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Letter from the Editors

The Martin Institute was established at the University of Idaho in 1979 to provide students with the opportunity to understand and gain experience in international topics and negotiations. The Martin Institute creates an inviting environment for students, staff, and faculty to come together in deliberations and discoveries over global issues, international institutions, and the affairs of peace. We, as International Studies majors, have found our niche here at the Martin Institute. This opportunity gives us the ability to share our passions with one another, in hopes of one day making a difference in our world, and provides us with the courage to not only see the world but to be leaders in it.

The Martin Institute is a multidimensional program. The Bachelor of Arts degree in International Studies is one dimension; it allows students to study another language, choose regional and topical emphases, and facilitate a study abroad experience. Students are also able to participate in the National Model United Nations Conference in New York City, where they represent a country within a UN committee. International leaders and scholars visit the university to speak at Martin Forums and the affiliated Borah Symposium, which gives students the opportunity to be educated, involved, and inspired.

Along with the various opportunities the Institute provides for its students, the Journal of the Martin Institute was launched in 2009 as a way to publish the most notable pieces of work from the Senior Capstone White Papers. These papers explain topics as follows: defining the problem, presenting the possible solutions, and recommending a solution. The Journal of the Martin Institute is a platform for students to share knowledge and insight on global issues as viewed through many disciplinary and interdisciplinary lenses.

This year's edition offers diversity in topics as well as thorough research and innovative policy recommendations. We are pleased to share it with all of you.

Lastly, we would like to express our gratitude to the seniors of the 2019 capstone class. Your diligence and adherence towards the improvement of our global systems deserve public recognition.

Michaela Avants



Danielle Coleman



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 and namesake of the Martin School, at the Institute's inauguration, 1980



This issue is dedicated to the memory of

Lowell A. Martin

*long-time supporter and friend
of the Martin Institute*



2019

**Journal of the Martin Institute
International Studies**

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Innovative Solutions for Latin America's Growing Waste Problem

– Annarose Qualls

ABSTRACT

Latin America is a diverse region of cultures, languages, and people groups. Running from the Southern tip of Patagonia to the Mexican border town of Tijuana, it contains wide economic variance. Due to a history of conflict and colonization, Latin America is still young in its development. As the region rapidly globalizes, consumption is rising, along with waste. Infrastructural sectors such as waste management remain unregulated and un-standardized, resulting in issues of health and human rights. This paper examines ten possible solutions to the problem, ranging from dump closures and bans on single-waste plastics to musical garbage trucks. Considering the geographical, cultural, and economic variance of the region, an integrated approach is recommended. Uniting efforts to form integrated waste management systems, promote environmentally responsible production and consumption, efficiently handle organic waste, and create societal change through public education has the potential to reverse impending environmental degradation in Latin America.

OVERVIEW AND BACKGROUND

Waste management is not a new concept in Latin America. Before the Spanish conquest, Mayan cities established formal waste repositories and up to 1,000 low-caste street cleaners kept the ancient Aztec city of Tenochtitlan shimmering.¹ Colonial-era Mexican authorities produced sanitation laws, addressing the private origins of household waste and dictating its management. Throughout the centuries, waste management systems in Latin America and the Caribbean have evolved. The 1900's played a crucial role in this development, complimented by three catalyzing global laws: the Clean Air Act, the Resource Conservation and Recovery Act, and the Clean Water Act.² Despite improvements in the system, Latin America faces a harsh array of waste management challenges.

Rapidly developing, this region has one of the highest rates of urbanization in the world – with 80% of its population located in the city.³ By 2050, this figure is projected to reach 90%.⁴ Rapid industrial development and a booming population have unleashed an array of pollution issues and are pushing marginalized groups to the outside, closer and closer to where they dump waste.⁵ As the region globalizes, consumption rises, waste levels in tow. The problem is that the system has not caught up.⁶ According to the United Nations Environment Programme, 40 million people lack access to waste collection in this region.⁷ In addition,

145,000 tons of waste per day are still disposed in open dump sites (17,000 tons of which is plastic).⁸ These issues are not void of inequality. Higher prosperity is linked to higher per capita waste,⁹ yet those on the lower economic crust of Latin America's wealth gap bear the heaviest burden of poor waste management.¹⁰

Most cities in Central America, the Caribbean, and the Andean countries of South America (excepting Chile and Colombia) lack acceptable landfills.¹¹ Through the generation of biogas and leachates, open air dumps and poorly engineered landfills -- such as the one in Morelia, Mexico -- foster widespread environmental harm by polluting the air, water, and soil.¹² Straddling a tropical zone, Latin America is particularly vulnerable to ensuing climate change. Human exposure to waste contamination has caused developmental defects and severe health consequences,¹³ an estimated 5 million dying each year due to inadequate waste disposal systems. While raising the healthcare burden of the state, this issue endangers "enjoyment of human rights and fundamental freedoms."¹⁴ We sit at a critical moment in environmental history, the entire region of Latin America faced with impending degradation. A solution must be found.

1 Sarah Hill, "Privatizing Latin American Garbage? It's Complicated...", *Revista Harvard Review of Latin America*, no. Winter (2015). Accessed April 01, 2018. <https://revista.drclas.harvard.edu/book/privatizing-latin-american-garbage-its-complicated>

2 Hill.

3 Atilio Savino et al, "Waste Management Outlook for Latin America and the Caribbean: Summary for Policy Makers." UN Environment Document Repository Home. October 2018. Accessed April 01, 2019. https://wedocs.unep.org/bitstream/handle/20.500.11822/26436/Waste_Summary_EN.pdf?sequence=2&isAllowed=y.

4 "Recycling Outlook for Latin America," *BioEnergy Consultant*, October 24, 2018, <https://www.bioenergyconsult.com/recycling-latin-america/>.

5 Savino et al pg. 5

6 Amalia Laborde et al., "Children's Health in Latin America: The Influence of Environmental Exposures," *Environmental Health Perspectives* 123, no. 3 (March 2015): 201–9, <https://doi.org/10.1289/ehp.1408292>.

7 Savino et al pg. 2

8 See Appendix A

9 Silpa Kaza et al., *What a Waste 2.0: A Global Snapshot of Solid Waste Management to 2050* (The World Bank, 2018), <https://doi.org/10.1596/978-1-4648-1329-0>.

10 UN-Habitat "WASTE-WISE CITIES: A Call for Action to Address the Municipal Solid Waste Challenge." UN Habitat. October 2018. Accessed April 2019. <https://www.unhabitat.org/wp-content/uploads/2018/10/Advocacy-Toolkit-And-Guide.pdf>.

11 World Bank, *Managing Municipal Solid Waste in Latin America and the Caribbean : Integrating the Private Sector; Harnessing Incentives* (The World Bank, 2015), <https://doi.org/10.1596/978-1-4648-0484-7>.

12 "Israde-Alcantara et Al. - 2005 - Geological Characterization and Environmental Impl.Pdf," n.d.; World Bank, *Managing Municipal Solid Waste in Latin America and the Caribbean : Integrating the Private Sector; Harnessing Incentives*; Savino et al pg. 5

13 Laborde et al., "Children's Health in Latin America."

14 Sensi, Stefano. "The Adverse Effects of the Movement and Dumping of Toxic and Dangerous Products and Wastes on the Enjoyment of Human Rights." OFFICE OF THE HIGH COMMISSIONER FOR HUMAN RIGHTS. 2009. Accessed April 2019. <https://www2.ohchr.org/english/issues/environment/waste/docs/StefanoSensiPresentation.pdf>.

SOLUTION 1

Closing Substandard Dumps & Opening Better Facilities with Strategic Urbanization in Mind

Confronting environmental and health harms of poor solid waste management (SWM) infrastructure,¹⁵ UN Environment advocates for the progressive closing of open dumpsites.¹⁶ This will discourage the improper disposal of waste, decreasing water and soil pollution as well as gas emissions.¹⁷ Latin American communities will see improvement in clean water and sanitation rates, moving one step closer to accomplishing Sustainable Development Goal 6.¹⁸

One way governments can improve their selection of landfill sites is by utilizing Geographic Information Systems (GIS).¹⁹ Coupled with predictions of future population and waste generation, this high-tech innovation assesses geological, hydrological, and other physical factors to determine the most suitable location for management facilities. Provided adequate funding, Latin American governments could embrace this method, modeled first in Johor Bahru, Malaysia.²⁰ Scientific methods like these can help, though not eliminate, the political complications that lead to drawn-out site selection processes.²¹ Economic incentives

are necessary to accomplish these upgrades, such as tax holidays for formal waste treatment facilities. The biggest challenge for this solution is its financial demands.²² Although local governments may be able to accomplish this via re-allocation of funds, it may be low priority. In addition, issues of social justice for communities reliant on these landfills exist.²³

SOLUTION 2

Privatization of Municipal Solid Waste Management

Latin America has a complicated history of teetering between public and private entities, demonstrated during the Cold War era. Mexico City demonstrates the blurred lines between public and private waste management in that its municipal public system possesses many distinct traits of private enterprise.²⁴ MSWM employees work independently and are paid by the market value of goods collected, driving them to do more and quickly. There are many benefits to the private sector: access to funds that governments lack, increased resources (capital, expertise, and knowledge), efficiency and flexibility, among others.²⁵ The private sector provides these things through business principles of accountability, strict budget constraints, and clear performance objectives.²⁶ Put simply, it can accomplish what government and the informal sector cannot.

Although there is greater public support in Latin America for waste privatization than that of the highly politicized water sector,²⁷ obstacles remain. The privatization period in Latin America brought great initial success coupled with corruption and lack of transparency, leaving behind a bad taste. Concern for these

15 See Appendix B

16 Savino et al pg. 5

17 "Large population - more sanitation - The state of urban solid waste management in Latin America," Waste Management World, July 1, 2008, <https://waste-management-world.com/a/large-population-150-more-sanitation-the-state-of-urban-solid-waste-management-in-latin-america>.

18 "SDGs .: Sustainable Development Knowledge Platform," accessed April 2, 2019, <https://sustainabledevelopment.un.org/sdgs>.

19 Habiba I Mohammed, Z Majid, and Yamusa B Yamusa, "GIS Based Sanitary Landfill Suitability Analysis for Sustainable Solid Waste Disposal," *IOP Conference Series: Earth and Environmental Science* 220 (February 21, 2019): 012056, <https://doi.org/10.1088/1755-1315/220/1/012056>. factors, constraints, and numerous spatial data such as environmental, economic, social etc. This paper introduced an integration of Geographic Information Systems (GIS)

20 Ibid., 1

21 Paras Singh, "Delhi: New Landfill Site, Old Issues Remain - Times of India," The Times of India, accessed March 31, 2019, <https://timesofindia.indiatimes.com/city/delhi/new-landfill-site-old-issues-remain/articleshow/68605277.cms>.

22 Kaza et al. pg. 1

23 Wall Street Journal, *The Devastating Impact of Closing Latin America's Biggest Landfill*, accessed March 31, 2019, <https://www.youtube.com/watch?v=92e0DeRULY>.

24 Hill

25 UN-Habitat

26 Hill

27 World Bank, *Managing Municipal Solid Waste in Latin America and the Caribbean : Integrating the Private Sector, Harnessing Incentives*.

reasons will prohibit this from being the complete solution.

SOLUTION 3

Embracing the Informal Sector in an Integrated Approach to Waste Management

In Latin America, waste pickers are the lifeblood of the waste management system. Processing 90% of recyclable items,²⁸ they form an integral part of each state's economy with low-cost, labor intensive work.²⁹ Despite little public knowledge or investment, an active informal sector can achieve twice the recycling rate of a formalized waste management system.³⁰ However, they are at greater risk than anyone. With little recognition and government protection, waste pickers face harsh working conditions and exposure to toxins.³¹ We have seen a constant tension between the private, public, and informal sectors, but maybe there is another way. Several countries in this region – Ecuador,³² Chile,³³ Colombia,³⁴ – have implemented integrated solid waste management (ISWM) systems, which pull the strengths of each sector together. The success story of the recicladores of Bogota³⁵ animated waste pickers region-wide, launching them into alliances with one another.³⁶ This sector cannot be ignored or pushed aside. However, conditions cannot remain the same. Just as in

28 “Recycling Outlook for Latin America.”

29 World Bank, *Managing Municipal Solid Waste in Latin America and the Caribbean : Integrating the Private Sector, Harnessing Incentives.*

30 UN-Habitat

31 Ibid, pg. 2

32 “Programa ‘PNGIDS’ Ecuador.” Ministerio Del Ambiente. July 10, 2013. Accessed February 13, 2019. <http://www.ambiente.gob.ec/programa-pngids-ecuador/>.

33 Michela Giovannini and Benjamin Huybrechts, “How Inclusive Is Inclusive Recycling ? Recyclers’ Perspectives on a Cross-Sector Partnership in Santiago de Chile,” *Local Environment* 22, no. 12 (December 2017): 1497–1509, <https://doi.org/10.1080/13549839.2017.1363727>.

34 Rachel Simon, “How Bogotá’s Recicladores Are Picking a Fight (for Inclusion),” *Resource Magazine*, last modified June 05, 2017, <https://resource.co/article/how-bogot-s-recicladores-are-picking-fight-inclusion-11893>.

35 “Recycling Outlook for Latin America.”

36 Ibid, pg. 5

Bogota, governments must weave waste pickers into their legal framework, improving labor conditions and upgrading them to community-based organizations.³⁷ Even the simple addition of a sorting site roof makes a difference.³⁸ This will lift up one of the lowest groups in the social sphere, offering opportunities for healthcare, education, and a better future, as seen with the Socosema cooperative in Juárez, Mexico.³⁹ Making a more efficient and environmentally responsible waste management system while incorporating the informal sector is possible, but it will require vigorous municipal involvement.⁴⁰

SOLUTION 4

Promoting Responsible Production & Consumption as Well as the Reduction of Each

Launching a wrench in the international system, China’s National Sword policy (2018) forced the world to sober up to its lavish production of waste. No longer able to ship their trash to the Asian superpower, states must find a new solution.⁴¹ Studies show that 90% of Latin American waste goes un-utilized.⁴² This is where ‘reduce, reuse, recycle’ comes in. Turning our gaze to the root of the problem, decreasing unnecessary production will play an essential role in sustainability and is a primary focus of Latin American leaders.⁴³ They must first target the mass producers of trash – industries

37 Medina, Martin. *The Informal Recycling Sector in Developing Countries : Organizing Waste Pickers to Enhance Their Impact.* Vol. 44. Gridlines. World Bank, Washington, DC, 2008.

38 “Recycling Outlook for Latin America.”

39 Hill

40 Sarah Moore, “Jutta Gutberlet, Recovering Resources – Recycling Citizenship: Urban Poverty Reduction in Latin America.” *Singapore Journal of Tropical Geography*, 31 (2010): 130-131. doi:[10.1111/j.1467-9493.2010.00388_1.x](https://doi.org/10.1111/j.1467-9493.2010.00388_1.x)

41 Innova Market Insights, “Recycling Tops Packaging Trends in 2019,” *Food Processing*, March 2019, , <http://foodprocessing.com.au/content/sustainability/article/recycling-tops-packaging-trends-in-2019-1425361244>.

42 See Appendix A

43 “Programa ‘PNGIDS’ Ecuador.” Ministerio Del Ambiente. July 10, 2013. Accessed February 13, 2019. <http://www.ambiente.gob.ec/programa-pngids-ecuador/>.

of construction,⁴⁴ textile,⁴⁵ and tourism, along with universities.⁴⁶ An example of progress, a popular Caribbean resort responded to environmental pressure by establishing its own advanced recycling and incineration plant.⁴⁷ Another major factor to consider is responsible and ethical packaging. Paper is renewable, recyclable, and compostable, and companies in Latin America have already begun making the shift.⁴⁸ In addition, enhancing the recycled content of products is necessary. To encourage market participation, governments can offer financial incentives such as no VAT or sales tax on the sales of compost or recycled products.⁴⁹ Additionally, the system of paying collection contractors and landfill operators per tonnage disposed must be reversed to encourage reduction.⁵⁰ Banning single-waste plastics (already done in the Galapagos⁵¹ and maybe necessary for Caribbean states) will put pressure on companies to improve their practices. Administered through a sound legal

framework, financial incentives, and public education, this solution could alter waste streams and reduce social costs.

SOLUTION 5

Harnessing the Waste-To-Energy Potential in Latin America as a Means of Income Generation, Waste Reuse, and Environmental Sustainability

Buenos Aires, capital of Argentina and home to almost three million, generates over 16,000 metric tons of waste per day.⁵² Most of this is disposed of in four sanitary landfills. One of the four, created by the Coordinadora Ecológica Área Metropolitana Sociedad del Estados (CEAMSE), has already closed and two are scheduled to close soon. Buenos Aires needs to find a solution and energy recovery could be the answer. There are many different forms of Waste-to-Energy (WtE) practices – anaerobic digestion, pyrolysis, incineration, and gasification, to name a few. As seen in Lebanon, this has proved a successful solution for excess waste.⁵³ While bringing in revenue, it decreases greenhouse gas emission, frees up landfill space, and can mitigate power shortages in

44 Helen Lingard et al., “Improving Solid Waste Reduction and Recycling Performance Using Goal Setting and Feedback,” *Construction Management and Economics*, no. 8 (February 2001): 809–17, <https://doi.org/10.1080/01446190110070952>.

45 Ipek Yalcin-Enis, Merve Kucukali-Ozturk, and Hande Sezgin, “Risks and Management of Textile Waste,” in *Global Business in Local Culture*, by Philipp Aerni (Cham: Springer International Publishing, 2019), 29–53, https://doi.org/10.1007/978-3-319-97922-9_2.

46 Quetzalli Aguilar-Virgen et al., “Cutting GHG Emissions at Student Housing in Central Mexico through Solid Waste Management,” *Sustainability* 9, no. 8 (August 11, 2017): 1415, <https://doi.org/10.3390/su9081415>. but fewer studies have assessed the composition of solid waste within institutions of higher education or university student residences. Studies carried out in universities usually refer to the academic buildings, yet, reports of waste characterisation from student housing and the associated greenhouse gas emissions are scarce. The goal of this work was to present a study case where both equivalent carbon dioxide (CO₂e)

47 Jake Kheel, “Launching Recycling, Composting In Resort Region,” *BioCycle* 52, no. 10 (2011): 51–52. <https://www.puntacana.org/images/pdf/en/2011/BioCycle.pdf>

48 “Recycling Tops Packaging Trends in 2019.”

49 UN-Habitat

50 World Bank, *Managing Municipal Solid Waste in Latin America and the Caribbean : Integrating the Private Sector, Harnessing Incentives*.

51 “Una ola de medidas contra el plástico recorre América Latina y el Caribe,” UN Environment, accessed March 30, 2019, <http://www.unenvironment.org/es/news-and-stories/reportajes/una-ola-de-medidas-contra-el-plastico-recorre-america-latina-y-el>.

52 Jonathan Thomas, “Waste-to-Energy Market 2018 Competitive Landscape by New Product Launches, Agreements, Collaborations and Partnership Forecast to 2023 – Norwalk Daily,” accessed March 31, 2019, <https://norwalkdaily.com/2019/03/24/waste-to-energy-market-2018-competitive-landscape-by-new-product-launches-agreements-collaborations-and-partnership-forecast-to-2023/>.

53 Ismail I Abbas et al., “Solid Waste Management in Lebanon: Challenges and Recommendations,” n.d., 10. only 8% and 15% of solid waste are recycled and composted respectively. Unfortunately, 48% of the waste are disposed in sanitary landfills. Dumping of waste and open burning is predominant outside Beirut and Mount Lebanon. Adequate treatment is unavailable for wastes produced by slaughterhouses, industrial premises and healthcare centers. Corruption, lack of human resources and suitable facilities and inadequate technical skills are responsible for inefficient municipal solid waste management. This paper aims at determining the current practices of municipalities in terms of segregation, collection, treatment and final disposal of solid waste. It also considers key policy challenges and recommendations for improving the municipal solid waste management system.”,”language:”en”,”author:”[{"family:”Abbas”,”given:”Ismail I”}, {"family:”Chaaban”,”given:”Jinane K”}, {"family:”Al-Rabaa”,”given:”Abdel-Rahman”}, {"family:”Shaar”,”given:”Ali A”}]}]”,”schema:”https://github.com/citation-style-language/schema/raw/master/csl-citation.json”}

the developing world.⁵⁴ The sentiment for sustainability and renewable energy is spreading through Latin America; this is a strong solution for a planet with limited resources.⁵⁵

SOLUTION 6

Mechanization of the Recycling Process

Following the lead of many developed nations in the Global North, some local governments desire a shift to mechanization, believing it will help modernize their society and catalyze development. This automation, with the help of technology like optical sorting equipment, has revolutionized waste management in cities like San Francisco.⁵⁶ It offers increased efficiency, limited error, and lower human risk. In addition, it removes human labor from this low-level and often dangerous job. However, in a highly populated region where millions are in need of work and governments are financially limited, low-cost, low-tech, and labor-intensive methods are most effective.⁵⁷ This may be an appropriate step further down the road of development, when there is less strain of unemployment and more self-sustaining economies.

SOLUTION 7

Improving Management of Organic Waste

A recent article by well-known Latin American news source, El Tiempo, stated that more than 50% of municipal waste⁵⁸ generated in the

region is food.⁵⁹ In most cases, there is no special collection or processing protocol for organic waste.⁶⁰ This leads to overflowing landfills and environmental harms associated with biological products (greenhouse gases and leachates). A study conducted in Vicente Guerrero, Mexico, showed food waste and plastic as the primary byproducts and confirmed the potential of waste recovery, lamenting the lack of municipal authority in this rural community.⁶¹ UN Environment's "Waste Management Outlook for Latin America and The Caribbean" comments that organic waste is "first in generation, yet last in management," signifying the need for a change.⁶² The international organization recommends promoting source separation and separate collection of dry and organic wastes, as well as bans on dumping biodegradable waste on landfills. Governments and civil society should promote composting as a positive alternative. Additionally, communities should reduce the amount of food waste they produce, becoming more responsible consumers.

SOLUTION 8

Promoting Waste Reduction by Enhancing Personal Responsibility

For many decades, Taiwan was referred to as "garbage island." Geographically limited by the Pacific Ocean, its growing population posed a daunting problem – what would they do with the waste when space ran out? Through the implementation of innovative policies, this island nation has reversed their dilemma and become

54 Thomas

55 "Why Waste Disposal Is Very Important in Latin America," *Crosswrap* (blog), March 18, 2019, <https://crosswrap.com/why-waste-disposal-is-very-important-in-latin-america/>.

56 Kaza et al., *What a Waste 2.0*.

57 "Recycling Outlook for Latin America."

58 See Appendices A and C

59 "Los Alimentos Son Los Desechos Que Más Se Desperdician En América Latina - Latinoamérica - Internacional - ELTIEMPO.COM," accessed March 26, 2019, https://www.eltiempo.com/mundo/latinoamerica/los-alimentos-son-los-desechos-que-mas-se-desperdician-en-america-latina-340952?fbclid=IwAR122m8nXP4a2C2j4XzOjpT4mabKurVTsE_oDBVOtcN563ZessZ45D0WzQs.

60 See Appendix D

61 Paul Taboada-González et al., "MANEJO Y POTENCIAL DE RECUPERACIÓN DE RESIDUOS SÓLIDOS EN UNA COMUNIDAD RURAL DE MÉXICO," *Revista Internacional de Contaminación Ambiental* 29, no. Sup. 3 (January 2013): 43–48. https://www.researchgate.net/publication/288730360_Handling_and_recovery_potential_solid_waste_in_a_rural_community_of_Mexico

62 Savino et al, pg. 6

a world leader in effective waste management.⁶³ To achieve one of the highest recycling rates on planet earth, Taiwan promoted personal responsibility of one's trash. They eliminated public trash cans and installed fines for littering, forcing individuals to carry their own trash with them. This in itself is a major incentive to reduce. Instead of placing their trash cans out at the curb, citizens buy government-issued bags (cost depending on size you purchase) and personally bring their waste out when the truck goes by (which happens at various times to accommodate diverse schedules). Adding a unique twist, the trucks play a musical melody to notify neighborhoods of their arrival. Although very unique, the transition to this system was relatively smooth. Now, it is the way of life in Taiwan. With its communal nature, this system could prove appealing in the Latin American context. In addition, bag design and music choice could be adapted to fit the culture. While this may be challenging in the densely-populated, unregulated urban settings of South America, it could translate very successfully to Caribbean island states and is a strong option for their sustainable future.

SOLUTION 9

Reducing Waste and Promoting Recycling Through Public Education & Students as Leaders

New York City's waste management leaders identified three major barriers to effective recycling in their area: 1) lack of public knowledge about how to do it and what can be recycled, 2) rules that shift over time, and 3) limited understanding of its importance.⁶⁴ These issues are not isolated to New York. Latin American countries can mitigate lack of knowledge through public education. This would take place at the municipal level through public school curriculum, community workshops, and public advertising. Schools can make a powerful

63 "How Taiwan Has Achieved One of the Highest Recycling Rates in the World," Smithsonian, accessed March 30, 2019, <https://www.smithsonianmag.com/innovation/how-taiwan-has-achieved-one-highest-recycling-rates-world-180971150/>.

