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# **One Island, Two Realities: Comparing Differences in Climate Change Vulnerabilities Between Haiti and the Dominican Republic**

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# Introduction

Increasing levels of greenhouse gas emissions in the earth's atmosphere are leading to global warming, which, over time, has been changing the planet's climate and will continue to do so in the future (Intergovernmental Panel on Climate Change, 2021). It is projected that at the end of this century, the global average temperature will be 2.1-2.9 degrees Celsius higher as compared to pre-industrial levels (United Nations Framework Convention on Climate Change, 2022). According to the Intergovernmental Panel on Climate Change (IPCC), this global warming will make the frequency, magnitude and extent of extreme weather events worse in the future, and the timing more uncertain (Intergovernmental Panel on Climate Change, 2022). Unless societies quickly adapt to this scenario and build resilience, the number of climate change related disasters can be expected to rise, too (Intergovernmental Panel on Climate Change, 2022). This thesis will focus on the island of Hispaniola, where precipitation patterns are expected to change significantly in the future. Such change implies that the dry season will bring more intense droughts while there will be more floodings and a higher risk of landslides in the rainfall season (Ministerio de Medio Ambiente y Recursos Naturales de la República Dominicana et al., 2018). Moreover, the number of storms and hurricanes will increase (UNDP Climate Change Adaptation, 2023). The island of Hispaniola is shared by two countries – the Republic of Haiti and the Dominican Republic (D.R.), yet their vulnerabilities regarding current and future climate change events differ greatly. This thesis identifies and examines the main reasons for such differences in climate change vulnerabilities between the two countries. I will explore how factors like governance, economic wealth, and disaster preparedness, among others, can explain differences in the two countries' vulnerabilities to climate induced hazards. My analysis shows how theoretical concepts like the Pressure and Release (PAR) model by Wisner, Blaikie, Cannon & Davis (2004) can be used in practice, here serving as the analytical framework. The model offers a structured approach to analysing vulnerabilities, which includes more than just the natural hazard, but a versatile set of economic, social, and cultural factors. The thesis begins with presenting the background, conceptual and analytical framework, followed by the analysis of the vulnerabilities of Haiti and the D.R. and an assessment of how these differ between the two countries. I apply the model to both countries and consequently discuss the results. Finally, the conclusion will reflect on the main findings and recommend avenues for further research.

# Background and Conceptual Framework

## Haiti and the Dominican Republic

Haiti and the D.R. share the island of Hispaniola, which forms part of the Greater Antilles. Haiti occupies about one third of the island in the West while the D.R. constitutes the Eastern two thirds, respectively being the third- and second-largest countries in the Caribbean region. Haiti is rather mountainous with a tropical climate. Its capital city, Port-au-Prince, is located in a bay only 36 km away from the D.R.-Haiti border. As of 2021, almost 11.4 million people are living in the country (World Bank, n.d.b), most of which speak Haitian Creole (Hebblethwaite, 2021). Haiti is constitutionally a semi-presidential republic with a multi-party system. Executive power should be divided between the president and the government which is led by the prime minister. Currently, however, Ariel Henry is prime minister as well as acting head of state after the assassination of former president Jovenel Moïse in July of 2021 (German Federal Foreign Office, 2023). Thus, democracy is at least temporarily replaced by autocracy. The D.R., though almost double the size of Haiti, has a comparable number of inhabitants, being 11.1 million in 2021 (World Bank, n.d.a). The country's geography and climate are similar to that of Haiti. Its capital city is Santo Domingo, and the official language is Spanish. The D.R. is a representative democracy, also with a multi-party system. The government is the executive, whose head is the president of the D.R., currently Luis Abinader ("Change in Dominican Republic as opposition wins presidency", 2020).

## Development

The concept of development is subject to constant change. Initially, the intention of development work was achieving economic growth, measured in Gross Domestic Product (GDP). In 2021, Haiti had a GDP of 20.94 billion US\$, and respective 1,829.6 US\$ per capita (World Bank, n.d.a). The D.R., in contrast, had a GDP of 94.24 billion US\$ and respective 8,476.8 US\$ per capita (World Bank, n.d.b), making it one of the strongest economies in the Caribbean. These numbers show the substantial difference between the citizens' affluence of the two countries. However, development does not only entail economic well-being. The Human Development Index (HDI) includes further measures such as education, decent living standard, age, and health. Respective indicators are mean years of schooling, Gross National Income (GNI) per capita, and life expectancy at birth. The HDI ranges from 0 to 1. The higher

the value, the more 'developed' the country is. There are four categories for indicating the development status, ranking from low over medium and high to very high. In 2022, Haiti's HDI value was 0.535, putting it in place 163 out of 191 (low), while the D.R. had a value of 0.767, placing it at rank 80 out of 191 (high) (UNDP Human Development Reports, n.d.). This indicator, too, clearly shows the disparities of development between the two countries. Moreover, the "HDI [...] turns out to be the best predictor of deaths triggered by extreme natural events", (Wisner et al., 2004, p. 26) and is therefore also a relevant measure in the vulnerability analysis as I will examine public health care, education, and poverty levels.

## **Shared history**

The D.R. and Haiti share a deeply intertwined history which essentially shapes the countries' relation to each other up until today. Starting in the 7<sup>th</sup> century, Taíno people inhabited Hispaniola. After Christopher Columbus arrived in 1492, the Spanish enslaved the indigenous Taíno people and established a colony which later became the D.R.'s capital city (Britannica, T. Editors of Encyclopaedia, 2023). Newly introduced diseases by the colonists and intermarriages between Taíno and Spanish people further contributed to the decline in the Taíno people and their culture. Later, the Spanish left the island for more profitable colonies in other Central and South American regions. During the mid-1600s, France started to colonise western Hispaniola, which officially became Haiti in 1697. After a slave rebellion and unsuccessful attempts of the French to suppress the revolution, Haiti became independent in 1804 and was thus the first nation emerging from a formerly enslaved colony in the Caribbean (Jaramillo & Sancak, 2009). The D.R. declared independence from its former coloniser Spain in 1821. One year later, Haiti took control over the entire island (Jaramillo & Sancak, 2009). Though this was agreed upon consensually from both sides at first, Haiti's rule became increasingly unpopular after they imposed high taxes, among other reasons. In 1844, the D.R. became independent from Haiti and remained so despite Haiti's repeated attempts to regain control over entire Hispaniola. After several decades under a corrupt government and with a mismanaged economy, the D.R. was left highly indebted and therefore unable to repay European countries. Under Roosevelt's rule, the United States decided to take over the D.R.'s customs house, trying to stabilise the country (Jaramillo & Sancak, 2009). However, this dollar diplomacy and the US's occupation from 1916 to 1924 failed and left the country even more insecure than before (Fulfer, 2018). Around the same time, from 1915 to 1934, the US also

invaded Haiti to stop German economic influence (Jaramillo & Sancak, 2009). A strict dictatorship under Trujillo brought the D.R. back on track until he was assassinated. Bosch followed as new president, but the military soon overthrew him. In 1965, when a civil war emerged, the U.S. became concerned about a communist takeover and thus intervened again (U.S. Army Center of Military History, n.d.). Since then, the D.R. experienced stable economic growth and an increasing HDI. Meanwhile, Haiti struggled economically and politically. In 1991, a military coup overthrew President Aristide, so the US intervened again and reinstated him (Jaramillo & Sancak, 2009). Until today, Haiti's political landscape remains highly instable.

