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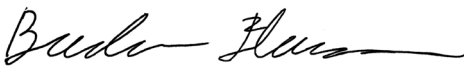


Letter from the Editors

The Martin Institute, founded in 1979, is the University of Idaho's institute for the study of peace. Its humble roots date back to 1939 when Germany invaded Poland and from the fact that war was once again ravaging the world, and founders Boyd and Grace Martin took their \$800 in savings and invested it to one day start a peace institute. All these years later, we have what we affectionately refer to as "The Martin." Dedicated to studying the causes of war, the conditions for peace and global issues, the Martin Institute provides its students in international studies with copious opportunities to engage and become well rounded professionals.

The Martin Institute has been committed to supporting student growth by providing many opportunities for students to get involved on campus and in their education. In 2025 alone, students had the ability to participate in trips such as visiting Washington D.C. to meet alums, travel to New York City to engage in the National Model United Nations Conference, journey to Portland to take part in learning about non-governmental organizations, attend the Student Conference on Religion in the Public Sphere in Utah, and of course, study abroad. Through these privileges, students are allowed to experience different career outlooks, which help deepen our understanding of possible professions. The institute also has opportunities for students to engage on campus, such as being an editor of the Journal of the Martin Institute or being a student committee member for the Borah Symposium. Regardless of how you want to participate, getting involved in Martin gives students the possibility to grow as a person and gain more experience in the professional world.

As editors, we are proud to take an active role in getting involved with the Institute by reading and reviewing the works of the previous seniors, all of whom did such an amazing job in their research and presented what they learned in a very educated way. The uniqueness of the topics was interesting to explore, and it took deliberation and thoughtful consideration to select the top papers. We hope you enjoy learning about these current world issues as much as we did.



Brendan Flanagan
Co-Editor



Kaitlyn Johnson
Co-Editor

It now becomes necessary for us to put our major global problems into a socially relevant global framework.

Our world has become too complex, too interdependent, to answer these questions by simplistic answers.

These problems call for creative thinking...

**Boyd A. Martin, founder of the Martin Institute
at the Institute's inauguration, 1980**



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Sustainability of Coffee Production in Latin American Countries in the Coffee Belt

Olivia Howell

ABSTRACT

This paper evaluates the sustainability of coffee production in Latin American countries. It investigates the sustainability issues plaguing the coffee production industry, such as modern slavery, poverty, and environmental deterioration. After conducting extensive background research, the most optimal solution to the sustainability issues in the coffee production industry in Latin America is to use the NAMA Café program as a roadmap and enhance voluntary sustainability standard certifications. This solution is feasible in several ways and improves all three pillars of sustainability.

INTRODUCTION

The Coffee Belt is a section of the globe consisting of countries along the equator between the Tropic of Cancer and the Tropic of Capricorn.¹ The unique ecosystems within the Coffee Belt provide the ideal climate for growing temperamental coffee trees. Coffee trees grow most successfully in higher elevations, hot and damp climates, with nutrient-rich soil. Many Latin American countries fall within the coffee belt, and several provide the essential environment for coffee plants to thrive. As a result, coffee farming has been the number one principal export for seven Latin American countries and second for another two.² Countries like Brazil and Colombia are the world's top coffee-producing countries, and countries like Costa Rica produce specialty coffees that are desired worldwide.³ The global coffee market

1 Franca, A.S., & Oliveira, L.F. (2019). Chapter 17: Coffee. In *Integrated Processing Technologies for Food and Agricultural By-Products* (pp. 413-417). Essay, Academic Press.

2 Topik, S. C. (2000). Coffee anyone? Recent Research on Latin American Coffee Societies. *Hispanic American Historical Review*, 80(2), 225-266. <https://doi.org/10.1215/00182168-80-2-225>

3 Topik, et al., Coffee Anyone?

is valued at \$223.78 billion USD,⁴ and Latin American countries account for 48% of global coffee production.⁵ Brazil, Latin America's top coffee-producing country, produces over 40 million bags of coffee per year.⁶

While coffee production is significant in Latin America, coffee consumption dominates much of the rest of the world. In 2022, the United States imported over \$4 billion worth of coffee from Latin American countries alone.⁷ Though much within the coffee trade has changed over time, the demand for coffee and the industry's unsustainability have not. Since 2004, coffee consumption in the United States has increased by 37%.⁸ Globally, over 175 million 60-kilogram bags of coffee were consumed in 2021-2022, with an estimated 177 million bags consumed in 2023-2024.⁹

The pressure to meet the ever-increasing global demand for coffee has led to unsustainable practices within the industry. These practices include poverty and pay discrepancy, unacceptable working conditions, and deforestation, among others. Approximately 50-100 million people involved in the coffee sector, including both farm workers and owners, are living below the extreme poverty

line.¹⁰ This has led to many documented cases of forced labor, child labor, and gender inequality in the coffee sector.¹¹ The increase in demand for coffee has led many coffee farms to prioritize quantity over quality of coffee at the cost of the environment and the well-being of the workforce. This combined with climate change has resulted in environmental issues such as loss of soil fertility, habitat loss, deforestation, and biodiversity loss.¹² Paradoxically, farmers are making less than the cost of what it takes to grow the coffee beans, extreme weather events are destroying crops and making harvests unpredictable,¹³ and biodiversity is plummeting in areas because of various forms of habitat loss.

Furthermore, poor working conditions, environmental degradation, and negative economic impacts are active examples of unsustainable practices within the industry. This paper will evaluate the sustainability of Latin American coffee farms and suggest alternative solutions.

PROBLEM ANALYSIS

Coffee has strong economic implications in Latin American countries, though they are not always for the better. Many coffee farmers and farmworkers are living in poverty, with a portion of them living under the extreme poverty line of \$1.90 USD a day.¹⁴ However, while most coffee farmers and coffee-producing countries live in poverty, coffee consumption is at an all-

4 Grandview Research. (2023). *Coffee market size, Share & Growth Analysis Report, 2030*. Horizon. <https://www.grandviewresearch.com/industry-analysis/coffee-market>

5 O'Neill, A. (2024, July 5). *Average prices for Arabica and robusta coffee worldwide from 2014 to 2025*. Statista. <https://www.statista.com/statistics/675807/average-prices-arabica-and-robusta-coffee-worldwide/>

6 Villa, P. N. (2024, June 21). *Topic: Coffee industry in Latin America and the Caribbean*. Statista. <https://www.statista.com/topics/5244/coffee-industry-in-latin-america/#topicOverview>

7 McCook, S. (2017, July 27). Environmental History of Coffee in Latin America. *Oxford Research Encyclopedia of Latin American History*. Retrieved 14 Sep. 2024, from <https://oxfordre.com/latinamericanhistory/view/10.1093/acrefore/9780199366439.001.0001/acrefore-9780199366439-e-440>

8 National Coffee Association of U.S.A. Inc. (2024, April 11). Daily coffee consumption at 20-year high, up nearly 40%. *NCA*. Retrieved September 25, 2024, from <https://www.ncausa.org/Newsroom/Daily-coffee-consumption-at-20-year-high-up-nearly-40>

9 International Coffee Organization. (2024). *Coffee Market Report: Robustas at 47-year high for two consecutive months*. ICO

10 Barreto Peixoto, J. A., Silva, J. F., Oliveira, M. B., & Alves, R. C. (2022). Sustainability issues along the coffee chain: From the field to the Cup. *Comprehensive Reviews in Food Science and Food Safety*, 22(1), 287–332. <https://doi.org/10.1111/1541-4337.13069>

11 McCook, Environmental History.

12 Bager, S. L., & Lambin, E. F. (2020). Sustainability Strategies by companies in the Global Coffee Sector. *Business Strategy and the Environment*, 29(8), 3555–3570. <https://doi.org/10.1002/bse.2596>

13 Bilen, C., El Chami, D., Mereu, V., Trabucco, A., Marras, S., & Spano, D. (2022). A Systematic Review on the Impacts of Climate Change on Coffee Agrosystems. *Plants (Basel, Switzerland)*, 12(1), 102. <https://doi.org/10.3390/plants12010102>

14 Sachs, J. D., Cordes, K., Rising, J., Toledano, P., & Maennling, N. (2019). Ensuring economic viability and sustainability of coffee production. *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.3660936>

time high in coffee-consuming countries. This is explained by a concept called the coffee paradox.¹⁵ The coffee paradox is when coffee-producing countries are in a crisis, and coffee-consuming countries are experiencing a boom. This happens because coffee beans sold on the international market and coffee beverages sold to consumers are valued different. There are three attributes evaluated: material, symbolic, and in-person service.¹⁶ Material describes the physical parts of the coffee, symbolic describes the reputation (i.e. brand names, certifications, etc.), and in-person service describes interpersonal relationships. Coffee producers only receive money based on the material aspect whereas coffee-consuming countries receive the benefits of symbolic and in-person aspects. Essentially, because the coffee is exported in a raw state and early in the value chain, there is little economic value that stays in coffee-producing countries. This results in farmers and workers living in poverty and starving, with little access to health care or education.¹⁷

Coffee producers living in poverty due to the poor economic implications of coffee production in Latin American countries opens the door for several more issues. High poverty rates have led to many farm owners to go to a piece-rate payment system.¹⁸ A piece-rate payment system is when workers are paid by what they are producing, such as how many coffee beans they pick. While piece-rate payment systems sometimes work, they are often abused and result in wage violations, discrimination, and child labor.¹⁹ In some instances, workers have been given

unattainable daily quotas, like 45 kilograms of coffee picked in one day, to make just the minimum wage of \$3 USD.²⁰ Workers then resort to bringing their children with them to work to be able to meet the quota and provide for their families. Further, scarce employment opportunities in many Latin American countries have forced many people to migrate to work on coffee farms during harvest season, resulting in exploitation of the workers.²¹ In a documentary about forced labor in Brazil's largest coffee-producing region, farm workers share what they have experienced while working on some coffee plantations. Unsafe living conditions with bug-infested water, two bathrooms for hundreds of workers, plantation owners threatening workers with weapons if they tried to leave and taking their papers so they could not return home, and some workers never saw the pay they were promised.²² Women were given half the wages that the men were given if they were paid at all.

Poverty, poor working conditions, and high product demand have led to poor farm management and unsustainable farming habits. In the 1980's, farmers found that sun-grown coffee produces more coffee cherries than the traditional shade-grown coffee.²³ Additionally, many believed that sun grown coffee would limit the amount of disease faced. This was then promoted by many Latin American governments and farmers to increase yields, resulting in mass deforestation. The deforestation of these unique ecosystems within the coffee belt caused biodiversity loss, increased soil erosion, and reduced carbon sequestration.²⁴

20 Verité, Root cause analysis.

21 *The Human Cost of Coffee: Rescuing slave workers in Brazil's farm.* (2024). Aljazeera. Retrieved September 26, 2024, from <https://www.aljazeera.com/program/witness/2024/8/19/the-human-cost-of-coffee-rescuing-slave-workers-in-brazils-farms>

22 The Human Cost of Coffee, Aljazeera.

23 Millard, E. (2017, December 1). *Still Brewing: Fostering Sustainable Coffee Production.* World Development Perspectives. <https://www.sciencedirect.com/science/article/pii/S2452292917300899>

24 Reeves, P. (2021, September 22). *How Brazil's severe drought affects the entire world's Coffee Supply Chain.* NPR. <https://www.npr.org/2021/09/22/1039800090/how-brazils-severe-drought-affects-the-entire-worlds-coffee-supply-chain>

15 Daviron, B., & Ponte, S. (2005). *The coffee paradox: Global Markets, commodity trade and the elusive promise of development.* Zed Books.

16 Sachs et al., Ensuring economic viability.

17 Verité. (2022). *Root cause analysis of labor violations in the coffee sector.* DOL. <https://www.dol.gov/agencies/ilab/root-cause-analysis-labor-violations-coffee-sector>

18 Nguyen, A. (2024, May 30). *Bitter origins: Labor exploitation in coffee production.* The Borgen Project. <https://borgenproject.org/labor-exploitation-in-coffee-production/>

19 Teixeira, F. (2019, December 12). *Picked by slaves: Coffee Crisis Brews in Brazil.* Reuters. <https://www.reuters.com/article/world/picked-by-slaves-coffee-crisis-brews-in-brazil-idUSKBN1YG13D/>

Furthermore, the coffee industry has not gone unscathed by climate change. The impacts of climate change have been seen around the world worldwide, with extreme weather events and increased pests and diseases rocking the coffee industry. Farmers in Brazil's top coffee-producing areas struggle because of lack of precipitation and unstable weather events. Dried out leaves, dead plants, and lower coffee cherry production per plant are some of the consequences producers see because of no rains hitting the region for weeks or months on end.²⁵ Frost and hailstorms, uncommon in these parts of Brazil, result in massive damage to crops. These climate change consequences have resulted in a coffee production decline, fewer coffee-optimal areas, and an increase in pests and diseases.²⁶ Coffee leaf rust, a bacterium that plagues the leaves of the coffee tree, causes defoliation that leads to the death of the branches of the trees and, eventually, the entirety of the tree.²⁷

Several trends have had an impact on the unsustainability of coffee production. First, there are different types of voluntary sustainability standards, or VSS, and certifications coffee farmers can receive to designate their products as sustainable. The creation of VSS certifications for coffee has been the biggest effort to combat sustainability issues over the past few decades. VSS certifications like the Fairtrade Certification, Rainforest Alliance Certification, and Organic certification focus on one or all the sustainability aspects. For example, the Fairtrade certification's primary focus is the social and economic stability of the

farms,²⁸ with some environmental protection regulations, whereas the Rainforest Alliance certification focuses more on protecting biodiversity and limiting environmental impacts,²⁹ with limited regulation on economic and social standards. These certifications have helped to inform the consumers, put more eyes on the industry, and create a standard for companies when looking to purchase coffee beans. The increase in certifications in coffee production is a result of several factors, all relating back to demand. In recent years, consumers have increased the demand for certified coffee as injustices within the industry have become more well known.³⁰ Several studies found that consumers are willing to pay a premium for variations of certified coffee.³¹ Companies, cafés, and brands are also increasing demand for sustainable certified coffee in response to consumer demand. Companies like Starbucks and Nestlé have created their own sustainability standards per company sustainability initiatives.³²

Additionally, some countries are taking steps towards improving the unsustainability of coffee production in their country. For example, in 2022, Costa Rica established a program called "Low Carbon Coffee NAMA" or NAMA Café. This project was created to transform the coffee sector in Costa Rica to meet carbon-emission goals. NAMA Café helped foster a change in farm production

25 Pham, Y., Reardon-Smith, K., Mushtaq, S., & Cockfield, G. (2019, September 4). *The impact of climate change and variability on coffee production: A systematic review - climatic change*. SpringerLink. <https://link.springer.com/article/10.1007/s10584-019-02538-y>

26 Pham et al., The impact of climate change.

27 Avelino, J., Cristancho, M., Georgiou, S., Imbach, P., Aguilar, L., Bornemann, G., P., Anzueto, F., Hruska, A. J., & Morales, C. (2015, March 11). *The Coffee Rust Crises in Colombia and Central America (2008–2013): Impacts, plausible causes and proposed solutions - food security*. SpringerLink. <https://link.springer.com/article/10.1007/s12571-015-0446-9>

28 *Fair Trade Coffee: Why is fair trade certified coffee important?* Fair Trade Certified. (2024, May 24). <https://www.fairtrade-certified.org/what-we-do/what-we-certify/coffee/>

29 *What does "Rainforest alliance certified" mean?* Rainforest Alliance. (2024, July 8). https://www.rainforest-alliance.org/insights/what-does-rainforest-alliance-certified-mean/?utm_campaign=cyl8aware&utm_source=18vvaawarecomms&utm_medium=cpc&src=ADK18VX&s_subsrc=18vvaawarecomms&gclid=CjwKCAjw4qCKBhAVEIwAkTYsPIG4f18sUMtu2vviA2Al2LaUwHONBOWPR494LL6XhSdRsObpEzV0hoCZ33QQAvD_BvE

30 Barreto et al., Sustainability Issues.

31 Fuller, K., Grebitus, C., & Schmitz, T. G. (2022). The effects of values and information on the willingness to pay for sustainability credence attributes for coffee. *Agricultural Economics*, 53(5), 775–791. <https://doi.org/10.1111/agec.12706>

32 Barreto et al., Sustainability Issues.

by using financial incentives beneficial to the farmer and investors and informed and advised farmers on policy and mitigation techniques.³³ NAMA is a UN program that supports “any measure that reduces emissions in developing countries that is supported by a national government initiative”.³⁴ One financial incentive offered through the NAMA Café project is a grant for planting shade trees. This, in turn, not only helped the farmers produce better quality coffee beans but also reduced pests, increased carbon sequestration, increased soil fertility, and decreased soil erosion. Other mitigation outcomes from the NAMA Café project include improved water management and wastewater treatment and more efficient use of fertilizers.³⁵ Costa Rica is a country with ambitious environmental goals, contributing only .02% to global carbon emissions,³⁶ having an incredibly low ecological footprint, and a goal of reaching net zero carbon emissions by 2050.³⁷ NAMA Café is a response to Costa Rica’s drive for the country’s environmental health and sustainability. Coffee production is about 8% of Costa Rica’s domestic GDP but about 10% of the country’s greenhouse gas emissions.³⁸

The current trends of VSS certifications and independent country sustainable coffee goals are influential but limited. VSS certifications are sometimes unattainable for farmers because of the costs of buying into

the programs, and corporate sustainability certifications are often less rigorous than an NGO and far less transparent. Costa Rica’s NAMA Café is a step in the right direction but is not currently being applied elsewhere. With the massive increase in demand for coffee from consumers, farmers are not buying into certifications or sustainable programs when it reduces the quantity produced. Unsustainable practices, like sun-grown coffee, produce a higher amount of beans and a higher payout in the short term. Suppose additional resources and policies are not applied to the coffee sector in Latin American countries. In that case, the current trends will remain the same and modern slavery, poverty, and environmental deterioration will continue.

SOLUTIONS

Solution 1

Keeping the Status Quo

Currently, coffee production regulations are all dependent on the country exporting the product and the market the coffee beans are going to. Individual coffee producers are responsible for pursuing their own VSS certificates if they wish to do so. As previously mentioned, VSS certifications are a step in the right direction and beneficial in some instances but are inconsistent with the three pillars of sustainability and have ethical concerns in terms of transparency. Independent country coffee regulations, like NAMA Café in Costa Rica, are currently positive in use but not widespread. Maintaining the status quo will result in some improvements in the sustainability of coffee production, but it will be limited in scope.

Solution 2

Enhance VSS Certifications

This solution will take what is already in play, VSS certifications, and enhance them. Evaluating the pitfalls of VSS certifications and improving them will help to enhance VSS certifications and make them more useful. Pitfalls like the unattainability of

33 Mitigation Action Facility. (2023, April 6). *Costa Rica – low-carbon coffee*. Mitigation Action Facility <https://mitigation-action.org/projects/costa-rica-low-carbon-coffee/>

34 United Nations Framework Convention on Climate Change. (n.d.). Nationally appropriate mitigation actions (NAMAs). UNFCCC. Retrieved December 10, 2024, from <https://unfccc.int/topics/mitigation/workstreams/nationally-appropriate-mitigation-actions>

35 Mitigation Action Facility, *Costa Rica – low-carbon coffee*.

36 United Nations. (2019, September 20). *Costa Rica: The “living Eden” designing a template for a cleaner, carbon-free world*. UNEP. <https://www.unep.org/news-and-stories/story/costa-rica-living-eden-designing-cleaner-carbon-free-world>

37 United Nations. (2019, March 4). *Costa Rica Commits to Fully Decarbonize by 2050*. United Nations Climate Change. <https://unfccc.int/news/costa-rica-commits-to-fully-decarbonize-by-2050>

38 Mitigation Action Facility, *Costa Rica – low-carbon coffee*.

VSS certifications for small farm owners, lack of transparency, and only focusing on one sustainability pillar would be addressed with this solution. Creating more specific, affordable, and streamlined pathways for small farm owners would make it easier for small farm owners to attain a VSS certificate while still reaching sustainability goals. Using a third party to complete audits and making results and information regarding the expectations and standards more accessible to the public will improve the lack of transparency and trust with VSS certifications. Further education to both consumers and producers about VSS certifications and the differences between each of them will help to improve trust as well. Each VSS certifier would need to do an internal reflection to understand which sustainability pillar they are lacking in to be able to address where they might need to improve to ensure that all sustainability pillars are being met. If a certifier wants to be more specific to one or two of the sustainability pillars, working with another certifier that specializes in the other pillar would also be a solution. By improving accessibility to certifications for small farm owners, transparency, and addressing all the pillars, VSS certificates would be more useful and create a greater impact on the sustainability of coffee production than the current standards in use.

Solution 3

NAMA Café

This solution aims to utilize the NAMA Café program put into place in Costa Rica as a road map for programs in other Latin American coffee producing countries. NAMA Café, supported and primarily funded by the United Nations, provides financial breaks and incentives for farmers to use more sustainable farming practices.³⁹ NAMA Café is the first NAMA of its kind but has proven to be successful within its five-to-seven-year time frame. NAMAs are open for any developing country to apply for with the UN, and the NAMA Café program lays out a roadmap that has proven to be successful. Other developing

Latin American Countries could use this roadmap, tailor it to its own needs and abilities, and apply it to coffee production in that country. In Costa Rica, NAMA Café took about 7 billion US dollars to implement and complete over the five-to-seven-year time frame however this cost could vary dependent on the country's goals. As mentioned previously, NAMA Café has resulted in significantly reduced carbon emissions and other greenhouse gasses due to the use of smart fertilizers and improvement of water management systems, higher coffee yields and income as a result of improved production technologies, and improvement of poverty levels within the coffee farming community because of cost saving, income diversification, and capital building at the farming level.

RECOMMENDATION

A combination of both Solution 2 and Solution 3 would help resolve the unsustainability of coffee production in Latin American countries. Encouraging countries to pursue the NAMA Café program while also improving VSS certification standards helps to tackle the unsustainability of coffee production from several angles, including the needed financial support for improved technologies, reduction of greenhouse gasses, and incentives for long term sustainability practices.

NAMA Café in Costa Rica has proven that the program works scientifically. After just the first round of NAMA coffee was harvested, Costa Rica was able to produce 700 kg of coffee with a carbon footprint of less than 1 kg of CO₂ per kg of coffee. VSS certifications have been found to have positive impacts on the sustainability of coffee production.⁴⁰ Additionally, the combination of these two solutions is economically feasible for several reasons. The NAMA program has money pooled as well as several partners and investors, including the Coffee Institute and International Climate Initiative, to fund

39 United Nations Framework Convention on Climate Change.

40 Elliott, K. A. (2018, August). What are we getting from voluntary sustainability standards for coffee? Center for Global Development. <https://www.cgdev.org/sites/default/files/what-are-we-getting-voluntary-sustainability-standards-coffee.pdf>

further NAMA programs. Enhancing the VSS certifications would be funded by the independent NGOs that certify, like the Rainforest Alliance. The necessary changes would not require a significant amount of money, rather a realigning of resources. Politically, the combination of the two solutions is palatable because meeting greenhouse gas reduction goals as a result of NAMA programs is beneficial to addressing global climate change issues which is a large political hot topic currently. The NAMA program will help a country meeting greenhouse goals and carbon emission requirements. Similarly, this recommendation is socially acceptable as consumers already have high demand for sustainably produced coffee that is VSS certified in some way.

CONCLUSION

The sustainability of coffee production in Latin American countries has room to grow. Currently, high demand for coffee has led to unsustainable practices within the industry, like poverty, pay discrepancy, inhumane working conditions, deforestation, habitat loss, and more. The goal is to improve the sustainability of coffee production in Latin American countries in the most plausible way, ensuring the solution is the most scientific, economic, political, and socially feasible. Combining Solutions 2 and 3 is the recommended solution because they improve each sustainability pillar: economic, social, and environmental. They are scientifically sound, with statistics to show the emissions reductions as a result of NAMA Café, and research to back overall sustainability improvement in the coffee sector because of VSS certifications. These solutions combined are economically feasible because NAMA Café has money for these projects and several investors for sustainability initiatives like this. They are politically palatable because they help to address a global political concern: climate change. Finally, these two solutions are in response to high demand for sustainable coffee from consumers, making them socially acceptable. 



Spain's Management of Its Secessionist Movements: Catalonia and the Basque Country

Bailey Davies

ABSTRACT

Spain's management of its secessionist movements in Catalonia and the Basque Country remains a persistent challenge, rooted in deep historical, cultural, and economic divisions. Decades of repressive centralized governance, an uptake on restrictions for regional autonomy, and Madrid's rigid responses to separatist demands have failed to resolve tension and, in many cases, exacerbated separatist sentiment. Full independence remains a contested issue and ongoing demands for greater regional autonomy continue to challenge Spain's territorial integrity and democratic stability. A resolution is necessary to not only prevent future crises but to ensure long-term political stability and democratic legitimacy within the Spanish state. This paper explores the limitations of Madrid's current approach and argues more sustainable solutions that move beyond repression and political impasse, allowing Spain to balance sovereignty with regional aspirations.

OVERVIEW/HISTORY

Spain is a diverse nation-state composed of multiple ethnic and cultural identities, comprised of seventeen autonomous communities governed under a decentralized system, with the Basque Country and Catalonia in particular standing out due to their historical and cultural distinctiveness. Both regions possess longstanding national identities that predate Spain's unification, contemporary cultural oppression and suppression of regional autonomy has fueled persistent secessionist movements and challenges to Madrid's authority.

The Basque Country has one of Europe's oldest cultures and languages, having remained politically autonomous for centuries due to its

geographic isolation in the Pyrenees.¹ Its formal integration into the Kingdom of Castille in 1512 marked the beginning of ongoing struggles for self-governance in the region. By the late 19th century, Basque nationalism intensified in response to rapid industrialization in Bilbao and the central government's policies regarded as oppressive.² Under Francisco Franco's dictatorship, the Basque language and culture were heavily repressed, prompting the rise of ETA, a Basque militant separatist group that carried out widespread violent attacks for decades until concessions granted by Madrid brought about its dissolution in 2018.³ While full independence remains a minority position today, demands for expanded autonomy and cultural protection continue to shape Basque politics and pose challenges to Madrid.

