Artículos

Global Warming and Displacement: Challenges and Solutions in the Maldives

Calentamiento global y desplazamiento: desafíos y soluciones en Maldivas

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Abstract: For Small Island Developing States such as the Maldives, climate change poses an existential threat to the future and welfare of their countries' populations. The effects of global warming, such as rising sea levels and increased flooding, have forced countries to consider different measures in order to adapt, and some are even worried about a possible climate forced migration as a result of these dangers. Unfortunately, a lack of recognition of climate migrants under international law means that island states are left on their own to decide the best course of action. This raises an important question: What are possible challenges and solutions for Small Island Developing States [SIDS], such as the Maldives, who are planning for the climate forced migration of their populations? Using a case study of the Maldives, this paper explores both mitigation and adaptation measures that the Maldivian government has considered to develop its climate resilience. It also argues that rather than plan for relocation, the Maldives and other SIDS should prioritize keeping their populations together, maintaining cultural integrity, and implementing initiatives which support sustainable development.

Keywords: migration, climate, relocation, mitigation, adaptation, population, sovereignty, culture, development.

Resumen: Para los pequeños Estados insulares en desarrollo como las Maldivas, el cambio climático representa una amenaza existencial para el futuro y el bienestar de las poblaciones de sus países. Los efectos del calentamiento global, como el aumento del nivel del mar y el aumento de las inundaciones, han obligado a los países a considerar diferentes medidas para adaptarse, y algunos incluso están preocupados por una posible migración forzada climática como resultado de estos peligros. Desafortunadamente, la falta de reconocimiento

de los migrantes climáticos bajo el derecho internacional significa que los estados insulares deben decidir por sí mismos el mejor curso de acción. Esto plantea una pregunta importante: ¿Cuáles son los posibles desafíos y soluciones para los Pequeños Estados Insulares en Desarrollo [PEID], como Maldivas, que están planificando la migración forzada climática de sus poblaciones? Utilizando un estudio de caso de Maldivas, este documento explora las medidas de mitigación y adaptación que el gobierno de Maldivas ha considerado para desarrollar su resiliencia climática. También argumenta que, en lugar de planificar la reubicación, las Maldivas y otros SIDS deberían priorizar mantener unidas a sus poblaciones, mantener la integridad cultural e implementar iniciativas que apoyen el desarrollo sostenible.

Palabras clave: migración, clima, reubicación, mitigación, adaptación, población, soberanía, cultura, desarrollo.

Introduction

In an opening speech given at the most recent United Nations Climate Change Conference, the COP26, held in Glasgow, Scotland, the president of the small island nation of the Maldives, Ibrahim Mohamed Solih, began his address by describing the existential threat that global warming poses to his country: "Our islands are slowly being eaten by the sea, one by one. If we do not reverse this trend, the Maldives will cease to exist by the end of the century...Please, please do not let this opportunity go to waste" (Meredith, 2021).

For Small Island Developing States [SIDS] like the Maldives, Fiji, Tuvalu, and other island nations, the COP26 represented a pivotal moment to show the world, and in particular nations that are high emitters of carbon dioxide [CO2] such as the United States of America and the People's Republic of China (Blokhin, 2021), how crucial taking global climate action is before rising sea levels force the displacement of hundreds of millions of people across the world by the end of the century (Brown, 2008). Bodies such as the International Organization for Migration [IOM] and the Intergovernmental Panel on Climate Change [IPCC] predict that environmental degradation resulting from factors such as rising sea levels and flooding (Baillat, 2021) will not only worsen humanitarian issues like poverty and war (Podesta, 2019), but could also result in changes to migration that will fundamentally affect human mobility (Kälin and Weerasinghe, 2017). According to IOM, in SIDS such as the Maldives, where it is predicted that rising sea levels will overtake all of its islands by 2100, temporary or "permanent migration may be the only option[s] for those who anticipate their homes becoming permanently uninhabitable as a consequence of environmental changes" (Kälin and Weerasinghe, 2017). In addition, the "permanent relocation of populations – whether initiated or supported by governments – is increasingly considered as a solution of last resort" due to the costs and complexities involved with planning for such scenarios (Kälin and Weerasinghe, 2017). Moreover, if these migrants are not provided with sufficient assistance, they may be more at risk from "exploitation, discrimination, and [even] human rights" abuses (Kälin and Weerasinghe, 2017), forcing governments to intervene as they find ways to manage their populations' needs. In addition, for many islanders, the land they live on is considered a "part of their identity", and making the decision to leave the place of their ancestors is often a traumatic experience which brings physical and psychological hardships (Borsa, 2020). All of these concerns raise an important question: *What are possible challenges and solutions for Small Island*

Developing States [SIDS], such as the Maldives, who are planning for the climate forced migration of their populations?

Using the Maldives as a case study, this paper explores the phenomenon of climate migration, first by contextualizing the terminology used in such discussions and then identifying relevant existing international regulations and frameworks. It will then explore potential mitigation and adaptation measures developed by the Maldives and subsequently provide policy recommendations for SIDS' governments whose countries' futures are threatened by the realities of climate change.