64 NowThis News, *What Happens to Your Recycling After It's Collected?* | NowThis, accessed April 2, 2019, <https://www.youtube.com/watch?v=s4LZwCDaoQM>.

change by employing waste sorting, composting, and recycling initiatives.⁶⁵ Financial gains made by sale of paper waste and other products could supplement educational improvements. Alongside hands-on programs, enhanced awareness of the severity of environmental degradation due to poor waste management is necessary.⁶⁶ Leaders of the future, students hold great influence over their families and communities. With the opportunity to learn and engage, they can be the driving force behind a more sustainable Latin America.⁶⁷ Additionally, governments should enhance formal education within their system of waste management to produce a new generation of qualified leaders and staff. Public education surrounding effective waste management can be achieved by cooperative efforts between governments, NGO's,⁶⁸ IGO's (such as the International Solid Waste Association),⁶⁹ and civil society.

SOLUTION 10

Capacity-Building of Municipal Structures

In the case of Lebanon mentioned earlier, researchers found that capacity-building of municipalities was essential for an improved

65 UN-Habitat, pg. 6

66 "Why Waste Disposal Is Very Important in Latin America."

67 Ibid, pg. 6

68 "Mundo Sustentable," Mundo Sustentable, accessed April 2, 2019, <http://mundosustentable.org/bienvenidos>.

69 "ISWA: The International Solid Waste Association," accessed April 2, 2019, <https://www.iswa.org/>.

waste management system.⁷⁰ Many local governances are ill-equipped and lacking education to effectively address their community's waste management needs. In addition, municipalities could benefit from training to successfully establish cross-sector partnerships and regular, reliable collection systems.⁷¹ To develop these competencies, governmental entities should collaborate with NGO's, educational institutions, and other consultants.⁷² As is common in Latin America,⁷³ Ecuador realized that its municipalities had weak institutional image and lacked financial and administrative autonomy. For an integrated approach to be successful, the central government built the capacity of local institutions through their National Program for the Integrated Management of Solid Waste (PNGIDS).⁷⁴ While central governments need to provide solid legal and institutional framework (with circular economies as a backbone), municipalities can more directly effect change for a more sustainable future.⁷⁵

RECOMMENDED COURSE OF ACTION

While all of the potential solutions listed above are viable, some face challenges of accessibility, legislation, and funding. It can be tempting to emulate prosperous countries of the Global North; however, it is essential to recognize differences and choose appropriate actions.⁷⁶ The recommendation made here is a compilation of the most implementable and impactful solutions for the Latin American context. A combination of solutions 2⁷⁷ and 3,⁷⁸ alongside 4,⁷⁹ 7,⁸⁰ and 9⁸¹ will have a large impact on mitigating societal harms associated with poor waste management.

An integrated cross-sector system (Solutions 2 and 3) allows the efficiency of privatization while still benefiting informal workers. It toes the middle line, avoiding corruption concerns of full privatization, and affords waste pickers job legitimization and protection. While the solution for countries in the Global North may be to privatize and mechanize, this advancement would leave thousands of Latin Americans jobless. The informal sector provides valuable opportunities to migrants of low education and functions where governments may not. It distributes cheap primary materials to industries and reduces the amount of waste that must be collected, transported, and placed in landfills by the government,⁸² decreasing costs and increasing landfill lifetimes.⁸³ With a nod to SDG 17 (Partnerships), this integrated approach brings together the strengths of the public, private, and informal sector. In addition, it promotes community (a strong cultural value) through the establishment of

70 Abbas et al., "Solid Waste Management in Lebanon: Challenges and Recommendations." only 8% and 15% of solid waste are recycled and composted respectively. Unfortunately, 48% of the waste are disposed in sanitary landfills. Dumping of waste and open burning is predominant outside Beirut and Mount Lebanon. Adequate treatment is unavailable for wastes produced by slaughterhouses, industrial premises and healthcare centers. Corruption, lack of human resources and suitable facilities and inadequate technical skills are responsible for inefficient municipal solid waste management. This paper aims at determining the current practices of municipalities in terms of segregation, collection, treatment and final disposal of solid waste. It also considers key policy challenges and recommendations for improving the municipal solid waste management system." "language": "en", "author": [{"family": "Abbas", "given": "Ismail I"}, {"family": "Chaaban", "given": "Jinane K"}], {"family": "Al-Rabaa", "given": "Abdel-Rahman"}, {"family": "Shaar", "given": "Ali A"}] "schema": "https://github.com/citation-style-language/schema/raw/master/csl-citation.json"

71 Savino et al, pg. 4

72 UN-Habitat, pg. 4

73 World Bank, *Managing Municipal Solid Waste in Latin America and the Caribbean : Integrating the Private Sector, Harnessing Incentives.*

74 "Programa 'PNGIDS' Ecuador," Ministerio del Ambiente, October 31, 2012, <http://www.ambiente.gob.ec/programa-pngids-ecuador/>.

75 Ibid, pg. 3

76 Hill

77 Privatization of Municipal Solid Waste Management

78 Embracing the Informal Sector in an Integrated Approach to Waste Management

79 Promoting Responsible Production & Consumption as Well as the Reduction of Each

80 Improving Management of Organic Waste

81 Reducing Waste and Promoting Recycling Through Public Education & Students as Leaders

82 Martín Medina, "Reciclaje de Desechos Sólidos En América Latina," *Frontera Norte* 11, no. 21 (January 1999): 9, <http://ida.lib.uidaho.edu:2294/apps/doc/A79480058/IFME?sid=googlescholar>.

83 "Recycling Outlook for Latin America."

waste picker cooperatives. Multi-disciplinary and intersectional, it is demonstrated by governments around the world⁸⁴ and is a strong leap towards democratization and development.⁸⁵ Solution 4, “Promoting Responsible Production & Consumption as Well as the Reduction of Each” (with an emphasis on sustainable packaging and the industry), attacks the heart of waste mismanagement rather than its mere extremities. If effective policies, regulations, facilities, and processes are implemented, this would make a major impact on the environmental landscape of Latin America. Food waste, addressed by Solution 7, is Latin America’s largest waste output.⁸⁶ By harnessing the organic and compostable potential of this refuse, the region could reverse poor recycling trends and ease the urbanization process by freeing up limited-space landfills. With its combination of strong cultural values, public education and student engagement, Solution 9 is perhaps the most suitable and implementable option. With its grassroots nature, this system can exist anywhere. Young people in Latin America are increasingly connected to the globe and have a long history of social involvement, raising the potential for impactful student-led movements.

Stretching from Patagonia to Tijuana, Latin America presents a diverse landscape with no one-size-fits-all solution. However, the approaches of forming integrated waste management systems, promoting environmentally responsible production and consumption of goods, efficiently handling organic waste, and creating societal change through public education provide a path towards environmental sustainability for Latin America. 🌍

APPENDIX A

KEY FACTS OF WASTE IN LATIN AMERICA⁸⁷

Waste Management Outlook for Latin America and the Caribbean

Key Facts

1 kg/day

of waste generated on average by each inhabitant in the region

541,000 tons/day

of municipal waste are generated in Latin America and the Caribbean, a figure that will increase at least

25% by the year 2050

40 Million

people lack access to waste collection

145,000 tons/day

of waste are still disposed in open dumpsites, including

17,000 tons/day of plastic waste.

50%

of municipal waste is organic

90%

of waste are not utilized

Editor: In-Chief: Adolfo Soriano, Asociación para el Estudio de las Realidades Sociales (ARES), Argentina / Asesor: Adolfo Soriano (Asociación para el Estudio de las Realidades Sociales - ARES, Argentina), Centro Solidario (Ecuador), EDESA (ARSA, México), Centro Quepa (Centro Municipal de Atención, Uruguay), Munda (Caribbean Council (MAG) Colombia, Colombia) / Theme project by BCCC-BC3C Latin America and the Caribbean, Caracas, México, Nicolás Masini, Virginia Serrano / Supervision and coordination UN Environment; Latin America and the Caribbean Office José Pin, Marco Basso A., Milan

Murillo (until December 2016), María Alejandra Fernández, Juan Tello. Special support from the International Environmental Technology Centre (Murillo, Ecuador), Chacra (Greenwell, Alaska, Corporate until December 2016) / Design and layout: Puentes.org Realizaciones (www.puentes.org.com.ec) / Cover image: © STEA, Shutterstock.com

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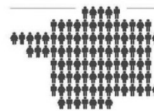
APPENDIX B⁸⁸

DUMPSITES:

A Global Health & Environmental Emergency

40%
Dumpsites receive of the world's waste.

38 out of the 50 biggest dumpsites directly threaten marine and coastal areas.



The 50 biggest dumpsites directly affect the daily lives of **64 million** people, a population the size of France.

More than **750** people died in the first half of 2016 because of poor waste management on dumpsites.

Big criminal business: the annual turnover of illegal waste dumps amounts to **10–12 billion USD**.



Climate change: without action, dumpsites will account for **10%** of GHG (Greenhouse Gas) emissions by 2025.



84 Charles Reilly, *New Paths to Democratic Development in Latin America: The Rise of NGO-municipal Collaboration*. Boulder: Rienner, 1995

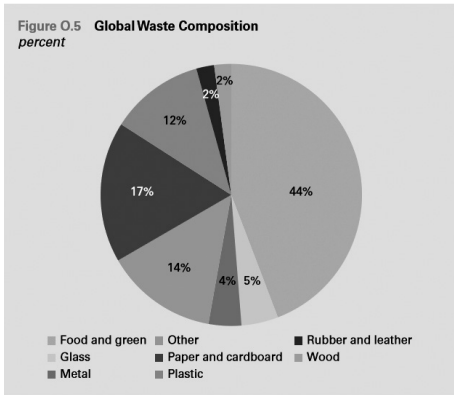
85 Medina, “Reciclaje de Desechos Solidos En America Latina.”

86 See Appendix A

87 Savino et al pg. 2

88 UN-Habitat, pg. 9

APPENDIX C⁸⁹

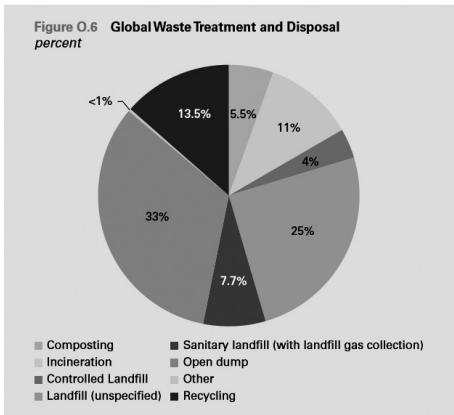


ADDITIONAL WORKS CONSULTED

Martin Medina-Martinez, “Scavenging on the Border: A Study of the Informal Recycling Sector in Laredo, Texas and Nuevo Laredo, Mexico” (Ph.D., Yale University, 1997), <https://search.proquest.com/docview/304383696/abstract/B84708484CE64ECCPQ/1>

Sergio Sastre, Jaume Llopart, and Ignasi Puig Ventosa, “Mind the Gap: A Model for the EU Recycling Target Applied to the Spanish Regions,” *Waste Management* 79 (September 2018): 415–27, <https://doi.org/10.1016/j.wasman.2018.07.046>.

APPENDIX D⁹⁰



89 Kaza et al., *What a Waste 2.0*. pg. 8

90 Ibid, pg. 9



Combatting Organized Crime in Canada

– Kate Behrmann

ABSTRACT

Canada has a long history of organized crime. Organized crime has flourished due to outdated or poorly-maintained laws and regulations that the Canadian government has been trying to fix for decades. Organized crime in Canada takes many forms, and many solutions exist, including: enforcing existing legislation, encouraging testimony from female organized crime members, limiting youth gang recruitment, eliminating money laundering in the real estate market and creating provincial anti-corruption agencies. Each proposed solution tackles a different area of organized crime, all of which need to be addressed at some point in time. The recommended solution to eliminate money laundering in the real estate market should be implemented by the Canadian government because it targets sophisticated individuals, allows more housing opportunities for lawful Canadians and has the backing of an international non-governmental organization.

In 2013, Vito Rizzuto, long-time leader of the Montreal Mafia, Canada's strongest organized crime group, died, leaving Canada's organized crime sector in a state of upheaval. While 'organized crime in Canada' may not be a commonly understood issue, Canada has been battling this problem since its founding, Rizzuto being the latest and most sophisticated example.¹ The Canadian government defines organized crime as "being composed of three or more persons, having as one of its main purposes a serious offence likely to result in financial benefit."² The stereotypical images of Italian godfathers are outdated; criminal organizations in Canada are more diverse and complex than ever before and will require new tactics to combat them effectively.

Canadian organized crime in the 19th century was primarily focused on small-scale robberies, smuggling and currency counterfeiting. The American Prohibition of the 1920s led to a significant increase in Canadian organized crime through the creation of an underground market to supply alcohol to the US by increasingly sophisticated and influential criminal groups.³ Following the end of Prohibition in the 1930s, Canada witnessed an increase in illegal gambling and the rise of the Italian Mafia. The aftermath of the World Wars saw a rise in the demand for illegal drugs, further increasing the authority of criminal organizations. Trafficking in heroin, cocaine, marijuana and synthetic drugs aided the creation of a diverse range of criminal organizations in the 1960s-1990s.⁴ Today, Canadian organized crime consists of hundreds of different groups and networks of

thousands of individuals that vary by region.⁵ Organized crime primarily centers around large cities on the country's east and west coasts, with the West characterized by Asian and outlaw motorcycle gangs, money laundering and a slight Mafia presence,⁶ while the East is dominated by highly-structured organized hierarchies or families primarily centred around Montreal, a major port of entry for narcotics; these groups facilitate drug trafficking, gambling, prostitution, loansharking, fraud, government corruption and money laundering throughout Canada.⁷ The presence of multi-ethnic gangs is also on the rise in most major cities, such as Vancouver, Toronto and Montreal, blending crime syndicates from a variety of backgrounds. In 2013, the Criminal Intelligence Service Canada (CISC) estimated that 672 active organized crime groups existed in Canada, though this number has likely grown.⁸

Canada is at a pivotal moment now in the early years following Rizzuto's death. During his reign, Rizzuto was able to unite rival gangs into a sophisticated business organization where the parties could pursue shared interests.⁹ While economic-based crimes committed by organized crime groups cost Canadians billions of dollars each year, the violence, intimidation and corruption associated with organized crime affects far more than bank accounts. With pervasive organized crime, Canadians' faith in fundamental systems, such as law enforcement, diminishes, leading to increased fear and anxiety.¹⁰ The government has many

5 Ibid.

6 "Canada 2018 Crime & Safety Report: Vancouver." United States Overseas Security Advisory Council, 2018. <https://www.osac.gov/Pages/ContentReportDetails.aspx?cid=24117>.

7 Dubro, James R., Pierre De Champlain, and William L MacAdam. "Organized Crime in Canada." *The Canadian Encyclopedia*, 2014. <https://www.thecanadianencyclopedia.ca/en/article/organized-crime>.

8 Munch, Christopher and Warren Silver. "Measuring organized crime in Canada: Results of a pilot project." Statistics Canada, 2017. <https://www150.statcan.gc.ca/n1/pub/85-002-x/2017001/article/14689-eng.htm>.

9 Nicaso, "How Canada Enabled the Rise of Mafia Boss Vito Rizzuto."

10 "Impacts of Organized Crime." The Royal Canadian Mounted Police, 2011. <http://www.rcmp-grc.gc.ca/soc-cgco/impact-eng.htm>.

1 Nicaso, Antonio. "How Canada Enabled the Rise of Mafia Boss Vito Rizzuto." *Macleans*, 2017. <https://www.macleans.ca/opinion/how-canada-enabled-the-rise-of-mafia-boss-vito-rizzuto/>.

2 Government of Canada, Royal Canadian Mounted Police. "Serious and Organized Crime." Royal Canadian Mounted Police Website, 2013. <http://www.rcmp.gc.ca/soc-cgco/index-eng.htm>.

3 Schneider, Stephen. *Canadian Organized Crime*. Toronto: Canadian Scholars, 2017. <https://books.google.com/books?hl=en&lr=&id=y0hBDwAAQBAJ&oi=fnd&pg=PP1&dq=organized+crime+in+canada+&ots=cQgPEvIBL&sig=ou6s21Ho2fBebVQhJZSbRGUtOVS#v=onepage&q&f=false>.

4 Ibid.

potential options to capitalize on the chaos that has followed Rizzuto's death to prevent the ascent of another refined and influential boss, decreasing both the presence and power of organized crime throughout Canada.

POSSIBLE SOLUTIONS

OPTION 1

Maintain the Status Quo

The Canadian government is aware of both the effects and actions of criminal syndicates and has made a series of legislative changes in recent years to cut down on organized crime. In 2011, police officials adopted the Canadian Law Enforcement Strategy on Organized Crime to detect, reduce and prevent organized crime. CISC¹¹ represents the Strategy, which facilitates the production and exchange of criminal intelligence information within the law enforcement community. CISC works in collaboration with a variety of institutions to provide expertise and analyses of current and future criminal developments.¹² Beginning in 2013, the Canadian government encouraged law enforcement to use the Incident-based Uniform Crime Reporting Survey (UCR2) to identify incidents connected to organized crime, allowing police forces to track patterns of organized crime occurrences and create strategic responses.¹³ In 2017, Public Services and Procurement Canada, the Competition Bureau and the police created a public telephone hotline and online form for Canadians to report

suspected fraud, collusion or corruption in federal contracts.¹⁴

11 Note: Criminal Intelligence Service Canada (CISC)

12 Criminal Intelligence Service Canada. "Organized Crime in Canada - Background." Government of Canada, 2014. <http://www.cisc.gc.ca/media/2014/2014-08-22-eng.htm>.

13 Research Division. "Organized Crime – Research Highlights 2017-H007." Public Safety Canada, 2017/ <https://www.publicsafety.gc.ca/cnt/rsrscs/pblctns/2017-h007/index-en.aspx#a05>.

14 "Report Wrongdoing in Government Contracts and Real Property Agreements - Federal Contracting Fraud Tip Line." Government of Canada, 2017. <https://www.ic.gc.ca/eic/site/094.nsf/firm-eng/MBED-AJL22H>.

While it has made progress in recent years, Canada's enforcement of existing organized crime policies is irregular and needs strengthening. Over the past four years, Canadian citizens have felt the government became slightly, yet steadily, more corrupt, indicating a lack of public confidence in existing programs.¹⁵ If it chooses not to reinforce its status quo, the government risks becoming complacent and inadvertently allowing organized crime to flourish in Canada.

OPTION 2

Encourage Testimony from Female Organized Crime Members

Women have a complicated status in organized crime that varies by syndicate. Women most frequently play low-level roles in organized crime by upholding values and traditions in a domestic context and participating in nonviolent illicit activities.¹⁶ Though often the victims of violence,¹⁷ women in organized crime are often privy to the details and inner workings of their clan. The testimony of four Italian women against the organized crime group they were born into, the 'Ndrangheta,¹⁸ led to the arrest of sixty-four members and the confiscation of \$400 million¹⁹ worth of assets in the mid-2000s, though the 'Ndrangheta assassinated two of the women, making other women fearful testify.²⁰ The Canadian government needs to encourage women in organized crime to come forward by listening, offering protection and helping them to start a new life.

15 "Corruption Perceptions Index 2018." Transparency International, 2019. <https://www.transparency.org/cpi2018>.

16 Allum, Felia, and Irene Marchi. "Analyzing the Role of Women in Italian Mafias: The Case of the Neapolitan Camorra." *Qualitative Sociology* 41, no. 3 (September 7, 2018): 361-80. <https://doi.org/10.1007/s11133-018-9389-8>.

17 Perry, Alex. "Canada Is on the Frontline of a New War against the Rise of Global Organized Crime." *The Globe and Mail*, 2018. <https://www.theglobeandmail.com/opinion/article-canada-is-on-the-frontline-of-a-new-war-against-the-rise-of-global/>.

18 Note: Based in Italy, the 'Ndrangheta is present in over 120 countries, including Canada.

19 Expressed in USD. \$539 million CAD

20 Perry, "Canada Is on the Frontline of a New War against the Rise of Global Organized Crime."

Canada must learn from the 'Ndrangheta case and acknowledge the necessity of protection for former organized crime members. The Canadian government should partner with women's shelters around the country and teach them how to encourage women who have escaped from organized crime syndicates to report and testify against their abusers. Local shelters will be better equipped to reach the public and have greater experience dealing with delicate situations. Officials must acknowledge women's need for self-determination, or the ability to freely make decisions without external compulsion, so as not to pressure women who come forward to testify.²¹ Instead, the women should be provided with information about the trial process and what the government can do to protect them, so they can confidently decide on a course of action.

OPTION 3

Limit Youth Gang Recruitment

The recruitment of youths for organized crime membership, particularly amongst gangs, is extremely common. At least 430 active gangs exist in Canada today, including youth gangs.²² Youth gangs are a group of at least three young people who self-form due to mutual interests and engage in delinquent or criminal behavior, often involving violence, fear and intimidation, on a regular basis.²³ Approximately 94% of Canadian youth gang members are male.²⁴ Membership in a youth gang often leads to involvement (forced or voluntary) in adult gangs. Some adult gangs specifically recruit children to gain access to younger markets for

various purposes.²⁵ Gangs frequently provide economic, psychological and/or social benefits, which makes membership enticing for children who do not have those needs met at home.²⁶

To decrease youth gang involvement, and thus decrease gang populations overall, the Canadian government must implement school-wide programs to raise awareness about gangs and encourage the building of strong connections between youth, their families, schools and the community in general, such as the successful Warrior Spirit Walking program for Aboriginal youth in Saskatchewan.²⁷ Additionally, money should be invested in creating year-round extracurricular programs for teens in at-risk areas. The programs should be diverse and designed according to the interests of children in each region. Extracurricular programs would not only help keep youths off the street and in a safe environment, but they would provide an outlet for the children to build relationships with peers and foster a sense of community belonging.

21 Buchbinder, Eli and Rouzin Barakat. "Self-Determination in Intervention With Battered Arab Women in Community Health Clinics in Israel." *Ethics & Behavior* 26, no. 2 (February 17, 2016): 87-98. <https://doi.org/10.1080/10508422.2014.987922>.

22 Northcott, Paul. "Just the Facts: Gangs." *Gazette Magazine – Royal Canadian Mounted Police* 80, no. 30 (2018). <https://www.rcmp-grc.gc.ca/en/gazette/gangs>.

23 Dunbar, Laura. *Youth Gangs in Canada: A Review of Current Topics and Issues*. Department of Public Safety, 2017. <https://www.publicsafety.gc.ca/cnt/rsrscs/pblctns/2017-r001/index-en.aspx>.

24 Northcott, "Just the Facts: Gangs."

25 Duggan, Graham. "How Gangs Are Recruiting Some Canadian Teens into a Life of Crime." Canadian Broadcasting Corporation, 2018. <https://www.cbc.ca/cbcdocs/pov/features/gangs-are-recruiting-some-canadian-teens-into-a-life-of-crime>.