### **Current relations**

This joint history significantly shapes the two countries' relations today. For example, the Dominican War of Independence from Haiti between 1822 and 1844 still leaves the D.R. suspicious of its neighbour. Nevertheless, the D.R. has also been aggressive towards Haitians. In 1937, Trujillo ordered killing 17.000-35.000 Haitians living in Dominican villages close to the border, also known as the Parsley Massacre (Łaszkiwicz et al., 2016). Up until today, D.R.'s citizens perceive themselves as superior to the predominantly black population of Haiti (Łaszkiwicz et al., 2016). Only during 2010 when a disastrous earthquake struck Haiti in which 220.000 people lost their lives, the inherent hatred between the two countries seemed to be put aside. The D.R. was among the first to provide aid and treated many Haitians in their hospitals. However, Dominicans soon realised that many Haitian refugees planned on staying, which was met with familiar resentment. Illegal immigration of desperate Haitians into the D.R. keeps fuelling the tension between the two countries (Luscombe, 2022). Over the last year, mass deportations have been taking place, including people with Haitian parents that were born in the D.R. and consequently do not speak Haitian Creole. The reasons for the deportations are racism and xenophobia as Dominicans fear disease, poverty and violence to spill over from the Haitian side. In February of 2022, the D.R. started building a bordering wall to Haiti with the aim of stopping illegal immigration and to facilitate border control (Parkin Daniels, 2021). Hence, the relations between the two countries are not only influenced by a history of invasions and massacres, but also by current development differences and racist attitudes of Dominicans toward the Haitian people.

## **Vulnerability, Risk, and Disaster**

The book “At Risk”, written by Wisner, Blaikie, Cannon & Davis (2004), offers elaborate explanations of the relevant terms *vulnerability*, *risk*, and *disaster*. Wisner et al. (2004) define *vulnerability* as “being prone to or susceptible to damage or injury” (p. 11), and further as the “characteristics of a person or group and their situation that influence their capacity to anticipate, cope with, resist and recover from the impact of a natural hazard” (p. 11). Combined with the likelihood of a natural disaster, vulnerability describes the degree of *risk* that a person is facing. Risk can not only be determined by the statistical likelihood of a hazard (Wisner et al., 2004). Connected to this is a changing discourse which, instead of identifying vulnerable people or groups, determines vulnerable situations. Wisner et al. (2004) find that people move into and out of these situations, depending on changing circumstances which the person can actively shape or passively be subjected to. It is important to remember that the people of a country, here Haiti or the D.R., are not one homogenous entity with regards to their vulnerability. As Wisner et al. (2004) stated, “humans are not equally able to access the resources and opportunities; nor are they equally exposed to the hazards” (p. 6). The vulnerability of each person is therefore essentially dependent on power relations within a society or group.

A *disaster* occurs once a natural hazard intersects with a high degree of vulnerability. Disasters are not only triggered by natural events such as hurricanes, earthquakes or landslides, but are a “product of social, political and economic environments” (Wisner et al., 2004, p. 4). This perspective shifts the discourse away from portraying disasters as solely biophysical phenomena toward a more contextual understanding. Furthermore, disasters can be more than a single, ephemeral event. Shocks can take place over a longer period or repeat themselves, as well as they can occur simultaneously with other shocks.

## **Analytical Framework**

### **Pressure and Release model**

Wisner et al. (2004) continue by presenting the Pressure and Release (PAR) model which will serve as basis for the analysis. It shows how the intersection of vulnerabilities and hazards can result in disasters (see figure 1). Moreover, the model emphasises the importance of local contexts and history. The left-hand side of the model depicts the progression of vulnerability, divided into three stages which are not separate from each other but interconnect across time

and space. Starting from the left, the root causes include political and economic systems, limited access to power, structures, and resources. They essentially shape the functioning of a society, which consequently affects the dynamic pressures in stage two (Hammer et al., 2019). These pressures include, but are not limited to, lack of local investments and training, rapid population growth, deforestation, and debt repayment schedules. Lastly, there are factors that exacerbate unsafe conditions, such as a dangerous physical environment, weak local economies and social relations, incapable public institutions, and insufficient actions. One key element in the progression of vulnerability is disaster risk management institutions, which I will examine in the analysis of unsafe conditions. The vulnerability, which is built up through these three stages, eventually meets a hazard. This could create a disaster, depending on the respective level of vulnerability.

Aspects presented in the model will be given different levels of attention due to differing degrees of relevance to the analysis. Also, the order of subcategories within each stage will be subject to slight changes for reasons of interconnectivity between certain aspects that are not listed consecutively in the original PAR model, and some subcategories will be merged. The model facilitates understanding what shapes vulnerabilities in practice. Moreover, it shows how vulnerabilities and consequent disasters can differ in their extent regardless of the natural hazard and/or geographic location. Wisner et al. point out that technology has become significantly more important ever since the publication of the model in 2004. They argue that technology can decrease vulnerabilities on the one hand, for example by serving as early warning mechanisms through measuring seismographic activity. On the other hand, technological or grey infrastructure approaches often ignore the root causes that create vulnerabilities in the first place and rather treat symptoms, thereby enforcing existing vulnerabilities or even creating new ones (Wisner et al., 2004). However, the technological aspect is most relevant for highly developed countries. Hence, this factor is not of major importance when analysing vulnerabilities in Haiti and the D.R. A key component of influencing the degree of a disaster, next to the vulnerability and hazard itself, is exposure. Though indirectly included in the physical environment, the PAR model does not explicitly mention exposure when explaining how disasters are formed, as Hammer et al. (2019) pointed out. However, exposure is a critical component of vulnerability, and hence needs more attention than the model provides. Finally, the purpose of the model is to explain vulnerability, not to measure it through assigning numbered or weighted categories.



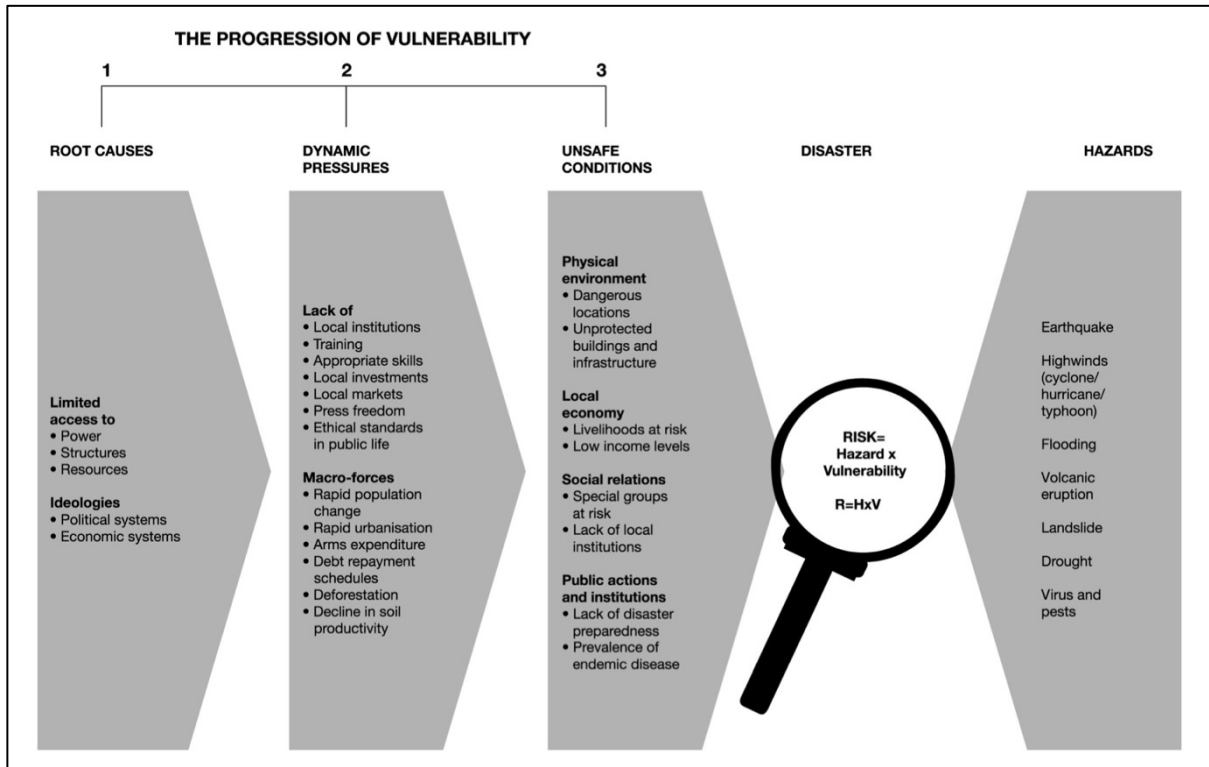


Fig. 1: The Pressure and Release model by Wisner et al. (2004)