Methodological apparatus

The purpose of this paper is to provide a literature review of existing analysis on the climate action measures planned by the Maldives and other SIDS. This sweep of the literature will be used as a means of identifying the appropriate next steps that such states can take to tackle the long-term effects of climate change on their population.

The literature used was first identified through searches on search engines such as Google Scholar and JSTOR, as well as previous background reading done in an undergraduate course on international migration. The materials analyzed were also authored by renowned experts in the topic, such as Ilan Kelman, Johannes Luetz, Sumudu Atapattu, Alex Arnall, and Uma Kothari.

Such secondary sources were also chosen for their relevance to the study of climate change impacts on international migration, and were used to examine the phenomenon of climate migration from several perspectives, including environmental viewpoints, international legal frameworks, and governance. The literature cited in this analysis also includes the work of several international organizations, including the International Organization for Migration [IOM], World Bank, European Commission, United Nations Development Programme [UNDP], United Nations High Commissioner for Refugees [UNHCR], National Aeronautics and Space Administration [NASA], and the World Refugee and Migration Council.

In order to ensure the quality and accuracy of the information in this paper, the editorial process was followed with an anonymous peer review which provided feedback and recommendations for revision. A further virtual meeting of peer researchers was conducted in order to provide a space for questions and comments relevant to the feedback.

Clarification of Terminology

Firstly, it is important to clarify the terminology relevant to the context of migration and climate change, as the lack of any globally recognized or international legal definitions for migrants as a result of environmental degradation (International Organization for Migration, 2020) means that different organizations and groups utilize a variety of terms to describe the issues involved. One term developed by IOM in 2007 is the phrase "environmental migration" to denote any type of migration in which environmental disasters are the drivers of human movement (Kälin and Weerasinghe, 2017). Furthermore, IOM defines *environmental migrants* as "persons or groups of persons who, predominantly for reasons of sudden or progressive change in the environment that adversely affects their lives or living conditions, are obliged to leave their habitual homes, or choose to do so, either temporarily or permanently, and who move either within their country or abroad" (International Organization for Migration, 2020).

However, for the Maldives and other SIDS, another, narrower term has also been used as a way to better represent the realities of forced migration from the effects of climate change: *climate migration*. According to IOM's guide to international migration law, "Glossary on Migration", climate migration is a specific "subcategory of environmental migration" and is defined as the "movement of a person or groups of persons who, predominantly for reasons of sudden or progressive change in the environment due to climate change, are obliged to leave their habitual place of residence, or choose to do so, either temporarily or permanently, within a State or across an international border" (International Organization for Migration, 2020). Similar to environmental migration, the term 'climate migration' is not a recognized one in international law; however, it has appeared in several international legal instruments in the past few decades, including the *binding* "Cancún Agreements on Climate Change Adaptation" adopted by countries at the COP16 conference in 2010, an agreement which recognized three types of human movement exacerbated by climate change: "displacement, migration, and planned relocation" (International Organization for Migration, 2020). These terms also indicate specific patterns or forms of migration; for example, *displacement* is used to discuss people who flee their homes as a result of "sudden-onset events in the environment" (International Organization for Migration, 2020). Moreover, *planned relocation* is, "in the context of disasters or environmental degradation, including when due to the effects of climate change, [refers to] a planned process in which persons or groups of persons move or are assisted to move away from their homes or place of temporary residence, are settled in a new location, and provided with the conditions for rebuilding their lives"

(International Organization for Migration, 2020). Thus, unlike displacement, which is a consequence of a climate related disaster, planned relocation is a more deliberate course of action which seeks to provide relief to migrants over a long term period.

Although all the terms mentioned above may connect to each other in some way, it should be emphasized that the nature of their utility truly lies within their specificity. Why? Well, using the correct terminology is critical to a comprehensive understanding of the issues involved in migration resulting from environmental degradation. For example, *climate forced migrants* who have been assisted with planned relocation from their homes due to rising sea levels are facing very different circumstances than, perhaps, *environmental emergency migrants* who have had to flee due to a tsunami or earthquake. The consequences of either group's situation should not be minimized in any way, but for the former, the rising sea levels may pose a threat to the very survival of their country. In short, for all the aforementioned reasons, it may be more appropriate to refer to the people living in [SIDS] like the Maldives as 'climate forced migrants' rather than an alternative, broader term such as 'environmental migrants'.

Secondly, recognizing the correct terminology is an important step in an analysis of this issue, particularly because the terms used to describe climate migrants often connect to the lack of existing *binding* international legal frameworks or agreements that are relevant in this area. For example, there is a popular misconception that environmental migrants, or even specifically climate migrants, may also be referred to as 'climate refugees'; however, this term is inappropriate, for a variety of reasons. One is that in order to be considered a refugee, a person must be, as defined by the 1951 Refugee Convention, "unable or unwilling to return to their country of origin owing to a well-founded fear of being persecuted for reasons of race, religion, nationality, membership of a particular social group, or political opinion" (UNHCR, 2017). Refugees cannot simply be used to describe people who are fleeing their home; there must be an extreme factor such as war, armed violence, or persecution (UNHCR, 2017) that makes it particularly unsafe for that person to return. To call environmental or climate migrants 'refugees' is not only misleading and holds "no legal basis in international migration law", but also "could potentially undermine the international legal regime for the protection of refugees" (Olsson, 2015). Although climate migrants face their own unique struggles, it appears that most are not in immediate danger or afraid that they will be targeted for belonging to a specific group. As a result, binding international legal treaties which recognize and serve to protect refugees, such as the 1951 Refugee Convention, or principles under international human rights law, such as the principle of non-refoulement, do not acknowledge

migrants facing environmental degradation as holding refugee status. Thus, environmental or climate migrants are not protected under international law or afforded the same rights, i.e. the ability to seek asylum.