Catalonia also has a deep-rooted historical identity, tracing back to the medieval Crown of Aragon. Its integration into Spain was formalized after its defeat in the War of the Spanish Succession in 1714, followed by periodic autonomy and economic prominence in the region. In the 20th century, Catalan nationalism surged under the repressive regimes of Miguel Primo de Rivera and Franco, both of which sought to suppress Catalan political and cultural expression.⁴ After Franco's death, Catalonia regained autonomy in 1979, with further regional government powers granted under the 2006 Catalonia Statute of Autonomy. The following 2010 ruling of the Spanish Constitutional Court significantly retrenched these powers, sparking a vehement resurgence of separatist sentiment. The 2014 non-binding referendum and the 2017 independence vote, both of which

deemed illegal by Madrid, escalated tensions, leading to harsh crackdowns and continued political deadlock, prompting continual violence and intense widespread separatist sentiments against Madrid.⁵

Madrid faces a critical challenge in addressing these secessionist movements while preserving national unity and territorial sovereignty. Both Catalonia and the Basque Country remain important economic contributors (Catalonia at ~20% GDP; Basque Country ~6% GDP)⁶ for Spain, making their retention vital for Spain's financial stability. Secessionist demands center on expanded political and fiscal autonomy, as well as cultural and linguistic recognition. Catalonia has engaged in ongoing international paradiplomacy to protect its financial interests and assert its independent identity internationally.⁷ Resolving these issues requires a delicate balance between regional aspirations and the integrity of the Spanish state, necessitating an empirical and sustainable approach to governance.

POSSIBLE SOLUTIONS

Solution 1

Creating a Legal Framework for Secession

One of the central issues stemming from the 2014 and 2017 Catalan Referendums was the absence of a clear legal framework for secession. This ambiguity led to heightened tensions, with Madrid dismissing the referendums as unconstitutional and

1 Wilkinson, Isambard. 2025. *Wine vessel could spill secrets of Europe's oldest language*. February 28. <https://www.thetimes.com/world/europe/article/wine-vessel-secrets-europe-oldest-language-basque-spain-vj6h7p3v1>.

2 Woodworth, Paddy. 2008. *The Basque Country: A Cultural History*. New York: Oxford University Press, Inc.

3 Tellidis, Ioannis. "(2020) Peacebuilding Beyond Terrorism? Revisiting the Narratives of the Basque Conflict." *Studies In Conflict & Terrorism*, March 2018, 1–23. <https://doi.org/DOI:10.1080/1057610X.2018.1452794>.

4 "Catalonia Profile-Timeline." BBC.com, May 14, 2018. <https://www.bbc.com/news/world-europe-20345073>.

5 Carvalho, Catarina L, Isabel R Pinto, and Jose M Marques. "The Nationalist Movements in Spain, Today: A Catalanian and Basque Comparison." *Revista de Psicologia*, 2223-3733, 39, no. 2 (July 2021): 689–713. <https://doi.org/10.18800/psico.202102.007>.

6 Manevich, Dorothy. Catalonia accounts for one-fifth of Spain's economy. Pew Research Center. Pew Research Center, November 6, 2017. <https://tinyurl.com/34txxew3>.

7 Dermawan, Windy, and Akim Akim. "Catalan Identity and Paradiplomacy Strategy in Catalonia's Independence Movement." *Global: Jurnal Politik Internasional*, 2579-8251, 22, no. 2 (2020): 318–31. <https://doi.org/10.7454/global.v22i2.485>.

separatists citing democratic principles.⁸ Establishing a preparatory legal framework would provide a structured, mutually agreed-upon process for addressing legitimacy. For reference, Canada has effectively managed its separatist movements through its Clarity Act, passed in 2000 in response to the Quebec independence referenda,⁹ of which Spain could adapt by defining specific conditions under which a referendum can be initiated, ensuring the clarity of referendum questions, and requiring a broad consensus, including consideration of national and regional interests.¹⁰ Such a framework would not only reinforce democratic legitimacy but also allay separatist grievances by offering a lawful path to self-determination while maintaining national stability.

Solution 2

Power Sharing and Federalization

Madrid's centralized governance model has long fueled resentment in Catalonia and the Basque Country, as both regions perceive a substantial loss of their historical autonomy resulting from it. Federalization, accompanied by robust power-sharing mechanisms, presents a sensible solution. A 2017 poll revealed that 46% of Catalans would support remaining within Spain if granted new and exclusive powers, demonstrating the potential of federal agreements to reduce secessionist sentiments.¹¹ Implementing differentiated federalism, a system in which subnational regions retain significant legislative authority in relation to a central

government, by which certain regions receive unique autonomous powers, would acknowledge the distinct identities of the Catalan and Basque, while preserving Spain's territorial integrity. Additionally, cooperative governance structures, such as binding intergovernmental negotiations on national policies affecting these regions, would further ensure their voices are heard and taken into consideration.¹² A comparable precedent exists in the United Kingdom, where Scotland, Wales, and Northern Ireland have been granted devolved powers in education, health, and local governance without compromising the unity of the state.¹³ This system demonstrates how regional autonomy can coexist with national sovereignty without necessitating full independence, offering a practical model for Spain to consider within its own reforms.

Solution 3

Asymmetrical Fiscal and Political Autonomy

Economic grievances have remained a primary driver of separatist movements, with Catalonia alone contributing approximately 20% of Spain's GDP while experiencing significant fiscal imbalances due to Madrid's taxation policies.¹⁴ Addressing these economic disparities through asymmetrical fiscal and political autonomy would alleviate tensions. The Basque Country already benefits from the "Concierto Económico" its unique fiscal model that allows for self-governance over its

8 Hamid, Nafees, and Clara Pretus. "How Spain Misunderstood the Catalan Independence Movement." *The Atlantic*, October 1, 2017. <https://www.theatlantic.com/international/archive/2017/10/catalan-referendum-spain-independence/541656/>.

9 Evidence, Legislative Committee on Bill C-20, An Act to Give Effect to the Requirements for Clarity as Set out in the Opinion of the Supreme Court of Canada in the Quebec Secession Reference § SC 2000, c 26 (2000).

10 Caro, Javier Romero. "The Spanish Vision of Canada's Clarity Act: From Idealization to Myth." *Perspectives on Federalism*, 2036-5438, 9, no. 3 (2017): 135-54. <https://doi.org/10.1515/pof-2017-0023>.

11 De Miguel, Rafa. "Catalonia Prefers Greater Autonomy over Independence from Spain." *El País*, April 17, 2017. https://english.elpais.com/elpais/2017/04/17/inenglish/1492411475_829922.html.

12 Agranoff, Robert. "FEDERAL ASYMMETRY AND INTERGOVERNMENTAL RELATIONS IN SPAIN." *Asymmetry Series* 17 (2005): 1-8. https://www.queensu.ca/iigr/sites/iirwww/files/uploaded_files/Agranoff2006.pdf.

13 House of Commons, Matthew Leeke, Chris Sear, and Oonagh Gay, An introduction to devolution in the UK § (2003).

14 Manevich, Dorothy. "Dissatisfaction Was Widespread in Spain Even before Catalan Secession Vote." *Pew Research Center*, November 6, 2017. <https://www.pewresearch.org/short-reads/2017/11/06/dissatisfaction-was-widespread-in-spain-even-before-catalan-secession-vote/>.

taxation and spending.¹⁵ Expanding a similar model to Catalonia would enable the region to retain a greater share of its tax revenues, directly funding local infrastructure, social programs, and economic initiatives.¹⁶ Beyond fiscal autonomy, granting broader political authority, such as control over trade, tourism, and international cultural engagement, would empower these regions while reinforcing their ties to Spain.¹⁷ This tailored approach ensures economic fairness and regional self-determination without endangering national unity.

Solution 4

Cultural and Linguistic Protection

A key driver of secessionist sentiment is the perception that Madrid undermines regional identities. Ensuring constitutional recognition and legal protection of these cultures and languages would be a significant step in addressing these concerns. Spain could amend its constitution to officially recognize regional languages as co-official at the national level, strengthening legal protections for their use in government, education and media.¹⁸ A useful precedent is the Åland Agreement between the Åland Islands and Finland, where autonomous cultural protections help maintain the region's unique identity within a unified state. Additionally, developing educational policymaking to regional governments

would allow for curricula tailored to local history, language, and traditions, further reinforcing cultural preservation.¹⁹ These policies would affirm Spain's commitment to regional diversity while reducing the sense of cultural marginalization that fuels separatist movements.

Solution 5

Legal and Constitutional Conflict Resolution Mechanisms

Establishing structured conflict resolution mechanisms would provide a proactive approach to managing tensions before they escalate into political crises. A key measure would be reinstating elements of the 2006 Catalonia Statute of Autonomy, which granted increased powers to regional governments. Restoring provisions that allow greater self-governance in areas such as taxation and judicial autonomy would address longstanding demands while maintaining national integrity.²⁰ Additionally, Spain could implement treaty-based agreements between Madrid and regional governments to outline conflict resolution strategies, such as amnesty provisions for nonviolent political actors and diplomatic mediation efforts to prevent unilateral actions.²¹ These mechanisms would promote constructive dialogue, reducing hostility and promoting long-term political stability.

15 Gray, Caroline. "Chapter 3. BASQUE AND CATALAN FINANCING: THE FUNDAMENTALS OF THE CONCIERTO AND THE COMMON SYSTEM." Essay. In *Nationalist Politics and Regional Financing Systems in the Basque Country and Catalonia*, 1–298. 978-84-7752-604-9. Bilbao: Treasury department of Bizkaia, 2016.

16 Rovira, Marc. "Uno de Los Expertos Encargados de Diseñar El Nuevo Modelo de Financiación Catalán: 'Aquí No Hay Un Cupo Vasco.'" *El País*, November 30, 2024. <https://elpais.com/espana/catalunya/2024-11-30/uno-de-los-expertos-encargados-de-disenar-el-nuevo-modelo-de-financiacion-catalan-aqui-no-hay-un-cupo-vasco.html>.

17 Office of European Analysis (n.d.). <https://www.cia.gov/readingroom/docs/CIA-RDP84S00555R000200020003-7.pdf>.

18 Martínez-Herrera, Enric, and Jeffrey Miley. "The Constitution and the Politics of National Identity in Spain." *Nations and Nationalism* 16, no. 1 (January 1, 2010): 1–25. [file:///C:/Users/bdaves/Downloads/The_Constitution_and_the_Politics_of_Nat.pdf](https://www.cia.gov/readingroom/docs/CIA-RDP84S00555R000200020003-7.pdf).

19 Daftary, Farimah. "INSULAR AUTONOMY: A FRAMEWORK FOR CONFLICT SETTLEMENT? A COMPARATIVE STUDY OF CORSICA AND THE ÅLAND ISLANDS," October 2000. https://www.files.ethz.ch/isn/19610/working_paper_09.pdf.

20 Sanjaume-Calvet, Marc, Berta Barbet Porta, and Mireia Grau Creus. "Catalan Self-Government: From Autonomy to Self-Determination?" *Autonomy Arrangements in the World* 2 (May 2022): 1–41. <https://doi.org/10.577749/WAX4-H342>.

21 Wilson, Joseph, and Teresa Medrano. "Spain's Parliament Gives Final Approval to Amnesty Law for Catalonia's Separatists." *pbs.org*, May 30, 2024. <https://www.pbs.org/newshour/world/spains-parliament-gives-final-approval-to-amnesty-law-for-catalonias-separatists>.

Solution 6

Structural Mediation and Ongoing Dialogue

To ensure the effectiveness of any agreement, it remains pertinent for Spain to establish a permanent domestic body dedicated to managing disputes between the central government and regional authorities. Research indicates that mediation efforts initiated one to three months of a dispute have a 37% success rate in de-escalating conflicts.²² This body, separated from both Madrid and regional governments, would oversee ongoing negotiations, ensuring that agreements are implemented effectively and that emerging grievances are addressed in a timely manner from a non-partisan perspective.²³ Regular reviews and assessments would provide a structured approach to conflict resolution, preventing future crises and maintaining stable relations between Spain's communities. This institutionalized mediation framework would serve as a long-term solution for facilitating dialogue, reducing tensions, and ensuring cooperative governance.

RECOMMENDED SOLUTION

Spain's ongoing secessionist challenges require a multiplex approach that balances national sovereignty aspirations of Spain and the regional autonomous aspirations. No singular solution can adequately address the complexities of these movements, however a combination of a legal referendum framework, constitutional reform, asymmetrical autonomy, and a permanent negotiation council present the most viable solutions toward stability.

A legal framework for referendums is essential to providing a structured and legitimate process for addressing regional secessionist demands. By establishing clear criteria for

secessionist votes, Madrid can mitigate unilateral secession while also upholding democratic legitimacy.²⁴ This approach would prevent political instability and provide a transparent and legal mechanism for regional aspirations to be addressed within Spain's constitutional order.²⁵

Constitutional reform, particularly reinstating the 2006 Statute of Autonomy and officially recognizing regional cultural and linguistic identities, is pertinent to reducing tensions and managing stability.²⁶ This would reinforce Spain's commitment to regional diversity while addressing long-standing and pressing grievances relating to cultural rights.²⁷ Such reforms would build trust between Madrid and regional governments, ultimately reducing the appeal of full secession.

Expanding asymmetrical fiscal and political autonomy is a pragmatic response to economic and governance grievances.²⁸ Extending a similar model to the Basque Country's *Concierto Económico* in Catalonia would grant it greater financial autonomy, enabling it to manage its revenues and allocate resources

22 Swanson, Donald L. "Seven Findings about 'Successful Mediation' - from a Study of Mediation in International Relations." American Bankruptcy Institute, July 11, 2017. https://www.abi.org/feed-item/seven-findings-about-%E2%80%9Csuccessful-mediation%E2%80%9D-%E2%80%94-from-a-study-of-mediation-in-international?utm_source=chatgpt.com.

23 Doren, Emily. "SECESSIONIST MOVEMENTS TO SECEDE OR NOT TO SECEDE," 2019.

24 Casañas-Adam, Elisenda. "Constitutional Law and Secession in Spain." *The Routledge Handbook of Self-Determination and Secession*, 9781003036593, 1 (January 13, 2023): 604–16. <https://doi.org/10.4324/9781003036593-49>.

25 López Bofill, Hèctor. "Hubris, Constitutionalism, and 'the Indissoluble Unity of the Spanish Nation': The Repression of Catalan Secessionist Referenda in Spanish Constitutional Law." *International Journal of Constitutional Law* 17, no. 3 (September 9, 2019): 943–69. <https://doi.org/10.1093/icon/moz064>.

26 Lyons, Matthew, and Morgan Shaffer. "Whose Line Is It Anyway? Catalonia's Struggle." Web log. *Fordham International Law Journal* (blog). *Fordham International Law Journal*, March 13, 2018. <https://www.fordhamilj.org/iljonline/2018/03/13/whose-line-is-it-anyway-catalonias-struggle>.

27 Dowling, Andrew. "Catalonia, Spain's Nationalism Problem." *History Today*, October 11, 2017. <https://www.historytoday.com/miscellanies/catalonia-spains-nationalism-problem>.

28 Morales, María Jesús. "Intergovernmental Relations in Spain and the Constitutional Court Ruling on the Statute of Autonomy of Catalonia: What's next?" *The Ways of Federalism in Western Countries and the Horizons of Territorial Autonomy in Spain*, 978-3-642-27717-7, April 2013, 83–109. https://doi.org/10.1007/978-3-642-27717-7_6.

according to regional priorities.²⁹ Additionally increasing political autonomy in these regions and granting them greater legislative control over key sectors such as education, infrastructure, and trade policy would further strengthen their role within Spain³⁰ while reducing separatist sentiment.

A permanent negotiation council is necessary to institutionalize ongoing dialogue and conflict resolution.³¹ By creating an independent body dedicated to mediating disputes, Spain can prevent future crises and serve as a stabilizing force, offering a formal mechanism for negotiation that deters unilateral action and reinforces cooperative governance.

This combination of legal, constitutional, economic, and diplomatic measures directly addresses Spain's unique secessionist challenges. Rather than a one-size-fits-all approach, this strategy ensures flexibility, democratic legitimacy, and stability making it the most applicable and effective method for Spain to manage its secessionist movements. 

29 Fernandez-Villaverde, Jesus, and Francisco de la Torre Diaz. "El Concierto Para Cataluña (i): Lo Que Hay y Sus Problemas." *elconfidencial.com*, September 7, 2024. https://blogs.elconfidencial.com/economia/la-mano-visible/2024-09-07/el-concierto-para-cataluna-i-lo-que-hay-y-sus-problemas_3955945/.

30 Pereyra, Miguel A. "Changing Educational Governance in Spain: Decentralisation and Control in the Autonomous Communities." *European Educational Research Journal* 1, no. 4 (December 2002): 667–75. <https://doi.org/10.2304/eeerj.2002.1.4.5>.

31 León, Sandra, and Mónica Ferrín Pereira. "Intergovernmental Cooperation in a Decentralised System: The Sectoral Conferences in Spain." *South European Society and Politics* 16, no. 4 (August 26, 2011): 513–32. <https://doi.org/10.1080/13608746.2011.602849>.

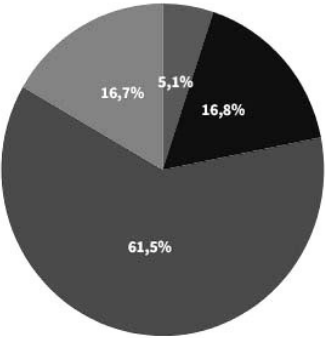
APPENDICES

Appendix A

Percentage breakdowns of Catalanian sentiments for the prompt on if the 2010 ruling was fair.³²

Una sentència justa?
Amb la perspectiva d'aquests 10 anys, quina d'aquestes dues frases expressa millor la seva opinió respecte a aquella sentència contra l'Estatut?

- No ho sap
- Cap de les dues
- Va ser un cop d'estat judicial contra la voluntat dels catalans que havien votat aquell estatut
- Va ser una sentència justa

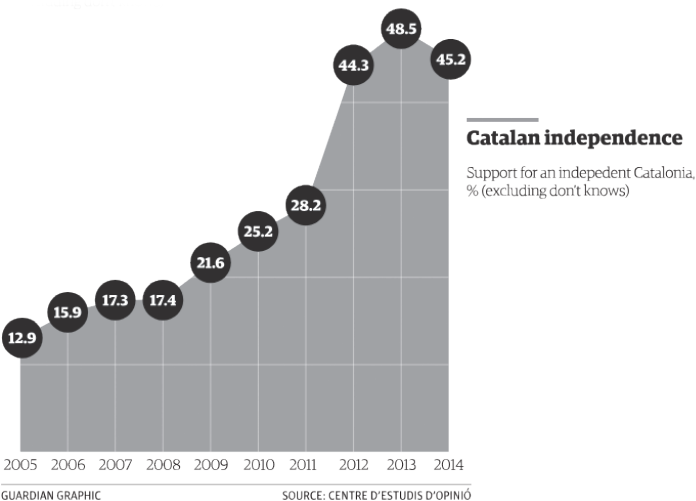


"A fair ruling? With the perspective of these 10 years, which of these two sentences best expresses your opinion regarding that ruling against the Statute?"

³² González, David. "How It Began: 61% of Catalans Believe 2010 Court Ruling Was a 'Judicial Coup d'etat.'" ELNACIONAL.CAT, January 14, 2025. https://www.elnacional.cat/en/politics/how-it-began-61-of-catalans-believe-2010-court-ruling-was-judicial-coup-etat_521613_102.html.

Appendix B

Public poll on support for an independent Catalonia.³³

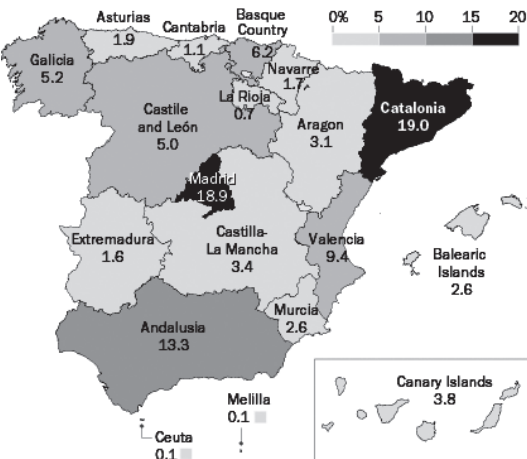


Appendix C

Graph of Spain's total gross domestic product, by region.³⁴

Catalonia accounts for one-fifth of Spain's economy

Share of Spain's total gross domestic product, by region



33 Catalan Independence. November 10, 2014. The Guardian. <https://www.theguardian.com/news/datablog/2014/nov/10/why-an-independence-referendum-in-catalonia-is-inevitable-in-two-charts>.

34 Manevich, Dorothy. "Catalonia accounts for one-fifth"



Resolutions to Coastal Land Reclamation: Isahaya Bay

Liliya Admire

ABSTRACT

The Isahaya Bay land reclamation project in Nagasaki, Japan, has led to serious ecological and socio-economic consequences following the construction of a 7-kilometer dike in 1997 that separated the bay from the Ariake Sea. Originally presented as an agricultural and disaster prevention initiative, the project resulted in the loss of a vital tidal flat ecosystem, severely impacting biodiversity, fisheries, and water quality. This paper evaluates potential solutions to mitigate the environmental degradation caused by the reclamation, including complete dike removal, water purification strategies, hypoxia reduction through bivalve restoration, Ramsar convention expansion, and partial dike reopening. This paper advocates for a phased partial reopening of the dike as the most practical and politically viable strategy. This approach offers a short-term balanced path toward ecological recovery, improved water quality, and the revitalization of local fisheries, while minimizing disruptions to agricultural activity. Ultimately, sustained collaboration among government bodies, researchers, and local communities is critical for restoring the Ariake Sea's health and achieving long-term environmental sustainability.

INTRODUCTION

Coastal land reclamation is the process of creating or expanding land along coastlines, often by constructing dikes and draining wetlands. Coastal wetlands are valuable ecosystems providing ecological services

and coastal security.¹ Since 1900, scientific estimates say that 64% of the world's wetlands have disappeared, with regions such as Asia experiencing even higher loss.² Many of these wetlands are developed for agricultural, industrial, and urban land use, compromising the coastal protection wetlands provide. For example, in China's Yangtze River Basin, the conversion of natural wetlands to support agriculture, aquaculture, urban growth, and dam infrastructure for economic benefits caused major ecological harm, including drying trends, reduced inundation (duration of submersion), and loss of biodiversity.³ Maintaining a balance between economic growth and coastal ecological protection requires developing sustainable management practices.

The case of Isahaya Bay, in Nagasaki, Japan, highlights the challenges accompanying land reclamation projects. The ¥235 billion government project began in 1986 and concluded in 2008.⁴ In April of 1997, a 7-kilometer dike was constructed, cutting off the bay from the Ariake Sea.⁵ Isahaya Bay, once a large tidal flat home to many endemic species, was drained and turned into 3,550

hectares of reclaimed land.⁶ Dike construction in tidal flats typically leads to changes in tidal networks and flow — and in this case, reducing the mixing of saltwater and freshwater tidal currents, with the weaker currents caused by the dike's construction leading to sudden and detrimental ecological changes. This project sparked major controversy for its negative impacts on fishing, seaweed harvesting, migratory bird habitats, and other marine life. Converting the area into farmland caused a sharp decline in biodiversity, wiping out a once-thriving ecosystem that supported a wide range of unique species.⁷ Over the years, the government repeatedly rebranded the project — initially presenting it as a rice cultivation plan and concluding as a disaster prevention measure.⁸ However, activist Hirofumi Yamashita discovered a hidden governmental report revealing the plan would not be effective as a flood prevention measure, and he also found that there was little demand in the area for farmland.⁹ Downplaying the environmental impacts and framing the project as essential for local safety forced the opposing fishermen into accepting the project.¹⁰ Isahaya Bay is part of the Ariake Sea, a vital center for nori (seaweed) cultivation, producing 40% of Japan's total yield. However, in 2000, severe discoloration rendered much of the crop unmarketable, which significantly reduced the nori production.¹¹ Following the construction of the dike, substantial ecological changes have tragically wiped out¹²

1 Wu, Wenting, Zhaoqing Yang, Bo Tian, Ying Huang, Yunxuan Zhou, and Ting Zhang. 2018. "Impacts of Coastal Reclamation on Wetlands: Loss, Resilience, and Sustainable Management." *Estuarine, Coastal and Shelf Science* 210 (October 15): 153–61. <https://doi.org/10.1016/j.ecss.2018.06.013>.

2 Ramsar Convention on Wetlands. n.d. *Wetlands: A Global Disappearing Act*. Gland, Switzerland: Ramsar Convention Secretariat. https://www.ramsar.org/sites/default/files/documents/library/factsheet3_global_disappearing_act_0.pdf.

3 Lu, Dongshuo, Yichen Zheng, Xiaoning Liu, and Jianbo Chang. 2024. "Changes in Wetland Landscape and Inundation Patterns in the Middle and Lower Reaches of the Yangtze River Basin from 1990 to 2020." *Ecological Indicators* 161: 111992. <https://doi.org/10.1016/j.ecolind.2024.111992>.

4 The Japan Times. 2019. "Isahaya Bay Reclamation Dispute Continues." *The Japan Times*, September 18. <https://www.japantimes.co.jp/opinion/2019/09/18/editorials/isahaya-bay-reclamation-dispute-continues/>.

5 Jinnai, Takayuki. 2017. "Isahaya Bay Reclamation Project—The Most Devastating Wetland Destruction in Japan." *The Ariake Sea Network of Fishermen and Citizens*, no. 4 (November 7): 4. <https://www.ariake-gyomin.net/info/171107aef04.pdf#page=4>.

6 Ueno Award. 1995. "Environmental Impact Assessment of the Reclamation Project in Isahaya Bay, Nagasaki, Japan." *Journal of Irrigation Engineering and Rural Planning* 1995 (28): 70–73. <https://doi.org/10.11408/jierp1982.1995.70>.

7 "Isahaya Bay, Fill in of the Tidal Flats, Japan." 2021. *EJ Atlas Global Atlas of Environmental Justice*, October 14. <https://ejatlas.org/conflict/isahaya-bay-nagasaki-prefecture-construction-of-the-dyke-japan>.