## Analysis

In the following, I will apply the PAR model to Haiti and the D.R. On its right-hand side, the PAR model provides a list of natural hazards, not all of which are related to climate change. In the context of Hispaniola, relevant current and future hazards for this analysis include droughts, floodings, landslides, hurricanes, and storms (Ministerio de Medio Ambiente y Recursos Naturales de la República Dominicana et al., 2018; UNDP, 2023; Sheller & León, 2016). Although Haiti and the D.R. are close to each other geographically, their degree of affectedness by extreme weather events between 2000 and 2019 differed significantly. The Global Climate Risk Index (2021) ranks Haiti in place three with regards to weather-related loss events globally while the D.R. is in place 50 (Eckstein et al., 2021). The following analysis examines how a set of interacting factors influence differences in the two countries' vulnerabilities to similar climate change hazards. After analysing the root causes for each country's vulnerabilities, I will focus on dynamic pressures, and eventually on unsafe conditions, following the progression of vulnerability as depicted in the PAR model. Each section will first look at Haiti, then at the D.R.

## **Root Causes**

This first section will focus on the underlying root causes of the countries' vulnerabilities to climate change related hazards. It is comprised of limited access to power, structures, and resources, as well as ideologies regarding the economics and politics of each of the two countries. The root causes of vulnerability will later interconnect with the following two stages of the vulnerability progression, i.e., the dynamic pressures and unsafe conditions.

### **Haiti**

In the case of Haiti, the current disordered situation shows how the limited access of the population to power and resources is intertwined with Haiti's political and economic system. Haiti's political landscape has long been characterised by arbitrariness and instability. Six presidents were in power since 2000, in addition to the current interim leadership of Henry after the assassination of prior president Moïse. During that period, only Preval (2006-2011) and Martelly (2011-2017) managed to serve their full terms (Embassy of the Republic of Haiti, n.d.). According to Freedom House (2022b), corruption in Haiti is high, as is impunity for government officials. Moreover, they found that a "series of expired mandates and constitutional impasses [are] leaving citizens without proper political representation" (Freedom House, 2022b). Even when there are elections, women are largely discouraged from participating in politics because of "election-related violence and social and cultural norms" (Freedom House, 2022b), leading to a restricted access to power for Haitian women. Though it is not the political system itself that inhibits women from entering politics, there is a strong societal influence. Furthermore, ever since the assassination of Henry in 2021, there have not been official elections to appoint a new president. The political instability is benefitting gangs, which are increasingly taking over Haiti, especially its capital city Port-au-Prince (Paultre & Cameron, 2023). Hence, Haiti's democratic structures are severely impaired, removing the power from its people and leaving it to a small elite (Sullivan, 2023) and criminal gangs, which can now decide about the distribution of resources and influence. Almost half of Haiti's population, about 4.9 million people, is currently highly food insecure. Though not the mere fault of gangs, they are now contributing to the problem by restricting access to water and food, and by controlling large parts of the country where rice is grown (Taylor, 2023). A major reason for the food crisis is inflation, which has sharply increased food prices and made groceries unaffordable for large parts of the population. Per January, Haiti's inflation has

increased by 49.3% compared to the previous year (Institut Haïtien de Statistique et d'Informatique, n.d.). The country's main industry is agriculture (Ferguson et al., 2023), yet Haiti must import much of the food it consumes (International Trade Administration, 2022a). Due to Russia's war on Ukraine, international food prices increased, which put high pressure on Haiti (UN News, 2022). Moreover, Haiti's currency, the Gourde, has increasingly become weaker to the US Dollar. And since the US is one of Haiti's main trading partners (Trading Economics, n.d.a), the imported goods are becoming too expensive for much of the population. According to the Gini Index in 2021, income inequality in Haiti is high (Romero, 2022a), and overall income is low. In the same year, about 30% of Haiti's population lived below the extreme poverty line of US\$ 2.15 per day (World Bank, 2022a).

A series of crises, above-mentioned political instability, and failed international intervention over the last two decades left the country with a fragile economy which is now about to collapse. Abi-Habib (2021) states that international aid providers created a "system where questionable actors with little national support — like Mr. Moïse — are propped up, the easiest way to achieve short term stability", instead of allowing Haiti to "carry out the institutional reforms necessary to rebuild the country". Moreover, Abi-Habib reports that "international aid given to the government had gone missing" (2021), once again pointing to corruption and untransparent governance.

### **Dominican Republic**

Haiti's neighbour, the D.R., also struggles with systemic corruption (Freedom House, 2022a). However, the government is taking active steps to counteract it. Since 2010, the D.R. has increased its budget transparency, scoring 77 out of 100 points by the judgement of Freedom House, while 45 points is the global average. This transparency is crucial for ensuring that "public money is spent on public interests" (International Budget Partnership, 2021, p. 1). Current president Abinader is also actively pursuing government transparency by implementing a set of reforms, alongside a police reform for improving officers' training and national security ("Luis Abinader says now more corruption cases are uncovered due to "open government", 2022). Public participation, i.e., allowing citizens to directly influence where the money is spent on, is a key pillar for transparency. As of 2021, the D.R. scored 22 out of 100 points, which is low, yet higher than global average (International Budget Partnership, 2021). The D.R. is a representative democracy with regular and free elections. However, "economic

oligarchies and organized crime groups have some influence over the political sphere” (Freedom House, 2022a). Another constraint on access to power for all people is a court decision from 2013 which took away citizenship of many Dominican-born people with Haitian ancestry (Sagás & Román, 2017). And though a 2014 law revised the 2013 act and enabled some of the impacted people to regain their citizenship, many have lost their right to vote (U.S. Embassy Santo Domingo, 2023). A good development though is that small parties can easily be formed (Freedom House, 2022a) and hence build up a diverse opposition to those who are currently in power, allowing for democratic discussion and representation of different perspectives.

The D.R. is a mixed economy with private and state enterprises, mainly based on providing services such as tourism, agriculture and free trade zone manufacturing (González & Wiarda, 2023; International Trade Administration, 2022b). The diversification of its industries makes the country more resilient to shocks, whether climate change related or not. For example, the country quickly recovered after the COVID-19 pandemic with a GDP growth rate of 12.3% in 2021 as compared to 2020 (World Bank, n.d.c). The D.R. has generally been enjoying stable economic growth over the last 25 years, making it the second fastest growing economy in Latin America and the Caribbean region (World Bank, 2022b). Though poverty remains an issue, its levels are much lower than compared to Haiti. In 2021, about 5.2% of the D.R.’s population lived in extreme poverty. Ever since 2004, poverty and extreme poverty have been constantly declining with only occasional small exceptions (CEPALSTAT, n.d.a). Although income inequality among the population exists, it is relatively reasonable and has generally been declining over the last 20 years (World Bank, n.d.d).