Coverage in Relevant International Legal Frameworks

Of course, this isn't to say that climate migrants are not recognized at all in international migration policy or law. Indeed, there are a few relevant *non-binding* agreements, i.e. the Global Compact for Migration [GCM], an international agreement which highlighted global warming and other phenomena of climate change as drivers "of forced migration through calls for building community resilience and adaptation capacity as well as for relocation schemes and commitments that 'enhance the availability and flexibility of pathways for regular migration'" (McCarney, 2021). However, even within the GCM, the terminology used effectively conceals the circumstances of people living in SIDS such as the Maldives, as the lack of meaningful solutions for migrants fleeing uninhabitable lands due to the effects of climate change [for example, rising sea levels] are not properly addressed. The agreement instead favors policies such as 'migration with dignity' and connecting migration guidelines to the Sustainable Development Goals (McCarney, 2021), which are not extensive enough to deal with the complexities of climate displacement issues.

Moreover, other *non-binding* frameworks, such as the United Nations Framework Convention on Climate Change [UNFCCC]'s Task Force on Displacement [TFD], which was developed by the Paris Climate Accords [2015], are restricted to providing recommendations (McCarney, 2021) that are not yet enforced by an international body, making it difficult for climate migrants to be supported in practical ways. In fact, a report made to the TFD in 2018 highlighted a frustrating lack of meaningful leadership and collaboration in this area, both in the United Nations and within international legal frameworks (McCarney, 2021). Worse still, not only has the UN failed to develop applicable solutions, but often even when mechanisms were created to support frameworks for climate migrants, the political will to act was so weak that there would be no follow through on the course of action. For example, in 2005 a resolution titled "The legal implications of the disappearance of States…for environmental reasons, including the implications for the human rights of their residents…" was adopted by the United Nations Sub-Commission on the Promotion and Protection of Human Rights in order to request the appointment of a Special

Rapporteur, who would create an inclusive study on the legal consequences of the disappearances of countries due to environmental degradation (McAdam, 2011). However, this study was never performed, and the resolution remains unfulfilled until today for unknown reasons.

In addition to the above-mentioned lack of protections, another gap in the legal protection of climate forced migrants is the lack of an acknowledgement of *de facto* statelessness, or persons who may enjoy the protections of a government currently, but may not be protected in the future if their governments don't exist or hold the capacity to provide needed assistance (Olsson, 2015). The reason for such a concern might be the following: if states such as SIDS might eventually have to consider measures such as planned relocation, an solution explored later in this paper, due to the disappearance of islands from rising sea levels, the respective governments could perhaps be unable to serve their citizens and provide them with the services typically coordinated by national officials. Just because these island populations are protected by their governments currently does not guarantee that the authorities can meet those commitments following a climate forced migration. Unfortunately, modern international law on statelessness, as derived from the 1954 Convention Relating to the Status of Stateless Persons, is "premised on the denial of nationality through the operation of the law of a particular state…despite the fact that a diversity of human rights are affected by environmentally induced migration" (Olsson, 2015).

In short, the combination of a lack of existing legally *binding*, enforceable migration policies for climate migrants, and little political will to create such policies, means that potential *climate forced migrants* from states such as the Maldives are stuck in a sort of 'legal limbo' that unfortunately provides them with little protection or even recognition in international governance.

Other Challenges with Current Terminology

According to Dr. Ilan Kelman, a renowned expert in risk and disaster reduction at the University College London in the U.K., there are two fundamental issues in current discourse on climate migration: the difficulty in establishing how many climate migrants there are in the world, and misunderstandings on what the basic causes of forced climate migration are. In his paper titled "Imaginary Numbers of Climate Change Migrants?", Kelman explains these issues in order to assert the following: there isn't any meaningful evidence to back up that climate change is a direct cause of any migration patterns (Kelman, 2019). While some intergovernmental organizations or agencies may point to statistics of climate migrants

in different countries, Kelman argues that no such numbers are accurate. There are many possible reasons for such a claim, one of which is that theoretically, the best way for researchers to count climate migrants in populations would be to wait until after the deaths of the migrants in order to record their status, as it cannot be definitive until it is known if the migrant would ever return, or whether their migration was a more permanent phenomenon (Kelman, 2019). However, this would never work in practice because human beings are not stationary; most don't stay in one place for their entire lives (Kelman, 2019). People can move away from their homelands and return in the future. As a result, when migrants do move away from their native countries and such movements are recorded, "inconsistency might emerge if people purport to move due to climate change impact", even if those migrants move back to their homelands in the future without considering possible threats from climate change (Kelman, 2019). This is an interesting view, as agreeing with Kelman's assertion means that experts can never be too sure about whether climate migrants exist at all, at least if they continue to use the same methods to calculate such populations.