8 Jinnai, 2017.

9 Goldman Environmental Prize. 2025. "Hirofumi Yamashita." Accessed May 8, 2025. <https://www.goldmanprize.org/recipient/hirofumi-yamashita/>.

10 Jinnai, 2017.

11 Kim, Sangyeob, Yuichi Hayami, Akira Tai, and Akihide Tada. 2018. "The Mechanism of Bottom Water DO Variation in Summer at the Northern Mouth of Isahaya Bay, Japan." *Journal of Oceanography* 74 (4): 611–620. <https://doi.org/10.1007/s10872-018-0467-z>.

12 Ibid.

large numbers of benthos (bottom-dwelling organisms including bivalves)—which are beneficial to other species such as birds and fish.¹³ Studies have linked this degradation of nori and the local environment to concerning amounts of NH₄⁺ (ammonium) which can fuel the growth of red tides (harmful algal blooms)¹⁴ and further contribute to hypoxia (low or depleted oxygen).

POTENTIAL SOLUTIONS

1. Dike Removal or Full Re-opening

An opening of the gates—or dike removal—would initially cause dramatic changes to the tidal channel landscape and improve drainage efficiency of the tidal flats.¹⁵ Although this may not fully restore the bay's original movement of water, and the tidal flats would not recover immediately, reintroducing seawater could counter the production of toxins in the reservoir. A full opening would generate stronger, faster currents on both sides of the gates, enhancing water exchange and potentially reducing eutrophication (nutrient-rich water leading to algal blooms, oxygen depletion, fish kills). Stronger currents would also promote vertical mixing, improving oxygen levels and helping to alleviate hypoxia in the reservoir. However, the increased current strength could contribute to sediment erosion. This re-suspended sediment could settle over clam cultivation areas along the northern coast of the inner bay, depositing more than 2 cm of mud—an amount that experts say can cause adult

clams to die.¹⁶ Furthermore, the mitigation of hypoxia may be limited and could potentially trigger occurrences in areas where hypoxia is not currently present.¹⁷ A partial reopening of the gates could offer a compromise—improving local environmental conditions while minimizing harm to aquaculture. Scientific experiments on sediment from the bay show that microbial activity, especially under higher salinity (3.4‰), enhances both denitrification—where nitrogen is converted to gas and released into the atmosphere—and nitrification processes. Salinity has a greater effect on denitrification,¹⁸ suggesting that restoring seawater flow can revive the bay's natural water purification functions.

2. Water Purification

Researchers created a model of the ecosystem using data from the Shiota River tidal flats as a proxy, recalibrating using limited historical data available from Isahaya Bay to estimate the natural water purification capacity of the area, looking at nitrogen removal in particular. In 1988, before the reclamation's completion, researchers estimated that the remaining 35.64 km of the tidal flat could remove 0.39 metric tons of nitrogen per day (t-N d⁻¹)—equivalent to 0.0109 t-N per km² per day. Meaning, the amount of nitrogen removal equaled about 36% of all nitrogen pollution (1.07 t-N/day) coming from the surrounding basin.¹⁹ Before the Isahaya tidal flat's destruction, its natural filtration system was critical in maintaining water quality by reducing about a third of all nitrogen runoff entering the bay. The major loss of this natural purification

13 Sato, Masanori. 2010. "Anthropogenic Decline of the Peculiar Fauna of Estuarine Mudflats in Japan." *Plankton and Benthos Research* 5 (Supplement): 202–213. <https://doi.org/10.3800/pbr.5.202>.

14 Takasu, Hiroyuki, Tomoya Era, Kotaro Miyahara, and Maiko Ito. 2024. "Lability of Sedimentary Organic Nitrogen Estimated from Amino Acids in a Reservoir on Land Reclaimed from Isahaya Bay, Kyushu, Japan." *Limnologia* 106: 126174. <https://doi.org/10.1016/j.limno.2024.126174>.

15 LeiChen, ZengZhou, FanXu, MirianJimenez, JianfengTao, and ChangkuanZhang. 2020. Simulating the impacts of land reclamation and de-reclamation on the morphodynamics of tidal networks. *Anthropocene Coasts*. 3(1): 30–42. <https://doi.org/10.1139/anc-2019-0010>

16 Hayami, Yuichi, and Takaharu Hamada. 2016. "Isahaya Bay, Freshwater Lake to an Estuary Again." *Marine Pollution Bulletin* 102 (2): 250–55. <https://doi.org/10.1016/j.marpolbul.2015.10.017>.

17 Ibid.

18 Harada, Hiroyuki, Kyoshi Takikawa, and Yasuhiro Hayashi. 2004. "The Effects of Salinity on Water Purification Ability of ARIAKE Sediment." In *Asian Pacific Confederation of Chemical Engineers Congress Program and Abstracts*. <https://doi.org/10.11491/apcche.2004.0.402.0>.

19 Nishio, Toshiya, Wataru Nishijima, Koji Hamada, Kyoko Hata, and Kisaburo Nakata. 2016. "Model Estimation of the Water Purification Capacity of Lost Tidal Flats." *Japan Agricultural Research Quarterly: JARQ* 50 (4): 345–352. <https://doi.org/10.6090/jarq.50.345>.

system likely contributes to worse water quality and problems like algal blooms and hypoxia. Recent studies highlight worsening water quality in the reservoir, with chemical oxygen demand (COD) and total phosphorus (TP) levels exceeding agricultural standards set by Japan's Ministry of Agriculture, Forestry and Fisheries. This polluted water flows into the Ariake Sea, threatening marine life and local fisheries. While local authorities have introduced treatment and pollution control measures, their impact remains limited. Using ecological purification solutions— aquatic vegetation, bivalves, or high-efficiency filtration materials— could support recovery.²⁰ Restoring seawater flow may also revive microbial processes like denitrification, suggesting that ecological restoration and technical innovation is essential for improving long-term water quality.

3. Reducing Hypoxia

Hypoxia—low oxygen levels in water—has become a recurring problem in Isahaya Bay and the inner Ariake Sea, particularly during the summer months, killing off substantial amounts of bivalves. Since bivalves like oysters play a crucial role in filtering organic matter from the water, their decline has further intensified hypoxic conditions by allowing more organic material to accumulate on the seafloor. This creates a harmful cycle where hypoxia kills bivalves, and the loss of bivalves worsens hypoxia. To break this cycle, restoring bivalve populations—especially in mudflats where oxygen levels remain more stable—is suggested as a potential solution. Research shows that doubling oyster biomass could reduce the volume of hypoxic water in the inner Ariake Sea by up to 20%, suggesting that rehabilitating oyster reefs could be a practical and nature-based approach to improving water quality and reversing some of the ecological damage caused by the land

reclamation project.²¹ The benefits provided by increasing bivalve populations can enhance overall biodiversity and potentially support the recovery of the fishing industry, which has suffered from the bay's ecological decline. Implementing this strategy would likely require both regulatory support and cooperation from local fisheries, as well as careful monitoring to ensure bivalve populations are sustained long-term.

4. Ramsar Convention Expansion

Japan acceded to the Ramsar Convention in 1980 and is home to 53 Ramsar sites.²² According to the convention requires contracting states to accept responsibility for the wise use of all wetlands and water resources “through national plans, policies and legislation, management actions and public education”. The term “wise use” refers to conservation and sustainable use of wetlands and the ecosystem services they provide. Signatories should develop national wetland policies, monitor, and manage wetlands through management plans, and capacity-building through research and public awareness programs.²³ There are nine criteria to identify wetlands of international importance. Although the bay is not currently a Ramsar site, it could potentially qualify under multiple Ramsar criteria, including: being a representative example of a coastal wetland type in Japan, and having supported significant biodiversity including migratory birds and marine life.²⁴ Designating Isahaya Bay as a Ramsar site would bring international attention and pressure to support its restoration. It would open doors for access to global conservation networks, technical expertise, and potential funding from international environmental organizations. A Ramsar designation could compel the Japanese

²¹ Ibid.

²² Ramsar Convention on Wetlands. 2025. “Japan - Country Profile.” Accessed May 7, 2025. <https://www.ramsar.org/country-profile/japan>.

²³ Ramsar Convention on Wetlands. 2025. “The Wise Use of Wetlands.” Accessed May 7, 2025. <https://www.ramsar.org/about/our-mission/wise-use-wetlands>.

²⁴ Ramsar Convention on Wetlands. 2025. “Ramsar Sites Criteria.” Accessed May 8, 2025. www.ramsar.org/document/ramsar-sites-criteria.

²⁰ Jia, Rui, Huayang Lei, Takenori Hino, and Arul Arulrajah. 2018. “Environmental Changes in Ariake Sea of Japan and Their Relationships with Isahaya Bay Reclamation.” *Marine Pollution Bulletin* 135 (October): 832–44. <https://doi.org/10.1016/j.marpolbul.2018.08.008>.

government to implement sustainable wetland management policies, and move towards restoration of the bay through policy efforts. While this would require cooperation and negotiation between stakeholders, it would legitimize environmental concerns through established international legal frameworks and offer structured mechanisms to ecological and socio-economic restoration.

RECOMMENDED SOLUTION

Partial Dike Re-opening

Given the current socio-political and environmental context of Isahaya Bay, the more practical and politically feasible solution in the short-medium term would be a partial dike opening, addressing water quality issues and ecological restoration while minimizing disruption to local agriculture and livelihoods. However, for the long-term goal of fully restoring the natural functioning of the Ariake Sea ecosystem, an eventual dike removal may be necessary—but only after proper support systems (like coastal defenses—protecting the local area from flooding and erosion, compensation policies, and adaptive land-use planning) are in place. A phased or adaptive approach—starting with partial opening and monitoring the results, then expanding the opening over time—might balance ecological recovery with stakeholder concerns.

Restoring the Ariake Sea into a healthier, more sustainable ecosystem would require opening the floodgates, restoring the tidal flow, and revitalizing the tidal flats. However, strong opposition from the government and farmers occupying the reclaimed lands has complicated the matter through numerous court battles over the years. Concerns are cited over damages from flooding and saltwater, and increased difficulty in securing agricultural water from the reservoir if the gates are opened. As previously mentioned in the section on dike removal, although the tidal currents will not return to their former state and the effects of opening the floodgates may not be immediate, the reintroduction of seawater into the reservoir could help combat the production

of toxins that are also affecting the quality of water that is used for agriculture. Additionally, there may be an increase in *Corophium*, small, benthic, phytoplankton and organic-matter-eating creatures which also act as a food source for fish and shellfish. The rise in *Corophium* could enhance sediment oxidation (oxygen levels in the sediment), creating a suitable environment for larger benthic species to inhabit.²⁵ Researchers believe that opening the floodgates will result in fishery production recovery and overall improvement in the environment of the Ariake Sea. In the case of Ago Bay, in Mie, Japan, the enclosed coastal sea faced ecosystem degradation and declining marine resources similar to Isahaya Bay. The opening of a flap gate in the dike is said to have improved biodiversity.²⁶ The local government of Nagasaki should learn from cases such as Ago Bay and work towards a more sustainable future.

CONCLUSION

The Isahaya Bay reclamation project has shown serious consequences. While it was initially justified for agricultural and disaster prevention purposes, environmental and socio-economic costs have been significant, prompting debate and legal battles. The most viable solution to mitigating these impacts appears to be a partial reopening of the dike. This approach attempts to balance the interests of stakeholders while gradually restoring tidal flow and improving water quality. Moving forward, collaboration among the government, researchers, and local communities is essential to develop a sustainable strategy that addresses both economic and ecological concerns. Japan can work toward reversing environmental degradation while ensuring the livelihoods of those dependent on Isahaya Bay's natural resources. 

25 Jia et. al., 2018.

26 Kokubu, Hideki, and Osamu Matsuda. 2012. "Satoumi in Ago Bay: Embracing Integrated Coastal Management." *Our World*. United Nations University. July 27, 2012. <https://ourworld.unu.edu/en/satoumi-in-ago-bay-embracing-integrated-coastal-management>.



Sand-Bagging the ‘Sand Mafias’: Solutions for Effective and Safe Reporting on Illegal Sand Mining in India

Maggie Hunter

ABSTRACT

Illegal sand mining in India leads to environmental degradation, economic losses, and violent clashes with criminal organizations known as “sand mafias.” This paper examines the critical role of environmental journalism in exposing and combating this industry, proposing large-scale solutions to enhance both the safety and effectiveness of environmental reporting in India, a country where journalists are routinely threatened by mafia violence. Key strategies include strengthening media institutions through journalist training, policy, and partnerships and adding technological safeguards.

INTRODUCTION

Environmental journalism in India is a deadly profession. Reporters are burned alive and shot for exposing stories of environmental crime. These reporters routinely cover illegal sand mining, one of the world’s most overlooked environmental disasters. Global sand consumption has exploded due to a global urban construction boom, as sand is a core ingredient in concrete, glass, electronics and more. With rivers providing high-quality sand, this natural resource is now the second-most extracted material in the world after water and extraction is rising by 6% annually, a level that has extreme environmental consequences.¹

At least 80% of India’s mining industry is informal and illegal.² Illegal sand mining, often controlled by organized criminal groups known as “sand mafias,” involves the unlawful extraction of sand from rivers and beaches without permits or regard for environmental regulations. These operations deprive the government of revenue, resulting in significant

1 UN Environmental Program. 2022. *Sand and Sustainability: 10 strategic recommendations to avert a crisis*. Geneva, Switzerland: United Nations Environmental Programme.

2 Lahiri-Dutt, Kuntala, and James McQuilken. 2019. *India: State of the Artisanal and Small-Scale Mining Sector*. Delve.

economic losses. Indian state Andhra Pradesh alone has lost approximately \$800 million in government revenue over the last five years due to unregulated sand extraction.³ Beyond financial losses, excessive mining leads to severe environmental degradation and labor exploitation. An estimated 35 million miners in India rely⁴ on this sector for their primary income, and for many rural Indians, it's one of the only sources of income.⁵

An essential safeguard against the dangers of this industry is environmental journalism. Investigative media coverage has historically played a key role in exposing illegal extractive industries in India and other developing countries, from coal mining scams in India⁶ to illegal gold mining in Brazil⁷ and deforestation in Indonesia.⁸ However, environmental journalism is also dangerous. Almost half of the 28 journalists murdered in India in the last decade were covering environmental stories.⁹ These murders are brutal—one journalist

was burned alive,¹⁰ while another was shot six times.¹¹ Both had exposed illegal sand mining operations. Beyond direct violence, threats, physical assaults, harassment, and legal intimidation create a chilling effect, leading many journalists to self-censor.¹²

Despite these risks, journalism remains one of the most adaptive and community-centered methods for combating illegal sand mining. Unlike legal or policy-based reforms to illegal sand mining, the media provides a platform for diverse voices. Environmental journalism acts as a critical line of defense against environmental exploitation, particularly in areas where legal enforcement is weak. By exposing crimes and holding powerful mining interests accountable, journalists both inform the public and encourage legal and policy reform. Without the media, illegal industries like sand mining stay hidden, leading to more corruption and environmental harm. As a result, this paper proposes six solutions to enhance both the safety and effectiveness of environmental reporting on illegal sand mining in India: police crackdown; training, policy, and partnerships; technological advancement; defamation law reforms; whistleblower protections; and citizen journalism initiatives.

POSSIBLE SOLUTIONS

Solution 1

Police Crackdown

Law enforcement intervention through police crackdowns could curb illegal sand mining and violence against journalists. Some suggest

3 Rao M, Sambasiva. 2024. "Andhra Pradesh suffered revenue loss to the tune of ₹19,000 crore in mining under YSRCP rule, alleges Chief Minister." *The Hindu*, July 15

4

5 Baker, Matovu, Jerome Lugumira Sebbaduka, Expedito Nuwategeka, and Yasin Bbira. 2023. "The Complexity of Sand Mining in Coastal Regions of India: Implications on Livelihoods, Marine and Riverine Environment, Sustainable Development, and Governance." *KMI International Journal of Maritime Affairs and Fisheries* 57-91.

6 Jaliha, Shreegireesh. 2024. "Despite prescient warnings by BJP leader RK Singh and Rajeev Chandrasekhar, Union gov't went ahead with flawed coal auctions." *The Reporters Collective*. February 20. <https://www.reporters-collective.in/trc/coal-scam-letters>

7 Arzaba, Andrea. 2025. "Investigating Clandestine Gold Mines, Deforestation, and Corporate Misconduct: The Reporter Who Made the Amazon His Beat." *Global Journalism Investigative Network*. March 24. <https://gijn.org/stories/investigating-amazon-clandestine-gold-mines-deforestation-corporate-misconduct/>

8 Williams, Aled. 2024. "Corruption in Indonesia's forest sector: No victimless crime." *The U4 Anti-Corruption Network*. June 1. <https://www.u4.no/corruption-in-indonesias-forest-sector-no-victimless-crime>

9 Reporters Without Borders. 2024. "Almost half of the 28 journalists killed in India since Modi became PM were covering environment-related stories." *Reporters Without Borders*. April 18. <https://rsf.org/en/almost-half-28-journalists-killed-india-modi-became-pm-were-covering-environment-related-stories>

10 Reporters Without Borders. 2022. "Indian newspaper reporter burned alive after exposing corruption." *Reporters Without Borders*. August 12. <https://rsf.org/en/indian-newspaper-reporter-burned-alive-after-exposing-corruption>

11 International Media Support. 2024. "Environmental journalism: the dangers and a practical tool helping to mitigate them." May 2. Accessed March 3, 2025. <https://www.mediasupport.org/blogpost/environmental-journalism-the-dangers-and-a-practical-tool-helping-to-mitigate-them/>

12 UNESCO. 2022. "Threats that silence: Trends in the safety of journalists." Accessed March 3, 2025. <https://www.unesco.org/reports/world-media-trends/2021/en/safety-journalists>

that journalists could even be accompanied by police officers to ensure their safety.¹³ In March 2025, Odisha state police arrested 123 alleged illegal sand miners in 24 hours. Some environmental NGOs in India¹⁴ attest that these raids are an effective means to prevent sand exploitation. A subsequent component to a “crackdown” approach is harsher penalties for violence against journalists. India has been on the Committee to Protect Journalists’ Impunity Index for 17 years, as long as any other country on the list.¹⁵ More robust legal consequences for attacks on journalists could deter violent actors.

However, police crackdowns often displace illicit activities rather than eliminate them, as is often the case in Central American cocaine trafficking and illegal wildlife trade.¹⁶ Increased enforcement can drive up black-market sand prices, making the industry more lucrative and pushing operations further underground.¹⁷ In addition, police officers are often embedded in corruption networks,¹⁸ accepting bribes in exchange for certifying illegally mined sand or ignoring mafia violence.¹⁹ Sand mafias

also target police officers,²⁰ sometimes hiring private security forces to counteract enforcement efforts.²¹ Police crackdowns can escalate violence without effectively dismantling the criminal networks. In addition, many journalists believe that sources would not be inclined to speak with them if they are accompanied by law enforcement.²²

Solution 2

Training, Policy, and Partnerships

International partnerships and newsroom safety protocols offer a defense for reporters. Many NGOs, like the Natural Resource Governance Institute²³ for example, equip media professionals with risk assessment tools for environmental reporting.²⁴ Training and education are already available and employed in India but could be reinforced within the context of environmental reporting.

Newsrooms could also develop security policies to prevent and respond to violence, like wearing protective vests or reinforcing the building’s physical infrastructure.²⁵ In Mexico, many newsrooms have adopted security protocols.²⁶ These protocols often adapt to personal experience and preference, rather than being set solutions.²⁷ While these programs help journalists avoid immediate threats, the dangers of violence are still present.

13 Diaz-Cervero, Elba and Ibanez, Daniel Barredo. 2020. “Journalistic Coverage of Organized Crime in Mexico: Reporting on the Facts, Security Protocols, and Recurrent Subthemes.” *International Journal of Communication* 14. <https://ijoc.org/index.php/ijoc/article/viewFile/11937/3078>

14 Awaaz Foundation, for example

15 Committee to Protect Journalists. 2024. “CPJ 2024 Impunity Index: Haiti and Israel top list of countries where journalist murders go unpunished.” October 30. <https://cpj.org/2024/10/cpj-2024-impunity-index-haiti-and-israel-top-list-of-countries-where-journalist-murders-go-unpunished/>

16 Magliocca, Nicholas, Aurora Torres, Jared Margulies, Kendra McSweeney, Ines Arroyo-Quiroz, Neil Carter, Kevin Curtin. 2021. “Comparative Analysis of Illicit Supply Network Structure and Operations: Cocaine, Wildlife, and Sand.” *Journal of Illicit Economies and Development* 50-73

17 Magliocca et al.

18 Hayes, Hannah L., Keith C. Pilkey, Nelson G. Rangel-Buitrago, William J. Neal, Norma J. Longo, and Orrin H. Pilkey. 2022. “The Sands of Crime: Mafia, Sand Robbers, and Law.” In *Vanishing Sands: Losing Beaches to Mining*. Durham: Duke University Press. <https://muse.jhu.edu/book/102874>.

19 Mahadevvan, Prem. 2019. *Sand mafias in India: Disorganized crime in a growing economy*. Geneva: The Global Initiative Against Transnational Organized Crime.

20 Singh Rawat, Bhim. 2024. “May-June 2024: Sand Mafias Mowed Three Policemen to Death.” June 30, 2024. <https://sandrp.in/2024/06/30/may-june-2024-sand-mafias-mowed-three-policemen-to-death/>

21 Hayes et. al

22 Diaz-Cervero and Ibanez

23 Fitzgerald, Susannah, Alexandra Gillies, Sebastian Sahla, Matthieu Solomon, and Tom Shipley. 2023. *Diagnosing Corruption in the Extractive Sector: A Tool for Research and Action*. Tool, Natural Resource Governance Institute.

24 Canonge, James Christian, Matthew Purcell, and Michael Behrman. 2012. *Watchdog or Lapdog: Limits of African Media Coverage of the Extractive Sector*. School of International and Public Affairs, Columbia University.

25 Diaz-Cervero and Ibanez

26 Linares, Cesar Lopes. 2024. “Mexican news outlets learn to design custom security protocols.” December 5. *LatAm Journalism Review*. <https://latamjournalismreview.org/articles/mexican-news-outlets-learn-to-design-custom-security-protocols/>

27 Diaz-Cervero and Ibanez.

Beyond training within the newsroom, international partnerships provide support for investigative journalism. NGOs like the Organized Crime and Corruption Reporting Project provide shared datasets and research help.²⁸ Even partnerships among other journalists within India—or even within one state—can help minimize risks. “Environmental journalists must take care of each other,” said one Mexican journalist and founder of a network of reporters covering marine issues in Mexico.²⁹ Training alone is not enough—but combined with policy and partnerships, it builds an ecosystem of support for journalists.

Solution 3

Technological Advancements

Technological advancements ensure that newsrooms have digital protections in the face of threats. A report from Amnesty International and the Washington Post found that journalists in India were targets of highly invasive spyware and unlawful surveillance.³⁰ Therefore, secure communication tools like encrypted messaging apps and data diodes³¹ allow journalists to share sensitive information without government or mafia interception.

One major hindrance to this solution is limited resources. Though these technologies don’t have to be expensive, some may be challenging to implement for newsrooms that are financially stressed or have a very small staff. Some organizations, like Reporters Without Borders, provide free digital security training and tools for at-risk journalists. This

could make implementation more feasible for smaller newsrooms.

Social media and the internet can be helpful when a journalist faces threats. One journalist in Mexico said, “When I was in danger, the first thing I did was to tell the public, all of my Facebook friends.”³² Still, while public exposure can help deter threats, it can also make journalists more vulnerable to online harassment.

Solution 4

Defamation Law Reforms

On a larger scale, legal reforms could provide stronger protections for journalists covering illegal sand mining. One method is decriminalizing defamation for environmental reporting. Reforming criminal defamation laws would prevent powerful mafias from weaponizing the law against journalists. From 2009 to 2022, UNESCO reports that globally, at least 209 journalists and news outlets covering environmental topics have faced legal attacks, resulting in the imprisonment of 39 journalists.³³ Though India has a “fault” standard for defamation, India’s defamation laws are still frequently used to silence journalists.³⁴ UNESCO recommends that defamation should be decriminalized in nearly all cases.³⁵

Because this solution is dependent on government policies, it is likely not feasible, at least in the short term. The Modi government does not advocate for media freedoms and instead is often a threat to the press. Defamation is a frequent tool in Modi’s party’s toolbox, so

28 Organized Crime and Corruption Reporting Project. <https://www.occrp.org/en/about-us>

29 Pennacchio, Katherine. 2022. “Mexican environmental journalists unite to launch network centered on marine issues.” *LatAm Journalism Review*. July 12. <https://latamjournalismreview.org/articles/mexico-environmental-journalists-ocean-life/>

30 Amnesty International. 2023. “India: Damning new forensic investigation reveals repeated use of Pegasus spyware to target high-profile journalists” 28 December. <https://www.amnesty.org/en/latest/news/2023/12/india-damning-new-forensic-investigation-reveals-repeated-use-of-pegasus-spyware-to-target-high-profile-journalists/>

31 Story, Peter. 2023. Building an Affordable Data Diode to Protect Journalists. Conference Paper, Anaheim: Conference: Workshop on Privacy Engineering in Practice.

32 Diaz-Cerero and Ibanez.

33 Soraide, Rosario. 2022. “The ‘misuse’ of the judicial system to attack freedom of expression: trends, challenges and responses.” UNESCO. <https://unesdoc.unesco.org/ark:/48223/pf0000383832>

34 Rai, Suyash and Burman, Anirudh. 2023. “Reforming Criminal Defamation.” *Carnegie India*. April 5. <https://carnegieendowment.org/india/ideas-and-institutions/reforming-criminal-defamation-law-or-ethics-in-public-administration?lang=en>

35 Soraide.

there is little incentive for change.³⁶ For India, an alternative to completely decriminalizing defamation could be defamation law reforms, like removing imprisonment as a punishment for defamation. However, even a reform would likely still be a stretch in India's current political environment. In addition, fines could be even more devastating for already underfunded newsrooms than prison time. While unfeasible now, legal reform is crucial for long-term change. International pressure and public outcry have historically led to media law reforms in other countries, suggesting that similar momentum could build in India over time.