## **Dynamic Pressures**

This section will analyse how the root causes unfold more clearly under dynamic pressures. First, the focus will be on assessing a potential lack of local institutions, training and appropriate skills, local investments and markets, as well as lack of press freedom and of ethical standards in public life. After that, I will investigate how climate change vulnerability is influenced by macro forces such as population change, urbanisation, decline in forests and soil productivity, arms expenditures, and debt repayment schedules.

## Haiti

Haiti is substantially lacking basic infrastructure. This is partly due to the country's long history of economic instability, which will be explained further in the section on debt repayments below. There is an insufficient number of well-equipped hospitals and schools, and the food markets are currently breaking down. The Pan American Health Organization (PAHO) found that healthcare in Haiti "remains fragmented" and especially the "accessibility for rural community is a recognized inequity" (Pan American Health Organization, n.d.a). PAHO further states that decreasing public financing and continuous instability in the country's governance are hindering the development of its healthcare system, although the Haitian Ministry for Public Health and Population has a ten-year plan which aims at providing universal healthcare to its citizens.

With regards to food markets, there are two directions in which goods are traded. The first system consists of locals who sell their products on local or larger markets in the region to either a direct consumer or to a distributor who then sells the product in the cities (Schwartz, 2019). Markets in rural areas occur frequently, yet at irregular times, and are easily accessible to consumers. The other system is based on imports of mostly processed foods, rice, and cooking oils. These products are either sold to more wealthy people in urban areas, or distributors move them to more rural regions and towns, where the goods are often sold in small shops (Schwartz, 2019). Hence, the diversified food system appears resilient in theory. However, as the current food crisis shows, natural disasters and change in soil condition have reduced agricultural activities in the rural areas, and international food imports have become more expensive. These coinciding crises severely reduce the availability and accessibility of food, leaving half of the population currently food insecure (Taylor, 2023).

Opportunities for education are also insufficient, especially regarding higher education, which can be connected to the lack of training and appropriate skills. However, considerable progress has been made. As further explained in the section on population change, Haiti has a young dependency ratio, which puts a lot of pressure on the national school system. Thus, the state might not be able to provide essential education to everyone. Although Haiti has the sixth lowest percentage of GDP in spendings on education in the world and ranks last among countries of Central America and the Caribbean Region according to 2020 estimates (The World Factbook, n.d.a), Haiti's government is taking active steps for increasing literacy among its younger population. In its national report submitted to the Human Rights Council in 2022,

Haiti stated that free basic education has been expanded from six to nine years. Moreover, the report reveals that the number of state schools has doubled since 2000, and overall provision of education, public and private, has increased by over 20% until 2019 (United Nations General Assembly, 2022). Nevertheless, higher education remains unattainable for most of Haiti's population due to a deliberate language barrier. French is still the default language, although colonisation by France ended over 200 years ago, and about 90% of the Haitian population are monolingual in Haitian-Creole, not French. Hence, "Haitians are expected to acquire the foundation for personal and societal development in an inaccessible foreign language" (Hebblethwaite, 2021). Another side effect is that "Haitian students will not be able to learn about [...] climate change" (Hebblethwaite, 2021), among other topics, although knowledge about climate change and its impact on Haiti must become more widespread among the population. This language barrier must be removed to make the higher education system accessible to more people. Besides, overall job opportunities must be fostered, also for people with lower education, to stop Haitian emigration. This is essentially tied to the development of the country's economy. New jobs should be created in a diversity of economic sectors, making the national economy more resilient to shocks and the population not dependent on only one sector. The state must actively support local investments and people that start businesses to create new job opportunities so that people can have a stable income.

Another dynamic pressure is press freedom, which is important for any democracy. Regarding climate change vulnerability, free press ensures that the public is always well-informed about potential hazards and their consequences. Moreover, a free press is "gathering and transmitting information about affected areas; alerting government officials, relief organizations and the public to specific needs; and facilitating discussions about disaster preparedness and response for continuous improvement.", (Dave, 2021). Free press is also a crucial tool for holding the government responsible. A state-controlled media could cloak the consequences of a disaster made worse by poor governance. Although Haiti's constitution secures free press, journalists enjoy only little protection and often face threats (Freedom House, 2022b). Haiti's president prohibited the sharing of pictures of dead bodies during the COVID pandemic per decree, which shows that the government is still able to interfere with the supposedly free media during times of crisis. Therefore, the press does not reach its full potential for disaster management in Haiti.

From 2004 until 2017, the UN Stabilization Mission in Haiti (MINUSTAH) operated in Haiti. Its main task was to promote and protect Human Rights (The World Factbook, n.d.b). The mission has been highly disputed for several reasons such as connections to the new cholera outbreak in Haiti, and incidents of sexual abuse. Moreover, according to a UN report from 2018, “[s]ocial grievances, corruption and weak institutions still constitute major obstacles to the realization of human rights in Haiti.”, (p. 3). The report further lists recommendations that urge improvements regarding “human rights mechanisms related to pretrial detention, prison overcrowding, criminal legislation, accountability, illiteracy and the situation of internally displaced persons and migrants.”, (United Nations General Assembly, 2018, p. 1). Regarding climate change vulnerability, the OCHCR emphasizes that natural disasters severely impact the realisation of human rights in Haiti. Furthermore, political instability made the justice system fail. In 2022, only “3 of 12 justices of the Supreme Court of Justice continued working—meaning the court lacks a quorum to hear cases and issue rulings.”, (Human Rights Watch, n.d.).

An important macro force is debt repayment schedules. In 2022, Haiti’s external debt to GDP ratio was 23.1%, significantly lower than the average of the Latin America and Caribbean Region with 69.3% (International Monetary Fund, n.d.). However, Haiti has a long history of indebtedness, which profoundly influenced the current state of Haiti’s development. It began with the country’s independence in 1804 when France demanded Haiti to pay it 150 million francs. Though it was later reduced to 90 million francs, Haiti still paid 112 million francs, totalling an estimated US\$ 560 million worth today (Gamio et al., 2022). Haiti had to pay to become completely independent from its former coloniser and to be recognised as such. France further argued that the money served as compensation for previous slave owners who lost their properties. In addition to the huge debt payment, Haiti had to grant favourable customs treatment to French imports (Oosterlinck et al., 2022). The first payment over 30 million francs was about six times of Haiti’s total revenue, which forced the country into getting a loan from France, pushing Haiti into a double debt to France (Gamio et al., 2022). Though Haiti fully repaid its debt by 1947 (Sperling, 2017), the aftereffects still shape the state of Haiti’s economy today. The long-term debt withdrew Haiti of its “ability to build the essential institutions and infrastructure of an independent nation” (Porter et al., 2022). It is “felt in Haiti’s public hospitals, many of which lack basic equipment and supplies [and] in Haiti’s inadequate water and sanitation infrastructure”, (Gamio et al., 2022). Estimates

suggest that, if it were not for the debt, Haiti would have a similar per capita income as the D.R. today (Porter et al., 2022).