26 Dunbar, *Youth Gangs in Canada: A Review of Current Topics and Issues*.

27 Northcott, "Just the Facts: Gangs."

28 Note: Saskatchewan has the highest concentration of youth gangs per capita in Canada and has been active in the fight against child recruitment since the early 2000s. The Warrior Spirit program incorporates aspects of indigenous tradition with counselling and individualized care plans to help children exit or stay away from youth gangs. [*Youth Alliance Against Gang Violence*. Public Safety Canada, 2012. <https://www.publicsafety.gc.ca/cnt/rsrscs/pblctns/yth-llnc/index-en.aspx>]

OPTION 4

Eliminate Opportunities for Money Laundering in Real Estate

According to a 2019 report by Transparency International (TI) Canada, the Canadian real estate market appeals to money launderers due to its weak regulation and structures that allow owners to remain anonymous by using companies, trusts or straw men²⁹ to hold title to multi-million-dollar properties, as shown in Appendix 1. Anonymous property ownership makes individuals invisible to law enforcement and tax authorities. In Toronto's real estate market, private entities bought \$21.2 billion³⁰ worth of housing since 2008. Money laundering through real estate increases housing prices, eliminating opportunities for lawful Canadians. Real estate agents, brokers and developers are not required to conduct beneficial ownership³¹ or funding checks on buyers, and lawyers without anti-money laundering obligations can conduct transactions.³²

To eliminate opportunities for money laundering, Canada's federal government should require beneficial owners of real estate to identify themselves to land title authorities and make that information available to the public, as recommended by TI. In the future, the disclosure of beneficial ownership should be a prerequisite for all real estate purchases or transfers.³³ Exposing beneficial owners will decrease incentive to use straw men or corporations to purchase real estate, thus lessening the number of fraudulent purchases. Following another TI recommendation, Canada should amend the Proceeds of Crime (Money Laundering) and Terrorist Financing Act to

include other real estate-related businesses such as unregulated mortgage lenders or brokers, land registries, title and mortgage insurers, promoters and redevelopers.³⁴

OPTION 5

Create Provincial Anti-Corruption Agencies

While the Canadian government does have anti-corruption measures in place, they lack enforcement and do not effectively stop governmental corruption. The province of Quebec has its own anticorruption unit³⁵ that investigates corruption, collusion and fraud within its borders.³⁶ The government of Canada should create anticorruption units in its other provinces that can investigate region-specific inquiries and enforce existing anti-corruption legislation on a local scale, allowing existing bodies, such as the Auditor General and Public Service Commission, to investigate the higher levels of Canadian governmental corruption, such as the SNC-Lavalin scandal. Engineering and construction company SNC-Lavalin allegedly paid \$4.7 million to Libyan officials between 2001 and 2011. The Trudeau administration is accused of pressuring the public prosecution service to avoid a criminal trial and to impose a minimal punishment.³⁷

To create anti-corruption agencies, Canada must first form a branch of the Criminal Intelligence Service Canada to facilitate and manage the operation of the provincial agencies. The provincial agencies themselves should investigate local law enforcement, politicians and any facilities in the region that locals suspect. The agencies will be available for the public to register complaints and will keep the public informed on its findings through

29 Note: A "straw man" is defined by Merriam-Webster as "a person set up to serve as a cover for a usually questionable transaction"

30 Note: Expressed in US dollars. \$28.4 billion CAD.

31 Note: A "beneficial owner" is an individual who enjoys the benefits of ownership, despite the title of the property being in another name

32 Ross, Adam. "OPACITY Why Criminals Love Canadian Real Estate (And How to Fix It)." 2019. <http://www.transparencycanada.ca/wp-content/uploads/2019/03/BOT-GTA-Report-WEB-copy.pdf>.

33 Ibid.

34 Ross, "OPACITY Why Criminals Love Canadian Real Estate (And How to Fix It)."

35 *L'Unité permanente anticorruption*

36 Lévesque, Kathleen. "Québec Somme l'UPAC de Faire l'unité." *Le Devoir*, 2012. <https://www.ledevoir.com/politique/quebec/361733/ultimatum-de-quebec-a-l-upac>.

37 Aşgari, Nikou and Joshua Oliver. "Trudeau's political crisis: the controversy explained." *Financial Times*, 2019. <https://www.ft.com/content/f2b1b672-3f4e-11e9-9bee-efab61506f44>

a website. The anti-corruption agencies should operate independently of law enforcement, though it should report its findings both to provincial and national law enforcement groups. The agencies will collaborate with other anti-corruption agencies to enforce existing anti-corruption initiatives.


RECOMMENDED SOLUTION

Over time, Canada should aim to implement all of the aforementioned solutions, however, due to both time and financial constraints, the Canadian government should implement the changes recommended by TI Canada. Real estate accounts for nearly one-third of criminal assets confiscated worldwide, showing criminals' affinity for real estate-specific laundering. Money laundering should be targeted first because it is becoming increasingly more common in Canada and it is typically conducted by highly sophisticated, hard-to-catch individuals like Vito Rizzuto. Allowing criminals to invest in Canadian real estate worsens issues in cities with limited amounts of expensive housing, specifically in Vancouver, Toronto and Montreal.³⁸ By limiting opportunities for money laundering via real estate, the real estate market itself will favor lawful Canadians, giving them more options and a safer buying process.

TI Canada recommends creating a pan-Canadian registry of companies, including beneficial ownership information, that will be available to the public. The registry should feed into a main database controlled by the federal government. After the enactment of this proposal, the registrar must verify the identity of the beneficial owner under the corporation's title via government-approved identification, a sworn statement of beneficial ownership and regular randomized audits after the completion of the identification process; this new series of regulations will keep legitimate corporations

out of trouble while simultaneously keeping corrupt or nonexistent corporations out of the housing market.³⁹

The second part of the plan for eliminating money laundering through the real estate market focuses on the Proceeds of Crime (Money Laundering) and Terrorist Financing Act (PCMLTFA). Currently, the PCMLTFA focuses on implementing measures to detect and deter money laundering and terrorist financing to facilitate investigation or prosecution of said offences, assisting law enforcement by providing information and assisting in fulfilling Canada's international commitments in the fight against organized crime.⁴⁰ Amending the PCMLTFA to include other real estate-related businesses would increase both the enforcement of real estate regulations and would draw more public attention to the problem. Increased awareness of money laundering in the real estate sector paired with new regulations will effectively deter money laundering through real estate. After the implementation of the proposal, it will require minimal maintenance, so Canada will have the resources available to target other areas of organized crime.

Of course, just stopping money laundering through the real estate market will not completely solve Canada's organized crime problem. However, the proposed legislative changes will significantly decrease, if not outright eliminate, money laundering in the real estate market, a market that affects every Canadian. Having a reputable international non-governmental organization backing the proposed changes will aid the argument for prioritizing money laundering over other forms of organized crime on both a public and governmental scale. Increasing real estate market regulation could be the critical first step to stopping organized crime in Canada. 

38 Ross, "OPACITY Why Criminals Love Canadian Real Estate (And How to Fix It)."

39 Ross, "OPACITY Why Criminals Love Canadian Real Estate (And How to Fix It)."

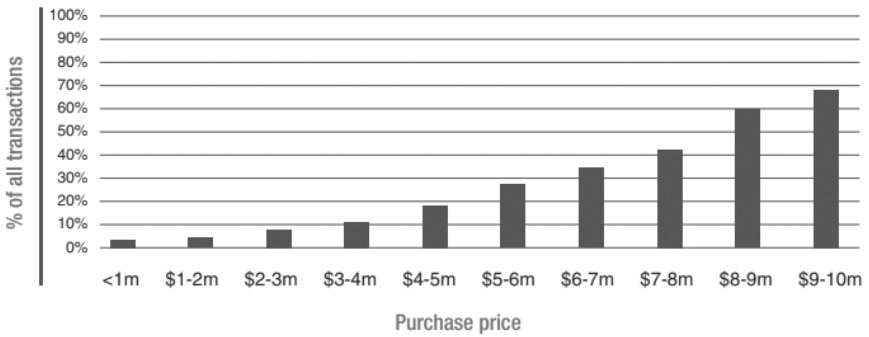
40 "Proceeds of Crime (Money Laundering) and Terrorist Financing Act." Financial Transactions and Reports Analysis Centre of Canada, 2015. <http://www.fintrac-canafe.gc.ca/act-loi/1-eng.asp>.

APPENDIX

APPENDIX 1

Transparency International Canada's Corporate Ownership by Property Value graph showing the percentage of high-value properties owned by corporations as of 2019⁴¹

Figure 1: Corporate Ownership by Property Value



41 Ross, "OPACITY Why Criminals Love Canadian Real Estate (And How to Fix It)."

ADDITIONAL WORKS CONSULTED

Bouchard, Martin, Morselli, Carlo, Hashimi, Sadaf, and Marie Ouellet. "Proportion of Criminal Incidents Associated with Organized Crime." Research report, Public Safety Canada, 2015. <https://www.publicsafety.gc.ca/cnt/rsrscs/pblctns/2015-r023/2015-r023-en.pdf>.

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Protecting the Prices of Quinoa to Preserve the Diet of Bolivians

– Jonathan Trusty

ABSTRACT

Quinoa, or the “Andean Super Food,” is a nutritious grain that is best grown in places with ideal growing conditions, such as Bolivia and other Andean countries. For centuries, quinoa has been one of the main food sources for Bolivia because of its nutritional value, in addition to its availability. Until recently, many Bolivians can’t afford the grain because international trade has caused fixed prices to increase. There has been an increase of demand from western countries because of the health benefits, but the supply is not increasing fast enough to maintain equilibrium. This is forcing Bolivians to eat more processed foods, which is increasing obesity and malnutrition. This paper examines the problem with the increased cost of quinoa and explores all viable solutions that can improve the overall health and well-being of the people of Bolivia.

OVERVIEW, BACKGROUND, CONTEXT, INTRO, DEFINITION

The concept of health has transformed the way that people live their lives, and especially the way humans eat. Western civilizations have recently discovered quinoa, which is packed with nutrients like protein, fiber, iron, and vitamin B6. Since then, the popularity has surged because of its health benefits.¹ A study done by NASA in 1993 stated “While no single food can supply all the essential life-sustaining nutrients, quinoa comes as close as any other in the plant or animal kingdom.”² Even the United Nations recognized quinoa because of its health

- 1 Szalay, Jessie. “Quinoa: Health Benefits & Nutrition Facts.” LiveScience. April 19, 2018. Accessed April 01, 2019. <https://www.livescience.com/50400-quinoa-nutrition-facts.html>.
- 2 Schilek, Greg, and David L. Bubenheim. Quinoa: An Emerging “New” Crop with Potential for CELSS. NASA. <https://ntrs.nasa.gov>. Accessed March 29, 2019. <https://ntrs.nasa.gov/archive/nasa/casi.ntrs.nasa.gov/19940015664.pdf>.

benefits and called 2013 the International Year of Quinoa. These types of health benefits are why the United States is demanding so much quinoa.

The increased demand for quinoa is a major issue for the country of Bolivia because despite being dependent on this grain for centuries, their people can no longer afford it. In economics, supply and demand go hand and hand. So, in any situation, when demand is higher than the supply, the prices rise.³ Between the years 2000 and 2014, the average price of quinoa exports from Bolivia more than tripled, to \$6-7 a kilogram. Bolivia is one of the poorest nations in Latin America and about two thirds of the population live below the poverty line.⁴The higher the price rises, the more unaffordable quinoa becomes to the average Bolivian.

The increased price of quinoa has made exporting the grain more desirable. Currently, the consumption of Bolivia has decreased significantly because of this price influx. The Bolivian Ministry of Agriculture states that the consumption of quinoa has fallen by 34 percent. This was never a problem until quinoa became a popular food. It was mainly used for domestic consumption because it was seen as a peasant food.⁵ This view on quinoa changed when people started to appreciate the nutritional value of it. The price of quinoa has increased by 600% from 2000 and 2008.⁶ These escalation in pricing is making quinoa unaffordable to much of the population.

The unaffordable price of quinoa has made Bolivians turn to other sources of food, such

as pasta and rice.⁷ Also, Bolivia is importing processed foods from abroad, which is further damaging the diets of Bolivians and creating a new problem for Bolivia, obesity.⁸ Obesity has been plaguing many countries all throughout Latin America, but the change of Bolivian diets is making more Bolivians obese.⁹ Quinoa is full of amino acids, dietary fiber, phosphorous, magnesium and iron. These supplants are needed to sustain a healthy life, and pasta and rice don't fill the nutritional void that quinoa provided. Critiques would say that the trade of quinoa has made farmers richer, but the increase of their farming techniques are making quinoa more insecure than ever.¹⁰ More needs to be done to bring down the price of quinoa so that Bolivians can eat a food that they relied on for centuries.

POSSIBLE SOLUTIONS

APPROACH ONE

Increase the Yield of Quinoa Sustainably

One possible solution to this problem would be to increase the yield of quinoa. A joint FAO/IAEA division is currently working on technology that can produce the yield of quinoa by three times.¹¹ The increase of demand has helped perpetuate

3 "Against the Grain." The Economist. May 21, 2016. Accessed March 28, 2019. <https://www.economist.com/finance-and-economics/2016/05/21/against-the-grain>.

4 "Countries." WFP. Accessed March 29, 2019. <https://www.wfp.org/node/3404/4218/641022>.

5 Superfoods' Dark Side: Increasing Vulnerability of Quinoa Farmers in Bolivia. (n.d.). Retrieved from <http://web.colby.edu/st297-global18/2019/01/22/superfoods-dark-side-increasing-vulnerability-of-quinoa-farmers-in-bolivia/>

6 See figure in appendix A

7 Jimenez, Glenelys, and Glenelys Jimenez. "A Quinoa Fad, Wealthy Demand of a Poor Supply: Globalized Economic Pressures on Rural Bolivia." Academia. edu. Accessed March 29, 2019. https://www.academia.edu/4144828/A_Quinoa_Fad_Wealthy_Demand_of_a_Poor_Supply_Globalized_Economic_Pressures_on_Rural_Bolivia.

8 See the attached figure in Appendix B

9 Mestral, Carlos De. "The Issue with Quinoa and Nutrition in Bolivia." Harvard College Global Health Review. February 1, 2012. Accessed March 29, 2019. <http://www.hcs.harvard.edu/hghr/print/spring-2011/quinoa-bolivia/>.

10 Superfoods' Dark Side: Increasing Vulnerability of Quinoa Farmers in Bolivia. (n.d.). Retrieved from <http://web.colby.edu/st297-global18/2019/01/22/superfoods-dark-side-increasing-vulnerability-of-quinoa-farmers-in-bolivia/>

11 "Quinoa Farmers Increase Yields Using Nuclear-Derived Farming Practices." IAEA. August 28, 2018. Accessed March 29, 2019. <https://www.iaea.org/newscenter/news/quinoa-farmers-increase-yields-using-nuclear-derived-farming-practices>.

unsustainable farming methods; and when you combine the factors of increased demand and the natural stressors that are attributed to climate change, the growth of quinoa becomes grimmer. The three different types of technology that the joint committee produced are mutation breeding, isotope tracing and water control using a water-absorbing polymer. Their report states the following: “The study evaluated 63 improved quinoa lines in farmers’ fields, specifically looking for their response to water and fertilizer. It also used nitrogen-15 stable isotope tracers to evaluate the optimum dose of nitrogen fertilizer needed to increase quinoa yields.”¹² The report also stated how they introduced new technology to keep water from running off the fields by using a water-absorbing polymer.¹³ Small improvements like can ensure that no drop of water is wasted.¹⁴ Innovation is the key to produce quinoa in a sustainable way. With these types of solutions, it is possible to increase the yield of quinoa, thus bringing down the overall price of the grain because there will be an increased supply.

APPROACH TWO

Increasing the Countries that Grow Quinoa

Another way to increase the supply of quinoa is having other countries begin growing it. All around the world, there are efforts to try to grow quinoa in other places besides the Andean region. For example, there are efforts to try to grow the grain in Southern Colorado, and they are trying to expand those efforts to other states and even Canada.¹⁵ In Europe, they are trying to grow quinoa in both the southern and the northern regions because of the permutable

climate, and they are seeing positive results. Denmark and The Netherlands are using the University of Copenhagen to improve the breeding of quinoa; the UK is using quinoa to slow erosion, improve soil health, enhance water availability, smother weeds, help control pests and diseases, increase biodiversity by using quinoa as a cover crop; farmers in France are analyzing the effects of growing quinoa organically.¹⁶ There are even efforts to start growing quinoa in the Middle East and Africa, which will only increase the supply further.¹⁷ In time, Bolivia won’t be one of the only suppliers of quinoa. The supply will be scattered and not as concentrated. This will only decrease the price of quinoa because there will be multiple suppliers, not just Bolivia.

APPROACH THREE

Quinoa Subsidy

Quinoa producing corporations should invest a portion of profits back into Bolivian quinoa production. The biggest stakeholders involved with quinoa is the National Association of Quinoa Producers, or ANAPQUI.¹⁸ ANAPQUI is responsible for setting the local price of quinoa and coordinating with international companies who are interested in buying various types of quinoa. If ANAPQUI set the price lower for Bolivia, that would allow for more Bolivians to afford quinoa and stop the trends of obesity and malnutrition. Rich countries can and will keep paying an increased price for quinoa in an economically sound market, so a slight uptick in the price won’t be a deterrent them from buying quinoa. The GDP in 2017 of the United States, Bolivia’s biggest importer of quinoa, is 19.319 trillion; and the GDP of Bolivia in 2017 was 37.509 billion.¹⁹ This will be a short-

12 “Ibid.”

13 “Ibid”

14 “Ibid”.

15 Ruiz, Karina B., Stefania Biondi, Ian S. Acuña-Rodríguez, Fabiana Antognoni, Enrique A. Martínez-Mosqueira, Amadou Coulibaly, Alipio Canahua-Murillo, Milton Pinto, Andrés Zurita-Silva, Sven-Erik Jacobsen Didier Bazile, and Marco A. Molina-Montenegro. “Quinoa Biodiversity and Sustainability for Food Security under Climate Change. A Review.” SpringerLink. November 15, 2013. Accessed March 29, 2019. <https://link.springer.com/article/10.1007/s13593-013-0195-0>.

16 Nationwide, SARE, and Andy Clark. “Cover Crops.” SARE. 2012. Accessed March 29, 2019. <https://www.sare.org/Learning-Center/Topic-Rooms/Cover-Crops>.

17 See attached figure in Appendix C

18 Antonio, Katherine. The Challenges of Developing Sustainable Agro-Industry in Bolivia: The Quinoa. Duke University. Bcb.gob.bo. 2011. Accessed March 29, 2019. <https://www.bcb.gob.bo/ceb/sites/default/files/paralelas5eeb/jueves/ActividadesEconomicas/KatherineMacarena.pdf>.

19 “Bolivia.” Data. Accessed March 29, 2019. <https://data.worldbank.org/country/bolivia>.

term solution, since increasing production domestically and internationally takes time. If ANAPQUI raised the price for American buyers and lowered the price the Bolivian buyers, the two price shifts will balance each other, and equilibrium would be restored. These variations of incomes prove that more needs to be done to make the market of quinoa fairer for everyone, but especially for the country that produces it.

APPROACH FOUR

NGO Intervention

NGOs could also bring awareness of the inequality of quinoa production and consumption by talking directly with those affected, the local Bolivians. The local Bolivians need to be included in the conversation of how to change the current economics of quinoa because this problem directly affects them. An NGO could make a successful campaign by including real testimonies of how the rising costs of quinoa changed their lives and spread those testimonies all over the world. Many people are not aware of this issue, and a compelling campaign or hashtag can bring light on this issue and possibly change the way people think about quinoa. The internet and social media are useful tools that can get a message right to the consumer. This would be especially effective if the NGO wanted to target people in Western countries. If people hear the horrors about malnutrition and how people are becoming obese because they can't use the crop that is grown in their own country, international traction could catch on. Bolivia can use that international attention to put pressure on ANAPQUI to change the domestic price of the grain. Putting international pressure on them could possibly force them to lower the domestic price for Bolivia, but the Bolivian locals need a tech savvy NGO to help them get their message out to the world. Technology is the bridge that connects us all. They just need an organization to let their stories be heard.

APPROACH FIVE

Bolivia Supporting Certain Producers

Bolivia should be more vocal and only support quinoa producers that practice corporate social responsibility. Corporate social responsibility (CSR) is a concept regarding changing business practices to revolve around working partnerships with local communities, socially responsible investments, and environmental protection and sustainability with the goal to boost one's brand.²⁰ If a quinoa brand marketed themselves to promote lowering the prices for Bolivians because of the economic inequality that comes with the trade by donating a portion of their profits, more people would be likely to buy that brand because of the social message behind it. That would not only help the people of Bolivia with their struggle for cheaper prices, but it would help the corporations themselves. Corporations that practice CSR are seen as more innovative because their operations of business are outside of the norm; they tend to save money because they act in a sustainable manner; their brand is distinctive because they have a unique message; they are thinking with a long term mindset to boost profits; and customers and employees become committed to the brand because of what it represents.²¹ CSR has also been shown to boost customer loyalty.²² Customers are very brand specific, and a brand that is associated with CSR is more likely to have that customer return and buy their product. Bolivia needs to be vocal to only support producers that practice this business model.

20 "What Is Corporate Social Responsibility?" The University of Edinburgh. July 03, 2017. Accessed March 30, 2019. <https://www.ed.ac.uk/careers/your-future/options/occupations/csr/what-is-csr>.

21 Epstein-Reeves, James. "Six Reasons Companies Should Embrace CSR." *Forbes*. June 03, 2012. Accessed March 30, 2019. <https://www.forbes.com/sites/csr/2012/02/21/six-reasons-companies-should-embrace-csr/#76c88a8f3495>.

22 Bediako, Benjamin Ohene. *The Impact of Corporate Social Responsibility on Customer Loyalty A Case Study of StanBed Tours Ky. Vaasan Ammattlkorkeakouiu*. <https://pdfs.semanticscholar.org/464a/002fa4b3c398255eac6419899bf00a854e77.pdf>.

RECOMMENDED COURSE OF ACTION

The best plan to combat the increased prices of quinoa would be to use sustainable farming practices to increase the yield of the crop because demand doesn't seem to be slowing down anytime soon. Quinoa farmers are already seeing increased yields from the nuclear technologies created by the joint FAO/IAEA division. They reported how Andean farmers have seen an increase in yield from 1.1 to 3.1 tonnes per hectare, while reducing the amount of fertilizer the farmer has to buy by 30%.²³

There are already efforts to implement this strategy and similar ones on a global scale. The Multilateral Investment Fund invested 3.9 million dollars in 2014 with the goal to reduce degradation of natural resources that is being caused by increased farming.²⁴ That 3.9 million dollars will help improve producers' resilience to climate change and help implement smarter farming strategies, but a large investment is still needed to increase the yield of crops resilient of climate change, since the effects of climate change are already being felt. Wealthy countries that consume most of the quinoa, such as the United States, should lead the charge with investing in these types of nuclear technologies. More countries would be likely to join in when they see the positive effects of climate resilient crops. Until then, climate change and unsustainable farming practices will equal destruction for quinoa.

The combination of unsustainable practices and rising global temperatures will shrivel up the crops and in towns all over Bolivia.²⁵ This trend will continue throughout the country if nothing is done to stop it. The need for climate resilient crops with an increased yield has never been greater for Bolivia. If this solution isn't met, food security will become an extensive issue throughout the country and prices will continue to rise because quinoa will become scarcer throughout the country. Quinoa is already unaffordable for many Bolivians, so it is essential to do everything to protect the basic components of quinoa from climate change first, then focus on increasing the yield to reduce the local price for Bolivians. Scientists have proven that it is possible to increase the yield and make them resilient to climate change. If this happens, the increased supply would lower the prices and allow for more Bolivians to afford it, and the threat of obesity would reduce since Bolivians wouldn't be eating as many processed foods. It would also grant food security for quinoa and ensure that production and distribution will continue throughout the world. Bolivia could continue to reap the economic benefits without the fear of losing quinoa forever because of unsustainable farming. Hopefully, more will be done to reduce the price of quinoa so that food insecurity and obesity won't continue to flourish throughout Bolivia. 🌍

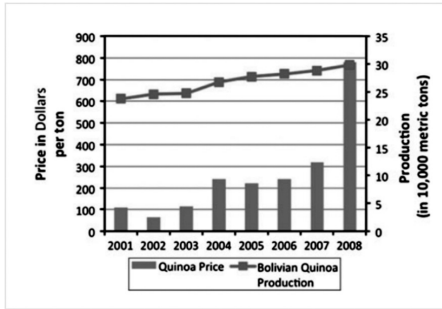
23 "Quinoa Farmers Increase Yields Using Nuclear-Derived Farming Practices." IAEA. August 28, 2018. Accessed March 30, 2019.

24 Moreno, Claudia. "Organization, Traceability and Technology Will Help Increase Sustainable Production of Organic Royal Quinoa in Bolivia." FOMIN Website. June 25, 2014. Accessed March 29, 2019. <https://www.fomin.org/en-us/Home/News/article-details/ArtMID/18973/ArticleID/2433/Organization-traceability-and-technology-will-help-increase-sustainable-production-of-organic-royal-quinoa-in-Bolivia-.aspx>.

25 Walker, Ben, Marianne Lavelle, Dan Gearino, Nicholas Kusnetz, David Hasemyer, James Bruggers, Phil McKenna, Sabrina Shankman, Marianne Lavelle, Nicholas Kusnetz, Marianne Lavelle, Georgina Gustin, Georgina Gustin, Georgina Gustin, David Hasemyer, Phil McKenna, Georgina Gustin, Nicholas Kusnetz, Ben Walker, and

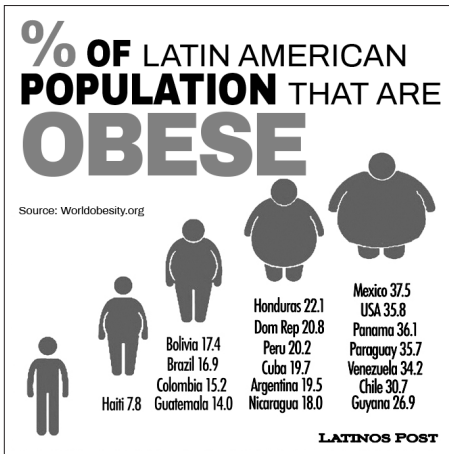
APPENDICES

APPENDIX A



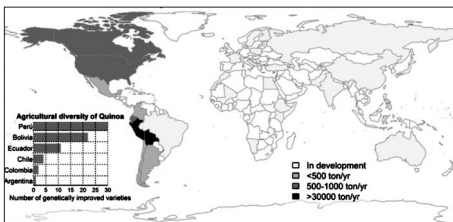
APPENDIX B

Most Obese Countries in Latin America



APPENDIX C

Worldwide production and distribution of Quinoa



ADDITIONAL WORKS CONSULTED

Rueda-Clausen, Christian F., Federico A. Silva, and Patricio López-Jaramillo.

