies (or other Multinational Corporations), the leading global corporation for intelligence in vibrational technology solutions.

As mentioned earlier, private enterprises have expressed a deep interest in lunar extraction, including Shackleton Energy Company, who want to develop technology dedicated to moon mining for uses such as lunar water extraction to be used as a propellant (Keravala et al., 2023). Unfortunately, none of their public milestones have been achieved due to a lack of adequate funding. It is best to invest in multinational corporations, including but not limited to Geospace Technologies, which would use secured funding for manufacturing and testing lunar mining equipment. They are widely considered to be the industry leader of technological aerospace developments and leading pioneers of aerospace engineering, so they serve as a noteworthy example. This policy will ensure the success of powerful

private and public sector collaboration between Multinational Corporations and the USSF. If proven successful with helium-3, more collaborative efforts for other mineral and metal lunar extractions can be continued.

3. Allocate more funding from DOE's budget, requiring a percentage of funding to go towards energy initiatives beyond Earth through creating a lunar energy sub-component.

According to USAspending.gov, the DOE for fiscal year 2023 has $151.33 billion distributed among its five sub-components, five times more than the $30 billion requested by the Space Force for FY 2024 (USAspending, 2023). The five sub-components of funding include Energy Programs, National Nuclear Security Administration, Environmental and Other Defense Activities, Power Marketing Administration, and Departmental Administration (USAspending, 2023). A great addition would be the lunar policy as a sixth sub-component to push a greater emphasis on developing and implementing such energy technologies and capabilities into fuel usable by both the military and public. The DOE can utilize Departmental Administration funds to coordinate efforts and ensure collaboration between the DOE and USSF. If efforts are successful, their future initiatives can include researching and developing technologies for other celestial bodies with energy sources, like Jupiter, which also contains helium-3 (European Space Agency, n.d.). This new sub-component could be transformative to celestial policy.

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Addressing the Issue of Bride Kidnapping by
Promoting Women's Rights

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Executive Summary

Despite its illegality, bride kidnapping (kyz ala kachuu in Kyrgyz) is a common practice in Kyrgyzstan. According to the Bishkek Women's Support Center, nearly 12,000 women are kidnapped each year. These women are forced into marriage and are often raped during this process (Hofmann and Chi, 2021). Contrary to legal protections against bride kidnapping, obtaining justice for offenses is a rarity. In 2020, 92 cases were reported, only eight of which made it to court. Meanwhile, most other cases go unreported due to social stigma (Mukhamejan and Zhakypbekova, 2022). Gender stereotypes in Kyrgyzstan are prominent, exacerbated by the fact that women who are not virgins are perceived as "unmarriable." According to Amnesty International, a woman who has been raped is more likely to agree to marriage to avoid shaming her family. These women typically cannot complete their education, compounding Kyrgyzstan's existing gender inequalities (Amnesty International, 2018).

Background

Acceptance of Patriarchial Cultural Norms

According to Human Rights Watch (2006), bride kidnapping is defined as when, "A young woman, below the age of 25, is typically taken through force or deception by a group of men, including the intended groom... She is taken to the home of … the intended groom and is put in a room and surrounded by his female relatives. These women use physical force and... psychological coercion to compel her to "agree" to the marriage and submit... to marry her abductor... She is often raped by her abductor, sometimes prior to her coerced consent to the marriage as a means of pressuring her to stay (Human Rights Watch, 2006, pg. 96)."

Many Kyrgyz people view bride kidnapping as a traditional Kyrgyz practice. Amnesty International reports (2018) that 64 percent of police officers in Osh, a city in the south of Kyrgyzstan, consider bride kidnapping as normal. Per the same report, 82 percent of these officers believe that the bride kidnapping is provoked by the women (Amnesty International, 2018). This belief stems from a misconception about formal arranged marriages, as both families must agree to the arrangement (Nawaz, 2015; Stakeeva et al, 2011). While there are some cases of consensual kidnapping as family tradition, the majority of bride kidnapping cases are not consensual. In these cases, women are often coerced through sexual assault and peer pressure (Mukhamejan and Zhakypbekova, 2022).

In many cases, government officials, law enforcement, and members of Kyrgyz society assume that bride kidnapping happens only with a woman's consent. When asked about this, officials state that victims report the forced bride kidnapping (Nawaz, 2015)

This is simply not the case, as the following example of Cholpon Matayeva illustrates, "Cholpon Matayeva was kidnapped for marriage by a husband who beat her frequently... When she finally demanded a divorce after a decade of marriage, he stabbed her to death. He has been jailed for 19 years...Cholpon barely knew her husband when he abducted her at the age of 19. She did not want to marry him but like many other women, she was afraid to leave him out of shame. (Abdurasulov, 2012)."

In addition to the individual-level harms associated with bride kidnapping in Kyrgyzstan, the practice has broader socio-cultural ramifications.

Bride kidnapping reaffirms men's masculinity and enforces purity culture by shaming women into marriage through rape (Nawaz, 2015). The acceptance of this practice led to victims not knowing that someone can be prosecuted for bride kidnapping, perpetuating injustice, and damaging stereotypes (Stakeeva et al., 2011).

Informational Vacuums in Rural Areas

Lack of access to information in rural areas enables bride kidnapping, as younger people in these areas may not know the laws and freedoms to which they are entitled. Victims of bride kidnapping will not report this because they do not know about their rights or that there are legal protections in place for them (Stakeeva et al, 2011). In some rural communities, many young women do not receive education after turning 15 because of cultural and socioeconomic barriers (UNFPA, 2021). When these young women leave the education system, they no longer have access to comprehensive sex education. The United Nations Population Fund (UNFPA) reports that students in Kyrgyzstan experience a substantial knowledge gap in where they can get help with contraception, unintended pregnancy, and male health issues (UNFPA, 2021).

Current Policy

The legal age of marriage in Kyrgyzstan is 18. The penalty for underaged marriage is three to five years imprisonment (UN News, 2022). The Kyrgyzstan Criminal Code forbids bride kidnapping and forced kidnapping, with Articles 154(2) and 155(2) specifically prohibiting abducting a woman to force her to marry (Lundber, 2021). However, enforcement proves difficult. In many cases, victims live with their husband's parents and have no assets or way to advocate for themselves. Their families will convince them to stay married to prevent social shame (Hughes, 2013). Victims often find that these crimes are unpunished if they file a complaint. In 2020, for example, of 92 reported cases, only eight cases were not dropped before they reached court (Mukhamejan and Zhakypbekova, 2022).

According to Kyrgyzstan's law, "On social and legal protection from domestic violence," legal officials are required to take victims to medical and

social services. However, this rarely happens. The forum of women's NGOs of Kyrgyzstan cites a lack of funding for women's rights projects as the reason that the law is not implemented. Additionally, the law does not specify protection measures for victims of bride kidnapping, but instead, victims of bride kidnapping must share limited crisis resources with other victims of domestic abuse (Stakeeva et al, 2011). Kyrgyzstan's continued challenges in reducing bride kidnapping is an example of a government failure. There are laws on the books, yet they are not enforced effectively. In fact, victims often do not even know about the laws against the practice in the first place, let alone what resources they may have to protect themselves.

Problem Identification

Bride kidnapping is a form of gender inequality that prevents Kyrgyz women from succeeding in their education and employment. It keeps women from becoming economically independent and productive members of Kyrgyz's economic and social order. In the interest of reducing inequality and promoting economic and individual independence and development, alternative and effective solutions to protect women from this practice of gender inequality must be found.

Goals and Potential Solutions

Reduce information insufficiencies at the national level: Public awareness campaigns and educational programs.

The first possible solution is to create public awareness campaigns in Kyrgyzstan. The government should work with local women's civil rights networks to develop educational programs for radio and television. These programs can focus on educating women, parents, and community members on the harmful effects of forced and child marriages on women. Public information should especially target rural women and girls.

The government of Kyrgyzstan should further enact comprehensive educational programs for all students on the laws and prevention of forced marriage and sex education. There have been efforts to introduce sex education to schools in Kyrgyzstan. Most recently, the Ministry of Educa-

tion and Science of the Kyrgyz Republic commissioned 48 video lessons in 2020 to 2021 on healthy lifestyles for grades six through eleven (UNFPA, 2021). Students' knowledge of human immunodeficiency virus (HIV) prevention has improved, but research shows significant knowledge gaps in contraception methods and unintended pregnancy (UNFPA, 2021). New programs should consider barriers that girls face in accessing education itself like fees, geography, sexual harassment, and lack of access to safe toilets and menstrual hygiene products. These programs would help decrease knowledge gaps in sexual health and women's rights while contributing to national awareness of issues like bride kidnapping and domestic violence.

Provide assistance to victims through emergency resource centers.

For direct assistance, local women's centers should be established to include health services, hotlines, shelter, legal aid, and economic aid. They must prioritize providing shelter because only one existing resource center had a shelter in 2022 (Childress et al., 2022). These centers assist in the promotion of overall well-being of women and girls in Kyrgyzstan. These resources can contribute to women's empowerment as they work to achieve independence from patriarchal norms and institutions.

Ensure application of the law: Law enforcement training.

The Kyrgyz government should mandate training programs for law enforcement on the laws and social dynamics of violence against women. An example of this is the Kyrgyz Association of Women in the Security Sector working with the Organization for Security and Co-operation in Europe (OSCE), which had a three-day training in September of 2023 (Zhanybekov, 2023). The program provided tools and information to law enforcement agencies to enhance gender equality standards.

Training is an integral component of any effort to combat bride kidnapping and other forms of gender-based violence, as law enforcement agencies and officials must have a full understanding of the laws that protect Kyrgyz women from violence. This training should be collaborative and highlight women's perspectives in the program's development. These programs

should be part of the initial training of law enforcement and of continuing education for them.

Recommendations

Addressing bride kidnapping in Kyrgyzstan is not a simple task. The following recommendations promote the rights of women through both short-term and long-term approaches.

Short term: Emergency resource centers

The government should establish emergency resource centers for Kyrgyz women, focusing on shelter provision. This allows access to information and resources promoting overall success. These centers also provide resources like career and education guidance, financial assistance, and legal advising.

Long-term: Public awareness campaigns and educational programs

 To promote gender equality for future generations, public awareness and educational programs should be created through collaboration between government and civil society. These programs raise society's awareness of issues related to bride kidnapping. With improved awareness throughout Kyrgyz society, men, women, law enforcement, and government officials at all levels will have a greater capacity to assist victims and prevent future cases of bride kidnapping.

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The F-35: A Military Marvel, but
at What Cost?

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Background

When the Lockheed Martin F-35 fighter jet was created in the 1990s, there was a great deal of ambition behind it (Board, 2021). The jet was destined to be a centerpiece of U.S. air power, filling unique roles for the Air Force, Marines, and Navy through conventional fighting, vertical landing, and aircraft carrier takeoff abilities, while filling their fighter aircraft needs for many decades into the future (Mathis, 2023). F-35 production is now in full force, with the United States utilizing the plane in various combat missions in multiple different countries (Board, 2021). However, the development of this plane took far longer and cost a larger sum than originally planned, as the plane is still receiving upgrades in the 2020s. Given the significant financial commitments and strategic value dedicated to the F-35 program in U.S. defense planning, it is important to examine the F-35's value to the United States and the extent to which American commitments to the jet should change in the future.

Policy Considerations

The F-35 boasts an impressive array of technological assets. Its electronic warfare capabilities are second to none among American fighter-bomb-

ers, with its jamming system possessing the ability to deceive or suppress enemy radar to help the plane avoid detection (Thompson, 2021). The F-35's stealth airframe further assists its ability to avoid detection by the enemy and is cloaked in radar-absorbing material designed to minimize radar contact (Episkopos, 2020). The F-35 is not only designed to optimize its self-preservation. The F-35 is an excellent tool for intelligence, surveillance, and reconnaissance, with its numerous onboard sensors being able to produce live depictions of battlefields which the F-35 can share with friendly vehicles and operation centers (Atlamazoglou, 2022).

While attacking, the F-35 is a fearsome and versatile weapon, with its fighter capabilities enabling it to neutralize enemy aircraft and its strike capabilities allowing it to destroy ground and sea targets using a wide array of smart bombs and missiles (Cooper, 2022). The F-35 is also interoperable with a wide variety of weapons systems among the United States' allies, so its use can help integrate the militaries of the United States and its allies (Breedlove, 2023). From an affordability standpoint, the F-35 has made sizable strides, with its production costs and flight-per-hour prices having fallen significantly over the past 10 years (Tirpak, 2022). Moreover, exports of the F-35 to U.S. allies have been rising in recent years, further improving the aircraft's cost-effectiveness (Atlamazoglou, 2022).

Despite considerable cause for optimism in the F-35, there are ample reasons to doubt the continued need to spend so much on the plane. To begin with, the F-35 is extremely expensive to build and maintain. It is projected that U.S. taxpayers will pay over $1 trillion for the F-35 over its 60-year life span (U.S. Government and Accountability Office, 2023). In the short term, they are paying around $44,000 for every hour of its flight compared to $27,000 an hour for flights from older F-16s (Kass 2024; Lister & Liebermann, 2023).The F-35's ample structural deficiencies and ongoing efforts to fix them are keeping its costs high (U.S. Government and Accountability Office, 2023).

These deficiencies include excessive vibrations from its cannon, stealth coating which often sheds while in supersonic flight, and vulnerability to lightning strikes from weaknesses in its gas generation system (Mathis,

2023; Insinna, 2022). These deficiencies have also caused substantial maintenance delays, which are so severe that F-35s are only mission capable 55 percent of the time, well below the Pentagon's goal of having F-35s be mission capable 85 to 90 percent of the time (Stricker, 2023). The persistence of these issues is especially troubling in light of lengthy delays suffered by the F-35's development as its designers struggled to integrate its immense number of evolving technologies into the plane's design in a timely and cost-effective manner (Povilas, 2023). The F-35's maintenance delays and high prices raise doubts about its value for conducting routine patrols of U.S. airspaces, strikes against enemy combatants that pose no threat to high-altitude jets, and other missions that do not require the full scope of the F-35's top-flight technologies (Roblin, 2021).

Policy Recommendations

U.S. military and legislative leaders face difficult decisions as they weigh the F-35's formidable tactical capabilities against their value for the F-35's costs and operational challenges. Ultimately, considering both perspectives, the United States should preserve the F-35 program. In order to do so, the United States should reduce its purchases of F-35s beyond projected spending levels going forward and plan on using older multirole combat aircraft, such as the F-16 and FA-18, to conduct lower-risk missions more often.

The primary reason for maintaining the F-35 program is the plane's advanced stealth capabilities. These defenses are required in case of war against a peer or near-peer competitor (Weisgerber, 2021). Moreover, as pricey as the F-35 program may be, the cost of terminating it and trying to develop a replacement would likely be even greater (Board, 2021).

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Striving for Climate Justice: An Analysis of the Importance of Indigenous Traditional Ecological Knowledge in Combating Environmental Degradation and Implementing the Sustainable Development Goals

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Executive Summary

Indigenous Peoples and Local Communities (IPLCs) possess traditional ecological knowledge (TEK) vital for combating environmental degradation and implementing sustainable development through the United Nations Sustainable Development Goals (SDGs).

Traditional ecological knowledge includes cultural beliefs, cultural practices, and adaptive capacity. If fully understood by UN member states, indigenous TEK could add value to the SDGs (Ariando, 2020). Due to their close relationship with nature, IPLCs experience adverse effects of climate change. Climate change often exacerbates equity issues that IPLCs face. Despite being among the most 'vulnerable' communities when faced with disasters, IPLCs have shown immense potential in their adaptation (United Nations Department of Economic and Social Affairs, 2021). This analysis highlights two case studies: indigenous groups in the Amazon Region and Sapmi. Both regions demonstrate a holistic understanding of the environment based on cultural practices, beliefs, and adaptive capacity to combat climate issues.

Within SDG 13, Climate Action, Targets 13.1 and 13.b focus on indigenous peoples' capacity to protect themselves and their land from climate

change. SDG 13 emphasizes the importance of TEK in climate planning. SDG 15, Life on Land, draws attention to indigenous TEK and the preservation of our planet's ecosystems (Target 15.1), biodiversity (Targets 15.4 and 15.5), and the issue of deforestation (Target 15.2). In SDG 16, Peace, Justice, and Strong Institutions, Target 16.7 reinforces the need for indigenous participation in the SDGs, International Climate Conferences, and Human Rights Treaties. This analysis evaluates SDGs 13, 15, and 16 in comparison to the United Nations Declaration of the Rights of Indigenous Peoples (UNDRIP) articles and concludes that a closer relationship between the SDGs and the UNDRIP is essential (Indigenous Navigator, n.d.).

Key takeaways from this research highlight that the SDGs and the UNDRIP must be implemented in unison to reinforce the human rights of IPLCs, and to influence sustainable development (International Institute for Sustainable Development, 2019). Human rights violations are still prevalent in UN member states and countries that have ratified the UNDRIP. Without UN member state recognition of IPLCs' fundamental human rights, the immense benefit that indigenous TEK could provide society is impossible. By implementing the SDGs and the UNDRIP together, IPLCs would become agents of sustainable development. Free, Prior, Informed Consent (FPIC) would be more widely understood among stakeholders (World Association for Christian Communication, 2019).

UN member states must take further initiative to include IPLCs in national and international framework meetings and forums to influence TEK in policy. Historically, UN member states and stakeholders excluded IPLCs from similar meetings. IPLCs must have legal autonomy and communal rights to further this influence. UN member states must recognize all IPLC rights before indigenous TEK can add value to the SDGs (Office of the High Commission for Human Rights, Secretariat of the Permanent Forum on Indigenous Issues, and United Nations Department of Economic and Social Affairs, 2017). Additionally, member states should develop instruments to collect further data on IPLC knowledge

and its benefit to climate mitigation and sustainable development (International Institute for Sustainable Development, 2019). IPLCs nurtured and sustained our planet for generations. Once governments fully recognize indigenous rights, the people who understand our planet best can guide its development.

Introduction

Nearly 370 million individuals worldwide identify as Indigenous, which equates to about 5 percent of the global population. Despite accounting for a small percentage of the universal populace, IPLCs manage nearly 28 percent of the world's land. They are the de facto guardians of 80 percent of the world's biodiversity (Campbell, 2019). IPLCs' dependency on nature for their livelihoods often indicates that they are the first to experience the effects of climate change. IPLCs feel these effects the deepest compared to other groups of people. Implications of environmental degradation affect the well-being of IPLCs worldwide (United Nations Department of Economic and Social Affairs, 2021). In the following sections, case study examples demonstrate specific IPLC experiences of these implications.

Many scientists estimate that nearly 90 percent of indigenous land is in a carbon sink (see Figure 1), (Selibas, 2022). This term refers to any area of land that collects more carbon from the atmosphere than it emits. Forests, soil, and the ocean sequester most of the world's carbon (Client Earth, 2020). Lands protected by IPLCs, on average, sequester 30 metric tonnes of carbon annually, about two times more than land indigenous groups do not manage (Selibas, 2022). In short, we cannot reach global climate goals without safeguarding the world's forests and carbon sinks. We must do so with the knowledge and expertise of IPLCs (Kaimowitz, 2021).

Policymakers and world leaders frequently exclude indigenous peoples from climate conversations. Instead, they are categorized as "vulnerable" in several human rights documents and the SDGs. Scientists can learn

valuable environmental information from indigenous groups and their cultural practices, beliefs, and adaptive capacities. IPLCs are on the front lines of the climate crisis and have an intimate relationship with nature (United Nations Department of Economic and Social Affairs, 2021). IPLCs tend to rely on the environment for survival. Many forest-dwelling groups base their livelihoods on caring for forests and the species within them. This relationship with nature has fostered the development and storage of traditional ecological knowledge (TEK) passed down from generation to generation. Indigenous groups worldwide are significant in combating environmental issues and ensuring sustainable development (Ramos-Castillo et al., 2019).

Analysis and Discussion

Traditional Ecological Knowledge and Climate Justice

Many researchers define traditional ecological knowledge (TEK) differently. The term was first introduced in 1993 by Fikret Berkes, an ecologist from the University of Manitoba (Ariando, 2020). Worldwide indigenous groups base their livelihoods on subsistence hunting and gathering, farming, and herding. Each group comprehensively understands what plants and animals they can consume at different points throughout the year (Krause et al., 2020). TEK materializes from generations of these environmental observations, which are recorded and understood by IPLCs. This knowledge is typically very flexible and transforms with the Earth as it changes (Ytterstad, 2020).

Ariando diverges TEK into three categories: cultural practice, cultural belief, and adaptive capacity (See Figure 2). Within each indigenous community, there are distinct cultural practices, cultural beliefs, and adaptive capacities that scientists and policymakers can learn from to mitigate climate issues effectively (Ariando, 2020). Additionally, climate change adversely affects the continuation of TEK. The obstacles that IPLCs face originate from colonialism and climate change exacerbated them. Colonialism's role in climate change is imperative because it was the exploitation of indigenous land and the subsequent extraction of fos-

sil fuels that amounted to the global warming and pollution that we see today. Pollution, extraction, and exploitation harm the ability of IPLCs to pass down critical ecological knowledge to younger generations (Begay, 2021).

Climate justice originates from the idea that the effects of climate change are felt differently among various groups of people. Some marginalized groups, such as IPLCs, tend to feel these effects inequitably compared to the rest of the population. Groups who experience these disproportionate effects have the least responsibility for climate change. Climate justice recognizes that climate change exacerbates inequity (Simmons, 2020). Recently, many NGOs advocated for climate justice and, ultimately, for a "just transition" away from fossil fuel extraction. The fossil fuel industry is a significant contributor to global warming, exploitation, and deforestation. With an equitable and "just transition" away from energy systems based on fossil fuels, the Climate Justice Alliance argues that climate justice may be possible (See Figure 3), (Climate Justice Alliance, 2022). International recognition of traditional ecological knowledge paired with an understanding of climate justice would likely influence better climate governance and more successful global climate action (Etchart, 2017).

Amazon Regional Cases: Implications in Colombia, Peru, and Brazil
The following section contains two case studies in different regions: the Amazon Region and Sapmi. The Amazon Rainforest region maintains global importance for carbon sequestration. The region has an overwhelming history of exploitation and considerable negative impacts faced by IPLCs as a result. Sapmi is the land that stretches across Finland, Norway, Sweden, and Russia and is home to the Saami people. This region is worth attention because the Arctic faces different consequences of global warming than the rest of the world. The Saami people are further distinctive because of their parliament. Most IPLCs have a different level of representation.

Approximately 400 indigenous tribes reside in the Amazon Rainforest

(Survival International, n.d.). Instead of focusing on one tribe specifically, researching the Amazon Rainforest is valuable because climate change and deforestation have heavily impacted the entire region. Many indigenous groups throughout the region have demonstrated similar adaptive behaviors to climate change and have cultural beliefs and practices that have sustained the forest for generations. Colombia, Peru, and Brazil hold most of the Amazon Rainforest within their borders. All three countries have recognized and ratified the UN Declaration of the Rights of Indigenous Peoples (UNDRIP), (United Nations, 2007). The Amazon Rainforest is one of the largest carbon sinks in the world, proving significant value to the rest of the planet. A recent study of the carbon density in the Amazon found that nearly 58 percent of the carbon stored in the Amazon region was held in Indigenous Territories or Protected Natural Areas (See Figure 4), (Walker et al., 2020).

Due to the magnitude of the Amazon, each country experiences a spectrum of threats from climate change and outside forces. In Colombia, two significant threats to IPLCs are armed conflict with the Revolutionary Armed Forces of Colombia (FARC) guerillas in the region and threats that encompass deforestation, including land grabbing, illegal logging, mining, and cattle ranching (González-González et al., 2021). In Peru, the most significant threats to IPLCs are oil spills, the palm oil industry, and illegal logging and mining (International Work Group for Indigenous Affairs, n.d). IPLCs in Peru additionally report experiencing extreme droughts, forest fires, an increase in vector-borne diseases, and food and water insecurity due to climate change (Hofmeijer et al., 2012).