Solution 5

Whistleblower Protections

In order to protect sources' anonymity, India could strengthen whistleblower protections. Whistleblowers and journalists are often intertwined; miners or locals act as sources, and journalists amplify their voices. Protecting one protects the other. India's existing 2014 Whistleblower Protection Act has been criticized for its weak applications.³⁷ Expanding protections specifically for journalists and their sources would encourage safer reporting. Whistleblowers are frequent targets of mafia attacks and protecting their anonymity is key to making progress in curbing illegal sand mining.³⁸

In addition, whistleblower networks--secure, anonymous, and independent tiplines for miners and locals to report illegal activities could expose violations while protecting sources from mafia violence. Ensuring access to independent networks can help whistleblowers skirt corrupt authorities. For example, WildLeaks, an environmental

reporting network run by the NGO Earth League International, receives hundreds of reports from dozens of countries and connects these tips to experts who can begin an investigation.³⁹

Similarly to defamation law reforms, because the legal backing of this solution is dependent on government policies, it is also likely not feasible in the short term. In addition, only 43% of Indians are internet users,⁴⁰ so web-based tiplines may not be accessible by all Indians, especially those in rural areas where mining is most pervasive.

Solution 6

Community-Based Monitoring and Citizen Journalism

One of the most effective ways to distribute risk and decentralize environmental reporting is to empower local communities by encouraging citizen journalism initiatives. Training community members in basic reporting skills and providing anonymous reporting platforms, perhaps through social media, can create a decentralized reporting network that is harder to silence.

This model has worked in other developing countries facing similar issues. In Ghana, for example, community-based monitoring of illegal gold mining has been instrumental in exposing environmental violations.⁴¹ In Mexico, where reporting on organized crime is highly dangerous, journalists rely on citizen networks and encrypted platforms to distribute risk and maintain coverage. Brazil has successfully used community-led initiatives in combination

36 Ellis-Petersen, Hannah. 2023. "Supreme Court suspends Rahul Gandhi's two-year defamation jail term." August 4. *The Guardian*. <https://www.theguardian.com/world/2023/aug/04/rahul-gandhi-wins-supreme-court-appeal-against-defamation-conviction>

37 Kohn, Kohn, and Colapinto. India Whistleblower Law. <https://kkc.com/india-whistleblower-law/>.

38 Reddy, Sudhakar U. 2021. "Targeted by Mining Mafia: Whistleblowers." March 4. *Times of India*. <https://timesofindia.indiatimes.com/city/hyderabad/targeted-by-mining-mafia-whistleblowers/articleshow/81318383.cms>

39 WildLeaks. 2020. "The first report of WildLeaks." September 8. <https://wildleaks.org/the-first-wildleaks-report/>

40 CIA World Factbook. "India." <https://www.cia.gov/the-world-factbook/countries/india/>

41 Ellington, Sarah and Hoosen, Sullaiman. 2025. "INDABA 2025: How can Ghana combat illegal mining?" February 25. <https://www.wfw.com/articles/indaba-2025-how-can-ghana-combat-illegal-mining/>

with satellite imagery to track illegal mining activities.⁴²

However, in some cases, sand mafias pay off local communities for their cooperation, which could be a drawback from this solution.⁴³ In addition, limited internet use is a major hindrance to how effective this solution can be. Citizen reporting does not replace traditional journalism, but rather strengthens evidence while dispersing risks for journalists.

RECOMMENDED SOLUTION

The most effective method to improve environmental reporting of illegal sand mining in India is the combination of solutions 2 and 3: strengthening media institutions through training, policy, and partnerships; and implementing technological safeguards to protect journalists in the field. Both solutions address the core issues Indian environmental reporters face like weak institutional backing and lack of personal safety, and offer tangible, replicable, and scalable solutions that do not depend on large-scale political reform.

Media training, institutional policy, and partnerships within the media can strengthen the media environment overall. If journalists better understand how to navigate the legal environment, address physical and online security, and use effective reporting techniques, they can more effectively report on environmental crime. These tools guide journalists in emergency situations and help coordinate coverage in order to minimize risk.

At the same time, in an era of digital journalism, technological solutions can help journalists maintain online security. These technologies allow journalists to gather, store, and exchange information without making themselves easy targets. These technologies

are cost-effective, scalable, accessible. When implemented alongside media training, policy, and partnerships, these technologies can help build digital security for journalists.

This multi-layered strategy has a far greater chance of working than government-led interventions alone. Legal reform and policy changes (solutions 4 and 5) would be extremely helpful in principle but are impractical in India's current political environment when press freedom is on a decline and corruption is common. Even if these solutions were implemented, enforcement may be weak. In addition, while police intervention is important, it is not part of the proposed solution because of corruption and limited effectiveness.

On the other hand, solutions 2 and 3 empower journalists to protect themselves and each other. They are more resilient to the state, adaptable to local needs, and scalable from region to region. Citizen journalism (solution 6) could also be incorporated into this model. However, citizen journalism is not part of the proposed solution because without a supportive ecosystem, asking untrained community members to take on dangerous reporting is neither safe nor sustainable.

Solutions 2 and 3 work well together. They form a multi-layered safety net that is less dependent on government cooperation, an essential feature given India's current political climate. By adapting successful frameworks from other developing countries and investing in both professional and grassroots reporting, India can curb illegal sand mining while protecting those who expose it. Without these interventions, violence against journalists and environmental destruction will continue to escalate, endangering not only the media but also the country's natural resources and democracy. 🌍

42 Potter, Hyury. 2023. "New Satellite Images Reveal Even More Destructive Mining in the Yanomami Indigenous Territory." February 23. <https://pulitzercenter.org/stories/new-satellite-images-reveal-even-more-destructive-mining-yanomami-indigenous-territory>

43 Rajshekhar, M. 2016. "Sand mining in Tamil Nadu is incredibly destructive – but it's also unstoppable." Scroll.in September 21. <https://scroll.in/article/815140/why-sand-mining-in-tamil-nadu-is-unstoppable-even-though-its-destructive>

ADDITIONAL WORKS CONSULTED

- African Center for Media Excellence. 2019. *Reporting Mining: A Journalists' Handbook*. African Center for Media Excellence.
- Arsenault, Chris, and Phillip Le Billon. 2022. "Covering crude bargains: The impacts of investigative media reporting on oil deals." *The Extractive Industries and Society*.
- Ayelazuno, Jasper Abembia, and Maxwell A Aziabah. 2023. "Making visible the galamsey scandals in Ghana: Digital media as new technologies of democratic accountability." *The Extractive Industries and Society*.
- Beiser, Vince. 2017. "He who controls the sand: the mining 'mafias' killing each other to build cities." *The Guardian*, February 28.
- Bendixen, Mette, Lars L Iversen, Jim Best, Daniel M. Franks, Christopher R. Hackney, Edgardo M. Latrubesse, and Lucy S. Trusting. 2021. *Sand, gravel, and UN Sustainable Development Goals: Conflicts, synergies, and pathways forward*. Review, One Earth.
- Marschke, Melissa, and Jean-Francois Rousseau. 2022. "Sand ecologies, livelihoods and governance in Asia: A systematic scoping review." *Resources Policy*.
- OECD. 2019. *Global Material Resources Outlook to 2060: Economic Drivers and Environmental Consequences*. Paris: OECD Publishing.
- Reporters Without Borders. 2022. *Red alert for green journalism – 10 environmental reporters killed in five years*. August 22. <https://rsf.org/en/red-alert-green-journalism-10-environmental-reporters-killed-five-years>.
- Reporters Without Borders. 2024. RSF Index. Reporters Without Borders. <https://rsf.org/en/index>.
- South Asia Network on Dams, Rivers, and People. 2022. *India Sand Mining Dec 2020 to March 2022: Violence & Accidents Killed 418 People in 16 Months*. April 24. Accessed February 27, 2025. <https://sandrp.in/2022/04/24/india-sand-mining-violence-accidents-killed-418-people-in-16-months/>.
- UN Environmental Program. 2019. *Sand and sustainability: Finding new solutions for environmental governance of global sand resources*. Geneva, Switzerland: United Nations Environmental Programme.



Safeguarding Submarine Cables in East Asia

Maurilio Ramirez

ABSTRACT

This white paper examines the growing importance and vulnerability of undersea cables in the Indo Pacific, specifically within East and Southeast Asia. As global communication networks become increasingly reliant on these submarine cables, their vulnerability to disruptions through sabotage, espionage, and accidental damage poses significant risks to a country's economy, security, and its ability to connect to the rest of the world. The paper outlines the history of undersea cables and explores the current geopolitical tensions exacerbating the threat to undersea cables. It argues that the existing international frameworks and undersea cable maintenance conventions are insufficient in deterring deliberate disruption events. The paper recommends a multi-tiered strategy for regional actors, centered on regional cooperation, international legal frameworks, and advanced surveillance to safeguard the critical infrastructure.

OVERVIEW/ HISTORY

Over 95% of total daily internet traffic flows through submarine cables (also known as Deep Sea or Under Sea cables).¹ These cables enable global financial transactions, military communications, and public networks, resulting in submarine cables being a vital infrastructure for any nation's state.² Originally, undersea cables were telegraph cables that allowed for instant point-to-point communication, rather than sending a transmission over a broadcast.³ In the early 1950s these cables were predicted to

- 1 [National Oceanic and Atmospheric Administration, "Submarine Cables," 2024.](#)
- 2 Colin Wall and Pierre Morcos, "[Invisible and Vital: Undersea Cables and Transatlantic Security,](#)" 2021.
- 3 Jonathan Reed Winkler, "[Bridging the Gap: The Cable and Its Challengers, 1918–1988,](#)" 2009.

become obsolete as satellite transmission began to take over, but an expansion in fiber optical cables have resulted in submarine cables becoming the dominant technology for global communications.⁴ This data ranges from national communications, banking information, encrypted data and more which can all be halted through cable disruption. This results in millions of economic damages for the length of time it takes to repair an undersea cable.⁵ Undersea cables nature of stretching over large bodies of water and interacting with multiple nation states ocean maritime borders, results in them being rather difficult to maintain and repair from both incidental and deliberate harm.^{6,7} While 99% of undersea cables are owned by private companies, they must respect nations sovereignty when it comes to any forms of repairs. Submarine cables are seen as a critical target when it comes to espionage, disruption, or sabotage as any sort of disruption can cause serious economic damage to a nation's state.⁸

While these intercontinental infrastructures are vital, there are currently varying protections or regulations on how to deal with disruptions surrounding the repairs of submarine cables. Highlighted under United Nations Convention on the Law of the Sea (UNCLOS) Article 113, nation states are responsible for the protection of submarine cables within their EEZ, and signatories are subject to implementing laws and jurisdictions that would punish ships that damage submarine cables.⁹ Yet many signatories of UNCLOS have yet to implement their obligations under article 113, or other countries have taken a more loose

approach to these regulations.^{10,11} While there are proper channels to report incidents and get compensation for damages to undersea cables, it is common for the price of the disruption over a long period of time to cost more than the cable repair itself, or for bad faith actors to avoid paying fines using gaps within the treaty.¹²

Within the region of East Asia, there are continued concerns with geopolitics playing a rather aggressive role in the continued defense and laying of new cables in the region.^{13,14} Taiwan has had multiple incidents of damage to their submarine cables within the last year and has detained a ship, linked to China, flying a Togo flag. Which has been linked to a cable disruption.^{15,16} Within the South China Sea China has made acquiring permits difficult through its expansion of artificial islands and complicating permits for repairs.¹⁷ China has also unveiled new deep sea cable cutter that can cut cables at up to 4000 meters below sea level.¹⁸ As concerns over increased disruption of under sea cables continue, what steps can nation states take to safeguard these critical infrastructures in the region?

POSSIBLE SOLUTIONS

Solution 1

Regional Cooperation

A proposed solution would be the creation of a new regional group that focused on cable

4 Jeff Hecht, "Fiber-Optic Submarine Cables," 2009.

5 APEC Policy Support Unity, Economic Impact of Submarine Cable Disruptions, 2012.

6 Jack Haddon, "Indonesian Policy Delays Sea-Me-WE 5's Repair," 2024.

7 Andy Palmer-Felgate et al., "Marine Maintenance in the Zones," 2013.

8 Anna Blue, "Submarine Data Cables: Latest Target of the U.S.-China Rivalry," 2024.

9 UN General Assembly, Convention on the Law of the Sea, 1982.

10 Douglas R. Burnett, "Submarine Cable Security and International Law," 2021.

11 Tara Davenport, "Submarine Cables, Cybersecurity and International Law," 2024.

12 APEC Policy Support Unity, 2012.

13 Justin Sherman, Cyber Defense across the Ocean Floor, 2022.

14 Elina Noor, "Center for Indo-Pacific Affairs," 2024.

15 "Taiwan Detains Suspicious Ship Linked to China," 2025.

16 Chih-yu Chen and Shelley Shan, "Undersea Cable Safety Law Needed," 2025.

17 William Yuen Yee, "Laying Down the Law under the Sea," 2023.

18 Jill Goldenziel, "China's Cable Cutter Claims Deserve a Sharper Look," 2025.

protection within the Indo Pacific region that would allow for enhanced regional coordination with maintaining of cables.¹⁹ This would help with reducing time for permits in the region and create and share the burden of sensing and monitoring equipment.²⁰ In the region of East Asia, it is paramount that regional cooperation is at the forefront of protecting undersea cables. With the regions tense geopolitical rivalries as well as their overlapping territorial claims creating security challenges with nations. Existing cooperative frameworks can be seen within the European Union. With a framework that under their Network and Information Security 2 (NIS2) directive outline steps to further increase the security of the EU's shared submarine cables.²¹ With further plans to implement risk assessment for future cables, cable security mitigating measures and further funding to safeguard submarine cables in their region.²² In the Indo-Pacific region Australia has partnered with the U.S, India, and Japan to create the Quadrilateral Security Dialogue (QUAD), which planned to fund Cables in the Indo-Pacific and providing technical assistance to Indo-Pacific governments, expanding on repair capabilities in the region through multinational cooperation.²³ With the Geopolitical tensions in the region countries are weary to choose to align with either China or the United States.²⁴ Countries within the Association of Southeast Asian Nations (ASEAN) have had lackluster approaches when it comes to establishing binding agreements on cybersecurity and undersea cables protections.²⁵

Solution 2

International Policy and Regulatory Measures

Regulatory frameworks play a crucial role in safeguarding undersea cables, especially within regions with high geopolitical tensions such as East Asia. The region lacks a unified regulatory framework for undersea cables. While some countries have national laws governing cable protection, these regulations do not extend beyond territorial waters. Which further complicates matters, with various land and EEZ claims in the region, resulting in jurisdictional conflicts.²⁶ A regionally cohesive framework of national policy and regulatory measures would enhance regulatory coordination, allowing for universal penalties for cable interference. Without clear and enforceable regulations undersea cables in the region continue to remain vulnerable to disruptions. Countries that have successfully implemented strong regulations, such as Australia and the United States, provide a model for the region. Australia's Telecommunication and other Legislation Amendment (TOLA) act, also known as Assistance and Access act, granted government agencies oversight on Australia's telecommunication infrastructure.²⁷ As well as having introduced protection zones for cables of national significance with criminal penalties of up to 10 years imprisonment for damaging cables in the zone.²⁸ Similarly in the United States, the TEAM Telecom process allows for national security agencies to review foreign investments in critical telecommunication infrastructure; However recently the Federal Communications Commission (FCC) is looking into expanding its licensing rules to better safeguard cables from espionage and sabotage.²⁹

19 Elina Noor, "[Subsea Communication Cables in Southeast Asia](#)," 2024.

20 Jeslyn Tan, "[Securing the Backbone](#)," 2024.

21 "[Joint Communication to Strengthen the Security and Resilience of Submarine Cables](#)," 2025.

22 "[Commission and the High Representative Present Strong Actions](#)," 2025.

23 Asha Hemrajani, The Quad Partnership for Cable Connectivity and Resilience, 2023.

24 Noor, "Center for Indo-Pacific Affairs."

25 ASEAN, [Guidelines for Strengthening Resilience and Repair of Submarine Cables](#), 2012.

26 Tan, "[Securing the Backbone](#)."

27 Telecommunications Act and Other Legislation Amendment (Assistance and Access) Act, 2018.

28 Karl Hoerr, "[What Lies Beneath](#)," 2024.

29 "Review of Submarine Cable Landing License Rules," Federal Register, 2025.

Solution 3

Cybersecurity measures

Within the region of East Asia data traffic is only expected to grow. As e-commerce in the region continues to expand and geopolitical tensions rise, reinforcing cyber security should be a priority for the region.³⁰ With encryption playing a key role for nation states in the region. After encryption, nation states could look towards one another to build upon and expand cyber security in the region. Creating a regional cyber security consortium that would share intelligence on rising cyber security threats. Tampering undersea cables to collect data has been a long-time threat since undersea cables were originally telegraph cables.³¹ However, in modern-day cybersecurity threats have become a more pressing issue with the vast number of systems that rely on a steady transmission of data. With massive amounts of confidential information passing through these cables every day, nation states need to take measures to ensure the safety of their data even if their undersea cables become compromised.³² In Europe, governments have implemented strong encryption protocols, threat monitoring, and a cyber security task force through the European Cyber Security Organization.³³ This approach safeguards undersea cables landing stations, as larger cables may have multiple landing stations where cables data may be accessed if a breach where to occur.³⁴

Solution 4

Cable monitoring and sensing

Advanced monitoring technologies like fiber sensing, optical sensors, oceanographic sensors, and acoustic sensors allow nation

states to monitor undersea cables.³⁵ The region could create a network that would deploy real time data analytics through fiber sensing, AUVs, and systems such as DAS to detect anomalies along the cables and report unauthorized access. Japan's AI powered maritime monitoring system, V-BAT, an unmanned aircraft system; could be transitioned from security defense to monitoring and defense of submarine cables alongside AUVs in the water. ^{36,37} By using technological innovation cable disruption could be minimized and safeguarding could become an initiative-taking process rather than a responsive process.

Fiber-optic sensing, a continually advancing technology, such the Distributed Acoustic Sensing, allows nations to use acoustic signals and vibrations by analyzing changes in light pulses transmitted through fiber optic cables. Undersea cables can transmit notifications to nearby ships that are within a certain range of cables as well as being able to transmit other kinds of environmental data, such as early earthquake warnings. ^{38,39} These sensors combined with Autonomous Submarine Vehicles (AUVs) can be used to monitor deep sea cables more effectively as the sheer length of these cables makes them difficult to monitor.⁴⁰

Solution 5

More Submarine Cables and Cable Repair Ships

When it comes to critical infrastructure redundancy is key to ensuring that a nation state is still able to operate when plans go awry; In this capacity increasing the total amount of submarine cables that a nation state has

35 Dimitrios Eleftherakis and Raul Vican-Bueno, "[Sensors to Increase the Security of Underwater Cables](#)," 2020.

36 "Shield AI V-Bat Selected," 2025.

37 Noor, "Subsea Communication Cables in Southeast Asia."

38 Mike Claire, "[Submarine Cable Protection and the Environment](#)," 2024.

39 Yuancong Gou et al., "[Leveraging Submarine DAS Arrays](#),"

40 Bob Paap et al., "[Leveraging Distributed Acoustic Sensing](#)," 2025.

30 Louise Marie Hurel et al., "[Cyber Capabilities in the Indo-Pacific](#)," 2024.

31 "From Australia to Zimmermann: [A Brief History of Cable Telegraphy](#)," 2013.

32 Daniel F. Runde et al., "[Safeguarding Subsea Cables](#)," 2024.

33 ENISA, 2024 [Report on the State of the Cybersecurity in the Union](#), 2024.

34 Tan, "Securing the Backbone."

access to can reduce the criticality of certain cables.⁴¹ Combined with an increased amount of domestic cable repair ships, that allows for a quicker response to disruptions. Europe and North America have implemented diversified cable routes and increased the availability of repair ships to minimize downtime when undersea cables are disrupted.⁴² With regards to cable repair ships, concerns are being raised that filling the positions with young people will be the pressing issue, as the job of working on a repair ship can be dangerous and that the industry is seen as invisible or overshadowed by other fields. The region of East Asia should have a dedicated fleet of repair ships that are shared with the region to handle disruptions. The European Union is currently trying to implement such a measure within the Baltic Sea.⁴³ To increase the number of submarine cables the nation states should partner with major tech companies in the region to fund new cable routes, ensuring multi-route redundancy in the region.⁴⁴

PROPOSED SOLUTION 1,2, AND 4 AND ANALYSIS

Safeguarding deep sea cables in East Asia is a complex and multilateral issue, from tense geopolitical disputes over territory and ocean claims to international relations dictating the time it takes to repair undersea cables. The region is overwhelmingly unprepared for a wide scale disruption event that could sever multiple cables in a small amount of time causing millions of dollars in damage. With China showcasing new technology that is specifically aimed at cutting undersea cables to cause disruption safeguards need to be in place for if an event were to occur. Regional cooperation is necessary, with a focused framework around the establishment, protection, monitoring, and enforcement of undersea cables that will allow for the

safeguarding of undersea cables in the region.⁴⁴ Through a multilateralism approach, which focuses on the achievement of an objective rather than an ideological cooperation, regional cooperation can be established. Nation states within the region can establish a standardized legal framework surrounding the protection and maintenance of submarine cables; the regional organization could then implement the final cornerstone of protection, increased monitoring and sensing.⁴⁵ While the use of UAS for monitoring submarine cables can be seen as too costly by current means, the implementation of DAS on all new fiber optic undersea cables can be established as a regional norm. With an increase in live data, protection of submarine cables would become proactive, notifying the regional organization of vessels that are too close to the cables. If a disruption were still to occur, then the closest UAS would be able to collect data surrounding the incident. Which in turn would help expedite repairs on the undersea cable and help pinpoint perpetrators. Resulting in fines equal to the repair of the cable and more depending on the timeframe for repairs, to be placed on said perpetrators.

With the combination of standardized legal frameworks in the region with increased sensing that provides more data on cable disruptions, countries within the regional organization can effectively impose penalties and fines on bad actors within the region, such as China. As currently state actors that cause disruptions around undersea cables use gaps within UNCLOS to attempt to evade paying for reparations to the damage.⁴⁶ As well as denying any involvement in cable cutting incidents, which can be difficult to prove with only circumstantial evidence. While currently the most notable interference with undersea cable disruption is Taiwan, there have been reports of disruption in Vietnam, with no clear reason as to how the cables were

41 [The State of the Network](#), 2022.

42 [“Joint Communication to Strengthen the Security and Resilience of Submarine Cables.”](#)

43 Pratinashee Basu, [“Explore Pacific Forum’s Insightful Indo-Pacific Analysis,”](#) 2024.

44 Runde et al., [“Safeguarding Subsea Cables.”](#)

45 Agarwal, [“Enhancing Capacity and Capabilities in Repair of Submarine Cables.”](#)

46 [Taiwan Detains Suspicious Ship Linked to China,](#) 2025.

damaged.⁴⁷ Without reliable data and real time sensing, these incidents can be dismissed or remain unresolved allowing for continued vulnerability. To effectively safeguard submarine infrastructure, on which financial, security, and civilian systems rely upon, the region must pursue a multifaceted approach that utilize the proposed solution to secure this critical transnational infrastructure. 

ADDITIONAL WORKS CONSULTED

Laksmana, Evan A. "Fit for Purpose: Can Southeast Asian Minilateralism Deter?" Asia Policy 17, no. 4 (2022): 35–42. <https://doi.org/10.1353/asp.2022.0064>.

Mladenov N. Minilateralism: A concept that is changing the world order. The Washington Institute 2023. <https://www.washingtoninstitute.org/policy-analysis/minilateralism-concept-changing-world-order>

⁴⁷ 1. Paul Lipscombe, [Three subsea cables go down in Vietnam, leading to mass internet outages](#), June 18, 2024,



Ensuring the Conservation of Freshwater Biodiversity in the Balkans

Natalya Cork

ABSTRACT

The Balkans, a region recognizable by its freshwater systems that host some of the most biodiverse ecosystems in the world, faces threats to those very ecosystems. These threats highlight the necessity to implement conservation strategies to protect the ecosystems from further damages inflicted by climate change, pollution, invasive species, and the decline in habitat quality invoked by man. The governments of the region have the potential to remedy the matter through the adoption of solutions focused on the introduction of protected areas, restoration processes, alternative energy sources, regional collaboration, and the implementation of European Union policies. With the issue of conservation being a transboundary one, the countries of the region must project a united front towards solutions as the outcome is one that affects all. Therefore, an increased effort must be made in regional collaboration to ensure the success of the remaining solutions.

INTRODUCTION

Developments in the effects of climate change and its causes have led to much of society implementing innovative and improved environmental policies. A portion of said environmental policies are applicable to the member states of the European Union (EU) due to the concerns surrounding a decline in nature and in which motivations to remedy the decline have been set in objectives such as the Nature Restoration Regulation under the EU Biodiversity Strategy.¹ Potential for a decline in nature despite the implementation of environmental strategies, especially in that of freshwater biodiversity, remains for Europe and specifically in the region of the Balkans.

¹ "Nature Restoration Regulation." European Commission. (2025). https://environment.ec.europa.eu/topics/nature-and-biodiversity/nature-restoration-regulation_en

The Balkans, a peninsula often referred to as The Blue Heart of Europe and one home to rivers and lakes abundant in biodiversity and rare species, stretches across several nations of Southeast Europe.² The threat of climate change to the protection of freshwater ecosystems in the Balkans has equally been stacked against the prolonged threats of pollution, invasive species, and an overall regression in the quality of habitats. The recognition of governments in the necessity to combat these concerns diminishes with the inability of the EU to either ensure³ or enforce⁴ its new era of policies. The governments of the Balkan region have no obligation to fulfill EU environmental policies as out of the countries of Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Kosovo, Montenegro, North Macedonia, Romania, Serbia, and Slovenia, only four have member state status. The categorization of candidate countries granted to much of the region under the intent of the Stabilization and Association Process for accession⁵ even lacks application to policy fulfillment, instead escalating transboundary pollution, resource exploitation, and unregulated borders that allow for the introduction of invasive species.