Epidemic of Overweight and Obesity in Latin America and the Caribbean. *International Journal of Cardiology*. <https://www.internationaljournalofcardiology.com>. December 31, 2006. Accessed March 31, 2019. [https://www.internationaljournalofcardiology.com/article/S0167-5273\(07\)00401-9/pdf](https://www.internationaljournalofcardiology.com/article/S0167-5273(07)00401-9/pdf).

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Sustaining the European Wine Industry in the Face of Climate Change

– Maggie Thornsberry

ABSTRACT

Viticulture is a predominant socio-economic sector in Europe and the strong sensitivity of grape vines to climate factors warrant the need to address future challenges this industry is expected to run into as temperature rises, droughts persist and extreme events increase in frequency. Terroir is at risk of being undermined which will weaken the value based geographical relationship these varieties have developed in the traditional wine growing regions of old world Europe. This industry will face challenges on multiple fronts, most concernedly in the agricultural stages with new climate variables, but additionally in measuring up to the well-known demand in consumer preferences for unique grape attributes. Viable solutions to sustain the European wine industry in the face of climate change must acknowledge the fact that growers are motivated to maintain their legacy of producing some of the finest wines in the world and consumers are expecting these same standards to be maintained.

OVERVIEW AND BACKGROUND

The grape vine is one of the oldest cultivated plants and throughout its history of specialized development and connection through geographical ties, wine has consumed a rich cultural space in the lives of people all around the world but most notably in Europe.¹ The European region is specifically the largest producing region of wine in the world due to its favorable climatic niches between the 45°N

1 Fraga, Helder, *et al.* "Modelling Climate Change Impacts on Viticultural Yield, Phenology and Stress Conditions in Europe." (Alto Douro, Portugal: *Global Change Biology*, 2016) Vo: 22, no. 11: 3774–88. <https://onlinelibrary.wiley.com/doi/epdf/10.1111/gcb.13382>

and 53°N parallels.² In 2017, the EU accounted for 56% of global wine production and 54% of global consumption.³ This geographical zone includes climatic parameters that are favorably suitable for grape growth in context of quality and yield. These regions have historically optimized the ripening phase and produced the harmonious amounts of sugar content, acidity, color and aroma year round.⁴

Similar to other agricultural crops, climate is the most essential component of health and production of grape plants. Climate change is no longer a future threat, but an immediate reality for this industry. Global average surface temperature has warmed by 0.85°C between 1880 and 2012 but the European region has surpassed this global average.⁵ Changes in Earth's radiation budget and deviations from the thus far adapted atmospheric circulation system and hydrologic cycle will bring forth challenges to viticulture and wine production. These changes have emerged as this sector has already experienced a decrease in the number of cold days and an increase in the number of extremely hot days, radically changing customary practices and reliable techniques.⁶ It is understood that the impacts of climate change are going to affect the suitability of regions in diverse ways but in any vineyard, increased warming will test the region in its

ability to produce existing varieties.⁷ The result of ideal temperatures is a sensitive combination of sugars and acids that create the ideal wine quality per variety.⁸ It is a delicate balance between the development of sugars and the maintenance of acidity in grape plants and if the shift in seasons wasn't enough of a risk to physical crop practices, warmer climates induce phenological events to happen faster, resulting in higher and earlier sugar ripeness and a loss of necessary acidity, intensifying the change in growing and harvesting periods.⁹ This increases alcohol levels and weakens the wines' vital aging process. Not only do these phenologic implications arise with warmer temperatures, but the fundamental loss of crop yields alone requires attention. Grape plants are already being affected from too much heat and in many vineyards are dried past the point of use.¹⁰ Climate change has created a combination of unexpected regional warming, high variability in seasonal rainfall and a quickened phenological development within grape vines.

These challenges are forcing growers and consumers to make choices about what they are willing to compromise. The audacious commitment growers have to their old world heritage in the winemaking sector emphasize the importance in maintaining geographical ties and quality variability in wines. Consumers respect these assurances and make decisions based on these features. The high value of these qualities for both stakeholders, and the unyielding rate of climate change signify the need to explore avenues of adaptation for long term sustainability of this world famous drink.

2 Fraga, Helder, *et al.* "Future Scenarios for Viticultural Zoning in Europe: Ensemble Projections and Uncertainties." (Alto Douro, Portugal: *International Journal of Biometeorology*, 2013) Vo. 57, no. 6: 909–25. <https://link.springer.com/content/pdf/10.1007%2Fs00484-012-0617-8.pdf>

3 Anonymous. "The Reforms of the EU Wine Market." Agriculture and Rural Development - European Commission. February 22, 2017. https://ec.europa.eu/agriculture/wine/reforms_en.

4 Duchêne, Eric, *et al.* "Towards the Adaptation of Grapevine Varieties to Climate Change: QTLs and Candidate Genes for Developmental Stages." (Colmar, France: *Theoretical and Applied Genetics*, 2012) Vo. 124, no. 4: 623-35. <https://link.springer.com/article/10.1007/s00122-011-1734-1#Abs1>

5 IPCC, 2013b: Summary for Policymakers. In: *Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate* (Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA) pp. 3–29. https://www.ipcc.ch/site/assets/uploads/2018/02/WG1AR5_all_final.pdf

6 Fraga, Helder, *et al.* "Modelling Climate Change Impacts on Viticulture Yield" 3775.

7 Jones, Gregory V. "Climate Change: Observations, Projections, and General Implications for Viticulture and Wine Production." (Oregon: *Journal of Viticulture and Enology*, 2007) 1-15. https://chaireunesco-vinetculture.u-bourgogne.fr/colloques/actes_clima/Actes/Article_Pdf/Jones.pdf

8 Made from or belonging to a single specified variety of grape.

9 Jones, Gregory V. "Climate Change: Observations for Viticulture and Wine Production" 2.

10 *Ibid.*, page 2.

APPROACH 1

Introducing new appellation requirements in wine quality standards

The wine industry is facing the reality of climate change and there is little interest in compromising appellation¹¹ regulations of old world wine varieties in order to sustain the industry. Since the 1960s, the European Union has stood behind strict regulations for wine that are based on quality, geography, supply prices and labeling.¹² These regulations have ensured the uniqueness of the wine industry in Europe and have created the desirability of old world wine products. A solution worth exploring may compromise the prestige of the wine industry in Europe but the rise in temperatures may leave the region without a choice. In 2018, the French Institut national de l'origine et de la qualité (INAO) approved a new varietal under the Appellation D'Origine Contrôlée, their AOC classification system, that will allow for the introduction of "grape varieties for climate and environmental adaptation."¹³ This change in regulation has allowed France to control the evolution of grape varieties against climate change with a controlled experimental grape vine. In this specific trial type, grape varieties must be of the *vitis vinifera*¹⁴ origin and must already be under the French catalogue of varieties. This system has a ten-year period which offers a check and balance measurement to make sure the wine produced is suitable for the appellation. New plantings of the trial varieties will be limited to 5% of the land which will ensure the rest of the vineyard still produces a sufficient yield.¹⁵ Due to its recent inception, this varietal is still in its experimental phase. With the wide variety of landscapes,

11 *Appellation*-A geographical based term to identify where the grapes for a wine were grown.

12 Meloni, Giulia, and Johan Swinnen. "The Political Economy of European Wine Regulations." *LICOS Centre for Institutions and Economic Performance*, 2012. EconStor. <https://www.econstor.eu/bitstream/10419/74854/1/dp320.pdf>

13 Mileham, Arabella. "INAO to Allow AOCs to Trial Climate-Change Varieties." *The Drinks Business*, November 15, 2018.

14 *Vitis Vinifera*: A large genus of species of wine grapevines.

15 Ibid.

regulatory groups in their respective countries need to consider reforming the strict standards of quality appellations and trying their own adaptable varietal.

APPROACH 2

Northward redistribution of vineyards

Anticipating the reality of warming temperatures in European regions, a solution for the maintenance of the wine industry must invite the idea of a northward redistribution of vineyards. The movement of climate regions due to natural forcings has been noted through history and predates the Mesozoic Era.¹⁶ In context, these shifts have made areas in northern China and southern England resemble the 1970 French Champagne region.¹⁷ It is thus expected that some northern regions in Europe are projected to become more suitable to grow a wide variety of grapes as southern European regions will need to either adapt their varieties to warmer and dryer climates or lose their ability to produce yields.¹⁸ The Huglin index has been used to measure these viticulture zones in the past and present and is an important index when addressing the necessary amount of heat that plants need to receive in a day. This is especially significant as grape vine growth and health is strongly correlated to appropriate hours of sun exposure.¹⁹ This index has confirmed the current reality that southern and central European regions are much more

16 L. Bruce Railsback, *et al.* "Petrographic and isotopic evidence for Holocene long-term climate change and shorter-term environmental shifts from a stalagmite from the Serra do Courel of northwestern Spain, and implications for climatic history across Europe and the Mediterranean." (*Palaeogeography, Palaeoclimatology, Palaeoecology*, 2011) Vo. 305, no. 1-4, Pages 172-184. <https://www.sciencedirect.com/science/article/pii/S0031018211000988>

17 Harlan, Chico and Stefano Pitrelli. "Italy's wine industry is being tested by the effects of climate change in its vineyards," *The Washington Post*, October 28, 2018. <https://www.washingtonpost.com/world/europe>

18 Fraga, Helder, *et al.* "An overview of climate change impacts on European viticulture." (*Food Energy Security*, 2012) Vo. 1: 94-110. <https://onlinelibrary.wiley.com/doi/full/10.1002/fes3.14>

19 Fraga, Helder, *et al.* "Future Scenarios for Viticultural Zoning in Europe." (*International Journal of Biometeorology*, 2013) Vo. 57, no. 6: 909-25.

suitable for wine production than northern regions.²⁰ As warming continues however, future viticultural zoning will move northward as new suitable regions in the latitude range 50°N - 55°N are expected to appear.²¹ Although southern countries that have relied on wine production economically and culturally would experience a loss in this relied upon industry, this upward shift in vineyards would introduce economic advantages and a diaspora of cultural traditions to countries that have not been able to partake in the wine industry.

APPROACH 3

Implementation of irrigation measures

Water is essential for agriculture in any means but principally important in grape vine development and reproductive health. The future of water availability will define soil moisture and plant dryness in the European region.²² Irrigation has historically been forbidden in wine operations because it can alter the grape yield and unique quality attributes.²³ These strict regulations may be reconsidered however, as irrigation is a short term solution to climate change impacts and changes in precipitation for viticulture. In Portugal for example, regulations regarding irrigation have been loosened and these techniques are being implemented.²⁴ Crop models are the primary tool for anticipating plant responses in relationship to baseline water needs. A model developed by the French National Institute for Agronomic Research, the Simulateur Multidisciplinaire pour les Cultures Standard (STICS), has been used in assessing impacts of climate change on viticulture in the European region and as a result has been used to propose drip irrigation

strategies for climate change adaptation.²⁵ Drip irrigation systems provide the most control over water management and through this system, wine growers can calculate the exact amount of water needed for each vine once the baseline level of water stress is reached.²⁶ By using the STICS model and applying irrigation at the recommended level per region, yield losses in the future can be greatly eased.²⁷ This solution carries costs not only for the environment but also for the economy and social development as water scarcity will sweep over Europe in every sphere.²⁸

APPROACH 4

Earlier harvesting due to changing seasons

One of the foreseen changes due to climate change on viticulture is going to be the effect on harvest dates. These temperature increases in seasons are going to shift the acclimated growing and harvesting seasons that wine growers have relied on to establish their unique quality.²⁹ Although harvest dates also incorporate subjective evaluations of grape readiness, and are therefore variable, a widespread observation has indicated that harvest dates have advanced faster in the last 10-30 years compared to historical measurements of these advances happening over much longer periods of time.³⁰

³¹ The Johannisburg winery in Germany reports that harvest now takes place roughly 2-3 weeks earlier than it did through the 18th - 20th

20 See Appendix A. *Ibid.*, page 915.

21 *Ibid.*, page 914.

22 Fraga, Helder, *et al.* "Viticultural Irrigation Demands under Climate Change Scenarios in Portugal." (Alto Douro, Portugal: *Agricultural Water Management*, 2018) Vo. 196: 66-74. <https://www.sciencedirect.com/science/article/pii/S0378377417303499#bib0145>

23 *Ibid.*, page 67.

24 *Ibid.*

25 Fraga, Helder, *et al.* "Modelling Climate Change Impacts on Viticultural Yield." 3774-88.

26 Neethling, Etienne, *et al.* "Adapting Viticulture to Climate Change." (France: *LIFE ADVICLIM*, 2016) 5-39. <http://www.adviclim.eu/wp-content/uploads/2015/06/B1-deliverable.pdf>

27 Fraga, Helder, *et al.* "Viticultural Irrigation Demands." Vo. 196: 66-74.

28 *Ibid.*, page 68.

29 Fraga, Helder, *et al.* "An overview of climate change impacts on European viticulture." 102.

30 Mira de Orduña, Ramón. "Climate change associated effects on grape and wine quality and production." (Cornell University: *Food Research International*, 2010) Vo. 43, no. 7, 1844-1855. <https://www.sciencedirect.com/science/article/pii/S0963996910001535>

31 See Appendix B.

centuries.³² Grapes not only ripen prematurely due to an advance in warmer temperatures, but also because their phenology is inherently advanced.³³ This means budburst events happen sooner, compromising the quality of the wine because the plants do not have sufficient time to flower and ripen.³⁴ The solution therefore, is to advance harvest dates. These adjustments will make it easier to manage the annual variability in grape composition due to inconsistent seasons. A complementary solution to harvesting the grapes earlier is to entertain the idea of picking grapes at cooler temperatures of the days which have been recorded to happen at night.³⁵ Incorporating refrigerated spaces post harvest is also a viable strategy for example using refrigerated trucks during transports.³⁶ Stepping away from strict old world practices and considering earlier harvesting while maximizing cool temperatures, vineyards will lessen the vulnerability to warming temperatures.

APPROACH 5

Use of drought and heat resistant rootstocks

A key change in adapting to climate change in wine production will be planting grape vine varieties that have higher summer stress resistance and different thermal requirements.³⁷ This solution changes the historical rootstock that most wine plants are grafted onto and introduces them to rootstocks that are able to manage a larger variety of viticulture stresses.³⁸ This movement away from established

enological practices and to new technological developments is difficult for traditional wine cultivators because an important part of making wine in Europe incorporates a unique and traditional style of viticulture. Some rootstock varieties that are more suitable to dryer and warmer climates are Cabernet Franc, Cabernet-Sauvignon, Malbec, Merlot, Syrah, and Tempranillo.³⁹ Drought tolerances vary among vitis species and are dependent on the vine's ability to adapt to their natural habitats. Higher vigour rootstocks can explore root zones and reach deeper soil layers as a drought tolerance mechanism more so than low vigour rootstocks can.⁴⁰ Using rootstocks that induce longer cycles lend ripening to later periods and can therefore prolong harvesting. This is going to be especially useful for vineyards that become unsuitable for wines like Merlot and Cabernet-Sauvignon but can maintain their wine growing status by growing types that flourish in warmer climates such as Zinfandel and Carignane.⁴¹ A key advantage to root stock exploration is that is environmentally friendly and doesn't acquire new production costs.⁴²

APPROACH 6

Tillage systems for soil management

In terms of agricultural mitigation measures against climate change, tillage strategies are of key importance. Agitating the soil in this way has traditionally been used for stimulating plant competition and increasing plant performance and quality, but is now being explored as a solution for climate change adaptation.⁴³ Grape vines thrive in soils that provide water during the growing season but remain dry during ripening. Through conservation soil tillage (CST) some or

32 Ibid., page 1854.

33 Leeuwen, Cornelis Van, and Philippe Darriet. "The Impact of Climate Change on Viticulture and Wine Quality." (Bordeaux: *Journal of Wine Economics*, 2016) Vo. 11, no. 01: 150-67. <https://search.proquest.com/docview/1796348962/fulltextPDF/19C71598575C421C/PQ/1?accountid=14551>

34 See Appendix C.

35 Neethling, Etienne, et al. "Adapting Viticulture to Climate Change." (France: *LIFE ADVICLIM*, 2016) 5-39. <http://www.adviclim.eu/wp-content/uploads/2015/06/B1-deliverable.pdf>

36 Ibid., page 21.

37 Fraga, Helder, et al. "An overview of climate change impacts on European viticulture." 102.

38 Ibid., page 102.

39 Jones, G. V. "Climate and terroir: impacts of climate variability and change on wine." (Oregon: *Geoscience Canada*, 2006) 1-14. <https://www.linfield.edu/assets/files/Wine-Studies/GregJones/GJones%20Climate%20Change%20Geoscience%20Canada.pdf>

40 Neethling, Etienne, et al. "Adapting Viticulture to Climate Change." (France: *LIFE ADVICLIM*, 2016) 5-39. <http://www.adviclim.eu/wp-content/uploads/2015/06/B1-deliverable.pdf>

41 See Appendix D.

42 Ibid., page 25.

43 Fraga, Helder, et al. "An overview of climate change impacts on European viticulture." 103.

all of the previous season's crop matter is left on the surface of the field which cycles nutrients, protects from erosion and retains moisture. It is important to measure appropriate tilling strategies because while CST increases water use efficiency, and when practiced at the right level can contribute to lower soil evaporation; fields already embedded in loose soil are negatively affected by even the most cautious tilling.⁴⁴ Each soil type and terrain slope will require different tilling intensities and durations as soils on hillsides are at more risk of erosion if heavy tilling is implemented. Tillage systems have a copartner relationship with irrigation efforts as the soil becomes better equipped to store water. Tilling also reaps benefits in weed reduction and pest control because the disturbance of the soil kills pest habitats and breaks established weed roots.⁴⁵ Dovetailing this benefit, an increase of organic biomass in the soil naturally supports vine development while decreasing the reliance on heavy use of pesticides and fertilizers. Soil agitation also reduces greenhouse gas emissions by creating a carbon sequestration sink in the soil.⁴⁶ Although tillage amount would vary per region, this adjustable bottom up approach is a viable solution as it focuses on soil health to support wine preservation.

APPROACH 7

Cover cropping for soil management

Similar to the tillage approach, the use of cover crops benefits the soil first rather than an immediate application on the physical plant. In the case of vineyards, it incorporates planting perennial grass between rows of vines that cycle nutrients through the soil and maintain

water retention.⁴⁷ Cover cropping increases soil moisture water retention and the Tokaj region in Hungary is seeing this benefit firsthand. It was reported that covering the soil with straw mulch had a positive effect on the soil water content in this vineyard.⁴⁸ While there is validated concern of water competition due to the introduction of more plants in a field, some varieties of grape vines benefit from decreased accessibility to water because water over-consumption affects vegetative growth and takes energy away from reproductive growth and the development of berry clusters on the plants.⁴⁹ Implementing crop cover enables vines to get practically all of the nutrients necessary without external help from fertilizers and other sources.⁵⁰ Wine plants would then rely on organic content in the soil and take from stored carbon dioxide below the ground. In addition, the compounds in grape vines that are responsible for aroma and flavor such as the sugar-acid ratio are safeguarded due to cover crops.⁵¹ Inducing the growth of beneficial organisms in the soil, cover crops create a symbiotic environment in which the soils and grape vines both profit from.⁵² It is crucial to respect soil as a fundamental part of wine quality and consider its own sustainably of paramount importance.

RECOMMENDED COURSE OF ACTION

Although all of these approaches offer feasible options that strive to keep the wine industry

44 Ibid.

45 Neethling, Etienne, *et al.* "Adapting Viticulture to Climate Change." (France: *LIFE ADVICLIM*, 2016) 5-39.

46 J.E. Olesen, *et al.* "Consequences of climate change for European agricultural productivity, land use and policy." (Denmark and Florence: *European Journal of Agronomy*, 2002) <https://www.sciencedirect.com/science/article/pii/S1161030102000047>

47 Zhu-mei Xi, *et al.* "Impact of cover crops in vineyard on the aroma compounds of Vitis vinifera L. cv Cabernet Sauvignon wine," (City: *Food Chemistry*, 2011) Vo. 127, no. 2: 516-522. <https://www.sciencedirect.com/science/article/pii/S0308814611000999>

48 Fraga, Helder, *et al.* "An overview of climate change impacts on European viticulture." 103

49 Zhu-mei Xi, *et al.* "Impact of cover crops in vineyard on the aroma compounds." 520.

50 Schmidt, Hans Peter, *et al.* "Delinat Guidelines for organic wine-growing, organic wine-making and social aspects," (Switzerland: *Delinat*, 2013) 5. http://www.dc.delinat-institut.org/richtlinien/guidelines_delinat_2013.pdf

51 Zhu-mei Xi, *et al.* "Impact of cover crops in vineyard on the aroma compounds." 520.

52 Schmidt, Hans Peter. "Delinat Guidelines for organic wine-growing, organic wine-making and social aspects." 5.

alive through the challenges of climate change, the European region needs an integration of these ideas as one will not likely suffice as a promising solution on its own. Respecting growers as important stakeholders and the actors of these changes, decisions that compromise the old world quality legacy are not solutions growers are ready to entertain. Therefore, a combination of approaches one, four, five, six and seven is necessary for Europe to continue producing one of consumers' most enjoyed and reputable beverages.

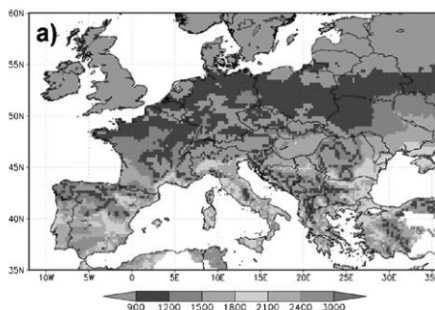
A restructuring of appellation standards would umbrella all of the proposed solutions because it would allow farmers to plant and maintain a wider range of varieties that could survive inconsistent temperature fluctuations and extreme weather events. Because there is some resistance to this idea, due to old world tradition, this change will take time to manifest. In the meantime, and in conjunction, a shift in harvesting is a necessary accommodation due to the development of phenological stages that will hasten with no regard to long-established practices. This solution is especially viable because of its easy implementation and absence of environmental and quantifiable economic costs. This approach pairs well with the introduction of heat and drought resistant varieties as these breeds have more flexibility in their environments. Planting varieties with a higher vigour rootstock combat drought limitations and can be suited for the representative regions that are at foreseeable risk of decreased precipitation. In essence, these solutions aim to allow growers to create a controlled agricultural scenario by limiting causal variables. If harvest time and rootstock breed become choices, cultivators can stabilize climatic variables by creating schedules for specific varieties.

The strategies of tilling and cover crops should be incorporated within the solutions aforementioned. Based on soil type in vineyards, farmers can utilize tillage to recycle nutrients that are susceptible to loss by runoff and maintain water retention to combat drought inevitability. Partnering tillage with cover crop techniques induces the grape plants to efficiently use water in support

of their reproductive growth rather than vegetative growth, optimizing yields in berry clusters. Paying attention to soil sustainability is imperative to managing vine health for the reason that wine plants produce optimal results in soil with specific characteristics.