Brazil has the most substantial number of isolated indigenous peoples in the Amazon region, with approximately 107 groups. In addition to extreme weather patterns, the most prominent threats for IPLCs in Brazil are hydroelectric and mining companies. The president of Brazil, Jair Bolsonaro, threatened Brazilian IPLC rights with his political agenda. During his presidency, Bolsonaro revoked the legal developments that protected indigenous land. Since rescinding these protections, indigenous peoples have faced increased violence from officials and develop-

ers. Bolsonaro further placed the responsibility for safeguarding agricultural rights in the hands of the Department of Agriculture, a department of the Brazilian government well known for siding with businesses that wish to gain power over indigenous lands (International Work Group for Indigenous Affairs, n.d.).

Throughout the Amazon region, many indigenous groups take spirituality very seriously. In addition to many of the above climate-related impacts on these groups, they stand to lose aspects of their culture connected to local flora and fauna. Elders, shamans, and older members of indigenous communities are at risk of losing their reputations because of these implications. For example, if shamans cannot obtain the herbs they need to heal people, they often risk losing their status within the community (World Wildlife Fund, n.d.).

Amazon Region: Traditional Ecological Knowledge

Each tribe and ethnic group in the Amazon region partake in unique practices. Several overarching TEK themes are present in the region. In terms of cultural practice, many indigenous groups follow an ecological calendar that helps to manage the forest and local biodiversity (Krause et al., 2020). This calendar dictates seasons for hunting and gathering, with some plants and animals being hunted at various seasons throughout the year.

Regarding cultural beliefs, Shamans throughout the region ask for permission from the spiritual owners of each plant and animal species before using them for consumption. Throughout Indigenous Amazonian tribes, there are often particular species that they refrain from consuming or only consume at certain times of the year due to spiritual reasons or celebrations (Krause et al., 2020). These cultural belief practices ensure that the plants and animals are only used when needed, therefore avoiding overconsumption.

In terms of adaptive capacity, IPLCs respond to the productivity of the

forest at the time of hunting or gathering. In doing so, tribes do not gather crops before they have had the opportunity to flourish, nor do they hunt animals that appear too young or skinny. These adaptive behaviors coincide with local seasons and climate fluctuations (Krause et al., 2020). Some IPLCs have taken it upon themselves to mitigate deforestation and climate issues in the Amazon. Groups will plant tree seedlings in the forest to combat deforestation as well. Other groups have taken their adaptive behavior to the next level by protesting or lobbying local government officials about the condition of their land. IPLCs in the Amazon region partners with NGOs to employ their TEK locally, nationally, or internationally (Rodrigues, 2021).

Implications for the Saami Peoples

An estimated 50,000 to 100,000 Saami people live throughout Scandinavia's northern territories - Norway, Sweden, Finland, and the Russian Kola Peninsula (Jamet, 2021). Norway, Sweden, and Finland all are members of the United Nations and have adopted and ratified the UN Declaration of the Rights of Indigenous Peoples (UNDRIP), while Russia refrained from adoption. The Saami peoples within the Northern Scandinavian countries have a parliamentary council of Saami members. Russian Saami peoples are not represented in this parliament due to Russia's lack of recognition of the UNDRIP. However, even with parliamentary representation, the UN Special Rapporteur on the Rights of Indigenous Peoples examined the human rights practices of each Scandinavian country in 2016. The Rapporteur's report determined that all three states were not fulfilling their obligation to guarantee the human rights of the Saami (International Work Group for Indigenous Affairs, n.d.).

The race to achieve green energy throughout Europe harmed Saami land and livelihood. Although these practices seem beneficial to the environment, they are burdensome to the Saami. Industrial-scale wind turbines have dispersed reindeer herds in Norway and Finland. The construction of new roads and infrastructure surrounding these wind turbines has exacerbated the issue. The Saami parliament president, Ailo Keskitalo, re-

ferred to these technological advancements as "green colonialism." This term links the harmful colonialist practices that the Saami have faced for decades with the trend of establishing renewable energy and greening policies (Normann, 2021).

In addition to green colonialism, the climate impact throughout Sapmi has been detrimental. According to a recent study, the Arctic region is warming four times faster than the rest of the world (Voosen, 2021). The average temperature in the area has risen by 2.3 degrees Celsius since the Industrial Revolution. The most significant climate-related threat the Saami face is warming temperatures, which directly impacts reindeer herding and salmon fishing. These two practices make up the Saami way of life and overall well-being (World Wildlife Fund, n.d.). Due to rising temperatures, snow cover has been sporadic and icy. The ice has made it increasingly difficult for reindeer to dig under the snow for lichen, causing them to search further away from the Saami people. Scientists believe that reindeer have lost 70 percent of their grazing lands over the last century due to hydroelectric dams, renewable energy initiatives, logging, and mining (McVeigh, 2021).

These impacts on the Sapmi reindeer and other species in the region have a domino effect on the Saami peoples' cultural identity, heritage, and traditional knowledge (See Figure 5). Salmon fishing is a considerable part of the Saami economy and culture. Many traditions and cultural practices depend on salmon fishing. This practice is a critical factor in the security of the Saami peoples. Several scientists specializing in arctic salmon and fish species predict that shorter, warmer winters will likely continue to bring heavier rainfall, leading to early migration of several salmon species. When salmon migrate too early, they often do not reach sexual maturity, making reproduction almost impossible. Scientists linked early migration to an increase in disease among the fish. Saami fishermen have reported already noticing some of these concerns (Markkula and Rasmus, 2019).

Saami: Traditional Ecological Knowledge

Like many other indigenous groups, traditional ecological knowledge among the Saami people is generational. Regarding cultural practice, Saami were initially nomadic herders and pastoralists following their reindeer throughout the Sapmi region. For thousands of years, Saami herders have followed the siida system, an ideological institution among Saami pastoralists to promote kinship and equality. All who wish to participate in kinship are permitted regardless of social status. Although Saami herders are no longer fully nomadic, they report following these principles today (Naess et al., 2021).

Regarding cultural beliefs, Saami peoples in the 15th century were primarily polytheistic Animists. Animism is common among many traditional indigenous groups because of their close relationship with nature. Followers of Animism often believe that every object serves a purpose and every living thing has a soul. This belief fosters a low-waste mentality. Present-day Saami peoples are predominantly Lutheran or Eastern Orthodox; however, they still follow many practices surrounding the usefulness of objects and living creatures (Naess et al., 2021).

In terms of adaptive capacity, Saami reindeer herders in recent years have provided supplementary feedings to Sapmi reindeer (Reindeer Herding, 2020). They altered many herding methods using the siida system to suit the change in reindeer migration patterns. With the help of new technology, Saami herders track reindeer migration using GPS collars and drones. Although not permanent solutions, these adaptive capacities have enabled Saami people to continue their way of life and sustain their livelihoods (University of Oulu, 2020).

A Closer Look at the SDGs

Indigenous rights and knowledge should be incorporated into every Sustainable Development Goal, target, and indicator. However, there is a distinct value that indigenous traditional ecological knowledge adds

SDG TARGET	UNDRIP ARTICLES
Target 13.1 Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries.	Article 7.1 Indigenous individuals have the rights to life, physical and mental integrity, liberty, and security of a person.
Target 13.b Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries, including focusing on women, youth, and local and marginalized communities.	Article 5 Indigenous peoples have the right to maintain and strengthen their distinct political, legal, economic, social, and cultural institutions, while retaining their right to participate fully, if they so choose, in the political, economic, social, and cultural life of the State.
	Article 18 Indigenous peoples have the right to participate in decision-making in matters which would affect their rights through representatives, chosen by themselves in accordance with their own procedures, as well as to maintain and develop their own indigenous decision-making institutions.

Figure 6: Indigenous Navigator

to SDGs 13 (Climate Action), 15 (Life on Land), and 16 (Peace, Justice, and Strong Institutions). UN member states routinely overlook Indigenous TEK when implementing the SDGs and other Human Rights treaties. The Indigenous Navigator is a tool and organization that analyzes the recognition of IPLC rights in various treaties and frameworks throughout the world (Indigenous Navigator, n.d.). The Indigenous Navigator reports that the term "indigenous peoples" is used only four times throughout the entirety of the SDGs. Additionally, when IPLCs are mentioned in the SDGs, they are often referred to as vulnerable (O'Sullivan, 2019). Reference to vulnerability overlooks IPLC knowledge, strength, and self-determination.

SDG 13: Climate Action

Two of the five targets listed under SDG 13 are worth noting compared

to the articles listed in the UNDRIP, Targets 13.1 and 13.b. Target 13.1, in conjunction with article 7.1 of the UNDRIP, highlights the right and capacity of IPLCs to protect themselves and their communities from climate change (Indigenous Navigator, n.d.).

Target 13.b relates to Articles 5 and 18 of the UNDRIP, which emphasizes the right of IPLCs to participate in implementing climate related-policy and decisions made locally, nationally, and internationally (Indigenous Navigator, n.d.).

Figure 7: Indigenous Navigator

SDG TARGET	UNDRIP ARTICLES
Target 15.1 By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains, and drylands, in line with obligations under international agreements.	Article 26.1 Indigenous peoples have the right to the lands, territories, and resources which they have traditionally owned, occupied or otherwise used or acquired.
Target 15.2 By 2020, promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests and substantially increase afforestation and reforestation globally.	Article 26.2 Indigenous peoples have the right to own, use, develop, and control the lands, territories, and resources that they possess by reason of traditional ownership or other traditional occupation or use, as well as those which they have otherwise acquired.
Target 15.4 By 2030, ensure the conservation of mountain ecosystems, including their biodiversity, in order to enhance their capacity to provide benefits that are essential for sustainable development.	Article 29.1 Indigenous peoples have the right to the conservation and protection of the environment and the productive capacity of their lands or territories and resources. States shall establish and implement assistance programs for indigenous peoples for such conservation and protection, without discrimination.
Target 15.5 Take urgent and significant action to reduce the degradation of natural habitats, halt the loss of biodiversity, and, by 2020, protect and prevent the extinction of threatened species.	Article 29.2 States shall take effective measures to ensure that no storage or disposal of hazardous materials shall take place in the lands of indigenous peoples without their free, prior, and informed consent.

Indigenous TEK provides climate change mitigation strategies that preserve the environment and promote sustainable development in unison. Target 13.1 would be achievable once IPLCs were given the necessary tools to adapt to climate change. Accomplishing Target 13.b would be possible if non-indigenous peoples and world leaders adopted conservation methods that have been successful in indigenous communities thus far. IPLCs are spiritually connected to the environment and deeply understand nature and its needs. Although non-indigenous individuals and world leaders may not share the spiritual values that IPLCs have, society can learn from the methodology that IPLCs use to care for and respect the environment. This theoretical understanding could be adapted into individual frameworks and tailored on a much larger scale. IPLCs possess knowledge that sustains their local environments and allows them to continue their ways of life despite the interruption of climate change (Ariando, 2020). If UN member states adopted this knowledge within local, national, and international frameworks, and if all IPLC rights were widely respected, Target 13.b would be achievable.

SDG 15: Life on Land

Although most targets under SDG 15 are relevant to the UNDRIP, adopting indigenous TEK could significantly enhance targets 15.1, 15.2, 15.4, and 15.5. All four SDG targets are related directly to articles 26.1, 26.2, 29.1, and 29.2 in the UNDRIP.

In addition to Climate Action, indigenous TEK influences the conservation of Life on Land, specifically the world's forests and biodiversity. With Target 15.1 in mind, indigenous TEK already successfully ensures the preservation of various ecosystems based on cultural hunting, gathering, and herding practices. Target 15.2 focuses specifically on deforestation, which, as highlighted in the Amazon Region case study, is a priority of many IPLCs throughout the Amazon (Krause et al., 2020). Targets 15.4 and 15.5 emphasize conserving biodiversity and natural habitats for sustainable development. IPLCs are the de facto guardians of 80 percent of the world's biodiversity and are the best custodians of natural resources

(Forest Peoples Programme, n.d.).

Growing human population density puts additional pressure on IPLCs and their vital knowledge of sustainable development. Without significant shifting in worldwide consumption patterns, indigenous TEK could be completely lost. Minimizing this tragedy is possible if UN member states give IPLCs the authority to utilize their knowledge and protect these ecosystems from further degradation. The authority to protect these ecosystems begins with the UNDRIP and the SDGs as a unified framework.

The UNDRIP focuses on the need for concrete indigenous land rights and Free Prior Informed Consent (FPIC) regarding protecting Life on Land. Indigenous land rights and FPIC are necessary to ensure effective conservation. Indigenous TEK is vital for understanding how ecosystems operate and must continue to operate for sustainable outcomes. Indigenous TEK unified with many of the UNDRIP articles would add substantial value to methods of sustaining Life on Land (International Institute for Sustainable Development, 2019).

SDG 16: Peace, Justice, and Strong Institutions

SDG 16's targets are relevant to IPLC rights in all sectors. With Climate Justice and the UNDRIP in mind, Target 16.7 is the most applicable. UNDRIP articles 5 and 18 most closely coincide with Target 16.7.

Target 16.7 and its relation to UNDRIP articles 5 and 18 directly reinforce the need for indigenous participation within the SDGs, International Climate Conferences, and Human Rights Treaties. These principles include the need for consultation and FPIC when local and national policymakers are convening for decisions that include indigenous land. If proper IPLC participation and consultation occurred, indigenous TEK would enhance the frameworks that result from these meetings (International Institute for Sustainable Development, 2019).

SDG Takeaways

SDG TARGET	UNDRIP ARTICLES
Target 16.7 Ensure responsiveness, inclusive, participatory, and representative decision-making at all levels.	**Article 5** Indigenous peoples have the right to maintain and strengthen their distinct, political, legal, economic, social, and cultural institutions, while retaining their right to participate fully, if they so choose, in the political, economic, social, and cultural life of the State.
	Article 18 Indigenous peoples have the right to participate in decision-making in matters which would affect their rights, through representatives chosen by themselves in accordance with their own procedures, as well as to maintain and develop their own indigenous decision-making institutions.

Figure 8: Indigenous Navigator

When paired with various UNDRIP articles, the SDGs provide a robust framework for incorporating IPLC rights and TEK into sustainable development. The most substantial barrier to these frameworks is that they often do not coincide, and indigenous voices are the least likely to be heard when similar frameworks are formulated (O'Sullivan, 2019). The SDGs on their own do not provide IPLCs enough leverage to ascertain their rights nor to safeguard the planet. A significant gap exists between implementing the SDGs and local and national law. What is written in the SDGs and law established by member states does not equate to what happens in practice (Forest Peoples Programme, n.d.).

Governments create loopholes in policy that allow specific agendas to seep through, such as the case in Brazil (International Work Group for Indigenous Affairs, n.d.). IPLCs frequently die defending their land from governments and developers. In 2016, more than 1,000 IPLCs were murdered, harassed, or incarcerated in 25 different countries while protecting their land (Forest Peoples Programme, n.d.). Human rights violations still prevail in UN member states and in countries that have ratified the UNDRIP. Fundamental human rights must be understood and enforced before indigenous TEK can benefit society. SDGs 13, 15, and 16

could provide opportunities to champion indigenous TEK and Climate Justice initiatives, but there is substantial room for improvement when recognizing indigenous rights and protection.

Conclusions and Recommendations

To effectively implement the SDGs, they must be executed in unison with the UNDRIP and its 46 articles (International Institute for Sustainable Development, 2019). Equitable and sustainable development is more conceivable once the UN and its member states can approach human rights and sustainable development through this lens. The UNDRIP would bring attention to the pervasive issues that IPLCs face surrounding the lack of self-determination and Free, Prior, and Informed Consent (World Association for Christian Communication, 2019). After this recognition, IPLCs would become agents of sustainable development. The SDGs and the UNDRIP are both working towards the same end but are using different means (International Institute for Sustainable Development, 2019).

The SDGs could benefit from a Human Rights-Based Approach (HRBA) to implementation (International Institute for Sustainable Development, 2019). An HRBA would benefit the SDGs by shifting the focus on universal human rights issues and violations based on international human rights standards, inherently driving equity in the application of the SDGs (Dianova, 2019). The inclusion of IPLCs within the United Nations and international forums is vital for achieving climate justice and incorporating indigenous TEK into development (Office of the High Commission for Human Rights, Secretariat of the Permanent Forum on Indigenous Issues , and United Nations Department of Economic and Social Affairs, 2017). UN member states should ensure that IPLCs are present at the annual High-Level Political Forum and all budgetary and planning meetings.

On an international and national level, UN member states must give IPLCs legal autonomy (Yesno, 2019). To foster the conservation and use-

fulness of indigenous TEK, the World Intellectual Property Organization (WIPO) should implement an instrument or framework intended to protect indigenous languages and knowledge (International Institute for Sustainable Development, 2019). Organizations and countries must collect more data and metrics on indigenous TEK in conjunction with sustainable development (DeLuca, 2017).

For the world to benefit from indigenous traditional ecological knowledge, the SDGs must first recognize that the rights of IPLCs are not upheld. After member states fully maintain fundamental IPLC rights, the UN can encourage using indigenous TEK when implementing every SDG. This begins by prioritizing SDGs 13 (Climate Action), 15 (Life on Land), and 16 (Peace, Justice, and Strong Institutions). Colonialism and capitalistic approaches to development have strained the planet, creating irreversible damage and jeopardizing indigenous peoples and their knowledge. Now is the time to include the voices of IPLCs in the implementation of the sustainable development goals. Society has a great deal to learn from IPLCs when it comes to achieving true sustainability (Climate Justice Alliance, 2022).

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Justice Jargon: An Interdisciplinary Approach to Analyzing Police Collective Bargaining Agreements for Improved Transparency and Accountability

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Abstract

Large Language Models (LLMs) have become a hot topic with the release of OpenAI's ChatGPT and competing models. These models have unparalleled abilities to extract semantic meaning from text and answer human-generated questions. We test a novel application of these systems in classifying the contents of police union contracts from Allegheny County, Pennsylvania. Using a set of 84 contracts collected by the Center for Analytical Approaches to Social Innovation, we manually construct training data, provide it to OpenAI's davinci_003 model, and task it with assigning labels to test data and compare its results with human-generated labels. We find that even with modest training data, the LLM is able to correctly label text in 75 percent of cases, and this performance scales quickly with the amount of training data. Our results suggest that LLMs can outperform traditional text classification models, especially in cases where training data are limited. There is significant room for these results to be expanded and applied in other contexts, and we conclude by suggesting several avenues for further research.

Introduction

Police union collective bargaining agreements define many of the rights and responsibilities that the police officers owe to the municipality and that the municipality owes to them in turn, within the employer-employee relationship context. These contracts are "public records" in the sense that they can be requested from local police departments, but the process of requesting and interpreting contracts can be difficult for general audiences without a law or policy background. These contracts are often lengthy and can be difficult for laypersons to parse and understand. Much of the language used is legal terms of art that have specific meanings not widely understood outside the legal and policy communities. The contracts themselves often make explicit reference to extrinsic sources such as statutes or prior agreements that laypersons may not be familiar with or be able to readily access. These contracts also take certain information for granted, such as the requirements for obtaining a police certification, which is governed by state law and a regulatory body, the Municipal Police Officer Education and Training Commission (MPEOTC). Additionally, agreement sections that pertain to internal disciplinary processes often describe procedures that serve as barriers to police accountability, such as allowing officers access to evidence before being interrogated for potential misconduct. Without a legal background, a layperson may misidentify much of this information as irrelevant. As a result, activists wanting to lobby for edits to future contracts may overlook these clauses and exclude them from further consideration.

Recent developments in Machine Learning provide a promising remedy to these concerns. Since its public release in November 2022, ChatGPT and OpenAI's associated GPT-3.5 LLMs have been a prominent topic in the field of natural language processing (Katz et al., 2023). A valuable application of GPT models is the classification of text into either predefined categories or unsupervised, model-generated categories or descriptions. These models take user input as a plain-English question or prompt, and referencing a vast corpus of documents, generate a response that aligns with the information it has been trained with. In the case of OpenAI's

GPT models, this corpus consists of publicly available information taken from the internet, information purchased from third parties, and user inputs (OpenAI, n.d.). The models are designed to generate the most likely response based on all of the documents it was trained on. In our case, we provide a relatively small amount of task-specific training data in addition to the model's baseline training data, which leverages its extensive corpus toward a specific task. A valuable application of GPT models is the classification of text into either predefined categories or unsupervised, model-generated categories or descriptions.

This paper applies GPT 3.5 and other Natural Language Processing (NLP) models to police union contracts based on annotation categories created by the authors through manual annotation. We utilize a novel dataset of police union contracts in Allegheny County, Pennsylvania, collected by the Center for Analytical Approaches to Social Innovation (CAASI), hosted at the University of Pittsburgh's Graduate School of Public and International Affairs. With this set of human-generated annotations as training data, we test the ability of several commercially-available LLMs to classify contract phrases into semantic categories.

The goal of this project is to prepare an annotated dataset of police union contracts that identifies clauses of interest for the general public and police accountability researchers, and test the ability of LLMs to replicate these annotations automatically. The "baseline" method for identifying clauses is a keyword search, which may return unrelated or incomplete results. Additionally, a keyword search may not capture non-explicit references that are still of interest to human readers. Preparing an annotated dataset will allow for deeper error analysis and possibly even automated classification of clauses at scale. While we were initially interested in LLM's ability to replicate contract sections and generate new provisions, we instead explored how GPT 3.5 models performed at classifying annotated text using our annotation scheme.

By annotating and focusing on specific clauses that speak to both police accountability and spending by the municipality on police resources, we aim to extend the work of CAASI and provide local activists and taxpay-

ers with a resource for understanding and addressing issues they find with the agreements made between the police agencies and their municipalities. We hypothesize that the LLMs will have a performance advantage in classifying text due to their large corpora of training data and semantic parsing ability, and when provided with modest training data for a specific task, LLMs will effectively classify sections of contract text. Even if the LLM is unable to perform this annotation task autonomously, it will be valuable to aid or review the work of human annotators.

This project makes several independently valuable contributions. First, we fully annotated 42 police union contracts from the work of CAASI's Allegheny County Policing Project, which filled the need for a publicly available collection of police labor contracts in a central location. This is a modest sample, but is valuable as a baseline for an improved system of contract indexing, beyond what a keyword search offers. Second, we produced an annotation guide that provides a standardized set of terms and categories for analyzing the key features of police labor contracts and our dataset of completely annotated contracts, available with the source code on GitHub. Third, we show the value of LLMs in classifying text based on limited training data, with tests on different model and hyperparameter specifications. Fourth, to our knowledge, this is the first automated classification of police union contract contents, and is a proof of concept that LLMs can be reliably applied to label and extract meaning from these documents.

The remainder of this paper proceeds as follows: first, we will review the relevant literature on text classification. Second, we will describe our corpus of police labor contracts, the methods we used to extract relevant information from these documents, and the barriers we faced in obtaining these data. Next, we will present the annotation methods we used to train our classification model and the LLMs we tested. We will then present the selected model's performance in automatically classifying agreement text compared to human annotators, followed by discussion of the findings. The final section identifies limitations of our work and concludes.

Literature Review

Automated text classification has existed as a field of research for about 60 years, but with applications in Machine Learning, Political Science, and Medicine among others, it has sparked significant interest around the turn of the century (Sebastiani, 2001; Grimmer and Stewart 2013; Adeva et al., 2014) Traditional text classification models have relied on single-task classifiers such as the Naive Bayes model to assign labels to a whole text or specific strings (Grimmer and Stewart 2013). The release of OpenAI's GPT research preview has created an opportunity for further research applying LLMs to text classification. LLMs have a broader knowledge base to draw from and may have superior performance in text classification due to their ability to parse semantic meaning that prior models lacked (Ashley, 2022; Grimmer and Stewart, 2013). There are several additional disadvantages to traditional textual analysis that we attempt to sidestep with our design. The first and most pressing is that it typically relies on large training data, with 500 labels per category as a standard recommendation, and 100 as a minimum (Hopkins et al., 2007). Traditional models also run the risk of misclassification on phrases that would be intuitive for humans due to their lack of semantic knowledge (Grimmer and Stewart, 2013).