Similarly, Kelman's second issue, which asserts that climate migration is generally the result of a "lack of support mechanisms to deal with climate change impacts, rather than climate change" itself, also highlights that current statistics of climate migrants may not be helpful (Kelman, 2019). These groups may not have been forced to move due to the effects of climate change, such as rising sea levels, but instead have faced the consequences of their governments' failure to implement feasible adaptive measures. Subsequently, the term 'climate migrants' may not be the appropriate name for this group, but could potentially be a distraction to solving the challenges presented by national development. Kelman argues that if countries stop blaming their issues on climate change and instead focus on their preparedness for threats to security, they can be successful in improving the quality of life for their populations. One example of a successful country to model after its disaster reduction structure is, according to Kelman, Bangladesh (Kelman, 2020). The southasian country, which is vulnerable to climate disasters such as tsunamis and flooding, has for decades experienced high migration levels, but through its national planning on cyclone preparation, Kelman contends that Bangladesh has "indicated what can and what should be achieved regarding weather, irrespective of climate... change" (Kelman, 2020). In short, climate migration may not be an issue if countries are adequately prepared for natural disasters, which is why having strong mitigation measures and adaptation measures is so crucial to ensuring people aren't forced from their homes in the first place.

Mitigation Measures

Ergo, all these considerations lead to a crucial question: If climate forced migrants are not protected under international law, then what can countries like the Maldives, Fiji, Tuvalu, or other Small Island Developing States [SIDS] that fear the disappearance of their islands do to protect the future of their peoples? Although global warming is of course a problem which can't be solved by the SIDS alone, there are practical measures that countries like the Maldives are already taking in the interests of their populations' welfare. In the context of climate action, these types of measures are often divided into two categories: mitigation and adaptation. Mitigation refers to measures that help maintain or lower carbon dioxide and other greenhouse gas emissions, while adaptation refers to adjusting to the current consequences of climate change (National Aeronautics and Space Administration, n.d.). Over the past few decades, the Maldives has implemented several mitigation and adaptation measures with the purpose of overcoming the effects of climate change, and in particular global warming, in order to protect Maldivians from rising sea levels and flooding.

Subsequently, one major focus of the Maldives' mitigation measures has been promoting "low carbon development" as a means to help decrease carbon emissions (Climate and Clean Air Coalition, 2015). According to information gathered by the Global Climate Change Alliance Plus Initiative, a climate focused project funded by the European Union, the Maldives has prioritized "leveraging public-private partnerships" in order to manage energy efficiency and support further development of renewable energy sources [i.e. wind, solar, hybrid, etc.] on the islands (Climate and Clean Air Coalition, 2015).

In addition, the government has collaborated with local private resorts to create new finance frameworks which would help decrease carbon emissions produced by the country's popular tourism sector (Global Climate Change Alliance Plus (Climate and Clean Air Coalition, 2015). Moreover, in 2019, the Maldives introduced its *National Action Plan on Air Pollutants*, a comprehensive scheme that details twenty-eight different mitigation measures "across three priority source sectors: waste, electricity generation, and transport" (Climate and Clean Air Coalition, 2015). According to the United Nations Development Programme, the plan "is viewed as a landmark initiative within the disaster risk reduction and adaptation communities" (United Nations Development Programme, n.d.). Among the suggestions made, the most notable ones are: advancing existing and improving access to "public transport, bicycle lanes, and

footpaths"; making electric cars or other electric vehicles tax-free; pledging to discontinue the development and sale of hydrofluorocarbons [HFCs] in favor of the more sustainable method, district cooling; and even banning future sales of cars older than five years in the country (Climate and Clean Air Coalition, 2015). According to the Climate and Clean Air Coalition at the United Nations Environment Programme [UNEP], if this National Action Plan is fully carried out, the Maldives would see a "forty percent reduction of black carbon and a twenty-seven percent reduction of nitrogen oxide…emissions" by the year 2030. Arguably, this would be an incredible outcome, considering that the Maldives already only contributes "0.003% to global emissions" (Climate and Clean Air Coalition, 2015).

Nevertheless, how do these mitigation measures connect to migration, and more specifically, climate forced migrants? According to the United Nations Intergovernmental Panel on Climate Change's report on Mitigation of Climate [2014], the aim of mitigation is to ensure that development is consistent with sustainability (National Aeronautics and Space Administration, n.d.). Bearing this aim in mind, it is important to reiterate that if the world continues to follow an unsustainable path through development, which then increases carbon emissions, the consequences would be severe for people living in SIDS, which are dramatically affected by rising sea levels. Thus, countries like the Maldives enact mitigation measures because while they unfortunately can't always influence other more powerful states to take climate action, they can take their own steps to reduce their likelihood of climate forced migration in the future.