Difficulties in the unification of the region politically reflect on the organizational and implementational efforts for freshwater biodiversity conservation, difficulties that stem from a long period of unrest and political tensions from komitadji⁶ and a culture of violence frequently associated with the fall of the Ottoman Empire and the wars that

followed.⁷ These previous stressors have prompted residual affecters towards the ability of production and effectiveness in conservation solutions and the perception regarding the region, factors detrimental to environmental and economic opportunities. Several of these opportunities, such as the financial provisions earned from participation in the tourist industry,⁸ have yet to obtain proper investment despite the potential to encourage freshwater conservation processes. Non-governmental Organizations (NGOs) such as United for Rivers have partnerships across several nations to create a coalition focused on preservation efforts,⁹ but the necessity for counteractive solutions to rectify the damage that has already occurred continues to persist. Solutions such as the establishment of protected areas, processes for restoration, transition into alternative energy sources, increased regional collaboration, and the implementation of EU policies can further secure the success of freshwater biodiversity conservation.

POSSIBLE SOLUTIONS

Solution 1

Protected Areas

The establishment of protected areas in the Balkans offers a promising solution to improve freshwater biodiversity and invoke conservation measures to safeguard habitats. These protected areas, commonly identifiable as national parks or nature reserves can ensure the conservation of freshwater biodiversity

2 Caillouette, Britton. "Blue Heart." dir. Britton Caillouette (2019), Patagonia. <https://blueheart.patagonia.com/>

3 "Participation of Non-Member States." Council of Europe, (2025). <https://www.coe.int/en/web/conventions/participation-of-non-member-states>

4 "Types of EU Law." European Commission, (2025). https://commission.europa.eu/law/law-making-process/types-eu-law_en

5 De Munter, Andre. "The Western Balkans." European Parliament. (2024). <https://www.europarl.europa.eu/factsheets/en/sheet/168/the-western-balkans>

6 Komitadji defines the insurgent and counter-insurgent movements in the remaining decades of the Ottoman Empire as well as any attempt at an inclusion in politics through violent means (Arisan, 399).

7 Arisan, Mehmet. "Violence as a Means of Nation-Building: The Case of the Balkans (1890-1913)." *Journal of Muslim Minority Affairs*, (2019). <https://research-ebsco-com.uidaho.idm.oclc.org/c/bp5zdc/viewer/pdf/fty4stgigz?route=details> p. 399, 408

8 Smith, Melanie, Judit Sulyok, Andras Jancsik, Laszlo Puczko, Kornelia Kiss, Ivett Sziva, Arpad Ferenc Papp-Vary, and Gabor Michalko. "Nomen Est Omen – Tourist Image of the Balkans." *Hungarian Geographical Bulletin*, (2018). <https://www.proquest.com/docview/2518795585?accountid=14551&parentSessionId=%2FMYChYIng4T6OY%2BSTxqSk4msTyQSk9sjfTut8cQRRs%3D&pq-origsite=primo&sourcetype=Scholarly%20Journals> p. 179

9 "Our Vision and Mission." United for Rivers, (2022). <https://unitedforrivers.org/en/>

in its creation of spaces that allow species to migrate throughout the habitat unprohibited.¹⁰ The idea of a protected area has produced results through experimentation, seen in the example of Bosnia and Herzegovina and their creation of Blidinje Nature Park.¹¹ Not only can protected areas benefit natural ecosystems, but it can provide economic opportunities for the area and surrounding communities as well. The intent behind the protected area safeguarding ecosystems can be achieved through the presence of research and monitoring teams that ensure the proper establishment of biodiversity and quality of life. As recognized in the case study on the Blidinje Nature Park within the Journal for Nature Conservation, “the identification of fish biodiversity hotspots could be useful for setting priorities in conservation management and testing improvement management strategies on inland waters.”¹² The surrounding communities of the protected areas would reap the benefits that the job opportunities in research and management offers and the strengthening of their economy that ecotourism produces.¹³

Solution 2

Processes for Restoration

Nature-based solutions provide protection and restoration to natural and modified ecosystems while having beneficial effects on the wellbeing of humans.¹⁴ The restoration of river and wetland ecosystems that have previously degraded can improve water flow and the conditions of the habitat that the threatened species reside in. In implementing nature-based practices into the Balkan’s infrastructure, the results will appear in the communities of the region by experiencing higher water quality and reducing the likelihood of flood risks from the conservation of natural defenses. The International Union for Conservation of Nature (IUCN) reports on the initiative ADAPT, the application of nature-based solutions in the Western Balkans to reduce disaster risk through works that increase ecosystem and community resilience.¹⁵ ADAPT has boots on the ground through their pilot projects that allow them to conduct capacity building training sessions to “be delivered to decision makers, local authorities, natural resource managers, [and] disaster risk managers.”¹⁶ Projects like this one that embed themselves into the community reflect the importance in educating its individuals in order to establish successful conservation efforts in the first place. Without the acceptance of conservation tactics in a community-based setting, the acts harmful to the freshwater ecosystems will only persevere.

Solution 3

Investment in Solar and Wind Energy Infrastructure

A transition to renewable sources for energy systems is not a newfound method, but one of necessity for the countries of the Balkan Peninsula that largely rely on hydropower for

10 Watson, James E. M, Nigel Dudley, Daniel B Segan, and Marc Hockings. “The Performance and Potential of Protected Areas.” *Nature (London)*, (2014). <https://www-nature-com.uidaho.idm.oclc.org/articles/nature13947> p. 68

11 Carosi, Antonella, Francesca Lorenzoni, Fabrizio Oneto, Matteo Capurro, Jasmina Ovcina, Deborah Rezzoagli, Chiara Petroselli, et al. “The Role of Protected Areas in the Balkan Freshwater Biodiversity Conservation: The Case of Blidinje Nature Park (Southwestern Bosnia-Herzegovina).” *Journal for Nature Conservation*, (September 22, 2024). <https://www.sciencedirect.com/science/article/pii/S1617138124001882> p. 10

12 Carosi, Antonella, et al. “The Role of Protected Areas in the Balkan Freshwater Biodiversity Conservation: The Case of Blidinje Nature Park (Southwestern Bosnia-Herzegovina).” <https://www.sciencedirect.com/science/article/pii/S1617138124001882> p. 10

13 Smith, Melanie, et al. “Nomen Est Omen – Tourist Image of the Balkans.” (2018). <https://www.proquest.com/docview/2518795585?accountid=14551&parentSessionId=%2FMyChYIng4T6OY%2BST1xqSk4msIyQSk9sjfTuttc8cQRRs%3D&pq-origsite=primo&sourcectype=Scholarly%20Journals> p. 174

14 “ADAPT: Nature-Based Solutions in the Western Balkans.” IUCN, February 19, 2025. <https://iucn.org/our-work/region/eastern-europe-and-central-asia/our-work/adapt-nature-based-solutions-western>

15 “ADAPT.” IUCN, 2025.

16 “ADAPT.” IUCN, 2025.

their energy source. The Balkans have a higher potential to successfully shift energy tactics towards ones of solar and wind energy, resulting in increased action by conservationists. The reliance on hydropower plants has meant that further construction of dams in the region has occurred,¹⁷ disrupting ecosystems through the creation of access roads, bridges, and even in tearing down the surrounding forests.¹⁸ The use of Small Hydropower Plants (SHPPs) stems from the desire to produce limited carbon gas emissions with lower costs,¹⁹ a situation equally achievable with a transition to solar and wind energy sources. Solar and wind energy technologies produce less gas emissions than hydropower does, exhibiting more beneficial properties due to these low emissions and lack of interaction with water systems. In making the transition into the alternative energy sources of solar and wind, the Balkans have the opportunity to place the power sources in areas previously used for coal production, providing no disruption to freshwater ecosystems. Although NGOs and local communities have rallied for the legal ban of building dams, with relative success in Bosnia and Herzegovina,²⁰ regional collaboration would push the transition into full effect across all nations.

Solution 4

Regional Collaboration

The issue of the conservation of freshwater biodiversity is a transboundary one due to many Balkan rivers and water bodies crossing national borders.²¹ Historically, the Balkan nations often do not agree with policies and have hesitancy towards working with one another, even if only improving relations. Although some of this apprehension remains today, there have been improvements in which the Western Balkans used various bilateral or multilateral initiatives to better establish a presence in NATO and the EU for those nations not yet members.²² If these relations continued over into areas of environmental policy, the Balkan nations could use the joint establishment of their systems to introduce new environmental policy and remedy the old. To do so, dialogue between the countries must occur to establish a common ground and in sustaining a joint environmental policy, may encourage candidate countries to practice the more widespread policies of the EU.²³ Policies focused on nature-based solutions and a transition away from SHPPs need full support from the whole of the Balkan region to succeed as intended. Without said support, the biodiversity of freshwater ecosystems will still experience the effect of pollution and contamination, whether at the fault of their own nation or not.

Solution 5

Implementation of European Union Policies

The enhancement of international cooperation in the Balkans ensures that the nations receive funding and assistance from countries of foreign aid and international organizations.

17 See Appendix 1 for map of existing and planned SHPPs and their locations.

18 "Freshwater Conservationists Worldwide Implore Federation of Bosnia and Herzegovina to Permanently Protect Europe's Last Wild Rivers." IUCN, September 22, 2020. <https://iucn.org/news/species-survival-commission/202009/freshwater-conservationists-worldwide-implore-federation-bosnia-and-herzegovina-permanently-protect-europes-last-wild-rivers>

19 Pavlakovic, Barbara, Andrea Okanovic, Bojana Vasic, Jelena Jesic, and Polona Sprajc. "Small Hydropower Plants in Western Balkan Countries: Status, Controversies and a Proposed Model for Decision Making." *Energy, Sustainability and Society*, (2022). <https://www.proquest.com/docview/2628406186?accountid=14551&parentSessionId=jVmaGOVUYG%2F5JM%2FZdw63mf17hmfSDBqQIYhMHU9WQ84%3D&pq-origsite=primo&sourcecetype=Scholarly%20Journals>

20 "Freshwater Conservationists Worldwide. . . Protect Europe's Last Wild Rivers." IUCN.

21 See Appendix 2 for a map and list of these transboundary systems.

22 Mirela Metushaj. "Collaboration of Western Balkans Countries, An Essential Element in Promoting Peace and Prosperity in the Balkans Region." *The International Conference "The European Integration – Realities and Perspectives,"* (2022). <https://dp.univ-danubius.ro/index.php/EIRP/article/view/276/276> p. 240

23 Mirela, (2022). <https://dp.univ-danubius.ro/index.php/EIRP/article/view/276/276> p. 241

International cooperation also invokes the sharing of water management practices and environmental data and monitoring, informing the region and introducing systems such as regional warnings for floods. Cooperation extends to the nations that are member states through their following of the laws of the EU, an action that is still necessary for candidate countries or those that aim towards candidacy. In accordance to being member state candidates, “the countries have pledged to align with the EU Climate Law” and align their climate and energy policies with that of the European Green Deal.²⁴ As the European Commission plans on investing much of their budget into climate initiatives,²⁵ the funding and leadership that the participating Balkan nations would receive from these investments would greatly benefit the communities and ongoing conservation efforts. While a solid solution, the likelihood of the entirety of the Balkan region implementing environmental policies based on EU strategies is debated. Despite the slim margins, overall international cooperation poses as a beneficial tactic to the Balkans, prompting further exploration within this method to receive true consideration from the region.

RECOMMENDED COURSE OF ACTION

The need for conservational solutions such as these comes from the hope for a more sustainable and better world for future generations. Nations need to begin to implement environmental policies that focus on prevention tactics and collaborate

with one another to reduce the threats that climate change, pollution, and invasive species create for freshwater ecosystems. There is the expectation that climate change will only exacerbate these threats and result in “alterations in the magnitude, frequency, duration, timing and variability of thermal and hydrological freshwater attributes.”²⁶ Due to this expectation and the current decline in freshwater biodiversity for the rivers and bodies of water in the Balkan Peninsula, solutions are readily needed. The suggestions of solutions for protected areas, processes in restoration, alternative solar and wind energy sources, regional collaboration, and the implementation of EU policies have the potential to ensure the accessibility of the nations to affordable alternatives and conservational efforts already implemented. The recommended course of action involves the sole adoption of the regional collaboration solution in the way of common environmental policies. By adopting this specific solution, the nations of the Balkans can resolve any conflict preventing the true success of environmental policy regarding the freshwater ecosystems and establish a better perception from outside actors. As a transboundary issue, even if a nation has introduced environmental policies to their communities, residual pollution and contamination can still occur from surrounding nations that do not have the same outlook on such policies. In order to guarantee the conservation of freshwater systems, the Balkan Peninsula must collaborate and implement similar tactics or policies. This collaboration can also establish equal use of funding and assistance from NGOs and international organizations across the region.

Regional collaboration equally has the potential to safeguard investments from the EU, as a reduction in past conflict and the agreement upon environmental policies can further the non-member states into acceptance. The focus of the EU in Sustainable

24 Fejzic, Emir, Taco Niet, Cameron Wade, and Will Usher. “Aligning the Western Balkans Power Sectors with the European Green Deal.” *Environmental Research Communications*, (2024). <https://www.proquest.com/docview/3127364805?accountid=14551&parentSessionId=YABO6wiY0%2B84aEhTr2bF2%2F92t%2BNsnGGvY%2FPvbOZVsf0%3D&pq-origsite=primo&source=Scholarly%20Journals> p. 1-2

25 Knez, Sandi, Snezana Strbac, and Iztok Podbregar. “Climate Change in the Western Balkans and EU Green Deal: Status, Mitigation and Challenges.” *Energy, Sustainability and Society*, (2022). <https://www.proquest.com/docview/2615909642?accountid=14551&parentSessionId=vPPHbyPuLLgxCf4g%2FiC5AYTryY6QnLiNEp35FUzuJ0Y%3D&pq-origsite=primo&source=Scholarly%20Journals> p. 2

26 Markovic, Danijela, Savrina F Carrizo, Oskar Karcher, Ariane Walz, and Jonathon N. W David. “Vulnerability of European Freshwater Catchments to Climate Change.” *Global Change Biology*, (2017). <https://onlinelibrary-wiley-com.uidaho.idm.oclc.org/doi/full/10.1111/gcb.13657> p. 3567

Development Goals and the European Green Deal secures financial assistance and overall support for the Balkans to embrace environmental solutions, even if the solutions may impact the economy temporarily. The adoption of a solution surrounding regional collaboration will result in a waterfall affect to the remaining solutions and increase the likelihood of a more established management system and communal support to implement said solutions. Without a strong management system and support within the community, the freshwater ecosystems will remain at risk from factors that will only continue in their difficulty to control. A linear project that goes through the mechanisms for an umbrella solution will influence future conservation efforts and establish the protection of biodiversity in freshwater ecosystems for generations to come. 🌍

APPENDIX 1

See corresponding color map for difference between existing, in progress, and planned plants.



APPENDIX 2

The Balkan Peninsula hosts 7 main transboundary rivers; the Drin, Neretva, Evros, Strymon, Nestos, Axios, and Aaos, and 4 main transboundary lakes; the Shkodra, Ohrid, and Prespa (two separated by isthmus).



ADDITIONAL WORKS CONSULTED

Bruch, Carl, Geeta Batra, Anupam Anand, Shehla Chowdhury, and Sierra Killian.

"The Mediterranean Region: Lebanon and the Balkans." *In Conflict-Sensitive Conservation*. Routledge, 2024.

<https://library.oapen.org/bitstream/andle/20.500.12657/75315/9781000964288.pdf;jsessionid=522C0C31DDE8C624A73A25E441451994?sequence=1>

Cantonati, Marco, Sandra Poikane, Catherine

M Pringle, Lawrence E Stevens, Eren Turak, Jani Heino, John S Richardson, et al. "Characteristics, Main Impacts, and Stewardship of Natural and Artificial Freshwater Environments: Consequences for Biodiversity Conservation." *Water (Basel)*, (2020). <https://go-gale-com.uidaho.idm.oclc.org/ps/i.do?p=AONE&u=mosc00780&id=GALE%7CA810510586&v=2.1&it=r>

Carvalho, Laurence, Eleanor B Mackay,

Ana Cristina Cardoso, Annette Baattrup-Pedersen, Sebastain Birk, Kirsty L Blackstock, Gabor Borics, et al. "Protecting and Restoring Europe's Waters: An Analysis of the Future Development Needs of the Water Framework Directive." *The Science of the Total Environment*, (2019). <https://www.sciencedirect-com.uidaho.idm.oclc.org/science/article/pii/S004896971835126X>

"Eco-Masterplan for Balkan Rivers." Save the Blue Heart of Europe. (2025). <https://www.balkanrivers.net/en/masterplan-storymap>

Fagan, Adam. "Global-Local Linkage in the Western Balkans: The Politics of Environmental Capacity Building in Bosnia-Herzegovina." *Political Studies*, (2008). <https://journals-sagepub-com.uidaho.idm.oclc.org/doi/full/10.1111/j.1467-9248.2007.00711.x>

Oikonomou, Anthi, Fabien Leprieur, and

Ioannis D Leonardos. "Biogeography of Freshwater Fishes of the Balkan Peninsula." *Hydrobiologia*, (2014). <https://go-gale-com.uidaho.idm.oclc.org/ps/i.do?p=SCIC&u=mosc00780&id=GALE%7CA385069808&v=2.1&it=r&sid=summon>

Papadaki, Christina, Konstantinos Soulis, Rafael Munoz-Mas, Francisco Martinez-Capel, Stamatis Zogaris, Lazaros Ntoanidis, and Elias Dimitriou. "Potential Impacts of Climate Change on Flow Regime and Fish Habitat in Mountain Rivers of the South-Western Balkans." *The Science of the Total Environment*, (2016). <https://www.sciencedirect-com.uidaho.idm.oclc.org/science/article/pii/S0048969715303338>

Piria, Marina, Predrag Simonovic, Eleni

Kalogianni, Leonidas Vardakas, Nicholas Koutsikos, Davor Zanella, Milica Ristovska, et al. "Alien Freshwater Fish Species in the Balkans — Vectors and Pathways of Introduction." *Fish and Fisheries (Oxford, England)*, (2018). <https://research-ebsco-com.uidaho.idm.oclc.org/c/bp5zdc/viewer/pdf/6fkxthsvbv?route=details>

Puecker, Christian, and Tamara Steger.

"Protecting the Last Wild River in Europe from Hydropower Development in Albania: An Environmental Movement Strategy in a Flawed Democracy." *Case Studies in the Environment*, (2023). <https://www.proquest-com/docview/2917655568?accountid=14551&parentSessionId=%2Fo0Ra80WoHrUAQno7uzjhhDeZA%2BSgMeeafmFHK6%2BY%3D&pq-origsite=primo&sourcetype=Scholarly%20Journals>

Szabolcs, Marton, Felicia Kapusi, Savrina

Carrizo, Danijela Markovic, Jorg Freyhof, Nuria Cid, Ana Cristina Cardoso, et al. "Spatial Priorities for Freshwater Biodiversity Conservation in Light of Catchment Protection and Connectivity in Europe." *PLoS One*, (2022). <https://go-gale-com.uidaho.idm.oclc.org/ps/i.do?p=SCIC&u=mosc00780&id=GALE%7CA704080900&v=2.1&it=r&sid=summon&aty=ip>



Incentives to Reduce Plastic Waste in the United States

Belen Garcia Arias

ABSTRACT

Plastic waste is a growing environmental concern, with the United States as one of the largest contributors globally. Despite increased awareness, the nation's recycling rate remains critically low. Much of its plastic waste is incinerated or exported – often to countries with inadequate waste management systems. This paper examines the scope of the plastic waste crisis in the U.S. and presents seven major strategies to address it: strengthening international regulations, enhancing global collaboration, improving domestic regulations, incentivizing innovation, building a circular economy, promoting consumer education, and implementing a national Extended Producer Responsibility (EPR) framework. These approaches target plastic reduction at multiple levels – policy, production, infrastructure, and behavior. Each offers different benefits and challenges, and their combined implementation is necessary for meaningful progress. The paper recommends a national EPR program as the most effective strategy, supported by complementary reforms to ensure long-term sustainability and equitable participation in reducing plastic waste.

OVERVIEW

Plastic waste is one of the most serious environmental issues damaging our planet.¹ The U.S. Environmental Protection Agency (EPA) defines plastic waste as material generated through “the production, use, and disposal of mono-material or multi-material plastic products.”² As plastic production has

1 Plastic Pollution Blogger, “The Plastic Waste Problem and Its Solutions,” Plastic Collective, September 14, 2023, <https://www.plasticcollective.co/the-plastic-waste-problem-and-its-solutions/>

2 “About Plastic Products and Plastic Pollution,” EPA, November 21, 2024, <https://www.epa.gov/plastics/about-plastic-products-and-plastic-pollution>.

increased over the past decades, so too has the volume of waste, creating growing challenges for its management. Since 1950, over 8 billion tons of plastic have been produced, with half ending up in landfills and only 9% recycled.³ Nearly every product we use in our daily lives is wrapped in plastic, which explains why packaging is the largest contributor – accounting for 46% of global plastic waste.

The United States plays a significant role in this crisis, being the second largest producer of plastic waste in the world, closely behind China. In 2018 alone, the U.S. generated 35.7 million tons of plastic waste and burned about six times more than it recycled.⁴ Even at its peak recycling rate in 2014, only 9.5% of plastic was recycled – a number that has continued to decline. The problem is that those unrecycled plastics end up either on landfills or incinerated, contributing to environmental pollution and greenhouse gas emissions.⁵

These trends are not new. Since the mid-20th century, plastic production and use have steadily risen, generating vast quantities of waste. Initially, the United States relied heavily on landfilling and incineration. As environmental awareness grew, recycling initiatives have expanded but failed to match the pace of plastic consumption. One contributing factor is that many developed countries like the U.S. export much of their waste to other countries for recycling, which may lack the infrastructure to manage waste sustainably. As a result, exporting countries often delay improving their recycling systems because they rely on importing countries – many of which lack

the infrastructure and regulations needed to sort and recycle waste effectively.⁶

The system collapsed in 2018 when China – then the world's largest importer of plastic waste – implemented its National Sword Policy,⁷ banning the import of solid waste, including several types of plastics.⁸ In response, many exporting countries – including the U.S. – did not improve their recycling systems but instead shifted their exports to other nations or increased reliance on landfilling and incineration. As a result, more plastic is now ending up in the environment or in poorly managed waste streams.

To solve the global plastic waste issue, it is crucial for the United States to play a leading role. Addressing this challenge will require a comprehensive strategy involving international cooperation, coordinated federal and state legislation, private-sector accountability, and public engagement. This paper presents potential solutions that reflect the history and scale of U.S. involvement in the problem and offers actionable paths forward with varying levels of resource commitment.

POSSIBLE SOLUTIONS

Solution 1

Strengthening international regulations

Plastic waste is a global issue, yet international regulation remains fragmented. The Basel

3 “Plastic Pollution by Country 2025,” World Population Review, 2025, <https://worldpopulationreview.com/country-rankings/plastic-pollution-by-country#top-10-countries-that-produce-the-most-plastic-waste-tons>.

4 Becky McKay, “Global Plastic Pollution Statistics and Facts,” GreenMatch.co.uk, September 17, 2024, <https://www.greenmatch.co.uk/blog/plastic-pollution-facts>.

5 Margaret Osborne, “At Least 85 Percent of U.S. Plastic Waste Went to Landfills in 2021,” Smithsonian.com, May 9, 2022, <https://www.smithsonianmag.com/smart-news/the-us-recycled-just-5-percent-of-its-plastic-in-2021-180980052/>.

6 Shelby Browning Browning, Betsy Beymer-Farris, and Jeffrey R Seay, “Addressing the Challenges Associated with Plastic Waste Disposal and Management in Developing Countries,” ScienceDirect, April 6, 2021, https://www.sciencedirect.com/science/article/pii/S2211339821000149?casa_token=YndOy1e-IH4AAA-AA%3AcKgVaDi9FBDt1lrRZkpu2FmZiMpnLX9kHcxnz4TIHAhHa00Bz8sOy9xtmSu7vWSIQVS9QHv84.

7 Cheryl Katz, “Piling up: How China’s Ban on Importing Waste Has Stalled Global Recycling,” Yale e360, March 7, 2019, <https://e360.yale.edu/features/piling-up-how-chinas-ban-on-importing-waste-has-stalled-global-recycling>.

8 Martina Igini, “The Consequences of China’s Import Ban on Plastic Waste,” Earth.Org, October 4, 2023, <https://earth.org/chinas-import-ban/>.

Convention,⁹ adopted in 1989, aims to prevent the transfer of waste shipments from developed to developing nations and was expanded in 2019 to include contaminated and mixed plastic waste.¹⁰ However, the United States has signed but not ratified the Convention,¹¹ meaning it is not legally bound by these new rules. This gap allows the U.S. to continue to export plastics that are hard to recycle to developing countries.

China's 2018 National Sword Policy banned most plastic waste imports due to high contamination and environmental risks.¹² The United States initially redirected its waste exports to Southeast Asian countries such as Malaysia, Thailand, and Indonesia, but these nations soon enacted their own trade restrictions to stem the influx.¹³ Consequently, the U.S. attempted to improve domestic processing and infrastructure, highlighting deep inefficiencies in the country's recycling system. Meanwhile, China has pivoted to developing a circular economy and expanding domestic recycling capabilities to manage its own stockpiles.¹⁴

The U.S. should lead by ratifying the Basel Convention and enforcing global plastic waste trade rules. It can work with multilateral bodies like the UN Environment Programme to establish a global plastics treaty,¹⁵ promote standardized labeling, and support infrastructure development in low-income countries through technical and financial assistance.

Solution 2

Advancing Global Collaboration and Monitoring

Solving the global plastics crisis requires not only regulations, but also robust cooperation among international organizations, governments, NGOs, and the private sector.¹⁶ The United Nations Environment Programme (UNEP) and the Global Alliance for Incinerator Alternatives (GAIA)¹⁷ are two prominent advocates for stricter plastic waste controls and global transparency. Both support negotiations toward a legally binding Global Plastics Treaty,¹⁸ aimed at reducing production and standardizing global rules on plastic trade and labeling.

As part of these discussions, experts have proposed the creation of an independent international body to track plastic flows, identify illegal waste shipments, and enforce compliance. This would mirror the monitoring mechanisms used in climate and trade agreements.¹⁹ Though it is still under negotiation, it reflects growing international

9 "Basel Convention on the Control of Transboundary Movements of Hazardous Waste and Their Disposal," UNEP, March 22, 1989, [https://wedocs.unep.org/bitstream/handle/20.500.11822/8385/-Basel Convention on the Control of Transboundary Movements of Hazardous Wastes -20113644.pdf?sequence=2&amp%3BisAllowed=](https://wedocs.unep.org/bitstream/handle/20.500.11822/8385/-Basel%20Convention%20on%20the%20Control%20of%20Transboundary%20Movements%20of%20Hazardous%20Wastes%20-%20113644.pdf?sequence=2&amp%3BisAllowed=).