Similarly, contract annotation has been a longstanding area of practical and research interest that is expanded by advancements in AI. Basic contract annotation provides valuable quantitative and qualitative data that describe its contents. Legal document annotations are valuable to layperson understanding because they identify relevant sections of legal texts which are typically complex and difficult to read (Rättzén, 2022). Existing methods for annotation rely on human legal experts, either to generate annotations manually, or to create a large training dataset for an AI model to apply (Saovi et al., 2022). In the case of semi-automated systems, these training sets can require as many as 13,000 annotation examples or models specifically tailored to legal review (Hendycks et al. 2021; Soavi et al., 2022). Due to their extensive training on widely varied data and general-purpose applications, LLMs are a promising remedy

to this barrier. Applying LLMs to this task is a new and rapidly evolving area of research, with recent findings showing exceptional performance from LLMs in contract annotation with no task-specific training (Savelka and Ashley, 2023).

Extracting meaning from legal text is a newer field that focuses on extracting not just semantic, but precise legal meaning from a document (Ashley, 2022; Park et al., 2021). Using a variety of methods, these systems can parse legally significant information from a text to explain its contents or aid in decision-making (Ashley, 2022; Bhuttacharya et al., 2019) Police union contracts present an area of special interest for text extraction and classification. Prior work has justified the need for public access to contract contents and the importance of making those contents easy to understand for the general public (Ahn et al., 2022; CAASI, 2022). Yet, as those authors note, accessing the contracts at all presents a challenge, and understanding their contents is another matter altogether. Some work has been done to create a standard codebook for police contracts (Campaign Zero, 2022), but we expand on that work here in pursuit of a more uniformly applicable model.

Data

Our dataset is a corpus of police union contracts from departments within Allegheny County. These contracts were digitally collected by CAASI in response to requests by local organizations working on police accountability (CAASI, 2022). The contracts were originally collected by CAASI as a part of the Allegheny County Policing Project via Right-To-Know (RTK) requests to the individual departments (CAASI, 2022). We restricted our dataset to Township, Borough, and City Police Department contracts in order to minimize variation in the substantive content of the agreements. Our restricted dataset consists of 84 contracts from Allegheny County police departments. Of these contracts, 42 pseudo-randomly selected contracts were used as the sample for analysis. To our knowledge, this is the most complete source for municipal police contracts in Allegheny County.

The contracts were collected in PDF format, and needed to be converted to plain text via Optical Character Recognition (OCR). For this processing stage, we used the "pytesseract" library, a publicly available OCR tool for Python. This yielded plain-text versions of each contract, but introduced many errors due to the imperfect translation of PDF contents to plain text. In particular, tables of contents and tabular information were significantly compromised in the OCR process, but these errors had a minimal impact on our analysis. There were some aspects of the contracts that challenged our OCR tools such as hand-written notes and document control numbers, as highlighted in Figure 1. Some forms of data that were commonly presented in tables included base salary rates, raises, vacation time, and holidays recognized by police departments. Other useful information was lost when translating from PDF contracts to a basic text file including indentation of lists and clauses when bullet points were not used and references to specific paragraphs and pages of the contract (i.e., "paragraph 3 of page 5"). These intratextual references were lost in our analysis, but a more significant preprocessing approach could recover this information.

Figure 1: A screenshot of Bell Acres Borough's contract showing hand-written text that is incompatible with off-the-shelf OCR techniques. The end of this clause has been recognized in OCR as, "...hereby have hereunto set their hand(s) and seal(s) this /2 day of DES. 0: LB .Q"

The plain text contracts were formatted to remove some page numbers, whitespace, and unnecessary paragraph breaks induced by the OCR process. The formatted contracts were then uploaded to the GLOSS platform developed by Jaromir Savelka at Carnegie Mellon University (Savelka, n.d.). GLOSS is an online annotation platform that allows multiple users to annotate text files with pre-defined labels and returns these annotations as JSON data, which was suitable for our analysis. The authors were trained in using GLOSS in advance, and agreed on general annotation guidelines before beginning work.

Since the core motivation of this project was to both aid in layperson understanding of collective bargaining agreements between police departments and municipalities as well as identifying clauses that promote accountability, annotation categories addressing both goals were identified by the authors through an iterative process of review and discussion. Inspiration was also taken from Campaign Zero's scheme for police accountability contract clauses (Campaign Zero, 2022). Over the course of annotating, we identified a need for additional non-substantive labels for data organizational purposes and to identify structural elements of contracts like section headings. A full list of the annotation categories can be found in Appendix 2.

Methods

Our methods for this paper broadly followed this structure: a preliminary annotation guide was established based on the Campaign Zero categories and ex-ante assumptions on the contract contents. The authors each independently annotated the same six contracts, meeting periodically to discuss findings and compare annotations. Disagreements on annotation style were resolved and clarified in the annotation guide. After the guide was completed, the authors individually annotated a set of contracts for final analysis based on the guidelines. We identified LLM models to analyze and tested their performance on a small set of test data. Once a model was selected, we further refined hyperparameters to fine-tune the model's performance. Finally, we trained the model on our set of annotations and measured its performance based on agreement with the human-generated annotations.

Our annotation scheme used annotation labels to capture the semantic meaning of clauses (e.g., internal investigations, discipline processes, critical incidents, hiring requirements, and employee benefits) as well as labels to capture the structure of the contract (e.g., headings, citations, definitions, and OCR mistakes like typos or meaningless "noise"). The labels were developed iteratively along with the annotation guide. The original set of labels was adapted from Campaign Zero's prior work in identifying police contract contents, discussions with legal scholars, and

those familiar with police contracts generally. The major headings cover the topics that one would expect to find in any labor contract, and provisions of police contracts that would be of interest to the general public: Definitions, Internal Investigations, Discipline Processes, Critical Incidents, Hiring Requirements, Benefits, References to Extrinsic Sources, and Miscellaneous. Each of these is further refined in sub-categories, all of which can be found in Appendix 2.

Annotations from 42 contracts were included in this analysis. Six of those contracts were each annotated by all four authors to ensure they agreed on the annotation scheme. The remaining 36 contracts were each annotated by a single annotator, so no inter-annotation agreement statistics exist for these documents, but we expect a high degree of similarity given the collaborative development of the annotation guide. The authors also met regularly to discuss any discrepancies in and updates to the annotation guide over the course of the annotation process. Across the 42 contracts, we produced a total of 3,422 annotations, which fall into our annotation categories as described above. The summary data in Table 1 provide important context about the substantive content of these contracts and the relative frequency of each category in the text.

Model Selection

Next, we determined the appropriate commercially available OpenAI model for text classification. We expected to see different results between models, as they are trained on different corpora of data. We tested four different LLMs for our classification task, namely the ada_001, davinci_002, davinci_003, and gpt-3.5-turbo models. All models were given the base prompt of "The following text came from a police union contract and can either be classified as 'benefits', 'internal investigations', 'discipline processes', or 'hiring requirements'. Which category best describes this text?" followed by text of a particular annotation. We provided the model with these four labels for testing, and coded any other response as "other". We chose these labels to check how the models performed on categories with different amounts of training data, and to ensure that test cases were clearly distinguishable to a human reader, though there were

still edge cases, which we discuss in the Analysis section. A random sample of 100 annotations was picked from the semantic annotations. Since there were only six total annotations referring to "critical incidents," this category was dropped from the analysis.

Testing revealed that the davinci_003 model had the most consistent performance, so we then tested a range of "temperature" settings for the model. Temperature is a hyperparameter that informs how deterministic the model's output will be. Lower temperatures typically result in more consistent, 'expected' results, while higher temperatures afford more 'creativity' to the model. We expected that lower temperature settings would perform best for this task, but we tested a range of temperatures to confirm and test the robustness of our temperature selection.

Analysis

Following these procedures, we sought to determine: 1) the composition of police union contracts in terms of our annotation guide and categories, 2) the hyperparameters that led to the most consistent results for automatic annotation, and 3) the accuracy of the tuned model in replicating human annotations. The first two questions provide important baseline information that can refine our results and inform a better-tailored model for analyzing these contracts. The third is the primary result we were interested in measuring, as a proof of concept for automated annotation with little training data. To this end, we trained the final model on our manually-prepared annotations except a training set of 500 annotations, which were used to test the model's classifications against the human results.

Annotations

Across the 42 contracts we manually reviewed, we generated 3,422 annotations, 1,993 of which were semantically meaningful. The rest fell within category 1: 'Definitions' or category 8: 'Miscellaneous'. Full summary statistics for the annotations can be found in the Appendices. The summary statistics show that the primary content of the contracts addresses pay

(15 percent of semantic annotations), insurance (15 percent), leave (16 percent), and other benefits such as uniform or education allowances (19 percent). This is an expected result, given that labor contracts must necessarily contain comprehensive information about pay and benefits. There was a notable gap between the six largest categories and all others, with the top six appearing consistently in each contract, and others only present in some agreements. For example, only five of the 42 analyzed contracts make any reference to "Critical Incidents" or any of its sublabels. While we expected to find 'typical' labor provisions in each contract, the lack of specific provisions related to law enforcement was a surprising result.

Model Selection

Of the four models we tested (ada_001, davinci_002, davinci_003, and gpt-3.5-turbo), davinci_003 had the most consistent strong performance. The ada model technically belongs to the GPT-3 family, but is advertised as the fastest, cheapest, and simplest model offered by OpenAI. Unfortunately, it was also the least reliable. It did not "understand" that the labels were mutually exclusive and regularly predicted multiple categories. It also offered summaries of the text but without a clear label. The davinci_002 and gpt-3.5-turbo models experienced similar issues with wordiness or providing unsolicited summaries of the text. Only the davinci_003 model consistently provided single-label classifications. However, even these labels occasionally diverged from the predefined labels or davinci_003 would summarize the text but clearly say "Answer: Benefits" at the end of the annotation. With these results, we selected davinci_003 as our primary model to analyze.

Model Temperature

As noted, we sought to determine the optimal temperature for the classification task for the davinci_003 model. This experiment used the same random sample of 100 annotations used to test different models. Temperature values ranged from 0.5 to 1.5 (inclusive) in increments of 0.25.

As indicated earlier, davinci_003 will sometimes predict labels not included in the prompt. The number of erratic labels increased with model temperature as shown below. Since the goal of this task is to classify text using the annotation scheme, fewer unique responses indicated better performance. For this reason, a temperature of 0.5 was used for the final classification experiment. An example to motivate this point is an annotation (ID: 6436d247c6537d54ff058363) dealing with "required training" (i.e., a hiring requirement) that was classified by davinci_003 as "benefits" from temperatures 0.5 to 1.0 and then "attendance of training activity" for 1.25 and "going to school and training activity" for 1.5. We did not test temperatures below 0.5 in this analysis, but the results here suggest that may be a valuable line of inquiry.

Temperature	1.5	1.25	1	0.75	0.5
Unique responses	24	17	14	12	9

However, there are other interesting findings that warrant further investigation. Among predictions that conformed to the four-label annotation scheme, changing the temperature occasionally changed the prediction back and forth. For example, an "internal investigations" clause (ID: 64165089c6537d54ff0572d4) was properly classified from temperatures 0.5 to 1.0 as well as 1.5, but was improperly classified as "benefits" at 1.25.

Final Model Evaluation

Using davinci_003 with a temperature of 0.5, a larger random sample of 500 annotations was shown to the model. The raw output was minimally edited for clarity. For example, the model's predictions for "benefits" were sometimes written as "benefits." with a period or "C) Benefits" as though the possible categories were listed A through D. These were all cleaned to just say "Benefits." However, some predictions still did not conform to the annotation scheme, and these were labeled "other" for performing an error analysis. For this reason, no annotation will have a true label of "other" in the confusion matrix.

The results from the davinci_003 model are displayed in Figures 2 and 3. Figure 2 shows the model's performance on the test data. In the figure, the results are measured by category as:

$$precision = \frac{true\ positives}{true\ positives + false\ positives}$$

$$recall = \frac{true\ positives}{true\ positives + false\ negatives}$$

$$f1 = \frac{2}{\frac{1}{precision} + \frac{1}{recall}}$$

The results are then aggregated into averages across all categories, where the weighted average of f1=0.79 is the most relevant due to our unbalanced test data.

Figure 3 presents the recall visually as a confusion matrix. The values in the confusion matrix represent the most intuitive interpretation of the model's accuracy. For example, the benefits row should be interpreted as "80 percent of benefits annotations were classified as benefits, 1.2 percent of benefits annotations were classified as discipline processes, etc…"

It is important to note that sometimes these "other" annotations were actually more accurate than the four categories specified and aligned with one of the original 26 labels. For example, an annotation in the Port-Vue Borough contract (ID: 64378ba9c6537d54ff058805) was accurately classified by davinci_003 as "Drug and alcohol testing" which was one of the original 26 granular labels, but it should have been labeled "hiring requirement" if it was fully following the prompt. This example was manually marked "other" and is technically considered an error in this model.

```
                        precision   recall  f1-score   support

              Benefits       0.95     0.80      0.87       325
     Discipline Process      0.76     0.82      0.79        99
     Hiring Requirements     0.29     0.45      0.35        42
  Internal Investigation     0.76     0.47      0.58        34
                 Other       0.00     0.00      0.00         0

              accuracy                          0.75       500
             macro avg       0.55     0.51      0.52       500
          weighted avg       0.84     0.75      0.79       500
```

Figure 2: Classification Report for davinci_003 classification task
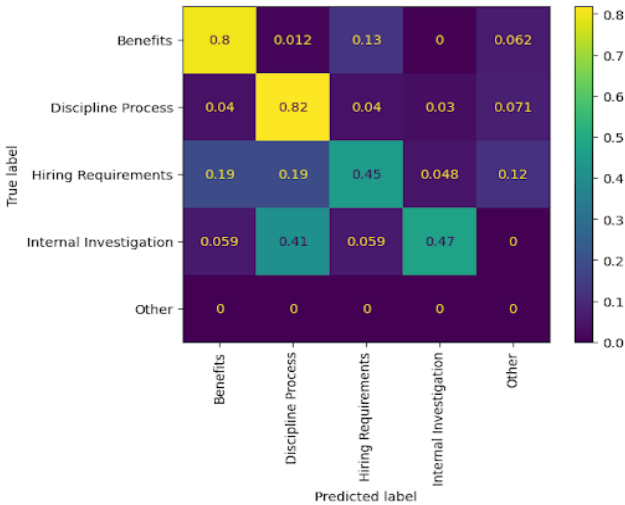
Figure 3: Confusion Matrix for davinci_003 classification task. Confusion Matrix of the davinci_003 model's outputs, as a percentage of true labels. For a confusion matrix of raw counts, see the Appendix.

Discussion of Findings

Using a training set containing 500 annotations for these four categories of analysis, the davinci_003 model produced a weighted F1 score of 0.79, indicating strong performance even with limited training data. This contrasts with prior work by Hopkins and King (2010) that suggested 500 annotations per category, with 100 as a minimum. Here, our

smallest category, 'Hiring Requirements', had only 17 annotations to train on, and completed the task with an F1 score of 0.35. This result is modest, but presents a marked improvement in training-performance efficiency when compared to traditional classifiers. Our largest category, 'benefits', still fell short of the 500 annotation benchmark at 378, but showed exceptional performance, with an F1 score of 0.87. These results demonstrate that large language models offer a promising route to more efficient text-as-data research by leveraging their extensive corpora of training data, and supplementing with smaller task-specific data. This application of LLMs performed especially well with little training data and showed better F1 scores in categories with more data. We do not test this model against a traditional classifier, we would expect such a model to perform worse under the same conditions based on limitations outlined in the existing literature. This offers support for our hypothesis, but further work is needed to show specific advantages under identical conditions.

Model temperature proved to be a significant driver of our results, with lower temperatures performing better at the classification task. Our final evaluation used a temperature of 0.5 since that was the optimal value in our second experiment, but the temperature parameter can range from 2 to 0. There might be an even better temperature between 0 and 0.5. We did not perform an exhaustive hyperparameter search, and the decision to stop at 0.5 was arbitrarily set before performing our analysis. ChatGPT also offers other model parameters that can be tuned, as well as the option to perform fine-tuning of the entire model. We expect that further refinements to the hyperparameters that lead to more deterministic results would further improve the findings. This task requires little "creativity", so we are primarily interested in the model's ability to behave logically given the information provided.

We noted over the course of analysis that references to extrinsic sources are common and highly relevant to the substantive content of the agreements. Contracts frequently included references to the Heart and Lung Act, other legislation, and past agreements. Our model did not attempt

to link the content of these extrinsic sources and simply labeled them as extrinsic. Incorporating some of this external information would be an important improvement to this model, accounting for benefits and requirements that are only indirectly referred to in the contract text. Since these references were generally restricted to the same set of extrinsic sources, we believe that grouping the annotations in this way does not significantly skew our results, though future work to identify their topics would be valuable.

A key motivation of this paper was to make police union contracts accessible to the general public and to develop a framework for parsing the semantic meaning of their contents with minimal intervention from lawyers. To that end, these results are promising. With training data compiled by four non-lawyers from 42 contracts, the davinci_003 large language model was able to categorize phrases from test contracts with an average accuracy of 75 percent. This model, while imperfect, represents a significant improvement in accessibility for the average person. It allows a user to highlight sections of a contract, and have an AI label them in plain-English categories, rather than having to parse complex legal terms themselves.

Conclusion

In this paper, we test a novel application of OpenAI's LLMs to string-level classification of police union contract sections. We found that the davinci_003 model with a temperature setting of 0.5 performs well in replicating human annotations, with a weighted average F1 score of 0.79 across the four categories analyzed. F1 performance correlated with the number of training annotations provided, indicating the intuitive result that a larger training set will produce stronger results. Even with only 25 training labels, the model identified Internal Investigation clauses with an F1-score of 0.58, a promising result for the model's performance with limited training data. Traditional text classification models require at least four times as many annotations to reliably classify text, supporting the hypothesis that LLMs can outperform traditional models in classifying text into predefined categories.

There are several avenues for promising work based on our findings here. First, conducting similar analysis with a more comprehensive preprocessing system may lead to stronger performance, due to the amount of informational error our OCR process introduced. The structure of our classification task could also be altered to create results that are more useful in practice. In essence, we asked the GPT models, "Given that this text belongs to one of four categories, which category does it belong to?" In practice, not every sentence in a police union contract relates to these four categories, so additional evaluations should encourage the model to first identify whether a chunk of text is relevant and then assign it to a category. There is also significant room for future work by applying this annotation guide to other police contracts outside our dataset. The annotation guide is designed to be generalizable, so that data from other jurisdictions will be comparable, and therefore valuable in a larger analysis. Additionally, there is one step in the process that we have not attempted to automate. While our model converts contracts into readable documents and classifies portions of their text into categories, selecting what portions to classify is still a manual process. Future work to automatically identify these sections would completely automate the workflow and make this model immediately accessible to any person with a police contract in PDF form.

Our analysis of these annotations via the OpenAI API also presents interesting results with the most opportunity for future work. Our approach did not attempt to fine-tune our base prompt that asked GPT models to classify annotations. Our base prompt was directly modeled after Open AI's prompt in their text classification example but additional work on prompt engineering may yield different results (OpenAI, n.d.). For example, we tell the model that "The following text came from a police union contract" but the model might perform differently if we omitted this context or simply said "labor union contract." Additionally, the GPT model never saw our annotation guidelines, so it is simply using a generic definition of "hiring requirements" or "internal investigations" rather than the definition and examples written in the annotation guide.

We must caution against the use of AI and LLM classification without human oversight, noting that even in the best case, this model did not always produce accurate results. Additionally, we cannot determine the source of these errors due to the proprietary nature of LLM training. Researchers should review the outputs of machine learning systems before including them as results in any academic or professional work.

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Appendix

Category	Total Annotations	Average Appearances	Standard Deviation	Minimum	Maximum
1	258	6.14	4.01	0	18
2	25	0.6	1.11	0	4
2A	63	1.5	1.21	0	8
2B	37	0.88	1.17	0	4
2C	40	0.95	1.25	0	4
3	57	1.36	2.05	0	7
3D	229	5.45	8.24	0	36
3E	47	1.12	2.12	0	8
3F	49	1.67	3.26	0	21
4	5	0.12	0.33	0	1
4G	0	0	0	0	0
4H	1	0.02	0.15	0	1
5	17	0.4	0.8	0	3
5I	66	1.57	4.99	0	31
5J	29	0.69	1.29	0	6
5K	23	0.55	0.71	0	3
5L	9	0.21	0.47	0	2
6	378	9	8.62	0	42
6M	291	6.93	8	0	32
6N	287	6.83	8.35	0	47
6O	318	7.57	7.33	0	34
7	85	2.02	3.19	0	13
7P	136	3.24	5	0	25
7Q	15	0.36	0.79	0	3
7R	16	0.38	0.79	0	3
8S	985	23.45	25.76	0	129
8T	107	2.55	4.48	0	17
8U	79	1.88	3.94	0	22

Table 1: Annotation Summary Statistics
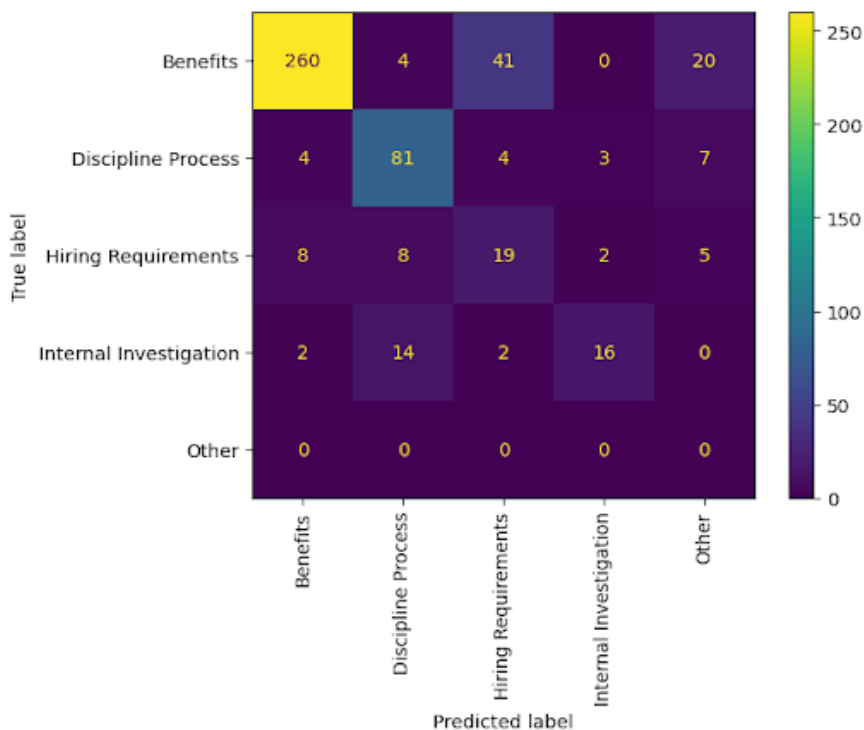
Figure 4: Confusion Matrix for Davici_003 classification task (raw counts)
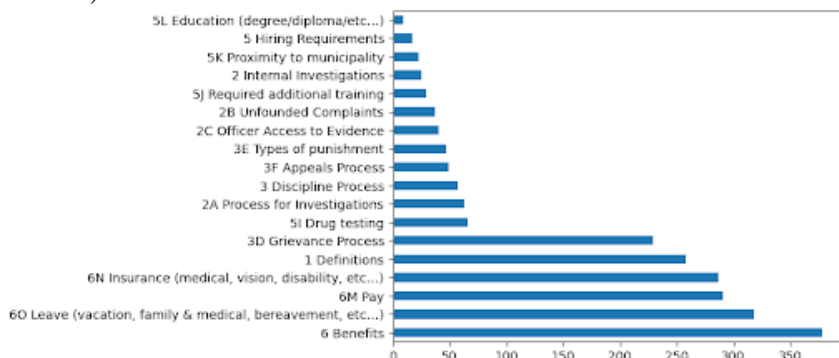
Figure 5: Distribution of "semantic labels" in corpus (i.e., excluding extrinsic sources and miscellaneous labels)

How and why does space power develop over time? A factor-based qualitative and quantitative approach to understanding global space power development.

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Abstract

This paper answers the question of how and why space power developed over time. The analysis proceeds in three stages: 1) case studies, 2) factor-based regional analysis, and 3) quantitative analysis. Existing research on space power is typically compartmentalized by country or capability. This paper breaks from such compartmentalization to produce globally applicable conclusions. The paper's conclusions are relevant to the U.S. in two ways. First, the underlying motivations for space power development will inform U.S. efforts to lead in developing sustainable, globally accepted space policy. Second, the dual nature of space capabilities will likely destabilize the current balance of power. This paper provides critical context for how and why a particular region or country accessed outer space. This information will assist the U.S. in interacting with other nations in this newly unstable era.