Adaptation Measures

Naturally, mitigation measures are often not sufficient for countries to prepare for the effects of climate change, which is why the Maldives has also implemented adaptation measures. Such efforts are not only designed to help the Maldives adjust to climate change, but to also "take advantage of any positive opportunities that may arise" (The European Climate Adaptation Platform Climate-ADAPT, 2020). There are different types of adaptation techniques which have been grouped into the following classifications by the European Climate Adaptation Platform: "gray, green, and soft measures" (The European Climate Adaptation Platform Climate-ADAPT, 2020). Gray measures are "technological and engineering solutions" designed to generate new types of infrastructure and land management in order to adapt to climate change challenges (The European Climate Adaptation Platform Climate-ADAPT, 2020). Green measures strengthen the "resilience" and "adaptation capacity"

of a country through an "ecosystem-based approach", and soft measures may include "legal, social, financial" or governmental policies which can reinforce adaptation capacity as well as mobilize awareness on the effects of climate change (The European Climate Adaptation Platform Climate-ADAPT, 2020).

Wetland Conservation

One green measure which constitutes a significant feature of the Maldives' Climate Change Adaptation Project [CCAP] has been conserving the country's wetlands (Ali, 2018). The importance of protecting these areas cannot be understated, as wetlands "can store several tens of millions of cubic meters of water", providing a powerful flood management tool which act as natural "barriers against rising sea levels" (Ali, 2018). Wetlands also help to purify the groundwater flowing through the ecosystem and manage erosion of shorelines (Ali, 2018). Thus, in order to protect these important areas, the Maldives has begun carrying out new solid waste management projects to safeguard the wetlands from illegal waste dumping practices (Ali, 2018). The purpose of such initiatives is to bolster already occurring phenomena in the hydraulic cycle like groundwater recharge, which can "restore groundwater levels and store water for later use" as well as "reduce flood risk" (Escriva-Bou et al., 2021).

Moreover, such a project can also be considered a soft measure for its boost to the wider population's awareness of climate change. In the interest of "biodiversity conservation", the Maldives is using the protection of the wetlands to increase its nature based tourism by making the areas more enticing to tourists (Ali, 2018). This will be achieved by defining spaces as national parks for hiking activities, building bird observatories for bird-watching enthusiasts, and building more pathways along the coast for visitors who wish to experience the Maldives' grand views (Ali, 2018). The revenue generated from this development in the tourism sector can then be used to renovate infrastructure for climate change resilience, while simultaneously bringing attention to a new feature of the country, notwithstanding its beaches or coral reefs (Ali, 2018). More importantly, though, these developments will not only benefit tourists but Maldivians too, as protecting the wetlands will also support their livelihoods. One of the plants native to the Maldives' wetlands, taro, is considered both an important source of food, but is also used as a "medicinal herb" and a material used in traditional "embroidered handicrafts" such as mats and baskets (Ali, 2018). Safeguarding the wetlands means that the supply of taro will be protected against illegal cutting of the plants, which is a growing

concern among the islands' artistic communities. It also provides visitors with an opportunity to view first-hand how protecting the islands from the effects of climate change is crucial to maintaining the locals' way of life and why it is fundamental for the world to invest in SIDS such as the Maldives.

Sea Wall Infrastructure

However, protecting the wetlands is only the 'tip of the iceberg' in terms of the Maldives' adaptation measures. One adaptation measure which is not only a possible solution for the Maldives, but one which the island state is actively implementing, is the building of sea walls to deal with rising sea levels (Kapoor, 2020). Sea walls are defined by the National Maritime Foundation as "heavily engineered inflexible structures which…prevent sliding of the soil" and are helpful in acting as a defensive barrier against flooding (Kapoor, 2020). The Maldives has been exploring the use of sea walls for decades, but it recently began increasing production of the barriers, which are usually made of concrete or mortar (The European Climate Adaptation Platform Climate-ADAPT, 2020), following the El Niño phenomenon in 2016, a "warming of the equatorial Pacific Ocean" that led to one of the most damaging losses to coral life via "mass bleaching" in the Maldives since 1950 (Stockdale et al., 2017). Sea walls are incredibly useful to coastal communities for several reasons: they are designed to be storm-resistant; they preserve eroding cliffs and other rock structures; and they shield the land from "wave overtopping" as their heights can secure the distance between the mainland and the beach level, also called the dune (The European Climate Adaptation Platform Climate-ADAPT, 2020). According to the Maldives' current Minister of Foreign Affairs, Abdulla Shahid, building more sea walls is fundamental to protecting the country's coasts from the ravaging effects of climate change, as highlighted by his quote in an interview with the Reuters news agency in 2020: "In order to protect the islands, we need to start building sea walls…It's expensive, but we need [them]. We can't wait until all of [the islands] are being taken away" (Pal & Ghoshal, 2020).

Fortunately, some larger states have already stepped up to help develop the Maldives' sea walls. For instance, Japan had finished constructing a six kilometer long sea wall in 2002 along the Maldivian capital of Malé which ended up protecting the city considerably "from the 2004 Indian Ocean Tsunami" (Kapoor, 2020), one of the deadliest underwater earthquakes ever documented. Such a sea wall is not only useful for protection against natural disasters in the short-term, but perhaps long term defense as well, particularly against rising sea levels and increased flooding resulting from global warming.