A second macro force is national arms expenditures. In 1995, Haitian president Aristide disbanded the national army due to repeated political interference. Only in 2017, after UN Security forces left the country, it was re-established. The main tasks of the Haitian army include border control, especially to inhibit smuggling, and to provide assistance during natural disasters (“Haiti to reform army after 20 years without”, 2017). Military spendings are very low, totalling only 0.2 % of the national GDP in 2021 (World Bank, n.d.g). With about 15,000 officers, the police remains the most important body for national security. Haiti cannot expect much financial support from other countries to build its army, as international donors have just “poured billions of dollars into developing the Haitian National Police” (“Haiti to reform army after 20 years without”, 2017). Hence, with about 2000 soldiers in 2023 (Sanon, 2023), the Haitian army plays a minor role in disaster management.

According to the PAR model, rapid population change is another important dynamic pressure. Haiti’s population is steadily increasing, though its population growth rate has been generally declining since 1990, reaching 1.2% in 2021 (World Bank, n.d.e). Haiti is among the countries with the youngest population in Latin America, though its demographic is slowly shifting toward becoming an older population. Over the last decade, the age group of fifteen- to 65-year-olds has been increasing while the group of up to fifteen-years old remained stable (Romero, 2022b). Usually, a “young population brings many opportunities for economic growth and innovation, if these opportunities can be recognised and utilised.”, (United Nations, n.d.). A lack of education and perspective for such a young population can have severe consequences. For example, not being able to find work could draw them into joining criminal gangs like those currently taking over Port-au-Prince, further destabilising the country.

Another important trend when looking at Haiti’s population is migration within Hispaniola. For 2023, it was estimated that Haiti had a net migration rate of -1.86 per 1000 inhabitants (The World Factbook, n.d.b). Haiti is the top emigration country in the Caribbean while the D.R. is the top immigration country (International Organization for Migration, 2022). Haitians serve as cheap labour in the D.R. and send remittances to their families to support them financially. The lack of economic opportunities, as well as concerns for safety and security within their home country keep pushing Haitians to emigrate (International Organization for Migration, 2022).



Apart from international migration, Haitians also relocate within their country. In 2021, urbanisation in Haiti was at 58% (World Bank, n.d.f). Rapid urban development is “not accompanied with investments in infrastructure that would be adequate” (“Haïti: l'urbanisation s'accélère sans créer de richesses”, 2018). Hence, if not paired with necessary improvements in the cities' infrastructures, “rapid urbanisation [will be] putting increased numbers of people at risk” (Wisner et al., 2004, p. 5). As of 2018, “a third of Haitian city dwellers still [did] not have access to drinking water and two thirds [did] not have access to sanitation services” (“Haïti: l'urbanisation s'accélère sans créer de richesses”, 2018). Not only are overpopulated cities with insufficient infrastructure more vulnerable to natural disasters, but the disasters themselves also inhibit the economic development of the cities by frequently destroying what has already been built, setting back any developmental progresses (World Bank, 2018).

One key reason behind Haiti's rural-urban migration is the degradation of arable land in the rural areas, which consequently restricts possibilities for successful farming (Alscher, 2011). In a paper published by Hedges et al. (2018), they found that “Haiti has less than 1% of its original primary forest and is therefore among the most deforested countries” (p. 11850). Large-scale deforestation has a long history on Hispaniola, beginning with the French and Spanish colonisers' extraction for their plantation economies and wood production (Alscher, 2011). Deforestation increased after the colonisation when Haiti could not repay its debt to France and was forced to cut down much of its forest to sell the tropical timber. Over the last decades, deforestation was mostly driven by the need for charcoal as energy source (Cohen & Singh, 2014) and cleared areas for agriculture and livestock production (Alscher, 2011). Reforestation efforts exist, some driven by the government and supported by the United Nations Environment Programme, others initiated by NGOs (United Nations Environment Programme, 2021; Hance, 2022). Nevertheless, any successes must be strictly monitored and protected, as the need for forest resources remains large and “most of the established protected areas [by the state] are not generally supported by management plans and adequate resources” (Posner et al., 2010, p. 12). The extensive deforestation already increased droughts due to changes in rainfall patterns, and increased the occurrence of landslides due to lack of natural barriers such as forests. Altogether, the current deforestation level significantly increases Haiti's vulnerability which “becomes obvious when comparing the impact of tropical storms and other extreme weather events in Haiti and the Dominican Republic.”, (Alscher, 2011, pp. e168-

e169). The deforestation is accompanied by decline in soil productivity. Estimates suggest that approximately half of Haiti's topsoil has been washed away by erosion which is a natural consequence of deforestation. Hence, "the affected lands have become irreclaimable for farming purposes" (Alscher, 2011, p. e168) and rural populations are forced to migrate to urban areas to find other livelihood activities.

### **Dominican Republic**

Although access, coverage, and resources of the healthcare system are above average in the D.R., "deficiencies in the quality of the services, inequalities in the regional distribution of the resources, and inefficiencies in public expenditures" (Rathe, 2018, p. 31) persist. The provision of healthcare services accumulates in urban areas, and particularly the people working in the informal sector often lack access to healthcare, most of whom are migrants, i.e., Haitians (Morales & Rodríguez, 2022). Rathe (2018) further states that the resulting poor health outcomes are also related to distribution of income and opportunities. A report by the Pan American Health Organization (PAHO) presents how, like Haiti, the D.R.'s government has been focusing on advancing access to universal healthcare for all its citizens and improving access to clean drinking water and sanitation for all (n.d.b), the latter already having shown progress since the early 2000s (World Bank, 2022b). The report states that the country's government is aware of existing inequalities regarding access to healthcare and thus aims at erasing these inequalities. Although PAHO mentions socially marginalised groups as one target group for improving access to universal healthcare, it does not explicitly name people of Haitian descent, which are often denied access to public services due to revocation of their citizenship.

Another healthcare issue in the D.R. is teenage and adolescent pregnancy. In turn, this mostly unplanned motherhood is a major obstacle for girls' and women's education in the D.R, apart from cultural norms that keep them from going to high school (Núñez, 2022). Numbers of students enrolled in and finishing higher education are generally low in the D.R., regardless of gender (Ministerio de Educación de la República Dominicana, 2017). Nevertheless, and in contrast to Haiti, the D.R. has a very high literacy rate of 98.9% among its 15-to-24-year-olds in 2021 (CEPALSTAT, n.d.a). In 2021, about 90% of children were enrolled in primary education which is free and mandatory for all, with equal numbers among girls and boys.

Food supply systems are another key infrastructure. In the D.R., there are two food retail channels, modern and traditional. The first is comprised of supermarket chains and food shops with mostly imported goods, while the latter system consists of neighbourhood stores and walk-in food warehouses with mostly local food products (Carvajal, 2020). Although the modern market is growing, the traditional market still dominates food distribution in the D.R. This “broad mix of domestically produced and imported products” (Carvajal, 2020) makes the country’s food system more resilient as it does not heavily depend on imported food. Hence, if a disaster hampered food imports to the D.R. for some time, the country would still be able to sustain itself through the traditional markets. Likewise, if a natural hazard hit and local food production was temporarily reduced, structures for food distribution from global markets already existed and would probably dominate in times of crisis.

The situation regarding press freedom is similar to that of Haiti. The country’s constitution protects free media, and Reporters Without Borders found that the media landscape in the D.R. is “diverse, strong and dynamic and the journalists regularly reveal scandals involving personalities in power and also those who were in power and/or are close to these two sectors.”, (n.d.). However, journalists are still occasionally found guilty of committing defamation or libel (Reporters Without Borders, n.d.). Hence, journalists do not enjoy full protection and might risk legal consequences or regulatory pressure when investigating issues such as corruption with powerful people being involved (Freedom House, 2022a). Nevertheless, free press is currently becoming further decriminalised and enjoying increasing protection. It can thus generally perform its essential role of informing the public before, during and after the occurrence of a hazard.