Acknowledgements

Introduction

The dawn of the space age made apparent the many potential uses for space technology beyond spaceflight. Despite the benefits of space technology for intelligence gathering, environmental monitoring, and global communications, most countries remain non-independently spacefaring. However, the number of spacefaring nations is rapidly increasing, according to Our World in Data (2023), as decreasing launch costs have made accessing space significantly cheaper (Roberts, 2020). This increased activity in space has two notable consequences. First, it calls for the development of global space policy that will be respected and endure. Second, it alters the current balance of power as more countries gain access to space technology, which can then be used for peaceful and non-peaceful purposes.

The reasons a country develops space power and how it attempts to do so are relevant considerations in crafting sustainable space policy and ensuring there is a peaceful balance of global space power. Space power is defined by the U.S. Space Force as, "...the totality of a nation's ability to exploit the space domain in pursuit of prosperity and security," (Dorian et al., 2020). Sustainable policy is designed from the outset to, "Achieve the goals that proponents set out to achieve and attract no criticism of any significance and/or is virtually universal." (McConnell, 2020, p. 351). Accomplishing universal acceptance requires the policymaker to identify, understand, interact with, and account for minority, dissenting, and absent voices. Overlooking inclusion in the policy environment invites political and social rifts, such as those which could emerge as non-spacefaring nations become active in outer space and inherit a policy framework to which they did not agree. It is therefore important to understand the historical context and trends driving how and why countries have,

or have not, developed space capabilities. Historical trends clue decision-makers into the thought process behind another actor's behavior. In this approach, not only can the U.S. craft nuanced global policy that accounts for different space actors, but it will be aware of potential pitfalls and develop nuanced approaches to bilateral and multilateral interactions in space endeavors.

This paper examines 70 years of space history to investigate how and why each global region developed power in outer space. It uses qualitative case studies to identify regional trends and quantitative analysis to substantiate them. The trends are summarized and compared, producing results that demonstrate the factors that led each region to develop space power. The conclusion summarizes how these results can inform U.S. efforts to lead global space policy in a sustainable, globally accepted manner, and how the results can inform U.S. interactions with others in this newly unstable space age.

Qualitative Study

This study includes three distinct yet complementary parts: 1) case study collection, 2) regional analysis, 3) quantitative analysis. Case studies were completed on individual countries, followed by regional analyses using the information gathered. The regions and their countries are summarized below:

Africa: Kenya, Nigeria, Rwanda, South Africa

Asia: China, India, Japan, North Korea, Pakistan, South Korea

Europe: Finland, France, Italy, United Kingdom

Middle East: Egypt, Iran, Israel, Saudi Arabia, Turkey

Latin America: Argentina, Brazil, Mexico, Venezuela

U.S. and Allies: U.S., Canada, Australia

All countries chosen for case studies have a form of space programming,

whether advanced or basic. Countries were divided regionally based on geography. Once the studies were completed, authors ranked each region on thirteen factors to determine salient factors for space power development in that region. The thirteen factors, which are derived from the substance of the case studies, are shown in Table 1. After ranking, authors compared the factors across the regions to draw conclusions about development and the future of development in that region.

The qualitative portion of this study reveals trends that map onto the quantitative results. Table 2 shows complete rankings for each region. The case studies and regional analysis show that Latin America and Africa have the least developed space programs. These regions are the most underdeveloped socioeconomically, have weaker militaries, and face more domestic unrest and less international (i.e., cross-border) turmoil than other regions. Latin America and Africa are rich in natural resources and have historically faced consistent extraction, and therefore might have a greater incentive to use space power for environmental monitoring and protection purposes (Amazonia: Uses and Applications, n.d.; Harding, 2013, p. 148; Behera, 2021; Ayman, 2021).

In other regions, a stable government, whether democratic or autocratic, is highly relevant to the initial and continued development of space power. The ease with which private actors can enter the space industry are also relevant factors. Such markets that are more likely to present complex regulatory schemes, have frequent government intervention, and consist of preferential treatment towards domestic industry tend to inhibit space power development and appear more often in countries with autocratic governments.

The analysis suggests that security concerns during the Cold War often drove early space programs. In contrast, new countries entering the space industry today are motivated primarily by environmental or economic concerns. These concerns include, for instance, ensuring a country's workforce has adequate communications infrastructure to perform essential duties and a desire to increase global standing and garner inter

Factor	Ranking (1 to 5)
Strong government driver	1: Private sector drove the initial development of space power 5: Government drove the initial development of space power
Strong civilian vision	1: Space power developed mainly for civilian applications (telecommunication, environmental monitoring) 5: Space power developed mainly for military purposes
Continued government driver	1: Private sector is driving most of the space power development today 5: Government is driving most space power development today
Conflict as main driver of development	1: Space power developed mainly as a response to a civilian desire for national modernization efforts 5: Space power developed mainly as a response to conflict to increase national security
Democratic form of government	1: The region is highly democratic 5: The region is highly autocratic
International partnerships	1: International partnerships were not important to the development of space power 5: International partnerships were critical to the development of space power
Domestic unrest (high government turnover, rebellions, civil wars, etc.)	1: The region faces little to no domestic unrest 5: The region faces constant domestic unrest
International conflict (regional unrest, foreign invasions/intervention, has clear enemies/allies, generally feels threatened, etc.)	1: The region faces little to no international unrest 5: The region faces constant international unrest
Environmental concerns (frequent natural disasters, significant illegal activity such as logging/poaching, rich in natural resources, etc.)	1: The region is not very concerned with the environment 5: The region is highly concerned with the environment
Socioeconomic development (GDP, poverty, education, health, etc.)	1: The region is significantly underdeveloped 5: The region is highly developed
Private enterprise	1: The region is closed to private enterprise (most enterprise is government driven) 5: The region is open to private enterprise (significant investment and innovation occurs in the private market)
Military	1: The region is the weakest militarily 5: The region is the strongest militarily
Nuclear and ballistic missile capabilities	1: The region has no nuclear or ballistic missile capabilities 5: The region has many countries with nuclear and/or ballistic missile capabilities

Table 1: Shows each factor on the left and contains the descriptor for the high/low ranking on the right. Each factor is contained in its own row.

national investment. Programs initiated primarily for military or security purposes tend to last longer given their directed, narrower, focus. Additionally, a strong military with nuclear and ballistic missile capabilities indicates greater space power, whereas the presence of natural resources does not necessarily indicate the same.

Finally, international partnerships are critical to most regions' space power development. Most countries could independently and rely on sharing expertise and importing technology regionally and internationally. Partnerships are particularly important in regions with fewer security threats and lower socioeconomic development.

Quantitative Study

The quantitative analysis explores factors that might affect the development of a country's space program. The first method employed for the quantitative analysis consisted of an ordinary least squares (OLS) model where the number of satellites was predicted using five factors. OLS is an effective statistical technique often used to determine the relationship between a dependent variable and one or more independent variables, assuming a linear relationship exists. We aim to predict the number of satellites based on the following quantitative economic and geographical factors:

GDP-PPP per capita: A country's economic output likely influences its ability to develop a space program.

Shoreline length: It is hypothesized that access to shorelines is beneficial for rocket testing and development which is important to developing a space program because launches occur most often on the coast.

Net Migration: Net migration intends to capture factors that make a country a favorable/unfavorable place to live, and whether it could be experiencing brain drain.

Percent of GDP spending on education: It is hypothesized that countries that prioritize education spending (especially in science and technology)

Factor	Africa	Asia	Latin Am.	Middle East	Eurasia	Europe	U.S., CAN, AUS
Strong government driver 1: Private sector drove initial development of space power 5: Government drove initial development of space power	5	4	5	5	4	3	5
Strong civilian vision 1: Space power developed mainly for civilian applications (telecommunication, environmental monitoring) 5: Space power developed mainly for military purposes	2	3	3	3	3	3	4
Continued government driver 1: Private sector drives most space development today 5: Government drives most space development today	4	4	4	3	3	3	3
Conflict as main driver of development 1: Space power developed mainly as a response to a civilian desire for national modernization efforts 5: Space power developed mainly as a response to conflict to increase national security	2	3	4	5	3	2	4
Democratic form of government 1: The region is highly democratic 5: The region is highly autocratic	4	3	3	5	2	1	1
International partnerships 1: International partnerships were not important to development of space power 5: International partnerships were critical to development	5	2	5	4	5	4	3
Domestic unrest 1: The region faces little to no domestic unrest 5: The region faces constant domestic unrest	5	2	4	5	2	1	1
International conflict 1: The region faces little to no international unrest 5: The region faces constant international unrest	1	5	2	5	3	2	3
Environmental concerns 1: The region is not very concerned with the environment 5: The region is highly concerned with the environment	5	5	5	4	2	5	3
Socioeconomic development 1: The region is significantly underdeveloped 5: The region is highly developed	1	3	2	3	3	5	5
Private enterprise 1: The region is closed to private enterprise 5: The region is open to private enterprise	2	4	2	4	2	5	5
Military 1: The region is the weakest militarily 5: The region is the strongest militarily	1	5	2	4	3	4	4
Nuclear and ballistic missile capabilities 1: No nuclear/ballistic capabilities 5: Many countries with nuclear/ballistic capabilities	1	5	1	5	2	4	4

Table 2: Shows each region's ranking for each factor on the 1 to 5 scale. The rows contain the factor description and the columns contain the regions.

will have an advantage in building space programs because there will be increased domestic population with the knowledge and skills to support a space program.

Gini Coefficient: Intended to measure the distribution of income inequality within a country.

The dataset used in the OLS analysis includes emerging space powers, defined as all countries operating at least one active satellite. This dataset excludes the U.S., China, and Russia because their dominance in the satellite industry dramatically skews the results. This analysis uses the Union of Concerned Scientists' (UCS) Satellite Database to estimate the number of satellites managed by each country. When multiple countries owned or operated a satellite, each country was credited for the satellite. The analysis excluded satellites managed by the European Space Agency because it is an organization and not an independent country. Military and non-military satellites were distinguished based on the "Users" listed by UCS. Satellites were classified as "military" where UCS listed multiple users including at least one military (i.e., "commercial/military"). The size of each country's military was compiled from The Military Balance, published by the International Institute for Strategic Studies, and included the total number of service members across all branches of a country's armed services. Averages were used when The Military Balance gave a range. The remaining data was sourced from the CIA World Factbook in May 2023.

The results of the first OLS model indicate that military size, GDP per capita, and shoreline length were statistically significant predictors of space power at the 0.05 level of significance. This model had an R-squared value of 0.4773, which suggests that the predictors included in the model can explain nearly 48 percent of the variance between countries. A second OLS model predicted the number of satellites controlled by each country's military. This model also used robust standard errors but showed no statistically significant predictors of the number of military satellites. However, this is likely because the sample size is too small to make an accurate prediction; of the 72 countries that operate at least

one satellite, only 26 have military-controlled satellites.

The second type of model used in the quantitative analysis was a hurdle model. The hurdle model assumes two processes are behind the development of an initial satellite and subsequent satellites. Once a country clears the hurdle of establishing a first satellite, a different set of factors will likely influence how many satellites a country controls. This type of analysis is helpful in determining if there are any preliminary barriers to entering the space arena, which in turn is useful in monitoring country-level space activity to predict when a country might become independently space faring.

All countries, including the U.S., Russia, and China, were factored into the hurdle model analysis, regardless of the number of satellites. This decision reflects the nature of hurdle models, which are well suited for zero-inflated datasets. This dataset is zero-inflated because only 75 countries possessed active satellites at the time of this analysis, while the remaining countries possessed zero satellites. The results of this model demonstrate that GDP per capita and military size are the two statistically significant predictors of launching a country's first satellite (i.e., the first process of the hurdle model). Then, each variable, except net migration rate, are statistically significant predictors for the development of future satellites (i.e., the second process of the hurdle model).

The results of the OLS and hurdle model suggest a correlation exists between developing a country's space program and its economic and military strength. However, these results do not necessarily suggest that GDP per capita or military size has a causal relationship with space programs. The second stage of the hurdle model provides a more nuanced view of the factors that predict the development of additional satellites after establishing a country's space program.

Discussion

This paper presents preliminary findings on how and why countries develop space power. The results demonstrate that countries develop space

power primarily through international partnerships. Two exceptions stand out: 1) early programs, such as the U.S. and Russia, which developed out of national necessity during the Cold War, and 2) programs in countries that are highly insular, such as China and North Korea. Those programs are primarily developed in-country and historically depend less on formal international partnerships. Apart from these exceptions, countries at all development levels rely on partnerships to advance their space programs. For example, Canada and Australia, two highly developed nations, rely on allies for technology sharing to develop space power cost-effectively, allowing wealthier countries to work out the technological issues before acquiring it themselves (OECD, 2022; UNDP, 2022, p. 298; Hanberg, 2017, p. 209). Additionally, European nations rely on the European Space Agency to build collective power rather than building their space capabilities alone. Underdeveloped countries, such as those in Latin America and Africa, must import technology from partners because domestic expertise has yet to develop.

Despite Russia's formidable nuclear arsenal and modern military, Russia lacks the economic and human resources to expand and improve upon their once powerful space program and instead relies on its critical partner China to foot the bill (Kramer and Myers, 2021). The U.S., China, and North Korea all leveraged technology and expertise from other countries to launch their space programs. The U.S. adapted German V2 rockets, Chinese space scientists gained their expertise through training in the U.S., Germany, Soviet Union, and Britain, and North Korea adapted Russian equipment for counterspace capabilities (Beardsley et al., 2016, p. 1; Uri, 2023; Harvey, 2019; Harrison et al., 2018). Thus, even in countries boasting strong, independent space programs, international partnerships have played a critical role in space power development.

The results show that wealth, including both monetary and human capital, and government ambition are two essential requirements that go hand in hand in space power development. Absent wealth, regions are less likely to develop independent space power, as Latin America and Africa demonstrate. These two regions imported most of their space

power, albeit with some domestic contributions being made (Klinger, 2020; Oyewole, 2020; Froelhich et al., 2020). Wealth allows countries to import technology and typically indicates a more robust education system and scientific programming, which in turn allows countries to develop domestic space technology. Absent government ambition, even wealthy countries will fail to build space power, as demonstrated in Canada and Australia (Jones and Macken, 2019, p. 22; Godefroy, 2011, p. 68). Ambition motivates governments to spend on space, whether to initiate domestic programs or import technology and expertise and encourages governments to welcome private space industry. This ambition and investment fuels rapid space mobilization through public-private partnerships. Therefore, both wealth and government ambition are critical drivers of space power development.

Underlying security concerns can also explain how and why countries developed space power. First, most space technology has roots in late World War II weapons technology. The space age opened with the close of World War II, when missile and rocketry technology advanced enough to produce enough launching power to send equipment into the atmosphere (Beardsley et al., 2016, p. 1; Uri, 2023). The desire for long-range weapons systems, secure global communications infrastructure, and intelligence gathered at a safe distance drove nations to develop launch facilities, powerful rockets, and satellites. Without developments in military technology, space technology might not be what it is today. Second, space and military power have been intertwined since the early days of space. One only must look to the development of nuclear weapons and the need to build, launch, and defend them in the beginning of the space race. Alternatively, one could look to the need for intelligence on hostile neighbors that drove the rapid acquisition and development of space technology in the Middle East in the 1970s and 1980s (Harvey et al., 2010). Space remains critical to modern defenses, as ballistic and nuclear weapons are each launched using space technology while satellites provide crucial intelligence on crucial security targets like troop movements and military installations. Therefore, it is easy to see why many early space programs were initiated to bolster hard power in the

latter half of the 20th century.

Through space programming, many countries still seek military power and other forms of soft power, such as the prestige that comes with being a spacefaring nation. Many newer programs, such as those started in Africa and revived in Latin America, are more focused on acquiring and implementing space technology for economic and environmental purposes. Regions that rely on natural resource extraction and sales, such as Latin America and Africa, seek to use space technology to monitor the environment for illegal activities and climate change-related disasters, hoping that they can reap economic benefits from such monitoring while bolstering their overall security and preparedness. In Brazil, for example, the Amazonia satellite program is used to detect and monitor Amazon rainforest deforestation to maximize profits and minimize illegal logging ("Amazonia: Uses and Applications," n.d.). Other regions see the space industry as an opportunity to boost the local economy by attracting foreign investment. For example, Australia recognized it was, "...failing to capture a significant share of a global space industry…" and has since worked to facilitate in-country investment in the private space industry (Dougherty, 2020; Blake and Lange, 2018). Still others see space to bring the country into the modern era, wanting to ensure that communication, internet, and broadcasting are reliable and accessible nationwide (Behera, 2021, pp. 52-53; Gottschalk, 2010, pp. 36-37). Typically, regions with little international conflict have the most peaceful space power applications, such as in Latin America and Europe. In contrast, countries and regions facing transnational threats, such as Asia and the Middle East, prioritize military applications.

Conclusion

The reasons behind space power development by any country are essential for the U.S. to understand for purposes of crafting foreign policy and engaging in international politics. The U.S. has significant space resources and expertise that it can leverage as bargaining power in interactions with other spacefaring countries. As a leader in outer space, the U.S. has a keen interest in influencing, if not shaping, global space policy

through its hard and soft power. Suppose the U.S. desires a sustainable, rules-based order framework for global space regulation. If so, the U.S. must advocate for inclusive policy, whether they are major spacefaring nations or U.S. allies, and proactively involve all countries in space policy creation. Proactive inclusivity will further the chance of long-term global compliance and make the policy resistant to later undermining efforts. By understanding how and why regions and individual countries seek space power, the U.S. will bring a more sensitive and nuanced position to global policy issues.

Understanding the historical context of how and why space power developed across the globe will be important in deciphering the era to come. The nuclear era found balance in mutually assured destruction; the space era will ultimately balance in the same way. Although many states pursue space assets for peaceful purposes, whether economic or environmental, most space technology is dual use. This means that space technology is simultaneously useful for peaceful and non-peaceful purposes. With more and more states entering the space arena, more states will have access to the non-peaceful applications of space technology. This dual nature of space, and the increasingly crowded domain of space itself, will alter international politics. Having context for how and why a particular region or country accessed outer space in the first place will be critical to informing nations on how they should interact with one another in this new unstable era.

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Securitization of the Regional Challenges: The Future of Inter-state Politics in South Asia

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Executive Summary

With South Asia dubbed as the "arc of crisis" it is destined for increased geopolitical attention (Kumar, 1984). Rapid securitization of current issues is a significant threat, and shapes the upcoming era of political relations among the countries. Most political dynamics of South Asia are determined by these interactions and how states protect their national interests. This paper focuses on the upcoming political dynamics among the states in South Asia, based on probable securitization of the existing regional challenges. It determines securitization levels of the current regional challenges and examines how the securitization of these issues impacts political relationships among the states. The qualitative framework was deduced by testing several hypotheses where the securitization of the four pre-determined regional challenges prefixed by Rajat Ganguly, Ali Riaz, and Eduardo Gomez. Analysis of the framework establishes the findings that these four regional challenges experienced different measurements of securitization and they redirect the political dynamics of South Asian politics respectively. Ultimately, the political future of the region is determined by four consequences of the securitization process: spiraling security dilemma, deteriorated relations among states, the need for new policies, and probable militarization. Securitization re-

mains a major threat to the states. Along with upcoming crises procured from these notions, policy development of the countries are consecutive, which maintains the spiral of the security dilemma.

Introduction

As a vital intersection of maritime trade, South Asia connects the production of natural resources with the consumer states, while consecutively turning into one of the most important parts of the map geopolitically. Regional stability is vital for the inhabitants here and stakeholders who deduce economic and strategic interests from this. South Asia is riddled with a problematic colonial history. With the independence of the last South Asian state in 1965, more countries started to enter their internal mode of governmental transition (Jalalzai, 2012; Encyclopedia, 1998). But often process was hampered by multiple circumstances including transborder ethnic insurgency (India-Bangladesh), terrorism (Pakistan, India, Bangladesh), economic dishevel (Sri Lanka), the dispute over resource-sharing (India, Bangladesh, Pakistan, Nepal), refugee and migration crisis (India, Bangladesh), climate change (Maldives, Bangladesh), border dispute (India-Pakistan, India-Bangladesh), and even invasion by an extra-regional states (Afghanistan) (Snedden, 2016).

Though these were mostly bilateral or internal issues, they did impact the entire region. With its eight countries, all connected geo-strategically, any issue that disrupts the peace in one state easily spreads across the region. From the North-East of India to the coast of the Indian Ocean in the Maldives, across the Pak-Afghan border to the Rohingya camps in Bangladesh, South Asia acts like a mesh of interconnected links. As a result, the challenges also go across the state boundary and affect other regional states. Many of these issues are not only restrained to the political arena, but are moving toward securitization of the complexes. These attributes in turn impact roles of the states in the geo-strategic and regional interactions. In the post-colonial period, most of the states here are in a transitory process that often engulfs them in multifaceted conflicts. This security crisis is dependent on how states and their actions visualize the problem and if they consider it as a threat to their security.

In South Asia, several conflicts are treated as security threats and most of them involve the military. Incidents like the Kashmir conflict, terrorism, the Rohingya crisis, cross-border insurgencies, and water disputes are considered prime state security concerns.

The ultimate goal of this paper is to determine which issues in the region are security concerns and the extent they are securitized. This mode of securitization determines the impact this situation has on the political relations that the states maintain in this region. The significance of this research is to create a framework used to understand the correlation between the predetermined independent variables derived from securitization theory and the consecutive dependent variables. This established framework used by future researchers to test the influence of each securitized issue in understanding the broader political dimension of the region. However, this paper eliminates security aspects in Maldives, Nepal, Sri Lanka and Bhutan, concentrating primarily on tIndia, Bangladesh, Pakistan, Afghanistan. This is because the securitization of the latter four states is more eminent with regards to sources available and impact. Since the theory of securitization covers a wide arena of issues, this write-up determines independent variables studied in recent research and establishes a connection of how these significant issues regulate the future of South Asian politics.

Literature Review

The political fragmentation in South Asia is deeply embedded in its history. Intra-regional trans-border issues keep them aloof, with no mediation by any regional organization to bring them to the negotiatory table (Snedden, 2016). Researchers previously analyzed these security issues but these researchers possess bias, mostly residing in South Asian countries such as India and Pakistan. These researchers include Ashok Kapur, Huma Baqai, and Ashis Nandy, including a few from Sri Lanka like S.D. Muni and Rupesinghe. This limits the external criticism of the region. Some researchers outside South Asia, like Rhoads Murphey, John D Kelly, and Donald S. Zagoria have contributed their literature, but mostly via book reviews. Through extensive research on South-East Asia and

other regions, South Asia rarely makes the cut. Primarily, attention is on economic conflicts in the region. Connecting the dots between economy and politics, it is suggested that postcolonialism had resulted in a major economic turmoil in South Asia (Murphey, 1960).

The most common dispute in South Asia is rooted in intense communal and ethno-nationalistic tendencies. Researchers find these conflicts are related to foundational myth; others prescribe that these originated from the embedded historical and political intersections of the region (Jain, 2001; Nandy, 2002). There was a rise in many South Asian countries of a sectarian state, along with a development of ethnic and identity conflicts (Azam, 2001; Sahadevan, 2002; Tambiah, 1996). Kumar Rupesinghe formulated a conceptual framework for understanding the nature of the ethnic conflicts that have become endemic to the wider context of the protracted conflicts in the South Asian social formations. He emphasizes mechanisms necessary to resolve these conflicts through the case of Sri Lanks and Indian Peacekeeping missions as vital points (Rupesinghe, 1988). Huma Baqai, on the other hand, views water as a major issue of conflict among South Asian countries (Baqai, 2008). Similar notions are supported on the grounds of asymmetrical hydroclimatic conditions and unhelpful political realities that pushed the region towards a large-scale water conflict; widespread issues of intercontinental, water quality, environment, and displacement issues that remain despite several water-distribution treaties among the countries; correlating water rights to the multisectoral level of conflicts and acceptance of justice in the region (Baqai, 2008; Verghese, 1997; Roth et al., 2014). This water dispute is one of the many issues that arose from the complexities of boundary division—the most known of which gave birth to the year-long Kashmir conflict and the enclave dispute between India and Bangladesh (Lal, 2006). Apart from this, other research explores other areas concerning South Asia, like terrorism, refugees, climate change, and militarization (R. Q. Ahmed and Arif, 2017; Akhmat et al., 2013; Oinam, 2013; Jones and Smith, 2002; Bose and Phyro, 2012; Ahmed, 2019; Gautam, 2012; Tortajada and Biswas, 2016).