Nevertheless, it is important to note that the building of sea wall infrastructure does have disadvantages, some of which may arguably outweigh any previously referenced benefits. One disadvantage is that focusing too much on building sea walls or other types of "hard infrastructure" might divert attention and resources away from soft adaptation measures which can be just as critical for building a climate resilient country and economy, i.e. training policymakers or supporting climate action education for local communities (Kapoor, 2020). Another disadvantage is that sea walls are not completely sustainable in the long term for the preservation of the local environment, especially in relation to beaches. Although sea walls serve as excellent defensive barriers, they have been "reported to aggravate the problem of beach erosion" (Kapoor, 2020), a process which has severe consequences on the animals who have made the beaches their home. For example, sea walls may block sea turtles from "nesting sites" and can even be trapped by them (Kapoor, 2020). Subsequently, the repercussions of the structures on erosion and animal habitats raise concerns on whether sea walls are sufficiently environmentally friendly to justify their continued production, or if alternative, less damaging options need to be emphasized.

Floating City Model

Another innovative adaptation measure the Maldives has begun implementing is the development of waterfront residences for the purpose of building a "floating city" (Marchant, 2021). The project is being designed by the Maldivian government in collaboration with the Netherlands to develop "thousands of waterfront residences and services floating along a flexible, functional grid across a 200-hectare lagoon" (Marchant, 2021). These residences will form the basis of an "island city" that will be located in a "warm-water lagoon" about ten minutes from Malé by boat (Marchant, 2021). The reasoning behind such a design is rooted in a focus on sustainability and protecting the islands from rising sea levels. The Maldives is hoping that by modeling the Netherlands' innovative production of "floating social housing", it can create unique aquatic, urban grids which can meet the growing needs of its population (Marchant, 2021).

One reason why the floating city model might be preferable to the production of sea wall infrastructure is that it has "minimal impacts" on the local environment in that it doesn't contribute to beach erosion or destruction of the coral reefs (Marchant, 2021). The waterfront residences can also be created independently, meaning that no existing land needs to be used for the model to work. More importantly, though, rising sea levels would not be as great of a concern as the residences would rise along with the waves (Marchant,

2021). Such an outcome could be groundbreaking for the Maldives, as the presumption of climate forced migration from the country is generally based on rising sea levels making the lands uninhabitable in the future. However, if the floating city model allows the state to adapt with the sea while maintaining the population's quality of life, this migration would not have to take place.

Another benefit to the floating city model is that the interconnectedness inherent in the model's plan would not only help Maldivians deal with issues from climate change, but could also propel the country further towards more sustainable development. The idea is to construct a chain of connecting water channels, bridges, and docks that would make it easy for locals to go to businesses, houses, and other facilities across the floating city (Marchant, 2021). Moreover, the city would run on energy derived from renewable resources such as solar, wind, and aquatic power, making the country less reliant on fossil fuels or other sources contributing to the climate crisis.

Artificial Islands

Likewise, a third adaptation measure which could be a powerful solution for the Maldives if further developed is the construction of artificial islands. This plan goes a step further beyond the floating city model, as building new islands means physically raising the height of the existing land to make the environment more flood-resistant. While the plan might seem difficult to execute at a first glance, the Maldives had already begun building such an island in 1997. Known to the locals as Hulhumalé, this artificial island was built in order to "relieve overcrowding in Malé", and today it is the "fourth-largest island" in the country with a population of over 50,000 people (Voiland & NASA Earth Observatory, 2021). Hulhumalé was constructed by "pumping sand from the seafloor onto a submerged coral platform", allowing it to rise about two meters above sea level, which is about twice the height of Malé (Voiland & NASA Earth Observatory, 2021). While the island had not initially been developing with climate-resilience in mind, Hulhumalé has the capacity to inhabit or house other groups of the population who might need to evacuate there in case of natural disasters such as earthquakes or tsunamis (Voiland & NASA Earth Observatory, 2021), providing the government to with an opportunity to already begin moving people from smaller islands which are more vulnerable to flooding.

In addition, locals who now inhabit Hulhumalé prefer living on the raised island for the following reasons: it "has wide sand beaches instead of a concrete sea wall" (Hamilton, 2008), due to the lack of a

need for a physical barrier; there is more space for individuals and families, alleviating the congestion that locals previously living in Malé had to deal with; and it's clean because the government could already build modern sanitation systems from the initial phase of the development.

Following these positive reactions, one recommendation for the Maldivian government would be to not only help more locals move to Hulhumalé, but to focus on the expanded development of artificial islands. Further land raising would help protect the Maldives against rising sea levels and could be a long-term climate-resilient solution combined with the floating city model. It would also support urbanization and greater sustainable development in the country. Of course, there are some considerations which need to be accounted for in such planning. For example, the extent of "the height allowance over time" would need to be thought through in relation to variables such as "flood hazard e.g. sea levels, waves, surges, tides, and exposure e.g. land use and defenses" (Brown et al., 2020). Naturally, the higher the allowance for sea level rise, the better, as the higher the islands rise in height, the lower the chance would be of those islands having to face flooding (Brown et al., 2020). There are also some challenges which arise from this practice; for instance, even if the rising sea levels do not directly impact the raised islands, the "secondary effects of sea level rise such as groundwater stalinization" would still have to be dealt with (Brown et al., 2020). A more significant challenge, moreover, would be the costs involved in such a project. The following question remains: Who would be paying to build these raised islands? Well, according to the Maldives, other countries, particularly those which are higher emitters of carbon dioxide and thus larger contributors to global warming, should be responsible for contributing the funds (Hamilton, 2008). While these countries would be hesitant to help, it is arguably in their best interests to do so, as the lack of long-term solutions like the floating city model and artificial islands could mean that planned relocation, albeit a gradual, phased one, might be the only option for the Maldivian population.