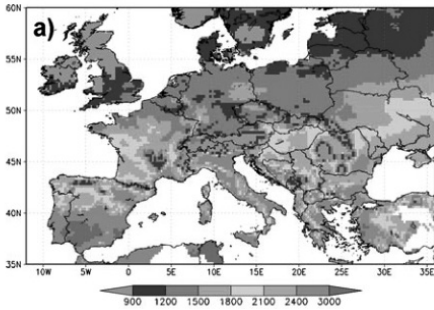
The implementation of these solutions in a multifaceted approach creates a space for growers to control the variables anticipated to be most affected by climate change. Producers and consumers alike understand the unique position European wine regions are in and both parties are hopeful and determined that through changes in climate, quality is not jeopardized. By combating the variability of climate change consequences, through introducing new appellation standards, controlled earlier harvesting dates, decisive rootstock changes, and soil management techniques, the European region will not only produce crop yields that survive climate challenges, but remain recognizable around the world for their influence in fine winemaking. 🌍

APPENDIX A⁵³



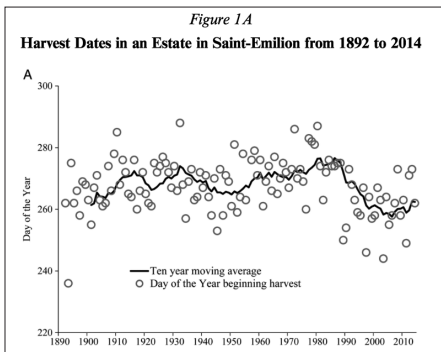
Huglin index (HI) measured between 1980-2009

⁵³ Fraga, Helder, *et al.* "Future Scenarios for Viticultural Zoning in Europe: Ensemble Projections and Uncertainties." (Alto Douro, Portugal: *International Journal of Biometeorology*; 2013) Vo. 57, no. 6: 915. <https://link.springer.com/content/pdf/10.1007%2Fs00484-012-0617-8.pdf>

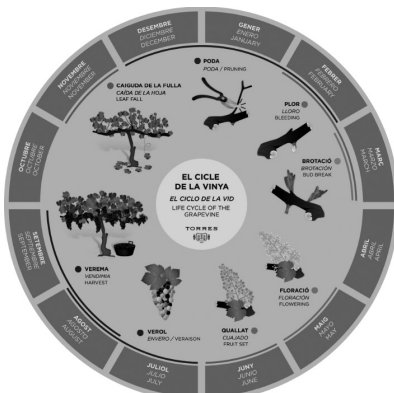


Future projections through HI 2041-2070

APPENDIX B⁵⁴



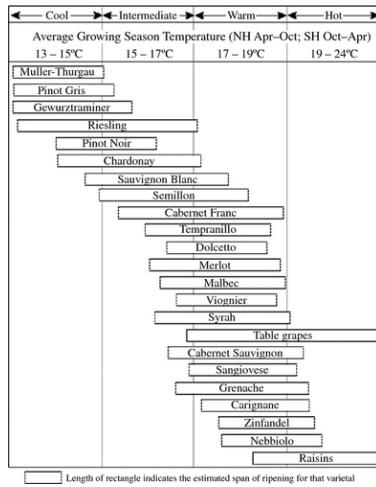
APPENDIX C⁵⁵



54 Fraga, Helder, *et al.* "An overview of climate change impacts on European viticulture." (*Food Energy Security*, 2012) Vo. 1: 97. <https://onlinelibrary.wiley.com/doi/full/10.1002/fes3.14>

55 Campbell, Ysla. "La Vida Es Breve: La Vida Es Sueño." *Memoria De La Palabra*, 2004, 429-36. <https://www.torres.es/ca/blog/planeta-vi/el-ciclo-de-la-vinya>

APPENDIX D⁵⁶



ADDITIONAL WORKS CONSULTED

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56 Leeuwen, Cornelis Van, and Philippe Darriet. "The Impact of Climate Change on Viticulture and Wine Quality." (*Bordeaux: Journal of Wine Economics*, 2016) Vo 11, no. 01: 153. <https://search.proquest.com/docview/1796348962/fulltextPDF/19C71598575C421C/PQ/1?accountid=14551>



Saving Venice from Rising Tides

– Kya-Xé Z. Dudney

ABSTRACT

Venice, Italy has been jeopardized by sea level rise and high tides since its early existence. For decades now engineers have been constructing a small-scale flood gate system aimed at protecting the city from rising tides. However, this system is only partially operational, expensive, and poses threat to the sensitive lagoon ecosystem. The rate of sea level rise is expected to increase at an alarming rate, therefore Venice is in need of an immediate solution. This paper analyzes the costs of the existing operation and proposes 4 solutions that work towards protecting the city from rising tides. The suggested approach recommends Venice pursue subsurface fluid injections, in conjunction with the flood gate operation. By implementing this action Venice could make progress in abating rising tides by producing a natural heave in elevation, all while limiting flood gate dependency.

OVERVIEW AND BACKGROUND

The “floating city” of Venice, Italy consists of 118 small islands in the heart of the North Venetian Lagoon.¹ The history of Venice began in early 400 A.D. when the first settlers sought refuge from barbaric conquerors on the Italian mainland.² Subsequently, this center for refuge transformed into what is now one of the most visited places in the world, because of its’ unique beauty. Since early existence this historically rich hotspot has been adversely affected by a combination of climatic and human activity related factors such as; flooding, land subsidence, mass-level tourism, and rapid

1 Ferraro, Joanne M. *Venice: History of the Floating City – Chronology of Historical Events*. (June 23, 2016), 2.

2 *Ibid*, xxiii

sea level rise (RSLR). As a result of oceanic and atmospheric warming, sea levels are expected to further increase at an alarming rate.^{3 4}

Given the low elevation of Venice, emerging at a mere 90 cm above the Northern Adriatic seal level; the city has historically been vulnerable to the regular flooding phenomenon of Acqua Alta, or “high tides.” Which by official definition; “Occur when water is higher than 90 cm (35.4 inches) above normal sea level (Venice Weather and Tide Forecasts).”⁵ Over the past decade frequency of Acqua Altas have increased by more than seven times, as a symptom of the Earth’s warming climate.⁶ The components of relative seal level rise (RSLR) in the 20th century have also contributed to the increasing frequency of these high tide events; which have detrimentally impacted the city’s infrastructure and inhabitants in various ways.⁷

As comparative records show, this severe pattern of flooding corresponds with rising tides that are primarily instigated by two climate change related factors; water thermal expansion and glacial melting.⁸ Independent of these two factors, Venice experiences local issues that do not mirror the global trends of sea level rise.⁹ Factors such as: land subsidence resulting from the withdrawal of groundwater and gas; prolonged winds; and an increase of atmospheric pressures due to the high state

of the North Atlantic Oscillation (NAO).¹⁰ With this combination of global and local issues, the city of Venice is more vulnerable to rising tides than ever before. The city has been identified as the most at risk to flooding (97%) among all of the Mediterranean UNESCO World Heritage Sites,¹¹ while the current rate of sea level rise has the potential to jeopardize Venice’s entire existence.

In short, an idea for a defense flood gate system has been in progress for approximately 40 years but it has yet to be complete, with costs rising billions of dollars above their predicted estimate. Given the current rates of RSLR and anthropogenic land subsidence, it is essential that a multi-layered plan be put forth immediately in order to save this Italian haven from rising tides.

POSSIBLE SOLUTIONS

APPROACH ONE

Maintaining the Status Quo - The MOSE System

The Venetian flood gate system of Modulo Sperimentale Elettromeccanic: Experimental Electromechanical Module (MOSE) began construction in the 1980s and has yet to be complete. The project has been financed by the Interministerial Committee for Economic Programming (CIPE) and other

3 “Is Sea Level Rising?” National Oceanic and Atmospheric Administration. U.S. Department of Commerce. Accessed March 26, 2019. <https://oceanservice.noaa.gov/facts/sealevel.html>

4 See Appendix A. “Past and Projected Changes in Global Sea Level”

5 “Venice Weather Forecasts.” Venice Weather and Tide Forecasts (updated daily). Accessed March 26, 2019. http://venicexplorer.net/venice_weather.php?hlang=en

6 “Venice Weather Forecasts.” Accessed March 26, 2019.

7 Carbognin, Laura, Pietro Teatini, Alberto Tomasin, and Luigi Tosi. *Global Change and Relative Sea Level Rise at Venice: What Impact in Term of Flooding*. Springer-Verlag. (June 7, 2009). Accessed March 26, 2019. <https://link.springer.com/content/pdf/10.1007/s00382-009-0617-5.pdf>.

8 *AR5 Climate Change 2013-Chapter 13: Sea Level Rise*. The Intergovernmental Panel on Climate Change (2013), 1139. Accessed March 26, 2019. https://www.ipcc.ch/site/assets/uploads/2018/02/WG1AR5_Chapter13_FINAL.pdf

9 Ibid, 1139.

10 Carbognin, Laura, rbognin, Laurthe Floating City. Chronology would have adverse cosmetic affects on the city; and ad corruption. Givenhigh cost *et. al. Global Change and Relative Sea Level Rise at Venice. Approached Solution: ions are Complete) h d for olitical corruption, which s in the conclusion so that way here yoivenhigh cost*

11 Reimann, Lena. Vafeidis, T. Athanasiois, *et. al.* “Mediterranean UNESCO World Heritage at Risk from Coastal Flooding and Erosion due to Sea-Level Rise.” *Nature Communication*. DOI: 10.1038/s41467-018-06645-9 (2018). Accessed: April 2, 2019. https://www.researchgate.net/publication/328316768_Mediterranean_UNESCO_World_Heritage_at_risk_from_coastal_flooding_and_erosion_due_to_sea-level_rise

small contributors.¹² In 2013, the construction company for MOSE was found guilty of diverting public funds through fake invoices; explaining why the project exceeded its 5 billion EU cost prediction.¹³ As a result of this scandal the remaining funds will be required to be looked after by the Committee for Policy, Coordination and Control (Comitatone) to ensure the project's progress, and avoid further corruption and combat public mistrust.¹⁴

The system when complete will consist of four separate barriers in the three main inlets of the lagoon,¹⁵ and will be composed of 78 floodgates total; each gate measuring 20 m tall.¹⁶ These structures will sit on the seabed during calm weather, and be activated when tides rise greater than 43 inches (110 cm).¹⁷ While this system is designed to protect Venice from a catastrophic flooding event, MOSE will not aid the existing flood phenomenon that take place in low-lying sites like Saint Mark's Square. Climate change projections determine the Mediterranean Sea will rise up to five feet prior to 2100; consequently the mean sea level (msl) for Venice could reach the threshold of 110 cm.¹⁸ If this were the case the flood gates would need to be activated on a regular basis, absent of an extreme water event. The

Venetians are aware of said projections, and continue to express worries moving forward with the project in regards to: gate activation time; rate of usage; ecosystem impacts; and maintenance costs.

APPROACH TWO

The Dutch Barrier System (Maeslantkering)

Amsterdam is a city that is comparably threatened by rising tides, and for thousands of years Dutch engineers have taken extraordinary precautions to manage sea level rise. The Maeslantkering (Maeslant) flood prevention system is of the largest in the world, having two 240 meter barriers resting visibly above sea level at the Rotterdam conduit.¹⁹ When water levels exceed three meters it triggers a computer module to close the gates horizontally; at an average rate of use being 10 times per year.²⁰

The Maeslant Barrier is of the cheaper flood gates systems, with total cost being 450 million euros to fully construct in six years.²¹ Meanwhile, MOSE has nearly tripled its budget estimate since beginning construction over 20 years ago.²² Considering the gates hover above the riverbed, they successfully avoid any issues of debris build up and resulting maintenance costs; many which the MOSE system encounters.²³

Given Venice's unique infrastructure and ecosystem, large-scale flood prevention projects like the Maeslant Barrier were and are not suitable for the city moving forward. Many civilians were in opposition because

12 MOSE. "Worksites." *Ministero delle Infrastrutture e dei Trasporti - Provveditorato Interregionale per le Opere Pubbliche del Veneto, Trentino Alto Adige, Friuli Venezia Giulia - Concessionario Consorzio Venezia Nuova*. Accessed: March 26, 2019. <https://www.mosevenezia.eu/mose/?lang=en>

13 MOSE. "Worksites."

14 Lo Storto, Corrado. "The MOSE Project: A Megaproject Case Study" *Mega Project EU*. Accessed May 8, 2019. http://www.mega-project.eu/assets/exp/resources/The_MOSE_project.pdf

15 Trincardi, F., A. Barbanti, M. Bastianini, A. Benetazzo, L. Cavaleri, J. Chiggiato, A. Papa, A. Pomaro, M. Sclavo, L. Tosi, and G. Umgiesser. 2016. The 1966 flooding of Venice: What time taught us for the future. *Oceanography* 29 (4), 178–186, Accessed: March 26, 2019. <https://doi.org/10.5670/oceanog.2016.87>

16 *Ibid*, P. 178–186.

17 Madricardo, Fantina. "High Resolution Multibeam and Hydrodynamic Datasets of Tide Channels and Inlets of the Venice Lagoon." *Scientific Data*. Vol: 4, Article No. 170121 (2017). Accessed: March 31, 2019. <https://www.nature.com/articles/sdata2017121#ref24>

18 Weeman, Katie. Lynch, Patrick. *Global Climate Change – Vital Signs of the Planet*. NASA. (February 13, 2018) Accessed: April 1, 2019. <https://climate.nasa.gov/news/2680/new-study-finds-sea-level-rise-accelerating/>

19 Earls, William. "Flood Prevention and Mose Mobile Gates." University of Pittsburgh Swanson School of Engineering, Session A10, Paper #42. (Submitted March 3, 2017), P. 7. Accessed April 14, 2019. <https://pdfs.semanticscholar.org/9c62/cc923845b456c37a5fe86b466705b42e92ee.pdf>

20 *Ibid*, P. 7

21 European Environmental Agency (EEA). "Storm Surge Gates/Flood Barriers (2015)." *European Climate Adaptation Platform Climate-ADAPT* (last updated May 5, 2015) Accessed April 14, 2019. <https://climate-adapt.eea.europa.eu/metadatas/adaptation-options/storm-surge-gates-flood-barriers>

22 Earls, William. "Flood Prevention and Mose Mobile Gates." P. 5

23 *Ibid*, P. 5

they claim that a system whose gates would be visible above water when not-active would “distract from the city’s beauty.”²⁴ While closing these large barriers at a frequent rate, would only disrupt the weak ecosystem and calm waters.²⁵ It is for these reasons that engineers were forced to craft the small-scale solution of MOSE. With its fast rate of operation, and lack of obtrusiveness being its biggest benefits and differences to the Dutch system.

APPROACH THREE

Building atop Existing Structures

Current structure foundations are weathering away as a result of high atmospheric concentrations of greenhouse gases, in combination with extreme flooding events that leave the brick corroded by the saltwater.²⁶ The rate of sinking is accelerating, and the infrastructure of the city is being further hampered from mass-levels of tourists that flood the city daily. It is essential that existing structures be repaired and that current inadequate infrastructure be improved upon, in order to ensure that Venice remains stable and above water. Existing local efforts that attempt to preserve building structures are not enough to withstand the rate of erosion, nor can they reverse already existing damage and stress on the brick.²⁷

Building restoration is necessary in many areas of the city; and is deemed a feasible solution that would create stronger, and taller, bases for buildings. Infrastructural improvements

that could be proposed include replacing eroding brick, or slicing buildings at the water line to raising them hydraulically to be placed on a higher foundation. Other options include proceeding with the further the development of the city inland, and adding manmade surface area to the lagoon that could provide higher bridges, plazas, with the potential of roadways. For Venice, battling unavoidable rising tides would be much easier if the city had higher, flatter, more developed grounds. Though it is of not a popular option amongst Venetians, because many believe that creating a modern city atop the old would alter the city’s distinct culture and heritage in such a way that it would become unrecognizable.

APPROACH FOUR

Subsurface Fluid Injection

In the mid-1990’s the extraction of groundwater, and gas caused the floors of the Venetian lagoon to sink, and between 1950 and 1970 the city’s land surface had dropped nearly 5 inches (12 cm).²⁸ The extraction has since halted because of legal repercussions, and the city is now sinking at a rate of less than 2 inches every decade.²⁹ Though land subsidence still occurs at a lesser rate, it proceeds to increase Venice’s vulnerability to rising tides.³⁰

A subsurface fluid injection trial that took place in Long Beach California, demonstrates how fluid injections can reverse the trend of subsidence when performed correctly.³¹ The trial that took place in Long Beach was done following a nearly 30 inch fall in overall elevation; the injections caused the subsiding

24 Earls, William. “Flood Prevention and Mose Mobile Gates.”, P. 6

25 Tam, Laura. “Strategies for Managing Sea Level Rise.” *The Urbanist* Issue 487 (First published November 1, 2009) Accessed April 14, 2019. <https://www.spur.org/publications/urbanist-article/2009-11-01/strategies-managing-sea-level-rise>

26 Del Monte, Marco, and Cristina Sabbioni. *Weddellite on Limestone in the Venice Environment Report No. 9*. Istituto Di Geologia, Università Di Bologna. Vol. 17. (1983), 518-22. Accessed: March 31, 2019. .rbognin, Laurthe Floating City. Chronology would have adverse cosmetic affects on the city; and ad corruption. Givenhigh cost

27 Imboden, Durant. “Venice’s Walls are Crumbling Down.” Venice for Visitors (Updated 2019). Accessed: March 30, 2019. <https://europeforvisitors.com/venice/articles/venice-saltwater-destroys-brick.htm>

28 Barbieri, C. A. Di Giulio, *et. al.* “Natural Subsidence of the Venice Area During the Last 60 Myr.” Vol. 19, Issue 1 (March 9, 2007) 105-123. Accessed: April 1, 2019.

29 Teatini, Pietro, Gambolati, G., *et. al.* “A New Hydrogeologic Model to Predict Anthropogenic Uplift of Venice.” *Water Resources Research* Vol. 47 Issue 12 (December 7, 2011). Accessed: March 31, 2019. <https://agupubs.onlinelibrary.wiley.com/doi/full/10.1029/2011WR010900>

30 *Ibid.*

31 Teatini, Pietro, *et. al.* “Land Uplift due to Subsurface Fluid Injection.” *Journal of Geodynamics* (January 2011). Accessed: March 31, 2019. <https://www.sciencedirect.com/science/article/pii/S0264370710000931#aep-section-id30>

area to reduce in size from 71 cm/year to 0 in 35 years; eventually subsidence in the area halted completely.³²

A realistic hydrogeological model has been simulated by researchers at the University of Padua, and provides definitive predictions for a similar uplift of Venice. Based on said predictions, researchers outlined a detailed plan of how to implement these injections within one to two years, which would be done in combination with the existing MOSE system.³³ The models identifies that 12 wells be constructed in a 10 km radius of the city,³⁴ which would pump approximately 40 billion gallons of fluid at high pressures 65-1000 m below the surface.³⁵ Over the course of a decade it would be expected that Venice would experience a natural uplift of approximately 12 inches. Given concerns of over injection, fluid would be pumped pragmatically at varying pressures, also done to successfully avoid structural damage and displacement.³⁶

RECOMMENDED APPROACH

The ongoing construction of the MOSE tide gate system is a positive step forward for the city of Venice, and is an essential component to fighting relative sea level rise (RSLR).³⁷ Though, as the project moves closer to completion it's anticipated that the gates will be used on a habitual basis, which will have adverse affects on the lagoon ecosystem. It is therefore essential that a solution be developed to help reduce these expected environmental and economic costs of Venice's current efforts. Moreover,

32 Ibid.

33 Teatini, Pietro, Gambolati, G., et al. "Anthropogenic Venice Uplift by Seawater Pumping into a Heterogeneous Aquifer System." *Water Resources Research* Vol. 46 Issue 11. Accessed: March 31, 2019. <https://agupubs.onlinelibrary.wiley.com/doi/full/10.1029/2010WR009161>

34 See Appendix B. "Feasible Pumping Sites"

35 "Anthropogenic Venice Uplift by Seawater Pumping into a Heterogeneous Aquifer System." Vol. 46 Issue 11 (November 24, 2010). Accessed: March 31, 2019. <https://agupubs.onlinelibrary.wiley.com/doi/full/10.1029/2010WR009161>

36 "Anthropogenic Venice Uplift by Seawater Pumping..." Accessed: March 31, 2019.

37 MOSE. "Worksites."

the policies in Approaches 2 and 3 are largely criticized by local Venetians and engineers, because of the way they alter the historically known image of the city. They fear that the Dutch gate system, and building atop existing structures, would alter the city so much that it would cause a loss of heritage and culture. This could result in Venice becoming less appealing to tourists, and if Venice were to experience a decline in tourism they may not create the revenue necessary to finance the completion of MOSE; this being their only existing solution to rising tides.

In order to prevent the looming long-term effects of sea level rise Venice must take a multifaceted approach of performing subsurface fluid injections, done in part with the MOSE barrier system. This would limit the use of the flood gates, which would reduce maintenance costs and simultaneously preserve Venice's culture and ecosystem. The subsurface of the lagoon suggests that performing fluid injections would produce a natural heave in elevation, while reversing the present natural subsidence experienced by the city.³⁸

Given the accurate and careful configuration of the hydrogeological model provided by the University of Padua, there is high certainty in the predicted uplift of the City that follow these injections. With there being high confidence in the projected model, the Interministerial Committee for Economic Programming (CIPE) and other current financial contributors to MOSE would feel comfortable with allocating public funds towards this. And when considering the previous public funding scandal regarding MOSE, locals are likely to entrust a newly proposed solution, especially one with higher a certainty of progress and an earlier implementation time.

The proposed project would entail multiple wells around a large parameter of the city, injections can be done at varying pressures, which would produce a uniform rise of land surface while avoiding issues of displacement

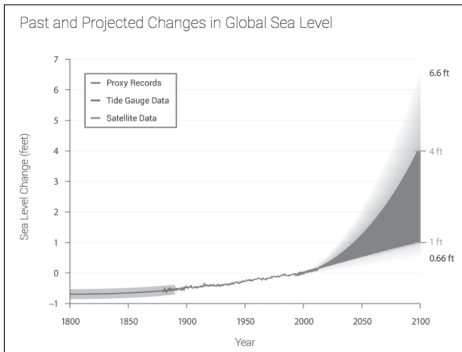
38 Teatini, Pietro. "A New Hydrogeologic Model to Predict Anthropogenic Uplift of Venice." Accessed: March 31, 2019.

and structural damage.³⁹ This escalation would: offset the predicted RSLR of the Northern Adriatic Sea; flatten the uplifted surface; reduce displacements of infrastructure and civilians, and limit the use of the high cost tide barrier system.

With the current rate of sea level rise, it is predicted that in less than 100 years Venice will be on the brink of drowning; with the waters that once protected the city now becoming its now greatest threat. In order to avoid such a historic travesty moving forward, Venice must embrace a newly proposed solution of performing subsurface fluid injections within the lagoon. The outcome of this project, and MOSE, would be of paramount importance to the city's waging war against rising tides because they would ensure the city's existence and prosperity in decades to come; by raising both Venice's elevation and chances of survival.



APPENDIX A ⁴⁰



Estimated, observed, and possible amounts of global sea level rise (1800 – 2100). The orange vertical line on the right shows the currently projected range of sea level rise of 1 to 4 feet by 2100. The large projected range represents climate uncertainty.

39 Teatini, Pietro. "A New Hydrogeologic Model to Predict Anthropogenic Uplift of Venice."

40 "Past and Projected Changes in Global Sea Level." Global Climate Change Gov. Accessed: March 31, 2019. <https://www.globalchange.gov/browse/multimedia/past-and-projected-changes-global-sea-level-rise>

APPENDIX B ⁴¹

Feasible Pumping Sites

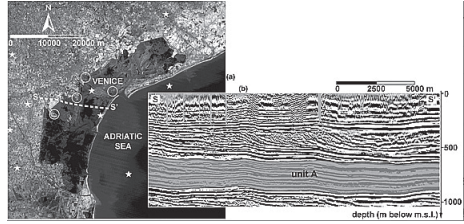


Figure 1a displays a Satellite image of the Venice Lagoon and Figure 1b shows a seismic section of the lagoon's Plio-Pleistocene subsoil (Also represented along the dashed line in Figure 1a). The locations of the four feasible implementation sites are shown by circles in Figure 1a. The white stars in Figure 1a give the location of the deep exploratory boreholes with available litho-stratigraphic information. The existing aquifer where the injections are planned to occur, is pointed out in Figure 1b as Unit A.

ADDITIONAL WORKS CONSULTED

Handwerk, Brian. "Injections Could Lift Venice 12 Inches, Study Suggests." National Geographic News. (January 12, 2012). Accessed: March 30, 2019.

<https://news.nationalgeographic.com/news/travelnews/2012/01/120112-venice-flooding-travel-science/>

Keahey, John. "Saving Venice from the Sea." PBS – NOVA. (November 18, 2002). Accessed: April 1, 2019.

<https://www.pbs.org/wgbh/nova/article/saving-venice/>

41 Teatini, Pietro, "Anthropogenic Venice Uplift by Seawater Pumping..." *Water Resources Research* Accessed: March 31, 2019. <https://agupubs.onlinelibrary.wiley.com/doi/full/10.1029/2010WR009161>



Normalization on the Korean Peninsula

– Ashton Mitchell

ABSTRACT

Due to an armistice that stopped the violence but not the war, North and South Korea have been separated by a heavily militarized border since the early 1950s. With the election of President Moon Jae-in of South Korea, whose main platform is normalization and cultural exchange with the North, and President Trump's communication with the North Korean dictator, the two nations have moved into an era of possible normalization that could lead to a peace treaty. Though there are many steps that must be taken before the war can end, looking at past examples of states in similar situations could give world leaders ideas of how they can help create this important relationship to benefit East Asia and the entire world.

BACKGROUND AND OVERVIEW

The two counties that currently take up the Korean Peninsula, North Korea and South Korea, have historically been a single Korea. The origins of the split began in 1910, when Korea became a colony of the Japanese Empire immediately following the collapse of Korea's Joseon Dynasty. Korea was not free until the Japanese lost World War II in 1945.¹ It was then that Korea found itself split in half and occupied by democratic American troops in the south and communist Russian troops in the north. Because Korea had not governed itself in decades, up and coming leaders were influenced by these forces and adopted their viewpoints. Each side elected their own leaders- Kim Il-sung in the north and Syngman Rhee in the south- and because Korea had never been separated, each leader wanted a unification of the peninsula under their own control. When the two leaders could not agree on a peaceful solution, tensions escalated until shots were fired over the border in 1950,

¹ Buzo, Adrian. *The Making of Modern Korea*. Third ed. Asia's Transformations. Milton Park, Abingdon, Oxon ; New York, NY: Routledge, 2017. 46-70.

beginning the Korean War as the North invaded the South.