Securitization is a new discourse in international relations, whose main prescriptions have come from the Copenhagen School by Barry Buzan, Jaap de Wilde, and Ole Wæver, portrayed in their book Security: A New Framework for Analysis (Wæver et al., 1997). Since this is a new issue, very little research was completed, with the exception of theory formation. Scarcer literature was found on the securitization of conflicts in South Asia. Nevertheless, Holger Stritzel initially conceptualized the theory, simultaneously criticizing the articulation of securitization by Wæver as contradictory to provide clear guidance for detailed empirical analyses (Strizel, 2014). On the contrary, Michael C. Williams has provided an assessment of its foundations and limitations, as well as its significance for broader areas of International Relations theory (Williams, 2003). Focusing on case studies, this theory has been used to evaluate the paradigms that shape the perception of DPRK and the policy options open to the international community, and to examine the role of identity in the U.S. response to the Indian and Iranian nuclear programs (Smith, 2000; Hayes, 2009). But most commonly, the theory has been analyzed in association with other concepts like migration, religion, refugees, terrorism, environment, and development (Keukeleire and Raube, 2013; Lazell, 2015; Ibrahim, 2005; Bagge Laustsen and Wæver, 2000; Edmunds, 2011; Rana and Riaz, 2022; Dixit, 2015; Hamilton and Lippert, 2020; Karafoulidis, 2012).

Only a few researchers singled out challenges in South Asia while discussing securitization. Monika Barthwal-Datta focuses on non-traditional security threats faced by India, Nepal, and Bangladesh, where they elaborate on the women-trafficking business in Bangladesh and Nepal and the dangers of climate change for India, through the examination of the influence of non-state actors and independent think tanks on state action (Barthwal-Datta, 2013). Murali Gopalakrishnan uses the Kautilya Arthashastra model of empowerment and integration for outsiders to resolve the refugee issue for host country—security issue and social concern dual paradigm emphasizing the framework of collective decision-making of regional institutions (Gopalakrishnan, 2019). Water security was highlighted under the securitization lens, specifically its

implications on Indian interstate and intrastate conflict (Gomez, 2018). An elaborative study on this concept has been done in the book Securitization Matrix in South Asia: Bangladeshi Migrants as Enemy Alien by Priyankar Upadhyaya (Upadhyaya, 2006).

Although the study of securitization and that of regional challenges in South Asia were conducted separately, a formed framework has not been established to indicate correlation between state theory and the political relations. This paper aims to fill that literature gap by concentrating on four definite regional challenges in South Asia as prescribed by Rajat Ganguly, Ali Riaz, and Eduardo Gomez, measuring their levels of securitization. Based on this framework, a connecting link is made on how this might impact the future of inter-state relations among the South Asian countries and thus determine the political future of South Asia.

Analytical Framework

Though the propagation of liberal democracy presents the establishment of institutions to enhance cooperation as the solution to every problem, realist concepts of state-centric security have not been established. The impact of this shadowed idea is taking a considerable turn on this side of the Indian Ocean, where most of the problems are deviating from the path of cooperation and moving towards securitization. The theory of securitization states:

 "Political issues are constituted as extreme security issues to be dealt with urgently when they have been labeled as 'dangerous', 'menacing', 'threatening', 'alarming' and so on by a 'securitizing actor' who has the social and institutional power to move the issue 'beyond politics" (Eroukhmanoff, 2018)

This theory focuses on the referent objects, the referent subject, the securitizing actors, and the audience. The referent object has a legitimate claim to its existence and survival and the referent subject is the entity or threat that is either imagined or real. The securitizing actor is the one who declares the referent object threatened—the government, institu-

tions, media, or pressure groups. This whole system needs support from the audience to act on behalf of the referent object to conclude the issue as securitized (Waever et al., 1997). The perception of securitization of the issue depends on the attribute of the state which is based on how that state is pursuing the threat, and to what extent that threat might refuel its security dilemma. South Asia has been going through innumerable issues since its rise during the post-colonial period. Most of these issues were converted into security concerns lately. However, this paper narrows down on four definite aspects which were deduced from three separate scholarly developments by Rajat Ganguly, Ali Riaz, and Eduardo Gomez respectively: territory disputes, terrorism, migration and refugees, and resource scarcity.

Methodology

The analysis of the data and the determination of the findings were completed based on qualitative methodology. All collected data are from secondary sources, mainly journal articles, a few books, newspaper articles, published interviews, and other online sources. Since the paper is based on the securitization theory, different articles on this concept were prioritized. As there is no established framework, four primary independent variables were derived from the works of Rajat Ganguli, Ali Riaz, and Eduardo Gomez. The level of securitization of these four variables has been tested to derive the impact of these issues and how they deduce the final dependent variable, that is, the future of inter-state politics in South Asia.

Analyzing the Level of Securitization of Regional Challenges in South Asia

Securitization is defined as, "(T)he process of actors transforming subjects from regular political issues into matters of, thus enabling extraordinary means used in the name of security (Waever et al., 1997). South Asia is a domain of cross-border issues heavily influenced by relationships among the countries. These countries are involved in various disputes following their independence from the British. The dynamics os
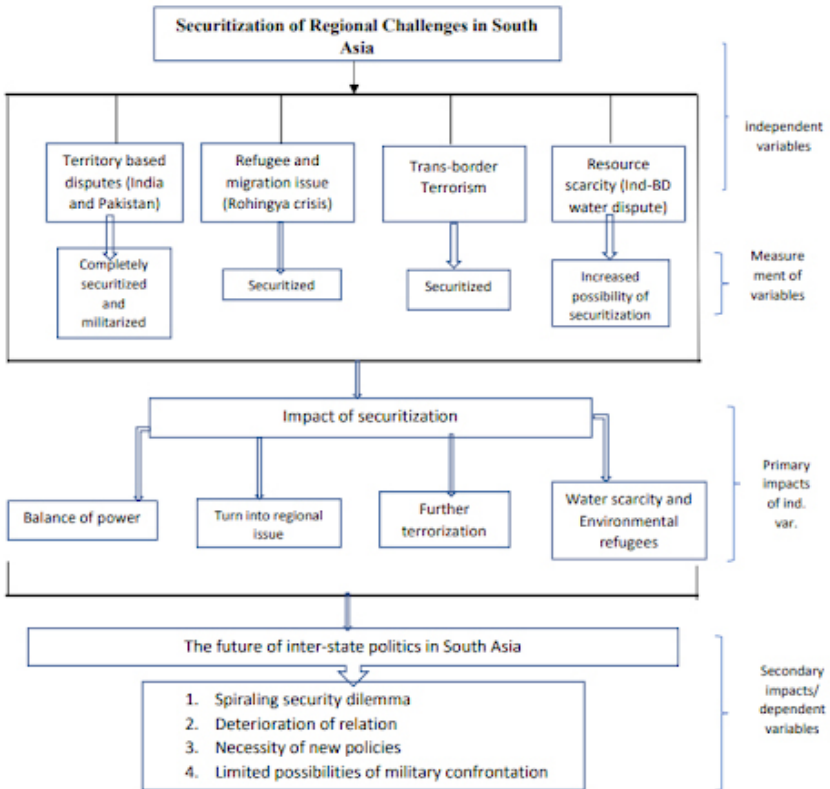
Fig: Framework for analysis

Figure 1: Framework for analysis: This framework measures the level of securitization that each of these issues go through and determine the present level of securitization. These conditions ascertain four possible futures of the inter-state relations among the South Asian states.

cillated around the conflicts between India and Pakistan, between 1948 and 2019 conflicts along the Line of Control. These dynamics heavily damaged inter-state relations between the countries by aggravating the sense of atrocity between the two. Besides, India, Bangladesh, Pakistan, and Nepal continuously dispute the equitable distribution of natural re-

sources. With the advent of time, the political arena took different routes with the influx of refugees across the borders and rising cross-border terrorism. These conflicts soured the relationships among states, increasing securitization and consequent militarization of issues. These conflicts were securitized, resulting in face-to-face war. The securitization of multiple issues in the region results in the securitization of the entire region, through deteriorating security consciousness. When security dilemmas arise, states sabotage others at the cost of military enhancement, hampering political relations.

For the sake of analysis, definite independent variables, territory disputes, refugees and migration, terrorism, and resource distribution were chosen as prime regional challenges. The elaboration of the territory-based dispute is limited to the India-Pakistan conflict over the possession of Kashmir, which has been identified as a major security concern by Rajat Ganguly (Ganguly, 2014). The issue of refugees and migration focuses on the Rohingya crisis in Bangladesh, which has been titled a, "Recent securitization phenomenon," by Sohel Rana and Ali Riaz (Riaz, 2022). Rajat Ganguly also covers the problem of terrorism in his literature. Finally, the notion of water scarcity between India and Bangladesh turning into a securitization issue has been noticed by Eduardo Gomez in his dissertation. The following analysis of these challenges relies on literature that indicates their securitization. The level of securitization of each of these issues draws images that portray the probable future of inter-state relations in South Asia.

Securitization of Territory-based Issues

The most significant inter-state conflict at the beginning of the list is the relationship between India and Pakistan. This conflict was securitized from the beginning, with clear indications of competitive state nuclearization (Ganguly, 2014). The most vicious wars since 1947 were fought between India and Pakistan. The securitization theory provides eminent empirical insights into India's conflict with Pakistan over Jammu and Kashmir, that are overlooked by more traditional approaches to security studies (Kapur, 2018). Following the securitization theory proposed

by Weaver, the Kashmir issue depicts all segments of the traditional state-centric perspective, the conventional-critical approach, and the securitization of identity discourse (Peter, 2015; Waever, 1998).

Much like a two-act play, India's securitization of the Pakistani threat occurred in two distinct acts in 2016. The first illocutionary move preceded the extraordinary measure of Indian troops crossing the Line of Control separating Indian and Pakistani-administered Jammu and Kashmir. The second speech following this action occurred when the Indian state uttered the phrase 'surgical strikes' while describing its attack in Pakistani-administered J&K, based on specific intel that terrorist groups had positioned themselves along the Line of Control to carry out infiltration (Singh, 2017). The recurrence of these vicious attitudes kept the states on the brink of war. The level of securitization in this context went so far that the Indian government had to decide on revoking Article 370 over J&K and subsequently bifurcated the state into two union territories so that the intensity of the security threat posed were brought under control. This deal had an internal dynamic of maintaining state sovereignty but a clear signal to the opposition that the government goes to any extent to secure its sovereignty and rise higher in the security dilemma paradox (Dar, 2020).

Securitization of Migration and Refugee Influx

The most prominent threat from cross-border influx that is happening in South Asia originated from the Rohingya refugee issue. Though the source is from outside the region, the main destination is mostly Bangladesh and India. Bangladesh has taken in more than one million Rohingya refugees since 2017 and the number is multiplying every day (UNO-CHA, n.d.). According to latest reports, Rohingya refugees from India are also crossing the border to Bangladesh (Molla, 2022). Though there are other refugee and displacement incidents across South Asia, this paper focuses solely on the Rohingya crisis because it is on the imminent verge of securitization. Besides, though Rohingyas are not entitled to become refugees in their country of asylum, their situation is evaluated based on their displaced status.

On the virtue of research, Md. Sohel Rana and Ali Riaz argue that the mechanism of securitizing the Rohingyas in Bangladesh is not a recent circumstance, but began in the 1990s and later in 2010, when a smaller fraction sought refuge than in 2017. The method of securitizing the refugees included both discursive and non-discursive securitizing practices (Rana and Riaz, 2022). The influx has already been speculated as a security threat to Bangladesh, causing socio-economic, internal as well as an external threat to the state (Daily Star, 2017). Several studies have explored the potential of the Rohingya refugee crisis as a menace to the social, political, economic, and environmental security of Bangladesh (Rahman, 2010). The Rohingyas are the victims of decade-long repression, torture, relative deprivation, mass killing, and other atrocities leading to human rights violations (Kipgen, 2013). Considering this, it is quite valid to hypothesize that this huge population residing in Bangladesh, with so many engraved grudges and a tendency to revolt, poses a heavy security threat to the country. Besides, all international refugees add a new dimension to the host state's national security and have the potential to pose political, socio-economic, and environmental security concerns to the host state (Pandey, 2016). The security threats posed by Rohingyas manifest itself in issues related to internal militarization, illegal trade and business, extremism, and environmental degradation (Rana and Riaz, 2022).

Securitization of Trans-border Terrorism

The rise of terrorist groups is without any doubt one of the biggest security threats for any nation and region. Technically, most south Asian countries are victims of direct terrorist attacks and are supported by one or other of their neighbors; specifically, the targets include India, Bangladesh, Sri Lanka, and Nepal. That spares little room to deny that the terrorism-originating states include Pakistan and Afghanistan—with their allegations of state-sponsored terrorism, sheltering terrorists, providing them with training bases, and ensuring widespread assistance from moral support to active military help including arms supply. Some of the most notorious groups, like Al Qaeda, LeT, HuM, Jamiat-e-Islami, the

Taliban, the Haqqani network, the Hizb-ul Jehadi Islami, the Students' Islamic Movement of India, the LTTE, and the United Liberation Front of Assam—have originated from this region. Nevertheless, almost all the major Islamist fundamentalist groups have connections with and receive assistance from Al Qaeda. These fundamentalist groups have worsened the security situation in the internal regime of Pakistan and Afghanistan and it has become a major security concern for the region (Ganguly, 2014). But still, the question stands - how much has the issue been securitized to impact state-level interactions?

The securitization of this issue has been elaborated on considering the Southeast Asian region in multiple pieces of research but few have focused on the South Asian region. It has primarily been considered a major security threat that poses all components of turning into an issue of securitization. The countries in South Asia are currently facing grave security threats due to increasing extremism and terrorist activities. The 'Talibanization' of Afghanistan and the rise of Islamist fundamentalism in Pakistan greatly magnified the threat here (Ganguly, 2014). Since the increase of extremism and terrorist activities in the last decade, South Asia has become one of the most notable regions with the highest annual fatalities from terrorist violence. Imminent threats are posed by ethnic, ideological, and political conflicts that pose a serious threat to stability and interstate relationships. The states face several security threats ranging from fundamentalist to ethnopolitical violence, and the situation is deteriorating with worsening socio-economic conditions (Butt, 2004). These incidents cause not only a major threat to the sovereignty of the states, but also to national and human security, the socioeconomic fabric of the communities, and ethnic and religious cohesion (Izarali and Ahlawat, 2021).

Securitization of Scarce Natural Resources

The most relevant resource-related conflict South Asian countries face is over equitable access to water, which is further fueled by increasing water scarcity. The decrease in renewable water resources is making the situation dire, and due to the lack of proper water distribution plans, coun-

tries are at odds with each other, affecting the people whose life depends on these resources. The main water-sharing complexities lie between India and Pakistan over sharing the water in the Indus River, over the Farakkha barrage, the Teesta treaty, and the Tipaimukhi barrage between India and Bangladesh, and some other disputes among India, Pakistan, Afghanistan, Bhutan, Nepal over sharing some other river boundaries (Faruque, 2021). Nevertheless, this paper focuses on the possible security threat that might culminate from the dispute between India and Bangladesh over sharing water resources from several sources.

Some of the consequences of a water dispute are mass migration, generation of environmental refugees, depleted food security, exacerbation of poverty, and even deterioration of diplomatic relations among states. With increasing population and degrading climate situations, states are becoming more protective of their resource acquisition mechanisms (Ismail, 2016). Since the Romans did not hesitate to kill Jewish people over a dispute to share water at the beginning of the first century (Pacific Institute, n.d.), it is highly irrational to assume that the same resource does not turn into a reason for serious conflict between the states in this era. The dimension of power imbalance has mostly shaped the hydro-conflict between India and Bangladesh. The construction of the Farakkha barrage on the Ganga basin and the lack of consensus on concluding a Teesta treaty is the main point of the conundrum between the two states. The securitization discourse of these issues is shaped by different factors of scarcity concerns, infrastructure, environment, cooperative prospects, and a technical interpretation (M.C. Williams, 2003). In this scenario, the political actors are using these discourses to portray a particular policy domain as under threat, and the environment is operating as a referent object (Warner and Boas, 2017).

Impact of Securitization and the Future of Political Dynamics in South Asia

Deriving from the theory of securitization, this paper has determined four independent variables that are currently driving the security concern of the region, namely territorial disputes, displacement and refu-

gees, transborder terrorism, and water scarcity. The issue of territorial disputes focused on the India-Pakistan conflict, a phenomenon that has already been securitized in the full sense. The rise of terrorism, mainly transnational terrorism, is considered a major security threat and conceptually matches the theory of securitization. The displacement issue focused on the Rohingya crisis, and though it has not become entirely securitized, the literature suggests that it is already on the pathway and considered a major security threat for the region. And lastly, the notion of water scarcity illustrates all variables that are likely to make the problem securitized; it depends on further research to create concrete evidence on that behalf. The next part of the paper discusses the impact the process of securitization has on these challenges and in turn how these impacts affect the political relations among the states. Since there is no theory to establish a direct relation between securitization and intra-regional political relations, the results of securitization derived from the analyzed data in the last section are considered to test the intensity of the situation, and these impacts prove to directly influence the inter-state political relations.

Impact of Securitization on the Regional Challenges

The aforementioned challenges have gone through different measures of securitization, and the impact of each of these concerns determine how the political relations among the states navigated. The impacts of these securitized issues and their consecutive influence on the future of inter-state relations in South Asia are discussed below:

The Balance of Power between India and Pakistan

The two nuclear states of South Asia are still engaged with each other in their 75th year of territorial disputes over Kashmir along with added geopolitical complexities, and conventional and military confrontations, making the possibilities of normalization a distant reality (Jilani et al., 2022). The continuous securitization of this relation is engraving an intense sense of threat among the audience, and thus the theory of secu-

rity dilemma is prominent in analyzing the given strategies (Srivastava, 2019). This very notion of security dilemma has led to the revocation of Article 370, ceasing the power of autonomy for Jammu and Kashmir; which received a sharp reaction from Pakistan (Tang, 2009). Besides, the interest of great powers determine the foreign policy of these states to a certain extent. A strategic quadrangle formed with India and the US on one side, and China and Pakistan on the other (Singh, 2014). Though clear demarcation of the border has been assured to maintain peace, recurrent terrorist conspiracy and deployment of armed forces along the border have always kept the possibility of eruption into consideration. On the other hand, mistrust, hostility, and conflict have undermined efforts toward peace and stability. Amidst all these, there is precedent that though the outburst of full-blown war might not happen in the near future due to a highly securitized form of deterrence, this mode of security dilemma continues to exist.

Exporting the Rohingya Concern across the Region

The Rohingya crisis has not only become a burden for the political institutions of Bangladesh, but has converted into a regional headache. The most prominent threat is the in-and-out radicalization of these people, who may soon turn into weapons used by terrorist groups. It appears that the Arakan Rohingya Salvation Army (ARSA) already maintains major international networks and receives funding from Islamic terrorist organizations. They have a connection with Islamic radicals in Afghanistan, and it is assumed that the Pakistan Inter-Services Intelligence (ISI) unit involved in the process of providing logistic support for their armed struggle to maintain contact with international terror outfits (Wolf, 2017). All these dynamics forwardly exhibit that the issue has already crossed the national border and has regional implications. Bangladesh has already communicated with India regarding the upcoming security concerns which vehemently influence the safety of both countries (Mitra, 2017). Besides, the large influx of Rohingyas in different refugee camps could become a potential target for enrolment by transnational religious extremist groups. Significant groups like Al Qaeda and ISIS

already appear interested in having a connection with this huge mass of enraged people, tortured based on their identity, and by and large, tagged as 'stateless,' with nothing to lose (Momen and Hossain, 2020). The Indian Express has reported that many Rohingyas have crossed the border into the northeast and Kashmir, and have also settled in Jammu. Protests by the radical Hindu nationalists of the region have begun to surface against these intruders, on reasons that they are destabilizing the security establishment in India (Khan, 2017). Thus, it is already explanatory that the securitization of these migrants not only affect the individual countries but the overall security of the region.

Further Terrorizing the Region

With the fall of Afghanistan, the nature of terrorism is assumed to change in this region. One of the most dangerous terrorist groups, the Taliban, has formed a government in Afghanistan after the U.S. had left the premises. After the September 11 Attacks, South Asia was identified as an epicenter of the 'war on terror' (Congressional Research Service, 2005). But that predominantly does not mean that the region does not face any further threats. The imposition of Taliban generally means that Al Qaeda is the prime beneficiary, seeking to regain their power. This enduring relationship presents troubling consequences for the region. Besides, substantial AQ-affiliated groups are still active in Bangladesh and India, and are expected to expand their network and plan future attacks. Moreover, aspiring terrorists from these countries are allegedly traveling to Afghanistan and Pakistan to receive better training. On the other hand, the presence of ISIS is also becoming prominent in the region. Though the group is losing its influence internationally, it conducted a few major operations in Bangladesh and Sri Lanka to inform others of its existence (Taneja and Siyech, 2021). From this perspective, the relationship that the newly formed government in Afghanistan maintains with other South Asian states requires a separate discussion. But it is beyond doubt that the security implications derived from terrorism exist in this region.

Increasing Water Scarcity and Environment Refugees

With rapid climate change, securitization of water scarcity is a concern of the present and has already started affecting inter-state relations. Lack of consensus has not only curbed diplomatic and political relations, but has also taken a heavy toll on the environment and livelihoods of the natives. 60 years of the Farakkha barrage and 25 years of the upgraded treaty have taken this dispute to nowhere but the consecutive disastrous situation of either dry season with no harvest, or overflowing water destroying the harvest in Bangladesh. With the changing climate and huge explosion of the population on both sides, the altered notion of this water basin is challenging to handle and the Joint Commission which was formed to resolve this issue is hardly showing any responsibility. Every year Bangladesh is facing serious water scarcity and salinization due to the full-fledged activation of the barrages, often violating the treaty, leading to low food production and continuous desertification in the north and north-eastern region. On the other hand, the construction of multiple barrages to restrict the water flow and divert the direction of the Teesta River has thinned the river entering Bangladesh and thus creating heavy water scarcity. Rangpur, Dinajpur, and the northern regions, which consist of prime crop cultivation places, are lacking irrigation and thus deteriorating the production causing food scarcity all over the country (Faruque, 2021). These, in turn, are imposing serious threats to human security, which might later result in a massive surge of climate-induced refugees. Survival surpasses all politics and people go to any extent to manage resources. The creation of a huge number of refugees lead to new dynamics of displacement, which the South Asian countries are hardly ready to deal with (Datta et al., 2022).

Future of Political Relations Due to the Impact of Securitization

The analysis of four independent variables derived from the notion of regional challenges in South Asia tested under the theory of securitization deduces four possible outcomes, namely increasing security dilemma between India and Pakistan, conversion of the Rohingya crisis into

a regional issue, increasing dangers of terrorization, and production of environmental refugees due to intense water scarcity. These phenomena in turn are used to determine the upcoming political relations among the South Asian states.

Spiraling Security Dilemma

The discussed securitized issues already exhibit that there is a spiraling mode of security dilemma among the states. Starting with deteriorating relations between India and Pakistan, the threat of militarization of the Rohingyas turning into a regional security concern, the further terrorization of the region through state-supported activities, to increased possibilities of displacement rooted in climate change and resource scarcity, all bring notice to the issues that the states have to deal with. The securitization of an issue itself causes the rise of the security dilemma, and the existence of so many cumulative regional threats worsen the situation (Taufiq-e-Faruque, 2020). Based on the security dilemma theory, the relations among the states continue to remain in utmost suspicion, and states prioritize their interests before cooperating on any issue (Tang, 2009). One instance is the Rohingya issue, in which no state other than Bangladesh is pushing for its resolution. On the other hand, the threat of terrorism is more pervasive than ever, because groups that execute terrorism are now in a position to govern countries. Overall, states continue to pursue their security concerns, while maintaining an uneasy relationship with others in the region.