Future Floating

Although it has already begun implementing various mitigation and adaptation measures, the Maldives is not the only island state which has developed new ways of tackling the effects of climate change. One method which Maldivians or other SIDS could learn from, and possibly apply to their own populations, is the 'future floating' model created in Bangladesh. According to Johannes Luetz, a social scientist specialized in human climate migration, Bangladesh's "revolutionary solution" to intense annual floods involves a "flat-

bottomed fleet of 42 boats that are school bus and schoolhouse in one, providing education and other services to more than 1,500 students in nearly 400 villages…" (Luetz, 2008). The main benefit of this model is that the students who live in coastal areas would not be forced to relocate to urban communities to pursue their secondary education [or even basic schooling, in many cases].

Nevertheless, there are numerous other advantages which not only protect these students from the impacts of rising sea levels, but even increase accessibility and promote sustainable development. For instance, many Bangladeshi students in coastal communities would drop out during monsoon season because taking a flooded route to school for a couple months was extremely dangerous (Luetz, 2008). However, the boats created for the 'future floating' model allowed these students to continue their education during monsoon season, preventing disruptions which would have otherwise limited their opportunities in the future. In addition, the Bangladesh government worked with indigenous communities to ensure that the production of the boats was done by indigenous manufacturers, supporting local development.

What is important to take away from the 'future floating' model, and other innovations similar to its design, is that mitigation and adaptation measures should not only be focused on climate action. As well, governments should consider how to implement policies which increase sustainable development and make the lives of their peoples better than before.

Planned Relocation and Its Challenges

However, why might planned relocation be considered a last resort option for the Maldives? Firstly, it is important to explain what exactly the term implies. Planned relocation does not mean moving to a new island within the Maldives as the artificial island developments are trying to achieve, but instead refers to moving to an entirely different country or territory. Thus, the reasons for the hesitance to implement such a system are varied, but one significant factor lies with the hardships associated with the moving process itself. For islanders in the Maldives, the land they live on is often considered a natural extension of their cultural identity. To leave their home behind as a result of climate change disruption would arguably be a traumatic experience, and would mean that communities formed over generations in ancestral lands would have to 'start over' in a place they've never been to before. Another challenge would be the "extent to which the needs of affected populations and the impact of planned relocations on them are taken into account" (Gallo, 2019). Moving an entire country's population to another territory would have

significant impacts on the lives of the population already living there, and if the relocation is not planned out carefully, the possibility for violence, xenophobia, discrimination, and perhaps even armed conflict between the two groups could be high. Moreover, a relevant concern would be "land tenure issues in terms of evacuated areas, land acquisition, [and] relocation sites" (Gallo, 2019). Not only would finding available land to house such a large population be difficult but obtaining that land legally and ensuring that the relocated population is recognized under domestic laws, as well as public international law, would be a major challenge. An additional challenge would relate to governance; for instance, how would the Maldives govern its population and form the basis of a country if its population was living in a new territory?

Subsequently, in such discussions about the challenges of planned relocation, it is critical to point out that current international law is often insufficient to resolve such issues, as the scope is neither large enough nor fully developed. For example, according to international environmental lawyer Sumudu Atapattu, the application of international legal principles, such as the right to self-determination, to contexts of planned relocation has never been thoroughly investigated, especially on such a large scale with regards to entire populations from SIDS (Atapattu, 2014). In her paper titled *Climate Change: Disappearing States, Migration, and Challenges for International Law* published by the Washington Journal of Environmental Law and Policy, Atapattu further explains that it is not yet known if populations from a disappeared state would govern themselves, or even if they could use the right to self-determination in order to demand territory from other states for their own sovereignty (Atapattu, 2014). Of course, self-determination is not the only defining principle of international law at play here; according to researcher Jeremy Keller, the right to nationality is also an important entitlement in international law, regardless of whether the territory of one's nation has disappeared (Kelley, 2011). Essentially, international law does not have adequate frameworks to unravel this dichotomy, as even existing legislation such as the Law of the Sea Convention does not articulate what would happen to maritime zones associated with disappeared states. As such, SIDS may have to rely on the goodwill of larger, more powerful states to support their enduring existence.

How, then, is the Maldives planning to execute planned relocation? And how should SIDS implement this process in order to account for the needs of all populations involved? First, the Maldivian government has been considering which countries are prime locations for planned relocation for over a decade, with Australia, India, and Sri Lanka having been considered due to proximity and similarity in culture (Ramesh, 2008). In fact, the

government has already "set up a sovereign savings account, funded by revenue from tourism" to purchase a new homeland in one of these countries (Burgess, 2012). Although other SIDS such as Kiribati and Tuvalu have held talks with the Australian government to "discuss the possibility of immigration assistance", the Maldives has created their fund with the hope that by owning their land, the government will not "require the bureaucratic generosity of other nations" (Burgess, 2012). However, such a solution is not feasible for all countries considering planned relocation.