10 Emily Benson and Sarah Mortensen, "The Basel Convention: From Hazardous Waste to Plastic Pollution," CSIS, October 7, 2021, <https://www.csis.org/analysis/basel-convention-hazardous-waste-plastic-pollution>.

11 "New International Requirements for the Export and Import of Plastic Recyclables and Waste," EPA, August 26, 2024, <https://www.epa.gov/hwgenerators/new-international-requirements-export-and-import-plastic-recyclables-and-waste>.

12 Cheryl Katz, "Piling Up: How China's Ban on Importing Waste Has Stalled Global Recycling," YaleEnvironment360, March 7, 2019, <https://e360.yale.edu/features/piling-up-how-chinas-ban-on-importing-waste-has-stalled-global-recycling>.

13 Jessica Heiges and Kate O'Neill, "A Recycling Reckoning: How Operation National Sword Catalyzed a Transition in the U.S. Plastics Recycling System," Journal of Cleaner Production, October 5, 2022, <https://www.sciencedirect.com/science/article/pii/S0959652622039397>.

14 Randy Miller, "What China's National Sword Policy Looks like in 2021," Miller Recycling, March 4, 2021, <https://millerrecycling.com/china-sword-policy-2021/>.

15 "Majority Agrees. Nature Must Win. Stop Plastic Pollution.," WorldWildLifeOrg, 2025, <https://www.worldwildlife.org/pages/global-plastics-treaty>.

16 The SBN Team, "What Role Do Public-Private Partnerships Play in Waste Management?," Simple But Needed, February 15, 2025, <https://sbnsoftware.com/blog/what-role-do-public-private-partnerships-play-in-waste-management/>.

17 Carissa Marne, Maria Guillén, and Dan Abril, "Homepage - Gaia," GAIA -, 2000, <https://www.no-burn.org/>.

18 "UN Plastics Treaty," Global Plastic Laws, March 24, 2025, <https://www.globalplasticlaws.org/un-global-plastics-treaty>.

19 Mary George et al., "An Independent Scientific Committee on Plastic Pollution (SCOPP)," ScienceDirect, November 2024, <https://doi.org/10.1016/j.marpolbul.2024.117041>.

momentum toward accountability and transparency.

Another key issue is the need to provide technical assistance and infrastructure support to low-and middle-income countries.²⁰ Wealthier nations can share knowledge, funding, and technology to improve waste management systems globally – preventing future environmental injustice and fostering long-term international equity.

Solution 3

Improving Domestic Legislation

While international cooperation is vital, the U.S. also needs stronger internal policies to reduce plastic waste. A notable proposal is the Break Free From Plastic Pollution Act,²¹ which calls for a national bottle deposit system, producer responsibility programs, and bans on certain single-use plastics. However, the legislation has repeatedly stalled in Congress, a sign of political stalemate and industry pushback.

Some states have taken initiative. For instance, California banned single-use plastic bags in 2016 and passed a 2022 law requiring all packaging to be recyclable or compostable by 2032.²² Washington, New York, and Oregon have enacted restrictions on plastic utensils, straws, and packaging foam. Yet the federal preemption laws and legal challenges often complicate state-level efforts, while policies vary widely across jurisdictions.

To create meaningful change, federal legislation must unify existing efforts while empowering states to go further. National

standards could include a plastic tax, recycled content mandates, and a ban on non-recyclable plastics. These measures would not only reduce consumption but also provide legal clarity and investment certainty for businesses and local governments.

Solution 4

Public Incentives & Industry Innovation

Economic incentives can motivate both businesses and consumers to reduce plastic use. Federal or state-level tax credits²³ could reward companies that design recyclable or compostable products, use alternative materials, or implement take-back systems. Similarly, grant programs could fund R&D into biodegradable materials and reusable packaging systems, with universities and start-ups as partners.²⁴

For consumers, incentives like rebates for reusable items or discounts for using refill stations can promote sustainable habits. Oregon's BottleDrop program,²⁵ for example, offers additional refunds when consumers use designated collection centers. Some supermarkets now offer zero-waste aisles, enabling customers to shop plastic-free.

However, not all incentive programs succeed. In some states, bans on biodegradable plastics backfired when alternatives were not readily available or lacked commercial composting infrastructure.²⁶ This highlights the importance of timing, education, and infrastructure.

20 World Bank Group, "Clean Cities, Bright Futures: Accelerating Investment and Reforms in Solid Waste Management in Developing Countries," World Bank, May 5, 2025, <https://www.worldbank.org/en/results/2025/04/30/clean-cities-bright-futures-accelerating-investment-and-reforms-in-solid-waste-management-in-developing-countries>.

21 "Break Free from Plastic Pollution Act of 2023," Congress.gov, October 25, 2023, <https://www.congress.gov/bill/118th-congress/senate-bill/3127/text>.

22 State of California, "California's Landmark Plastic Pollution Law Moves Forward," Governor of California, June 17, 2024, <https://www.gov.ca.gov/2024/03/08/californias-landmark-plastic-pollution-law-moves-forward/#:~:text=This%20landmark%20law%20requires%20that,plastic%20packaging%20and%20food%20ware>.

23 Tax Notes Staff, "The Plastic Problem: Using Tax to Protect the Environment," *Forbes*, May 8, 2024, <https://www.forbes.com/sites/taxnotes/2024/02/13/the-plastic-problem-using-tax-to-protect-the-environment/>.

24 "Braskem Announces REMADE Institute Grant Award to Develop New Recycling Process Technology to Extract Pure Polypropylene from PCR," Braskem, December 4, 2023, <https://www.braskem.com.br/europe/news-detail/braskem-announces-remade-institute-grant-award-to-develop-new-recycling-process-technology-to-extract-pure-polypropylene-from-pcr>.

25 "Oregon's Bottle & Can Return Program," BottleDrop, March 27, 2025, <https://bottledrop.com/#:~:text=In%20Oregon%2C%20we%20help%20keep,by%20providing%20convenient%20return%20options>.

26 "California's Plastic Bag Ban Backfires Bigly," American Energy Alliance, March 8, 2024, <https://www.americanenergyalliance.org/2024/03/californias-plastic-bag-ban-backfires-bigly/>.

Future initiatives should include performance monitoring, regular evaluation, and flexible funding to support high-impact activities.

Solution 5

Building a Circular Economy

A circular economy²⁷ reduces plastic waste by minimizing virgin plastic use and designing products for reuse and recycling. Currently, the U.S. recycles only 5-6% of its plastic waste,²⁸ largely due to inconsistent collection systems, outdated facilities, and consumer confusion. A national strategy must standardize recycling guidelines, invest in technologies like AI-powered sorting, and upgrade infrastructure across rural and urban areas.

Public-private partnerships can fund these investments. For example, the Closed Loop Fund has already helped U.S. cities upgrade recycling systems by offering low-interest loans supported by major retailers.²⁹ Such models could be scaled nationally, especially if paired with federal block grants or state matching funds.

The European Union's (EU) Circular Economy Action Plan³⁰ can serve as a successful example, as it mandates that all packaging has to be recyclable or reusable by 2030. The U.S. could adopt similar targets and integrate them into trade procurement, and manufacturing policy. Advancing a circular economy also helps decouple economic growth from

resource consumption, positioning the U.S. as a global leader in sustainable innovation.

Solution 6

Consumer Education & Grassroots Engagement

Policy change is essential, but individual and community action can drive cultural shifts around plastic use. Public awareness campaigns – such as those once used for smoking cessation or seatbelt use – can reshape behavior through TV, social media, and schools.³¹ These campaigns should highlight the hidden costs of plastic waste and provide accessible alternatives for daily routines – like reusable bags, water bottles, and containers.

Schools and universities can integrate sustainability into their courses,³² while local governments can run “plastic audits” to help households identify ways to reduce consumption. Community-based organizations could also lead clean-up drives or distribute reusable kits in underserved areas. One thing to keep in mind while implementing all of this is the importance of equity, as not all communities have equal access to reusable products or recycling programs.

Technology also plays a role. Apps like MyPlasticDiary or RecycleCoach offer tools to track plastic use, locate nearby recycling centers, or scan product barcodes for disposal tips.³³ These digital platforms – especially when gamified – can increase participation and accountability. Building environmental literacy at all ages is critical for long-term change and it supports pressure on corporations and legislators to act.

27 “What Is a Circular Economy?,” EPA, November 21, 2024, <https://www.epa.gov/circulareconomy/what-circular-economy>.

28 Tanya Brooks, “Plastic Recycling Is a Dead-End Street-Year after Year, Plastic Recycling Declines Even as Plastic Waste Increases - Greenpeace,” Greenpeace, December 10, 2024, <https://www.greenpeace.org/usa/new-greenpeace-report-plastic-recycling-is-a-dead-end-street-year-after-year-plastic-recycling-declines-even-as-plastic-waste-increases/#:~:text=The%20report%20also%20finds%20that,2014%20and%208.7%25%20in%202018>.

29 Mike Hower, “Closed Loop Fund Offering Zero-Interest Loans to Help Cities Develop Recycling Infrastructures,” Sustainable Brands, May 15, 2019, <https://sustainablebrands.com/read/closed-loop-fund-offering-zero-interest-loans-to-help-cities-develop-recycling-infrastructures>.

30 “Circular Economy Action Plan,” European Commission, March 2020, https://environment.ec.europa.eu/strategy/circular-economy-action-plan_en.

31 Fabiula Danielli Bastos de Sousa, “Consumer Awareness of Plastic: An Overview of Different Research Areas,” Circular economy and sustainability, March 25, 2023, <https://pmc.ncbi.nlm.nih.gov/articles/PMC10039692/>.

32 “Plastic Pollution Education: How Awareness Changes Behaviors,” TONTOTON, November 6, 2023, <https://tontoton.com/plastic-pollution-education-how-awareness-changes-behaviors/>.

33 Amy Serafin, “Recycling App Teaches People How to Sort Waste Responsibly,” European Investment Bank, March 16, 2023, <https://www.eib.org/en/stories/recycle-waste-app>.

Solution 7

Implementing a National Extended Producer Responsibility (EPR) Framework

Extended Producer Responsibility (EPR) laws shift the cost and burden of waste management from taxpayers to producers.³⁴ Under a national EPR program, companies would fund and manage the collection, recycling, and disposal of their products and packaging. This creates a strong incentive to reduce waste and improve product design.

EPR is already in place in Canada and across the EU,³⁵ where it has boosted recycling rates and reduced municipal costs. In the U.S., states like California, Maine, and Oregon have adopted EPR laws,³⁶ but their scope and standards vary significantly. A national framework would provide consistency, making compliance easier for companies and more impactful overall.

However, implementation faces political and logistical challenges. Industry lobbying, federal-state tensions, and varying recycling infrastructure can delay progress.³⁷ Spain's EPR rollout, for instance, struggled due to poor enforcement and producer resistance. To succeed in the U.S., an EPR program must include stakeholder engagement, strong enforcement mechanisms, and federal incentives for state cooperation.

RECOMMENDED SOLUTION

A National EPR Framework Supported by Circular and Educational Reforms

Among the seven strategies explored in this paper, implementing a national Extended Producer Responsibility (EPR) framework offers the most comprehensive and enforceable approach to reduce plastic waste in the United States. EPR policies shift the burden of plastic waste management from municipalities to the companies that produce packaging, creating strong incentives for upstream innovation in materials and design.³⁸ By aligning environmental accountability with financial responsibility, EPR addresses the root of the problem: unchecked plastic production and non-recyclable packaging.

EPR has already proven effective in Canada and the European Union, where national-level frameworks have improved recycling rates and reduced municipal costs. Canada's producers fund and manage waste collection and recycling, creating a circular economy for plastics.³⁹ The EU's regulations require producers to meet recycling targets and reduce plastic waste through sustainable product design.⁴⁰ In the U.S., however, only a few states – like California, Maine, and Oregon – have passed EPR laws, each with varying degrees of enforcement and success. A national framework would unify these efforts and ensure that all producers are held to the same standards, reducing confusion and increasing compliance.

34 "Extended Producer Responsibility Means the Polluter Pays," Beyond Plastics - Working To End Single-Use Plastic Pollution, November 2022, [https://www.beyondplastics.org/epr/#:~:text=Extended%20producer%20responsibility%20\(EPR\)%20is,of%20their%20products%20and%20packaging](https://www.beyondplastics.org/epr/#:~:text=Extended%20producer%20responsibility%20(EPR)%20is,of%20their%20products%20and%20packaging).

35 "Packaging Waste," European Commission, 1994, https://environment.ec.europa.eu/topics/waste-and-recycling/packaging-waste_en.

36 AJ Guikema, "U.S. Packaging Laws: EPR Programs and Reporting Requirements by State," Tetra Tech Sustainable Markets, October 29, 2024, <https://www.sustainable-markets.com/2024/10/29/u-s-packaging-laws-epr-programs-and-reporting-requirements-by-state/#:~:text=Which%20U.S.%20States%20Have%20Packaging,Jersey%2C%20Minnesota%2C%20and%20Washington>.

37 Nils Röpke, "EPR in the USA - A Major Challenge," Deutsche Recycling Service GmbH, October 29, 2024, <https://deutsche-recycling.com/blog/epr-in-the-usa-a-major-challenge/>.

38 Kibert, Nicole C. "Extended Producer Responsibility: A Tool for Achieving Sustainable Development." *Journal of Land Use & Environmental Law* 19, no. 2 (2004): 503–23. <http://www.jstor.org/stable/42842852>.

39 "EPR Summary Report 2016," EPR Canada, September 2017, <http://www.eprcanada.ca/reports/2016/EPR-Report-Card-2016.pdf>.

40 Tyson, Greg. "Resource Efficiency, Integrated Product Policy and Extended Producer Responsibility: European Experiences." Edited by Yasuhiko Hotta, Shiko Hayashi, Magnus Bengtsson, and Hideyuki Mori. *Extended Producer Responsibility Policy in East Asia: - In Consideration of International Resource Circulation* -. Institute for Global Environmental Strategies, 2009. <http://www.jstor.org/stable/resrep00834.9>.

Still, EPR alone is not sufficient. Its success requires political will, infrastructure upgrades, and strong public support.⁴¹ In today's polarized political climate, lawmakers face significant obstacles – including congressional gridlock and industry lobbying.⁴² However, progress is possible through pragmatic, bipartisan strategies. Federal lawmakers could offer grant-based incentives for early adoption, support pilot programs in key states, and design phased legislation that includes flexibility for small businesses. Broad stakeholder engagement – from local governments and industry groups to environmental organizations – will also be essential to building the coalitions needed for effective implementation.

Complementary strategies are essential to maximizing EPR's impact. Investments in national recycling infrastructure, circular economy initiatives, and uniform standards for recyclability will help producers meet their obligations efficiently. At the same time, consumer education and grassroots engagement are essential to shifting societal behavior. Programs like Oregon's BottleDrop and digital tools like MyPlasticDiary help individuals understand their own waste impact and participate in reduction efforts. These micro-level actions reinforce and legitimize broader policy reforms.

While other proposals like voluntary industry pledges or plastic taxes play supporting roles, EPR provides a structured, enforceable path toward measurable and lasting change. By tailoring a national framework to the U.S. political and economic landscape and pairing it with targeted reforms, policymakers can make lasting progress on plastic waste reduction. If the United States acts now, it has the opportunity to lead a global shift toward a circular and sustainable plastic economy. 

41 Dong, Yinhong, Fengjun Zhang, and Lili Fu. "Ecological Design: The Role of Extended Producer Responsibility System." *Journal of Coastal Research*, 2019, 354–61. <https://www.jstor.org/stable/26853291>.

42 Tess Kazdin, "EPR so Far," *Wastetodaymagazine.com*, March 28, 2025, <https://www.wastetodaymagazine.com/article/epr-so-far-experts-developments-in-extended-producer-responsibility-regulations/#:~:text=Felton%20said%20that%20while%20legislation,partisan%20politics%2C%E2%80%9D%20he%20said.>

ADDITIONAL WORKS CONSULTED

Aiguoabarueghian, Ikponmwosa, Uwaga Monica Adanma, Emmanuel Olurotimi Ogunbiyi, and Nko Okina Solomon. "Reviewing the Effectiveness of Plastic Waste Management in the USA." *World Journal of Advanced Research and Reviews*. Accepted May 24, 2024. <https://wjarr.co.in/sites/default/files/WJARR-2024-1518.pdf>.

Akenji, Lewis, Magnus Bengtsson, Mizuki Kato, Matthew Hengesbaugh, Yasuhiko Hotta, Chika Aoki-Suzuki, Premakumara Jagath Dickella Gamaralalage, and Chen Liu. *Circular Economy and Plastics: A Gap-Analysis in ASEAN Member States*. Institute for Global Environmental Strategies, 2019. <http://www.jstor.org/stable/resrep21872.6>.

Albanese, Madi. "Fixing U.S. Recycling Infrastructure Is Key to Ending the Plastic Waste Crisis." *Agilyx*, October 4, 2022. <https://www.agilyx.com/fixing-u-s-recycling-infrastructure-is-key-to-ending-the-plastic-waste-crisis/>.

"Advanced Recycling: A Different Way to Handle Used Plastics." *ExxonMobil*, 2024. <https://corporate.exxonmobil.com/what-we-do/materials-for-modern-living/A-different-way-to-handle-used-plastics>.

Climate Rights International. "Plastics: Countries Should Agree to a Cap on Plastic Production." November 27, 2024. <https://cri.org/plastics-countries-should-agree-to-a-cap-on-plastic-production/>.

Hopewell, Jefferson, Robert Dvorak, and Edward Kosior. "Plastics Recycling: Challenges and Opportunities." *Philosophical Transactions: Biological Sciences* 364, no. 1526 (2009): 2115–26. <http://www.jstor.org/stable/40485985>.

Jain, Akshat, ed. "Options for Plastic Waste Management." In *Plastic Recycling: Decoded*. Centre for Science and Environment, 2021. <http://www.jstor.org/stable/resrep37920.9>.

Know Plastics. "The Role of Consumer Behavior in Plastic Waste Reduction." July 9, 2024. <https://knowplastics.org/consumer-behavior-in-plastic-waste-reduction/>.

Ligare, Miho. "Plastic Industry's Legislative Ploy to Expand Production by Burning the Problem They've Created." *Surfrider Foundation*, April 14, 2023. <https://www.surfrider.org/news/plastic-industrys-legislative-ploy-to-expand-production-by-burning-the-problem-theyve-created>.

"Plastics: Material-Specific Data." U.S. Environmental Protection Agency. November 21, 2024. <https://www.epa.gov/facts-and-figures-about-materials-waste-and-recycling/plastics-material-specific-data>.

Resource Center. "What Are the EPR Directives in the EU?" *Source Intelligence*, March 24, 2023. <https://blog.sourceintelligence.com/what-are-the-epr-directives-in-the-eu>.

Ritchie, Hannah. "FAQs on Plastics." *Our World in Data*, September 2, 2018. <https://ourworldindata.org/faq-on-plastics>.

Ritchie, Hannah, Veronika Samborska, and Max Roser. "Plastic Pollution." *Our World in Data*, November 1, 2023. <https://ourworldindata.org/plastic-pollution>.

Trajano, Julius Cesar. "A Circular Economy for Sustainable Development and Environmental Protection." In *Advancing Non-Traditional Security Governance through Multi-Stakeholder Collaboration*. S. Rajaratnam School of International Studies, 2019. <http://www.jstor.org/stable/resrep20021.8>.

World Economic Forum. "How Advanced Technologies Can Help US Beat Plastic Pollution." January 7, 2025. <https://www.weforum.org/stories/2025/01/advanced-technologies-are-changing-our-lives-and-they-can-help-us-beat-plastic-pollution/>.



Mitigating Microloan Debt in Cambodia

Brenna Rostron

ABSTRACT

Microlending is a prevalent industry for financial services in Cambodia; however, its widespread application has shown to have negative consequences of compounding debt and in certain cases worsening poverty. Addressing the issue through a broad encompassing approach rather than a narrow focus limited to specific channels is necessary for achieving a long-term solution that accounts for the root causes of the problem and its immediate impacts. This paper supports that a combined effort of social programs, market incentives, and regulatory enforcement are both the most feasible and effective solution for ensuring long-term resolution of over-indebtedness in Cambodia.

OVERVIEW AND ISSUE HISTORY

The application of microloans is now a leading cause of the debt crisis in Cambodia that has resulted in increasing child labor, health complications, and deepening poverty.¹ Issues including higher interest rates, a visible comparison between other available interest rates in Appendix A., and lacking transparency regarding loan terms to prospective borrowers are notable problems fueling microloan debt. The severity of microloan consequences can often be related to the collateral backing many microloans: assets such as land and homes that are the basis of people's livelihoods securing the loan and being taken if left unpaid. To avoid this, the behavior of managing formal debts by incurring further debt through separate informal and formal means emerges, contributing to a continuous cycle of compounding debt that can

¹ Khan, S., & Seiff, A. (2023, May 30). *The Danger of Microfinance*. The Dial. <https://www.thedial.world/articles/news/issue-5/cambodia-microfinance-borrower-debt>

become impossible to repay.² In Cambodia, approximately one third of existing microloans are being used to repay other loans, and as of 2023 the total microloan debt has doubled over a four-year period surpassing 16 billion USD as the debt crisis continues to worsen.³

Since its modern introduction in the 1970s by Muhammad Yunus, microlending has been a prevalent financial service implemented with the intentions of supporting local communities by uplifting economic markets and fighting poverty.⁴ In theoretical application, microloans are successful through lending small amounts of cash to people who may not have access to traditional modes of financing, further detail in Appendix B, to then invest in business ventures and community projects that will generate a return in income and stimulate economic growth. Muhammad Yunus implemented this idea through making multiple small loans to a group of women in his local community in Bangladesh which resulted in significant economic growth and quality of life improvements for the overall community.⁵ In Cambodia the popularity of microlending grew rapidly upon the creation of The Association of Cambodian Local Economic and Development Agencies as a United Nations Development Program (UNDP) microfinance institution (MFI) in 1993, which soon expanded into a commercial bank operating in every province.⁶

While it is a financially lucrative industry for its many lenders, the consequences that have emerged for borrowers indicate a different reality that requires a resolution.

Attempts at regulating the microfinancing industry through creating an interest rate cap of 18% in 2017 were unsuccessful, causing official interest rates to remain below the cap while additional “fees” and loan sizes immediately increased leaving the effective interest rate still high, and the informal lending market grew.⁷ These loan fees are sometimes claimed as loan administration and loan processing fees, although frequently there is no reported justification for the additional monthly payments. Through examining interest and additional incomes of 82 microfinance institutions in Cambodia, the average reported interest rate in 2023 was approximately 15.3%, and after accounting for additional costs it was estimated at 20.4%. Appendix C. displays the full range of MFI interest rates. Seeking a solution that can effectively address this crisis is imperative for alleviating the growing debt burden for Cambodian citizens.