The D.R. struggles with incidents of several human rights violations. Though the government is actively prosecuting and punishing officials who were corrupt or violated human rights, it has also been the perpetrator in some cases. Moreover, it was sometimes inconsistent, and “ineffective application of the law sometimes led to impunity.”, (U.S. Embassy Santo Domingo, 2023). A problem in particular is police brutality, to which president Abinader responded with reforming the police system in the D.R (Freedom House, 2022a). Furthermore, *anithaitianismo* poses several threats to human rights realisations. It is a form of racism directed toward Haitians, Haitian descendants, or Black citizens of the D.R. who are assumed to be of Haitian descent, including both systemic racism and everyday interpersonal harassment. After the

2013 rule, Haitians in the D.R. were left “unable to perform basic civil functions such as register children at birth, enrol in school and university, participate in the formal economy, or travel in the country without risk of expulsion.”, (Human Rights Watch, 2015). The human rights situation in the D.R. displays how the state deliberately mistreats certain population groups that it does not recognise as its own, thereby choosing who will be given protection from hazards, and who will not.

The D.R.’s current population growth rate is 1.1% annually, which has been constantly decreasing over the last decades (World Bank, n.d.h). Hence, Haiti and the D.R. are experiencing similar population growth rates. However, life expectancy is ten years higher in the D.R. compared to its neighbour, and the people ratio aged 15 to 65 compared to zero-to-15-year olds is lower (CEPALSTAT, n.d.a; CEPALSTAT n.d.b), meaning that the overall pressure on the infrastructure is also reduced. For example, there will be less children per adult teacher, parent, or doctor. Hence, children can on average enjoy better education and health care, which makes the society more resilient.

Another factor regarding population change is location. While population growth is currently at -0.8% in rural areas, cities enjoy a growth of 2.4%. The D.R. is already highly urbanised, with about 83% of its population living in cities in 2021 (World Bank, n.d.f). The problem is that the “majority of Dominican cities grow from scattered and disorganized manner” (“Economic boom in the Dominican Republic brings chaotic urban growth”, 2022). Moreover, spendings on urban development are rather low, leaving many of its citizens without proper access to basic services such as the provision of water, sanitation, and electricity (Ereno Blanchet et al., 2022).

In 2021, arms expenditures in the D.R. were 0.7% of its GDP, a number that has not changed much since 2003 (World Bank, n.d.i). Hence, the D.R. spends comparatively more on its military than Haiti. This is, nevertheless, below global and regional average (World Bank, n.d.g). As of 2022, the D.R.’s military is mostly focused on border control, drug trafficking, and disaster relief (World Factbook, n.d.c). It also simulates disaster situations, where it actively includes civilians and students to participate in these events, so that they can learn and forward their knowledge to others (Ruiz, 2019). Thus, the D.R.’s military plays a more important role regarding climate change resilience than the military of its neighbouring country.

Unlike Haiti, the D.R. did not have to pay any debt to its former coloniser Spain when they gained independence. In 2021, the external debt of the D.R. to its GDP was 46.2% (Focus Economics, 2023), which has continuously increased over the last decade, reaching a historic peak in July of 2022 (Trading Economics, n.d.b). This level of external debt is similar to the average of Latin America and the Caribbean region (O'Neill, 2023). The money can be used for necessary investments in infrastructure, which is crucial for reducing vulnerabilities to climate change events in the D.R. However, developing and emerging economies that have high levels of external debt are often using public finances to repay the debt instead of investing it into the country's infrastructure, which "will be locking [them] into a cycle of unsustainable debt further fuelled by climate impacts", (Global Development Policy Center, 2022). However, external debt is unproblematic for the D.R. as long as it continues to experience stable economic growth. A report published by the Organization for Economic Co-operation and Development (OECD) classified the risk of external debt of the D.R. as economically "sustainable" (Piemonte, 2021, p. 17). In sum, the D.R. was able to build necessary infrastructure after its independence as it did not have the burden of a long-term double debt like Haiti did. The D.R. might have a higher external debt to GDP ratio than its neighbour but is also better able to benefit from and repay it.

Large-scale deforestation has been an issue in the D.R., too, also starting with colonisation. Throughout the 20<sup>th</sup> century, deforestation has mostly occurred because of agriculture, livestock farming and logging (Agence Française de Développement, 2020). However, today's deforestation level is much lower than in Haiti due to large-scale reforestation efforts since the 1980s. Moreover, the D.R. has actively been promoting energy sources other than charcoal which had been putting a lot of pressure on the forests (Alscher, 2011). As the World Bank (2020) pointed out, reforestation substantially improves resilience to climate change because it decreases the risk for soil erosion and hence landslides. Also, forests regulate the hydrological cycle and foster biodiversity. Therefore, the active engagement of the D.R.'s government in reforestation decreases the country's vulnerability to natural hazards. Conventional agriculture depletes the soil of its nutrients, making it unproductive in the long term and hence risking food insecurity among the D.R.'s population. Reforestation increases nutrient availability in the soils again. To still enable food production, agroforestry could be a viable solution if implemented correctly and adjusted to contexts (Deheuvels, 2017). It can

significantly contribute to food security, biodiversity and reduced climate change vulnerability. Similarly, the United Nations Environment Programme (2017) report recommended promoting sustainable agricultural development in the border zone of Haiti and the D.R., alongside better environmental governance, and other measures.

## **Unsafe conditions**

This segment on unsafe conditions connects all three stages of the progression of vulnerability. They include aspects of the physical environment, such as dangerous locations and unprotected buildings and infrastructure. Furthermore, unsafe conditions also explore the impacts of activities in the local economy and show how particular population groups are experiencing higher risks than others. Unsafe condition also includes a short section on the lack of local institutions and investigates any relevant prevalence of disease on Hispaniola. Eventually, I will analyse one of the most important aspects, which is disaster preparedness through public actions and institutions.

## **Haiti**

As presented in the introduction to the analysis, Hispaniola faces several climate change related threats, namely droughts, floodings, landslides, hurricanes, and storms. Clearly, some areas on the island are more dangerous than others. When looking at Haiti, particularly the country's most populated cities which are located along the coast face increased risks. As they are surrounded by steep, deforested hills, rainwater is often accumulating and henceforth flooding the urban areas (Climate Change Knowledge Portal, 2021). Moreover, coastal regions are more likely to suffer the dramatic consequences of hurricanes and storms, as these hazards will strike the coasts first. The rural areas, which is where most of Haiti's agriculture is done, are increasingly at risk of droughts. This is a consequence of changes in precipitation patterns, largely due to the massive deforestation, as well as the change in overall climate due to global warming (Alscher, 2011; Elusma et al., 2022). Hence, while urban populations are more likely to suffer floodings, storms and hurricanes, rural populations are faced with loss of water supply and livelihood. The decrease in possibilities for agriculture affects people in entire Haiti and is already visible in the current food crisis.