Though the North had the advantage of the support and military force of the Soviet Union and Communist China, the South, with the help of the UN, specifically led by the United States, was eventually able to take back their lost territory and both sides stood still on the 38th parallel. In a desperate attempt to stop the violence, the two sides organized and signed a ceasefire in 1953. A peace treaty was discussed, but South Korea refused to sign because they hoped to eventually unite a fully democratic Korean Peninsula. Because of this, the Korean War is still technically ongoing to this day.²

Since the ceasefire, North Korea has built nuclear facilities where they have developed multiple long-range nuclear missiles and have conducted six missile tests over the Japanese archipelago, proving that they have the capability to not only attack South Korea, but Japan as well, which threatens all of East Asia.³ Any war on South Korean soil would lead to an intervention from the United States, as the two share an alliance that includes American troops on South Korean soil since the war.⁴ As well as this, the people of North Korea suffer from some of the worst human rights violations on the planet under the dictatorship of the Communist Chairman Kim Jong-un. Alleged criminals in North Korea are often sent to prison camps or executed without trial, as are all their family members. The people are taught to worship the Kim regime over everything from birth, and they are experiencing starvation and a lack of basic freedoms that causes some citizens to try to cross the border into China or South Korea.⁵

Normalization could mean an end to the tensions caused by the North, which causes politicians in the South to be keen on positive relations between the two Koreas- here, normalization is being specifically defined as an official end to the Korean War. It could also end the human rights violations. These hopes are especially shared by the current South Korean president, Moon Jae-in. Since he was elected, he made it clear that his priority is normalizing relations with North Korea. Kim Jong-un has also expressed interest in normalizing relations and has recently discussed the possibility of a peace treaty and denuclearization in summits with both President Moon and President Trump. Though the summits have yet to result in anything concrete, they are still the most progressive things to happen when it comes to relations on the Korean Peninsula in the past 70 years. However, due to Kim Jong-un's unpredictability, achieving normalization, and by extension, unification, could happen in a variety of different ways, though all involve an official end to the Korean War.

POSSIBLE SOLUTIONS

SOLUTION 1

Continuation of the War (The Vietnam Model)

The solution that the international community is trying to avoid is the continuation of the Korean War, where the ceasefire ends and troops from the North and the South are once again in open combat. Like Korea, Vietnam was separated into a communist north and a democratic south, the two of which went to war in 1955. The Vietnam War resulted in North Vietnam taking over the entire country, uniting it into one communist Vietnam.⁶ With North Korea's multitude of threats to South Korea and the United States, and North Korea's nuclear capacity, it is not a stretch to believe that a nuclear Korean war is a possibility. However, with American troops still on South Korean soil, reigniting the war in Korea means a war with the United States, the

2 Stueck, William Whitney. *The Korean War an International History*. Princeton Studies in International History and Politics. Princeton, N.J.: Princeton University Press, 1995. 5-32.

3 CNN Library. (2015). North Korea Nuclear Timeline Fast Facts. CNN Wire, p. CNN Wire, May 14, 2015.

4 Pan, Esther. "South Korea's Ties with China, Japan, and the U.S.: Defining a New Role in a Dangerous Neighborhood." Council on Foreign Relations. February 8, 2006. Accessed April 2019. <https://www.cfr.org/backgrounder/south-koreas-ties-china-japan-and-us-defining-new-role-dangerous-neighborhood>.

5 Grimm, L. (2015). United Nations Report on North Korea's Human Rights Abuses. 49-52.

6 Willbanks, J. (2013). *Vietnam War*. Santa Barbara: ABC-CLIO.

size and strength of the US military could mean the complete end of North Korea and the Kim rule, and Kim Jong-un is aware of this fact. However, it is likely that China and Russia would back North Korea again, meaning a worldwide nuclear war could break out. Though this is the most violent possibility, this would put an end to the Korean War and result in a single unified Korea when one side is victorious.

SOLUTION 2

Peaceful Forced Unification (The Germany Model)

Many South Korean politicians and NGOs that are supportive of a unified Korean peninsula view the 1990 reunification of Germany as a model for Korea.⁷ At first glance, this looks like a perfect model to base a peaceful normalization of Korea on, as the two situations are very similar. West and East Germany were both separated by a militarized border to maintain the boundaries of the communist east and the democratic west. Currently, North and South Korea lack a peace treaty, which is imperative for this model. The Basic Treaty of Germany was only able to exist when the two sides agreed to acknowledge the others sovereignty.

This is exactly what North and South Korea refuse to do, as neither view the other as a sovereign state. As East Germany began to collapse, the positive relationship they had with the west allowed for an east and peaceful reunification.⁸ Were North Korea on the verge of collapse like East Germany was, there would be a pressing need to change their current view of the south. If there was also an uproar from the people on either side for unification, it would pressure the Koreas to move towards a faster normalization, a development peace treaty between the two countries would set the foundation. North and South Korea have recently discussed allowing the North citizens

more freedom when it comes to sharing culture with the South, which was a main driving force in Germany.⁹

SOLUTION 3

One Country, Two Systems (The Hong Kong Model)

A common phrase thrown around among Korean politicians is “One country, two governments.” Originally proposed by Kim Il-sung, this solution would create a single Korea governed under one federal government for international relations and defense, and two state governments to handle internal affairs in the North and the South. This would allow the two sides to maintain their views and power but also be officially recognized as a single Korea. In the past, South Korea has tried to work toward a freer version of this system, one that begins with a long-term cooperation on the Korean peninsula before anything more drastic is discussed.¹⁰

This one country, two systems concept has already been seen in Hong Kong, where communist China maintains ultimate control, but Hong Kong remains capitalist. It allowed for a peaceful transition of power from once British controlled Hong Kong who, though originally a Chinese territory, had become accustomed to 150 years of non-Chinese governing. The current gap in North and South Korea’s economies makes true unification incredibly difficult, as the South would suddenly be economically responsible for the North. This system would allow for a technical unification, but the two governments would still maintain some control over their side, resulting in a slow but full unification over a long period of time.¹¹ If

7 People for Successful COrean REunification. “Why Reunification?” PSCORE. Accessed March 06, 2019. <http://pscore.org/newest/about-us/why-reunification/>.

8 Grady, Tim. “A Shared Environment: German–German Relations along the Border, 1945–72.” *Journal of Contemporary History* 50.3 (2015): 660-79. Web.

9 Koll, Jesper. “Germany’s Unification Lessons for Korea.” *The Japan Times*. Accessed April 2019. <https://www.japantimes.co.jp/opinion/2018/06/01/commentary/world-commentary/germanys-unification-lessons-korea/>.

10 Power, John. “Could Hong Kong’s ‘one Country, Two Systems’ Work for Korea?” *South China Morning Post*. October 27, 2018. Accessed March 29, 2019. <https://www.scmp.com/week-asia/geopolitics/article/2170456/could-hong-kongs-one-country-two-systems-work-korea>.

11 Yeo, Jun-suk. “Two Koreas Need to Learn from China’s ‘one Country, Two Systems’.” *The Korea Herald*. August 14, 2018. Accessed April 2019. <http://www.koreaherald.com/view.php?ud=20180814000728>.

implemented in Korea, it would allow for a close and positive relationship between the North and South.¹²

SOLUTION 4

North Korean Revolution (The Libya Model)

Many past attempts at normalization have been sabotaged by the unpredictability of the Kim regime. It is therefore a viable option for Kim Jong-un to be overthrown, much like Libya's leader Muammar al-Gaddafi who was overthrown after the Libyan revolution in 2011. Like Kim Jong-un, Gaddafi was a dictator who was responsible for many human rights violations. When the opportunity presented itself, the Libyan people rebelled, leading to a full-scale civil war. This war was backed by international powers against Gaddafi, including NATO, which ultimately led to his downfall.¹³

A North Korean revolution could present the same results, meaning an end to the Kim regime. Libya had no clear plan after the war, which resulted in chaos. North Korea, on the other hand, has the advantage of having South Korea next door to help. A weak country after a civil war is likely to accept help, no matter the cost. Especially if that cost is full denuclearization, which has only been an issue in the past because of Kim Jong-un's priorities. A lack of immediate leadership is also the perfect time for South Korea to take control, whether they decide on going for the full unification route or not.¹⁴

SOLUTION 5

China's Push

Though the relationship between North Korea and China is not as strong as it was during the Cold War, North Korea still relies on China so it does not collapse. China has provided North Korea with military aid, consumable goods, and most importantly, economic trade. This support has also helped North Korea avoid overly harsh sanctions from the UN. In the past, China has claimed to support normalization on the Korean Peninsula for the good of the East Asian region, but they have also been more likely to support North Korea on international issues to help maintain their control over the area for personal gain. Siding with North Korea means China is going against South Korea and their allies, specifically the competing dominant power of the United States.¹⁵

However, China is quickly on its way to becoming the largest economy in the world with no signs of stopping. It is not impossible to believe that China could change and risk losing North Korea to help push positive inter-Korean relations. This decision could lead to a better relationship between China and South Korea as well, which would result in more power for China in the long run, were the Koreans ever to unify.¹⁶ The possibility has become more likely as Kim Jong-un has quickly advanced his nuclear capabilities. Despite North Korea's core value to remain self-sufficient and independent, China's choice to no longer support North Korea via aid could be the final push North Korea to need normalized relations with South Korea to maintain their economy.¹⁷

12 Cheung, Jimmy, and Tony Cheung. "Beijing and Hong Kong ... 20 Years of Tension Explained." *South China Morning Post*. July 20, 2018. Accessed March 29, 2019. <https://www.scmp.com/news/hong-kong/politics/article/2097872/balancing-one-country-two-systems-look-back-20-years-often>.

13 Laub, Karin. "NATO Powers Reject Gadhafi's Truce Offer." *CNBC*. April 30, 2011. Accessed March 29, 2019. <https://www.cnn.com/id/42836064>.

14 Vandewalle, Dirk. "After Gaddafi.(World)(Muammar Al-Qaddafi)." *Newsweek* 157.10 (2011): 21. Web.

15 Kim, Jin-moo. "North Korea's Reliance on China and China's Influence on North Korea." *The Korean Journal of Defense Analysis* 23, no. 2 (June 2011).

16 Kluver, Randy, Dean, Robert Hinck, and Skye Cooley. "Will China Help Trump Denuclearize North Korea?" *The Conversation*. November 15, 2018. Accessed April 2019. <https://theconversation.com/will-china-help-trump-denuclearize-north-korea-101586>.

17 Jun, Byoung-kon, and Jang-ho Kim. "China's Role and Perception of a Unified Korea." *The Korean Journal of Defense Analysis* 25, no. 3 (September 2013).

SOLUTION 6

Changes in US Sanctions

The US, which is usually considered the enemy of North Korea and communism, seems to have just as much influence over North Korea as China does. Though the UN has placed multiple sanctions on North Korea, China's status has prevented these sanctions from being too harsh. This leaves nations against North Korea to impose their own sanctions on the country as they see fit, and the US has imposed the most.¹⁸ US sanctions against North Korea were mainly put in place in response to North Korea's extensive nuclear capabilities. The hope was that North Korea would choose to denuclearize in order to get the sanctions taken off, as they are extremely damaging to their already weak economy. This has yet to work, and many sources claim that adding more aggressive sanctions could only anger Kim Jong-un, resulting in the opposite of the desired effect.¹⁹

However, the recent summits between President Trump and Kim Jong-un are historical, as both leaders have expressed an interest in a positive relationship between the two countries. Most notably, Chairman Kim has claimed he is willing to denuclearize if the US agrees to move American troops out of South Korea, or sanctions are lowered first. Denuclearization could mean the end of harsh sanctions for the North, and it would allow South Korea to help the North economically. This is an important step, as South Korea has stated that they will not consider a peace treaty until North Korea agrees to denuclearization. When denuclearization is achieved and sanctions lifted, South Korea can begin peaceful talks with the North without fear.²⁰

18 Tae-Seop, Bahng. "US Sanctions on North Korea and Their Implications." *SERI Quarterly* 3.4 (2010): 118-23,9. Web.

19 Friedman, Uri. "The Plan to Resurrect the North Korea Nuclear Talks." *The Atlantic*. April 11, 2019. Accessed April 11, 2019. <https://www.theatlantic.com/politics/archive/2019/04/south-korea-wants-bring-trump-and-kim-together-again/586894/>.

20 Sanger, David E., and Edward Wong. "How the Trump-Kim Summit Failed: Big Threats, Big Egos, Bad Bets." *The New York Times*. March 02, 2019. Accessed March 29, 2019. <https://www.nytimes.com/2019/03/02/world/asia/trump-kim-jong-un-summit.html>.

SOLUTION 7

Six Party Talks

In 2003, the two Koreas, USA, Russia, China, and Japan created the Six Party Talks, which were a series of meetings to discuss the control of North Korea's nuclear weapons and find a peaceful solution. During the talks, North Korea agreed to complete denuclearization. Kim Jong-il, however, never followed through with his agreement, and North Korea completely pulled out of the talks in 2009.²¹ The Six Party talks likely failed due to the selfishness of each party, as each was working toward their own personal goals instead of one common goal, making it impossible to agree on a solution. China, for example, was against any change in North Korea for fear of North Korean refugees flowing into China.

Since Kim Jong-un has greatly expanded North Korea's nuclear arsenal since his father pulled out of the talks, a reemergence of the Six Party Talks may result in a much better outcome. The United States under the Bush administration was very unlikely to compromise, as they did not even want to discuss anything one-on-one with North Korea. Again, however, the United States under the Trump administration is not opposed to discussing normalization, as has been seen with the US and North Korea summits.²²

SOLUTION 8

The Sunshine Policy

In 1998, South Korean president Kim Dae-jung created the Sunshine Policy in order to create a more positive relationship between the two Koreas. This was aimed to do two things: First, for the South to provide economic aid to the North, and second, to soften North Korea's negative view of South Korea. Though it looked promising, North Korea used the extra money to

21 Chung, Eun-sook. "Long-Stalled Six-Party Talks on North Korea's Nuclear Program: Positions of Countries Involved." *The Korean Journal of Defense Analysis* 25, no. 1 (March 2013): 1-15.

22 Bajoria, Jayshree, and Beina Xu. "The Six Party Talks on North Korea's Nuclear Program." *Council on Foreign Relations*. September 30, 2013. Accessed March 29, 2019. <https://www.cfr.org/background/six-party-talks-north-koreas-nuclear-program>.

continue to develop nuclear weapons, causing the Sunshine Policy to fade out in the late 2000s.²³

With the election of President Moon Jae-in, many aspects of the Sunshine Policy are making a comeback. President Moon and Chairman Kim have met for three summits, and there have only been a total of five since the separation, which suggests that there would be more communication between the Koreas if the Sunshine Policy were to be implemented once again. Most notably, President Moon has expressed interest in allowing South Koreans to tour the North, establishing a railroad to connect the Koreas, and reopening the Kaesong Industrial Complex. Establishing positive communication between the two leaders could lead to easier and faster joint economic projects when they are allowed. Promises of the reestablishment of the Sunshine Policy from a trusted source like Moon could also make Kim Jong-un more likely to compromise when it comes to things like denuclearization.²⁴

SOLUTION 9

Korean Cultural Exchange

One of the biggest and yet overlooked roadblocks is the opinion of the Korean people on both sides. The younger South Korean people are a generation that has not lived in a time where Korea was not separated. The youths in South Korea do not remember the devastation of the Korean War, and often forget that the North is even considered Korea at all.

There is, however, a possible way to get through to the people. If North Korean citizens were exposed to the trends of South Korea, such as fashion and music, the South Korean citizens would be much more likely to support normalization. This concept has been successfully implemented in Japan, where The Council on the Promotion of Cultural Diplomacy has been held. This council works

to spread Japanese culture in order to make Japan itself more attractive to foreign citizens and leaders. It also helps foreigners understand Japanese thought and decision making.²⁵ This kind of exchange would be incredibly easy to implement, as South Korean music stars have already gotten the chance to perform at a special concert to promote normalization in North Korea. Kim Jong-un himself adjusted his schedule in order to see South Korean girl group Red Velvet perform in Pyongyang and personally praised them. He has expressed that he would like to see more cultural exchange like this in the future.²⁶ Promoting a Korean cultural exchange program between the two Koreas could relax tensions and lead to easier decisions when it comes to peace treaties.

RECOMMENDATION

Loosening Sanctions and Denuclearizing Little by Little so the Sunshine Policy is Possible

Normalizing the Korean Peninsula would not only help to stabilize the entire East Asian region, but also relax the tensions between North Korea and the United States. North Korea's ever-present threat of nuclear war would no longer be a prominent issue in the minds of South Koreans and the rest of the world, as denuclearization and normalization go hand in hand. Therefore, it is imperative that world powers are on the course for Korean normalization.

The best course of action is for foreign powers to take small steps in lowering the sanctions on North Korea. Due to the sheer unpredictability of Kim Jong-un and the North Korean regime and because no previous talks have been successful in getting one side to relent first, going back and forth between the US and eventually the UN loosening sanctions, and the

23 Hogarth, Hyun-Key Kim. "South Korea's Sunshine Policy, Reciprocity and Nationhood." Perspectives on Global Development and Technology 11.1 (2012): 99-111. Web.

24 Moon Jae-in's grand design for the Korean peninsula. (2018). The Economist (Online), p. 18.

25 "Establishing Japan as a "Peaceful Nation of Cultural Exchange"." Basic Policies for Urban Renaissance. Accessed April 01, 2019. http://japan.kantei.go.jp/policy/bunka/050711bunka_e.html.

26 "Kim Jong-un Hails Girl Band Red Velvet, Who Serenade Him with 'Bad Boy'." South China Morning Post. July 20, 2018. Accessed April 01, 2019. <https://www.scmp.com/news/asia/east-asia/article/2139857/kim-jong-un-red-velvet-superfan-praising-k-pop-girl-band-who>.

North slowly denuclearizing, could successfully result in normalization. This could also build trust between North Korea and the rest of the world, who has seen Chairman Kim back out of many of his previous and more demanding promises.

The importance of beginning small on this issue cannot be overstated. If all the sanctions are loosened at once, North Korea could once again back out of the deal with an incredible amount of freedom and the same mindset and nuclear arsenal. If the first step were North Korea heavily denuclearizing with no proof of other countries keeping their end of the deal, North Korea would likely never even begin the process of denuclearization. Kim Jong-un needs incentive before he will do anything, meaning someone else would have to make the first move, no matter how small.

The loosening of sanctions would make it legal for South Korea to aid North Korea economically via the Sunshine Policy. Building a railroad that goes through both the North and the South and allowing South Korean tourists into the North would also allow for much needed cultural exchange between the people of the two nations, who are now facing a generation who does not remember a unified Korea. This solution, of course, requires a unified effort from both North Korea and South Korea and flexibility from their allies, but it seems very plausible now that leaders often communicate with one another and have expressed their hopes for better relations. The combined forces of politicians and people of both Koreas is something that has not been seen since the Kaesong Industrial Complex. When this kind of cooperation is widespread on the peninsula, the people will have the opportunity to exchange cultures and once again consider the possibility of being one single Korea. 🌐

APPENDIX A

Frequency of North Korean Nuclear Tests²⁷



²⁷ Macias, Amanda. "North Korea's Growing Nuclear Threat - in 3 Charts." CNBC. March 16, 2018. Accessed April 01, 2019. <https://www.cnbc.com/2018/03/15/north-korea-nuclear-threat-in-3-charts.html>.



Maintaining Security and Stability in the Arctic

– Cole Keehner

ABSTRACT

Human activity in the Arctic is increasing and has large implications for the security and stability in the region. The decisions made by the Arctic States, outside states, businesses, and international organizations will change the Arctic forever. Currently the situation is stable but this can rapidly change and the Arctic is at risk of becoming an arena of competition and spill over from conflicts elsewhere. The opportunity exists for a renewed commitment to human security, cooperation, and trust as the Arctic enters into a new century. This will require decision makers to challenge assumptions and seek creative solutions and compromises. The best path forward involves a combination of reforming the Arctic Council and protecting its role as a space for traditional competitors to find common ground in a vulnerable region, strengthen existing agreements like UNCLOS, and prepare contingency and develop strategies for action in the rapidly changing circumstances through partnerships like the NATO.

OVERVIEW, HISTORY, AND DEFINITION OF THE ISSUE

During the Cold War, the Arctic Ocean and lands in the circumpolar north had strategic importance between the democratic West and the communist East. The Arctic was characterized by the deployment of strategic nuclear weapons and warhead carrying submarines. This militarized character of the Arctic changed after the collapse of the Soviet Union, and the region entered into a period characterized by cooperation, scientific research, protection of indigenous rights, and relatively modest resource extraction and

speculation.¹ This current situation is under threat and action must be taken to continue the cooperation and coordination currently being undertaken. In the face of global climate change global actors increasingly see the Arctic as a “hotspot” for resources and a new route for shipping goods from East Asia to the North Atlantic.² Security is no longer viewed through the lens of deployment of strategic weapon systems and military formations, and has been generally broadened to include economic, human and food security, all issues that must be focused on to keep the region stable and secure. This broadened definition of security is largely the result of the work of the Arctic Council, an international body made up of eight Arctic States (A8) including the United States, Russia, Denmark, Norway, Finland, Iceland, Canada, and Sweden; as well as permanent participants from indigenous groups and outside observers.

This situation between the various actors becomes further complicated by outside changes in the geopolitical landscape, namely the Ukrainian Crisis.³ The use of force by the Russian Federation in 2014 has many Arctic States questioning the spirit of Russia's cooperation, especially given Russia's buildup of military power in the region. While much of this military buildup is for Search and Rescue operations, it has caused some Arctic States such as Denmark and Norway to feel less confident about the intentions of their northern neighbor. On the outside of it all are actors like the People's Republic of China who desire to play an assertive role in the future of the Arctic, which has created mistrust between the Arctic States and non-Arctic outsiders.

Other organizations and frameworks are involved in the Arctic and have roles to play in its future. The International Maritime Organization is a United Nations specialized agency responsible for the safety and security of shipping and works to prevent pollution of maritime environments. The International Maritime Organization (IMO) has legal power and has a history of building binding agreements between states, and has attended Arctic Council meetings as an observer. United Nations Convention on the Law of the Sea is the binding agreement that governs the legal status of the territorial sea, airspace, and seabed and subsoil. Currently the status of the Lomonosov Ridge under the North Pole is disputed between Canada, Denmark, and Russia; and is being settled by the Commission on the Limits of the Continental Shelf. The North Atlantic Treaty Organization is an alliance in Europe that is significantly concerned with Russia's behavior. Five of the eight members of the Arctic Council are also members of the North Atlantic Treaty Organization (NATO). The interplay between these actors will shape the future of security and stability in the Arctic for decades to come.

APPROACH 1

Maintain the Status Quo, with slight alterations to the Arctic Council

Instead of focusing on multilateral security agreements, the A8 should instead develop confidence building measures and focus attention on making modest reforms to the Arctic Council, including streamlining its working groups and becoming more inclusive and demanding of observer's states and other organizations.⁴ Currently, there are no inherent mechanisms for working groups to know what others are doing, and overlap between their works exists. It is the responsibility of individual member states to reduce overlap and conduct internal reporting. This responsibility should be shifted to an enhanced Secretariat, headed by a Secretary General, with the ability to directly engage with government ministers of the member states. The Secretary General would have greater ability to prioritize activities

1 Martin Eduard Debusmann, “Heather A. Conley and Matthew Melino: An Arctic Redesign. Recommendations to Rejuvenate the Arctic Council. 2016.” SIRIUS - Zeitschrift Für Strategische Analysen 1, no. 2 (2017): , accessed April 2, 2019, doi:10.1515/sirius-2017-0046.

2 Timothy L. Thomas, *Russia Military Strategy: Impacting 21st Century Reform and Geopolitics* (Fort Leavenworth, Ks.: Foreign Military Studies Office, 2015).

3 Ragnhild Groenning, *Military Security Cooperation in the Arctic: A Path of Peace or a Spiral of Insecurity?* Master's thesis, George Washington University, 2016 (Ann Arbor: ProQuest, 2016).

4 Debusmann, *An Arctic Redesign*. (2017)

and recommendations that are actionable and able to be implemented. Combining their efforts and improving internal communication and reporting would allow for more effective efforts to be made. Continuing to clarify the role of observers is desirable, as observers are able to provide new resources and expertise to the Arctic Council to further its work on sustainable development, protection of the marine environment, and protection of the rights of indigenous groups. Their inclusion is needed if a uniform, nondiscriminatory set of rules is desirable. This would also lead to greater regional stability and security by allowing a unified approach between Arctic and non-Arctic states and other actors in solving future problems in this sensitive region.