POSSIBLE SOLUTIONS

Solution One

Loan Forgiveness or Suspension

Loan forgiveness or suspending loan payments is often an initial thought when resolving a debt crisis, and it could be implemented as a solution to the short-term aspects of the debt crisis within Cambodia. Loan forgiveness programs have been introduced in a variety of social contexts internationally and remain a plausible method to stall the immediate effects of a debt crisis from materializing. In fact, during the COVID-19 pandemic, discussion by multiple organizations, both domestic and international, proposed suspending loan payments and

2 W. Nathan Green, Chhom, T., Mony, R., & Estes, J. (2023). The Underside of Microfinance: Performance Indicators and Informal Debt in Cambodia. *Development and Change*, 54(4). <https://doi.org/10.1111/dech.12778>

3 Debt Threats: A Quantitative Study of Microloan Borrowers in Cambodia. Cambodian League for the Promotion and Defense of Human Rights. (2023, August). <https://www.licadho-cambodia.org/reports.php?perm=242#:~:text=Equitable%20Cambodia%20%28EC%29%20and%20the%20Cambodian%20League%20for,features%20findings%20from%20a%20survey%20of%2071%20households.>

4 Krieger, R. (2006, October 31). *Frontline/world*. Uganda - a little goes a long way . history . PBS. Frontline World. <https://www.pbs.org/frontlineworld/stories/uganda601/history.html>

5 Campbell, C. (2024, June 24). *From “banker” to “bloodsucker” : The trials of Muhammad Yunus*. Time. <https://time.com/6991107/muhammad-yunus-trial-sheikh-hasina-bangladesh/>

6 Thath, R. (2018, March). *Microfinance in Cambodia: Development, Challenges, and Prospects*. Munich Personal RePEc Archive. <https://mpra.ub.uni-muenchen.de/89969/>

7 Samreth, S., Aiba, D., Oeur, S., & Vat, V. (2023). Impact of the interest rate ceiling on credit cost, loan size, and informal credit in the microfinance sector: Evidence from a household survey in Cambodia. *Empirical Economics*, 65(6), 2627–2667. <https://doi.org/10.1007/s00181-023-02443-5>

interest accrual for microloan debts related to the pandemic.⁸ Yet determining how to suspend loan payments and interest accrual is an issue, as complete widespread suspension would result in a revenue loss of millions of dollars, causing a shock to both the industry and the national economy due to the size of the microlending industry. Meanwhile, partial loan suspension, regarding loans for specific vulnerable demographics or loan purposes, raises the question of deciding which loans should be suspended and enforcing it among all MFIs. These issues apply directly to attempting to implement loan forgiveness as well. Furthermore, while loan forgiveness plans over long periods of time are a better option economically and provide current debt relief, it does not prevent further debt from incurring nor address root issues. Existing mixed political reception regarding loan forgiveness and payment suspension also poses a challenge for adopting this solution, and it has the potential to incite hostility as there has been tension between the national party and dissolved political opponents over the policy.⁹

Solution Two

Private Banking Market Incentive

Involving the private banking sector in mitigating over-indebtedness through applying market incentives for ethical and transparent behavior in the lending market can target a source of the growing microloan debt. One channel this can be accomplished through is certification by outside organizations guaranteeing proper practices, signaling borrowers to work with those certified safe lenders. In Cambodia, training, certification, and accreditation for finance professionals is available through the Institute of Banking and Finance (IBF); however, there is no existing certification specific to microlending practices despite the prevalence of MFIs in the banking

industry.¹⁰ Other market incentives such as small tax benefits for registered MFIs following ethical lending behavior, as guaranteed by the NBC, IBF, or other certification organizations, can also encourage private banking behavior while simultaneously mitigating the growth of informal lending by financially incentivizing official registration through the central bank. With existing infrastructure that can manage the certification and monitoring of financial institutions, market incentives can be applied with less burden and have better reception as lenders can benefit from it. Nevertheless, the effectiveness of this solution is reliant upon public awareness of certifications and time for lenders to adapt to changes, limiting the scope of this solution to the long-term future rather than achieving rapid results. Notably, market incentives can be taken advantage of by lenders without social advancements, and economic improvements are most associated with implementation of both market incentives and regulatory solutions.¹¹

Solution Three

Regional Standardization

Although many countries have enacted regulation and designated institutional responsibility to regulate microfinance domestically in some capacity, these systems vary dramatically in capacity, focus, and range of regulatory coverage. Incorporating aspects of existing microfinance regulations of the Southeast Asian region into a standard allows for cultural and structural environments to be considered for regulatory adoption by each country, including Cambodia. Standardization through collaboration between regional bodies such as ASEAN and regional banks could assist in managing microlending practices consistently and strengthen enforcement of regulation while still promoting economic

8 Human Rights Watch. (2020, October 28). *Cambodia: Micro-Loan borrowers face covid-19 crisis*. Human Rights Watch. <https://www.hrw.org/news/2020/07/14/cambodia-micro-loan-borrowers-face-covid-19-crisis>

9 Ibid.

10 Institute of Banking and Finance. (n.d.). *About IBF KH*. Institute of Banking and Finance. <https://www.ibfkh.org/en/about-us/>

11 Rose, N. L. (2001). Regulation: Empirical analysis. *International Encyclopedia of the Social & Behavioral Sciences*, 12957–12963. <https://doi.org/10.1016/b0-08-043076-7/02301-9>

growth.¹² This approach can incorporate informal and formal agreements as a common practice to encourage country adoption of policy and further enforcement. Notably, there are several challenges and limitations to establishing a regional standard of practices. Implementing standardization would require broad political support, willingness to cooperate to establish, and overlapping opinions on microlending policy. This structural, formal approach could additionally be counterproductive for targeting debt alleviation, as existing literature and simulations have suggested tight overarching regulation as a potential hindrance for poverty alleviation and economic growth, indicating that market solutions and flexible policy could pose a more beneficial outcome.¹³

Solution Four

National Regulation and Consumer Protection

Domestic regulation is a key mechanism for managing markets, and utilizing policy for managing the microlending industry and related debt is a viable option. In this case, the impact of the adopted policy depends on the enforceability and scope of issues addressed. While the existing interest rate cap in Cambodia has had a limited impact on curbing high interest rates, other countries have enforced loan fee caps alongside interest caps and seen better success and avoid lender evasion.¹⁴ These market regulations can also be combined with consumer protection policy to address potential predatory lending behavior. Consumer protection targeting deceptive term limits, repayment capacity consideration, and

transparency measures between borrowers and lenders can push ethical practices while also encouraging competition to lower interest rates.¹⁵ As formal MFIs are required to be registered with the central bank, The National Bank of Cambodia (NBC), and provide annual reports to ensure transparency, this can be a mechanism that is used to enforce national policy. Still Cambodia's current institutional capacity has limitations, and as such, national regulation and policy is limited in its effectiveness to formal lending services. When considering the prevalence of informal lending in Cambodia, this solution does not completely address the issue.

Solution Five

Social Program Investment

Investment in human capital in the form of social programs and public campaigns or initiatives that target improvements in education and financial literacy could have a lasting impact on society and debt reduction. Through focusing on a root cause of over-indebtedness in the population, low levels of financial literacy and education, savings behavior in relation to formal and informal debts as well as overall financial inclusion can be improved.¹⁶ In recent years, The NBC has also addressed the need for improved financial literacy, running a campaign promoting financial literacy in 2016 and 2021 while also highlighting the necessity of further initiatives and programs through financial service providers in their 2019-2025 National Financial Inclusion Strategy.¹⁷ The campaign had notable impact on Cambodian citizens, reaching over a million citizens and generating thousands of open discussions

12 Rojas-Suárez, L. (2002). International Standards for Strengthening Financial Systems: Can Regional Development Banks Address Developing Countries' Concerns?

13 Mitoko, J. (2021, June 21). *Economics of microcredit-from current crisis to new possibilities*. Munich Personal RePEc Archive. <https://mpra.ub.uni-muenchen.de/108392/>

14 Henriquez Gallegos, C. A., & Maimbo, S. M. (2016, April 20). *Interest rate caps around the world: Still popular, but a blunt instrument*. World Bank. <https://documents.worldbank.org/en/publication/documents-reports/documentdetail/876751468149083943/interest-rate-caps-around-the-world-still-popular-but-a-blunt-instrument>

15 Heng, D., Chea, S., & Heng, B. (2021). Impacts of interest rate cap on financial inclusion in Cambodia. *IMF Working Papers*, 2021(107). <https://doi.org/10.5089/9781513582634.001>

16 Morgan, P. J., & Long, T. Q. (2017, June 19). *Determinants and impacts of financial literacy in Cambodia and Viet Nam*. Asian Development Bank. <https://www.adb.org/publications/determinants-and-impacts-financial-literacy-cambodia-and-viet-nam>

17 National Bank of Cambodia, National Financial Inclusion Strategy 2019-2025. Retrieved from https://www.nbc.gov.kh/download_files/publication/blueprints_eng/Final_NFIS_in_English.pdf

about making decisions about money.¹⁸ Additionally, research also indicates there is a positive environment for encouraging financial literacy and education even in rural environments despite the lack of existing services and knowledge, emphasizing both a need and space for financial literacy regarding informal and formal financial services.¹⁹ The broad support of this solution in government institutions indicates apparent political feasibility, with the only notable limitation being in financial resources. However, the scale of financial responsibility varies with the form of investment, with campaigns being a less costly endeavor while direct monetary investment in public education or creation of specific targeted social programs will incur higher costs.

RECOMMENDED SOLUTION

Considering Cambodia's institutional capacity and financial resources, the optimal solution that is feasible to implement is a combination of solutions two, four, and five. While solution three could be a key mechanism in controlling microloan debt and its consequences in Cambodia and Southeast Asia as a whole, successfully realizing it would have the most political blocks towards acceptance and require a substantial amount of time. Beyond international political feasibility, domestic political acceptance is a critical consideration when weighing each solution, especially since the Cambodian government is a single party state. Solution one is politically impossible as it remains a contentious issue that the party president Hun Sen has been vocally against. Additionally, solution one has high financial costs yet only mitigates the immediate debt crisis, leaving the root issues affecting microloan systems unaddressed.

Utilizing both market and regulatory mechanisms is the most effective channel for implementing a lasting solution. Market incentives including a tax benefit and offering certification of ethical practices through IBF can be implemented as an initial measure to begin urging transparent behavior. Common practices will take time to shift and an increase in public awareness needs to occur to generate market demand pressure. Social campaigns encouraging financial literacy can act as an inciting force for public awareness, as well as encourage discussion across diverse populations. While these campaigns do require financial support during their beginning phases, involvement of the public creates further momentum that continues beyond the initial investment. These channels of change are significant for making an impact in rural areas, and there is existing infrastructure and political interest to support their usage. Through consistent social awareness, investing in human capital, and incentivizing lending behavior, a solution can target both actors in the market: lender and borrower.

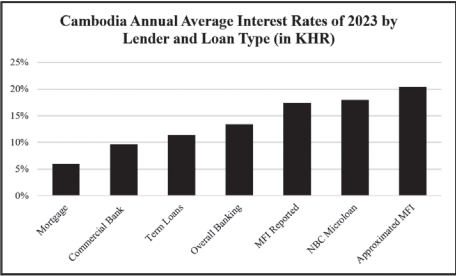
However, national market regulation is a key force for stopping debt accumulation by ensuring competitive behavior. The goal of limiting high interest rates that the existing interest rate cap aimed at achieving was not fulfilled due to the loophole of loan fees being uncapped. Rectifying this issue can be a major change that has greater impact on containing interest rates. Moreover, regulation can work alongside social improvements and market incentives to begin mitigating microloan debt. Although there is further possibility of alleviating debt accumulation in proposing consumer protection regulation, it may potentially face greater opposition than the fee cap due to it being a new proposition. Instead, the presence of social campaigns and the promotion of financial literacy can act as an informal mechanism for consumer protection through shared information and awareness while formal protection may be unable to be enacted or take time to be accepted. Due to this, government regulations, market incentives, and social programs can combined fulfill important roles in targeting root sources

18 Griffith Asia Institute. (2022, November 27). Cambodia's Creative Financial Literacy Campaigns. Griffith University. <https://blogs.griffith.edu.au/inclusive-digital-economies/2022/11/27/cambodias-creative-financial-literacy-campaigns/>

19 Cadungog-Uy, J., & Flores, E. (2024). Financial Literacy Awareness and practices among village savings groups in Cambodia. *Journal of Accounting, Finance, Economics, and Social Sciences*, 9(2). <https://doi.org/10.62458/jafess921>

of the consequences of microlending. Relying on purely one of these solutions leaves space for the debt to go unresolved and continue to grow. 🌐

APPENDIX A

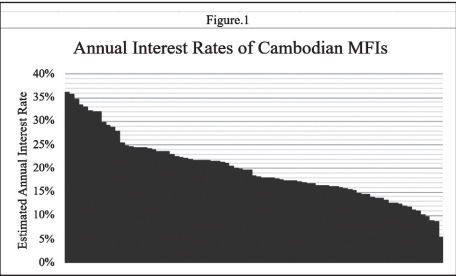


This chart provides average annual interest rate information for mortgages, term loans, loans from commercial banking, and overall banking industry loans to compare with microloan rates. MFI Reported is the officially reported average interest for the microlending industry according to the National Bank of Cambodia, NBC Microloan is the 18% microloan available through the central bank as well as the official interest rate cap, and Approximated MFI is the interest rate accounting for additional fees from data used in Appendix B.

APPENDIX B

To ensure higher chances of success and poverty alleviation, according to theory and research, microloans are aimed more towards rural populations, women, and groups of peers. Lending to groups allows for social pressure to ensure the money is allocated directly to the intended loan purpose and that the loan gets repaid. Rural populations are less likely to have access to traditional financing, so providing the opportunity is crucial for generating new sources of income in rural areas. Women also often lack access to financing and are disproportionately affected by poverty, yet they are more trustworthy borrowers in terms of lending which improves the likelihood of success for a microloan.

APPENDIX C



Data from this graph was gathered from the National Bank of Cambodia 2023 Report on Loans and Nonperforming Loans and Report on Profit and Loss Statement. Interest rates are estimated using Interest Income, Non-interest Income, Loans, and NPL Ratios. Deposit Taking Institutions are included, and institutions lacking information or having inconsistent data were excluded.



Strengthening U.S. Pharmacovigilance Framework: Addressing Adverse Drug Reactions and Antimicrobial Resistance

Niamh Berry

ABSTRACT

Adverse drug reactions (ADRs) and antimicrobial resistance (AMR) represent two converging public health threats that threaten the safety and efficacy of modern healthcare. ADRs contribute to approximately 250,000 deaths annually, making them the third leading cause of death.¹ They are estimated to account for 20% of all hospital admissions due injury and they can prolong hospital stays which can increase healthcare expenses.² ADRs are widely unreported due to unclear guidelines, voluntary reporting systems, and lack of clinical education.

Antimicrobial resistance (AMR) contributes to 2.8 million infections and 35,000 deaths annually in the U.S.³ AMR hinders the success of treatments for infectious illnesses, increases the risk of severe illness and death, and poses threats to procedures such as surgery, organ transplantation and cancer treatment. The World Health Organization recognizes AMR as a critical priority with reported resistance in all sectors of the world.⁴ Coordination between surveillance systems remains

- 1 The American Society of Pharmacovigilance. 2025. "Predicting Adverse Drug Event Prevalence: A Data-Driven Approach" Stopadr.org. March 24, 2025. <https://stopadr.org/blog/predicting-adverse-drug-event-prevalence-a-data-driven-approach>.
- 2 Dunkin, Mary Anne. 2022. "Costs of Severe Drug Reactions Resulting in Hospitalization at the VHA - U.S. Medicine." U.S. Medicine. May 12, 2022. <https://www.usmedicine.com/pharmacy-update/costs-of-severe-drug-reactions-resulting-in-hospitalization-at-the-vha>.
- 3 WHO. 2014. "WHO's First Global Report on Antibiotic Resistance Reveals Serious, Worldwide Threat to Public Health." WHO. April 30, 2014. <https://www.who.int/news/item/30-04-2014-who-s-first-global-report-on-antibiotic-resistance-reveals-serious-worldwide-threat-to-public-health>.
- 4 Muteeb, Ghazala, Tabish Rehman, Moyad Shahwan, and Mohammad Aatif. 2023. "Origin of Antibiotics and Antibiotic Resistance, and Their Impacts on Drug Development: A Narrative Review." *Pharmaceuticals* 16 (11): 1615. <https://pmc.ncbi.nlm.nih.gov/articles/PMC10675245/>.

disjointed, restricting prompt detection and response.

Discovered in the early 20th century, Antibiotics have served as the cornerstone for modern healthcare.⁵ The term antibiotic was coined by microbiologist and inventor Selman Waksman in 1941, to characterize molecules produced by microorganisms that hinder development or eradicate other microorganisms.⁶ As antibiotic treatment has become more accessible, their improper usage has fostered an increase in cases of antimicrobial resistance. Misuse, including overprescription and patients not completing treatment courses to their entirety, have accelerated the emergence of resistant strains.⁷

This paper proposes 3 federal policy interventions to strengthen the U.S. pharmacovigilance framework and address the growing threat of ADRs and AMR: [1] standardizing and enforcing REMS (Risk Evaluation and Mitigation Strategies) protocols through a centralized FDA-led task force, and a national REMS compliance reporting system; [2] improving ADR detection by requiring the integration of automated digital reporting tools into electronic health records (EHRs); and [3] enhancing AMR surveillance through a unified One Health data infrastructure, increased sentinel site use, and performance-based financial incentives to encourage responsible antibiotic use.

These reforms would enhance regulatory oversight, improve clinical safety and strengthen the nation's resilience to medication-related public health threat.

BACKGROUND

Pharmacovigilance plays a critical role in maintaining public health by ensuring medication safety and efficacy, particularly in the face of growing concerns regarding adverse drug reactions (ADR) and antimicrobial resistance (AMR). The United States regulatory frameworks, such as Risk Evaluation and Mitigation Strategies (REMS), are designed to protect patients against high-risk medications by enforcing strict prescribing, monitoring, and reporting requirements.⁸ These programs are overseen by the Food and Drug Administration (FDA), which ensures that all REMS programs are enforced to make certain that high-risk drug's benefits outweigh its risks. However, significant gaps within REMS enforcement, inconsistent ADR reporting, and inadequate AMR surveillance have weakened its overall effectiveness, contributing to unintended drug safety risks, that pose a threat to public health.⁹

ADR related complications can pose significant challenges for a patient, leading to ineffective treatments, hospitalization and often prolonged health risks. Antibiotics are most frequently associated with ADR cases, that result in incomplete treatment, which encourages the adaptation and resistance of bacteria. Patients experiencing severe allergic or gastrointestinal reactions, may be prescribed antibiotics, but may prematurely discontinue their treatment as a result of their lessening symptoms, or minor ADR side-effects, thereby, unintentionally fostering

5 Clardy, Jon, et al. 2009. "The Natural History of Antibiotics." *Current Biology* 19 (11): R437–41. <https://doi.org/10.1016/j.cub.2009.04.001>.

6 Clardy, Jon, et al. 2009. "The Natural History of Antibiotics." *Current Biology* 19 (11): R437–41. <https://doi.org/10.1016/j.cub.2009.04.001>.

7 Llor, Carl, and Lars Bjerrum. 2014. "Antimicrobial Resistance: Risk Associated with Antibiotic Overuse and Initiatives to Reduce the Problem." *Therapeutic Advances in Drug Safety* 5 (6): 229–41. <https://pmc.ncbi.nlm.nih.gov/articles/PMC4232501/>

8 FDA. 2023. "Risk Evaluation and Mitigation Strategies (REMS)," U.S. Food and Drug Administration. May 16, 2023. <https://www.fda.gov/drugs/drug-safety-and-availability/risk-evaluation-and-mitigation-strategies-rems>

9 "40 Medicine Safety Plan RMP and REMS – All about Pharma Covigilance," n.d. All about Pharma Covigilance. <https://allaboutpharmacovigilance.org/40-medicine-safety-plans-rmp-and-rems/>.

conditions for AMR development.¹⁰ ADRs contribute to antibiotic misuse and expedite antimicrobial resistance, which has created an urgent need for better pharmacovigilance strategies that effectively integrate REMS with ADR and AMR monitoring efforts.¹¹

Despite REMS’ intent, the program has not been universally implemented across healthcare institutions. As a result, this leaves prescribers with unclear guidelines on the handling of medications that have the potential high risk of ADR.¹² According to the FDA, varied interpretations of REMS requirements combined with burdensome documentation and reporting obligations create significant compliance barriers, particularly in resource-limited settings. Physicians face increased workloads due to patient agreements, counseling, follow-up reporting, which can complicate consistent compliance.¹³

In addition to impacting individual patient care, the REMS implementation challenges can impede public health initiatives by limiting access to vital treatments, exerting pressure on healthcare capacity, and increasing inequities in care, specifically in marginalized communities.¹⁴ To achieve successful REMS implementation, there must be coordinated efforts from healthcare across the healthcare

systems to promote positive outcomes across communities.¹⁵

These vulnerabilities within pharmacovigilance, including inconsistent REMS implementation, increased demands on health care providers, insufficient patient education and the lack of live AMR surveillance reflect an uncoordinated response to an increasingly urgent public health threat. The cycle of antibiotic resistance remains unchecked without more preemptive approaches to self-reporting ADR and real time surveillance of AMR, further dwindling the efficacy of life saving antibiotics. To reinforce pharmacovigilance, it is critical for policymakers to address existing gaps through the implementation of more effective enforcement of REMS, enhanced monitoring systems for ADR, optimized antibiotic stewardship, improved oversight mechanisms by the FDA, and expanded initiatives for patient education. This paper proposes three targeted policy interventions to strengthen the framework of the United States’ pharmacovigilance: standardizing REMS implementation across institutions, integrating AMR surveillance with ADR monitoring systems and expanding ADR monitoring through the integration digital reporting systems.

POLICY SOLUTIONS

Solution One:

The standardization and enforcement of REMS Implementation across Institutions

Designed to mitigate the dangers of high-risk medications, Risk Evaluation and Mitigation Strategies (REMS) are a vital safeguard to US pharmacovigilance efforts.¹⁶ Yet across healthcare institutions, prescribers encounter inconsistent institutional practices, unclear

10 CDC. 2024. “Antimicrobial Resistance Facts and Stats,” Antimicrobial Resistance. CDC. April 22, 2024. <https://www.cdc.gov/antimicrobial-resistance/data-research/facts-stats/index.html>.

11 Bennett, Charles L. 2007. “Evaluation of Serious Adverse Drug Reactions.” JAMA Internal Medicine 167 (10): 1041. <https://doi.org/10.1001/archinte.167.10.1041>.

12 “Research Tools REMS.” 2022. National Comprehensive Cancer Network. 2022. <https://www.nccn.org/business-policy/business/research-tools-remis>.

13 Manzo, Claudia. n.d. “Part 2 - Implementation: Challenges and Opportunities.” U.S. Food and Drug Administration. <https://www.fda.gov/drugs/our-perspective/risk-evaluation-and-mitigation-strategies-remis>

14 Siva, Dr. 2025. “Navigating the Complex Landscape of FDA REMS Programs | Blogs | What We Think | Indegene.” Indegene.com. Indegene. February 17, 2025. <https://www.indegene.com/what-we-think/blogs/fda-remis-program-medications-safety>.

15 Siva, Dr. 2025. “Navigating the Complex Landscape of FDA REMS Programs | Blogs | What We Think | Indegene.” Indegene.com. Indegene. February 17, 2025. <https://www.indegene.com/what-we-think/blogs/fda-remis-program-medications-safety>.

16 FDA. “Risk Evaluation and Mitigation Strategies (REMS),”

guidelines and increased workload burdens when attempting to comply with REMS protocol. In addition to this, physicians must manage patient agreements, ensure patient understanding of the medication guide, deliver safety guidance and conduct follow-up reports which create complications of compliance.¹⁷ The standardization of REMS implementation across all healthcare institutions would refine this process and reduce any variation within provider adherence which increases the safety of a patient.

REMS was established by the FDA Amendments Act of 2007 to ascertain that the benefits medicinal benefits of drugs outweigh their associated risks.¹⁷ Although the FDA determines which drugs require REMS protocols, they do not monitor how institutions perform REMS protocols. As a result, hospitals, pharmacies and other institutions enforce REMS guidelines inconsistently and with different interpretations.¹⁸

National REMS Oversight Task Force:

To address these challenges Congress should pass federal legislation establishing a nationally standardized REMS protocol. This statute would authorize the formation of a National REMS Oversight Task Force within the FDA. This task force would be responsible for developing unified training modules and flexible implementation processes adaptable for large health systems and under-resourced clinics.¹⁹ It would oversee routine compliance audits and collaborate with manufacturers to align institutional practices with labelling and safety protocols. Through the standardization of these procedures, the task force would reduce the burden on healthcare professionals and strengthen the core safety goals of REMS

by removing any uncertainty around its safety requirements.²⁰

A critical component of this effort involves the use of Structured Product Labelling (SPL) in REMS. SPL is a format designed to present medication information uniformly so that it can be read by a machine, allowing for easy integration into healthcare information systems.²¹

The FDA developed a guidance titled “Providing Regulatory Submissions in Electronic Format – Content of the REMS Document Using Structured Product Labelling” to standardize SPL format in response to old REMS document formats being unstructured and challenging to search for or manage. This standardization enhances healthcare providers’ access to REMS information.²²

The standardization of REMS implementation would reduce the variability in provider adherence, increasing patient safety across clinical settings. Clear guidance and routine monitoring would reduce compliance uncertainty and supply healthcare providers with the resources and self-assurance to manage high-risk medications.

Centralized REMS Compliance Reporting System:

In addition to REMS standardization protocols, establishing a compliance reporting system overseen by the FDA is vital. This system would require all healthcare institutions to submit compliance reports regularly, allowing for the identification of areas requiring enforcement assistance or further targeted interventions. This centralized reporting system would

17 Manzo, Claudia “Part 2 - Implementation: Challenges and Opportunities.”

18 FDA. 2018. “FDA’s Role in Managing Medication Risks.” U.S. Food and Drug Administration. January 26, 2018. <https://www.fda.gov/drugs/risk-evaluation-and-mitigation-strategies-rems/fdas-role-managing-medication-risks>.

19 The FDA Group. 2024. “Risk Evaluation Strategy (REMS) Audits: How to Execute a Successful Program.” The FDA Group, The FDA Group LLC. August 20, 2024. <https://www.thefdagroup.com/blog/rems-audit>.

20 Syneos Health, 2019. “The Future of REMS: The Time Is Now for REMS Training and Professional Development” Syneos Health. July 17, 2019. <https://www.syneoshealth.com/insight-hub/future-rems-time-now-rems-training-and-professional-development>.

21 Gaunt, Michael J. 2023. “Maximizing REMS Potential to Reduce Risk of Errors, Patient Harm.” Pharmacy Times 89 (9) <https://www.pharmacytimes.com/view/maximizing-rems-potential-to-reduce-risk-of-errors-patient-harm>.

22 FDA. 2024. “Risk Evaluation and Mitigation Strategies (REMS) Part 2 – Implementation: Challenges and Opportunities.” U.S. Food and Drug Administration. 2024. <https://www.fda.gov/drugs/our-perspective/risk-evaluation-and-mitigation-strategies-rems>

promote greater accountability and consistent compliance among clinicians.²³

Beyond enforcement, the reporting system would also serve as a platform to inform institutions of updates on REMS requirements and the best evidence-based practices. This system would provide ongoing education and help clinicians maintain compliance standards as drug safety information evolves.

The REMS reporting infrastructure can also streamline administrative workflows by decreasing repetitive and unorganized documentation that can overwhelm healthcare professionals. Having access to real-time, comprehensive data allows regulators to make evidence-based policy decisions and increase resource optimization. This strategy can strengthen pharmacovigilance efforts by enhancing regulatory oversight, increasing compliance, and promoting safer medication practices for patients.²⁴

Solution Two:

Expand ADR Monitoring Through Integrated Digital Reporting Systems

Adverse drug reactions (ADRs) represent a critical public health concern in the United States, with over 29 million cases reported to the FDA between 2011 and 2024.²⁵ Despite the scale of the issue, ADRs are exceedingly underreported which leads to postponed regulatory intervention and results in incomplete safety surveillance. The manual procedure of reporting ADR cases is time-consuming and can be disconnected from medical processes, causing data gaps that can risk patient safety. Without a precise real-time ADR database, the FDA encounters

difficulties in recognizing harmful drug effects and providing prompt guidance to healthcare professionals.²⁶

Regardless of FDA initiatives to collect and publish data on adverse events and medication errors through the Adverse Event Reporting System (FAERS), it remains limited because its reporting mechanisms rely on voluntary submissions.²⁷ Healthcare providers lack awareness of the reporting process or encounter systemic barriers like insufficient training, concern of liability, and ambiguous protocols that discourage their participation.²⁸ The lack of live data integration between federal reporting systems and patient care data restricts the effectiveness of pharmacovigilance platforms. These platforms tend to be reactive to issues after they occur instead of adopting a proactive approach to prevent potential concerns.