Although urban populations are generally very prone to disasters, differentiations still need to be made with regards to who is affected in particular. Wisner et al. (2004) state that

urbanisation “results in land pressure as migrants from outside move into already overcrowded cities, so that the new arrivals have little alternative other than to occupy unsafe land, construct unsafe habitations or work in unsafe environments” (p. 70). This concerns especially low-income families that are forced into living in urban squatter settlements (Wisner et al., 2004). Hence, once a hazard strikes, poorer urban populations are particularly at risk due to substandard building quality and lack of infrastructure, as already explained in the section on urbanisation as a dynamic pressure. Where people live and work essentially depends on their socio-economic class. They are being pushed into positions where they become vulnerable. An example given by Wisner et al. (2004) is that “poor people can only afford to live in slum settlements in unsafe ravines and on low-lying land within and around the cities where they have to work.”, (p. 6). They further state that, although vulnerability is not a direct consequence of poverty, “the two are often very highly correlated.”, (p. 12). Thus, Haiti’s low-income population has generally decreased capacities to deal with climate change hazards due to restricted access to resources and information. Nevertheless, Haitians can clearly not be seen as homogenous group with equal levels of vulnerability to climate hazards. As already mentioned throughout the analysis, there are special groups at risk in Haiti as vulnerability depends on different factors and how these intersect. A detailed examination of all forms of vulnerabilities would exceed the limits of this paper. Among the most significant factors that can influence a person’s level of vulnerability are gender, people in need of medical assistance or care, and age (Wisner et al, 2004, pp. 6;11). Also discussed were the role of a person’s immigration status, as to whether they are ‘legal’ or ‘illegal’, and the role of ethnicity more generally, which is a relevant key variable for Haitians living in the D.R. Moreover, Wisner et al. (2004) mention the importance of the nature and extent of social networks.

Furthermore, there is generally a lack in local institutions in Haiti, in both rural and urban areas. I will not reiterate previous findings here, but rather shortly focus on the more recent, specific events regarding local institutions and how this impacts vulnerability to climate change events. In the capital city Port-au-Prince, gang violence is taking over and the police is continuously losing power there (Paultre & Cameron, 2023). Hence, security in everyday life can no longer be guaranteed to the citizens. Due to substantial flaws in healthcare infrastructure, international aid organisations have set up short-term solutions to help the Haitian population. However, the increasing gang violence is resulting in blockages of

humanitarian aid and several “international humanitarian officials have left the country due to dire security conditions in recent months”, (International Crisis group, 2022, p. 7). Thus, sick people or those who have been victim to gang violence related collective rape have reduced possibilities for seeking help. The gangs in Port-au-Prince are using sexualised violence to intimidate and control the population. Furthermore, the Office of the United Nations High Commissioner for Human Rights reported that “once victims of sexual violence manage to relocate, they are usually deprived of their belongings and resources, and are then exposed to further risks and vulnerabilities” (2022, p. 11), including natural hazards.

The restrictions for healthcare also aggravate Haiti’s current cholera epidemic. In October of 2022, Haiti reported a re-emergence of cholera after managing three years without any new cases (World Health Organization, 2022). The epidemic shows disproportionately high numbers in the Ouest department, in which Port-au-Prince is located. Moreover, affected people are predominately male, and mostly children in the age group of one to four years, followed by people aged 20 to 39 (World Health Organization, 2022). Vulnerability to cholera is very high due to several factors, most of which are rooted in the dynamic pressures presented earlier. Factors include, for example, food insecurity, the lack of access to clean drinking water and sanitation, internal displacement in urban areas due to gang violence, and overall limited healthcare capacities (World Health Organization, 2022). The cholera outbreak is now putting additional pressure on the country, particularly on its healthcare system. Moreover, sick people are generally more vulnerable to climate change events. A hazard could destroy key infrastructure that is necessary for treating people infected with cholera, thus decreasing their chances for survival.

Haiti regularly experiences reoccurring weather events. Recently, these have been changing in magnitude and timing due to climate change, such as droughts. However, Haitian communities have started building resilience and “are challenging cycles of extreme weather” (Dickinson, 2022), often with the support of international organisations such as the World Food Programme and government support (United Nations General Assembly, 2022). Moreover, the government has implemented a set of measures aiming at raising awareness of natural disaster risks, including drills, setting up emergency operation centres at different governance levels, and spreading educational messages (United Nations General Assembly, 2022). Nevertheless, hazard awareness among the Haitian population and small-scale resilience projects must also be paired with institutional capacities to prevent disasters in the



first place or to respond adequately after a disastrous event happened, which often remains insufficient. An example of the government's restricted involvement in climate change response is the case of Lake Azuéi, where "climate-induced variations in lake level [...] have led to extensive flooding" (Sheller & León, 2016, p. 32). Research found that often the "Haitian national government was described as incapable or unwilling to take responsibility.", (Sheller & León, 2016, p. 41). However, there are multiple actors involved in risk reduction and disaster response on Hispaniola. One key institution in Haiti is its national Civil Protection Agency (DPC), which is working under and receiving support from the Ministry of Interior and Territorial Communities. The DPC coordinates on-site disaster relief and disaster-related research for Haiti, also fulfilling other tasks. Furthermore, the DPC is responsible for the well-functioning of Haiti's National Disaster Risk Management System (SNGRD) (Protection Civile, n.d.). The SNGRD is a decentralised apparatus that, in times of crisis, is activated through emergency operation centres and supported by about 20.000 volunteers (Ministry of Planning and External Cooperation of the Republic of Haiti, 2021). The SNGRD is responsible for coordinating humanitarian assistance, crisis information and analysis, emergency operations and needs assessments (Ministry of Planning and External Cooperation of the Republic of Haiti, 2021). The national government is implementing a set of mitigation measures including "canal clearance, watershed management and the repair of houses whose roofs are damaged or have holes" (United Nations General Assembly, 2022, p. 18) prior to the occurrence of an expected hazard. Additionally, a warning system has been installed. Haiti, unlike the D.R., is also part of the Caribbean Disaster Emergency Management Agency (CDEMA). CDEMA is an intergovernmental disaster response organisation in the Caribbean that coordinates and provides aid in times of crisis (Caribbean Disaster Emergency Management Agency, n.d.). For example, the DPC requested coordination assistance from CDEMA after an earthquake in August of 2021. CDEMA then deployed members of the CARICOM Operational Support Team to Haiti (CARICOM Today, 2021). CARICOM, the Caribbean Community and Common Market, is a regional organisation that "promotes and supports a unified Caribbean Community" (CARICOM, n.d.) in political and social regards.

Despite the benefits of immediate response aid, it does not always provide what it promises. For example, the American Red Cross raised almost US\$ 500 million to rebuild Haiti after the earthquake in 2010. However, large amounts of the money raised "never reached the people" (Sullivan, 2015). Moreover, the "Red Cross has very little experience in the difficult work of

rebuilding in a developing country” and “many of the projects it started [in Haiti] ran into trouble” (Sullivan, 2015). Clearly, this case is not representative for all disaster relief work in Haiti, yet it shows that, apart from sufficient financial resources, effective disaster management requires transparency, local knowledge, and low levels of bureaucracy.