APPROACH 2

Strengthen current operational international legal regimes to govern the Arctic Ocean

The strengthening of current international legal regimes is necessary to ensure that regulations pertaining to the protection of the environment are consistent and effectively enforced, and regional problems are addressed in a more comprehensive and timely manner.⁵ This is supported by the five Arctic littoral states (A5) in the Ilulissat Declaration, which calls upon a strengthening of current regimes and increasing cooperation.⁶ The most likely and effective way to do this would be within the legal foundation of the UN Convention on the Law of the Sea (UNCLOS). There is consensus between both Arctic and non-Arctic States in this regard. Art. 122 and 123 of UNCLOS defines Enclosed or Semi-Enclosed Seas, and Art. 197 defines Regional Seas. Looking at the Arctic Ocean, which is the world's smallest and shallowest, it is possible to apply these articles to it as a Semi-Enclosed sea. This is appealing to the A5 because it calls for the coastal states to be the

leading role. However, Non-Arctic states would prefer an ordinary Regional Seas agreement, as it calls for more equality between states in decision making. Creating a sort of hybrid arrangement for the Arctic Ocean is a way forward, and it can be done under the UNCLOS framework, which is desirable to Arctic and Non-Arctic state alike⁷. Furthermore, cooperation between the IMO and the Arctic Council should be a priority. By strengthening already existing relationships, the current regime will be more successful in making the region a cleaner, safer, and more prosperous place for all in the region.⁸

APPROACH 3

Clarify NATO Arctic strategy

Currently the military situation in the Arctic is stable, but this situation could change due to spillover from other conflicts. To be prepared for this and assure NATO members who are also Arctic States, NATO must create a security strategy for the Arctic. Increasing troop presence or deploying weapon systems into the Arctic is not desirable, as it will likely cause Russia to escalate and put the spirit of cooperation in the Arctic into jeopardy, and an Arctic arms race should be avoided. Instead NATO should build capacity to monitor developments happening in the Arctic, create an Arctic working group at NATO headquarters to identify, review, and evaluate potential security concerns and develop plans to help allied Arctic States improve SAR capabilities. These actions will unlikely be of serious concern to Russia, and would be viewed as a natural development in light of increasing human activity within the region. There is also disagreement within the alliance on just how involved NATO should be in the Arctic⁹, and this solution is a good “middle

5 Catherine Emmett and James Stuhltrager, “After the Ice Melts: The Need for a New Arctic Agreement,” *American Bar Association* 26, no. 2 (Fall 2011): 33-35, accessed April 2, 2019, New Arctic Agreement.

6 The Arctic Council, *The Ilulissat Declaration: Arctic Ocean Conference*, Ilulissat, Greenland, 27-29 May 2008 (Tromsø, Norway: Arctic Council, 2008)

7 Oran Young, “Governing the Arctic Ocean,” *Elsevier* 72 (April 24, 2016): , accessed April 14, 2019, keyword: Governance, Operational regimes, Arctic.

8 Ilker Basaran, “The Future of Arctic Navigation: Cooperation Between the International Maritime Organization and Arctic Council,” *Journal of Maritime Law & Commerce* 48, no. 1 (January 2017): , accessed April 2019, keyword: Cooperation IMO Arctic Council.

9 Valery Konyshev and Aleksandr Sergunin, “The Arctic at the Crossroads of Geopolitical Interests,” *Russian Politics & Law* 50, no. 2 (2012): , doi:10.2753/rup1061-1940500202.

ground” and will reassure states like Norway that NATO is paying attention to the region, while not frustrating Canada, who would rather NATO left security in the Arctic to the Arctic States themselves. NATO should also place attention on other potential threats, such as China’s strategy in the High North, and keep the alliance informed.¹⁰

APPROACH 4

Realign US Unified Combatant Commands and designate the European Command as the lead Command for the Arctic

As outlined by the US National Security Presidential Directive 66, the US has a clear interest in maintaining security in the Arctic. Currently responsibility for the Arctic is split between the US Northern Command and US European Command (EUCOM). The US Joint Chiefs of Staff should realign the Unified Combatant Commands and designate EUCOM as the lead command¹¹. Six of seven non-US Arctic states fall within EUCOM’s Area of Responsibility. Two non-NATO Arctic States, Finland and Sweden, are enhanced opportunity partners. The US has the smallest geographic hold in the Arctic and should pursue security in a multilateral fashion with its allies. EUCOM’s robust history of cooperation and engagement with NATO would allow for optimization of resources and enhance coordination. Having EUCOM take the lead will facilitate coordination and cooperation with allies, while reducing overlap between US Combatant Commands. EUCOM’s position in Europe is best for cooperation, training, and information sharing. The US should lead NATO in developing an Arctic strategy as outlined above. This organizational change will incur large benefits for US commanders and allies, without escalating military tensions in the region. Russia

10 North Atlantic Treaty Organization, Political Committee, NATO and Security in the Arctic, by Gerald E. Connolly (2017), 89.

11 Daniel Kochis, “Designating EUCOM Lead Combatant Command in the Arctic Will Better Protect U.S. Interests,” The Heritage Foundation, , accessed April 14, 2019, <https://www.heritage.org/global-politics/report/designating-eucom-lead-combatant-command-the-arctic-will-better-protect-us>.

has its own Joint-Strategic Command¹² taking lead in the Arctic for its military forces, the US must follow suit to stay situationally aware.

APPROACH 5

Broaden the Arctic Councils mandate to include hard security issues

The Arctic Council is primarily focused on scientific, sustainable development, and environmental issues, but explicitly did not include “hard security” issues as part of its mandate.¹³ This mandate worked until now, as relations between the West and Russia were largely cooperative. Twenty-three years after the creation of the Arctic Council and the surge of interest in the region globally, the Arctic Council cannot keep up with demands for more participation by outside stakeholders, or deal with new cross cutting issues. The current mandate is not enough and makes it difficult for the council to address questions of security in a meaningful and comprehensive way.¹⁴ The Arctic Council needs to change into a body akin to the Organization for Cooperation and Security in Europe. This Arctic Security and Cooperation Organization will tackle economic, human, and security issues, to ensure that confidence building and cooperation. The first binding agreement organized by the Arctic Council pertained to the use of Coast Guard ships to conduct search and rescue operations, and over time such practices of “soft security” may erode to give way to “hard security” issues naturally. By using the Arctic Council to address security issues, it can allow for multilateral contact when bilateral military contact is suspended between states. By using the Arctic Council instead of NATO to be a platform for

12 Timothy L. Thomas, *Russia Military Strategy: Impacting 21st Century Reform and Geopolitics* (Fort Leavenworth, Ks.: Foreign Military Studies Office, 2015).

13 The Arctic Council, *Declaration on the Establishment of the Arctic Council* (Ottawa, Canada, 1996) (Ottawa: Foreign Affairs and International Trade Canada, Aboriginal and Circumpolar Affairs Division, 1996).

14 Martin Eduard Debusmann, “Heather A. Conley and Matthew Melino: An Arctic Redesign. Recommendations to Rejuvenate the Arctic Council. 2016.” *SIRIUS - Zeitschrift Für Strategische Analysen* 1, no. 2 (2017): , accessed April

this communication allows Russia to be more of an equal partner than a threat held at arm's length, and allow for more engagement with Russia.

RECOMMENDED SOLUTION

Reform of Arctic Council, Revision of UNCLOS, and Realignment of Strategic Planning

Solutions 1, 2, 3, and 4 are all viable and if implemented together, they will supplement each other and cover gaps between them. Cooperation in the Arctic is necessary, and an arms race or fierce competition in the Arctic benefits no one. Modest reforms at the Arctic Council would improve the work being done in the various working groups. The Arctic Council is recognized as the Arctic's leading organization, but twenty years after its birth it needs the changes as outlined above. These changes are possible because none of the A5 want a new treaty to govern the Arctic, all believe that current frameworks that exist will be adequate. A permanent secretariat was recently established in Tromsø Norway in 2013, it is not a large leap to establish a permanent Secretary General. None of the Arctic Council members desire hard security topics to be discussed in the forum, successful cooperation on the Arctic Councils various projects can reduce the mistrust that is being felt among its members. Outside actors like China, Japan, and South Korea do not want to be froze out of the Arctic, and will push for a role in its future. Revisiting UNCLOS and clarifying the Arctic Oceans status as a Semi-Enclosed Sea or Regional Sea and negotiating on this will give them an opportunity while the Arctic States are in a position of strength to negotiate a deal that does not limit their sovereignty over the region, but alleviates pressure from the outside. This does not require creating an "Arctic Treaty" akin to treaty that governs Antarctica which none of the A5 will go for. States like Denmark and Norway are worried about Russia's intentions, and their fears can be calmed by having NATO clarify its own Arctic strategy, so that NATO is prepared to come to their aid should hostilities arise. The US can aid this by realigning its

Combatant Commands to the new reality faced on the ground. A buildup of military forces in the Arctic will be costly and only escalate the situation. Having a plan in case of conflict or spill over will not escalate the situation further and will alleviate allied concerns. Having NATO assist in SAR will support the work of the Arctic Coast Guard Forum, at a distance so as to not increase fears on the part of the Russians. The beauty of the Arctic Council is that it brings traditional competitors like Russia and the West to the table to talk about issues not security oriented, this progress should be protected, and security should come from increasing trust between states, not building up fears that a war is about to burst onto the scene. 🌍

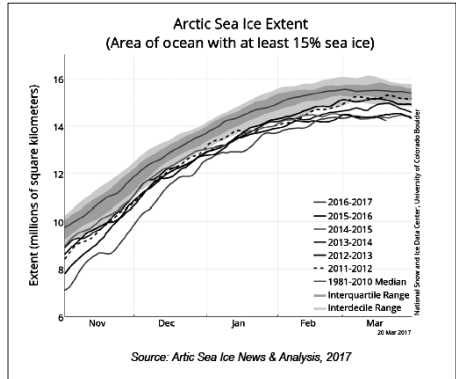
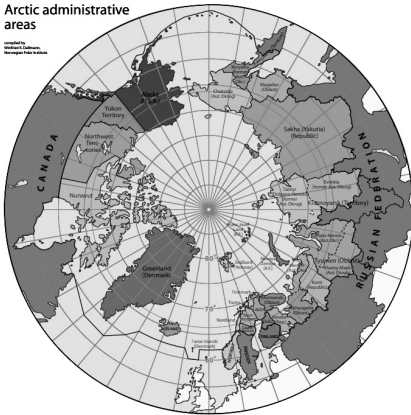
APPENDICES

APPENDIX III

Graph of melting Sea Ice in Arctic Ocean

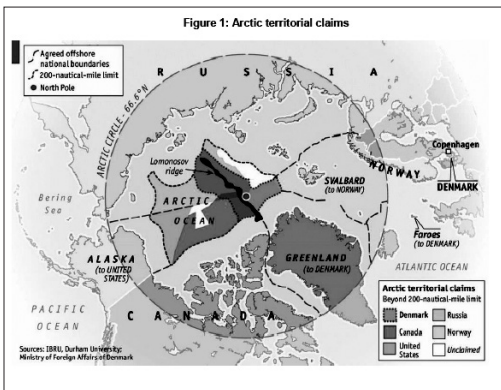
APPENDIX I

A geographical depiction of the Arctic for the purposes of this paper.



APPENDIX II

Map display of current Arctic territorial claims, centered on the Lomonosov Ridge



APPENDIX IV

Arctic Council: the intergovernmental forum promoting cooperation, coordination, and interaction among Arctic States, indigenous communities, and Arctic inhabitants on common issues. Members are Canada, Denmark, Finland, Iceland, Norway, Russia, Sweden, and the United States. In addition are six indigenous organization, known as Permanent Participants. They are the Arctic Athabaskan Council, Gwich'in Council International, Inuit Circumpolar Council, Russian Association of Indigenous Peoples of the North, and the Saami Council.

A8: The eight Arctic States that are members of the Arctic Council

A5: The five Arctic States that share a maritime border with the Arctic Ocean to include Russia, the United States, Canada, Norway, and Denmark.

NATO: The North Atlantic Treaty Organization

IMO: The International Maritime Organization

CLCS: The Commission for the Limits of the Continental Shelf

UNCLOS: UN Convention on the Law of the Sea
Observer States: States that are observers of the Arctic Council.

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Eradicating the Protracted Refugee Situation in Nakivale Camp

– Fredrick Shema

ABSTRACT

The Protracted Refugee Situation (PRS) in Nakivale camp in Uganda continues unabated, with the camp hosting more than 100,000 refugees from ten different countries who fled their home country in search of safety. The camp is run by the collaboration of the Uganda's Office of Prime Minister (OPM) and the United Nations High Commissioner for Refugees (UNHCR).

The issue of PRS is linked to the weak policies that are set up in the camp that do not equally favor these refugees. The UNHCR and OPM need to improve the Self-Reliance Strategy and create working groups to educate refugees about voluntarily repatriation as well as providing humanitarian assistance to refugees willing to return back home. They also need to resettle the vulnerable refugee populations to a third country and collaborate with other stakeholders at the camp, including the Refugee Law Project (RLP) to handle issues of land policies.

BACKGROUND AND OVERVIEW

For the purposes of this review, a Protracted Refugee Situation (PRS) is one where refugees find themselves in a long-lasting and intractable state of limbo. After years in exile, a refugee in this situation is often unable to break free from enforced reliance on external assistance.¹ The Nakivale refugee camp is located in the western part of Uganda, Isingiro district more than 100 miles away from Mbarara, the second largest city in Uganda. Nakivale camp, a home to over 100,000 refugees fleeing from over 10 countries, is one of the oldest refugee camps

¹ Executive Committee of the High Commissioner's Programme, "Protracted Refugee Situations" (EC/54/SC/CRP.14, Standing Committee 30th meeting, June 2004), 1.

in Africa.² It was officially established in the early 1960s to host the Tutsi population fleeing the civil war in Rwanda.³ It only hosted the Tutsi victims who were escaping the civil war in Rwanda. As years passed, more refugees started hearing about the services that Nakivale camp was offering to the asylum seekers, thus attracting more refugees.

The Nakivale camp now hosts refugees from ten nationalities across Africa who come to the camp seeking asylum. These nationalities are comprised of the Congolese, Rwandese, Sudanese, Ethiopians, Kenyans, Burundians, Eritreans, Banyamulenge, South Sudanese and Somalis.⁴ The camp is run and managed by the collaboration of Uganda's Office of Prime minister (OPM) and the United Nations High Commissioner for Refugees (UNHCR).⁵ The OPM is in charge of receiving and granting asylum to refugees in accordance with both international and legal instruments. The OPM is also in charge of settling refugees granted asylum as well as developing and implementing humanitarian interventions at the camp.⁶ The UNHCR in return provides humanitarian assistance to refugees, plays a catalytic role in encouraging development agencies, and then incorporates the Self-Reliance Strategies (SRS) into their programs to benefit refugees while in charge of resettlement.⁷

The PRS in Nakivale camp is a serious issue that has and is continuing to affect the lives of refugees in ways that has caused even more problems in the camp. According to Ahimbisibwe (2014), the presence of so many protracted refugee situations can be

linked to the failure of local integration.⁸ For example, in the Nakivale camp, current policy is unrealistically predicated on the belief that subsistence agricultural livelihoods can support refugee communities to achieve self-reliance which would improve the local integration sector.⁹ The causes of PRS are different from camp to camp depending on political, social, and economic circumstances in the particular host country. Some of the most observed causes of PRS in Nakivale camp include: conflicts and non-intervention, residual caseloads, political hostage, repatriation, and integration.¹⁰

POSSIBLE SOLUTIONS

LOCAL INTEGRATION IN NAKIVALE CAMP

Until 2001, the problem of PRS was largely ignored by scholars and policymakers.¹¹ The UNHCR has therefore come to an agreement that the PRS has become a huge issue that requires attention and improvement of bids to eradicate the issue.¹² The UNHCR established SRS for refugees in Nakivale camp,¹³ under a system known as self-reliance. Refugees at the

2 Interview with Office of Prime Minister Staff, June 23, 2018.

3 Suzan Ilcan, Marcia Oliver, Laura Conroy, "Humanitarian Assistance and the Politics of Self-Reliance in Uganda's Nakivale Refugee Settlement," CIGI Papers 86, (2015): 2, https://www.cigionline.org/sites/default/files/cigi_paper_no.86.pdf.

4 Ibid, 2

5 Ibid, 3

6 "Office of Prime Minister." Refugee Management Objectives, OPM, 2015, <https://opm.go.ug/refugees-management/>.

7 "Trends at a Glance." UNHCR Global Report, UNHCR, 2004, <https://www.unhcr.org/42ad4dbd0.pdf>.

8 3. Frank, Ahimbisibwe, "The Effect of Land Conflicts on the Livelihoods of Refugees: Implications for Refugee Protection in Uganda," The International Journal's Research Journal of Social Science and Management, Nov 2013, https://www.researchgate.net/publication/309209994_The_Effect_of_Land_Conflicts_on_the_Livelihoods_of_Refugees_Implications_for_Refugee_Protection_in_Uganda.

9 Erik Svedberg, "Refugee Self-Reliance in Nakivale Refugee Settlement, Uganda," SIT Study Abroad, (Spring 2014):3-6, https://digitalcollections.sit.edu/cgi/viewcontent.cgi?referer=https://www.google.com/&httpsredir=1&article=2810&context=isp_collection.

10 Jeff, Crisp, "No Solution in Sight: The Problem of Protracted Refugee Situation in Africa," The Center for Comparative Immigration Studies, Dec 2002, https://ccis.ucsd.edu/_files/wp68.pdf

11 Gil Loescher and James Milner, Protracted Refugee Situations: Domestic and International Security Implications (London and New York: Routledge Taylor & Francis Group, 2007), 8.

12 "UNHCR, African host countries agree on final steps to resolve Rwandan refugee situation." UNHCR The UN Refugee Agency, 30 Sept 2016. <https://www.unhcr.org/news/press/2016/9/57f20dd54/unhcr-african-host-countries-agree-final-steps-resolve-rwandan-refugee.html>

13 Ibid, 4

Nakivale camp are expected to receive basic needs for survival: simple cooking utensils, adequate food, blanket, a jerry can, mosquito nets, and a small allotment of land to farm.¹⁴ The SRS mainly helped certain nationalities over others depending on their background. For example, Somalis aren't able to rely on agriculture which usually makes them sell their SRS assistance to Congolese and instead invest in other ways of bringing in income such as shops and markets in the camp. However, the UNHCR believes in order for this approach to be successful, there needs to be a strong partnership with the stakeholders involved in the camp to enable planning, building ownership, and increase available resources.¹⁵

In 2006, Uganda implemented the Refugee Act that focused on local integration, which is meant to recognize the rights of refugees to earn a better livelihood.¹⁶ The UNHCR believes with proper collaboration between the stakeholders, the Refugee Act of 2006, in line with UNHCR's local policy approach, would temporarily integrate the refugees in the Nakivale camp into Ugandan society.¹⁷ Local integration would give refugees established livelihoods, earn income, and, create potential business relationships with the host population.¹⁸

VOLUNTARILY REPATRIATION OF SOME REFUGEES IN THE CAMP

Creation of working groups to help spread and educate the refugees about new policies on volunteer repatriation would help many refugees to return home without any fear.

14 Ibid, 2

15 Dr. James Milner, "responding to protracted refugee situations: Lessons from a decade of discussion" (Forced Migration Policy Briefing 6, Oxford Department of International Development, 2011), 12.

16 Tollebrandt Sandra and Wrede Sophia, "Power Distribution Between Refugees and Host Population: A Case Study of the Nakivale Refugee Settlement." Bachelor's diss., Linnaeus University Sweden, (2013): 1-3, <http://nu.diva-portal.org/smash/get/diva2:650657/FULLTEXT01.pdf>.

17 Ibid, 12

18 "Trends at a Glance." UNHCR Global Trends, UNHCR, 2013. <https://www.unhcr.org/en-us/statistics/country/5399a14f9/unhcr-global-trends-2013.html>

These working groups can be locally based with representative members from all nationalities in the camp to make sure the whole camp is aware of continuous introduction of new policies. Overcoming the caustic legacy of mistrust which now pervades Nakivale will be difficult but the UNHCR could make some simple moves in the right direction.¹⁹ This can be achieved by continuously communicating to all the refugees about new policies concerning their refugee status and continuity of providing assistance and protection to those refugees whose status had been invoked.²⁰ For example, in recent meetings with the UNHCR, the Ugandan government confirmed that they would continue to promote the option of voluntary repatriation to Rwandan refugees and make sure they return home in safety and with dignity because they are the oldest nationalities in the camp.²¹ The UNHCR is believed to be ready to voluntarily repatriate refugees willingly to return home by providing them with necessary services. At the same time, the UNHCR agreed to provide an enhanced return package, and to progressively transition from in-kind support to a more cash-based form of assistance to ensure their sustainable reintegration, which is expected to encourage many refugees to voluntarily return to their home countries.²² These forms of assistance can help refugees start a new life once they get back to their home countries.

REFUGEE RESETTLEMENT TO A THIRD COUNTRY

Resettlement to a third country is an alternative in situations where it is impossible for a refugee to go back to their country of origin or remain in the host country.²³ Among refugees, resettlement seems to have not become a solution per se, but another goal in itself is to

19 Ibid, 11

20 Ibid, 9

21 Ibid, 9

22 Ibid, 9

23 Ibid, 15

seek a better life in industrialized countries which is accessed through the humanitarian setting of the Nakivale camp.²⁴

Between 2008 and 2013, about 11,000 Congolese refugees arrived in the U.S due to the escalation of conflict in their home country.²⁵ Resettlement is seen as the most durable solution for PRS but is sometimes the more difficult decision when the willingness of third states to accommodate refugees is not achieved.²⁶ Refugee resettlement is expensive and is, with exception of family reunification, only employed in situations of special need or protection: insecurity gender based violence, women at risk and medical risk.²⁷ However, since 2012, most of the refugees resettled were from the Congolese and Somalis populations, ignoring the rest of the other nationalities. The UNHCR has prioritized these two nationalities over the rest which has affected the vulnerable refugees to be stuck in the camp for a prolonged time without any way out or any help from the UNHCR and Ugandan government.

In spite of this, the resettlement process would be a better solution to PRS once the UNHCR and other agencies in the camp partner together to focus on the main criteria for resettlement which would resettle the more vulnerable refugee populations in the camp, which might help weaken the belief that resettlement was something that refugees could organize and achieve.²⁸

IMPROVING THE LAND POLICIES TO END LAND CONFLICTS

The Ugandan government and the UNHCR have created tension between Ugandan nationals

24 Bram J. Jansen, "Between vulnerability and assertiveness: Negotiating resettlement in Kakuma refugee camp, Kenya," *African Affairs*, 107, no.429 (Oct 2008):569-587.

25 Helena Frischtak, "The World's Refugee Crisis: An Overview of Conflicts, Life in Camps, and Future Perspective," MS4, Feb 2017, https://med.virginia.edu/family-medicine/wp-content/uploads/sites/285/2018/11/Frischtak_Refugee-Camps_2-2017.pdf.

26 Ibid, 22

27 Ibid, 22

28 Ibid, 22

and the refugee populations with the land as well as uneven power distribution, which has contributed to the PRS in Nakivale camp.²⁹ Some refugees with enough resources end up buying more land property from Ugandan nationals who scam them with false land titles. According to Bagenda (2003), land given to refugees often appear to be empty and bushy, and sometimes the land has also been previously owned by local Ugandans who lose it to refugees which always ends up causing conflicts within these groups.³⁰

The Ugandan government needs to set up a task force to investigate land ownership led by the representatives from the nationals and refugees to help ameliorate the tensions, hatred and miscommunication mostly caused by the UNHCR.³¹ These task forces can be led by Refugee Law Project (RLP) and work along with UNHCR in educating the refugees the right way of acquiring property from the Ugandan nationals to avoid future conflicts. The RLP would therefore help these refugees when acquiring to buy properties either from the refugees themselves or the nationals. This would help eradicate conflicts amongst refugees and Ugandan nationals. It would also minimize confusions surroundings Nakivale camp regarding the laws behind obtaining land properties.

RECOMMENDATION:

The fight against protracted refugee situations in the Nakivale camp is going to require a combination of durable approaches and tremendous collaboration between stakeholders in the base camp. The number of refugees and asylum seekers in Nakivale camp are expected to increase due to ongoing conflicts in the neighboring countries of Uganda so it's the Uganda's OPM and UNHCR responsibilities to improve the way the camp is run. The UNHCR has made it clear that the PRS cannot be resolved in a short time but a lot of work can be done with the help of the Ugandan government,

29 Ibid, 12

30 Ibid, 14


31 Ibid, 6

International Organization for Migration (IOM) and many other international agencies available at camp.³²

The three PRS durable situations could prove to be crucial in the battle to end the exile for many refugees but the policies have to be strengthened for the solutions to be successful. Local integration should be the main focus for the Ugandan government by improving the land policies which would be able to integrate many refugees and avoid conflicts within the camp. Local integration policies aiming for broader freedom of movement within and outside the camp would benefit some refugees to even acquire citizenship which would be a step closer to ending PRS.³³

The second approach should be focused on voluntarily repatriation for refugees whose countries back home are safe and suitable for them to return. With proper communication within the camp, this solution would be successful because most of the refugees in the Nakivale camp would be better off repatriating than staying in current crude conditions. The introduction of the working groups in the camp would help educate and inform the refugees about the information they never had access to as well as play a huge part in eradicating the protracted issue. The working groups would mainly focus on informing refugees about new policies in the camp on repatriation, resettlement, integration and other changes at the camp. This would simplify the work for the UNHCR because they would now have to focus on the vulnerable refugee populations for resettlement and introduce other solutions to the rest of the refugees in the camp.