To improve ADR surveillance, the federal government should require the use of built-in electronic health records tools that are capable of detecting, recording and submitting adverse events to the FDA. A successful model of this is the Adverse Drug Event Spontaneous Triggered Event Reporting (ASTER) pilot established by Pfizer and the Brigham and Women's Hospital in 2008.²⁹ In this study, physicians used an automated system that identified potential adverse drug events during a patient's appointment. The system encouraged more physicians to report ADE to the FDA; the 30 participating clinicians who

23 Center for Drug Evaluation and Research. 2022. "REMS Compliance Program." U.S. Food and Drug Administration, September 22 2022. <https://www.fda.gov/drugs/risk-evaluation-and-mitigation-strategies-rems/rems-compliance-program>.

24 FDA. "Risk Evaluation and Mitigation Strategies (REMS) Part 2 – Implementation: Challenges and Opportunities."

25 Lynch, Shalini S. 2025. "Adverse Drug Reactions." Merck Manual Professional Edition. Merck Manuals. April 2025. <https://www.merckmanuals.com/professional/clinical-pharmacology/concepts-in-pharmacotherapy/adverse-drug-reactions>.

26 Dereyan, Antranig. 2016. "FDA Deficient in Postmarket Drug Surveillance, GAO Reports." Pharmacy Times, January 29, 2016. <https://www.pharmacytimes.com/view/fda-deficient-in-postmarket-drug-surveillance-gao-reports>.

27 FDA. 2024. "Sociodemographic Characteristics of Adverse Event Reporting." U.S. Food and Drug Administration. March 1, 2024. <https://www.fda.gov/drugs/spotlight-cder-science/sociodemographic-characteristics-adverse-event-reporting>.

28 O'Donnell, Carolyn, Tammie Lee Demler, and Charisse Dzierba. 2022. "Perceptions and Barriers of Adverse Drug Reaction Reporting within Inpatient State Psychiatric Facilities." *Mental Health Clinician* 12 (4): 247–53. <https://doi.org/10.9740/mhc.2022.08.247>.

29 Gliklich, Richard E, Nancy A Dreyer, and Michelle B Leavy. 2014. "Interfacing Registries with Electronic Health Records." NIH. Agency for Healthcare Research and Quality (US). April 15, 2014. <https://www.ncbi.nlm.nih.gov/books/NBK208625>.

had not submitted any reports in the previous years had submitted an average of 5 reports over 3 months.³⁰ Implementing a system like ASTER in the US would require standardized terminology for all adverse drug events and real-time validation mechanisms to ensure report accuracy prior to submission.³¹

An alternative approach to improving surveillance could be modelled after the Center for Medicare & Medicaid Services Promoting Interoperability Program, which requires hospitals and critical access facilities to electronically report public health data – especially antimicrobial use and resistance – through EHR systems.³² This federal effort demonstrates how policy incentives can drive the integration of health IT, incorporating public health reports into medical workflows and optimizing the consistency and efficiency of data collection. Compliance within this program has been tied to Medicare reimbursement therefore encouraging the widespread adoption of EHRs.³³ If this framework is applied to pharmacovigilance, the FDA would have a decrease in the institution's reliance of manual reporting systems and instead automate the identification of ADRs in EHRs. Currently the FDA's FAERS program is facing difficulties due to its voluntary reporting nature.³⁴ Utilizing the CMS Promoting Interoperability Program to include ADR surveillance would ensure that there are live reports of drug safety data that can be integrated into patient care and accessible for any early detection and response of adverse events.

Solution Three:

Strengthening AMR Surveillance with Integrated Pharmacovigilance Infrastructure

Antimicrobial resistance (AMR) is increasingly becoming a threat to public health in the United States, contributing to 2.8 million infections and 35,000 deaths annually.³⁵ In face of its urgency, the surveillance and regulation of AMR is heavily disjointed and under-managed, resulting in postponed regulatory action and a heightened/greater risk of patient endangerment. Current surveillance systems National Antimicrobial Resistance Monitoring System (NARMS) which directly monitors food-related bacteria and is managed independently from medical treatment reports.³⁶ This under-coordinated effort limits the real-time utilization of AMR data in clinical decision making/workflows and undermines the detection of emerging resistance trends.

Unified One Health AMR Surveillance:

The federal oversight of AMR is allocated to agencies such as the FDA, CDC, and USDA, however these institutions all operate independently with different sectors of interest, protocols, and databases.³⁷ The lack of coordination across these agencies reduces the speed and accuracy of resistance surveillance, particularly in hospital settings where timely decision making is critical. Healthcare professionals commonly are unaware of their AMR reporting obligations or face difficulties such as unclear guidelines, insufficient training, technological error, and patient liability concerns, which can limit their tracking contributions. Consequently,

30 Drug Information Association. 2009. "ASTER One Year Later a New Business Model for Postmarketing Reporting." SlideShare. July 20, 2009. <https://www.slideshare.net/mibara/ibaradia09final>.

31 Gliklich, Richard E, Nancy A Dreyer, and Michelle B Leavy. "Interfacing Registries with Electronic Health Records"

32 CDC. 2024. "Medicare Promoting Interoperability Program." Public Health Data Interoperability. December 12, 2024. <https://www.cdc.gov/data-interoperability/php/about/goals-and-benefits-of-data-interoperability.html>

33 CDC. "Medicare Promoting Interoperability Program."

34 FDA. "Sociodemographic Characteristics of Adverse Event Reporting."

35 CDC. 2024. "Antimicrobial Resistance Facts and Stats." Antimicrobial Resistance. CDC. April 22, 2024. <https://www.cdc.gov/antimicrobial-resistance/data-research/facts-stats/index.html>

36 Center for Veterinary Medicine. 2024. "About NARMS." FDA. May 1, 2024. <https://www.fda.gov/animal-veterinary/national-antimicrobial-resistance-monitoring-system/about-narms/>

37 Darin W, et al. 2024. "Navigating the Network: A Narrative Overview of AMR Surveillance and Data Flow in the United States." Antimicrobial Stewardship & Healthcare Epidemiology 4 (1). <https://doi.org/10.1017/ash.2024.64>

AMR monitoring systems perform reactively, only detecting resistance data after it has an impact on a patient's health outcome.³⁸

To remedy this fragmentation, the federal government could institute a unified multi-sectoral reporting system to merge resistance data from pharmaceutical, veterinary and medical workforces. This framework would require institutional reporting participation and distribute verified resistance instances to all relevant institutions. This platform would not depend entirely on manual data collection or be sector specific (e.g. NARMS), instead it would incorporate live data from EHRs, microbiology labs, pharmacy antibiotic usage reports and food safety testing.

An existing model of this program is the Danish Integrated Antimicrobial Resistance Monitoring and Research Programme (DANMAP). This program is a multisectoral program that has successfully unified human, animal and food data into a single AMR reporting system.³⁹ If the U.S. implemented a similar practice would encourage the approach of "One Health", to address health challenges, such as antimicrobial resistance, at the interconnection of human, environmental, and animal health. Healthcare providers would have rapid access to resistance data that can provide better insight into patient conditions.

Expanding the Use of Rapid Diagnostic Technologies for Clinical Settings:

Establishing a federally funded network of sentinel surveillance sites is vital to enhance the rapid detection and assessment of emerging antimicrobial resistance patterns. A sentinel site is a designated healthcare or laboratory location that collects clinical specimens and data on disease and resistance patterns. These sites serve as early warning systems and provide precise, cost-effective surveillance without requiring full population

coverage.⁴⁰ By tracking inpatient and outpatient cultures, these sites can evaluate resistance trends in real time and report their findings to a centralized data management system.⁴¹

The network of sites would not only be a surveillance system but also a platform for directing research to assess resistance threats, develop evidence-based interventions, and enforce strategies to lessen the impact of resistant diseases. This approach ascertains resistance threats are immediately identified, facilitating prompt public health interventions.⁴²

Gathering data from a range of sentinel locations allows the network to deliver an in-depth insight into antimicrobial resistance patterns. This system would inform evidence-based policymaking as well as the efficient allocation of resources. This system enhances the US's ability to respond to antimicrobial resistance health threats and safeguards public health.

Promoting Antibiotic Stewardship via Pay-for-Performance Models:

Despite the awareness of antibiotic resistance, overprescription of antibiotics is still prevalent in both inpatient and outpatient environments. Around 30% of antibiotic prescriptions in the US are not clinically necessary, contributing to the development and spread of resistance strains.⁴³ This issue is combined with the lack of incentive for clinicians to comply with the evidence-based antibiotic stewardship guidelines. Without any motivation, healthcare

38 Werth, Brian J., et al. 2022. "Reporting Behaviors and Perceptions towards the National Healthcare Safety Network Antimicrobial Use (AU) and Antimicrobial Resistance (AR) Modules." *Infection Control and Hospital Epidemiology*, June, 1-7. <https://doi.org/10.1017/ice.2022.131>.

39 The Danish Integrated Antimicrobial Resistance Monitoring and Research Programme. n.d. "About DANMAP." DTU. <https://www.danmap.org/about>.

40 World Health Organization. "Early Detection, Assessment and Response to Acute Public Health Events: Implementation of Early Warning and Response with a Focus on Event-Based Surveillance." WHO. January 1, 2014. <https://www.who.int/publications/i/item/WHO-HSE-GCR-LYO-2014.4>

41 Spellberg, Brad. 2011. "Combating Antimicrobial Resistance: Policy Recommendations to Save Lives." *Clinical Infectious Diseases* 52 (suppl_5): S397-428. <https://doi.org/10.1093/cid/cir153>.

42 Spellberg, Brad. "Combating Antimicrobial Resistance: Policy Recommendations to Save Lives."

43 Centers for Disease Control and Prevention. 2024. "Outpatient Antibiotic Prescribing in the United States." *Antibiotic Prescribing and Use*. June 28, 2024. <https://www.cdc.gov/antibiotic-use/hcp/data-research/antibiotic-prescribing.html>.

providers will maintain prescribing wide spectrum antibiotics even when it is not clinically appropriate, contributing to the growing resistance to antibiotics.

Medicare and other private insurers currently offer minimal alignments between reimbursement structures and adherence to antibiotic stewardship practices. In other words, financial incentives are not linked to provider compliance with stewardship protocol, which minimizes their accountability and impedes progress to appropriate use of antibiotics. Hospital stewardship programs are often voluntary, underfunded, lack enforcement or are inconsistently applied.⁴⁴

Physicians can often experience pressure to prescribe antibiotics driven by patient expectation or fear of malpractice. They lack systemic support to help guide appropriate prescribing behaviors like decision aid, or feedback mechanisms.⁴⁵

To address overprescription and strengthen compliance with stewardship protocols, the federal government could broaden existing pay-for-performance frameworks by incorporating antibiotic stewardship adherence as a quality metric. Healthcare facilities like hospitals and outpatient clinics could receive financial incentives for meeting such as complying with evidence-based infectious disease guidelines, minimizing unnecessary prescriptions and utilizing diagnostics before prescribing antibiotics. The CMS Hospital Value-Based Purchasing (VBP) Program serves as a model for using financial incentives to advance clinical performance and healthcare outcomes.⁴⁶ By linking stewardship with reimbursement incentives,

this policy would motivate health systems to integrate stewardship practices into clinical care and prioritize investments in antibiotic oversight tools like decision support systems and dedicated stewardship staff.

IMPLEMENTATION DISCUSSION

The implementation of the proposed pharmacovigilance policy reforms – standardizing REMS protocols, integrating digital ADR reporting systems, and strengthening AMR surveillance through a unified One Health data infrastructure – involves sustainable funding, united federal leadership, and collaborative work among public health agencies, medical institutions, and commercial entities. Although each reform is viable individually, their success is dependent on a national framework that can address any lapses in technology, oversight, and medical practice.

The key to successful implementation is cross-sectional coordination across agencies, as well as strong federal leadership. A pharmacovigilance reform strategy should be led by the FDA working in unison with the CDC, CMS and USDA. A REMS Oversight Task Force would be able to monitor the application of REMS protocols across the nation. This task force would conduct compliance audits for clinics to align with institutional practices.⁴⁷ It would also develop training modules, and issue guidelines for large health systems and under-resourced clinics.⁴⁸ The regulation and standardization of these practices would allow the task force to strengthen the goals of REMS and assist healthcare professionals to be confident in the REMS safety protocols.

Improved digital infrastructure is vital to improving the surveillance of adverse drug reactions (ADR) and antimicrobial resistance (AMR). For these automated digital reporting systems to be successful, they require widespread integration of patient's electronic

44 Infection Control Today. "Research Suggests Hospital Antimicrobial Stewardship Programs Are Beneficial." 2011. ICT. October 20, 2011. <https://www.infectioncontrolday.com/view/research-suggests-hospital-antimicrobial-stewardship-programs-are>.

45 Reali, Savannah, et al. 2025. "Factors Influencing Physicians' Antimicrobial Prescribing Decisions: A Systematic Review of Qualitative Studies." *British Journal of Clinical Pharmacology*, March 12, 2025. <https://doi.org/10.1002/bcp.70011>.

46 Centers for Medicare and Medicaid Services. 2024. "Hospital Value-Based Purchasing." *Www.cms.gov*. September 10, 2024. <https://www.cms.gov/medicare/quality/value-based-programs/hospital-purchasing>.

47 Gliklich, Richard E, Nancy A Dreyer, and Michelle B Leavy. 2014.

48 CDC. 2024. "Medicare Promoting Interoperability Program."

health records (EHR)⁴⁹. These systems will require real-time data validation, standardized medical terminology, and accessible interfaces to guarantee accurate reports. To achieve this there will need to be collaboration among healthcare organizations, and IT developers to engineer and implement these reporting tools. To encourage its integration, the federal government can expand existing models utilizing incentive programs such as the CMS Promoting Interoperability Program.⁵⁰ In addition to this, all clinicians should be provided with technical training and assistance to ensure they have complete access to these systems.

Long-term success of implementation will require financial backing and a stable source of funding. Initial government funding should be directed towards grants and trial projects that will evaluate the automated reporting systems and standardized systems of REMS enforcement across clinical settings. As the implementation settles in, linking compliance to pharmacovigilance protocols to incentivized systems, like the CMS Value-Based Purchasing (VBP) Program, motivates medical providers to comply to REMS requirements and antibiotic safety guidelines. The incentivization of reduced antibiotic use, appropriate prescribing procedures, and consistently accurate reporting of ADRs, will allow for the adherence of safety procedures across healthcare institutions

We must also take into consideration: legal and regulatory matters. With the addition of implemented automated systems for data sharing, HIPAA compliance must be safeguarded to maintain patient privacy.⁵⁰ A framework is necessary to provide institutions with established legal boundaries for automated data usage and to protect healthcare providers from liability when reporting ADRs in accordance with standard procedures. The legal protection of patients could be adjacent to those given under the

Patient Safety and Quality Improvement Act of 2005 (PSQIA), a law that provides confidential reporting and examination of medical errors by clinicians to report safety action without fear of that information being used in legal actions.⁵¹

After implementation, the reforms will need consistent evaluation and refinement. Federal agencies can develop metrics to track progress, ensure accuracy of data reports and evaluate the resulting patient safety outcomes. Providing annual reports to Congress and maintaining open access databases will strengthen accountability and support necessary adjustments to the regulatory framework. Consistent monitoring of these systems is vital for identifying areas that require additional financial support or alterations, ensuring that pharmacovigilance efforts continue to be effective and adaptable in responding to emerging public health threats.

RECOMMENDED SOLUTION

In conclusion, implementing these pharmacovigilance reforms is a challenging but necessary step to reinforcing and modernizing the nation's ability to address adverse drug reactions (ADR) and antimicrobial resistance (AMR). Responding to urgent public health threats will require unified national leadership, targeted funding for advanced digital infrastructure, standardized regulatory policies, and incentive models that promote implementation and long-term stability. These actions will enhance drug safety oversight, prevent avoidable harm, and lead to more favorable patient outcomes. An important benefit of this effort will be an increase in public trust in the safety and efficacy of essential medications. Moreover, it will ensure that healthcare providers in rural and underserved areas are fully integrated and supported, guaranteeing an inclusive and successful healthcare system. 

49 Centers for Medicare and Medicaid Services. 2024. "Hospital Value-Based Purchasing."

50 U.S. Department of Health & Human Services. 2024. "The HIPAA Privacy Rule." HHS.gov. September 27, 2024. <https://www.hhs.gov/hipaa/for-professionals/privacy/index.html>.

51 Agency for Healthcare Research and Quality. 2014. "Patient Safety and Quality Improvement Act of 2005 (July 2005) | PSO." Pso.ahrq.gov. January 2014. <https://pso.ahrq.gov/resources/act>.

2025
Lewis Award
for Excellence
in Position
Paper Writing

Each year since 2012, the Martin Institute presents the Lewis Award for Excellence in Position Paper Writing. The award is named for former Institute director Rand C. Lewis, who established the tradition of taking Institute-affiliated students to the National Model United Nations (NMUN) Conference in 2000. Position papers are normally written in advance of a meeting in order to communicate a national, organizational, or personal position on a particular issue or set of issues. They emphasize both thoroughness and succinctness in equal measure, given that as many entities as will attend a particular meeting generate position papers. They differ from policy papers and white papers in that they do not seek to justify why a particular position is being advocated, but rather to communicate a country's position/policy.

At its core, each issue dealt with in a position paper has three main components, each one paragraph in length; these are complemented by an overview paragraph. Each seeks to emphasize the country's engagement in and leadership related to the issue and essentially "justify" why other countries should heed a particular national position. The main three:

History and Definition of the Issue, including the key international agreements the country supported, leadership roles the country may have played, and important ongoing efforts in the international arena regarding the issue that are supported by the country.

Current Efforts, whether international, regional, or national that demonstrate a country's engagement with the topic.

Position and Future Direction, featuring specific statements about what a country would like to see adopted regarding the issue.

Position papers in the Martin Institute typically deal with two issues, each of which must fit onto a single page, front and back.

This year's recipients of the Lewis Award are Kaden Kerr and John Sullivan.



Delegation from The Republic of Chile

Position Paper for the General
Assembly First Committee

The issues presented before the United Nations General Assembly First Committee are as follows: Confidence-Building Measures in the Regional and Sub-Regional Context; and Promoting Nuclear Disarmament and International Security. As a member of the Organization of American States, the Community of Latin American and Caribbean States, the Agency for the Prohibition of Nuclear Weapons in Latin America and the Caribbean, the Asia-Pacific Economic Cooperation, the Latin American Integration Association, and the International Atomic Energy Agency, Chile remains committed to the following issues:

CONFIDENCE-BUILDING MEASURES IN THE REGIONAL AND SUB-REGIONAL CONTEXT

The issues presented before the United Nations General Assembly First Committee are as follows: Confidence-Building Measures in the Regional and Sub-Regional Context; and Promoting Nuclear Disarmament and International Security. As a member of the Organization of American States, the Community of Latin American and Caribbean States, the Agency for the Prohibition of Nuclear Weapons in Latin America and the Caribbean, the Asia-Pacific Economic Cooperation, the Latin American Integration Association, and the International Atomic Energy Agency, Chile remains committed to the following issues:

The Republic of Chile recognizes the important role that confidence-building measures have in building trust between the nations of the world and reducing the risks of conflict between them. Chile remains committed to ensuring compliance with and support of key regional and international confidence-building measures such as A/RES/67/234 titled *The Arms Trade Treaty* and A/RES/2826(XXVI) titled *Convention on the Prohibition of the Development, Production and Stockpiling of*

Bacteriological (Biological) and Toxin Weapons and on Their Destruction. Chile believes that an important foundation to building confidence with the international community and its regional partners is built by providing accurate and timely information for the series of reports titled *Objective Information on Military Matters, Including Transparency of Military Expenditures* (A/RES/77/33 most recently). Chile additionally emphasizes the findings put forth in A/RES/78/36 titled *Regional Disarmament (2023)* and A/RES/78/38 titled *Confidence-building Measures in the Regional and Subregional Context*, and reaffirms the importance of implementing these resolutions in a way that unifies member states in support of these confidence-building measures.

With a strong history in confidence-building in the Latin American region, the Republic of Chile continues to lead from the front in furthering similar efforts at the international level. With the legacy of A/RES/2373

(XXII) titled *Treaty on the Non-Proliferation of Nuclear Weapons in Latin America* in mind, Chile is a leading proponent for a global treaty of the same name and has maintained firm commitment against the greatest threat to confidence-building globally: nuclear weapons. Chile continues to collaborate with regional partners to establish a South American zone of peace and it continues to support the United Nations Regional Centre for Peace, Disarmament, and Development in Latin America and the Caribbean (UNLIREC), an organization dedicated to an “in-house disarmament policy” localized to South America and the Caribbean. Additionally, Chile reaffirms its continued support of the *Santiago Declaration on Confidence and Security-Building Measures* of 1995 and the guidelines for confidence building in South America and Latin America laid out within. Chile strives for a future in which regional peace and communication are commonplace by committing to an integrated cyber security strategy in cooperation with fellow members of the Organization of American States (OAS) and supports similar integration efforts in other regions. Chile reaffirms the national

sovereignty of the Latin American states and of all UN member states. Chile additionally reaffirms to the United Nations Development Programme (UNDP) and the delegates of the General Assembly First Committee its continued efforts to boost internal government transparency, engage in confidence building measures, and participate in general disarmament to support international security and peacebuilding efforts at the regional and sub-regional levels. Chile strives to hold itself to the standards of the OAS and UN and wishes to affirm and endorse continued and fervent efforts to promote peace.

Chile calls upon its fellow member states to heed the words of the Secretary-General's, *Agenda for Disarmament* and the points laid out in the A/RES/79/1 titled *Pact for the Future*. Key to the future envisioned within is the building of confidence and trust between member states, both through the stemming of military tensions as well as the construction of cooperative economic relationships. By acceding to and remaining in compliance with the crucial treaties and agreements facilitated by the United Nations and its partners in confidence-building at the regional level, nations can foster a future of cooperation and economic collaboration. The Republic of Chile is committed to this future and encourages all member states to assume the same position. Finally, Chile wants to reiterate its firm support for a zone of peace in Latin America, as it provides a vital guarantee of peace in a region that continues to work towards ensuring safe routes of immigration for those who would choose to undertake it.

PROMOTING NUCLEAR DISARMAMENT AND INTERNATIONAL SECURITY

The Republic of Chile has recognized the danger that nuclear weapons have posed to the world since their inception and has stood decisively on the side of disarmament from the adoption of A/RES/1 (I) titled

Establishment of a Commission to Deal with the Problems Raised by the Discovery of Atomic Energy, to the present day. Chile is an inflexible participant in the present international framework for disarmament and control of nuclear weapons, affirming the adoption of A/RES/2373 (XXII) titled *Treaty on the Non-Proliferation of Nuclear Weapons in Latin America* A/RES/2222 (XXI) titled *Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies*, A/RES/34/68 titled *Agreement Governing the Activities of States on the Moon and the other Celestial Bodies*, and A/RES/55/41 titled *Comprehensive Nuclear-Test-Ban Treaty*. Chile has remained a signatory and is compliant with all treaties and agreements regulating the development, possession, transfer, and use of nuclear weapons. Chile is party to multiple IAEA safeguards agreements to ensure compliance with these non-proliferation agreements. To this end, Chile supported the adoption of A/RES/78/239 titled *Nuclear Disarmament Verification*, supporting the continued enforcement of and compliance with relevant disarmament agreements. Not limited to just nuclear weapons, Chile voted in favor of A/RES/2826 titled *Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on Their Destruction*, a firm commitment against weapons of mass destruction (WMD) in all forms. The proliferation of WMDs has given rise to the threat of said weapons coming to be possessed by terrorists. Chile supported the adoption of A/RES/78/43 titled *Measures to Prevent Terrorists from Acquiring Weapons of Mass Destruction* and continues to encourage the implementation of prevention measures.

The Republic of Chile has remained committed to leading the international effort to reduce the threats posed by nuclear weapons and their proliferation by co-sponsoring and consistently voting for the adoption of resolutions such as A/RES/79/38 titled *Treaty on the Prohibition of Nuclear Weapons*, a global treaty of the same stock as the *Treaty on the Non-Proliferation of Nuclear Weapons in Latin*

America (Treaty of Tlatelolco). Consistent emphasis within the General Assembly First Committee on the signing of this treaty is a cornerstone of reaching nuclear disarmament, and the Republic of Chile encourages all non-signatories of the global-scale treaty to sign it, and those that have acceded to reach and remain in compliance with its stipulations. Chile's effort within the Organization of American States continues to support non-proliferation at the regional level, reinforcing the regime established by the *Treaty of Tlatelolco* and supporting local and UN-sponsored education campaigns on disarmament. The domestic Chilean Nuclear Energy Commission (CNEC) works to further the utilization of nuclear power to pioneer scientific advancement while ensuring the safe use and nonproliferation of this technology. Deliberate control measures implemented by the Republic of Chile are crucial to ensuring that seaports in-country are not used for the illicit trafficking of dual-use components and prevention of the arming of terrorists with weapons of mass destruction. Key border control agreements such as the *Montevideo Declaration Regarding the Agreement on Residence for Nationals of the States Parties of Mercosur, Bolivia, and Chile* facilitate international reciprocity while safeguarding against trafficking of firearms and illicit substances of concern.

Chile is committed to the peaceful coexistence of all nations, nuclear disarmament being at the center of this commitment. Chile emphasizes that all nations should accede to the *Treaty on the Prohibition of Nuclear Weapons*, and that all parties currently bound by it work to be consistently in compliance with its stipulations. In addition, maintaining the key diplomatic and legal framework created by the *Outer Space Treaty*, the *Moon Agreement*, the *Comprehensive Nuclear-Test-Ban Treaty*, and all relevant treaties and agreements is crucial to ensuring international security and cooperation towards full nuclear disarmament, especially as human ambitions turn towards Earth's moon and beyond. While seeking to disarm, it is paramount that the findings of the Secretary-General in the

most recent report on *Measures to Prevent Terrorists from Acquiring Weapons of Mass Destruction* be heeded and applied to ensure that weapons of mass destruction do not fall into the hands of non-state actors that would seek to use them for acts of terror. Nations that continue to possess nuclear weapons must seek a concerted decommissioning of current warhead stockpiles with careful attention to the environmental and ecological impacts of discarded nuclear material. Universality of commitment to full disarmament is the only way in which the world can truly be safe from the threats nuclear weapons pose, in the hands of state actors or otherwise. 🌍



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