### **Dominican Republic**

As Haiti and the D.R. are sharing one island, the type of physical exposure to hazards is similar in both countries. Hispaniola is located in a hurricane belt, resulting in storms that often damage the coastal areas, in the D.R. especially in the north-eastern region (Climatelinks, 2017). Hence, this zone is also more prone to floods and mudslides. Due to their proximity to the coast, many cities in the D.R. are highly exposed to natural hazards. This, combined with the fact that the country’s urban areas are “growing in an unplanned and disorganized way” (“Dominican urban sprawl; from 56.7% to 81.7% in 28 years”, 2022) makes them highly vulnerable to climate change events. Rural populations are faced with a different threat. Increasing temperatures result in more droughts, which jeopardise agricultural harvests (Climatelinks, 2017). These climate changes will impact the people’s livelihoods, whether it is agriculture in the countryside, or tourism and fisheries in the coastal areas (Climatelinks, 2017). As tourism is an important sector of the D.R. ’s economy, many jobs are at stake. However, there are also other groups at risk of climate change hazards. Most of the key variables that influence vulnerability have been presented in the section on unsafe conditions in Haiti, and apply to the D.R., too. A group to point out is Haitian immigrants or people of Haitian descent living in the Dominican Republic. Many of them have been stripped of their citizenship, which puts them “in a position of permanent vulnerability” (Sagás & Román, 2017, pp. 54-55). The cycle of poverty that they are put in involves unsafe housing, lack of resources to rebuild homes after a hazard struck, restricted access to necessary health care and education to break out of this poverty trap (Sagás & Román, 2017, p. 55), which eventually results increased climate change vulnerability. As the non-profit organisation Entreculturas states, the “lack of nationality makes more vulnerable a population that already lives in un human conditions in the most marginal urban settlements or in the "bateyes"” (2008). Bateyes are sugar cane settlements where many Haitian immigrants went to find work. Though many of the state’s bateyes are closed today or became privatised, hundreds of thousands of Haitians or people of Haitian descent remain in these neglected villages. The D.R.’s

government is known for withholding essential services in these regions, resulting in a massive lack of sanitation, electricity, food security, schools and hospitals. Children of the Nations reports that “when natural disaster strikes [...], the bateyes are the last in line to receive assistance from the government—if they receive any at all.”, (n.d.).

Referring back to the example of Lake Azuéli, which is located on Hispaniola’s internal border, a set of interviews among inhabitants on the D.R.’s side showed that multiple participants identified the national government as key actor who responded to the climate change induced event (Sheller & León, 2016). Though again not representative for the country’s general engagement in climate change response, it is a clear illustration of the differences between government capacities in Haiti and the D.R.

A key institution in the D.R. for responding to disasters is the National Emergency Commission (CNE). Its task is to “ensure for the appropriate response and management of disasters; caused by floods, earthquakes, storms, hurricanes, fires, shortages, inadequate distribution of material supply, or other similar reasons” (UN-SPIDER Knowledge Portal, n.d.) and to generally ensure welfare and protection within the country. The CNE is controlled by the National Council for Disaster Prevention, Mitigation and Response (CN-PMR), and hence responsible for implementing CN-PMR’s policies (Comisión Nacional de Emergencias, n.d.). One of the 34 institutions that constitute the CNE is the Dominican Republic’s Red Cross. A recent project in which the Red Cross was involved with in the D.R. was *Resilient Islands*. Its purpose was to support the restoration of natural habitats as a form of both climate change adaptation and mitigation strategy. One focus area was increasing habitats with mangroves which reduce the impacts of floods and storms (International Federation of Red Cross and Red Crescent Societies, 2021). This is crucial for the D.R. as much of its population lives in urban areas along the coast, and their lives and livelihoods are currently profoundly at risk of being hit by a climate change hazard.

Moreover, both the D.R. and Haiti have been receiving aid from the United Nations (UN). For example, the UN Stabilization Mission (MINUSTHA) supported Haiti after the Hurricane in 2010 (UN News, 2010), and the UN also provided aid to the D.R. in 2007 after the country experienced a major storm (UN News, 2007).

## Discussion

Root causes, dynamic pressures and unsafe conditions are deeply interconnected. All three stages heavily influence the countries' vulnerabilities to climate change events today and in the future.

The analysis showed that Haiti's weak economy and political instability are leaving the country highly vulnerable to disasters. Haiti is unable to invest in safe infrastructure or to provide basic necessities to its citizens. Large parts of the population live in poverty, and about half is currently suffering from high food insecurity. International aid seems inevitable but has often proven insufficient or inefficient because of low institutional capacity. Furthermore, democratic elections are unlikely to happen, impeding the possibilities for a stable and representative government that could lead the country out of its crisis. The current government, characterised by corruption and nonrepresentation of its citizens, may not act in the interest of the population's safety, but rather in self-interest, i.e., personal economic gain and influence. Hence, Haiti's instable economy and non-representative government are leaving the country highly vulnerable to climate change related hazards. The analysis further showed that a long history of indebtedness has hindered Haiti from building the institutions and infrastructures that are necessary for establishing a stable nation, which profoundly shapes the country's vulnerability to any form of disaster today. Deforestation and decline in soil quality are pushing people into cities, but urban infrastructure development cannot keep up with the high influx of people. The government must improve the provision of health services and education opportunities for its growing and especially young population. Providing the next generations with good education and subsequent employment opportunities is essential for ensuring long-term stability of the country, which again is crucial for climate change resilience. A new cholera outbreak is currently taking a toll on the Haitian healthcare system, leaving many people without necessary assistance. Another key factor in determining vulnerability is physical exposure. Hurricanes, storms and floods threaten the coastal areas, while droughts jeopardise agricultural activities in the inland. This range of threats requires a diverse set of resilience building and disaster management. Haiti has its own institutions for this while being part of regional disaster management organisations and receiving aid from international bodies such as the United Nations and its Environment Programme. However, Haiti is facing a dilemma between the urgent need for humanitarian assistance that simultaneously undermines the establishment of a stable and self-governing

state. Especially the country's capital city is currently experiencing power struggles between the state and violent gangs, which are representative of the political instability in entire Haiti as people cannot rely on receiving any support from their government.

Meanwhile, the D.R. is mostly improving its overall political performance. Although issues of corruption and public participation persist, the D.R. is currently taking active steps to advance the government's transparency and overall compliance with democratic structures and functioning. Nevertheless, systemic discrimination against Haitian-descending people remains a pressing issue, as the large-scale removal of their citizenships and hence their rights leave them without political power or the possibility to advocate for their interests as other population groups can. The D.R. is increasing its overall resilience to all kinds of hazards by improving its economic and political performance but is actively excluding one of its population groups that is already amongst the most vulnerable. Issues of income inequality and poverty persist in the D.R., though to a much lesser degree than in Haiti. Disorganised urban growth due to rural-urban migration is also a major problem in the D.R. Most cities are located by the coast, which exposes large parts of the population to climate change hazards. Much of the country's important industry such as tourism is located there. Hence, building resilient urban areas is pivotal for ensuring a safer future. Although the D.R. also faced large-scale deforestation in the past, the country is now making substantive efforts to reforest its landscape. Consequent better soil quality also allows better for agriculture in the D.R., and the harvested food is being sold alongside fewer imported foods. Press freedom is relative in the D.R., just like in Haiti, and is crucial for disaster management, though it occasionally faces infringements. Also, disaster management in the D.R. is mostly the responsibility of the National Emergency Commission (CNE), while the country also partakes in international resilience building programmes.

## Conclusion

The analysis and subsequent discussion have shown that, although vulnerabilities to climate change hazards remain in both Haiti and the Dominican Republic, they do so to different degrees and in slightly different areas, rooted in an intertwined yet distinct history of the two countries.

Haiti's main restraint on building resilience is weak governance, which inhibits the country's economic development and the possibilities for building a more equal and well-off society. In the Dominican Republic, human rights violations put the most vulnerable, the Haitian descendants, at increased risk. It is a vulnerability that people are deliberately pushed into, which therefore must be resolved by changes in government policies and action. In both countries, special attention must be paid to urban populations. People living in cities are already highly vulnerable, and urban growth is expected to continue in the future. Furthermore, reforestation is crucial for improving possibilities for sustainable agriculture that can counteract food crises in both countries, Haiti especially. In a more globalised world with more dependence on imported goods, vulnerabilities can be reduced through more self-sufficiency, as the consequences of Russia's war on Ukraine have shown.

Using the PAR model allowed for an in-depth analysis of the two countries' vulnerabilities to climate change hazards. For future research, it would be interesting to examine which climate change adaptation would be most suitable for each country according to their individual vulnerabilities.

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