Deterioration of Relations

With India and Pakistan often on the brink of war, it is not possible for their interactions to go any worse. Besides, the Taliban taking over governance and establishing a non-democratic state has already created a strain in the region. If the Rohingyas issue is not contained, and if these stateless people become the pawns of terrorization by major groups, the level of cooperation among the states decreases. Furthermore, the changing climate is signaling that the future of resource availability creates more vulnerabilities, leading to the rise of environmental refugees. With

difficulties in handling the existing migrants, the millions of displaced people in search of water face vicious consequences. The relationship between West Bengal in India and Bangladesh is already deteriorating due to this issue, and will become worse in the near future (Kumar, 2013).

The Necessity of New Policies

With the deterioration of relationships, different measures are needed to sustain regional peace. Foremostly, the water distribution policies between the states need to agree upon. Secondly, forming a new regional association or strengthening existing ones is of utmost importance. Cooperation over counter-terrorism, refugee and migration, and dealing with climate change would be the main agenda of this association. (Conflicts in South Asia: Challenges to SAARC Regionalism, 2019) One notable measure for fighting terrorism is joint counter-terrorism initiatives by the countries. Countries are gradually coming to realize the need for a collaborative holistic approach to this threat and are recalibrating the balance between "hard" and "soft" counterterrorism measures (Rosand et al., 2009). Hopefully, further developed counter-terrorism measures help the mode of cooperation among the states and diminish the menaces from the securitization of the issue. With time passing, the necessity of newer policies for collaborating laws against terrorism, territory dispute, resource management, refugee management, climate change, and other regional issues skyrocket.

Limited possibilities of military confrontation

With India and Pakistan already taking their stance along their borders, along with a history of consecutive wars, it is evident that the region has been militarized. If this relation further deteriorates, the two nuclear states might consider deployment and another surgical strike might emerge. Besides, if the Rohingya crisis moves across the region, it takes little time to militarize and the apprehension of more refugees generated adds to the concern. So, even though the possibility of militarization of the region due to these challenges might be scarce, it is a probability that is considered to understand the political environment.

Conclusion

Following the securitization theory, states are constantly putting their guard up and posing threats against each other. Whether it be territorial maintenance, eradication of terrorism, combating refugee influx, or climate change, countries are focused on protecting their interests rather than collective regional relationships through proper channels of diplomacy. This paper has tried to highlight the points where the regional issues are going through state-centric securitization and how this definite policy might impact the future of politics. Since this paper has been written based on scarcely available research and the concept of securitization has not reached every periphery, a new analytical framework has been devised to establish the connection. Nevertheless, it shows that the continuous securitization of issues in every state, which is already experiencing intense tension, might get worse, resulting in them constantly putting their guard up. However, this is leading to a spiraling security dilemma and an increase in the rate of militarization. As a result, the security threats are increasing; and with the added number of non-state actors, civil society groups, and citizens, the realist grounds for these consequences are getting more complicated. Since there is no established theory to bridge the process of securitization to the regional political dynamics, the impact of securitization on significant challenges has been tested to measure their effect on political relations. It is expected that this work on the issue will lead to the development of the concept and raise questions about how these are combated. Only a proper analysis of this theory in relation to the pre-existing circumstances create a policy that might reduce the sense of securitization and create an environment of cooperation among the states in South Asia.

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Private Military Contractors: Global Functions and Rise

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Private Military Contractors: A New Security Paradigm?

The emergence of Private Military and Security Companies (PMSCs) is a massive security development of the twenty-first century. PMSCs are defined as, "Any company which offers an array of services which were traditionally or are contemporarily performed by the military to support and conduct combat operations, and which could be and would have to be performed by the military if a contractor was not forthcoming" (Swed and Crosbie, 2017). Throughout the paper PMSC identifies and discusses broad global trends, presented following case studies. The paper features two case studies. The first case study examines Black Water, the private military company that had members commit the Nisoor Square Massacre. The second case study examines TigerSwan, the Private Security Company that was the most heavily involved in repression against environmental activists at Dakota Access Pipeline protests.

States and corporations contract out these groups to carry out various jobs that often necessitate the use of force. The proliferation of Private Military and Security Contractors exploded into a global phenomenon, with security contractors working solely for state authority. States across the globe utilize the employment of these corporations. Employment in-

creased steadily since the 1990s, and it is related closely to the trend of neoliberalism policies and practices (Kinsey, 2007). This study carefully examines how PMSCs historically evolved and the strategies and tactics they most often deploy to repress local groups and movements, both for state and private entities. PMSCs worked to integrate themselves into the governance of countries worldwide, providing services and products that go far beyond just boots on the ground. We focus on two case studies to examine the behaviors and effects of PMSCs: one deployed to function internationally as a Private Military Company (PMC) and one deployed domestically as Private Security Companies (PSCs). Both case studies involve American-owned PMSCs, to allow analysis of U.S. hegemonic dominance in defense spending and international military norm-setting. In the public context, the case study examines PMCs in Iraq as an example of states contracting out military work for the Global War on Terror. In the private context, the case study explores PMSs contracted to construct the Dakota Access Pipeline in the U.S. The conclusion highlights multiple policy recommendations, while summarizing findings of the paper.

Throughout the paper the term PMSC discusses global changes and activities broadly of these actors. When discussing the specific firms and their actions they will be differentiated from each other with the designation of PMC or PSC. This paper was written using Global Studies Research design to cover a global issue that explicitly challenges the state and transcends borders. The state's security capacity is one of its most essential functions, and by conceding its responsibility to private actors, it appears to be implicitly giving up parts of its sovereignty. The process of decentering the state is the principal global transdisciplinary framework used in this study to explain PMCs. It allows intersecting theme exploration that affect the decentering of the state, such as neoliberalism and the privatization of state capacity.

PMSCs rely heavily on the states that pay them yet are independent actors who perpetuate themselves and expand their roles in the international community. This paper addresses nationalism and neocolonialism

issues, as many PMCs are from the global north and owned by wealthy and influential caucasian actors while being employed in the global south in lower income countries. This includes postcolonial contexts, with different ethnic and racial and religious makeup. The case study design supports holistic analysis using a variety of data sources, and will illustrate local, global, historical, and neglected voices by using case studies to explain themes and conditions for local actors on the ground and extrapolate them to these larger global changes, themes, and dimensions of the problem of use of PMSCs. Using various case examples will strengthen our analysis and provide important context when exploring this complex issue.

Development of the PMC Phenomenon

States use PMCs for many reasons. These range from states lacking the capacity to train sufficient armed forces to being a cheap quick fix. PMC usage is nearly ubiquitous in global security. Superpowers like the U.S. and states with weak capacity in the Global South find their use. Their global use reflects the development of international security conditions in the post-Cold War Era. PMCs also provide states with unique tools they can use outside of traditional military structures. The neoliberal drive of states to continually privatize their functions is a global phenomenon. By relying on PMCs to carry out security policy, states give PMCs political and financial power that can be leveraged against or independent of the state. States can use PMCs in the context that using the military would be legally or morally dubious. This gives states a new and unique tool to exercise control, but these actors can also have their own interests. This section traces historical development of PMCs globally, explores how states use them, and examines the global forces continuing their expansion through the transdisciplinary mechanism of decentering the state.

Historical Development

A Blackwater representative once said, "We are accountable. We are transparent. We would never get another contract if we were against the

U.S. government's interests," (Verkuil, 2007). Many citizens of democracies worldwide are alarmed by the rise of PMCs like Blackwater. Still, their governments are allegedly held accountable to them through voting and continue to hand contracts to PMCs. As the Blackwater representative succinctly stated, governments employ PMCs because of their own self-interest. Historically, that has not always been the case, but due to the shifting economic and security conditions of the post-Cold War era, states worldwide have begun to employ PMCs for state use.

Throughout the evolution of warfare, mercenaries were a constant part of militaries worldwide. Throughout the violent tumult of the 17th century, in which modern capitalism and modern conceptions of the state developed in Western Europe, mercenaries were the backbone of armies employed by both lords and monarchs. The tug of war for power between lords, who traditionally organized and controlled military forces for the monarch under feudalism, and monarchs controlling military forces was a decisive factor in the emergence of the modern state in which the monarch controlled state structures and power. In the west, this began to change when Revolutionary France introduced the concept of the "nation in arms" or mass conscription, enabled by the burgeoning concept of nationalism. Under Napoleon, these massive armies, fighting for the French nation, managed to conquer much of Europe. Monarchies across Europe realized that their aristocratic militaries, made up of small cadres of professionals were no match for Napoleon and had to imitate the French Army to defeat it (Singer, 2003). Mercenaries were insufficient for the task of modern war.

Mercenaries went out of style for three important reasons. First, they were more expensive and less effective on the battlefield, as proven in the Napoleonic Wars. Second, state capacity increased greatly as the Industrial Revolution increased the material efficiency of modern armies and provided the capital needed for large state apparatuses. Through increased revenue, states could train, arm, supply, house, and, most importantly, pay their own armies. Third, the 19th century was the advent of nationalism. Citizens organizing around the concept of "nation-states"

became potent political ideas in which the ultimate form of service was embodied in serving in the military. Millions of men across Europe were voluntarily conscripted into massive armies,where often they would serve a few years of mandatory service followed by years in reserves. As many European states embraced some form of democracy, conscription was a way for citizens to buy into the nation's project and have a tangible part to play. The natural result of these massive armies hyper-charged by nationalism and the industrial revolution contributed to the causes of the two World Wars because states had the capacity and the political will to carry out industrial slaughter. When the fighting ended, the U.S. became a hegemon with its massive military and industrial capacity. It developed into a Cold War with its ideological opposite, the communist USSR. Both states used conscription militaries through the first decades of the Cold War, but beginning in the 1970s, political and economic forces began to move states away from conscription forces.

Vietnam Syndrome, Neoliberalism, and the Return of PMCs

It is important to note that most of the processes that have resulted in the proliferation of PMCs across the globe originate in the U.S. and the West (Kinsey, 2007). Even during the Cold War, the U.S. was by far a larger economic force than the USSR (James and Imai, 1996). Due to its hegemonic role, the country established international institutions that governed the postwar economic and political state interactions. After the USSR collapsed, the U.S. became the sole superpower in terms of military and economic power by wide margins (Scott, 2000). Because of its military and economic influence, the policy decisions of the U.S. had an outsized effect on the global economy and security trends.

Many political theorists believe that the state's first and only duty is the monopoly of violence (Pearce, 2019). Inside its territory, only the state has the ability to use violence to enforce laws or coerce policy. The state's sovereignty is confirmed by its ability to hold the monopoly of violence and protect its citizens from invasion. The process of privatizing the defense of the state is a state directly outsourcing parts of its sovereignty as the responsibility of defense, and the implementation of violence is

contracted out to private corporations. This appears to decenter the state, as it reduces its capacity and empowers non-state actors with its power. Before examining the extent of the rise of PMCs functions at the expense of state capacity, it is important to examine the political and economic forces that drove their preeminence in the 1970s.

The 1970s U.S. dealt with "Vietnam Syndrome." Vietnam Syndrome equates to the unwillingness of the American people to fight long foreign wars after the defeat and political turmoil of the Vietnam War (Simons, 2018). The widespread participation of America's middle and working classes in the draft was a factor in driving the political resistance to the Vietnam War. With so many Americans being legally coerced into fighting the war from broad backgrounds. Minorities and the poor were drafted disproportionately. Over 16 percent of all soldiers drafted were Black and 23 percent of combat troops were Black, despite only being 11 percent of the civilian population (Bates and Chow, 2020). Large swaths of the citizenry either were directly involved in the fighting or had a family member who was involved. Because of these personal connections to the war, Americans had increased investment in the political outcome of the war. However, unlike WWII, where Nazism and Japanese Militarism produced attacks on the U.S. and provided an existential threat, Vietnam was a war of choice, and many Americans did not see the necessity of fighting it. Thus, as casualties mounted and no tangible end was in sight, the Vietnam War became extremely unpopular. It became apparent to politicians and military leaders that in the future if leaders needed to wage wars that they thought were in the national interest, but were not popular at home, they would have to get around conscription (Ettinger, 2015). To solve the problem of conscription, the U.S. transitioned to an all volunteer force of military personnel in 1974 (Glass, 2012). The logic of this was that people who volunteered to join the military would already have ideological buy-in to these institutions and that one way to reduce popular political opposition to military action would be to end the institution that directly bonded the public to warfighting (Holland, 1996).

The draft is still on the record, with American males still required to sign up for the Selective Service at 18. But the potential political costs never made a military draft a realistic option to implement, even at the peak of the war on terror. The rhetoric of the 1980s and 1990s reflected a need in the American Psyche to shake off the defeatist malaise of Vietnam syndrome. The U.S. tried to do this in multiple small conflicts against opponents that had no real chance of winning. The U.S. invaded and toppled governments in Grenada and Panama, and these efforts culminated in evicting Saddam Hussein's Iraqi army from Kuwait. In the wake of the collapse of communism, the U.S.stood as the sole superpower. These small, but clear victories showed policymakers that the U.S. could still be militarily dominant without a draft. Combining the all-volunteer force with the rise of "Reaganomics" in the 1980s, which emphasized deregulation and privatization, the U.S. was able to export this security and economic model that would become neoliberalism across the globe in the 1990s due to the end of the Cold War.

For the sake of this paper, neoliberalism is defined as the transfer of state responsibilities, capabilities, and capacity to private actors, often private corporations (Manning, 2020). "Neoliberalism sees competition as the defining characteristic of human relations. It redefines citizens as consumers whose democratic choices are best exercised by buying and selling, a process that rewards merit and punishes inefficiency" (Monbiot, 2016). Neoliberalism began in the 1970s as a result of the most significant economic downturn since the beginning of the Postwar era. The era saw rising inflation, partially due to the gas crisis triggered by OPEC countries in response to American support for Israel (Office of the Historian, 2012). Many in America's corporate sector saw that the only way out of the slump was to cut big government in the form of welfare and deregulation (Monbiot, 2016).

This broad coalition was made up of many interests from various industries from finance to energy, and conservative and libertarian ideologies. These economic and political actors believed that only through the government's non-interference in market competition could the stagna-

tion of the 1970s could be overcome. Even though Margaret Thatcher and Ronald Reagan are viewed as stalwarts of the neoliberal turn, the transition to neoliberalism began during the Carter Administration, as President Carter deregulated the banking and trucking industry. Deregulation was implemented to encourage growth and competition. Individuals and corporations saw cutting taxes on the rich as a way to enable wealth to "trickle down," with the expectation that they would invest the capital saved from lower taxes into businesses and workers. Reagan and Thatcher both began to chip away at the welfare state (Kitschelt, 2008). The theory was that neoliberalism would reduce the role of the state in individual lives but increase wealth; the Neoliberal era saw the reduction and outsourcing of state capacity, which transitioned to the 1990s (Demartino, 2016).

As the Neoliberal era moved into the 1990s, the international political situation, combined with a rising number of countries implementing neoliberal policies, produced the conditions of today that see PMCs being so prevalent. With the end of the Cold War, the U.S. had no real geopolitical rival to challenge its position as the sole global superpower. Without the traditional impetus of competition against rival powers , the neoliberal trend affected the state's security apparatus across the globe due to a lack of a competing model like the USSR's communism (Piatek, 2017). Decoupling the larger citizenry from the military began with the end of the conscription army, and it was accelerated by the end of the Cold War. The 90s saw a continued trend in cutting spending and no serious foreign competitors saw the military budget cut to comply with a balanced budget (Swed and Crosbie, 2017). This saw a great reduction in both equipment and manpower. When the Global War on Terror began, the military did not have the personnel or allied support to wage the global conflict the Bush Administration foresaw with military campaigns in multiple countries. However, the onset of the Global War on Terror following the September 11th terrorist attacks brought renewed motivation to increase the military budget massively. This glut of funding and lack of personnel created the niche for PMCs. This rapid policy change set the stage for the rapid proliferation of PMCs.

American political writer and Director of the Open Society Project at the Niskanen Center Brink Lindsey defines state capacity as, "The ability of a state to collect taxes, enforce law and order, and provide public goods" (Lindsey, 2021). One direct way that state capacity in the U.S. has been reduced is by looking at how tax revenues since the 1970s have consistently fallen as a proportion of total GDP (Lachman, 2020). This shows that the state has lost much capacity in order to continue large projects or begin larger-scale programs. Neoliberalism naturally decenters the state by diminishing its capacity while increasing the influence and effectiveness of other actors. Neoliberalism has had zero to little influence on international relations theory because, often, its dynamics are examined through the domestic and internal state processes. However, through the use of PMCs, neoliberalism threatens to decenter the state from its traditional duties completely in the sense that it is not the one directly responsible for both its citizens' well-being and safety; they are contracted out to private actors.

One of the oldest and most established theories of states is from Thomas Hobbes. Writing in the 17th century, Hobbes posited that the state's main responsibility is to possess the monopoly of violence. The monopoly of violence means that the state is the only actor to legitimately use force under civilian authority (United States Institute of Peace, 2024). Domestically, that means that only state agents can use force to arrest citizens for violating the law or to protect citizens or property. Internationally, the state is obligated to protect a fixed piece of geography designated as its territory from foreign invaders. When the American military has PMCs take up parts of its duties that potentially involve them carrying out violence, it's the military voluntarily giving up part of its monopoly of violence and leaving violent acts to be carried out at the private actor's indiscretion. Leaving out allegations of the CIA using contractors to conduct clandestine operations, many militaries have allowed PMCs to operate in combat roles (Lachmann, 2022). For example, Wagner Group, a Russian private military company operating on the Russian government's behalf, is currently fighting in the Ukraine War (Kim, 2022).

PMC Uses

It is important to divide how states use PMCs between strong and weak states because of how drastically different the relationship between the state and contractor is in this context. PMCs operate drastically differently in the two separate situations. A strong state has a robust governing institutions and a competent, civilian-controlled military. On the other hand, weak states have weak institutions and a history of either an ineffectual military or one where the military has ruled. In the modern era, strong states have used PMCs largely in supporting roles when operating overseas (Kidwell, 2011). PMCs handle many logistical operations for militaries, from food and base maintenance to intelligence and communication work. Even when operating in combat environments, PMCs are not permitted to engage in combat unless they are under serious threat (Banks, 2011). "There is general agreement that PMCs, both the companies and their employees, are civilians and cannot be considered combatants under humanitarian law," (Banks, 2011). Often when deployed in a security operation, PMCs protect bases, diplomats, and convoys. These are sometimes clearly valid military targets, which risks engaging PMCs in combat. Strong states use PMCs because, often, it is easier for them to hire a firm to do a specific job than it is for them to recruit, train, and supply a soldier to do the same role. Even if the soldier's pay would likely be lower, the military would not need to pay and equip the PMCs, saving the military money. On rare occasions, strong states use PMCs directly in combat roles. The state can use PMCs in order to avoid direct repression or responsibility for atrocities. Strong states use PMCs to perform tasks that are not direct combat roles but can be used in a way to save money and resources for the military, and the use of private employees keeps political costs down and allows for plausible deniability.

Weak states resort to hiring PMCs because they lack the same military infrastructure as strong states. Building the institutions necessary for a competent military takes generations and is not a problem that can be fixed solely by spending large amounts of money. When these countries face either civil or external war, PMCs are a quick option to be an effec-

tive fighting force. This is a clear example of neocolonialism, as these PMCs are mostly based out of the global north and are often white. These PMCs become influential in the country's governance and direction of fighting due to their alleged expertise and ability to fight. Just like any other sort of governmental or non-governmental organization, PMCs have their own unique institutional goals. Militaries are often trying to maximize their funding and influence within a larger governmental structure, while profit motive drives PMCs. Many PMCs do not have any scruples for working for unsavory benefactors or operating in illegal ways (Singer, 2003). PMCs can bring security and peace to a country in the global south, but they operate in a sort of extractive capitalism structure.The state pays the PMC with revenue that could have been allocated to building a stable state security infrastructure, and over time, from this the state becomes increasingly dependent on the PMC for security. This way, PMCs can provide short-term stability to weak states but stifle their long-term development.

State Use Case Study: The Iraq War

The American invasion of Iraq in 2003 brought the culmination of the political and economic forces that created the modern PMC class that is known today. The emergence of PMCs as distinct and important actors contributed to the chaotic environment of the American occupation (Singer, 2007). PMCs were hired to fill gaps that the American military did not have the capability to carry out. Even though the U.S. military greatly outspends its competitors, it still did have the ability to complete all logistical and security operations when operating a personnel-heavy occupation (Johnston, 2009). The image of Americans in unmarked uniforms and Humvees driving around Baghdad are the famous stereotype of PMCs during the war, but the PMCs completed many essential logistical jobs from food services, and communications, to base and equipment maintenance (Elsea. et al, 2008). Regarding armed affairs, PMCs were mostly used for the security and training of Iraqi forces.

As discussed in the theory section, the need for PMCs rose in the 1990s due to military budget cuts due to the end of the Cold War and the continuation of neoliberal policies (Engbrecht, 2011). The U.S. was the global hegemon, setting the global security and economic order. The centrality of the U.S. to the global order positions it as the most important state to consider as a case study for the use of PMCs. The U.S. not only establishes the terms and doctrines for their use by others but also creates the conditions for their deployment. In 2003, the U.S. was already in the middle of the global War on Terror. In this global security environment, the U.S. could not provide the requisite personnel to carry out the occupation and state-building operation Iraq required effectively. There were domestic and international reasons for this lack of manpower. In the domestic context, the U.S. resorted to an all-volunteer force as traditional recruiting methods proved insufficient in raising adequate manpower. American males must still sign up at 18 for the draft, but reintroducing conscription would have likely have been a political disaster for the Bush administration. PMCs could replace this lack of manpower without the political controversy and were cheaper. "Private Military Contractors can provide the 'surge capacity' necessary to prepare for war" (Verkuil, 2007). Even if the average American PMC made more money than an enlisted soldier, they were still cheaper for the American Government to contract out a PMC instead of spending the thousands of dollars necessary to train and equip a soldier (Engbrecht, 2011). As spending on the military increased, the Pentagon was flush with money, government contracts and short timetables to begin anti-terror operations across the globe. A quick way to expand the ability of the military to operate in so many disparate environments was for it to hire PMCs to fulfill non combat roles.

Over 60,000 armed PMCs were estimated to be deployed in Iraq during the Iraq War, including 135 companies (Banks, 2011). Many were American, but other Europeans and local Iraqis also worked for these companies. The military did not have enough troops that were necessary for the occupation of Iraq. Two other factors made the manpower problem more acute. The lack of anticipated allied support left the U.S. missing

personnel that would fulfill auxiliary roles that the allies would usually fulfill (Johnston, 2009). Former Secretary of Defense Donald Rumsfeld and many others within the Pentagon were major supporters of an evolution in military affairs that would see the U.S. become a more mobile and smaller force on the battlefield. The Pentagon fundamentally miscalculated how many soldiers it would take to operate an effective occupation (Johnston, 2009). On top of many factors, including the lack of troops, Iraq quickly broke down into sectarian fighting while the U.S. struggled to keep any semblance of peace or begin any state-building project. This acute need for manpower led to the U.S. turning to PMCs to fill many of the roles they did. With billions of dollars in Pentagon contracts available, many entrepreneurs were willing to set up PMCs to meet this need.

PMCs in Iraq were not involved in combat operations, yet they provided vital services for the war efforts. Outside of various logistical operations they completed for coalition forces, their main operation was providing security for diplomats and important officials, defending bases, and convoys. PMCs are technically non-combatants in international law, so legally they are allowed to protect various officials who are not considered legitimate targets. Providing defense to bases and convoys that can easily be seen as legitimate military targets calls into question the legal status of PMCs (Banks, 2011). PMCs also provided training to Iraqi Security and police. This highlights the versatility of the use of PMCs in Iraq.