The UNHCR's introduction of increased initiatives in the camp to help other nationalities would help eradicate conflicts in the camp for unequal power distribution. For example; the introduction of the Congolese initiative focused on resettling the most vulnerable

Congolese populations from 2012-2015.³⁴ The introduction of different initiatives, like the Rwandan initiative, would not only benefit other nationalities in the Nakivale camp but would also utilize the working groups to inform and educate the rest of the refugees on these initiatives. An added benefit to these initiatives would be an additional hope and be one step closer to eradicating protracted refugee situations in Nakivale camp. 

32 Ibid, 11

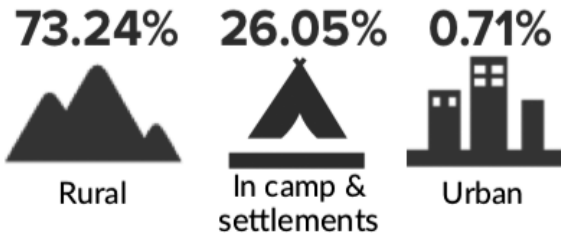
33 Kaiser Tania, "Between a Camp and a Hard Place: Rights, Livelihood and Experiences of the Local Settlement System for Long-Term Refugees in Uganda," *Journal of Modern African Studies* 44, no.4 (Dec 2006):604-605, https://www.jstor.org/stable/4486705?seq=1#page_scan_tab_contents

34 Ibid, 23

APPENDICES

APPENDIX A

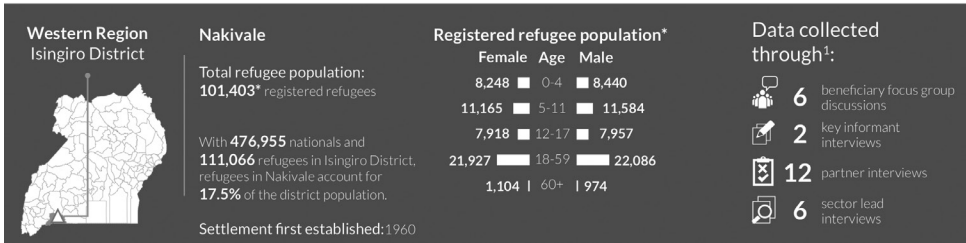
Refugees and Asylum Seekers from DRC-Operational Portal.³⁵



³⁵ The UNHCR: "Refugees and Asylum-Seekers in DRC," 2019. <https://data2.unhcr.org/en/documents/details/68456>

APPENDIX B

Fact sheet of Nakivale Camp- Uganda Refugee Response Monitoring.³⁶



APPENDIX C

Nationality distribution at Nakivale camp.³⁷

Location		Number	% of overall total
Nakivale total		62,849	32%
Origin	DRC	32,659	52%
	Somalia	11,007	18%
	Rwanda	9,452	15%
	Burundi	7,875	13%
	Eritrea	1,329	2%
	Other countries	527	1%

³⁶ Uganda Refugee Response Monitoring: “Settlement Fact sheet” <https://reliefweb.int/sites/reliefweb.int/files/resources/66773.pdf>

³⁷ Dr. Naohiko Omata, Dr. Josiah Kaplan, “Refugee Livelihoods in Kampala, Nakivale and Kyangwali Refugee Settlements,” Refugee Studies Center, (2013). <https://www.rsc.ox.ac.uk/files/files-1/wp95-refugee-livelihoods-kampala-nakivale-kyangwali-2013.pdf>

APPENDIX D

Map of Nakivale camp: A map that shows refugee villages in the camp.³⁸



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³⁸ Alexander Bretts, Lousie Bloom, Josiah Kaplan, Naohiko Omata, *Refugee Economies: Forced Displacement and Development* (Oxford University Press, 2017),1.



China in Africa: Facilitating a Mutually Beneficial Relationship

– Ayomipo Kayode-Popoola

ABSTRACT:

The economic partnership between China and the African continent spans loans, trade, and investment, and continues to steadily increase, leading to concerns about a potential imbalance that skews the long-term benefits of this partnership in favor of China. Both stakeholders ought to increase loan transparency to allow for global accountability on lending policies. Additionally, African nations establishing a unified regional policy to govern economic relations with China and taking action to improve their bargaining power, will ensure that the relationship between the continent and China is more mutually beneficial for both parties.

OVERVIEW, HISTORY AND DEFINITION OF THE ISSUE

China has had a longstanding presence in Africa. Up until 1949, transnational trade, maritime exploration, and the mutual experience of colonialism marked Sino-African relations, the correspondence between China and Africa. The 1949 founding of the People's Republic of China and the wave of independence of African nations created a new era between China and the continent, formally established at the 1955 Bandung Conference and cemented through the creation of the Forum on China-Africa Cooperation in 2000. This new relationship was marked by diplomatic relations, increased trade, loans, and official development assistance (ODA).¹

¹ Marlene Guillon and Jacky Mathonnat. "What Can We Learn on Chinese Aid Allocation Motivations from Available Data? A Sectorial Analysis of Chinese Aid to African Countries." *China Economic Review* (2019), <https://doi.org/10.1016/j.chieco.2019.01.004>

To illustrate, Chinese foreign direct investment (FDI)² to Africa steadily increased between 2003 and 2015, rising from \$0.5 billion to \$34.7 billion, and establishing China as the largest developing country to invest in the continent.³ The principal recipients of Chinese FDI in Africa are nations that are resource rich with minerals or oil, such as Nigeria, Algeria, Sudan, Zambia, and Angola.⁴ Currently, China is Africa's largest trading partner, number one for nine countries,⁵ and the most important export partner,⁶ with trade volume rising from \$2 billion in 1999 to \$160 billion in 2012 and a projected increase to \$1.7 trillion by 2030.⁷ Between 2000 and 2017, the Chinese government loaned an estimated \$143 billion to African governments and various state-owned enterprises.⁹ Due to the magnitude of Sino-African relations and the vulnerability of African nations, despite its benefits, which span investment in infrastructure, housing and urban

development, and a condition free loan policy, it is critical to assess and mitigate the risks that they face in this economic relationship.¹⁰ While China benefits steadily from this economic partnership through maintenance of its status as a global superpower, a new market for its manufacturing industry, and a steady source of natural resources, raw materials and oil, the potential long-term negative consequences of Chinese economic presence on African socio-economic development continue to rise, evidenced in industry losses and debt risks.^{11,12} The import of cheap Chinese goods and the resulting displacement of African suppliers creates an unbalanced competition with local manufacturing in a myriad of industries, especially the textile industry, that renders local factories unproductive and unprofitable, encouraging continued dependency on China.¹³ Additionally, the availability and magnitude of loans from China to African nations for infrastructure projects increases risks of financial dependency, as the repayment process of these large sums threatens the socio-economic development of borrower countries. To illustrate Africa's increasing financial dependency on China, Uganda's debt to China is \$3 billion out of the country's overall \$11 billion external debt.¹⁴ Although these loans are condition free, unlike those from the International Monetary Fund (IMF) and the World Bank, repayment will still take years,

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- 2 The International Monetary Fund (IMF) defines FDI as "a category of international investment that reflects the objective of a resident in one economy obtaining a lasting interest in an enterprise resident in another economy" International Monetary Fund (2003) <https://www.imf.org/external/np/sta/fdi/eng/2003/102803.pdf>
- 3 Marlene Guillon and Jacky Mathonnat. "What Can We Learn on Chinese Aid Allocation Motivations from Available Data? A Sectorial Analysis of Chinese Aid to African Countries." *China Economic Review* (2019), <https://doi.org/10.1016/j.chieco.2019.01.004>
- 4 David Shinn "The Environmental Impact of China's Investment in Africa." *Cornell International Law Journal* 49, no. 1 (2016): 46-49 <http://ida.lib.uidaho.edu:2081/login.aspx?direct=true&db=lgh&AN=115720990&site=ehost-live&scope=site>.
- 5 "Direction of Trade Statistics." *International Monetary Fund*, accessed April 2019, <https://data.imf.org/?sk=92D6028D4-F14A-464C-A2F2-59B2CD424B85>.
- 6 Maria Pigato and Wenxia Tang. "China and Africa: Expanding Economic Ties in an Evolving Global Context." World Bank Group, March 2015, <https://openknowledge.worldbank.org/bitstream/handle/10986/21788/951610WP00PUBL050March010600PUBLIC0.pdf?sequence=1>
- 7 Courage Mlambo, Audrey Kushamba, and Blessing Simawu. "China-Africa Relations: What Lies Beneath?" *The Chinese Economy* 49, no. 4 (2016): 257-76
- 8 Victor Mlambo, "Exploitation Dressed in a Suit, Shining Shoes, and Carrying a Suitcase Full of Dollars: What Does China Want in Africa?," *Journal of Public Affairs* 19, no. 1 (February 1, 2019), <https://doi.org/10.1002/pa.1892>.
- 9 China Africa Research Initiative. *John Hopkins School of Advanced International Studies* (2019), <http://www.sais-cari.org/data-chinese-loans-and-aid-to-africa>

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- 11 Francoise Lafargue. "China's Presence in Africa" *China Perspectives* (2006), <https://journals.openedition.org/chinaperspectives/519#ftn1>
- 12 Abdoukadre Ado and Zhan Su. "China in Africa: A Critical Literature Review." *Critical Perspectives on International Business* 12, no. 1 (2016): 40-60. doi:<http://ida.lib.uidaho.edu:2153/10.1108/cpoib-05-2013-0014>. <http://ida.lib.uidaho.edu:2048/login?url=https://ida.lib.uidaho.edu:2096/docview/2083788153?accountid=14551>.
- 13 Busse, Matthias, Ceren Erdogan, and Henning Mühlen. "China's Impact on Africa - The Role of Trade, FDI and Aid." *Kyklos* 69, no. 2 (2016): 228-262
- 14 Victor Mlambo. "Exploitation dressed in a suit, shining shoes, and carrying a suitcase full of dollars: What does China want in Africa?" *Journal of Public Affairs* 19, no. 1 (2019): <https://ida.lib.uidaho.edu:3454/10.1002/pa.1892>

leaving African nations in the debt-cycle. While China has attempted to improve its economic relationship with the continent through debt forgiveness programs, these are nominal and thus the debt trap for African nations endures.¹⁵

INCREASING LOAN TRANSPARENCY

While Chinese loans to African nations have the appeal of being directed primarily towards infrastructure and without the policy conditionalities that characterize Western DFI's, the opacity of these loans threaten borrower nations.¹⁶ Currently, the Chinese government's loans to African nations are based on domestic policy and are primarily administered through the National Development Bank or either of China's two national policy banks, following negotiations and a signed loan agreement from the borrower nation.¹⁷ None of these agreements are accessible to the broader community. China has been criticized by major global entities, like the IMF, WTO, and the U.S. Department of the Treasury for its donor relations with African nations not being in line with international donor regulations, specifically the practice of loan repayments via commodity exports and resources, which violates existing international lending policies set forth in the Organization for Economic Cooperation and Development (OECD).¹⁸ The lack of transparency by both the Chinese government and borrowing nations

about the scale, terms, and composition of these loans further fuels speculation and distrust from the global community.¹⁹

These contracts ought to be made available to the general public, both by borrower nations and the Chinese banks. This information ought to be published in an annual report to increase transparency and accountability for both China and borrowing nations. This will lead to increased data for academic research publications, policy-maker decisions, citizens awareness, and third-party accountability of bilateral relations between African governments and China.

NATIONAL AND REGIONAL ESTABLISHMENT OF A SINO-AFRICAN POLICY

The creation of strategic national policies to govern Sino-African relations is crucial in ensuring that this economic partnership is beneficial to nations' development strategies. Furthermore, there ought to be collaboration across nations to determine a unified policy to strengthen regional capacity.²⁰ Through this strategic approach, resource-rich nations can leverage their contributions to China to ensure that the government is abiding by the regional policy in its interactions with all countries.²¹

In 2006, the Chinese government released an official paper declaring China's African policy, including guiding principles, measures taken, and plans for future cooperation across sectors.²² This has proved useful in serving as the foundation and guide for China's continuing relationship with the African continent. To emulate this in an African context, regional bodies ought to be utilized. The African Union, the Economic Community of West African

15 Bates Gill, Chin-hao Huang and J. Stephen Morrison, "Assessing China's Growing Influence in Africa." *China Security* 3, no. 3 (2007): 3-21.

16 Gregory T. Chin and Kevin P. Gallagher, "Coordinated Credit Spaces: The Globalization of Chinese Development Finance: The Globalization of Chinese Development Finance," *Development and Change* 50, no. 1 (January 2019): 245-74, <https://doi.org/10.1111/dech.12470>.

17 Ibid

18 Bates Gill, Chin-hao Huang and J. Stephen Morrison, "Assessing China's Growing Influence in Africa." *China Security* 3, no. 3 (2007): 3-21. <https://www.files.ethz.ch/isn/44743/Vol%203%20Issue%203.pdf>

19 Deborah Bräutigam and Kevin P. Gallagher, "Bartering Globalization: China's Commodity-Backed Finance in Africa and Latin America," *Global Policy* 5, no. 3 (September 1, 2014): 346-52, <https://doi.org/10.1111/1758-5899.12138>.

20 Carlos Lopes. "Contextualizing Sino-African Relations." *Waterlines* 35, no. 1 (2016), 8-10

21 Ibid

22 Ministry of Foreign Affairs, the People's Republic of China. Retrieved from <https://www.fmprc.gov.cn/zftf/eng/zgdffzce/t481748.htm>

States, the Southern African Development Community, and the New Partnership for Africa's Development could play central roles in the creation of a regional policy by creating a platform for necessary dialogue amongst government officials and private sector representatives.²³ This will ensure that bargaining positions with China and regional goals are not contradictory across nations.²⁴ Establishing a similar strategy and thus a policy of integration regarding trade, loans, and FDI from China will ensure that the region's economic development needs are being met in an efficient and sustainable manner, facilitating a mutually beneficial relationship.²⁵

QUOTAS ON IMPORTS FROM CHINA

Chinese imports have been criticized for crushing Africa's growing manufacturing sector, with various studies showing effects such as the closing of factories in Zambia, Nigeria, and Ghana, amongst other nations, due to competition from China and ensuing losses in sales.^{26,27}

African nations ought to take a more direct role and firm stance in their trade relationships with China, establishing quotas on the imports of certain Chinese products that threaten to displace local manufacturing. In 2007, the South African government negotiated a settlement with China and established quotas on 70% of the clothing and textile imports from

China.²⁸ Additionally, South African importers compensated for the quota by importing textiles from other low-cost countries throughout the duration. Due to these factors, a survey through the South African Reserve Bank showed that in the first year, there was a 2.68% output increase in domestic output of textiles and clothing, but the second year saw a 1.47% decrease.²⁹

Despite the apparent ineffectiveness of quotas in stimulating South Africa's textile manufacturing sector, they can be efficiently utilized by other countries if all limitations are accounted for. One method could be a thorough analysis of the nation's financial market and awareness of all trading partners, not just China, whose cheap imports threaten the development of local manufacturing industries. While China is the major trading partner for many countries, quotas ought to be fairly distributed to all trading partners whose goods could be detrimental to the local market by acting as a substitute during the quota period with China.

STRENGTHENING PROTOCOLS TO ENSURE AFRICAN PARTICIPATION

There is a widespread negative perception that China only brings their own workers for infrastructure projects in Africa, disregarding the talent and labor force that already exists in these countries. Sino-African experts show that this is an unfounded assumption, as employment surveys find that nearly three quarters or more of the workers on Chinese sponsored projects are local.³⁰ Additionally, in recent years, most contracts now specify the number of African workers that each development project must employ, as mandated

23 Mike Morris and Felix N'Zue, "An Assessment of China-Africa Investment Relations," *African Journal of Economic Policy* 16 (January 1, 2009).

24 Ibid

25 Ibid

26 Allan Wanjohi Ngengi, "CHINESE INVESTMENTS IN AFRICA AND THE POLITICS OF UNSUSTAINABILITY: A CASE STUDY OF THE KENYA'S STANDARD GAUGE RAILWAY," *Global Journal of Politics and Law Research* 6, no. 7 (December 2018): 9-38.

27 Lawrence Edwards and Rhys Jenkins, "The Impact of Chinese Import Penetration on the South African Manufacturing Sector," *The Journal of Development Studies* 51, no. 4 (April 3, 2015): 447-63, <https://doi.org/10.1080/00220388.2014.983912>.

28 Johann van Eeden, "South African Quotas on Chinese Clothing and Textiles Economic Evidence," *Econex* (2009).

29 Ibid

30 Deborah Brautigam, "U.S. politicians get China in Africa all wrong," *The Washington Post* (April 12, 2018), https://www.washingtonpost.com/news/theworldpost/wp/2018/04/12/china-africa/?utm_term=.5d5b5ad96b76.

by the national governments.³¹ Although Africa and China have made this strides in ensuring the equilibrium of partnership, more work needs to be done for this standard to be upheld across nations.

DIVERSIFICATION OF AFRICAN EXPORTS

Between 2014 and 2015, while Chinese exports to Africa remained stable, reaching \$106 billion in 2015, African exports to China declined from \$79.8 billion to \$46.1 billion, a 42% drop, largely due to the global oil price collapse, as oil is the largest product that China imports from Africa.³² While the numbers evened out significantly the next year, the imbalance still continues.³³ The alarming lack of diversity in African products that are imported by China poses severe consequences that need to be addressed through diversification by African nations. Export diversification is positively associated with economic growth for developing nations because it reduces income volatility and vulnerability to declines.³⁴ Currently, most African nation's exports to China are dominated by a single product. For example, over 90% of Angola's trading exports constitute of petroleum products. Understandably, low commodity prices are detrimental for African economies, especially impacting the export values of their trade with China.³⁵

Countries that trade with China ought not to rely on their single exports but create avenues for other commodities and manufactured products to take part in their trade relations.

This will ensure that their export values are less affected by fluctuating commodity prices in the global market. Ethiopia is modelling this practice through slight improvement in its export composition. In 2010, oilseed products made up 85% of Ethiopian exports but by 2015, it made up 72% of exports.³⁶ Other African nations ought to begin taking similar steps to diversify their exports beyond the resource sector, thus creating increased equilibrium in Sino-African trade.

IMPROVING AFRICA'S BARGAINING POWER

Since exports from Africa to China are typically primary products, this raises the risk of undermining the industrial sectors of these countries due to the reduced prioritization of manufacturing.³⁷ African nations ought to implement practices that increasing their bargaining power with China, such as encouraging manufacturing, thus changing the type of goods exported to China from commodities to manufactured products. Additionally, this strengthens the path towards economic growth, as research has shown that a thriving manufacturing sector is foundational to development.³⁸

In March 2018, the AU launched the African Continental Free Trade Area (AfCFTA), a free trade agreement which seeks to create the world's largest trade zone³⁹, increase competitiveness in the global market, and aid industrial development,⁴⁰ further strengthening

31 "China's Investment in Africa: What's the Real Story?" *Knowledge at Wharton* (January 19, 2016), <https://knowledge.wharton.upenn.edu/article/chinas-investments-in-africa-whats-the-real-story/>.

32 Lucas Atkins, Deborah Brautigam, and Yunnan Chen, "Challenges of and Opportunities from the Commodity Price Slump," *P U B L I C A T I O N S*, no. 1 (2017): 10.

33 Janet Eom, Deborah Brautigam, and Lina Benabdallah, "The Path Ahead: The 7th Forum on China-Africa Cooperation," *P U B L I C A T I O N S*, no. 1 (2018): 10.

34 Vera Songwe and Deborah Winkler, "EXPORTS AND EXPORT DIVERSIFICATION IN SUB-SAHARAN AFRICA," n.d., 44.

35 Atkins, Brautigam, and Chen, "Challenges of and Opportunities from the Commodity Price Slump."

36 Ibid

37 Ly Tibou and Fangmiao Hou, "Analysis of China's Trade Relations and Its Impacts on the Guinean Economy," *Open Access Library Journal* 04 (May 3, 2017): 1, <https://doi.org/10.4236/oalib.1103482>.

38 Landry Signe and Chelsea Jones, "The potential of manufacturing and industrialization in Africa," *Africa Growth Initiative at Brookings* (September 2018), <https://www.brookings.edu/wp-content/uploads/2018/09/Manufacturing-and-Industrialization-in-Africa-Signe-20180921.pdf>

39 Ibid

40 African Union. <https://www.tralac.org/documents/40-resources/african-union/2162-afcta-agreement-legally-scrubbed-version-signed-16-may-2018/file.html>

the regional manufacturing sector.⁴¹ In addition to this establishment, African governments ought to provide strong incentives to increase local production in manufacturing sectors, especially those that are susceptible to Chinese competition. One option is the creation of special economic zones (SEZs)⁴² that empower manufacturing companies to utilize improved infrastructure, tax benefits, protection from import competition, and free movements of goods.⁴³ Another incentive involves partnerships with Chinese manufacturing firms in specific sectors to create training programs for local workers to develop skills to increase manufacturing capacity.⁴⁴ These efforts could help to shift the import focus of China from resource commodities to manufactured products.⁴⁵

RECOMMENDED SOLUTION

The combination of the historic legacy and recent magnitude of Sino-African relations coupled with the establishment of both entities as major economic stakeholders for each other necessitates the consideration and implementation of policies to efficiently foster a mutually beneficial partnership.

In the short term, it is recommended that both China and Africa focus on establishing loan transparency and that Africa establishes a regional policy to guide its economic relationship with China. Loan transparency should include an annual reporting of agreements, exact amounts distributed, and repayment methodologies. This will bolster academic research by providing relevant and reliable data for informed analysis. Increased transparency will also enable global

accountability for both China and borrower African nations, as third parties such as other nations and intergovernmental organizations will be aware of the dynamics of bilateral economic relations. Moreover, transparency could potentially strengthen China's credibility as a major donor country to the African continent, dissuading the assumptions and non-fact-based criticisms regarding their loan practices. The Chinese government, along with policy banks, ought to commit to systematically releasing data on their loan initiatives.⁴⁶ Furthermore, collaboration amongst African nations to establish a regional policy that governs loan receipt, trade, and FDI with China is crucial to facilitate decisions that best support socio-economic development and equitable transactions. Additionally, the regional entities through which such collaboration occurs would be equipped and able to release annual reports on Sino-African economic relations, specifically detailing loans received and repayment plans. Through this medium, citizens of these nations will be aware of their governments' bilateral dealings with China and further able to support global accountability, thus reducing vulnerability to the debt cycle.

In the long term, Africa needs to establish incentives to increase their bargaining power through the development of the manufacturing sector. This is the best way to ensure sustained economic growth and consequently, an advantageous relationship with China.⁴⁷ Through the utilization of SEZs and collaboration with Chinese manufacturing companies to ensure the training of locals across various industries, African nations ensure the development of both human and economic capital and the fortification of the manufacturing sector. Lastly, although it will likely take many years to be fully actualized, the AfCFTA can only serve to bolster the economic partnership between China and Africa, by promoting the growth of African industry and manufacturing, further supporting the agency and self-determination of the continent. For China and Africa to continue to be significant

41 Landry Signe and Chelsea Jones, "The potential of manufacturing and industrialization in Africa"

42 According to the Foreign Investment Advisory Service (FIAS), SEZ's are


43 Weiyi Wang, Jinghao Lu, and Wilmot Allen, "The East Africa Shift in Textile and Apparel Manufacturing: China-Africa Strategies and AGOA's Influence," *PUBLICATIONS*, n.d., 4.

44 Eom, Brautigam, and Benabdallah, "The Path Ahead: The 7th Forum on China-Africa Cooperation."

45 Janet Eom et al., "The United States and China in Africa: What Does the Data Say?," *PUBLICATIONS*, no. 18 (2017): 8.

46 Deborah Brautigam. "Eastern Promises: new Data on Chinese Loans in Africa, 2000-2014"

47 "The Potential of Manufacturing and Industrialization in Africa"

contributors to each other's economies, it is necessary to address the imbalanced risks faced by African nations in this partnership. The approaches of establishing loan transparency, creating a cohesive regional policy, and implementing incentives to increase bargaining power, will serve to strengthen the Sino-African alliance and establish a mutually beneficial relationship for all stakeholders involved. 

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