Further Recommendations

In addition, a recommendation for SIDS who don't have the funds to purchase land in another country and are also facing bureaucratic resistance to requests for future humanitarian assistance, would be to propose setting up an autonomous state, similar to the governance structure of First Nations in Canada and Native American tribal reservations in the United States. In both countries mentioned, all members of the autonomous states living in these territories, i.e. Navajo Nation in southwestern U.S., Métis Nation in eastern Canada, etc., pay federal income taxes to the respective government (United States Department of the Interior Bureau of Indian Affairs, 1991). By following a similar model, island nations could be contributing to the economy of the host country while maintaining their own sovereignty. Naturally, though, binding agreements would need to be developed between the two countries that meet the requirements of human rights and other cornerstones of international law. Protecting the SIDS' government's sovereignty would be vital to the success of such a process, however, meaning that political and social considerations would need to be comprehensively accounted for.

Finally, it cannot be overemphasized that a planned relocation should be implemented in phases, and that it should only be considered if all other initiatives fail as adaptation measures. If countries such as the Maldives find planned relocation to be necessary, groups in the smallest or most vulnerable islands should be prioritized in a gradual movement towards the host country's territory. This phased relocation should be spread out over every couple of years in order to sufficiently take care of the needs of each group. This will not only reinforce the host government's effort to properly welcome the new inhabitants, but will allow the respective SIDS government to identify how much land and resources are required to support the growing populations.

Main Priority

Firstly, it is important to emphasize that when discussing initiatives such as planned relocation, the priority should be preparing for realistic outcomes. For instance, some scholars might argue that the best solution for SIDS would be to collaborate with the United Nations, or perhaps other intergovernmental organizations to produce new and/or binding frameworks for climate forced migrants within international law. Realistically, though, small states such as the Maldives will have to confront the fact that more powerful states might not feel responsible for providing territory or aid with relocation, regardless of any prior commitments expressed in climate frameworks like the United Nations Framework Convention on Climate Change [UNFCCC] (Atapattu, 2014). Moreover, even if land has already been bought for a planned relocation, concerns relevant to cost, governance, and naturally the maintenance of cultural integrity remain.

Furthermore, it is also crucial to recognize the dangers of allowing panic to influence major public policy making, rather than focusing on pragmatic solutions. Throughout the sphere of media, and even in discussions amongst politicians and environmental scientists, there is often a tendency to adopt an alarmist perspective "by invoking a policy discourse of immediacy and urgency" (Arnall and Kothari, 2015). These representations of a "climate apocalypse" are problematic for two reasons. First, they create a notion that developing states are helpless without the support of the Western World, adding to stereotypes of victimhood and reinforcing the idea that SIDS lack the independence required to solve such problems (Arnall and Kothari, 2015). Second, these representations portray climate threats with such a strong sense of "immediacy" that may distract governments from their populatuon's more pressing concerns, such as the economy, healthcare, or political freedoms (Arnall and Kothari, 2015).

However, the alarmist voice often used in the media and politics isn't necessarily the right one. Planned relocation is not the only solution to climate change for SIDS, and subsequently, should not be considered unless all other viable alternatives have demonstrably failed. Adaptation measures such as artificial islands and floating cities won't be easy to implement, but they will support the sovereignty of SIDS as well as the cultural integrity of the populations living there. As such, these types of measures need to be prioritized over planned relocation schemes which may only serve as distractions from the current issues that islanders are facing. Of course, this doesn't mean that adaptation measures should be implemented *in*

place of planned relocation; this scenario isn't necessarily an 'either-or' situation. Unfortunately, not every project can be invested into, and therefore, governments would be more proactive by investing in initiatives that further develop their economies.

Conclusions

In conclusion, the Maldives is one of many countries whose survival is being threatened by climate change. As the global temperature increases and sea levels rise, many states, particularly SIDS, must confront the possibility of planning for a future where their islands may be submerged in one hundred years. Fortunately, there are several measures used by the Maldives that can be duplicated by other countries to protect populations from flooding and natural disasters. Mitigation measures such as developing the use of renewable energy sources, and adaptation measures such as the construction of floating cities and raised, artificial islands can be used in conjunction with phased planned relocation to serve populations' short-term as well as long-term needs. However, what is most important to take away from this analysis is that SIDS considering a planned relocation need to primarily focus their attention and resources on adaptation measures.

While planned relocation is an option, its feasibility is questionable, and such an initiative would upend the lives of populations who may feel a strong cultural connection to their native homelands and would require national restructuring on a massive scale. Moreover, adaptation measures support countries in maintaining their sovereignty, and offer a current alternative to supporting sustainable development while tackling the effects of climate change. If policy officials work together now to protect their nations from the effects of climate change, they may prevent forced climate migration from occurring and ensure a more sustainable and hopeful future for all islanders.

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