The biggest issue with Private Military Corporations is that there is a critical lack of oversight over their activities. Often since they are a private company, they do not need to document information like whom they work for and what they do and submit it to the government for review. Getting information on these companies proves difficult and helps them operate in the shadows to escape public scrutiny. Many PMCs who had worked for unsavory clients found themselves fulfilling contracts for the coalition in Iraq. This lack of oversight also leads to tactical difficulties for the American military. These companies are not required to follow American chains of command (Isenberg, 2011). As a result, they are often ill-disciplined, and American forces often do not know whom

the PMC is supposed to report to or who is technically in charge. As private contractors operate in a de facto legal vacuum, cases in which employees of PMCs commit gross human rights violations frequently do not face legal consequences (Verkuil, 2007). PMCs also can be a brain drain on the military. Many experienced soldiers sign up for a PMC instead of resigning from the military when their contract expires. PMCs offer significantly higher salaries than the military; this high pay suggests they resemble mercenaries (Starzmann, 2017). Their years of military experience make them valuable employees for PMCs. However, since they got all their training and experience from the military, it can be seen as the military subsidizing the PMCs by millions of dollars. The military then loses capable soldiers to the private sector and has to spend more money training replacements, who might not be as skilled as those they replaced.

The most infamous incident involving PMCs in Iraq was when contractors of the Blackwater Company opened fire in Nisoor Square while protecting a convoy on September 16, 2007 (Zeeman, 2018). They misinterpreted an oncoming car as a terrorist attack and indiscriminately opened fire in the crowded area. It resulted in the death of 15 Iraqi civilians and dozens of injuries (Banks, 2011). During the investigation that followed, the contractors involved in the shooting were charged with many crimes. Yet, they were granted immunity in an Iraqi court and were prosecuted in the U.S. Due to a legal technicality, they were all acquitted and walked free. "The group mindset prevalent at the time in Baghdad allowed intelligent, law-abiding young American men to become killers in the same way the SS inducted sharp, outstanding Germans under the Nazi reign," (Engbrecht, 2011). The Nisoor Square Massacre is an example of PMCs' lack of accountability and their connection to human rights violations.

Private Use Case Study: Dakota Access Pipeline Case Study

Background

January 2016 saw the approval of the construction of a Dakota Access Pipeline (DAPL), that would create a direct transport of crude oil from

the Bakken oil fields in western North Dakota through South Dakota and Iowa into oil terminals near Patoka, Illinois (U.S. Army Corps of Engineers, 2016). The pipeline is owned by two companies, Energy Transfer Partners LP and Sunoco (Kelly, 2018). In December 2016, under the Obama Administration, easement for the construction of the pipeline under the Missouri River was denied by the Corps of Engineers, halting construction . The following month in January 2017 the Trump Administration signed an Executive Order reversing the decision and the pipeline was finished in April 2017, and it continues to operate today (Smith and Kassam, 2017). The original proposed path for the pipeline would have seen it go across the Missouri River just North of Bismarck, North Dakota, the capital of the state. This path was denied due to concerns about pollution of the city's water; the population of Bismark was 92.4 percent white in 2015 (U.S. Census, 2016). The alternative that was selected had it go under the Missouri River and extend just half a mile from the Standing Rock Sioux reservation. The construction of the pipeline would destroy ancestral burial grounds as well as potentially poison the water system which includes Lake Oahe of the Standing Rock Sioux tribe, a sovereign nation that has the right to, "Undisturbed use and occupation" of the reservation land surrounding the area where part of the pipeline would be constructed. This agreement was negotiated through Article 2 of Fort Laramie Treaties of 1851 (Native Knowledge, 360). This pipeline would also potentially heavily pollute the water of millions of people who rely on the Missouri River if there was ever a spill or break in the pipeline (ACLU Staff, 2017).

Grassroots protests

Protests began in April, 2016 when indigenous youth from surrounding communities organized a grassroots campaign opposing the pipeline. This campaign eventually led to the creation of a camp by the organizers for protestors, this the movement and their famous hashtag #NoDAPL would gain national and international attention. This movement brought together people from over 300 different indigenous tribes from all over the world as well as environmental justice activists who represented a

diverse range of identities and backgrounds. They all arrived at Standing Rock with the shared goal of preventing the construction of the pipeline through Sioux territory. Throughout the ensuing 10 months they would face violence and repression from official state authorities and PSCs all managed by the security corporation TigerSwan, at the behest of the pipeline owners (#MoveMe, 2020).

Figure 1: Veilleux, 2016.

PSC TigerSwan

There were a variety of PSCs on the ground, hired by Energy Transfer Partners to fight against the protestors. They employed a variety of extremely dangerous tactics that directly led to the #NoDAPL movement received even more international media attention, including shooting protests with water hoses during freezing temperatures and using attack dogs that severely injured a number of protestors (Goodman, 2016). The kind of tactics brought negative press to the efforts for the pipeline and

would eventually lead Energy Transfer to contact TigerSwan and bring them to act as the supervisor for the other security companies. Tiger-Swan is an International private security company, founded in 2008 by Jim Reese, who was formerly a U.S. Army commander of special operations in Iraq and Afghanistan. The company offers a diverse set of services including that of training military and security forces, information gathering, surveillance, information dissemination, and cyber security (Hagen, 2017).

Abuses and Crimes

TigerSwan is not an official law enforcement entity, meaning they do not operate to protect constitutional rights such as that of privacy and they do not use ethical tactics, nor do they exclusively use legal means (Brown. et al, 2017). TigerSwan even after nine months of on the ground and supervisory work at DAPL did not have a license and neither did any of their operatives to work in the State. These clear violations of the law are very in line when it is revealed that armed operatives had, "Lax training standards and haphazard oversight," (Zamost and Griffin, 2014). Counterinsurgency tactics were deployed by TigerSwan at DAPL,

these are straight from The U.S. government's Counterinsurgency Guide. Presented in the guide is the two parts of information tactics: intelligence gathering and use of the intelligence to influence different groups of the repressing the resistance, in this case the resistance was #NoDAPL (U.S. Government, 2009).

One of the main tactics of these corporations is working to discredit and turn the public against the environmental movements that they are tasked with repressing (Grossman, 2019). This counterintelligence repression was used against the indigenous anti-mining movement in Guatemala. From 2010 to 2019 the Tahoe Resources company operated the Ecobal Silver mine project, this land was the traditional land of the Xinca people and the company brought in both International Security and Defense Management and the Golan Group, security companies similar to Tiger-Swan to repress the protests (Argueta, 2013). These groups used counter-

insurgent tactics including lobbying the U.S. government, spreading information that the protesters were actively preventing the development of health, education and economics of the regions, and working to leak personal information and spread misinformation of illegal actions by the protestors to media outlets (El Observador, 2017) The counterinsurgent tactics mixed with less scrutiny against them allowed them and allows other PMSCs to operate using unethical and invasive tactics to gather info and to disseminate this info in a campaign to spread misinformation and villainize the #NoDAPL movement.

Relationship between international corporations, capital, and PMSCs

The Dakota Access Pipeline is a massively expensive piece of infrastructure, costing a reportedly 3.8 billion dollars to construct and is able to transport 750,000 barrels of crude oil everyday This importance to the U.S. economy suggests an increase in connection between law enforcement, PSCs, and extractive corporations. It was seen as a necessary solution to bring in more PSC's and give them more power due to corporations putting pressure on government authorities (Brown et al., 2017). The pipeline was financed by international financial institutions including Barclays, JP Morgan Chase, Bank of America, Royal Bank of Canada, Morgan Stanley, BNP Paribas, DNB Capital and ING Bank (Miles, 2016). The relationship between extractive corporations and the PMSCs with the support and approval of the state makes sense, especially when understanding who the extraction is benefiting and hurting the most. This pipeline benefits the powerful corporations and states actively destroying the earth and communities and it works to endanger physical safety, destroys important cultural sites, and further erodes the sovereignty of indigenous communities. #NODAPL stands as representation of indigenous resistance against the Dakota access pipeline as well as resistance against PMSCs and extractive corporations broadly. These abuses committed by the TigerSwan and other security companies present at DAPL as well as the extractive corporations and official government authorities replicate and continue the long legacy of colonial domination and violence (Granovsky-Larsen, 2020).

More Than Just Hired Guns

Market

Current projection of Private Military Security Corporations exceeds approximately $450 billion by 2030 with an annual expected growth rate of 7.4 percent from 2020 to 2030 (ASD News, 2020). Demand continues to grow, this is believed to be due to a variety of factors including PMSCs expanding their roles for which they are capable due to the more accepted prevalence of world governments privatizing functions that have been normally done by the state, and the power of the U.S. market.

Governance

PMSCs are aware of how they are perceived by a variety of actors internationally and have intentionally worked to change their image and invested heavily into websites and PR to manage their perception (Kruck and Spencer, 2013). A multitude of PMSC work to highlight on their websites the auxiliary and support services that they offer, this diversification has caused their explosive growth. They have worked to provide functions usually conducted by the government but since Neoliberal Revolution, have been brought into due work that is challenging or that is cut from the government budget (Prem, 2017). Full spectrum services including things such as cyber security, training, consulting, risk assessment, research, and general operations for sites are logistically challenging and very expensive, world governments have often brought in Private Military and Security companies that offer a wide range of support in the governance of the country (Roorda, 2012). They are essential parts of governance for states across the globe, two examples include Nigeria's oil extraction and Sierra Leone's diamond mining, which have had a symbiotic relationship with the PSC's that help to operate and safeguard these extractive corporations that are a huge part of their countries' economies. These private firms often have the financial, technical, managerial ability that surpass that of the state (Abrahamsen and Williams, 2009). Both case studies provide examples of states giving more power to PMSCs who in turn work to gain even more power and erode state authority

and protections to people globally.

The connection between the erosion of state authority, extractive corporations, and the world of PMSC is made even more salient when examining the content of a proposal given by Erik Prince to the Trump Administration in 2018 regarding the occupation of Afghanistan (Copp, 2018). Erik Prince is the founder of Blackwater, now named Academi. Prince has a long history of operating PMSCs across the world and is very aware of how to gain more power and this is illustrated through the proposal (DeYoung, 2018). His presentation highlighted a pitch to shift the operations of the occupation over to him and his company that would work on extraction of rare earth elements in two of Afghanistan's most mineral rich provinces of Nanghar and Helmand to pay for the security efforts in the country. He writes, "Over time, a strategic mineral resource extraction funded effort that breaks the negative security economic cycle" (Roston, 2017). What is portrayed here clearly by Prince is an understanding that PMSCs can take advantage of a military occupation to enrich themselves and keep themselves in power by taking over control. He recognizes the power of profit that comes from the extraction of natural resources and with the estimated value it would be within the interest of the governments and corporations to keep the operation going. PMSCs have been shaped by world governments but they plan to shape them and put themselves in power.

Policy Proposals

Increased regulation of PMSC firms is necessary both domestically and internationally to reign in their worst behaviors and to stop the development of private actors that can potentially compete with states for political power and resources in a way that would resemble the early modern period as a whole, from the 16th to the 18th century in Europe. These policy proposals will begin as more theoretical and global in stature, and work down to the local section.

The global security environment must fundamentally change in order to stifle the growth of PMSCs. Like a fire needs oxygen, PMSCs need a

global order filled with conflict, and actors need their services to generate profit and growth. The current war in Ukraine and the specter of war between China and the U.S. over Taiwan in the future has many believing that we are moving away from an era of global hegemony dominated by the U.S. into an era of multipolarity. Any sort of transition in the international order can lead to conflict. International leaders must be made hyperaware by their public that war is not a necessary or good policy option in the era of nuclear weapons. The emphasis should be put on the global climate crisis that in the coming century and beyond will threaten the security of more people than any individual state could possibly pose. Undoubtedly, PMSCs will be used in various capacities in these conflicts, and will likely see their power and influence grow. Through public pressure campaigns, leaders in all countries, and especially the U.S. as it loses its paramount position in the international hierarchy, must be pressured against the start of any great power wars that will as a result empower PMSCs.

The one fundamental action that states on the domestic level can do to lower the global temperature is to lower their military spending. This takes away the ability for states to wage prolonged conflict, takes away potential funding from PMSCs, and signals to other states that war is not a policy priority for states. In the current era that has seen a rise in military spending, it will be nearly impossible to curb spending. It would require buy-in from the most powerful states and the willingness of the international community to enforce spending cuts on bad actors who will be incentivized to increase spending to gain a competitive advantage against rivals. Even if cuts in spending seem unfeasible in the current geopolitical moment, intense diplomatic efforts could see positive steps taken to cut international spending. Funds earmarked for defense spending can be directed into globally productive ventures like policies to fight climate change and international development projects. By changing the incentive structure for states to use PMSCs by decreasing global levels of hostility and changing state priorities, PMSCs become less useful to states. This sees their funding drop, fewer chances of them committing human rights violations, and their move to more marginal roles in gov-

ernance and the economy of states worldwide.

The international legality of PMSCs must also be changed. There is the 2001 Convention on Mercenaries, a 21 article convention that aims to fight against mercenarism as well as works to prohibit the use of mercenaries, but this is weak law that states like the U.S. and Russia have not signed onto (OHCHR, 1989). Often PMSCs have legal defenses against the charges of being mercenaries from domestic sources. It is impossible to see any feasible ban of these groups at the domestic or international level due to their rapid growth and state dependencies, but important regulations can be imposed on their use and capabilities. A good step would be to strengthen the international ban on mercenaries by specifically defining the proper use of PMSCs in the international setting. Their capabilities should also be strictly regulated so that they can not have similar weaponry and equipment that is comparable to militaries. This will make them less valuable and reduce their capacity for violence and their potential to act as independent fighting forces on the battlefield. Legal regulation can reduce the potential harm that PSMCs can inflict and keep the phenomenon from spiraling out of control to the point in which they cannot be regulated.

Conclusion

There is a strong relationship between extractive corporations and Private Military Security Companies across the globe. The extraction of natural resources is a major component of global capital, through industries such as fossil fuels and fossil gas and they work to disrupt the lives of millions and potentially billions of people. This has led to movements arising to challenge and disrupt the extraction. Governments globally employ PMSCs as tools of repression to counteract movements against environmental extraction. Cultural and physical violence perpetuated by the extractive corporations, with the consent of the government and the security protection of TigerSwan and other security companies, is reflected in DAPL. As PMSCs diversify the broad range of services and products, their use and prevalence will continue to grow. The growth of PMSCs represents the comparative growth of corporations vis-a-vis

states.

The growth of PMSCs decenters the state, but it is not a positive development in the growth of governance infrastructure. The flaws of the nation-state are well known and documented, and efforts to tame the power of the state and marginalize nationalist tendencies are laudable, the potential of PSMCs to dislodge state power might lead to governing entities that are less accountable. PSMCs could potentially be the first sign of the next stage of human governance in which corporations play more of a visible role in governing than they do today through direct use of force. Potentially some sort of corporate authoritarian in which corporate power is exerted in a more naked and blatant way, and formal state structures exist to bestow legitimacy to corporations instead of being conduits for their policy interests. It is possible to ensure a future like this does not occur, but just like the early modern period that saw the end of traditional mercenaries, we are in a period of great global crisis. Through periods of crisis, new governing and economic structures emerge to address the instability in the system. In a global order suffering from pandemics, great power conflict, severe global inequality, and the overwhelming specter of climate change, new policies and orders will develop to cope with changing conditions. Through global collective organization and awareness, a positive, egalitarian, and human-centric alternative to corporate authoritarianism could emerge.

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University-Sponsored Business Accelerators in Chile: Case Studies from UDD Ventures and Instituto 3IE

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Introduction

Business accelerators are popular sources of support for startups and early-stage entrepreneurs, offering funding, mentorship programs, networking opportunities, and more. As of 2022, there are 530 cities in 86 countries where accelerators are present. Prior to accelerators, entrepreneurs primarily sought funding from business angels and financiers (Gonzalez-Uribe, 2022). This method caused high barriers to entry, as every entrepreneur does not have access to a network of business angels or received the proper education on starting a business. Accelerators help close this gap by making the process of starting an enterprise and sustaining a new venture more accessible to the wider population. By allowing more people to start successful businesses, this contributes to entrepreneurial ecosystem growth, creating positive effects on the accelerator, participants, non-participants within the surrounding community, and socio-economic growth (Moed, 2018). Figure 1 in the appendix demonstrates the multi-dimensional impacts of business accelerators (Gonzalez-Uribe, 2022).

Prior researchers sought to understand the effects of accelerators on participants and the wider, indirect effects on non-participants. However,

their findings are decentralized and fragmented. While research was conducted on entrepreneurship, there is sparse information about university-sponsored accelerators specifically and how they contribute to the overall entrepreneurial ecosystem and socio-economic growth. For the purpose of this research, Chile is the main focus due to its reputation as one of the best places in the world to build a startup. Its dynamic entrepreneurial environment contains various university-sponsored business accelerators, which have positive socio-economic initiatives. Furthermore, the accelerator application system experienced significant change since the COVID-19 pandemic, the effects of which have yet to be discussed.

This research aims to explore the role of university-sponsored business accelerators within the entrepreneurial ecosystem in Chile and how they affect participants and non-participants. Through the entrepreneurial lens, this interdisciplinary topic covers several global themes like inequality, social development, and economic development. This research focuses on one country in order to better understand how this global topic manifests itself at a local level. This research provides new insights, uncovering approaches in the university-sponsored business accelerator landscape and the effects they are having on the entrepreneurial ecosystem within Chile. This paper will examine case studies from two different university-sponsored business accelerators located within different regions of Chile to understand their processes and impacts. Additionally, the programming and approaches utilized may be transferable to other business accelerators located across the globe, given that the model is similar globally.

The primary research questions are: How do university-sponsored business accelerators fit into the larger entrepreneurial ecosystem in Chile? What are common approaches and processes? In what ways does this ecosystem affect the socio-economic landscape, such as inequality and business growth? I attempt to answer these questions by exploring the role of university-sponsored business accelerators and the entrepreneurial ecosystem in Chile. I will also examine case studies of two universi-

ty-sponsored business accelerators to showcase their services and programming. The first accelerator is the UDD Ventures, which has offices in Concepción in the BíoBío region and in Santiago, the metropolitan region. The second accelerator is the Instituto 3IE run by the Universidad Federico de Santa Maria located in the Valparaiso region. I will then compare and contrast approaches and processes of these case studies to understand how they interact with the ecosystem internally and externally along with how this ecosystem addresses social and economic themes. I conclude this work with recommendations concerning how university-sponsored business accelerators could potentially increase engagement with students and make suggestions for further research on this topic.

Throughout the years, universities have been called upon to be accountable towards the community they are located in and to contribute directly to local, regional, and national economic development (Hassan, 2020). Universities can do this through a business accelerator, supporting new business ventures through different types of training and support mechanisms while utilizing the resources and networks present at the university. Entrepreneurs benefit from research, expertise in specific fields, networks, and more that are present in the university community. If accelerators interact with students, this provides them with the opportunity for experiential learning through real business cases. These accelerators lie at the intersection of industry, academia, and government, or what is called the "triple helix" (Hassan, 2020). Within this triple helix, the strategic role of the university is in local production processes and knowledge transfer, as they can contribute to local development while promoting an inclusive approach (Ramirez Sánchez, 2017). This inclusive approach considers, "Different groups of students and scholars, and catering for the cultural, social and economic specificities of a local space," according to Ramirez Sánchez (2017). Reinforcing these links provides benefits and positive externalities to the university and society through technological transfer, research outcomes, and market commercialization. As shown in Figure 1 in the appendix, university-sponsored business accelerators provide outputs for participants (entrepreneurs) as

well as non-participants (society and the economy) by increasing innovation and creativity, increasing income generation, empowering youth, and increasing the success rate of new projects (Hassan, 2020).

Accelerator Landscape in Chile

To better understand the impacts that university-sponsored business accelerators make, it is important to know the general landscape of accelerators that exist. According to Gonzalez-Uribe and Hmaddi, accelerators have three dimensions which determine the type of accelerator that they are: strategic objective, sponsorship, and type of support offered, as shown in Figure 2 of the appendix (2022). The strategic objective is growth-oriented, which aims to support businesses with the highest potential to scale, or impact-oriented, which aims to address societal or environmental challenges, like working with marginalized communities or with ventures in high-impact sectors. Growth-oriented accelerators provide resources in exchange for equity stakes in the businesses they support, while impact-oriented ones may be equity-free, or, depending on the business' potential for impact and scaling, they may take a small equity stake (Gonzalez-Uribe, 2022). Accelerators can use a hybrid form of these strategies, as is the case with Chile's own Start-Up Chile. The Chilean government created this accelerator in 2010 to help boost local entrepreneurial ecosystems by supporting high-growth participants and the positive externalities that are associated with them which impact other local companies (Chilean Economic Development Agency, 2023). It is highly competitive to get into but hosts free events that engage the wider community as well.

As for the types of sponsors, these can be for-profit entities, not-for-profits, governments, or a mixture. Not-for-profit sponsors typically support impact-oriented accelerators. University-sponsored accelerators typically fall under this category. Governments also support impact-oriented accelerators or hybrid ones, as is the case with Start-Up Chile, which is sponsored by Corporación de Fomento de la Producción (CORFO), the Economic Development Agency of Chile (Gonzalez-Uribe, 2022).

The type of support offered is either financing or capability-building. The terms of financing vary, but most accelerators take only a small equity stake while others do not take any equity. Capability-building can be a wide variety of support options. Training, mentorship, in-cohort networking, and shared office space are all examples of ways accelerators support entrepreneurs. Some accelerators do training in cohort groups while others offer more individualized support. Mentorship is usually a component; entrepreneurs can be assigned a mentor, or they may be introduced to a variety of mentors.

For individual university-sponsored business accelerators, the mix of these dimensions can vary, but typically they have a hybrid objective and not-for-profit sponsorship given that they are affiliated with universities and provide capability-building rather than financing. In Chile, CORFO selects the participants of the accelerators on behalf of the university-sponsored accelerator. CORFO has two programs which university-sponsored business accelerators are a part of: Semilla Inicia (Initial Seed) and Semilla Expande (Startup Seed) ("Semilla Inicia"). Semilla Inicia is for entrepreneurs who are still in the idea or prototype stage of their project and have not yet had any sales. This program looks for innovative ventures that address a relevant problem or opportunity at the regional level at minimum, with the potential of expanding into new markets. Semilla Expande is for businesses with high growth potential that have already had initial sales of at least $100,000 within the last 12 months of application. These businesses must provide innovative solutions and have the potential to expand into new markets (Chilean Economic Development Agency, 2022).

These programs have different target markets and goals for the projects. Although the overall process is the same, as shown in Figure 4 of the appendix, the application evaluation criteria differ. For the Semillia Inicia funds, the evaluation criteria are broken up into two parts: national and regional. Both of these are evaluated on the same three criteria: innovation (40 percent), scalability (30 percent), and team (30 percent). The differences are in the sub-criteria. At the national level, innovation

is measured by the value proposition (30 percent) and market demand capacity (10 percent). Scalability is measured by market factors (15 percent), validation strategy (10 percent), and business model (5 percent). The team criteria are measured by the complementarity of the group of entrepreneurs who will work on and manage the project. The complementarity is determined by examining the technical and professional backgrounds of each member of the team to see how well the roles fit together. On the regional side, innovation is measured by the relevance of the problem (30 percent) and capacity to solve it based on present sectoral and regional factors (10 percent). Scalability is measured by the market barriers to entry and positive and negative externalities (15 percent), validation plan (10 percent), and social and environmental sustainability (5 percent). Lastly, the team is measured by team capacity (15 percent) and team commitment (15 percent) (Chilean Economic Development Agency, 2022).

In contrast to the Semilla Inicia application, the Semilla Expande application is not broken up by national and regional criteria. Although it has the same main three criteria and weight as above, the sub-criteria is different. Innovation is measured by the relevance of the problem (15 percent), value proposition (20 percent), and state of progress (5 percent). Scalability is measured by the business model (10 percent), market factors (10 percent), expansion plan (5 percent), and social and environmental sustainability (5 percent). Finally, teams are measured by team capacity (12 percent), team commitment (13 percent), and networks and/or alliances (5 percent)(Chilean Economic Development Agency, 2022).

Each of these criteria is utilized and used to evaluate each application. Following this, CORFO communicates the results to the applicants, entrepreneurs rank their top choices for accelerators that they would like to work with, and then they are notified of their placement. The university-sponsored business accelerators are responsible for setting them up for success in the market and in coordination with CORFO's requirements. However, supporting the beneficiaries of the CORFO programs is not

the only function of these university-sponsored business accelerators. They also have their own projects and activities as well, allowing them to affect the entrepreneurial community and external environment. I will explore these areas in the case studies below.

Case Studies: University-sponsored accelerators in Chile

UDD Ventures

UDD Ventures is the accelerator of the Universidad de Desarrollo (UDD) that offers acceleration services to entrepreneurs and small to medium-sized enterprises as well as innovation services to large businesses. The UDD is a private, not-for-profit university located in Santiago and Concepción. UDD Ventures conducted more than 590 executive training programs and supported over 460 ventures in 12 years. Their various lines of business allow them to interact with a variety of actors in the entrepreneurial ecosystem from a wide range of industries and sectors, such as retail, banking, e-commerce, health, and telecommunications. In 2018 and 2019, CORFO recognized UDD Ventures as the best university-sponsored incubator in the country. In 2021, it was ranked number five globally (Universidad del Desarrollo, n.d.).

UDD Ventures uses the I+V model to accelerate learning for individuals and organizations that are involved in entrepreneurial and innovation projects, as shown in Figure 5 in the appendix. The method of acceleration is based on the following pillars: financial structuring and investment, growth strategy, and commercial escalation. The services include mentor networks, specialized training, advisor councils, angel networks, corporate innovation consulting, technical and financial monitoring, and a portfolio of entrepreneurs. The mentor network consists of over 70 active professionals who use their technical and methodological experience to support these startups and SMEs. Specialized training is customized to fit the challenges that each enterprise is facing to strengthen capacity and incorporate new innovation practices (Caamaño, 2023; Chilean Economic Development Agency, 2022). The council of advisors behave like the Board of Directors of a corporation. These experts stay

up to date on current trends of startups and SMEs to best provide support and guidance. The UDD Ventures network of angel investors takes part in the process of raising private capital. The corporate innovation consulting services consist of strategic planning, team building, and designing and executing processes for each medium and large-sized company depending upon its needs. Throughout the acceleration process, the UDD Ventures team of executives and entrepreneurs monitor each enterprise technically and financially to provide continuous support and ensure results. Additionally, UDD Ventures utilizes its alumni network of over 400 entrepreneurs to help support its current beneficiaries. Lastly, UDD Ventures seeks to build relationships and connections between startups, corporate clients, and investors to launch the startup into success (Universidad del Desarrollo, n.d.). Based on all of these services, it is evident that UDD Ventures provides capability-building support.

As the university-sponsored business accelerator, UDD Ventures is a pioneer of entrepreneurship at the university. The pillars of the Universidad de Desarrollo are entrepreneurship and innovation, and these are experienced by students during their time at UDD. IncubaUDD is a program where students with an idea for a business can participate in the accelerator program. If the idea is valid and the student wishes to pursue the startup, they then apply to receive CORFO funds and select UDD Ventures as their sponsor (Universidad del Desarrollo, n.d.). This is one example of how UDD Ventures engages with the local community. Because UDD Ventures is tied to the UDD, the sponsorship type is not-for-profit.

There are UDD Ventures offices at both UDD campuses. Prior to the pandemic, each office supported growth-oriented entrepreneurial projects within their respective city and region. All programming was executed in-person. Concepción is located in the BíoBío region. The entrepreneurial ecosystem in this region is more supportive and collaborative than the Santiago region, which is more competitive. For example, UDD Ventures may provide resources to another local university-sponsored business accelerator, IncubaUdeC of the Universidad de Concepción.

Now that everything is conducted in a virtual format, there is no difference between the Santiago office and the Concepción office. All of UDD Ventures operate with a national-level model to support CORFO-sponsored projects from across the country.

UDD Ventures offers many types of support for CORFO-sponsored entrepreneurial ventures (the Semilla Inicia and Semilla Expande funds). At the beginning of the project, a UDD Ventures expert evaluates the current state of the venture to be able to give the most informed strategic advice. Additionally, the experts are assigned a Project Engineer and a Financial Executive who work with them throughout the duration of the program as the main line of support (Caamaño, 2023; Chilean Economic Development Agency, 2022). Networking is an important piece to this puzzle, and UDD Ventures offers many unique activities that expose entrepreneurs to a network of entrepreneurs, partners, and the UDD community. Training sessions consist of a variety of workshops that are focused on relevant entrepreneurial themes that are consistently updated to provide relevant support. This program consists of five sessions of one-on-one mentoring with a mentor who has been matched up with the entrepreneur. These mentors provide another layer of support and expertise on legal advice and intellectual property, marketing and communications, digital strategy, raising capital, and web services (Caamaño, 2023).

In addition to supporting beneficiaries of CORFO funds, UDD Ventures also supports small to medium-sized enterprises. This sector of businesses is a key player in economic growth, representing 98 percent of businesses in Chile (Universidad del Desarrollo, n.d.). However, they are presented with technological and strategic gaps. UDD Ventures provides individual support for each client to address their needs and to help them incorporate technology, diminish costs, and grow. The first program is called "Accelerate SMEs," and it is focused on growing sales. It uses some of the principles of the I+V lab presented earlier, such as mentoring, consulting, and training. The second program is called "Digital SME," and it focuses solely on providing digital and technological

support to businesses, as this can be a large barrier that SMEs face and which hinders their growth (Universidad del Desarrollo, n.d.).

Services for large businesses are focused on corporate innovation. In Chile, large corporations may have a difficult time adapting to societal and technological changes within the market due to their traditional structure (Universidad del Desarrollo, n.d.). UDD Ventures offers innovation programs customized to what each company needs. A viable innovation strategy is developed with the company team and innovation training is given by UDD Ventures to help adopt these ideas within the company. Once the innovation model is established, an open innovation approach is utilized where the company searches for an external startup to help them find a solution to incorporate within their business. This helps support the circular entrepreneurial ecosystem, where larger businesses are helping to support startups and SMEs. Alternatively, the company can perform an internal analysis and use an intra-entrepreneurship model. Ideas from the company's team are turned into new businesses and are supported through the business itself (Universidad del Desarrollo, n.d.).

The last area of service offering for UDD Ventures is in executive training, which aims to address various gaps within the ecosystem. Currently, there are three areas of executive training. Utilizing their vast experience in hosting their own mentorship program, UDD Ventures has designed an external-facing mentor training program. This aims to create new mentors within the ecosystem that are focused on supporting growth-stage businesses with unique and novel business challenges. The second service area focuses on strengthening the skills of the directors of growing companies. They are taught critical tools required to support technological companies within the growth stage. Additionally, they are taught about the benefits of diversity in a balanced board, including better business performance and higher shareholder value (Universidad del Desarrollo, n.d.). Offering these types of executive training, UDD Ventures is attempting to impact non-participants down the line by creating more quality mentors in the ecosystem, increasing diversity of Board of

Directors, and preparing people for the future of technology.

Instituto 3IE

The Federico Santa María Technical University's (Universidad Técnica Federico Santa Maria) university-sponsored business accelerator is called Instituto 3IE. This private, nonprofit university has three campuses: Santiago, Viña del Mar, and Valparaiso. The accelerator is housed in the main Valparaiso campus. This campus only offers engineering and technology courses to its students, as its goal is to be a leader in those areas. Therefore, to stay in line with the university mission, the 3IE accelerator, "Promotes entrepreneurship and innovation through programs for entrepreneurs and companies that want to revolutionize the technology industry" (Universidad Técnica Federico Santa Maria, n.d.). Since 2018, more than 70 percent of businesses that participated in 3IE's accelerator program had a post-discharge survival rate. Additionally, they have received over 1,400 applications and had $46 million USD in accumulated sales to the portfolio (Universidad Técnica Federico Santa Maria, n.d.).

Prior to the pandemic, 3IE intentionally selected entrepreneurial projects from the Valparaiso region focused on technology. Entrepreneurs would apply directly to 3IE to participate in the program and receive funds. Then, 3IE staff would select the projects and present them to CORFO, who would then approve or disapprove the projects. 90 percent of the time, CORFO approved the projects selected by 3IE (Universidad Técnica Federico Santa Maria, n.d.). Despite the change in the selection process by CORFO, this accelerator still primarily focuses on supporting projects within the technology industry. This is because the entrepreneurs that elect to work with 3IE are attracted by the university's reputation through institutional knowledge and word-of-mouth. Prior participants of 3IE's programming recommend it to other budding entrepreneurs within the field. However, it is possible that some projects may not be focused primarily on technology and that the projects come from various regions throughout Chile, not just Valparaiso. Due to the pandemic and this change, 3IE, like many other industries and sectors across the globe, has shifted to all virtual programming.

As discussed previously, there are many ways in which an accelerator interacts with the entrepreneurial ecosystem. At 3IE, the two branches or target beneficiaries are entrepreneurs and organizations. There are five service areas for entrepreneurs. Primarily, the entrepreneurs are CORFO-selected sponsors of the Semilla Inicia or Semilla Expande funds. Semilla Inicia beneficiaries participate in the incubation program, which has three principal areas: commercial strategy, marketing strategy, and design/customer experience. Entrepreneurs receive a project manager and have access to workshops and events, among other perks and benefits. Prior to starting the program, a business advisor conducts a diagnostic of the startup to detect needs and gaps. Once the co-created plan between the project manager and the entrepreneur is agreed upon, the incubation services are executed (Universidad Técnica Federico Santa Maria, n.d.).

Semilla Expande beneficiaries participate in the acceleration program, given that they already have a defined business model and sales. Before the program starts, the project is presented to the 3IE committee to evaluate the fit with the incubator. To move forward, a contract is signed between the entrepreneur and 3IE. CORFO receives this documentation next and communicates the start date of the project. The goal of this program is to create a strategic plan that will allow the startup to expand quickly and efficiently not only in Chile but abroad as well. Ventures choose from the following focus areas: Growth Strategy plans (key factors are developed to grow rapidly), Capital Raising (prepare team for investment rounds), or Internationalization of Companies (connections with strategic contacts primarily in the U.S. and Latin America) (Universidad Técnica Federico Santa Maria, n.d.).

As sponsors to the CORFO funds, it is the accelerator's responsibility to ensure that the entrepreneur is adhering to the requirements of CORFO. Therefore, they offer financial advice such as support of monthly expenses execution and preparing for accounting reviews, CORFO platform advice, and budget advice. In addition to the incubator and accelerator services, they also offer mentoring. Instituto 3IE has 96 mentors in its

network. 49 percent are managers and business executives, 32 percent are from the entrepreneurial ecosystem, and 19 percent are from academia (Universidad Técnica Federico Santa Maria, n.d.). To ensure the best mentoring fit for the entrepreneur, 3IE staff look to first understand the needs of the entrepreneur. Once both parties are satisfied with the match through a crossover meeting, five mentoring sessions take place. At the close of the program, evaluations occur to assess success.

For organizations, there are two lines of services: Mentor Training and Certification Program and the Introduction to Mentoring course. The mentoring program geared towards entrepreneurs has seen enough success and effectiveness for 3IE that they decided to offer the program to national and international clients. The first goal of the program is that participants learn key principles of being a mentoring consultant for technology-based ventures. The second goal is to learn the role and function of the consultant. The third goal is to learn how to access necessary tools, techniques, and methodologies (Universidad Técnica Federico Santa Maria, n.d.). The positive externalities of this program are twofold; for those associated with the program, it offers continuous learning and improvement. For 3IE, it expands its knowledge into other areas through the shared experiences of participants. The final expected result of the program is to, "Integrate a select group of mentors at the national level with the necessary skills to support ecosystem ventures in different areas," (Universidad Técnica Federico Santa Maria, n.d.). Therefore, 3IE, like UDD Ventures, attempts to make an impact on non-participants as well.

The Introduction to Mentoring course is a smaller alternative to the Mentor Training and Certification Program. It offers four virtual training modules to networks of national and foreign mentors, companies, organizations, and managers who are interested in developing mentoring skills and competencies. The objectives of this program are to learn the key principles and techniques of mentorship, and to expand knowledge about ethical decision-making, collaborative conversations, and advancing the venture (Universidad Técnica Federico Santa Maria, n.d.).

Upon completion of the modules, participants can elect to add on the remaining four modules that would accredit them with the USM mentor certification. This is the same one that participants of the Mentor Training and Certification Program receive.

Comparing and Understanding University-sponsored Business Accelerator Impacts

As the case studies above demonstrate, there are similarities between the programs and services of university-sponsored business accelerators in Chile. Both accelerators are affiliated with private nonprofit universities and have the same type of accelerator profile as defined by Gonzalez-Uribe: growth and impact objective, not-for-profit sponsorship, and capability-building support. Gonzalez-Uribe and Leatherbee conducted a case study on Start-Up Chile, which provided evidence that providing capability-building support is more important than providing funding. Although Start-Up Chile is sponsored by the government and not a university, it does have a similar profile to the university-sponsored accelerators aside from this.

Their capability-building is offered to sponsors of CORFO funds and the wider entrepreneurial community. This diversification of services allows them to affect non-participants, increase their own resources and operational revenue, and, in some cases, contribute to advancing certain development indicators. Through Instituto 3IE's Mentor Training and Certification program, it is growing the number of people throughout the community who are trained in mentorship and ethical decision-making. These principles may then be passed down to others who these trained mentors interact with. The UDD Ventures executive training programs attempt to fill gaps in the market and address diversity and inequality issues. If successful, this type of programming has the ability to increase gender equality over time. They also have programming which intersects large corporations, SMEs, and startups, connecting these businesses with one another where appropriate to solve each other's problems. Encouraging this type of collaboration may help to nurture new business relationships and economic growth.

Prior to the COVID-19 pandemic, this type of development focused on capitalizing on regional strengths where the university-business accelerator lies. Events and programming were conducted in-person. CORFO encouraged accelerators to define their own profile: innovative (high entrepreneurship potential) or traditional (local impact) (Chandra, 2012). These profiles also align with the university's mission statement and reputation. Because each university is unique in what it offers, this causes the affiliated university-sponsored business accelerators to have differences. Instituto 3IE focuses on projects within the technology industry. UDD Ventures has a wide range of projects due to alignment with the university's mission statement and reputation. Another difference is the locations of these accelerators: Valparaiso, Concepción, and Santiago. Each city and region differs in size and resources, which impact the delivery of the university-sponsored business accelerator's services. While the COVID-19 pandemic did create a multitude of challenges, this crisis has provided the opportunity to re-evaluate certain processes and policies to better ensure a more just society, a diverse and dynamic business sector, and supportive public services (Office of Clean Energy Demonstrations, 2021).

With the new application model, the university-sponsored business accelerators do not select projects they support and all programming is conducted virtually. CORFO does the selection process and provides the accelerator with a list of entrepreneurial projects. For Semilla Inicia funds, the evaluation criteria are broken down into regional and national, while Semilla Expande funds just focus nationally. The entrepreneurs choose to participate in each accelerator's program because of word-of-mouth and/or university reputation. These projects may still be located within their region. However, it is more common to be given projects from all over Chile. For example, UDD Ventures in Concepción may be supporting an enterprise located in Antofagasta over 1,100 miles away.

Although the university-sponsored accelerators have less agency over which projects they work with and support, it is now more feasible for an entrepreneur from a smaller region or city to be selected to partici-

pate in an accelerator program. Due to this change, there is the potential that university-sponsored business accelerators may help contribute to lessening income inequality over time as lesser developed regions receive more opportunities for startup growth. However, a downside to this increased centralization is that it can create more bureaucracy and "red tape," which has already been noted to be an issue with CORFO in 2012 with its lack of strategic goals for accelerators (Chandra, 2012). The OECD believes if Chile is capable of reducing the complexity of these regulatory procedures that businesses are more likely to grow, leading to gains in productivity (Office of Clean Energy Demonstrations, 2021).

Another way that they could make an impact in this area is through their interactions with the university students. Since UDD Ventures has knowledge about the impacts of diversity within large corporations, this concept could be applied at the student-level. Some methods to do this include, "Making entrepreneurial education accessible to all students, mixing students from economics and business studies with students from other faculties and with different backgrounds" (Hassan, 2020). However, given that there are already high inequalities between public and private universities within Chile, this may be difficult to do at this specific university. Because access to quality education in Chile is strongly linked to socio-economic status, more attention needs to be given to how opportunities are distributed so as to not continue to perpetuate inequality (Office of Clean Energy Demonstrations, 2021).

An example of a successful collaboration between university students and low-income entrepreneurial women took place in 2013 at the University of Viña del Mar, located in the Valparaiso region. Students and professors at this university worked as consultants for this group of entrepreneurs. The benefits were two-fold: the students gained professional experience working for a real-world client while the entrepreneurs received training and development opportunities (Ramirez Sánchez, 2017). This collaboration would not have been possible without funds received from the Innovation and Competitiveness Fund from the Regional Government of Valparaiso. This showcases the triple helix model and the importance

of coordination between universities and local government in order to address local development and economic opportunities. The market is inefficient, information asymmetries are common, and funding and capability gaps are ever present (Gonzalez-Uribe, 2022).

At Instituto 3IE, there is not great interaction with the student community aside from being located on the same physical campus. At UDD Ventures, the students are exposed to the accelerator program through an optional course and have the opportunity to participate in internships with some of the ventures that have passed through the accelerator. "Faculty and students serve as major resources for project development and commercialization for university-related incubators–experiential learning for students, faculty engagement, fostering innovation and contributing to economic development and society at large" (Chandra, 2012). The correlation between industry, development, and academic research creates opportunities for the generation of new knowledge and new businesses with supportive entrepreneurial activities (Hassan, 2020). Therefore, expanding more opportunities of interaction between the university-sponsored business accelerators, their projects, and students may create more positive outcomes.

Conclusions

This study of university-sponsored business accelerators and their impact on participants and non-participants is a new area of focus and contributes to the overall knowledge about the Chilean entrepreneurial ecosystem. This elevates perspectives of the university-sponsored business accelerator. The UDD Ventures and Instituto 3IE case studies showcase common processes and approaches utilized. These cases provide evidence that these types of business accelerators specialize in capability-building programming. A large part of this programming is supporting beneficiaries of CORFO Semilla Inicia and Semilla Expande funds to set them up for success in the market. They also offer programming and support to the wider entrepreneurial ecosystem, such as through training on innovation strategies and mentorship. These different programming areas allow university-sponsored business accelerators to have multidi-

mensional impacts on both participants and non-participants. The case studies revealed potential areas to increase impact through additional engagement with university students. The research suggests that these types of collaborations can have positive effects on both students and entrepreneurs, creating increased knowledge, skills, and professional development.

Following the start of the COVID-19 pandemic, students and entrepreneurs have had to adjust to the application process change by CORFO. This shifted the program delivery to a virtual format, took the application process away from the accelerators, and required them to shift from supporting projects within their physical region to supporting projects potentially all throughout Chile. The impacts of this change on the entrepreneurial landscape and social and economic development outcomes have yet to be uncovered, given that it happened recently and has not yet been studied. Therefore, it is suggested that future research explore this area.

Future questions to pose in this area include: How does the national accelerator application model impact the region and community where each accelerator is physically located? Does it still help boost business development in each respective region? Does this national accelerator application model change provide more business development opportunities for people from marginalized communities and backgrounds? This type of study makes it difficult to measure the impacts each accelerator has on the community and region given that there are a number of confounding variables. However, by collecting qualitative data from different triple helix stakeholder perspectives within the entrepreneurial ecosystem combined with quantitative data about where accelerators and entrepreneurs are located and the business growth in those areas could provide some insight.

University-sponsored business accelerators are an important piece within the triple helix of government, industry, and academia, sitting at the intersection of these three. They have the ability to convene important players within each of these sectors and contribute to a healthy entre-

preneurial ecosystem. Given that CORFO and the Chilean government are historically agile when responding to environmental changes, it is possible that with more evidence and support, coordination of the triple helix can enable the university-sponsored business accelerators to increase their impact on participants and non-participants, contributing to positive social and economic development outcomes.

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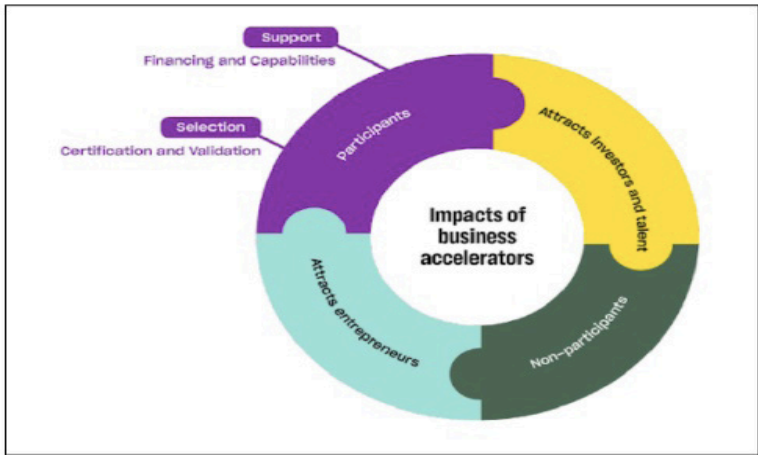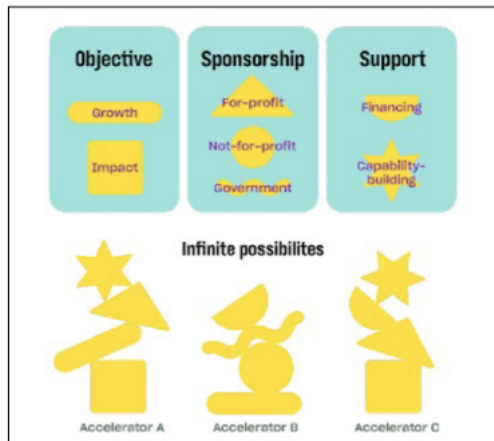
Appendix

Figure 1: Gonzalez-Uribe 2022.

Figure 2: Dimensions of Business Accelerators. Gonzalez-Uribe 2022.

Key Dimensions of Business Incubation	Chile
Strategic Focus	High growth, high impact entrepreneurship. Emphasis on technological innovation and entrepreneurial capability
Business Incubator Funding	Govt. main source of funds, private participation is on the increase, universities play supporting role.
Type of Incubatees Business	High tech, high growth preferred. Regional resource based businesses, i.e., salmon, wine.
Service Profile	Hard- administrative and rental; soft- networking with emphasis on the latter.
Financial Services	Incubators play linking or bridging informational role. Provide access and information on various lines of govt. funding.
Role of Government	Visible hand of government in terms of financial support; yet incubators make independent decisions. Support for angel network and for incubator trade associations.
Role of Private Industry	Increasing involvement of private industry in incubator and incubate development.
Role of Universities	Supporting role, provide intellectual capital and form part of incubator network.

Table 2: Key Dimensions of Business Incubator Design in Chile.

Figure 3: Chandra 2012.

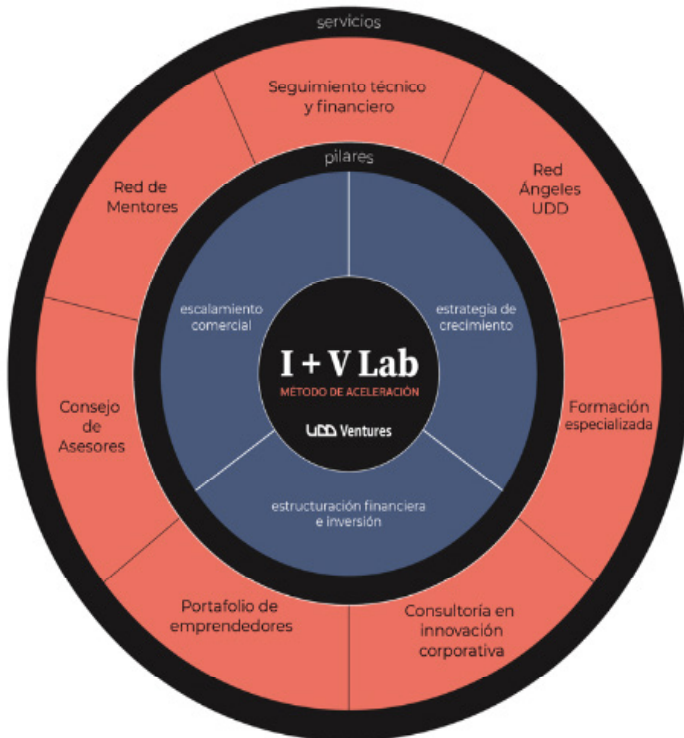*Figure 4: CORFO Semilla Inicia and Semilla Expande process CORFO.*

Figure 5: I +V Lab UDD Ventures, "UDD Ventures."